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ISS
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MY
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1994

UMI

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May 24, 1994 Volume 1162 Number 4

CONTENTS

Page

Patent and Trademark Office Notices

Patent Cooperation Treaty (PCT) Information .... 1162 OG 71
Patent Cooperation Treaty Update Accession by Lithuania .... 1162 OG 71
Listing of PCT Member Countries .... 1162 OG 72
Notice of Maintenance Fees Payable .... 1162 OG 73
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees .... 1162 OG 73
Notification of Acceptance of Delayed Payment Fee .... 1162 OG 79
Reissue Applications Filed .... 1162 OG 79
Requests for Reexaminations Filed .... 1162 OG 80
Notification of Expiration of Trademark Registrations Due to Failure to Renew .... 1162 OG 80
Public Hearing and Request for Comments .... 1162 OG 82
Adverse Decisions in Interference .... 1162 OG 83
Response Requested to 1993 Patent Examiner's Action Survey .... 1162 OG 84
Patent Certificates of Correction .... 1162 OG 84
Special Boxes for Mail .... 1162 OG 86
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries .... 1162 OG 87
Patent Examining Corps .... 1162 OG 89
Condition of Trademark Applications .... 1162 OG 90
Reexaminations 2219
Reissue Patents Granted (34,612) 2221
Plant Patents Granted (8,741) 2225

Patents Granted

General and Mechanical (5,313,665) 2227
Chemical (5,314,504) 2519
Electrical (5,315,057) 2679
Design Patents Granted (347,099) 2909
Index of Patentees .... PI 1
Indices of Reissue, Reexamination, Design, and Plant Patents .... PI 89

Classification of

Patents (Including Reissues and Reexaminations) .... PI 97
Designs, and Plants Applications .... PI 101

Geographical Index of Residence of Inventors

Patents (Including Reissues and Reexaminations) .... PI 103
Designs and Plant Applications .... PI 105
Change of Address Form .... PI 107
Subscription Order Form .... PI 109

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VOL
1162
ISS
4
MY
24
1994
UMI

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1160 O.G. 93, on Mar. 29, 1994.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective Oct. 1, 1993, due to changes in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1154 O.G. 25, on Sept. 14, 1993.

International fees were changed, effective on May 1, 1993, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1148 O.G. 20, on Mar. 9, 1993.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective Oct. 1, 1992, and were announced in the *Official Gazette* at 1141 O.G. 68, on Aug. 25, 1992.

The schedule of PCT fees (in U.S. dollars), effective Oct. 1, 1993, is as follows:

International Applications (PCT Chapter I) fees:	
Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1415.00
International fees	
Basic fee	530.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
For the first 10 national or regional offices designated	128.00
For each designation fee in excess of 10 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
Designation fee	128.00
Confirmation fee	64.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	450.00
—Additional examination fee, per additional invention (payable only upon invitation	140.00
—USPTO was not ISA in PCT Chapter I	670.00
—Additional examination fee, per additional invention (payable only upon invitation	230.00

U.S. National Stage fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
All claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA		
Filed without a search report from the European Patent Office or the Japanese Patent Office	475.00	950.00
Filed with a search report from the European Patent Office or the Japanese Patent Office	415.00	830.00
Other National Fees		
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

March 8, 1994

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks.

Patent Cooperation Treaty Update

Accession by Lithuania

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Kenya deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on April 5, 1994. Lithuania will become the 69th Contracting State of the PCT on July 5, 1994. Consequently, nationals and residents of Lithuania are entitled to file international applications under the PCT on and after July 5, 1994, and from the same date it is possible to file international applications designating and electing Lithuania (country code: LT).

VOL
1162
ISS
4
MY
24
1994
UMI

Listing of PCT Member Countries

	Country	Instrument		Deposit of Instrument		Entry into Force[1]
(1)	Central African Republic[2]	Accession	15	September 1971	24	January 1978
(2)	Senegal[2]	Ratification	08	March 1972	24	January 1978
(3)	Madagascar	Ratification	27	March 1972	24	January 1978
(4)	Malawi	Accession	16	May 1972	24	January 1978
(5)	Cameroon	Accession	15	March 1973	24	January 1978
(6)	Chad[2]	Accession	12	February 1974	24	January 1978
(7)	Togo[2]	Ratification	28	January 1975	24	January 1978
(8)	Gabon[2]	Accession	06	March 1975	24	January 1978
(9)	United States of America	Ratification	26	November 1975	24	January 1978
(10)	Germany[3]	Ratification	19	July 1976	24	January 1978
(11)	Congo[2]	Accession	08	August 1977	24	January 1978
(12)	Switzerland[3]	Ratification	14	September 1977	24	January 1978
(13)	United Kingdom[3]	Ratification	24	October 1977	24	January 1978
(14)	France[3]	Ratification	25	November 1977	25	February 1978
(15)	Russian Federation	Ratification	29	December 1977	29	March 1978
(16)	Brazil	Ratification	09	January 1978	09	April 1978
(17)	Luxembourg[3]	Ratification	31	January 1978	30	April 1978
(18)	Sweden[3]	Ratification	17	February 1978	17	May 1978
(19)	Japan	Ratification	01	July 1978	01	October 1978
(20)	Denmark[3]	Ratification	01	September 1978	01	December 1978
(21)	Austria[3]	Ratification	23	January 1979	23	April 1979
(22)	Monaco[3]	Ratification	22	March 1979	22	June 1979
(23)	Netherlands[3]	Ratification	10	April 1979	10	July 1979
(24)	Romania	Ratification	23	April 1979	23	July 1979
(25)	Norway	Ratification	01	October 1979	01	January 1980
(26)	Liechtenstein[3]	Accession	19	December 1979	19	March 1980
(27)	Australia	Accession	31	December 1979	31	March 1980
(28)	Hungary	Ratification	27	March 1980	27	June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08	April 1980	08	July 1980
(30)	Finland	Ratification	01	July 1980	01	October 1980
(31)	Belgium[3]	Ratification	14	September 1981	14	December 1981
(32)	Sri Lanka	Accession	26	November 1981	26	February 1982
(33)	Mauritania[2]	Accession	13	January 1983	13	April 1983
(34)	Sudan	Accession	16	January 1984	16	April 1984
(35)	Bulgaria	Accession	21	February 1984	21	May 1984
(36)	Republic of Korea (South Korea)	Accession	10	May 1984	10	August 1984
(37)	Mali[2]	Accession	19	July 1984	19	October 1984
(38)	Barbados	Accession	12	December 1984	12	March 1985
(39)	Italy[3]	Ratification	28	December 1984	28	March 1985
(40)	Benin[2]	Accession	26	November 1986	26	February 1987
(41)	Burkina Faso[2]	Accession	21	December 1988	21	March 1989
(42)	Spain[3]	Accession	16	August 1989	16	November1989
(43)	Canada	Ratification	02	October 1989	02	January 1990
(44)	Greece[3]	Accession	09	July 1990	09	October 1990
(45)	Poland	Accession	25	September 1990	25	December 1990
(46)	Cote d'Ivoire[2]	Ratification	31	January 1991	30	April 1991
(47)	Guinea[2]	Accession	27	February 1991	27	May 1991
(48)	Mongolia	Accession	27	February 1991	27	May 1991
(49)	Czech Republic	Declaration[4]	18	December 1992	01	January 1993
(50)	Ireland[3]	Ratification	01	May 1992	01	August 1992
(51)	Portugal[3]	Accession	24	August 1992	24	November 1992
(52)	New Zealand	Accession	01	September 1992	01	December 1992
(53)	Ukraine	Declaration[4]	21	September 1992	25	December 1991
(54)	Viet Nam	Accession	10	December 1992	10	March 1993
(55)	Slovakia Republic	Declaration[4]	30	December 1992	01	January 1993
(56)	Niger[2]	Accession	21	December 1992	21	March 1993
(57)	Kazakhstan	Declaration[4]	16	February 1993	25	December 1991
(58)	Belarus	Declaration[4]	14	April 1993	25	December 1991
(59)	Latvia	Accession	07	June 1993	07	September 1993
(60)	Uzebekistan	Declaration[4]	18	August 1993	25	December 1991
(61)	China	Accession	01	October 1993	01	January 1994
(62)	Slovenia	Accession	01	December 1993	01	March 1994
(63)	Trinidad and Tobago	Accession	10	December 1993	10	March 1994(64)
(64)	Georgia	Declaration[4]	18	January 1994	25	December 1991
(65	Kyrgyzstan	Declaration[4]	14	February 1994	25	December 1991
(66)	Republic of Moldvola	Declaration[4]	14	February 1994	25	December 1991
(67)	Tajikistan	Declaration[4]	14	February 1994	25	December 1991
(68)	Kenya	Accession	08	March 1994	08	June 1994
(69)	Lithuania	Accession	05	April 1994	05	July 1994

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[1] Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2] Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

[3] Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Monaco, Belgium, Italy, Greece and Ireland for which only European patents are available if PCT is used. Note: Only one designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

[4] Declaration of continued application.

April 28, 1994

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 21, 1991 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,016,284 through 5,018,219
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 19, 1987 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,665,561 through 4,667,342
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 17, 1983 for which maintenance fees due at 11 years and six months may now be paid. the patents have patent numbers within thé following ranges:

Utiility Patents 4,383,335 through 4,384,368
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months and 11 years and six months are set forth in 37 CFR 1.20(e) - (g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the . fee is due by three years and six months after the original .... grant:

By a small entity (§ 1.9(f))	$465.00
By other than a small entity	$930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f))	$935.00
By other than a small entity	$1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f))	$1,410.00
By other than a small entity	$2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9(f))	$65.00
By other than a small entity	$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable	$620.00
(2) unintentional	$1;500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 13, 1994 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re.34,418	07/164,432	10/26/93
(4,575,393)	(06/629,782)	(03/11/86)
4,319,399	06/230,832	03/16/82
4,319,556	06/241,703	03/16/82
4,319,625	06/231,197	03/16/82
4,319,629	06/226,094	03/16/82
4,319,680	06/224,903	03/16/82
4,319,884	06/218,887	03/16/82
4,319,898	06/246,031	03/16/82
4,319,906	06/219,693	03/16/82
4,319,917	06/243,005	03/16/82

VOL
1162
ISS
4
MY
24
1994
UMI

Patent Number	Serial Number	Issue Date
4,319,926	06/218,861	03/16/82
4,319,954	06/238,804	03/16/82
4,319,984	06/237,721	03/16/82
4,319,995	06/249,223	03/16/82
4,320,045	06/252,747	03/11/86
4,320,057	06/247,462	03/11/86
4,320,067	06/228,513	03/11/86
4,320,069	06/245,867	03/11/86
4,320,076	06/252,270	03/11/86
4,320,184	06/226,502	03/11/86
4,320,185	06/226,527	03/11/86
4,320,210	06/215,905	03/11/86
4,320,211	06/229,351	03/11/86
4,320,221	06/215,996	03/11/86
4,320,225	06/219,538	03/11/86
4,320,272	06/228,319	03/11/86
4,574,397	06/525,275	03/11/86
4,574,398	06/712,533	03/11/86
4,574,400	06/674,787	03/11/86
4,574,401	06/574,176	03/11/86
4,574,405	06/604,287	03/11/86
4,574,406	06/595,955	03/11/86
4,574,408	06/659,263	03/11/86
4,574,411	06/540,909	03/11/86
4,574,412	06/619,189	03/11/86
4,574,413	06/712,338	03/11/86
4,574,415	06/689,169	03/11/86
4,574,418	06/692,626	03/11/86
4,574,422	06/637,997	03/11/86
4,574,423	06/577,007	03/11/86
4,574,424	06/631,873	03/11/86
4,574,433	06/591,483	03/11/86
4,574,438	06/680,420	03/11/86
4,574,439	06/649,344	03/11/86
4,574,440	06/635,340	03/11/86
4,574,443	06/623,003	03/11/86
4,574,446	06/658,617	03/11/86
4,574,448	06/629,430	03/11/86
4,574,451	06/452,242	03/11/86
4,574,452	06/549,622	03/11/86
4,574,453	06/678,367	03/11/86
4,574,454	06/691,021	03/11/86
4,574,455	06/647,293	03/11/86
4,574,463	06/681,792	03/11/86
4,574,468	06/657,631	03/11/86
4,574,473	06/678,368	03/11/86
4,574,475	06/645,662	03/11/86
4,574,479	06/621,242	03/11/86
4,574,481	06/567,855	03/11/86
4,574,485	06/691,458	03/11/86
4,574,488	06/574,768	03/11/86
4,574,490	06/699,357	03/11/86
4,574,491	06/635,146	03/11/86
4,574,495	06/604,617	03/11/86
4,574,498	06/462,967	03/11/86
4,574,501	06/689,189	03/11/86
4,574,502	06/773,600	03/11/86
4,574,509	06/593,408	03/11/86
4,574,513	06/700,491	03/11/86
4,574,515	06/592,524	03/11/86
4,574,521	06/701,075	03/11/86
4,574,524	06/647,136	03/11/86
4,574,526	06/579,124	03/11/86
4,574,535	06/721,692	03/11/86
4,574,536	06/305,405	03/11/86
4,574,539	06/660,294	03/11/86
4,574,540	06/542,463	03/11/86
4,574,544	06/603,506	03/11/86
4,574,546	06/519,206	03/11/86
4,574,547	06/627,555	03/11/86
4,574,548	06/580,380	03/11/86
4,574,549	06/719,298	03/11/86
4,574,552	06/421,013	03/11/86
4,574,556	06/503,566	03/11/86
4,574,560	06/727,102	03/11/86
4,574,565	06/579,702	03/11/86
4,574,570	06/679,230	03/11/86
4,574,577	06/692,106	03/11/86
4,574,581	06/626,930	03/11/86
4,574,582	06/593,036	03/11/86
4,574,586	06/580,580	03/11/86
4,574,592	06/569,565	03/11/86
4,574,598	06/746,560	03/11/86
4,574,603	06/631,777	03/11/86
4,574,609	06/591,801	03/11/86
4,574,616	06/595,357	03/11/86
4,574,624	06/623,363	03/11/86
4,574,626	06/592,499	03/11/86
4,574,629	06/613,895	03/11/86
4,574,630	06/578,249	03/11/86
4,574,631	06/764,776	03/11/86
4,574,634	06/639,085	03/11/86
4,574,637	06/637,400	03/11/86
4,574,640	06/676,037	03/11/86
4,574,641	06/510,438	03/11/86
4,574,643	06/666,805	03/11/86
4,574,644	06/617,375	03/11/86
4,574,647	06/642,234	03/11/86
4,574,648	06/570,705	03/11/86
4,574,649	06/463,085	03/11/86
4,574,659	06/405,551	03/11/86
4,574,665	06/626,287	03/11/86
4,574,667	06/496,842	03/11/86
4,574,676	06/468,306	03/11/86
4,574,678	06/626,444	03/11/86
4,574,681	06/480,686	03/11/86
4,574,688	06/716,503	03/11/86
4,574,694	06/655,463	03/11/86
4,574,704	06/471,243	03/11/86
4,574,710	06/675,012	03/11/86
4,574,711	06/499,470	03/11/86
4,574,712	06/644,250	03/11/86
4,574,717	06/695,446	03/11/86
4,574,719	06/625,119	03/11/86
4,574,721	06/680,943	03/11/86
4,574,722	06/720,457	03/11/86
4,574,726	06/631,597	03/11/86
4,574,728	06/618,100	03/11/86
4,574,735	06/586,032	03/11/86
4,574,738	06/663,884	03/11/86
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Patent Number	Serial Number	Issue Date
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VOL
1162
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1994
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Patent Number	Serial Number	Issue Date
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Patent Number	Serial Number	Issue Date
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4,907,545	07/291,091	03/13/90
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4,907,552	07/330,760	03/13/90
4,907,585	07/128,431	03/13/90
4,907,588	07/264,417	03/13/90
4,907,592	07/282,504	03/13/90
4,907,599	07/231,907	03/13/90
4,907,603	07/115,833	03/13/90
4,907,604	07/185,848	03/13/90
4,907,606	07/148,701	03/13/90
4,907,618	07/313,616	03/13/90
4,907,631	07/315,552	03/13/90
4,907,633	07/236,545	03/13/90
4,907,642	07/201,277	03/13/90
4,907,644	07/184,603	03/13/90
4,907,648	07/264,849	03/13/90
4,907,649	07/266,266	03/13/90
4,907,650	07/375,249	03/13/90
4,907,660	07/170,993	03/13/90
4,907,663	07/246,369	03/13/90
4,907,664	07/285,594	03/13/90
4,907,668	07/314,682	03/13/90
4,907,672	07/165,784	03/13/90
4,907,673	07/378,644	03/13/90
4,907,675	07/205,248	03/13/90
4,907,676	07/332,596	03/13/90
4,907,690	07/233,737	03/13/90
4,907,693	07/365,377	03/13/90
4,907,696	07/252,196	03/13/90
4,907,697	07/377,853	03/13/90
4,907,698	07/324,667	03/13/90
4,907,704	07/255,489	03/13/90
4,907,709	07/269,599	03/13/90
4,907,710	07/156,403	03/13/90
4,907,715	07/267,835	03/13/90
4,907,716	07/379,101	03/13/90
4,907,720	07/049,098	03/13/90
4,907,723	07/242,169	03/13/90
4,907,732	07/147,233	03/13/90
4,907,733	07/173,792	03/13/90
4,907,738	06/762,550	03/13/90
4,907,744	07/189,668	03/13/90
4,907,752	07/183,771	03/13/90
4,907,755	07/256,439	03/13/90
4,907,756	07/342,837	03/13/90
4,907,758	07/358,187	03/13/90
4,907,760	07/196,618	03/13/90
4,907,774	07/286,623	03/13/90
4,907,777	07/000,221	03/13/90
4,907,780	07/186,928	03/13/90
4,907,793	07/331,614	03/13/90
4,907,794	07/137,769	03/13/90
4,907,795	07/305,545	03/13/90
4,907,798	07/280,674	03/13/90
4,907,801	07/245,702	03/13/90
4,907,802	07/352,438	03/13/90
4,907,803	07/335,955	03/13/90
4,907,804	07/300,272	03/13/90
4,907,805	07/008,476	03/13/90
4,907,806	07/261,892	03/13/90
4,907,808	07/270,946	03/13/90
4,907,809	07/203,736	03/13/90
4,907,810	07/251,981	03/13/90
4,907,811	07/372,208	03/13/90
4,907,812	06/915,589	03/13/90
4,907,814	07/314,553	03/13/90
4,907,823	07/298,059	03/13/90
4,907,824	07/245,526	03/13/90
4,907,826	06/906,090	03/13/90
4,907,827	07/169,594	03/13/90
4,907,835	07/229,347	03/13/90
4,907,837	07/315,994	03/13/90
4,907,839	07/307,697	03/13/90
4,907,844	07/328,665	03/13/90
4,907,845	07/245,227	03/13/90
4,907,855	07/294,861	03/13/90
4,907,870	07/336,340	03/13/90
4,907,871	07/378,980	03/13/90
4,907,875	07/252,416	03/13/90
4,907,878	06/934,980	03/13/90
4,907,879	07/144,473	03/13/90
4,907,881	07/166,582	03/13/90
4,907,889	07/172,711	03/13/90
4,907,893	07/264,899	03/13/90
4,907,894	07/286,793	03/13/90
4,907,901	06/945,995	03/13/90
4,907,913	06/458,052	03/13/90

VOL
1162
ISS
4
MY
24
1994
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Patent Number	Serial Number	Issue Date
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4,907,920	07/298,162	03/13/90
4,907,925	07/225,534	03/13/90
4,907,932	07/303,546	03/13/90
4,907,935	07/128,781	03/13/90
4,907,936	07/234,211	03/13/90
4,907,939	07/308,274	03/13/90
4,907,942	07/086,571	03/13/90
4,907,950	07/238,093	03/13/90
4,907,953	07/249,582	03/13/90
4,907,958	07/199,734	03/13/90
4,907,964	06/664,746	03/13/90
4,907,972	07/215,785	03/13/90
4,907,976	07/162,441	03/13/90
4,907,981	07/271,286	03/13/90
4,907,984	07/311,767	03/13/90
4,907,985	07/370,992	03/13/90
4,907,988	07/322,166	03/13/90
4,907,993	07/225,267	03/13/90
4,907,997	07/259,910	03/13/90
4,907,999	07/269,705	03/13/90
4,908,000	07/383,994	03/13/90
4,908,004	07/176,290	03/13/90
4,908,006	07/256,835	03/13/90
4,908,008	07/268,254	03/13/90
4,908,011	07/144,918	03/13/90
4,908,018	07/251,466	03/13/90
4,908,020	07/239,560	03/13/90
4,908,021	06/832,134	03/13/90
4,908,030	07/043,908	03/13/90
4,908,044	07/342,745	03/13/90
4,908,050	07/395,134	03/13/90
4,908,052	07/300,194	03/13/90
4,908,056	07/311,897	03/13/90
4,908,066	07/311,033	03/13/90
4,908,081	07/135,036	03/13/90
4,908,083	07/114,405	03/13/90
4,908,085	07/169,096	03/13/90
4,908,090	07/130,539	03/13/90
4,908,110	07/340,815	03/13/90
4,908,111	07/316,872	03/13/90
4,908,118	07/124,326	03/13/90
4,908,125	07/215,961	03/13/90
4,908,126	07/118,957	03/13/90
4,908,127	07/081,853	03/13/90
4,908,130	07/105,990	03/13/90
4,908,133	07/343,467	03/13/90
4,908,135	07/379,233	03/13/90
4,908,136	07/339,571	03/13/90
4,908,137	07/336,164	03/13/90
4,908,138	07/223,210	03/13/90
4,908,161	07/210,748	03/13/90
4,908,162	07/310,205	03/13/90
4,908,164	07/175,226	03/13/90
4,908,166	07/199,972	03/13/90
4,908,167	07/323,440	03/13/90
4,908,171	07/150,007	03/13/90
4,908,172	07/220,176	03/13/90
4,908,173	07/237,994	03/13/90
4,908,180	07/120,866	03/13/90
4,908,182	07/180,080	03/13/90
4,908,202	07/299,793	03/13/90
4,908,206	07/095,581	03/13/90
4,908,212	07/296,998	03/13/90
4,908,213	07/313,103	03/13/90
4,908,216	07/300,427	03/13/90
4,908,217	07/014,051	03/13/90
4,908,218	07/145,232	03/13/90
4,908,222	07/322,980	03/13/90
4,908,226	07/197,734	03/13/90
4,908,233	07/180,928	03/13/90
4,908,243	07/338,921	03/13/90
4,908,244	07/322,629	03/13/90
4,908,246	07/148,483	03/13/90
4,908,249	07/261,274	03/13/90
4,908,262	07/152,031	03/13/90
4,908,265	07/387,011	03/13/90
4,908,273	07/167,764	03/13/90
4,908,276	06/691,784	03/13/90
4,908,297	07/094,699	03/13/90
4,908,307	06/944,678	03/13/90
4,908,308	06/746,282	03/13/90
4,908,321	07/306,526	03/13/90
4,908,323	07/121,570	03/13/90
4,908,346	07/068,391	03/13/90
4,908,354	07/124,394	03/13/90
4,908,357	07/247,974	03/13/90
4,908,361	07/344,799	03/13/90
4,908,363	07/169,207	03/13/90
4,908,366	07/144,884	03/13/90
4,908,371	07/265,646	03/13/90
4,908,374	07/281,247	03/13/90
4,908,375	07/217,327	03/13/90
4,908,377	07/201,247	03/13/90
4,908,386	07/287,441	03/13/90
4,908,390	07/240,235	03/13/90
4,908,401	07/287,257	03/13/90
4,908,406	07/290,112	03/13/90
4,908,414	07/338,568	03/13/90
4,908,427	07/326,489	03/13/90
4,908,432	07/001,786	03/13/90
4,908,435	07/158,233	03/13/90
4,908,438	07/200,609	03/13/90
4,908,441	07/221,478	03/13/90
4,908,444	07/003,286	03/13/90
4,908,445	07/295,145	03/13/90
4,908,447	07/298,267	03/13/90
4,908,448	07/389,888	03/13/90
4,908,452	07/135,866	03/13/90
4,908,454	07/300,760	03/13/90
4,908,462	07/346,332	03/13/90
4,908,469	07/195,709	03/13/90
4,908,470	07/278,058	03/13/90
4,908,471	07/156,257	03/13/90
4,908,475	07/192,736	03/13/90
4,908,478	07/271,376	03/13/90
4,908,480	07/220,040	03/13/90
4,908,481	06/798,361	03/13/90
4,908,486	07/180,986	03/13/90
4,908,489	07/176,267	03/13/90
4,908,490	07/210,856	03/13/90
4,908,498	07/067,465	03/13/90
4,908,501	07/260,000	03/13/90
4,908,507	07/256,155	03/13/90
4,908,525	07/307,372	03/13/90
4,908,526	07/202,786	03/13/90
4,908,529	07/321,506	03/13/90
4,908,534	07/257,056	03/13/90
4,908,540	07/256,226	03/13/90
4,908,545	06/913,614	03/13/90
4,908,554	06/924,793	03/13/90
4,908,565	07/015,903	03/13/90
4,908,570	07/056,848	03/13/90
4,908,589	07/099,401	03/13/90
4,908,591	07/307,430	03/13/90
4,908,593	07/246,108	03/13/90
4,908,598	07/261,931	03/13/90
4,908,599	07/237,665	03/13/90
4,908,605	07/168,257	03/13/90
4,908,606	07/138,913	03/13/90
4,908,608	07/226,787	03/13/90
4,908,610	07/249,111	03/13/90
4,908,613	07/098,169	03/13/90
4,908,627	07/149,974	03/13/90
4,908,628	06/285,394	03/13/90
4,908,652	07/200,923	03/13/90
4,908,653	07/204,239	03/13/90
4,908,669	07/258,859	03/13/90
4,908,673	07/259,781	03/13/90
4,908,728	07/228,500	03/13/90
4,908,732	07/095,629	03/13/90
4,908,739	07/285,743	03/13/90
4,908,740	07/309,826	03/13/90
4,908,741	07/359,966	03/13/90
4,908,742	07/354,756	03/13/90

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4,908,751	07/108,774	03/13/90
4,908,771	07/070,846	03/13/90
4,908,781	06/796,870	03/13/90
4,908,785	06/766,738	03/13/90
4,908,787	06/894,994	03/13/90
4,908,791	07/146,743	03/13/90
4,908,792	07/087,995	03/13/90
4,908,801	07/358,435	03/13/90
4,908,807	07/346,422	03/13/90
4,908,828	07/138,852	03/13/90
4,908,829	07/276,212	03/13/90
4,908,842	07/311,360	03/13/90
4,908,845	07/212,295	03/13/90
4,908,860	06/853,296	03/13/90
4,908,868	07/312,447	03/13/90
4,908,875	07/326,571	03/13/90

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
Re. 33,840	07/571,869	03/10/92	08/22/90	03/14/94
(4,889,169)	(07/312,941)	(12/26/89)	(02/21/89)	
4,426,807	06/386,634	01/24/84	06/09/82	02/23/94
4,427,664	06/408,942	01/14/84	08/17/82	03/04/94
4,429,549	06/247,591	02/07/84	03/25/81	03/29/94
4,437,713	06/335,704	03/20/84	12/30/81	03/29/94
4,458,222	06/261,145	07/03/84	05/06/81	03/14/94
4,492,156	06/456,574	01/09/85	01/10/83	03/29/94
4,498,125	06/427,147	02/05/85	09/29/82	11/15/93
4,518,652	06/514,349	05/21/85	07/15/83	01/31/94
4,527,685	06/470,579	07/09/85	02/28/83	12/30/93
4,530,988	06/576,149	07/23/85	02/02/84	01/31/94
4,532,814	06/512,935	08/06/85	07/12/83	03/24/94
4,533,054	06/457,675	08/06/85	01/13/83	11/15/93
4,535,103	06/603,395	08/13/85	04/24/84	03/21/94
4,535,830	06/528,019	08/20/85	08/31/83	12/17/93
4,541,530	06/397,559	09/17/85	07/12/82	03/28/94
4,542,759	06/421,161	09/24/85	09/22/82	03/28/94
4,545,016	06/456,448	10/01/85	01/07/83	03/29/94
4,552,984	06/392,884	11/12/85	06/28/82	03/11/94
4,553,560	06/504,219	11/19/85	06/14/83	03/23/94
4,554,868	06/457,429	11/26/85	01/12/83	03/21/94
4,556,107	06/489,649	12/03/85	04/28/83	03/14/94
4,564,310	06/618,495	01/14/86	01/14/86	03/21/94
4,566,897	06/589,795	01/28/86	03/15/84	03/31/94
4,733,193	06/881,360	03/22/88	06/20/86	02/23/94
4,745,838	07/029,136	05/24/88	03/23/87	03/29/94
4,750,753	06/832,357	06/14/88	02/24/86	06/23/93
4,763,904	06/915,503	08/16/88	10/06/86	03/21/94
4,782,960	07/050,225	11/08/88	05/14/87	12/21/93
4,792,967	06/831,177	12/20/88	02/20/86	03/21/93
4,811,427	07/092,524	03/14/89	09/03/87	03/29/94
4,811,465	07/223,723	03/14/89	07/21/88	03/14/94
4,842,518	07/025,942	06/27/89	03/16/87	03/29/94
4,842,743	07/168,646	06/27/89	03/16/88	03/29/94
4,846,619	07/177,869	07/11/89	04/04/88	03/21/94
4,853,492	07/250,073	08/01/89	09/28/88	03/14/94
4,853,684	07/144,374	08/01/89	01/15/83	03/29/94
4,857,436	07/245,658	08/15/89	09/15/88	03/29/94
4,857,584	07/157,854	08/15/89	02/19/88	03/29/94
4,860,578	07/094,495	08/29/89	09/09/87	03/22/94
4,863,242	07/216,961	09/05/89	07/11/88	03/28/94
4,863,606	07/131,821	09/05/89	12/11/87	03/28/94
4,866,040	07/003,888	09/12/89	01/15/87	12/17/93
4,872,440	07/259,315	10/10/89	10/18/88	02/17/94
4,882,028	07/147,315	11/21/89	01/22/88	03/14/94
4,885,841	07/313,221	12/12/89	02/21/89	03/14/94
4,892,122	07/286,855	01/09/90	12/19/88	03/14/94

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

5,017,416, Re. S.N. 08/218,061,Mar. 25, 1994, Cl. 428/195, PAPER FOR USE IN ION DEPOSITION PRINTING, George R. Imperial, et. al., Owner of Record: *International Paper,Co., Purchase, N.Y.*, Attorney or Agent: Mark S. Graham, Ex. Gp.: 1513

VOL 1162 ISS 4 MY 24 1994 UMI

5,020,713, Re. S.N. 08/219,162, Mar. 28, 1994, Cl. 227/67, ASSEMBLY OF ATTACHMENTS AND DEVICE FOR ATTACHING SAME, Steven J. Kunreuther, Owner of Record: *Inventor*, Attorney or Agent: Robert L. Epstein, Esq., Ex. Gp.: 3204

5,100,778, Re. S.N. 08/217,117, Mar. 24, 1994, Cl. 435/18, OLIGOSACCHARIDE SEQUENCING, Thomas W. Rademacher, et. al., Owner of Record: *Monsanto Co., St. Louis, Mo.*, Attorney or Agent: James A. Oliff, Ex. Gp.: 1805

5,100,933, Re. S.N. 08/219,320, Mar. 29, 1994, Cl. 523/300, COLLAPSIBLE GEL COMPOSITIONS, Toyoichi Tanaka, Owner of Record: *Inventor*, Attorney or Agent: Warren A. Kaplan, Esq., Ex. Gp.: 1511

5,137,360, Re. S.N. 08/218,337, Mar. 25, 1994, Cl. 356/350, FIBER OPTIC GYRO WITH A SOURCE AT A FIRST WAVELENGTH AND A FIBER OPTIC LOOP DESIGNATED FOR SINGLE MODE OPERATION AT A WAVELENGTH LONGER THAN THE FIRST WAVELENGTH, Carl M. Ferrar, Owner of Record: *Honeywell Incorporated, Minneapolis, Minn.*, Attorney or Agent: Theadore F. Heils, Ex. Gp.: 2505

5,171,990, Re. S.N. 08/220,963, Mar. 30, 1994, Cl. 250/288, ELECTROSPRAY SOURCE WITH REDUCED NEUTRAL NOISE AND METHOD, Iain C. Mylchreest, et. al., Owner of Record: *Finnigan Corporation, San Jose, Calif.*, Attorney or Agent: Aldo J. Test, Ex. Gp.: 2506

5,193,004, Re. S.N. 08/218,970, Mar. 25, 1994, Cl. 348/413, SYSTEMS AND METHODS FOR CODING EVEN FIELDS OF INTERLACED VIDEO SEQUENCES, Feng Ming Wang, et. al., Owner of Record: *Trustees of Columbia University, Morningside Heights, N.Y.*, Attorney or Agent: Henry Y.S. Tang, Ex. Gp.: 2615

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,438,035, Reexam. No. 90/003,349, Mar. 1, 1994, Cl. 540/491, METHOD OF PREPARING BENZOTHIAZEPINE DERIVIATIVES, Mitsunori Gaino, et. al., Owner of Record: *Tanabe Seiyaku Co., Ltd., Osaka, Japan*, Attorney or Agent: Bierman & Muserlian, New York, N.Y., Ex. Gp.: 1202, Requester: American Cyanamid Co., Wayne, N.J. and Plantex, U.S.A., Inc.

5,049,432, Reexam. No. 90/003,350, Mar. 3, 1994, Cl. 528/159, METHOD FOR PREPARING A MARKETING STRUCTURE, Willem Ooms, et. al., Owner of Record: *Porelon, Inc., Cookeville, Tenn.*, Attorney or Agent: Foley & Lardner, Milwaukee, Wis., Ex. Gp.: 1503, Requester: Owner

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Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED APRIL 04, 1994 DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
40,667	70/040,667	06/30/1903
40,692	70/040,692	06/30/1903
92,336	71/069,358	07/01/1913
92,357	71/069,295	07/01/1913
92,359	71/068,505	07/01/1913
92,376	71/068,023	07/01/1913
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VOL 1162
ISS 4
MY 24 1994
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DEPARTMENT OF COMMERCE

Patent and Trademark Office

Public Hearing and Request for Comments on the Standard of Nonobviousness

Agency: Patent and Trademark Office, Commerce

Action: Notice of hearing and request for public comments

Summary: The Patent and Trademark Office (PTO) is conducting a review of the standard of nonobviousness by which inventions are judged to determine whether a more rigorous standard of nonobviousness is needed. As part of this review, the PTO is interested in obtaining public comment on the current standard of nonobviousness both as it is applied by the PTO and as interpreted by the Federal courts, as well as the impact of this standard on promoting the progress of science and useful arts. Interested members of the public are invited to testify and to present written comments on any of the topics of discussion outlined in the supplementary information section of this notice.

Dates: A public hearing will be held on July 20, 1994, at 9:00 a.m. Those wishing to present oral testimony at the July 20, 1994, hearing must request an opportunity to do so no later than July 8, 1994. Any written comments by those persons offering testimony at the hearings and related to that testimony should be submitted on or before July 8, 1994. Other written comments should be received by the PTO on or before August 31, 1994.

Addresses: Those interested in presenting written comments on the topics contained in the supplementary information section of this notice, or any other related topic, should address their comments to the Commissioner of Patents and Trademarks, marked to the attention of Kathleen G. Dussault, Attorney-Advisor, Office of Legislation and International Affairs. The hearings will be held in Marriott's Crystal Forum, a part of the Crystal City Marriott Hotel located in The Underground, 1999 Jefferson Davis Highway, Arlington, Virginia. Comments submitted by mail should be sent to Commissioner of Patents and Trademarks, Box 4, Patent and Trademark Office, Washington, D.C. 20231. Comments can be sent by electronic mail to Internet address *comments-obviousness§uspto.gov.* Comments may also be submitted by telefax at (703) 305-8885. Written comments should include the following information:

-Name and affiliation of the individual responding;

-An indication of whether comments offered represent the views of the individual's organization or are the respondent's personal views; and

-If applicable, the nature of the respondent's organization (e.g., business, law Firm, trade group, university, non-profit organization) and principal areas of business or research activity.

Parties offering testimony or written comments are asked to provide their comments in machine-readable format in one of the following file formats: ASCII text, WordPerfect for DOS or Windows version 4.2 or 5.x, or Word for Macintosh version 4.0 or 5.x.

Persons wishing to testify must notify Kathleen G. Dussault no later than July 8, 1994. Ms. Dussault can be reached by mail sent to her attention addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231; by phone at (703) 305-9300; or by telefax at (703) 305-8885. No requests to testify will be accepted through electronic mail.

Written comments and transcripts of the hearings will be available for public inspection in Room 902 of Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia. Persons wishing to obtain a machine-readable copy of the transcripts and public comments should contact Kathleen G. Dussault at the address listed below.

For Further Information Contact: Kathleen G. Dussault by telephone at (703) 305-9300; by fax at (703) 305-8885, by electronic mail at *dussault§uspto.gov*, or by mail marked to her attention addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

Supplementary Information:

I. Background

Recent debate has focused on whether United States patent policy is being effectively served by the current standard of nonobviousness both as it is applied by the Patent and Trademark Office during patent examination and as it has been interpreted by the Federal courts. Under 35 U.S.C. § 103, a patent may not be obtained "... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

In *Graham v. John Deere & Co.*, 383 U.S. 1 (1966), the Supreme Court defined a three-part test to be followed to determine the nonobviousness of an invention under 35 U.S.C. § 103. Under this test, (1) the scope and content of the prior art are to be determined; (2) the differences between the prior art and the claims at issue are to be ascertained; and (3) the level of ordinary skill in the pertinent art is to be resolved. According to the Court, secondary considerations such as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. The Court noted that as indicia of obviousness or nonobviousness, secondary considerations may have relevancy.

Some critics have charged that the *Graham v. John Deere* standard of nonobviousness has been changed by decisions of the Court of Appeals for the Federal Circuit. For example, it is argued that secondary considerations have been given too much weight when determining the nonobviousness of an invention to the extent that an invention with strong commercial success will be found not obvious despite appearing so in light of prior art. Other critics charge that the scope of the prior art to be considered when evaluating the obviousness of an invention has been improperly narrowed, precluding obviousness from being established by combining the teachings of the prior art to produce the claimed invention absent some express teaching or suggestion supporting the combination.

The PTO has the burden of establishing a case of *prima facie* obviousness to support a prior art rejection under 35 U.S.C. § 103. This burden can be met when the teachings from the prior art suggest the claimed subject matter to a person of ordinary skill in the art. Once established, the applicant must present evidence or arguments to rebut the Examiner's *prima facie* case. For example, an applicant may argue that there was no teaching or suggestion in the prior art to combine the references in the manner suggested by the Examiner to render the claimed invention obvious. The applicant may also rebut the Examiner's case of *prima facie* obviousness by demonstrating that the references cited by the Examiner teach away from the claimed invention.

Some critics argue that more guidance is needed to define when a *prima facie* case has been established and how it may be successfully rebutted.

It has also been suggested that the standard of nonobviousness has been inappropriately lowered. Alleged effects of this "lowered" standard include a decrease in the perceived stature of patented inventions (e.g., patents are being granted on inventions industry views as being trivial, simple or straightforward). Recent debate has also focused on the propriety of the *de novo* standard of review applied by the Court of Appeals for the Federal Circuit and whether greater deference should be given to the obviousness determinations of the PTO and the District Courts on appeal.

To resolve the issues presented, the PTO will conduct a public hearing to examine the issue of nonobviousness in the context of whether or not the current standard of nonobviousness effectively promotes United States patent policy and whether a more rigorous standard for awarding U.S. patents should be pursued.

II. Topics for Discussion

The hearing will address the following topics:

1. Justifications and rationale for and against the nonobviousness standard applied by the PTO and the Federal courts, including:

(a) Is a more rigorous standard of nonobviousness needed? If so, how should the standard be defined?

(b) Should the current standard of nonobviousness be administered differently?

(c) Is the standard of nonobviousness applied differently among the different examining groups within the PTO?

(d) Should the standard of nonobviousness vary according to the field of technology involved?

(e) What role should secondary considerations, such as commercial success, unexpected results, etc., play when determining the nonobviousness of the invention?

(f) Whether a *prima facie* case of obviousness based upon a combination of references should necessarily require "motivation" to combine the teachings of the prior art disclosures? Why or why not? What other standard or standards for evaluating the propriety of combining the teachings of references might be appropriate?

(g) Is the "ordinary level of skill" in the art being interpreted and applied correctly, and if not, what changes are needed?

(h) Whether obviousness determinations should be subject to *de novo* review on appeal to the Court of Appeals for the Federal Circuit? If not, what standard of review should apply?

2. Desirable characteristics of specific guidelines regarding the burden of proof needed to rebut an Examiner's *prima facie* case of obviousness.

(a) Is there is a need for more specific guidelines to govern the burden of proof to be followed in determining the nonobviousness of an invention? If so, what should they be?

3. Impact of a more rigorous standard of nonobviousness on promoting industrial and technological progress in the United States and strengthening the national economy.

(a) Would a stricter standard of nonobviousness help or hinder industrial and technological progress in the United States? If so, how?

(b) Is the current standard of nonobviousness applied by the PTO and interpreted by the Federal courts having a positive or negative impact on industrial and technological progress in the United States?

(c) Are problems being experienced in particular areas of technology as a result of the standard of nonobviousness applied by the PTO? If so, what are they?

(d) What would be the effect of a more rigorous standard of nonobviousness on the ability of industry to compete in the international market?

III. Guidelines for Oral Testimony

Individuals wishing to testify must adhere to the following guidelines:

1. Anyone wishing to testify at the hearings must request an opportunity to do so no later than July 8, 1994. No one will be permitted to testify without prior approval.

2. Requests to testify must include the speaker's name, affiliation (if any), phone number, fax number (if available), mailing address, and the questions in each topic that the speaker intends to address in his or her testimony.

3. Time allocated to each speaker will be determined after the final number of speakers has been determined.

4. Speakers must provide a written copy of their testimony for inclusion in the record of the proceedings no later than August 31, 1994.

5. Speakers must adhere to rules established for testimony. These rules will be provided to all speakers no later than July 15, 1994.

A schedule providing approximate times for testimony will be provided to all speakers no later than July 15, 1994. Speakers are advised that the schedule for testimony will be subject to change during the course of the hearing.

April 21, 1994

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,632,866, Yuichi Kubota, Akio Watanabe, MAGNETIC RECORDING MEDIUM, Interference No. 102,094, final judgment adverse to the patentees was rendered Mar. 22, 1994, as to claims 1-5.

Patent No. 4,714,706, Hirosi Kisida, Sumio Nishida, Makoto Hatakoshi, PYRIDYLOXY DERIVATIVES AND THEIR USE AS INSECTICIDES, Interference No. 102,400, final judgment adverse to the patentees was rendered Apr. 14, 1994, as to claims 1-7.

Patent No. 4,770,502, Saaki Kitazima, Katsumi Kondo, FERROELECTRIC LIQUID CRYSTAL MATRIX DRIVING APPARATUS AND METHOD, Interference No. 103,211, final judgment adverse to the patentees was rendered Apr. 20, 1994, as to claims 1-8.

Patent No. 4,849,471, Kazuaki Saito, Yoshifumi Nishimura, Shinichi Izawa, IMPACT-RESISTANT POLYAMIDE COMPOSITION, Interference No. 102,918, final judgment adverse to the patentees was rendered Apr. 5, 1994, as to claims 1-10.

Patent No. 4,859,446, Eric S. Abrutyn, Robert J. Sloan, PROCESS FOR PREPARING BASIC ALUMINUM COMPOUNDS HAVING INCREASED SWEAT RESISTANT ACTIVITY, Interference No. 102,895, final judgment adverse to the patentees was rendered Dec. 18, 1992, as to claims 2-10.

Patent No. 4,859,446, Eric S. Abrutyn, Robert J. Sloan, PROCESS FOR PREPARING BASIC ALUMINUM COMPOUNDS HAVING INCREASED SWEAT RESISTANT ACTIVITY, Interference No. 102,896, final judgment adverse to the patentees was rendered Dec. 18, 1992, as to claims 1-5, 7 and 8.

Patent No. 4,939,230, Sarat Munjal, Che I. Kao, Jimmy D. Allen, ELIMINATION OF MONOCARBONATE FROM POLYCARBONATE, Interference No. 103,054, final judgment adverse to the patentees was rendered Mar. 15, 1994, as to claims 1-49.

Patent No. 4,977,853, Allan F. Falcoff, Frank S. Fountain, Donald K. Pusey, NON-CONTACT WET OR DRY FILM THICKNESS MEASURING DEVICE, Interference No.

VOL
1162
ISS
4
MY
24
1994
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103,145, final judgment adverse to the patentees was rendered Apr. 12, 1994, as to claims 1-5.

Patent No. 5,039,833, Kenneth D. Woods, MICROWAVE HEATABLE MATERIALS, Interference No. 103,242, final judgment adverse to the patentee was rendered Mar. 21, 1994, as to claims 1-3.

Patent No. 5,107,842, Harold B. Levene, Elaine Villapando, James L. Barnhart, Kenneth J. Widder, METHOD OF ULTRASOUND IMAGING OF THE GASTROINTESTINAL TRACT, Interference No. 103,135, final judgment adverse to the patentees was rendered Mar. 24, 1994, as to claims 1-15.

Patent No. 5,113,947, Mark L. Robin, FIRE EXTINGUISHING METHODS AND COMPOSITIONS UTILIZING 2-CHLORO-1,1,1,2-TERAFLUOROETHANE, Interference No. 103,266, final judgment adverse to the patentee was rendered Apr. 22, 1994, as to claims 1, 3-7, 10 and 12.

Patent No. 5,124,053, Yuichi Iikubo, Mark L. Robin, FIRE EXTINGUISHING METHODS AND BLENDS UTILIZING HYDROFLUOROCARBONS, Interference No. 103,267, final judgment adverse to the patentees was rendered Apr. 22, 1994, as to claims 20-33.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals &
Interferences
(703) 603-3298

Response Requested to 1993 Patent Examiner's Action Survey

As part of the continuing quality reinforcement efforts of the Patent and Trademark Office, the Office has sent out a Patent Action Survey Form with each Patent Examiner's Office action mailed during a period of several weeks during December, 1993-January, 1994. **If you have received one or more of these forms, please complete each one, no later than the time of response to the Office action being surveyed.**

The survey is intended to determine whether Office actions are perceived to be clear and complete on certain specific and important items related to patent examining practices and procedures. The results of the survey will be used in the development of Office training programs. The survey is a follow-up to the Patent Action Surveys conducted in 1991 and 1992. Where training is provided to address identified deficiencies in performance, follow-up surveys are intended to be conducted in the future to determine whether the training was effective enough to improve performance in the measured areas.

The Survey Form is brief and easy to complete and does not permit identification of the respondent or of the particular application involved. The Survey Form may be completed at the time of response to the Office Action. It is possible that a practitioner may receive many Office Actions containing a Survey Form during the survey period. To have results that are meaningful, the Office needs a high response rate. Therefore, it is **important** that patent practitioners complete each survey form **no later than the time of response to the Office action being surveyed**. To assure that this form is completed and mailed back to the address indicated on the Survey Form, it would be desirable for patent practitioners to have their office managers/docketing personnel take appropriate steps to keep the form and Office action together for the practitioner's benefit.

Your cooperation in completing the Survey Form is appreciated.

Nov. 16, 1993

STEPHEN G. KUNIN
Acting Assistant Commissioner
for Patents

Certificate of Corrections
Issue May 24, 1994

P. 8,428
Re. 34,180
Re. 34,244
Re. 34,245
Re. 34,258
D. 306,741
D. 319,340
D. 332,077
D. 332,285
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VOL
1162
ISS
4
MY
24
1994
UMI

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	Detroit Public Library	(313) 833-1450
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VOL
1162
ISS
4
MY
24
1994
UMI

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	Columbus: Ohio State University Libraries	(614) 292-6175
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	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Clemson University Libraries	(803) 656-3024
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	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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Wyoming	Casper: Natrona County Public Library	Not Yet Operational

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PATENT EXAMINING CORPS

BRUCE LEHMAN, Commissioner
STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — JOHN E. KITTLE, Director	308-0661	5/31/93
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	3/25/93
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 —RICHARD V. FISHER, Director	308-0651	8/09/93
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/07/93
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	7/29/93
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — JOSEPH J. ROLLA, JR., Director	308-1782	9/29/92
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	10/19/92
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300 — GERALD GOLDBERG, Director	305-9600	4/27/92
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	5/02/93
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JANICE A. HOWELL, Director	308-0956	8/26/93
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	10/07/92
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	8/04/92
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	5/10/93
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	4/19/93
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/27/93
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — DONALD G. KELLY, Director	308-0861	12/04/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	6/10/93

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during April 1994 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents	Numbers 4,015,294 to 4,020,506 inclusive
Plant Patents	4,032 to 4,045

VOL 1162 ISS 4 MY 24 1994 UMI

TRADEMARK OPERATION

Bruce Lehman, Commissioner
Robert M. Anderson, Acting Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Operation
Condition of Trademark Applications as of April 1, 1994

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 3—Kathryn A. Dobbs, Managing Attorney, (703) 308-9103 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/12/93	12/10/93
Law Office 4—Sharon Marsh, Managing Attorney, (703) 308-9104 Scientific Equipment. Furniture, Houseware and Glass—Int. Classes 9, 20, 21 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/22/93	02/14/94
Law Office 5—Mary Sparrow, Managing Attorney, (703) 308-9105 Cosmetics, Cleaning Preparations, Paper Products and Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/18/93	01/06/94
Law Office 6—Myra Kurzbard, Managing Attorney, (703) 308-9106 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/18/93	01/18/94
Law Office 7—David Shallant, Managing Attorney, (703) 308-9107 Lubricants, Fuels, Industrial Equipment & Materials—Int. Classes 4, 6, 11, 14, 19 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/28/93	12/10/93
Law Office 8—Thomas Lamone, Managing Attorney, (703) 308-9108 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/18/93	01/18/94
Law Office 9—Sidney Moskowitz, Managing Attorney, (703) 308-9109 Lubricants, Industrial Equipment, Materials & Musical Instruments-Int. Classes 4, 6, 7, 8, 12, 13, 15, 16, 17, 18, 19, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/21/93	01/03/94
Law Office 10—Jean Logan, Managing Attorney, (703) 308-9110 Cordage, Fibers, Yarns, Threads, Fabrics, Clothing & Floor Covering-Int. Classes 22, 23, 24, 25, 26, 27 Services-Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/22/93	02/22/94
Law Office-11—Thomas Howell, Managing Attorney, (703) 308-9111 Paints, Pharmaceuticals & Medical Apparatus—Int. Classes 2, 5, 10 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/12/93	12/29/93
Law Office 12—Deborah Cohn, Managing Attorney, (703) 308-9112 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/15/93	03/03/94
Law Office 13—Craig Morris, Managing Attorney, (703) 308-9113 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/10/94	02/22/94
Law Office 14—Ron Williams, Managing Attorney, (703) 308-9114 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/29/93	01/25/94
Law Office 15—Paul Fahrenkopf, Managing Attorney, (703) 308-9115 Rubber, Leather Goods & Clothing—17, 18, 25 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/17/93	09/07/93
** Collective Marks—Class 200		
** Certification Marks—Classes A & B		
Office of Trademark Services—Jodi Rush, Director (703) 308-9000		
Post Registration Section—Jacqueline Cole, Managing Attorney, (703) 308-9500		
Affidavits Under Sections 8 & 15 (All Classes)	11/15/93	—0—
Renewals (All Classes)	12/06/93	—0—
Section 12(C) Publications (All Classes)	—0—	—0—

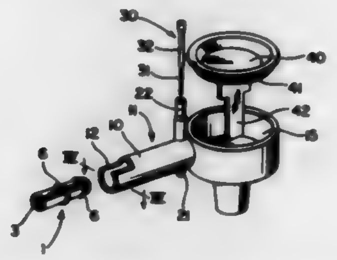
1. ** Assigned to each law office
2. Applicants with inquiries concerning the status of their applications and a touch tone telephone should call (703) 305-8747 from 6:30 A.M. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See Section 411 of the *Trademark Manual of Examining Procedure*.
3. * These dates identify the oldest unassigned new case in each law office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examiner.

REEXAMINATIONS

MAY 24, 1994

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,715,274 (2304th)
EMULSIFIER UNIT PARTICULARLY FOR EMULSIFYING STEAM AND MILK TO PREPARE CAPPUCCINOS AND THE LIKE BEVERAGES
Luciano Paoletti, Florence, Italy, assignor to SPIDEM S.r.l., Pero Frazione Cerchiate, Italy
Reexamination Request No. 90/003,220, Oct. 15, 1993.
Reexamination Certificate for Patent No. 4,715,274, issued Dec. 29, 1987, Ser. No. 824,853, Jan. 31, 1986.
Claims priority, application Italy, Jan. 31, 1985, 19311 A/85; Sep. 6, 1985, 22947/85
Int. Cl.^{5} B01F *3/00*
U.S. Cl. 99—454



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-10 is confirmed.

1. An emulsifier unit particularly for emulsifying steam and milk to prepare cappuccino and the like, comprising an emulsifying chamber having an outward dispensing opening, nozzle means defining a steam delivery channel and terminating in a nozzle positioned spaced from said chamber to define a suction chamber, a milk intake conduit and an external air intake conduit communicating with said suction chamber which in turn communicates with said emulsifying chamber whereupon steam introduced into said steam delivery channel jets out of said nozzle creating a vacuum in said suction chamber drawing milk and air into same to mix and emulsify in said emulsifying chamber and to be discharged therefrom.

VOL
1162
ISS
4
MY
24
1994
UMI

REISSUES

MAY 24, 1994

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,612

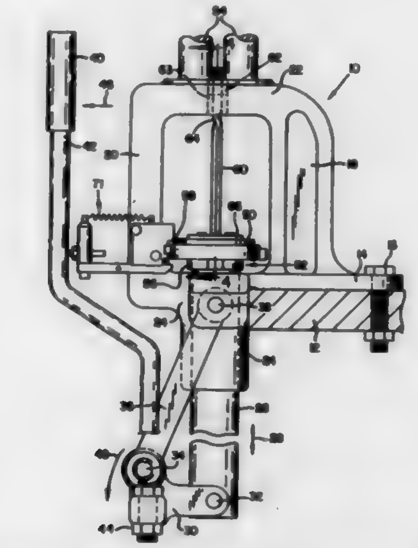
INDEXING RELOADER OF CARTRIDGES

Walter W. Bender, and Charles A. Gaustad, both of Oroville, Calif., assignors to Blount, Inc., Portland, Oreg.

Original No. 4,841,831, dated Jun. 27, 1989, Ser. No. 261,273, Oct. 24, 1988. Application for reissue Jun. 5, 1990, Ser. No. 533,527

Int. Cl.^{5} F42B *33/02*

U.S. Cl. 86—27 13 Claims



1. A device for reloading cartridges comprising;

a support structure, an overhead die holder forming a part of the support structure for holding a plurality of cartridge reloading dies in a symmetrical pattern spaced around a center opening, a rotatable bushing positioned in said center opening and a one-way clutch mechanism permitting rotation of the bushing in one direction and preventing rotation thereof in the other direction,

a plunger slidably mounted relative to the support structure for reciprocal vertical sliding movement from below the die holder toward the center opening therein, and actuating means for actuating said reciprocal movement of the plunger,

a cartridge holding turret rotatably mounted to the top of the plunger for rotation thereof in a horizontal plane, and an indexing shaft fixedly attached to the turret and projected upwardly therefrom through the bushing, said shaft having a configured cross sectional portion and said bushing having a complimentary configuration to allow sliding movement of the shaft therethrough but prohibiting rotation relative to the bushing, the [configuration of the shaft] *configured cross sectional* portion being twisted [spiral] *spirally* around the shaft a determined angle along an indexing section of the shaft, said configured shaft portion and *said* indexing section thereof being arranged relative to the reciprocal plunger movement whereby the configured shaft portion and *said* indexing section are forced through the bushing during such *reciprocal* movement to force indexing rotative movement of the shaft and *said* turret by said determined angle of twist *while the plunger is moving* in the direction of reciprocating movement wherein the bushing is prevented from rotative movement by the one-way clutch mechanism.

Re. 34,613

PROCESS FOR DECONTAMINATING RADIOACTIVELY CONTAMINATED METAL OR CEMENT-CONTAINING MATERIALS

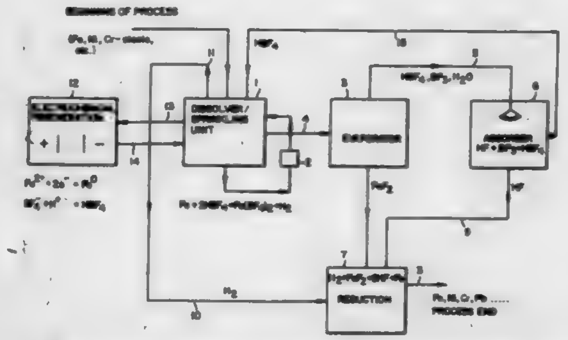
Jozef Hanulik, Zürich, Switzerland, assignor to Recytec SA, Switzerland

Original No. 5,088,044, dated Apr. 16, 1991, Ser. No. 349,586, May 9, 1989. Continuation-in-part of Ser. No. 19,799, May 27, 1986, Pat. No. 4,828,759. Application for reissue Nov. 25, 1991, Ser. No. 797,693

Claims priority, application Switzerland, May 28, 1985, 02238/85; May 28, 1985, 02239/85; Jun. 3, 1985, 02328/85

Int. Cl.^{5} G21F *9/16, 9/08;* C09K *13/08;* B08B *9/00*

U.S. Cl. 252—628 22 Claims



22. A process for decontaminating radioactively contaminated materials using a decontamination agent selected from the group consisting of fluoroboric acid; hexafluorosilicate acid; water soluble salts of fluoroboric acid; and mixtures thereof in aqueous solution, said decontamination agent having a concentration of about 0.05 to about 50 mol/liter in said solution, said process comprising contacting said radioactively contaminated materials to be decontaminated with said decontamination agent; and dissolving surface layers of said radioactively contaminated materials by said contacting with said decontamination agent.

Re. 34,614

BOWLING BALL

Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y. 12308

Original No. 5,098,096, dated Mar. 24, 1992, Ser. No. 607,752, Oct. 31, 1990. Continuation-in-part of Ser. No. 425,397, Oct. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 628,158, Jul. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 171,897, Jul. 24, 1980, abandoned. Application for reissue Apr. 13, 1992, Ser. No. 867,529

Int. Cl.^{5} A63B *37/04*

U.S. Cl. 473—126 28 Claims

[1. A bowling ball, comprising:

a) an inner core having a minimum specific gravity of 0.1063 per pound of ball weight, for balls ranging in weight from 8 to 16 pounds;

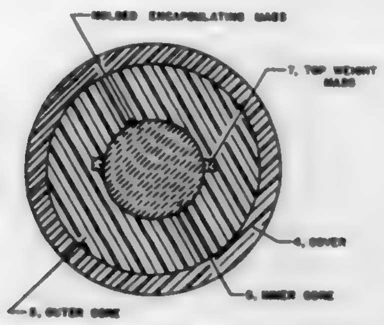
b) a molded encapsulating mass surrounding said inner core, wherein its specific gravity ranges downward to a minimum value of 0.38 for a specific fixed weight ball, to effectuate a decrease in ball moment of inertia;

c) the specific gravity of said inner core being greater than that of said encapsulating mass;

d) said ball moment of inertia decreases with an increase in

VOL
1162
ISS
4
MY
24
1994
UMI

inner core density, to effectuate a maximum moment of inertia about the ball's vertical axis of 0.318 in-ozs-sec^2 per



pound of ball weight, for the purpose of obtaining an increase in the total kinetic energy output of said ball.]

Re. 34,615
VIDEO PROBE ALIGNING OF OBJECT TO BE ACTED UPON

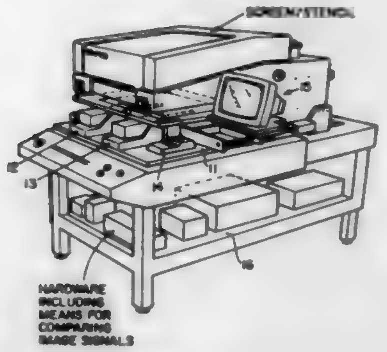
Gary T. Freeman, Beverly, Mass., assignor to MPM Corporation, Franklin, Mass.

Original No. 4,924,304, dated May 8, 1990, Ser. No. 116,490, Nov. 2, 1987. Application for reissue Jan. 31, 1992, Ser. No. 829,727

Int. Cl.^{5} H04N *7/18*

U.S. Cl. 348—95 **14 Claims**

MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 155 Pages)



1. Aligning apparatus comprising,
an object to be acted upon at predetermined locations defining a pattern,
a device characterized by said pattern for acting upon said object,
a video probe arranged to look at both said device and said object for providing image signals representative of both,
means for comparing both image signals to obtain an error signal representative of misalignment between the device and object,
means responsive to said error signal for [relatively positioning] *translating and rotating* said device [and said object] to reduce said error,
and means for operating upon said object with said device upon said predetermined locations.

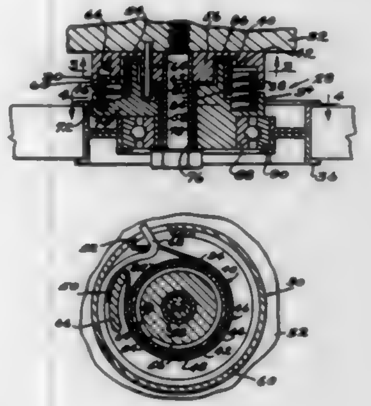
Re. 34,616
BELT TENSIONER WITH SPRING ACTUATED BAND BRAKE DAMPING

Jacek S. Komorowski, Weston, and Klaus K. Bytzek, Schomberg, both of Canada, assignors to Litens Automotive Partnership, Woodbridge, Canada

Original No. 4,725,260, dated Feb. 16, 1988, Ser. No. 29,695, Mar. 24, 1987. Application for reissue Dec. 21, 1992, Ser. No. 994,500

Int. Cl.^{5} F16H *7/12*

U.S. Cl. 474—135 **47 Claims**



42. A belt tensioner comprising,
a fixed structure,
a pivoted structure,
a belt tensioning pulley mounted on said pivoted structure for rotational movement about a rotational axis,
said pivoted structure being mounted on said fixed structure for pivotal movement about a fixed pivotal axis parallel with said rotational axis between a first position wherein said belt tensioning pulley can be transversely aligned with a loosely trained belt and a second position,
spring means for resiliently biasing said pivoted structure in a direction toward said second position with a spring torque which decreases as the position of the pivotal structure approaches said second position permitting manual movement of said belt tensioning pulley into said first position against such resilient bias so that upon manual release the resilient bias moves said belt tensioning pulley into an intermediate operating static equilibrium position in tensioning engagement with the belt wherein the spring torque is equal and opposite to a belt load torque which varies with the variation in the spring torque as the intermediate operation position approaches said second position due to belt elongation by maintaining the belt load force generally constant and varying the lever arm to said pivotal axis through which the belt load force acts,
the spring torque at any intermediate operating position being provided by the instantaneous spring force at the intermediate operating position and the lever arm to the pivotal axis through which the instantaneous spring force acts,
interengaging sliding friction damping surfaces operatively associated with said fixed structure and said pivoted structure for damping the pivotal movements of said pivoted structure as a result of dynamic belt load forces varying from the generally constant belt load force when the belt is moving,
said interengaging damping surfaces presenting sliding friction therebetween sufficient to establish a damping torque resistance to pivotal movement of said pivoted structure in a direction toward said first position by virtue of the pressure of interengagement of said damping surfaces and the position of interengagement of said damping surfaces from said pivotal axis of a magnitude sufficient to prevent movement in said direction in response to dynamic increases in the constant belt load force within 70% of said instantaneous spring force,
said interengaging damping surfaces and the operative association thereof respectively with said fixed structure and said pivoted structure being operable in response to the application of vibratory forces to said damping surfaces through said fixed structure independent of the dynamic belt load forces to instantaneously release the damping torque resistance to pivotal movement in said direction established by said damping surfaces so that instantaneous movement in said direction can take place which would otherwise be prevented.

Re. 34,617
VITAMINIZED COMPOSITIONS FOR TREATING HYPERCHOLESTEROLEMIA

Ronald J. Jandacek, Cincinnati, Ohio; Fred H. Mattson, San Diego, Calif., and Harry M. Taylor, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Original No. 4,005,196, dated Jan. 25, 1977, Ser. No. 657,529, Feb. 12, 1976. Application for reissue Dec. 2, 1991, Ser. No. 801,205

Int. Cl.^{5} A61K *31/70, 31/72*

U.S. Cl. 514—23 **69 Claims**

1. A composition of matter, comprising:
(a) an edible, non-absorbable, non-digestible liquid polyol fatty acid polyester having at least 4 fatty acid ester groups, wherein the polyol is selected from the group consisting of sugars and sugar alcohols containing from 4 to 8 hydroxyl groups and wherein each fatty acid group has from about 8 to about 22 carbon atoms:
  (b) sufficient anti-anal leakage agent , *other than tristearin,* to prevent leakage of said liquid polyester through the anal sphincter; and
(c) *said composition being fortified with* sufficient fat-soluble vitamin selected from the group consisting of vitamin A, vitamin D, vitamin E and vitamin K , *over and above that naturally present in said composition,* to prevent abnormally low levels of any of said fat-soluble vitamins in animals ingesting said composition.

Re. 34,618
INJECTION OF NICARDINPINE HYDROCHLORIDE AND PROCESS FOR THE PRODUCTION THEREOF

Katayasu Ogawa, Saitama; Go Ohtani; Shoji Yokota, both of Tokyo, and Masayoshi Aruga, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Original No. 4,880,823, dated Nov. 14, 1989, Ser. No. 338,402, Apr. 12, 1989. Continuation of Ser. No. 140,901, Dec. 23, 1987, abandoned, which is a continuation of Ser. No. 925,462, Oct. 30, 1986, abandoned, which is a continuation of Ser. No. 735,558, May 15, 1985, abandoned. Application for reissue Nov. 14, 1991, Ser. No. 791,358

Claims priority, application Japan, May 22, 1984, 59-102991

Int. Cl.^{5} A61K *31/44*

U.S. Cl. 514—356 **5 Claims**

1. A stable, injectable composition of nicardipine hydrochloride [in ampoule form] comprising an aqueous nicardipine hydrochloride solution containing 0.04 to 0.6 W/V% nicardipine hydrochloride and 2 to 7 W/V% of a polyhydric alcohol and wherein the pH of said solution is from 2.5 to 5, and the percentage of nicardipine hydrochloride remaining in said solution after a 12 week storage period at 60° C. is between 69.24 percent and 74.39 percent.

Re. 34,619
SYNTHETIC COOKING OILS CONTAINING DICARBOXYLIC ACID ESTERS

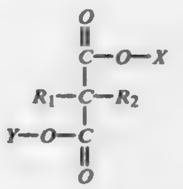
John Fulcher, Dallas, Tex., assignor to Recot, Inc., Dallas, Tex.

Original No. 4,582,927, dated Apr. 15, 1986, Ser. No. 598,063, Apr. 9, 1984. Application for reissue Nov. 8, 1990, Ser. No. 610,662

Int. Cl.^{5} C07C *69/347;* **A23D** *5/00*

U.S. Cl. 560—201 **11 Claims**

4. A diester [as claimed in claim 1,] *of the formula*



$$Y{-}O{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}\ \text{(}R_1{-}C{-}R_2\text{)}\ {-}\overset{\overset{\displaystyle O}{\|}}{C}{-}O{-}X$$

wherein R_1 and R_2, which may be the same or different, are hydrogen or alkyl of from 1 to 20 carbon atoms, with the provisos that at least one of the R groups, R_1 or R_2, is an alkyl of from 1 to 20 carbon atoms, wherein X and Y are both [alkenyl or dienyl radicals having from 12 to 18 carbon atoms] *oleyl or linoleyl radicals.*

VOL
1162
ISS
4
MY
24
1994
UMI

PLANT PATENTS

GRANTED MAY 24, 1994

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,741

CLIMBING ROSE PLANT NAMED 'JACSAT'

William A. Warriner, deceased, late of Tustin, Calif. by Alene Beatrice Warriner, legal representative , assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Feb. 17, 1993, Ser. No. 23,883

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—6 **1 Claim**

1. A new and distinct variety of rose plant of the climber class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous climbing habit; dark green, glossy, disease-resistant foliage; bright red flowers; repeat bloom; and ability to bloom on new wood.

8,742

ROSE PLANT LAVAWAY

Keith G. Laver, Caledon, Canada, assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Nov. 4, 1992, Ser. No. 971,324

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—8.1 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its compact, attractive growth habit; ease of propagation from softwood cutting; production of an abundance of near-white blooms in 4-inch pots in a greenhouse or outside in the garden, and the ability to be forced in a greenhouse to bloom in 5 to 7 weeks from softwood cuttings.

8,743

FLORIBUNDA ROSE PLANT NAMED 'TANRAVENS'

Hans Evers, Uetersen, Fed. Rep. of Germany, assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Apr. 22, 1993, Ser. No. 52,579

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of the presence of heavily appendaged sepals; an abundance of small thorns on all branches; a vigorous, upright habit of growth; bright, dark green, glossy and healthy foliage; and bright red flowers borne in large clusters.

8,744

PEACH TREE, "THIARA"

Sarbjit Thiara, 1896 Jacob Dr., Yuba City, Calif. 95991

Filed Dec. 21, 1992, Ser. No. 994,621

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—43.1 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is somewhat similar to the Loadel variety of peach tree (unpatented) with which it is somewhat closely similar in its physical appearance, but which is distinguished therefrom, and characterized principally as to novelty by bearing fruit which are ripe for commercial harvesting and shipment approximately July 1 through July 5 in the Sacramento Valley of California, and which further produces a clingstone fruit which has a good flavor, an attractive skin coloration, a larger size, and a date of maturity which is approximately 8 days earlier than the Loadel peach tree at the same geographical location.

8,745

STRAWBERRY PLANT CALLED 'AVILA'

Thomas M. Sjulin, Watsonville; Amado Q. Amorao, Camarillo, and Joseph I. Espejo, Jr., Watsonville, all of Calif., assignors to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Mar. 25, 1993, Ser. No. 37,063

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. We claim the new and distinct variety of strawberry plant described and illustrated and identified by the characteristics enumerated above.

8,746

STRAWBERRY PLANT OFRA

Shamay Izhar, and Eva Izsak, both of Rehovot, Israel, assignors to The Volcani Center, State of Israel, Ministry of Agriculture, Bet Dagan, Israel

Filed Jan. 22, 1992, Ser. No. 823,638

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. A new distinct variety of strawberry plant substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape and a long shelf life.

8,747

STRAWBERRY PLANT NAMA

Shamay Izhar, and Eva Izsak, both of Rehovot, Israel, assignors to The Volcani Center, State of Israel, Ministry of Agriculture, Bet Dagan, Israel

Filed Jan. 22, 1992, Ser. No. 823,721

Claims priority, application Israel, Apr. 10, 1991, 1679/91

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. A new distinct variety of strawberry plant substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape and a long shelf life.

8,748

STRAWBERRY PLANT VIRGINIA

Shamay Izhar, and Eva Izsak, both of Rehovot, Israel, assignors to The Volcani Center, State of Israel, Ministry of Agriculture, Bet Dagan, Israel

Filed Jan. 22, 1992, Ser. No. 823,802

Claims priority, application Israel, Apr. 10, 1991, 1680/91

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. A new distinct variety of strawberry plant substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape and a long shelf life.

8,749

ASTER PLANT NAMED WHITE MASTER

G. B. H. Bartels, Hornweg 53, 1432 GD Aalsmeer, Netherlands, assignor to G. B. H. Bartels, Aalsmeer, Netherlands

Filed Jul. 6, 1993, Ser. No. 86,143

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of aster plant named White Master, as illustrated and described.

VOL
1162
ISS
4
MY
24
1994
UMI

8,750
GERANIUM NAMED AMERICANA VIOLET

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Apr. 20, 1993, Ser. No. 50,528
Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct geranium cultivar substantially as herein shown and described, characterized by its magenta violet colored, semi-double flowers on large umbels, green foliage without a light zonation; the plant being fast rooting and having a vigorous upright growth habit.

8,751
GERANIUM NAMED ECLIPSE WHITE

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Apr. 20, 1993, Ser. No. 50,501
Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct geranium cultivar substantially as herein shown and described, characterized by its white colored, semi-double flowers on large umbels, dark green foliage with faint zonation; the plant being fast rooting and having a vigorous compact growth habit.

8,752
GERANIUM NAMED AMERICANA RED

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Apr. 20, 1993, Ser. No. 50,530
Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct geranium cultivar substantially as herein shown and described, characterized by its red colored, semi-double flowers on large umbels, green foliage without a distinct zonation; the plant being fast rooting and having a vigorous basal branching growth habit.

PATENTS

GRANTED MAY 24, 1994

ERRATA

For CLASS	See PATENT NO.
062-222	5,313,787
062-457	5,313,817
477-111	5,313,855
477-080	5,313,856
089-001	5,313,868
132-054	5,313,963
134-057	5,313,964
134-061	5,313,965
134-076	5,313,966
165-153	5,314,021
477-171	5,314,050
414-137	5,314,262
474-152	5,314,366
475-150	5,314,378
604-095	5,314,428
607-005	5,314,430
128-842	5,314,447
604-020	5,314,501
604-020	5,314,502
604-164	5,314,503
065-003	5,314,575
117-075	5,314,569
117-103	5,314,570
117-060	5,314,571
117-213	5,314,667
524-458	5,314,912
348-051	5,315,377
348-655	5,315,378
348-713	5,315,379
348-068	5,315,383
348-093	5,315,384
348-441	5,315,385
348-569	5,315,386
348-521	5,315,387

VOL
1162
ISS
4
MY
24
1994
UMI

ERRATA—CONTINUED

348-718	5,315,388
348-672	5,315,389
348-584	5,315,390
348-553	5,315,391
348-570	5,315,392
348-268	5,315,393
348-229	5,315,394
348-789	5,315,395
348-792	5,315,396
348-016	5,315,633

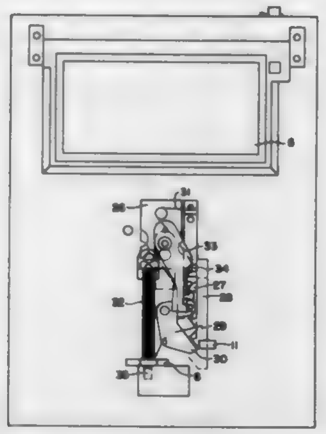
PATENTS

GRANTED MAY 24, 1994

GENERAL AND MECHANICAL

5,313,665
WELDER'S SHIELD, IN PARTICULAR FOR ARC WELDING

Janos Luczenbacher, Sr., and Janos Luczenbacher, Jr., both of Veresegyhaz u.92/B, H1151 Budapest, Hungary
Filed Feb. 19, 1992, Ser. No. 838,055
Claims priority, application Hungary, Jul. 7, 1989, 3445/89
Int. Cl.^{5} A61F *9/06*
U.S. Cl. 2—8 **9 Claims**



1. Welding shield in particular for arc welding provided with an adjustable fixing strap adapted to be placed onto the head of a welder, said shield having an inner surface adapted to face said welder and a lookout made of mirror-glass provided with an insert protecting the eye of the welder, said mirror-glass being arranged in a basic position at the eye-level of the welder when wearing said shield, in said basic position said mirror-glass is arranged parallel and adjacent a transparent flat-glass; a moving mechanism for moving said mirror-glass from its basic position to a second position away from said flat glass, said moving mechanism including a single-arm lever arranged on an inner surface of said welding shield, said lever being actuated by the chin of the welder, said moving mechanism being connected to a control mechanism having a base-plate fixed to a surface of said shield, a fastener arranged on a surface of said base-plate, having teeth, facing said welding shield and fixed to the arm of said single-arm lever, a closing wedge adapted to mesh with said teeth of said fastener for fixedly mounting said control mechanism in a given position, spring members for urging said control mechanism away from said given position and a control element adapted to release said control mechanism from said given position, said fastener, said closing wedge and said spring members being mounted on an outer surface of said shield opposite to said inner surface of said shield.

5,313,666
FACIAL SUN SHIELD APPARATUS

Vickie R. Bax, and Dale F. Bax, both of 403 Southeast Ter., California, Mo. 65018
Filed May 4, 1992, Ser. No. 877,793
Int. Cl.^{5} A42B *1/18*
U.S. Cl. 2—9 **6 Claims**

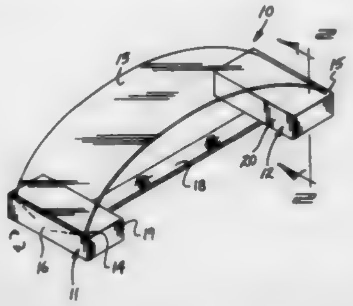
1. A facial sun shield apparatus, comprising,

a first support block spaced from a second support block, the first support block having a first block top wall, the second support block having a second block top wall, the first block top wall including a first slot, the second block top wall including a second slot, with the first slot and the second slot arranged in a parallel relationship relative to one another, and

a shield web having a convex outer surface and a concave interior surface directed into the first support block through the first slot, and directed into the second support block through the second slot, and

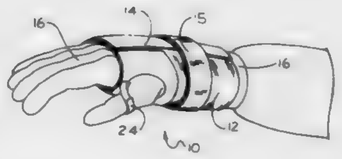
a first pivot axle dial orthogonally oriented relative to the first slot mounts the shield web within the first support block, a second shield pivot axle orthogonally directed through the second slot within the second support block pivotally mounts the shield web within the second block, and

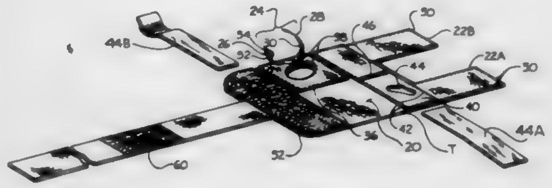
a flexible elongate connecting strap directed in fixed communication between the first support block and second support block.



5,313,667
SNOWBOARD WRIST PROTECTOR

Norman D. Levine, P.O. Box 1867, Pompano Beach, Fla. 33061
Filed Dec. 19, 1991, Ser. No. 810,493
Int. Cl.^{5} A41D *13/08*
U.S. Cl. 2—16 **11 Claims**





9. A wrist pad for protecting the wrist area of a wearer, comprising:

a waterproof elastic body portion having first and second sides which define a nominal wall thickness therebetween, bounded by a plurality of elongated side edges, said body portion further defining an aperture therethrough normal to said first and second sides to accommodate the thumb of said wearer, said body portion second side having a suede patch of nominal thickness attached thereto, and disposed adjacent said aperture, said body portion second side further having strap means disposed adjacent said aperture for securing said thumb of said wearer to said body portion, said strap means substantially preventing any outward movement or rotation of the thumb, said

VOL 1162 ISS 4 MY 24 1994 UMI

strap means secured to said body portion by said suede patch, wherein said body portion adds additional support to the wearer's wrist;

means for imparting structural rigidity to said body portion attached thereto, wherein said means for imparting structural rigidity comprises a first elongated elastic patch attached to said second side of said body portion along the peripheral edge of said first elastic patch, wherein a first hollow cavity is defined between said body portion second side and said first patch;

a first semi-rigid support member disposed within said first cavity, said first semi-rigid support member having a profile approximating the wrist-hand junction of a human arm, said first semi-rigid support member disposed such that it lies adjacent the back of the hand and wrist respectively;

a second elongated patch attached to said second side of said body portion along the peripheral edge of said second patch, wherein a second hollow cavity is defined between said body portion second side and said second patch;

a second semi-rigid support member disposed within said second cavity, said second semi-rigid support member disposed such that it lies adjacent the palm of the hand and wrist respectively; and

means for releasably securing said body portion to said wearer's wrist, said means for releasably securing comprising at least one flap integrally formed in said body portion having hook material attached to said first side; loop material attached to said body portion second side disposed transverse to said flap; and an elongated planar strap member attached to said body portion and extending outward therefrom, said strap member having hook and loop material disposed on opposing faces, said elongated strap member capable of being wrapped around the entire external periphery of said second side at least once, said elongated strap member thereby securing each of said first and second semi-rigid support members in place, whereby, when said wrist pad is being used, said body portion first side can be maintained in intimate contact with a snow glove being worn on said wrist by wrapping said body portion entirely around said wrist such that said body portion and rigid support member form a solid structure around said wrist area, thereby shielding said wrist from injurious falls.

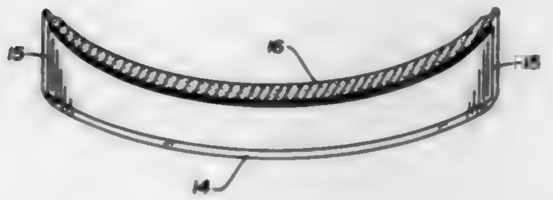
5,313,668
PROTECTIVE LINER FOR HAT

Jeffery F. Bogan, 108 Cherokee, Searcy, Ark. 72143, and Joseph L. Berry, Rte. 1, Box 446, Ward, Ark. 72176

Filed Mar. 25, 1993, Ser. No. 36,963

Int. Cl.^{5} A42C *5/02*

U.S. Cl. 2—181.4 **8 Claims**



1. A liner for the sweatband of a hat, comprising:

(a) a substantially rectangular body of moisture absorbing material having front and back surfaces, a pair of moisture impervious side edges and a pair of longitudinal edges, at least one of said longitudinal edges being moisture permeable;

(b) a layer of moisture impervious material affixed to and covering said back side of said moisture absorbing body; and

(c) adhesive means affixed to said layer of moisture impervious material for releasably securing the liner to the sweatband of the hat.

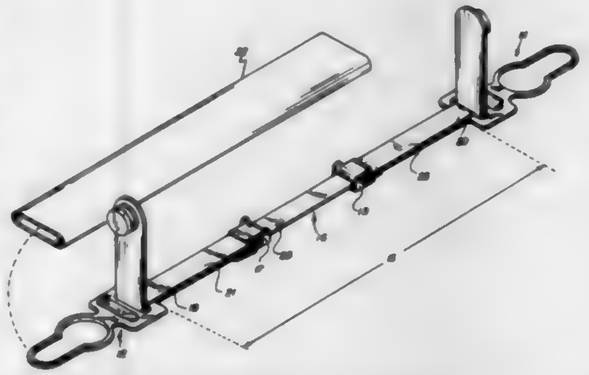
5,313,669
CLOTHING ANCHOR APPARATUS

Mornez Randell, and Thelma Randell, both of 868 Cypress Ave., Elkins Park, Pa. 19117

Filed Feb. 11, 1993, Ser. No. 16,559

Int. Cl.^{5} A41F *1/00*

U.S. Cl. 2—323 **7 Claims**



1. A new and improved clothing anchor apparatus, comprising:

a first clothing connector;

an elastic strap connected to said first clothing connector, said strap having a first end, an adjustable effective length, and a second end;

means, connected to said strap, for adjusting the effective length of said strap, wherein said strap adjusting means includes means, placed between said first end and said second end of said strap, for adjustingly doubling a portion of said strap;

a second clothing connector connected to said second end of said strap; and

soft, flexible jacket means for jacketing a portion of said elastic strap and covering said strap length adjusting means, said jacket means comprising a tubular sleeve having first and second opposed ends defining first and second openings, said tubular sleeve having a length between said first and second openings sufficient to extend between said first and second clothing connectors when said strap is slidably received through said first and second openings of said jacket to cover said means for adjusting said strap.

5,313,670
CERVICAL PROTECTION SYSTEM

Shreve M. Archer, III, Carmel, Calif., assignor to Entropy Racing, Monterey, Calif.

Continuation-in-part of Ser. No. 755,927, Sep. 6, 1991, abandoned. This application May 14, 1993, Ser. No. 62,083

Int. Cl.^{5} A42B *3/00*

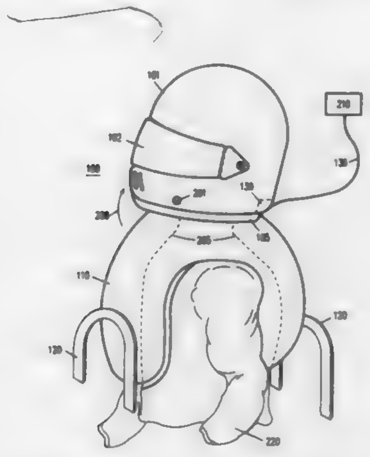
U.S. Cl. 2—411 **20 Claims**

18. A cervical protection helmet for a wearer comprising:

an inflatable bag disposed within a hollow collar region of and defined by the helmet; and

an inflation means disposed in a defined contour of the helmet, the inflation means coupled to the bag through a tube means for inflating the bag when initiated, the inflation means including a capsule, the capsule for providing a substance for inflating the bag;

the bag is deployed configuration extending continuously circumferentially around the neck of the wearer, extending under the jaw in the front of the wearer, extending under the occipital area in the back of the wearer, extending down to the sternum region in the front of the wearer, extending down to at least the seventh cervical vertebrae in the back of the wearer, and extending laterally on the shoulders of the wearer;



the bag being disconnectable from the helmet after deployment of the bag.

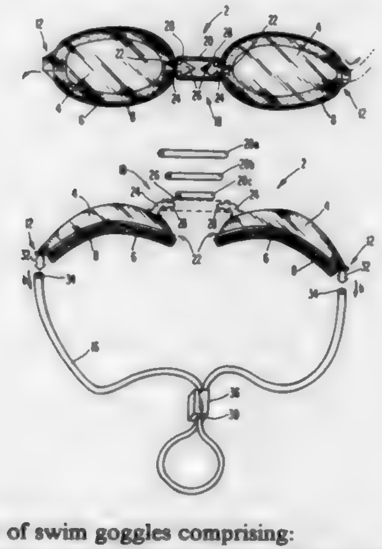
5,313,671
SWIM GOGGLES

Edmund L. Flory, Ketchum, Id., assignor to Flory, Inc., Philadelphia, Pa.

Filed Apr. 15, 1993, Ser. No. 47,640

Int. Cl.^{5} A61F *9/02*

U.S. Cl. 2—428 **15 Claims**



1. A pair of swim goggles comprising:

a) a seamless ovoid and convex-shaped pair of lenses,

b) a pair of barbed pointed posts having base portions attached to said pair of lenses;

c) a nose piece comprising resilient tubing, said pair of barbed pointed posts being disposed within the end portions of said resilient tubing,

d) a substantially flexible support for symmetrical containment of said lenses, and;

e) a head-strap attached at the distal ends of said support for securing said goggles to a face of a wearer.

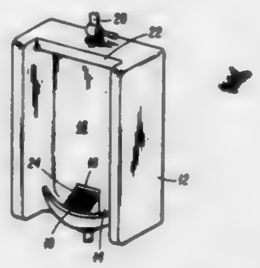
5,313,672
URINAL MAT

Richard C. Luedtke, Whiteladyes, Sandy Way, Cobham, Surrey KT11, and Kandiah Mahanandan, Woden Cottage, Firs Road, Kenley, Surrey CR2, both of United Kingdom

Filed May 13, 1991, Ser. No. 699,214

Int. Cl.^{5} E03D *13/00*

U.S. Cl. 4—301 **8 Claims**



1. A mat for placement in a urinal having a back wall and a floor having a drain therein, said mat overlying the drain of the urinal to restrain the passage of debris into the drain of the urinal while allowing liquids to pass therethrough, comprising

a base having a generally planar upper surface and a lower surface contoured to be receivable within the urinal and wherein said upper surface has a multiplicity of baffles upstandingly positioned thereon,

said base having a plurality of openings therethrough,

said upper surface has a network of voids disposed thereupon,

said base comprises a wedge with a thicker region disposed at a first edge of said base and wherein said mat is dimensioned such that when placed in a urinal, said first edge is positioned adjacent said urinal back wall and said lower surface lies over said drain.

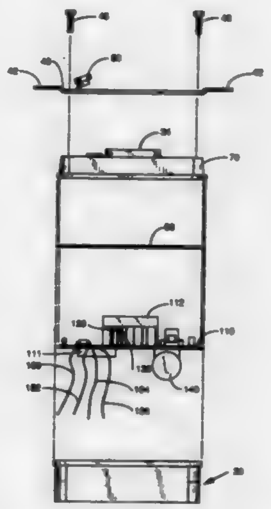
5,313,673
ELECTRONIC FLUSH VALVE ARRANGEMENT

Robert E. Saadi, Erie; Christopher J. Ball, Moon Township, Allegheny County, both of Pa., and Makoto Kodaira, Tokyo, Japan, assignors to Zurn Industries, Inc., Erie, Pa.

Filed Mar. 19, 1993, Ser. No. 33,844

Int. Cl.^{5} E03D *5/10*

U.S. Cl. 4—313 **21 Claims**



1. A sensor for a flushing device having an electric solenoid operated flush valve, said sensor comprising:

a control box;

a first radiation emitting source mounted in said control box;

a radiation detector adapted to detect reflected radiation

VOL
1162
ISS
4
MY
24
1994
UMI

from said first radiation emitting source mounted in said control box, said first radiation emitting source and said radiation detector forming a sensing unit;

a lens cover attached to said control box and adapted to permit radiation to pass therethrough to and from said sensing unit, said lens cover being spaced apart on one side thereof from said sensing unit; and

a control circuit contained within said control box responsive to said sensing unit and connected to the solenoid for initiating operation of said flush valve, said control circuit including means approximate said lens cover for bypassing said sensing unit for deactivating said flush valve, said means for bypassing said sensing unit being magnetically activated when subjected to a magnetic member disposed on the opposite side of said lens cover.

5,313,674

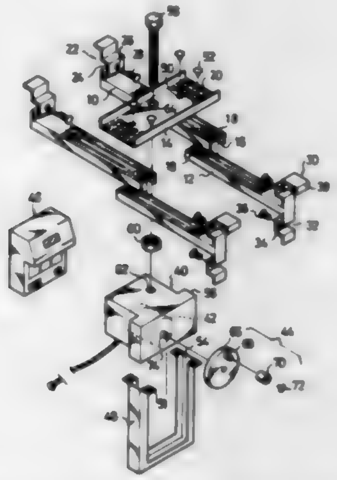
FLUSHING DEVICE

Sing Chiang, 4th Floor, No. 19, Lane 60, Chunghua Rd., Hsintien City, Taipei Hsien, and Chin-Hua Hsieh, No. 1, Lane 103, Yungtai St., Chungli City, Tao-yuan Hsien, both of Taiwan

Continuation of Ser. No. 807,310, Dec. 13, 1991, abandoned. This application Jan. 6, 1993, Ser. No. 901

Int. Cl.⁵ E03D *5/10*

U.S. Cl. 4—406 **3 Claims**



1. A flushing device for a toilet having a water tank and a valve device having a sealing position and a flushing position in the water tank, comprising:

a sensor for detecting the presence of a user of the toilet;

a driving means actuatable by said sensor for moving the valve device from the sealing position to the flushing position comprising:

a housing;

a motor being mounted in said housing and actuatable by said sensor;

a shaft extending from said motor through said housing and being rotatable by said motor;

a disk being attached to and rotatable by said shaft; and

a pin extending from said disk so that when said disk is rotated, said pin will move to one of an upper or lower position with respect to said valve device with one of the upper and lower positions corresponding to the flushing position of the valve device; and

a supporting means for supporting said housing at any point in a plane between an upper level and a lower level.

5,313,675

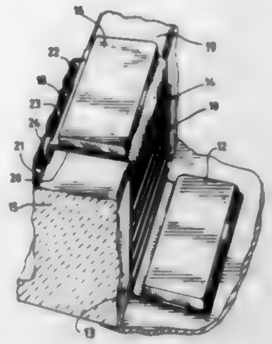
BATH AID DEVICE

Jay Tinen, 624 Raleigh Rd., Glenview, Ill. 60025

Continuation of Ser. No. 431,771, Nov. 6, 1989, abandoned. This application Dec. 20, 1991, Ser. No. 812,864

Int. Cl.⁵ A47K *3/02*

U.S. Cl. 4—580 **5 Claims**



1. A bath aid device for use in conjunction with a bathtub wherein said bath aid device assists one outside of said bathtub in the bathing of another within said bathtub, said bath aid device comprising:

a padded area for keeling or sitting;

a padded forearm and elbow rest;

a semi-rigid vertical portion interconnecting said padded area for kneeling or sitting and said padded forearm and elbow rest; said padded area for kneeling or sitting and said padded forearm and elbow rest being substantially thicker than said semi-rigid vertical portion;

a storage area for storing soaps, shampoos, washclothes, and other bathing articles;

wherein said padded area for kneeling or sitting rests on the floor adjacent and perpendicular to the sidewall of said bathtub, said padded area for kneeling or sitting being foldably connected to said semi-rigid vertical portion which extends upwardly along said outer portion of said bathtub wall, said vertical section being foldably connected to said padded forearm and elbow rest and wherein said padded forearm and elbow rest is located on the top side of said bathtub wall;

said padded forearm and elbow rest further being foldably connected to said storage area when said storage area is located against the inner wall of said sidewall of said bathtub.

5,313,676

SPORTSMAN SINK APPARATUS

Micheal W. Wright, 13168 W. 88th St. Court Apts. 193, Lenexa, Kans. 66215

Filed Mar. 8, 1993, Ser. No. 27,422

Int. Cl.⁵ A47K *1/05*

U.S. Cl. 4—645 **3 Claims**

1. A sportsman sink apparatus, comprising,

a table plate, the table plate including a sink cavity directed into the table plate, and the sink cavity having a sink cavity floor, and

a faucet mounted to the table plate in adjacency to the sink cavity extending over the sink cavity, and the faucet including a faucet valve to selectivity direct fluid flow through the faucet, and

the cavity floor having a drain opening, and

a flexible drain conduit extending from the opening below the table plate, and

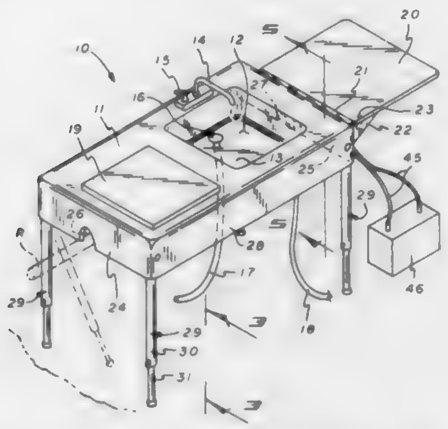
a resilient mat member mounted to the table plate in adjacency to the sink cavity for frictional engagement of workpiece components mounted upon the resilient mat, and

an extension plate, the extension plate including a hinge to pivotally mount the extension plate to the table plate, and

the extension plate includes a support web, the support web having a web axle pivotally mounting the support web to the extension plate to provide for engagement of the support web, and a continuous skirt mounted to the table plate extending downwardly therefrom in an orthogonal relationship, wherein the support web is arranged for selective engagement with the skirt, and

the skirt has a first side wall spaced from and parallel a second side wall, the first side wall including a first side wall opening extending into the first side wall from a lowermost edge of the first side wall, and the second side wall including a second side wall opening extending into the second side wall from the lowermost edge of the second side wall, with a first opening and a second opening arranged in a coaxially aligned relationship to receive a rail member therewithin, and the skirt including a skirt front wall and a skirt rear wall, and

a plurality of support legs mounted to the table plate within the skirt, each of the support legs includes a first tube and a second tube telescopingly received within the first tube, and the first tube having a spherical head spaced from the second tube, and a support rod, the support rod including a pivot axle pivotally mounting the support rod to the table plate, and the support rod having a support rod free end and support rod threads, and the support rod further including a latch rod orthogonally oriented and directed into the support rod, wherein the latch rod includes a latch rod spring captured between the support rod and the latch rod biasing the latch rod in a projected relationship relative to the support rod, and the latch rod further including a latch rod abutment, and a latch rod aperture directed through the skirt in adjacency to the latch rod to receive the latch rod when the support rod is orthogonally oriented relative to the table plate, and the support rod free end further including a resilient friction pad and the spherical head arranged for engagement with the friction pad, and a lock sleeve threadedly directed about the support rod threads and the lock sleeve including a lock sleeve flange, and the spherical head captured between the lock sleeve flange and the friction pad, whereupon securement of the lock sleeve about the support rod secures the spherical head against the friction pad to maintain alignment of the first tube and the second tube relative to the support rod.



5,313,677

DUAL OUTLET BATHTUB DRAIN VALVE AND WATER CONSERVATION SYSTEM

John A. Coe, 615 Marguette St., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 775,706, Oct. 10, 1991, Pat. No. 5,210,886. This application Mar. 9, 1993, Ser. No. 28,242

Int. Cl.⁵ E03C *1/232;* F16K *31/44;* F17D *1/13*

U.S. Cl. 4—683 **5 Claims**

1. A manually operated water drain control valve for use with an existing bathtub/shower having an existing water drain line, an existing overflow line, an existing sewer line and an existing water recycle line, said valve alternatively blocking water in the existing drain line or directing water from said existing drain line to either said existing sewer line or said existing water recycle line, the valve comprising;

a first inlet adapted to be connected to said existing drain line for accepting water from said existing water drain line;

a second inlet adapted to be connected to said existing overflow line for accepting water from said existing overflow line;

a first outle· adapted to be connected to said existing sewer line;

a second outlet adapted to be connected to said existing water recycle line;

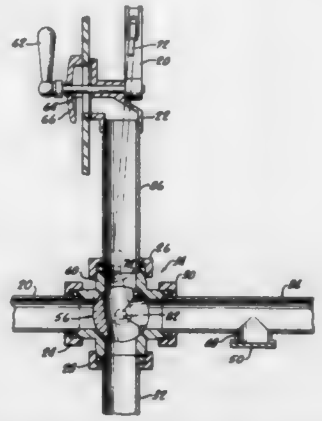
each of said first inlet, first outlet and second outlet having full port inlets and outlets, respectively, with internal diameters at least as large as the line to which the same can be connected;

rotatable means for alternatively blocking the first inlet, the first outlet and the second outlet, such that water is blocked from the existing drain line or water from the first inlet and the second inlet flows out the second outlet when the first outlet is blocked, and the water from the first inlet and the second inlet flows out the first outlet when the second outlet is blocked, said rotatable means including a three-directional passage which is fully open to three of said inlets and outlets when either of said first outlet or second outlet is blocked, said rotatable means comprising an element having said three-dimensional passage therethrough, said element being disposed within an intersection of the first inlet, the second inlet, the first outlet and the second outlet;

a handle connected to the element for rotating the element within the valve;

a lever adapted to be located in the bathtub/shower accessible to a user thereof, the lever having a first position, a second position and a third position; and

linkage connecting the lever and the handle, such that switching the lever between positions enabling water to selectively flow into the existing sewer line and the existing recycle water line and to block the existing drain line so the bathtub/shower may be filled.



5,313,678

ACOUSTICAL PILLOW

Frances H. Redewill, 24352 Acaso #7, Laguna Hills, Calif. 92656

Filed Jan. 8, 1993, Ser. No. 2,134

Int. Cl.⁵ A47G *9/00;* H04R *5/02*

U.S. Cl. 5—639 **9 Claims**

1. A pillow adapted to support the head of a user, comprising:

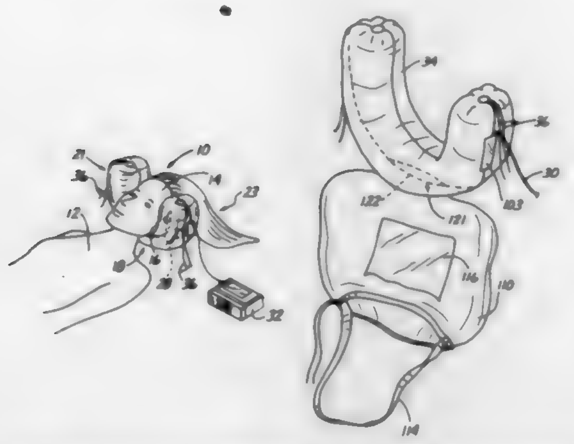
a core having an axis extending through a central section and opposing end sections;

VOL
1162
ISS
4
MY
24
1994
UMI

the central section having a thickness adapted to support the head of a user with the spine of a user disposed in a cervically correct configuration, the central section having a length generally equivalent to the width of the head of the user;

the end sections being bent from the central section along the axis of the core, and being generally coextensive in a common direction to provide the core with a generally U-shaped configuration;

the central section and end sections having an outer surface and an inner surface;



portions of the core defining a slit extending from one of the surfaces into the core;

a spring disposed in the slit and extending through the central section and into each of the end sections;

the spring having properties for biasing the end sections toward each other to provide a snug fit relationship with the ears of the user; whereby

the end sections tend to attenuate environmental sound by isolating the ears of the user from the environment.

5,313,679

BED HAVING SYSTEM FOR MOVING MATTRESS UP AND DOWN

Yoshihisa Yamaguchi, 3-17, Kitakoiwa 7-chome, Edogawa-ku, Tokyo, Japan

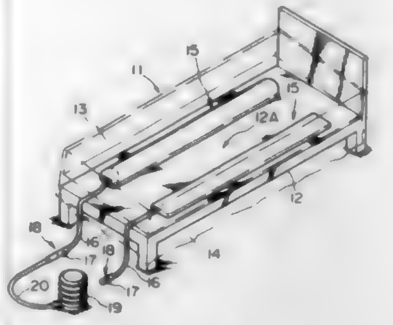
Continuation-in-part of Ser. No. 965,885, Oct. 23, 1992, Pat. No. 5,257,430. This application Mar. 11, 1993, Ser. No. 30,593

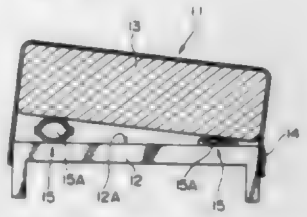
Claims priority, application Japan, Feb. 28, 1992, 4-044064; Apr. 30, 1992, 4-111961

Int. Cl.^{5} A47C *21/00, 21/06*

U.S, Cl. 5—659 **7 Claims**

1. A bed (11) consisting essentially of base (12), a mattress (13) provided on top face (12A) of said base (12), a pair of inflatable means (15) provided between said mattress (13) and said base (12), wherein each of said inflatable means (15) has a body in the form of an elongated envelope-shaped air bag formed from two plates sealed along their peripheral borders, each of said inflatable means (15) having an air supplying tube (16) connected at one end to said inflatable means (15), whereas one of said inflatable means (15) is laid on one side of said top face (12A) of said base (12), while the other said inflatable means (15) is laid on the other side of said top (12A) of said base (12), and each of said inflatable means (15) is independently connected to an air-supplying means (19) through said air-supplying tube (16).





5,313,680

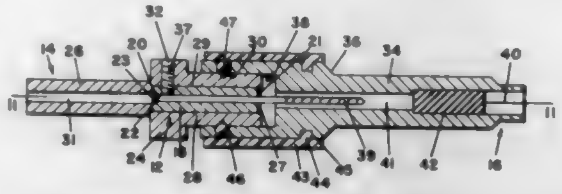
COMBINATION DRILLING AND WRENCHING TOOL

William G. Ringler, 50 Juniper Rd., Unit C-11, No. Attleboro, Mass. 02760

Filed Apr. 14, 1992, Ser. No. 868,554

Int. Cl.^{5} B25F *3/00*

U.S. Cl. 7—138 **12 Claims**



1. A combination drilling and wrenching tool for use with a power tool which has a chuck for gripping the shank of a tool, said drilling and wrenching tool comprising:

(a) an inner housing which has a central longitudinal axis, a first bore which extends along said axis, said first bore having a first forward opening for receiving the rear end of a drill bit so that the rear end of the drill bit lies in said first bore and the front end of the drill bit extends forwardly from said first forward opening along said axis,

(b) first connecting means for releasably fixing the rear end of said drill bit to said inner housing,

(c) an intermediate housing which has a rearward shank for insertion into the chuck of a power tool and a forward shank, said forward shank having a second bore which extends along said axis, said second bore having a second forward opening for receiving said inner housing so that the inner housing lies within said second bore and said first and second bores are coaxial, and the front end of a drill bit which is located within said first bore extends forwardly from said second forward opening,

(d) second connecting means for releasably fixing said inner housing to said intermediate housing,

(e) an outer housing having a forward portion and a rearward portion, said forward portion having a forward end which has a forwardly facing wrenching socket, said rearward portion having a rearwardly facing socket for receiving the forward shank of said intermediate housing, said outer housing having a third axial bore which extends along said central longitudinal axis from said rearwardly facing socket toward said forwardly facing socket and which is coaxial with said first and second bores for receiving the forwardly extending portion of said drill bit, and

(f) coupling means for releasably coupling, said second shank to said rearwardly facing socket so that rotation of said intermediate housing about said axis causes rotation of said outer housing about said axis, whereby said combination drilling and wrenching tool is effective for drilling when said outer housing is removed from said intermediate housing and effective for wrenching when said outer housing is applied to said intermediate housing.

5,313,681

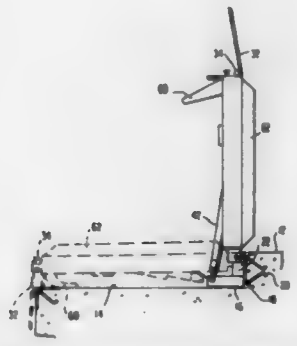
VERTICALLY STORING DOCK LEVELER

James C. Alexander, London, Canada, assignor to The Serco Corporation, Ontario, Canada

Continuation of Ser. No. 669,128, Mar. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 331,983, Apr. 3, 1990, Pat. No. 5,001,799. This application Nov. 20, 1992, Ser. No. 979,227

Int. Cl.^{5} E01D *1/00*

U.S. Cl. 14—71.1 **20 Claims**



1. A vertically storing dock leveler comprising;

a deck assembly, means at one end of deck assembly for hingedly mounting a said deck assembly to a fixed surface, means to move said deck assembly from an upright stored position to a horizontal operative position; a lip pivotably mounted to an opposite end of said deck assembly, means to move said lip and, a seal pivotably mounted on said deck assembly to close a space between said deck assembly and a floor when said deck assembly is in an operative position.

5,313,682

HAND HELD DOMESTIC UTENSIL CLEANING DEVICE

Naji Chamieh, 13206 Summertime Ln., Culver City, Calif. 90230

Filed May 19, 1993, Ser. No. 65,355

Int. Cl.^{5} A46B *13/06*

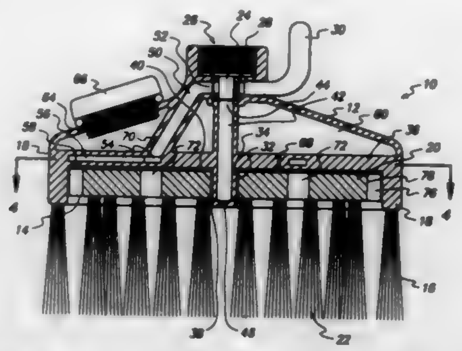
U.S. Cl. 15—29 **7 Claims**

1. A water operated rotatable scrubbing brush device, comprising:

a non-rotatable body portion;

a rotatable scrubbing disk plate which is rotatably carried on an extension of a rinse water channel which extends outwardly from the underside of said non-rotatable body, said rotatable scrubbing disk plate carrying scrubbing members on an underside thereof, and a plurality of water vanes located on its circumference;

a two-way valve with a water inlet for connection to a water supply, and two outlets through which water can be selectively directed, the first outlet being in fluid communication with the rinse water channel which exits the device, and a second outlet which is in fluid communication with a wash water channel, said wash water channel being in fluid communication with a plurality of jets which are aligned to direct water flowing therefrom to the vanes on the circumference of the rotatable scrubbing disk plate, and thereby drive the rotatable scrubbing disk plate, whereas when the user of the device desires to actuate a rotatable scrubbing mode of the device, the user positions the two-way valve to direct water through the wash water channel and jets, and when the user wishes to actuate a rinse mode of the device, the user positions the two-way valve to direct water through the rinse water channel, so that the water exits the device without rotating the rotatable scrubbing disk plate, and without intercepting the rotatable scrubbing disk plate.



5,313,683

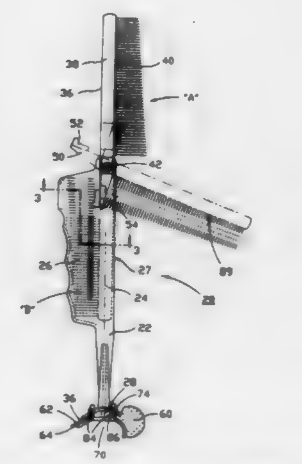
HOUSEHOLD CLEANING IMPLEMENT

Robert G. Dickie, Newmarket; Maurice Tousson, Thornhill; William A. Edgar, Claremont, and Peter Jennings, Toronto, all of Canada, assignors to Maubiter Trading Inc., Toronto, Canada

Filed Jul. 6, 1992, Ser. No. 908,076

Int. Cl.^{5} A47L *1/08*

U.S. Cl. 15—117 **7 Claims**



1. A device for effecting general household cleaning, comprising:

a main body member having a first longitudinal axis therealong, with a portion of said main body member having a generally hollow handle portion defining a storage area therein;

a head member affixed to a first end of said main body member, said head member having a second longitudinal axis;

a brush at a second end of said main body portion, and having an elongated spine and a plurality of bristles securely retained by said spine, said brush being connected in movable relation to said main body member and movable between an extended position and a retracted position;

a sponge securely retained on said head portion;

VOL
1162
ISS
4
MY
24
1994
UMI

a resilient blade securely retained on said head portion and adapted for wiping liquid from a surface; and

a retaining member secured to said head member by at least one clip which extends from said retaining member, whereby said retaining member is adapted for releasable attachment to said head member, and is further adapted to securely retain said sponge and said blade on said head member;

wherein said head and said retaining member are generally elongated and have opposed receiving surfaces adapted to receive and retain a portion of said sponge and said blade therebetween;

wherein a plurality of "L"-shaped clips are adapted to extend through co-operating apertures in said head member, and each of said clips is adapted to be retained by a co-operating projection on said head member; and

wherein said brush is pivotably mounted by means of a pivot member having a pivot axis that is perpendicular to said first longitudinal axis and which is parallel to said second longitudinal axis, said brush being arcuately movable in a plane generally perpendicular to said pivot axis.

5,313,684

DENTAL BRUSH HOLDING DEVICE

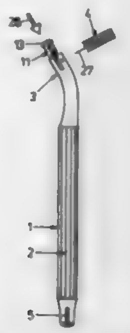
Holger Fitjer, Ansbach, Fed. Rep. of Germany, assignor to Georg Karl Geka-Brush GmbH, Bechhofen-Waizendorf, Fed. Rep. of Germany

Filed Aug. 28, 1992, Ser. No. 936,441

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1991, 9110747

Int. Cl.^{5} A46B *9/04, 3/00*

U.S. Cl. 15—167.1 **8 Claims**



1. A holding device comprising a handle and a holding section for exchangeably arresting a dental cleaning brush with a wire stem, the holding section having a longitudinal recess having a free end and defining an internal wall and a longitudinal axis and a bore (6) extending substantially perpendicular to said longitudinal axis of the holding section, said bore approximately corresponding to the diameter of the wire stem of the brush and into which the stem of the brush can be inserted, a displaceable locking member having a longitudinal slot being provided to arrest the stem within the longitudinal slot after said wire stem is bent by 90°, wherein the bore (6) communicates with the longitudinal recess (9) at said free end of the holding section (3), and wherein when a free end of the locking member (11) is inserted into the longitudinal recess (9), the stem (27) of the brush (4) is bent over by the insertion of the locking member (11) into the longitudinal recess in the axial direction and is arrested both between the longitudinal slot (19) of the locking member (11) and said internal wall of the longitudinal recess (9) and in the bore (6),

wherein the free end of the locking member (11) seen in the direction of insertion (arrow 28) into the longitudinal recess has a wedge portion (14) biased in relation to the longitudinal axis (8) for the purpose of initially bending the stem (27) of the brush (4).

5,313,685

DEVICE FOR REMOVING LIQUID FROM THE SURFACE OF A MOVING STRIP

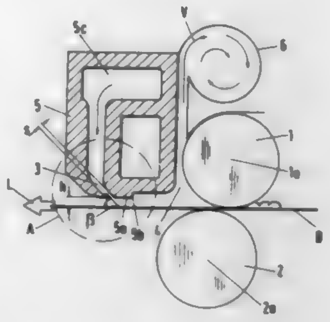
Carl Kramer; Bernd Konrath, both of Aachen; Bernd Berger, Kaarst, and Peter Reinthal, Hemer, all of Fed. Rep. of Germany, assignors to Sundwiger Eisenhutte Maschinenfabrik GmbH, Hemer-Sundwig, Fed. Rep. of Germany

Filed May 6, 1992, Ser. No. 880,204

Claims priority, application Fed. Rep. of Germany, May 17, 1991, 4116325

Int. Cl.^{5} A47L *5/38*

U.S. Cl. 15—309.1 **6 Claims**



1. Device for removing a liquid from the surface of a moving strip, comprising

means for blowing a jet of gas onto said strip so as to aerodynamically lift said liquid off the surface of said strip, said blowing means including a slot nozzle which is disposed transversely of the direction in which the strip is moving and is directed at said strip surface at an angle of between about 45° to 90° opposite to the direction of strip movement,

wherein the ratio of the distance (h) of said slot nozzle from said moving strip and the width (s) of said slot nozzle is in the range $h/s=2$ to $h/s=10$, so that the velocity of the gas jet emerging from said slot nozzle onto said strip is in the range of $0.3<\text{Mach}<2$, and

means for suctioning said aerodynamically lifted liquid away from said strip, said suctioning means including a suctional removal gap above said moving strip located at a distance which is 5 to 25 times as great as said slot nozzle distance (h) and upstream of a line of impingement of the gas jet emerging from the slot nozzle.

5,313,686

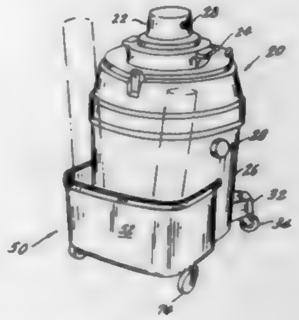
TOOL CADDY FOR ATTACHMENT TO CONTAINER, PARTICULARLY FOR A VACUUM CLEANER TANK

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Oct. 30, 1991, Ser. No. 784,924

Int. Cl.^{5} A47L *9/00*

U.S. Cl. 15—323 **11 Claims**



1. A tank and a caddy for emplacement on the tank, comprising:

first fixtures disposed on the tank;

a plurality of removable means for supporting the tank wherein the first fixtures are adapted to receive the support means; and

at least one second fixture disposed on the caddy adapted to be received by at least one of the first fixtures when tank support means are absent from at least one of the first fixtures,

wherein the caddy has a caddy wall and the tank has a peripheral wall and wherein the caddy wall and peripheral wall define the interior of the caddy when the caddy is placed on the tank.

5,313,687

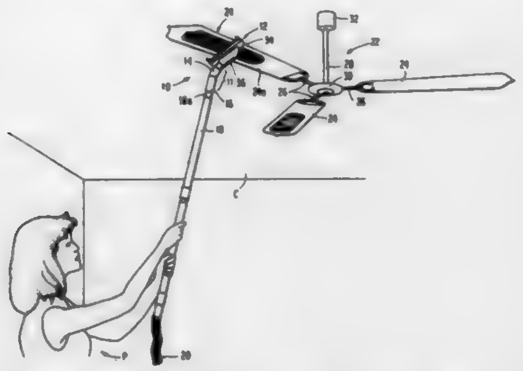
CEILING FAN BRUSH AND ADJUSTABLE ANGLE TUBE VACUUM CONNECTOR FOR SAME

Norman J. Schneider, 1120 S. King St., Honolulu, Hi. 96814

Filed Aug. 14, 1992, Ser. No. 929,336

Int. Cl.^{5} A47L *9/06*

U.S. Cl. 15—394 **14 Claims**



1. A ceiling fan brush for vacuum cleaning of thin, elongated, planar ceiling fan blades having laterally opposed, longitudinally extending opposite side edges, said ceiling fan brush comprising: an elongated body, a plenum chamber within said body and opening to one face of said body, a pair of side brushes mounted on said one face and projecting outwardly thereof, spaced laterally from each other and extending over the major length of said body, a pair of longitudinally opposed end brushes, spanning transversely across the body on said one face and projecting outwardly of said one face in the same direction as said side brushes and forming with said side brushes a vacuum chamber with the tips of said side brushes in contact along each face of said thin elongated planar ceiling fan blade, the end brushes having bristles of a length in excess of the length of the bristles forming said side brushes and being spaced from each other a distance generally equal to the lateral width of the ceiling fan blades to thereby engage respective opposite side edges of said elongated planar ceiling fan blades, and means carried by said body and opening to said plenum chamber for coupling said plenum chamber to a source of vacuum pressure such that said ceiling fan brush, when moved longitudinally over the surface of the fan blade, dislodges accumulating dust from the surface of the fan blade and said dust is sucked into the plenum chamber under vacuum pressure for effectively removing the dust from the ceiling fan blades.

5,313,688

FIBER WASTE SEPARATOR INCLUDING CARRIERS, MOVABLE COVERS, AND SUCTION HOOD

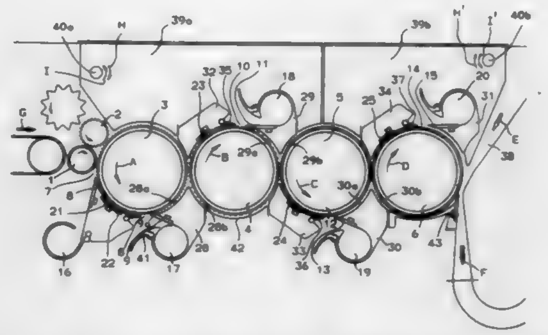
Ferdinand Leifeld, Kempen, and Konrad Temburg, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 17, 1991, Ser. No. 760,988

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1990, 4029415

Int. Cl.^{5} D01G *9/06, 9/20*

U.S. Cl. 19—107 **11 Claims**



1. In a fiber processing machine including two oppositely rotated, tangentially cooperating first and second clothed rolls, wherein said first roll is an upstream roll and said second roll is a downstream roll as viewed in a travelling direction of fiber material being entrained by the rolls on fiber-advancing portions thereof; said rolls having a generally horizontal axis of rotation and together defining opposite first and second converging gaps; a first carrier disposed in said first converging gap and partially extending over a circumferential portion of said first and second rolls; the improvement comprising a mote knife mounted on said first carrier and bounding waste discharge opening situated circumferentially along one of said rolls, further wherein said first carrier has a carrier part partially covering said fiber-advancing portion of said first roll; further comprising a second carrier disposed in said second converging gap; said second carrier having curved carrier parts extending over portions of circumferences of said first and second rolls and a suction hood mounted on said second carrier.

5,313,689

SLIVER DRAWING ROLLERS DRIVEN BY BELTS INCLUDING BELT CLEANERS

Rudolf Oexler, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP90/01688, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO91/05893, PCT Pub. Date May 2, 1991

PCT Filed Oct. 9, 1990, Ser. No. 687,859

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 3934576

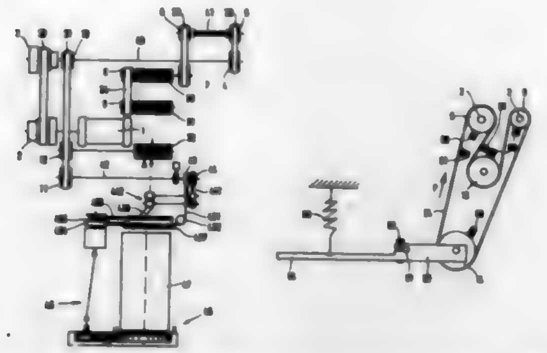
Int. Cl.^{5} D01H *5/18;* **F16H** *7/10*

U.S. Cl. 19—293 **7 Claims**

1. Drawing frame for drawing fiber sliver with drawing frame rollers comprising a pair of pre-drawing rollers, and a pair of main drawing rollers, each of said rollers being fixed to a respective shaft, a wheel for driving each of said shafts being fixed adjacent an end of each respective shaft, power transmission means engaging said wheels for driving said draw frame roller's wherein at least one of said power transmission means is a flat belt surrounding a respective pair of said wheels, a deflection pulley engaging and deflecting said flat belt between said respective pair of said wheels, said deflection increasing an

VOL
1162
ISS
4
MY
24
1994
UMI

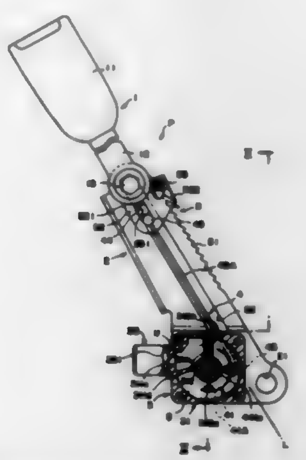
angle that form as said flat belt wraps around said respective wheels for providing a non-slip engagement between said flat belt and said respective wheels and cleaning devices in contact with said flat belt.



5,313,690

BUCKLE PRETENSIONER FOR SEAT BELT SYSTEMS

Koji Hiramatsu, and Ryoichi Yoshida, both of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan
Filed Jun. 14, 1993, Ser. No. 76,353
Claims priority, application Japan, Jun. 16, 1992, 4-180518
Int. Cl.^{5} A44B *11/00*
U.S. Cl. 24—641 1 Claim

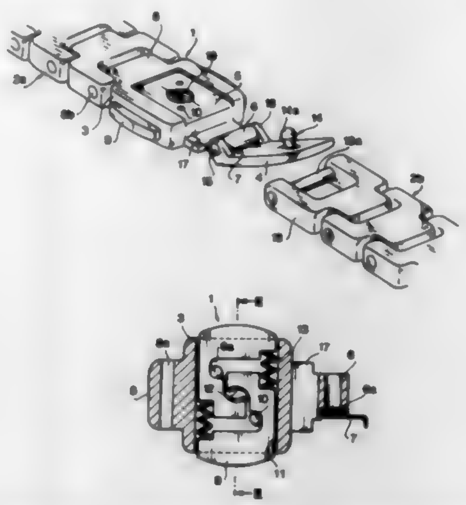


1. A buckle pretensioner for a seat belt system having a support member on which a buckle is mounted for movement generally downwardly from a normal upper position to a pretensioning lower position, driving means mounted on the support member for generating a driving force to move the buckle along the support member from the upper position to the lower position, connecting means connecting the driving means to the buckle for transmitting the driving force from the driving means to the buckle, and locking means for locking the buckle in the lower position to which it is driven by the driving force, characterized in that the driving means includes a rotary actuator having a rotor, and a gas generator for supplying operating gas to the rotary actuator, and in that the coupling means is a force-transmitting mechanism that transduces a tangential force produced by rotation of the rotor to a translational force for moving the buckle from the upper position to the lower position.

5,313,691

BUCKLE FOR WATCH BANDS

Norio Hashimoto, Tanashi, Japan, assignor to Citizen Watch Company, Tokyo, Japan
Filed Apr. 6, 1993, Ser. No. 42,781
Claims priority, application Japan, Apr. 24, 1992, 4–34415; Sep. 29, 1992, 4–73286
Int. Cl.^{5} A44C *5/00*
U.S. Cl. 24—69 J 9 Claims



1. A buckle for a watch band having a first band member and a second band member having an engaging rod which is provided at an end link of the second band member, the engaging rod disposed in a lateral direction with respect to a longitudinal direction of said watch band, the engaging rod being disposed so as to form a first opening between it and the end link, comprising:

- a housing having a second opening at an upper portion and connected to said first band member;
- a pair of push plates provided in the housing so as to be moved in said lateral direction;
- each of said push plates having an engaging hook;
- spring means for urging each of said push plates in an outward direction;
- stopping means for stopping each of said push plates urged by said spring means at a position where an outer end of the push plate is projected from the housing;
- a cover pivotally connected to an end of said housing;
- a lock pin secured to the underside of said cover;
- said cover being provided such that it is inserted into said first opening behind said engaging rod and turned onto said housing and that said lock pin is inserted into said second opening and engaged with said engaging hooks of said push plates;
- each of said push plates being formed such that the engaging hook is removed from the lock pin only when that push plate is pushed;
- an opening spring provided between said housing and said cover for urging the cover to an open position.

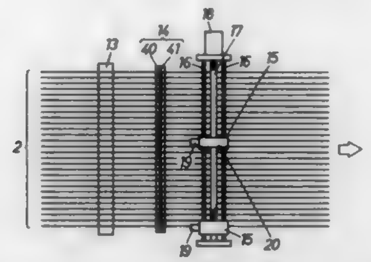
5,313,692

WARP YARN BREAKAGE DETECTING SYSTEM

Sotoo Mizuuchi, Kanazawa, and Isao Nishimura, Kahoku, both of Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan
Filed Jan. 22, 1993, Ser. No. 7,772
Claims priority, application Japan, Jan. 24, 1992, 4-032833; Jun. 19, 1992, 4-048734[U]
Int. Cl.^{5} D03D *51/28*
U.S. Cl. 28—187 28 Claims

1. A warp in combination with a yarn breakage detecting system comprising:

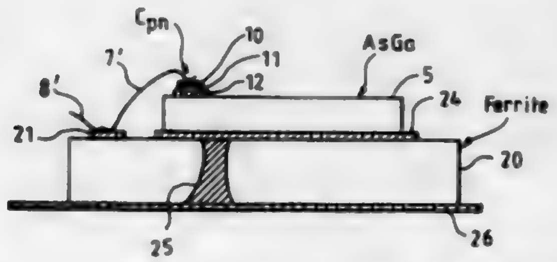
- a plurality of yarn detectors for photoelectrically detecting parallel warp yarns forming a warp and for providing electrical yarn detection signals; and
- a signal processing unit for counting peaks in said electrical yarn detection signals, representing the warp yarns and for providing a yarn breakage detection signal when a counted number of peaks is smaller than a predetermined number;
- wherein said warp yarns of said warp are divided into a plurality of groups of warp yarns by a provided dividing means so that adjacent groups of warp yarns are spaced apart by a predetermined distance greater than pitches of said warp yarns in said groups, and wherein said yarn detectors are disposed so as to be assigned respectively to correspond to said groups of warp yarns and respective monitoring ranges of said yarn detectors are preselected so as to respectively correspond to said groups of warp yarns, and wherein said signal processing unit is disposed so as to count said peaks in said electrical yarn detection signal of each of said yarn detectors; and wherein said signal processing unit includes means for counting the warp yarns in accordance with signals from each of said yarn detectors and further includes a means for summing the counted number of warp yarns and includes a means for comparing the sum with a preselected number and for outputting a yarn breakage signal in accordance with said comparison.



5,313,693

DEVICE FOR THE MOUNTING OF VERY WIDE-BAND MICROWAVE INTEGRATED CIRCUITS

Gérard Cachier, Bures sur Yvette, France, assignor to Thomson-CSF, Puteaux, France
Filed Nov. 3, 1992, Ser. No. 970,632
Claims priority, application France, Dec. 6, 1991, 91 15165
Int. Cl.^{5} H01G *4/00*
U.S. Cl. 29—25.03 3 Claims



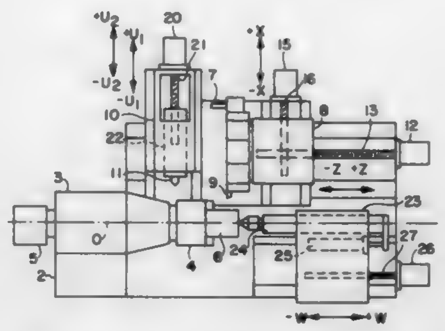
1. A device for the mounting of chips of very wide-band microwave monolithic integrated circuits comprising capacitors for the decoupling of the DC supplied of said circuits, said device comprising:

- a ferrite support on which said chips are fixed; and
- connection means to connect said capacitors to said supplied including metallized connection zones on said support and linking wires connecting said zones to said decoupling capacitors and being positioned so as to face bared parts of said ferrite support.

5,313,694

MACHINE TOOL FOR NON-CIRCULAR AND OTHER MACHINING

Katsuyuki Yonemoto, Kurashiki; Hidehiko Miyake, and Kazumasa Enoki, both of Okayama, all of Japan, assignors to Takisawa Machine Tool Co., Ltd., Okayama, Japan
Filed Jan. 25, 1993, Ser. No. 8,681
Claims priority, application Japan, Jan. 24, 1992, 4-34153
Int. Cl.^{5} B23B *3/06, 5/44, 7/04, 11/00*
U.S. Cl. 29—27 R 2 Claims



1. A machine tool for non-circular machining comprising a spindle stock which includes a main spindle having a rotational angle control function and a workpiece chuck provided on a distal end portion of the main spindle, a tailstock which is located opposite to a main spindle and provided movably in a direction of the axis of the main spindle, a carriage movable in parallel to the axis of said main spindle, first and second tool rests independently installed on respective cross slides on said carriage, and a numerical control device which effects the rotational angle control function of said main spindle and positioning control of said first and second tool rests, wherein said first and second tool rests move in directions perpendicular to the main spindle axis during machining, and the first tool rest is a tool rest supporting a single type or complex type cutting tool for lathe machining and/or milling of a workpiece, whereas the second tool rest is a tool rest supporting a single type or complex type cutting tool for performing non-circular machining exclusively, the second tool rest having a slider and means for moving the slider in the direction perpendicular to the main spindle axis direction in synchronism with the rotational angle control of the main spindle.

5,313,695

PROCESS AND DEVICE FOR BODY ASSEMBLY WITH LATERAL TOOLS THAT CAN BE INTERPOSITIONED

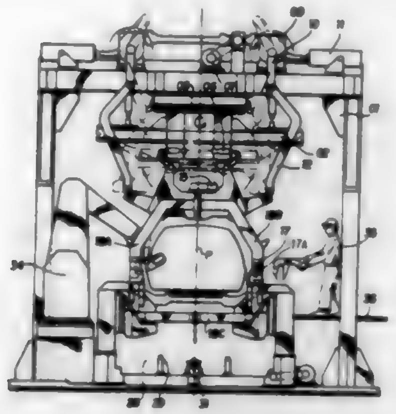
Bernard Negre, Paris, and Christian de Filippis, Evry, both of France, assignors to Renault Automation, Boulogne Billancourt, France
Continuation of Ser. No. 500,489, Mar. 28, 1990, abandoned.
This application Nov. 3, 1992, Ser. No. 970,963
Claims priority, application France, Mar. 28, 1989, 89 03979
Int. Cl.^{5} B23Q *3/00*
U.S. Cl. 29—33 P 1 Claim

1. A device for interpositioning positioning tools of a body assembly machine, comprising:

- a stationary frame in which a vehicle body having a median longitudinal plane can be positioned;
- first and second positioning tools detachably supported by the frame and respectively extending laterally on opposite sides of the median longitudinal plane of a vehicle in the frame;
- a third positioning tool supported within the frame at a position below a vehicle in the frame;

VOL
1162
ISS
4
MY
24
1994
UMI

means for clamping the first and second tools to the third tool to form a rigid structure independent of the frame and



surrounding and positioning the vehicle body in the frame.

5,313,696

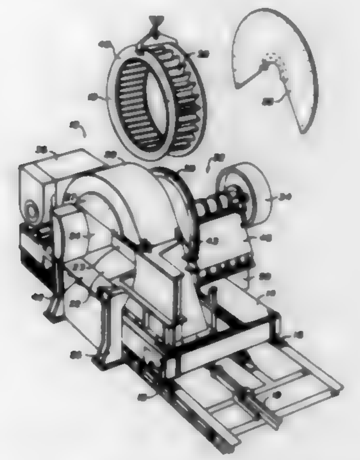
METHOD AND APPARATUS FOR REMOVING BLADE RING IN A RING FLAKER

Michael J. Dunne, North Vancouver, Canada; Douglas C. Beer, Bellingham, Wash., and Jan Marek, Surrey, Canada, assignors to CAE Machinery Ltd., Vancouver, Canada

Filed Sep. 17, 1993, Ser. No. 123,425

Int. Cl.⁵ B23P *19/00*; B27C *1/00*

U.S. Cl. 29—426.1 **11 Claims**



1. In a ring flaker apparatus for cutting wood into wood flakes including:

a housing having a front opening for insertion of wood to be flaked;

a blade ring within the housing encompassing a wood chamber, the blade ring having a plurality of knife blades spaced apart around the ring;

a hub disc attached to the blade ring, the hub disc cantilevered on an arbor rotating about a rotational axis, supported by an arbor support outside the housing;

drive means to rotate the arbor, hub disc and blade ring;

carriage on which the arbor support is mounted, and

means to move the carriage in a direction perpendicular to the rotational axis;

the improvement to remove and replace the blade ring comprising:

back opening in the housing of sufficient size to permit the hub disc and the blade ring to axially move out of the housing;

arbor support slide means to permit axial movement of the arbor support on the carriage in a direction away from the housing so the blade ring and hub disc pass through the back opening in the housing, and

means to slide the arbor support for a distance sufficient for the blade ring to be disconnected from the hub disc and lifted up for removal and replacement.

5,313,697

METHOD OF MANUFACTURING A LINK ROD OF A WIPER FOR A MOTOR VEHICLE

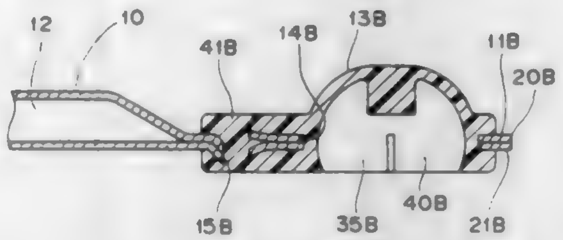
Kazunobu Kanno, Toyohashi; Satoru Hamano, Kariya, and Mikio Kawamura, Kasugai, all of Japan, assignors to Asmo Co., Ltd., Kosai, Japan

Division of Ser. No. 888,122, May 26, 1992, Pat. No. 5,213,008. This application Mar. 3, 1993, Ser. No. 25,671

Claims priority, application Japan, May 31, 1991, 3-129739

Int. Cl.⁵ B21B *1/46*

U.S. Cl. 29—527.4 **4 Claims**



1. A method of manufacturing a link rod of a wiper of a motor vehicle, comprising the steps of:

crushing each of opposite end portions of a tubular blank over a predetermined length by stamping;

punching the opposite end portions of the tubular blank such that a rod body having a pair of flat sections provided at its opposite ends, respectively and a cylindrical section provided between the flat sections;

punching a first hole having a large diameter and a second hole having a small diameter at outer and inner portions of each of the flat sections, respectively as viewed in a longitudinal direction of the rod body;

wherein a gap opens into an axially intermediate portion of a peripheral surface of the second hole such that interior of the cylindrical section is communicated with a mouth of the second hole through the gap;

washing the rod body with cleaning fluid;

discharging from the mouth of the second hole, the cleaning fluid which has penetrated into the cylindrical section;

coating the rod body; and

molding a pair of resinous coupling joints integrally with the flat sections, respectively;

wherein each of the coupling joints includes a joint portion disposed at the first hole and seals the second hole and the gap.

5,313,698

PROCESS FOR THE MANUFACTURE OF THE STATOR OF AN ELECTRICAL MACHINE

Roland Schaeftlmeier, Winnenden; Gerhard Pflueger, Markgroeningen; Bernhard Fakler, Esslingen; Klaus Georg Buerger, Markgroeningen, and Albrecht Knorpp, Murr, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

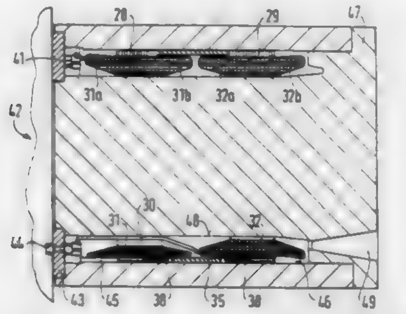
PCT No. PCT/DE91/00385, § 371 Date Aug. 27, 1992, § 102(e) Date Aug. 27, 1992, PCT Pub. No. WO91/19347, PCT Pub. Date Dec. 12, 1991

PCT Filed May 10, 1991, Ser. No. 924,038

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1990, 4018089

Int. Cl.⁵ H02K *15/14*

U.S. Cl. 29—596 **9 Claims**



1. A process of manufacturing an electrical machine with two stator plate stacks inserted at a distance from one another in a surface cooled metal housing one after the other in an axial direction, a stator winding being inserted in slots of the stator plate stacks and cooperating with two claw pole systems which are arranged on a drive shaft supported at opposite front sides of the machine, with the stator windings having winding ends which project out at a front and are enclosed by a metal housing for conducting off heat, the process comprising the steps of positioning the two stator plate stacks carrying the stator windings first relative to one another by spacing means for insertion into a compression mold; guiding connection conduits of a rear stator winding through slots in a front stator plate stack; fastening connection parts for the stator windings at a base part of a compression mold so that they are detachable and making contact of the connection parts with connection conductors of the stator windings; inserting the two stator plate stacks into an outer annular wall of the compression mold at their outer diameter with the spacing means; receiving the stator plate stacks at their inner diameter by an inner annular wall of the compression mold with an axially guided male die; injecting a heat conducting plastic in hot sate between the inner and outer annular wall so that the stator plate stacks, the spacing means, the winding ends and the connection parts are embedded in the heat conducting plastic to form a constructional unit.

5,313,699

METHODS FOR PACKAGING CIRCUIT BOARDS

D. Edmond Freige, Los Altos, and Richard N. Hibbs, Palo Alto, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

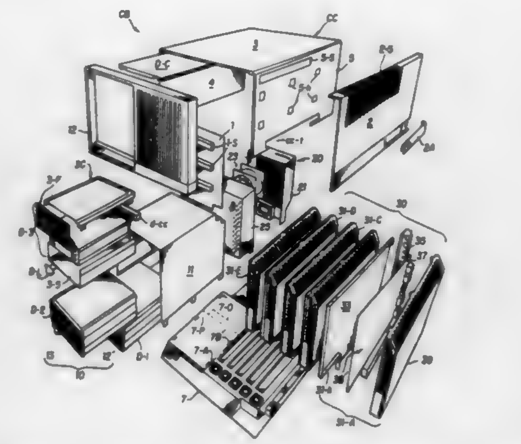
Division of Ser. No. 411,427, Sep. 22, 1989. This application Aug. 23, 1993, Ser. No. 109,883

Int. Cl.⁵ H05K *3/30*

U.S. Cl. 29—632 **28 Claims**

1. A method of providing removeable circuit package means for use with prescribed base means that includes receiving-circuit board means and superposed deck means including slot means and deck-vent holes, this method means comprising:

[illegible]nging said removable circuit board means to include connector means arranged to be removably connected into said receiving-board means; and providing nonconductive envelope means about said removeable board means, while constructing this envelope means to house and closely surround said removeable circuit board means, and to be relatively square and include tang means projected centrally from a bottom-edge portion thereof surrounding said connector means, while arranging and adapting said envelope means to interfit with a receiving one of said slot means in said deck means, and to include vent aperture means adapted for registry with respective ones of said deck vent holes; at said bottom-edge portion of said tang means;



while, further, making said envelope means to also include upper vent means along an upper-edge portion, opposite said bottom-edge portion, and also to include cooling-vent slit means in other portions of said envelope means whereby to conduct coolant-air from upper portions thereof, down across the circuit-board means, to exit through said vent aperture means in said bottom-edge portion and onto said receiving board means for cooling thereof.

5,313,700

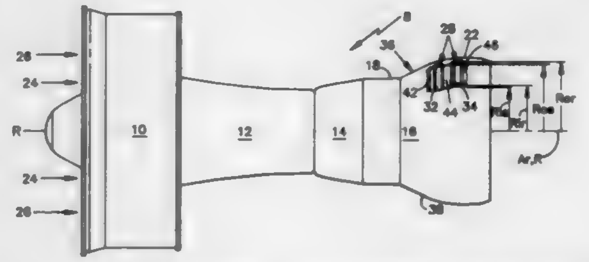
FORMING A FLOW DIRECTING ELEMENT FOR A TURBINE

Thomas E. Dorman, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 639,856, Jan. 11, 1991, Pat. No. 5,209,644. This application Oct. 8, 1992, Ser. No. 957,846

Int. Cl.⁵ B23D *15/00*

U.S. Cl. 29—889.7 **9 Claims**



1. A method for forming a flow directing element for a turbine of a rotary machine, the flow directing element having an airfoil and a flow of gases over the airfoil under operative conditions comprising:

establishing a critical roughness characteristic for the flow directing element by establishing a representative Reynolds number for flow passing through the airfoil under a preselected operative condition of the machine;

forming the flow directing element having the airfoil, the airfoil having a leading edge and a trailing edge which extend spanwisely and a convex suction side surface and a

VOL
1162
ISS
4
MY
24
1994
UMI

concave pressure side surface which extend chordwisely from the leading edge to the trailing edge, the convex surface having a roughened surface having a surface roughness that is within twenty (20) percent of the critical roughness characteristic and that is spaced chordwisely from the leading edge and the trailing edge.

5,313,701
ASSEMBLY AND TESTING OF ELECTRONIC POWER COMPONENTS INSULATION

Herbert Klinger, Nuremberg; Gerhard Thomas, Fuerth, and Martin Petrzik, Nuremberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

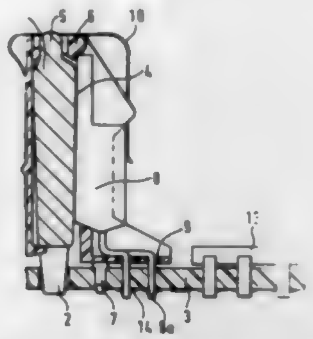
PCT No. PCT/DE91/00263, § 371 Date Jul. 30, 1992, § 102(e) Date Jul. 30, 1992, PCT Pub. No. WO91/16809, PCT Pub. Date Oct. 31, 1991

PCT Filed Mar. 23, 1991, Ser. No. 916,863

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012180

Int. Cl.^{5} H05K *3/34*

U.S. Cl. 29—840 **4 Claims**



1. A method for assembly and testing the insulation of electronic power components in electrical switching and control devices, particularly for motor vehicles, which are fastened to a heat sink so as to be thermally conducting and electrically insulated, which heat sink fits securely on a printed circuit board on which the power components and additional electrical elements are connected via conductor paths by soldering together with connecting parts and a circuit ground, the method comprising the steps of first fastening the heat sink to the printed circuit board so as to be free of potential; inserting the power components into the printed circuit board so as to be thermally conducting and electrically insulated at the heat sink; soldering connection pins of the power components with the conductor paths of the printed circuit board; testing the insulation between the potential-free heat sink and the power components by applying high voltage; and finally electrically connecting the heat sink with the circuit ground.

5,313,702
ELECTRICAL TERMINATION AND METHOD FOR MAKING SAME

Adam Fischer, Jr., Memphis, Tenn.; Richard F. Strauss, Morrisville, Pa.; Kwang-Ho Chu, Austin, Tex.; Sidney Levy, Belle Mead, N.J., and Mark Hurt, Telford, Pa., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Dec. 30, 1992, Ser. No. 998,822

Int. Cl.^{5} H01R *13/00*

U.S. Cl. 29—883 **14 Claims**

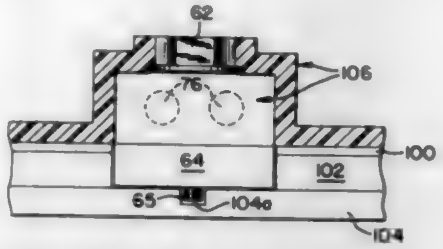
1. A method for terminating an electrical conductor, comprising the steps of:

(a) defining a housing having an open end and a closed end and at least one passage therethrough for entry of said conductor into said housing to permit a termination end of said conductor to be resident interiorly in said housing;

(b) closing said housing passage;

(c) disposing said housing with said housing open end vertically above said housing closed end and introducing sealant gel in flowable state interiorly of said housing;

(d) while said sealant gel is in said flowable state, securing with said housing, through said housing open end, means for terminating said electrical conductor;



(e) upon transition of said sealant gel to a cured state, opening said housing passage;

(f) inserting said conductor into said housing passage and into registry with said terminating means; and

(g) operating said terminating means to terminate said conductor.

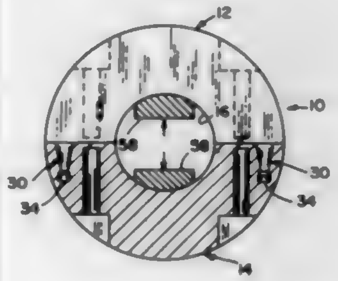
5,313,703
BEARING CAP AND METHOD FOR MAKING SAME

Dennis S. Shimmell, Hudsonville, Mich., assignor to Nelson Metal Products Corporation, Grandville, Mich.

Filed May 20, 1992, Ser. No. 886,694

Int. Cl.^{5} B23P *15/00*

U.S. Cl. 29—890.12 **11 Claims**



1. A method for making a bearing cap having first and second interfitting parts with mating surfaces disposed on opposite sides of a central opening for the passage of a shaft, said method comprising the steps of:

forming said first part such that said first part is formed with protrusions extending from the mating surfaces of said first part;

subsequent to the forming of said first part, forming said second part in place with said first part such that the material of said second part envelops said protrusions and mates precisely with the mating surfaces of said first part and;

separating said second part from said first part.

5,313,704
ELECTRIC SHAVER

Yukihiko Atsumi; Teruo Hishiki, and Makoto Onodera, all of Tokyo, Japan, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1992, Ser. No. 977,485

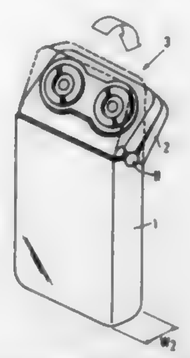
Claims priority, application Japan, Nov. 18, 1991, 3-301833

Int. Cl.^{5} B26B *19/28*

U.S. Cl. 30—43.6 **2 Claims**

1. An electric shaver comprising a housing formed as a grip, a shaving head comprising at least one cutting unit having an outer cutting member and an inner cutting member which is

rotatable relative to the outer cutting member, and drive means for driving the inner cutting member, said drive means comprising a drive motor having an output shaft, a flexible pulley-belt transmission coupling the output shaft and the inner cutting member, said shaving head being pivotably connected to said housing, said drive motor being accommodated inside said housing, and said drive means between the drive motor and said inner cutting member being adapted to follow the pivotal movements of the shaving head relative to the housing.



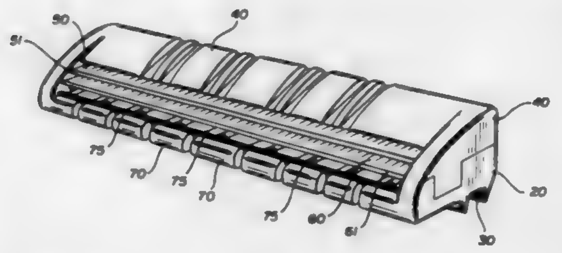
5,313,705
SEGMENTED GUARD BAR WITH IMPROVED SKIN FLOW CONTROL

David F. Rivers, Wallingford, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 699,066, May 13, 1991, Pat. No. 5,185,927. This application Feb. 1, 1993, Ser. No. 12,074

Int. Cl.^{5} B26B *21/14*

U.S. Cl. 30—50 **12 Claims**



1. A razor head comprising:
a cap member;
at least one blade having a sharpened edge;
a blade seat for supporting said blade comprising a plurality of blade supports wherein adjacent blade supports are separated by a corrugation;
a guard member comprising a plurality of segments disposed forwardly of said sharpened edge, each of said segments comprising a face engaging portion and a rearward portion, each of said segments being separate from adjacent segments thereby providing a space therebetween;
means for attaching said segments to said blade seat; and
means for controlling the flow of skin through at least one space between said segments.
wherein said segments comprise sidewalls and said controlling means comprises a web extending from said sidewalls on adjacent segments; and
wherein said web has at least one groove located thereon.

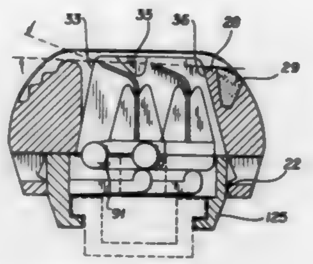
5,313,706
RAZOR HEAD WITH VARIABLE SHAVING GEOMETRY

Vincent C. Motta, Norwalk, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 732,293, Jul. 18, 1991, abandoned. This application Oct. 5, 1992, Ser. No. 956,527

Int. Cl.^{5} B26B *21/14*

U.S. Cl. 30—57 **18 Claims**



1. A razor head comprising:
a base member;
a forwardly positioned guard member secured to said base member;
at least one blade having a sharpened edge;
said base member comprising means for supporting said blade such that said blade is pivotally supported from a normal position about an axis disposed directly below said edge, wherein said blade is movable from said normal position in response to forces encountered during shaving; and
means for biasing said supporting means to said normal position, said biasing means operatively connected to said supporting means for returning said edge to said normal position;
wherein said razor head comprises a frame and said supporting means comprises a blade support for each blade, said blade support having;
an attachment section adapted to receive said blade; and
a connecting portion disposed at an angle to said attachment section, said connecting portion adapted for pivotably securing said blade support with said frame;
wherein said blade comprises at least one aperture; and
said attachment section comprises a pair of opposed, resilient members and at least on of said opposed, resilient members comprises a protrusion which extends into said aperture of said blade.

5,313,707
WATERMELON SEED REMOVER

Martin A. Tarafdar, P.O. Box 749, Crystal Bay, Nev. 89402

Filed Apr. 29, 1993, Ser. No. 53,744

Int. Cl.^{5} B26B *3/00*

U.S. Cl. 30—315 **7 Claims**

1. A device for cutting and removing the crescent-shaped, seed-bearing column from the flesh of a sliced watermelon, said device comprising:

a. a hollow, crescent-shaped die having a cutting edge sized and configured to encompass the seed-bearing column as said die is urged into the watermelon flesh,

said die including side walls upstanding from said cutting edge for frictional engagement with the peripheral surface of the seed-bearing column to effect withdrawal of the column concurrently with the removal of said die,

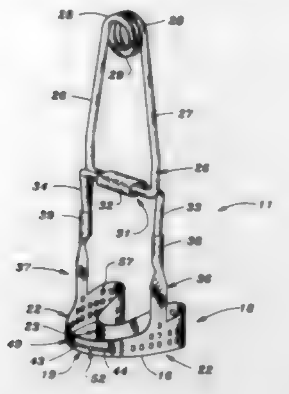
said side walls in at least one portion of the perimeter of said side walls being in overlapping and relatively slidable relation in order to contract and enlarge the areal extent of said die between a respective first contracted position in which said side walls engage the seed-bearing column and a second enlarged position in which the seed-bearing column is released from said side walls,

said side walls being of spring-steel-like material and in

VOL 1162 ISS 4 MY 24 1994 UMI

which the spring force urges said side walls toward said first contracted position;

b. a handle including means for opposing the spring force exerted by said side walls and means for urging said side walls toward said second enlarged position; and,



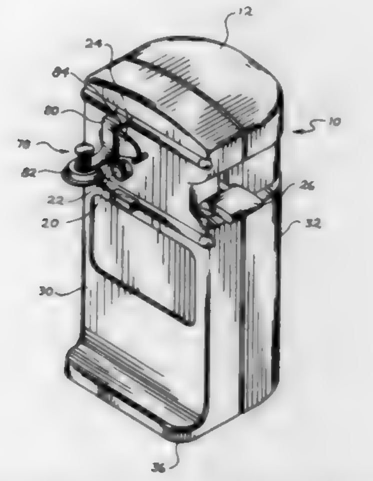
c. means for mounting said handle on said die for holding and urging said die into the watermelon flesh in congruent relation with the seed-bearing column.

5,313,708
CAN OPENER

Billie R. Edwards, Deepwater, and Mary K. Barrow, Clinton, both of Mo., assignors to The Rival Company, Kansas City, Mo.

Filed Dec. 4, 1992, Ser. No. 986,123
Int. Cl.⁵ B67B *7/00*

U.S. Cl. 30—417 **21 Claims**



1. In a can opener of the type comprising a housing, a motor, a feed wheel for rotating a can about its axis, a gear assembly connecting the motor and the feed wheel, and a cutter for severing a can lid from a can, the improvement comprising:

a) a cutter control associatively connected to the cutter and operable to bias a switch contact to a closed position while the cutter is severing the can lid from the can and to automatically open the switch contact after the can lid has been severed, the cutter control comprising an integrally formed spring operable to engage an armature mounted on the housing;

b) a cutter support plate supporting the cutter and associatively connected to the cutter control, the cutter support plate operable to lower a magnet assembly into contact with the can lid when the cutter is moved into contact with the can lid and to raise the magnet assembly and the can lid when the cutter is raised from the can after the can lid has been severed from the can; and

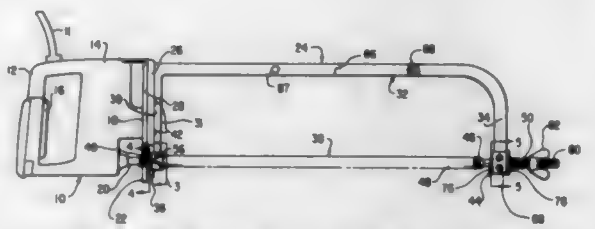
wherein the cutter support plate has a cam portion on which the magnet assembly rides, the cam portion of the cutter support plate operative to raise and to lower the magnet assembly.

5,313,709
ATTACHMENT FOR CONVERTING A RECIPROCATING POWER TOOL INTO POWER DRIVEN HACK SAW

Justo Pabon-Delgado, Las Piedras, P.R., assignor to Commonwealth of Puerto Rico, San Juan, P.R.

Filed Jun. 3, 1993, Ser. No. 70,874
Int. Cl.⁵ B23D *49/16*

U.S. Cl. 30—513 **5 Claims**



1. A hack saw attachment for converting an electrically driven reciprocating tool assembly into an electrically powered hack saw, said tool assembly including a sole plate having an outer surface, and a power driven arbor for reciprocating a tool through an open slot in said sole plate, said attachment comprising a flat attachment plate having inner and outer faces, a hack saw frame having an inner end centrally fixed to said outer face of said attachment plate and extending away from said attachment plate perpendicularly thereto, said frame having a down-turned outer end, a slotted first guide carried by the inner end of said frame for slidably receiving an inner end of a hack saw blade, means for releasably connecting to said sole plate said flat attachment plate with its inner face in abutment with said sole plate, said first guide being positioned on said frame such that when said flat attachment plate is releasably connected to said sole plate, said first guide aligns with said slot in said sole plate and with said arbor, a second guide carried by said down-turned outer end of said frame in alignment with said first guide, a second arbor reciprocally slidable within said second guide, means for releasably connecting an outer end of the hack saw blade to said second arbor, and a spring acting on said second arbor resiliently urging it in a direction away from said first blade guide at the inner end of said frame.

5,313,710
TOE ANGLE DETECTING APPARATUS

Takehisa Wakamori, and Takao Shibayama, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1991, Ser. No. 722,194

Claims priority, application Japan, Jul. 4, 1990, 2-177153; Jul. 19, 1990, 2-192508

Int. Cl.⁵ G01B *5/255*

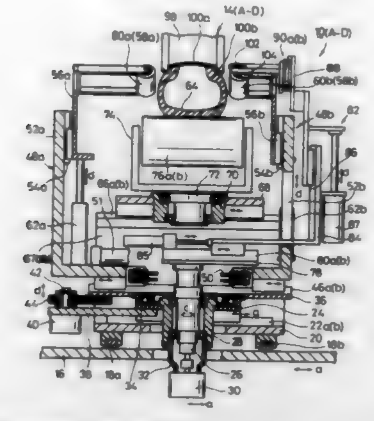
U.S. Cl. 33—203.12 **12 Claims**

1. A toe angle detecting apparatus comprising:

wheel supporting means for supporting thereon each wheel attached to a vehicle, said wheel supporting means being rotatably mounted on a vertical support shaft;

toe angle detecting means rotatably mounted on said support shaft and provided with a pair of contact shoes spaced horizontally at a predetermined distance from each other, said toe angle detecting means being rotatable independently of said wheel supporting means, said contact shoes being displaceable vertically and displaceable radially with respect to said support shaft, and brought into

contact with said wheel at predetermined portions thereof to rotate said toe angle detecting means about said support shaft toward a toe direction of said wheel; and



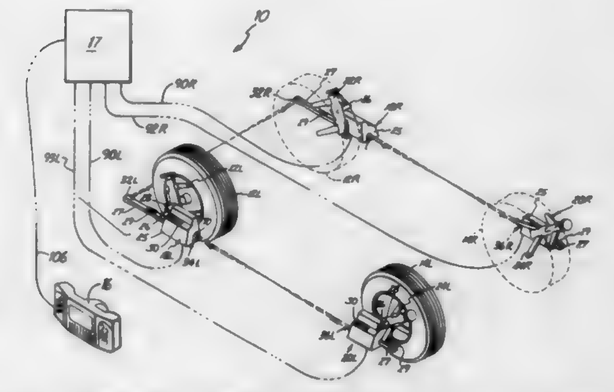
an angle detector for detecting an angle at which said toe angle detecting means is rotated about said support shaft.

5,313,711
WHEEL ALIGNMENT SYSTEM

Michael J. Kling, III, Mequon; Michael P. Alusick, Hartland; Gary R. Kercheck, Colgate; Jeff C. Krueger, Milwaukee; Duane M. Schmitz, Shorewood, and James L. Visser, New Berlin, all of Wis., assignors to Bear Automotive Service Equipment Company, New Berlin, Wis.

Continuation of Ser. No. 753,896, Aug. 30, 1991, abandoned.
This application Jan. 14, 1993, Ser. No. 4,779
Int. Cl.⁵ G01B *11/275, 7/315*

U.S. Cl. 33—288 **21 Claims**



1. An automotive vehicle wheel alignment system for aligning the four wheels of an automotive vehicle, comprising:

a left front head unit for coupling to a left front wheel of the automotive vehicle and providing an angle measurement output;

a right front head unit for coupling to a right front wheel of the automotive vehicle and providing an angle measurement output;

a left rear head unit for coupling to a left rear wheel of the automotive vehicle and providing an angle measurement output;

a right rear head unit for coupling to a right rear wheel of the automotive vehicle and providing an angle measurement output;

a communication/power bus coupled to the left front head unit, the right front head unit, the left rear head unit and the right rear head unit, the communication/power bus comprising:

left front coupling means for communicating information sent to the left front head unit, communicating information sent from the left front head unit, and carrying power to the left front head unit;

right front coupling means for communicating information sent to the right front head unit, communicating information sent from the right front head unit, and carrying power to the right front head unit;

left rear coupling means for communicating information sent to the left rear head unit, communicating information sent from the left rear head unit, and carrying power to the left rear head unit; and

right rear coupling means for communicating information sent to the right rear head unit, communicating information sent from the right rear head unit, and carrying power to the right rear head unit;

hand held module coupling means for communicating information and carrying power; supply/interface means coupled to the communication/power bus for providing power to the left front head unit through the left front coupling means, for providing power to the right front head unit through the right front coupling means, for providing power to the left rear head unit through the left rear coupling means, for providing power to the right rear head unit through the right rear coupling means, for providing power to the hand held module coupling means, and for providing an interface between the left front coupling means, the right front coupling means, the left rear coupling means, the right rear coupling means and the hand held module coupling means, wherein the left front coupling means, the right front coupling means, the left rear coupling means, the right rear coupling means and the hand held module coupling means carry information and the supply/interface means transfers information between the hand held module coupling means and the left front coupling means, the right front coupling means, the left rear coupling means and the right rear coupling means;

a hand held module operably coupled through the hand held module coupling means, the supply/interface means and the communication/power bus to the left front head unit, the right front head unit, the left rear head unit, and the right rear head unit wherein the hand held module obtains wheel alignment measurements and provides alignment information to an operator, the hand held module comprising:

power receiving means for receiving power from the supply/interface means through the hand held module coupling means and providing a power output to power the hand held module;

communications means operably coupled to the head units through the hand held module coupling means, the supply/interface means and the communication/power bus for receiving angle measurements and providing an output;

memory means for storing computer program instructions;

input means for receiving an input from the operator;

a controller coupled to the communications means, the memory means and the input means for processing the output from the communications means based upon the input from the operator and computer program instructions in the memory means and providing a display data output related to an angular relationship of the wheels of the automotive vehicle; and

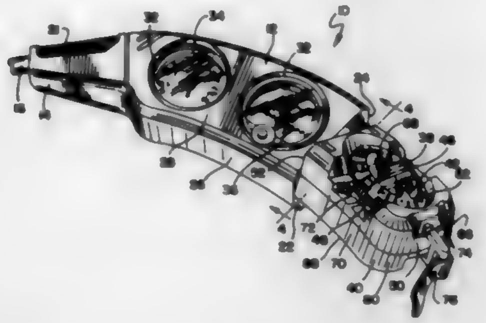
a liquid crystal display coupled to the controller wherein the liquid crystal display includes an liquid crystal display matrix for forming an image based upon the display data output from the controller.

VOL
1162
ISS
4
MY
24
1994
UMI

5,313,712
SCUBA DIVING INSTRUMENT CONSOLE HAVING SWIVELLING COMPASS ASSEMBLY

Timothy N. Curameng, Chicago; James R. Latz, Round Lake Beach, and Mark L. Walsh, Chicago, all of Ill., assignors to Dacor Corporation, Northfield, Ill.

Continuation of Ser. No. 905,730, Jun. 29, 1992, abandoned.
This application Sep. 10, 1993, Ser. No. 119,894
Int. Cl.^{5} G01C *17/00*
U.S. Cl. 33—354 **18 Claims**



1. An instrument console for use by a diver while diving, comprising:

a console body having a longitudinal axis, being adapted for connection to a pressurized air line, and wherein said console body has at least one instrument secured therein;

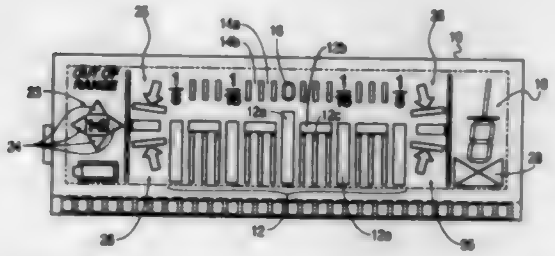
a compass;

a compass housing configured to accommodate said compass and being connected to said console body to be positionable into a laterally arranged relationship with said at least one instrument while held by the diver for monitoring, and also to be pivotal about said longitudinal axis of said console body, so that when the diver swims in a generally horizontal position with said console body held with an outstretched arm, said compass housing may also be adjusted to a generally horizontal position relative to said console body to promote accuracy in reading of said compass by the diver.

5,313,713
ELECTRONIC LEVEL WITH DISPLAY SCALE AND AUDIBLE TONE SCALE

Charles E. Heger, Saratoga, and Donald D. Kook, Los Gatos, both of Calif., assignors to Zircon Corporation, Campbell, Calif.

Filed Aug. 14, 1992, Ser. No. 930,960
Int. Cl.^{5} G01C *9/06, 9/18*
U.S. Cl. 33—366 **25 Claims**



1. An inclination sensor device comprising:

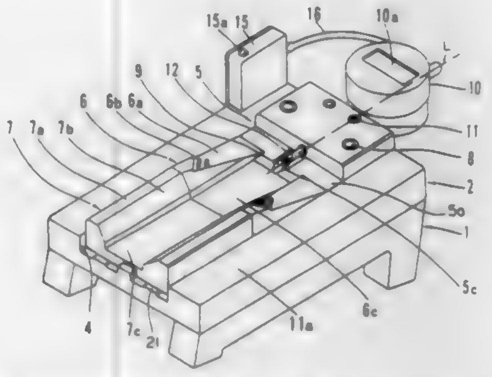
a sensor for determining an inclination of the device relative to a null inclination; and

a visual display for displaying the determined inclination, the visual display comprising a plurality of illuminated parallel and adjacent line segments, each line segment representing a predetermined increment of inclination expressed as a linear deviation per linear length, a particular number of line segments being displayed for each said determined inclination.

5,313,714
INSTRUMENT FOR MEASURING DIMENSIONS OF A CAN SEAM PORTION

Saburo Nakao, Machida, Japan, assignor to The Coca-Cola Company, Atlanta

PCT No. PCT/JP91/01362, § 371 Date Jun. 8, 1992, § 102(e) Date Jun. 8, 1992, PCT Pub. No. WO92/06348, PCT Pub. Date Apr. 16, 1992
PCT Filed Oct. 7, 1991, Ser. No. 852,234
Claims priority, application Japan, Oct. 8, 1990, 2-268524
Int. Cl.^{5} G01B *5/02*
U.S. Cl. 33—522 **5 Claims**



1. An apparatus for measuring the dimensions of a seamed portion of a can, comprising:

a base;

a cap can supporting block disposed on said base, said cap can supporting block including means for supporting a can on an upper surface thereof in a horizontal position of the can for measuring a width dimension of the seamed portion and means for supporting the can in an upright position of the can for measuring a height dimension of the seamed portion;

a measuring pin connected to the upper surface of said cap can supporting block for contacting an inner surface of the seamed portion of the can;

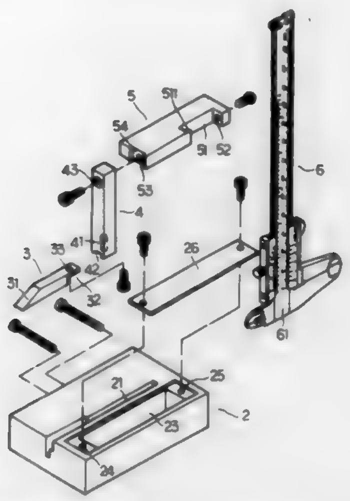
linear gauge means mounted on said base for measuring the dimensions of the seamed portion, said gauge including a measuring spindle movable along a straight line approaching said measuring pin to contact the outer surface of the seam portion thereby measuring the dimensions of the seamed portion of the can between the inner and outer surfaces thereof.

5,313,715
VERNIER CALIPERS INCORPORATED HEIGHT GAUGE

Lung Y. Wang, No. 9, Lane 128, Tsyr Shiou Rd., Changhua, Taiwan

Filed Apr. 30, 1993, Ser. No. 56,135
Int. Cl.^{5} G01B *5/14*
U.S. Cl. 33—810 **2 Claims**

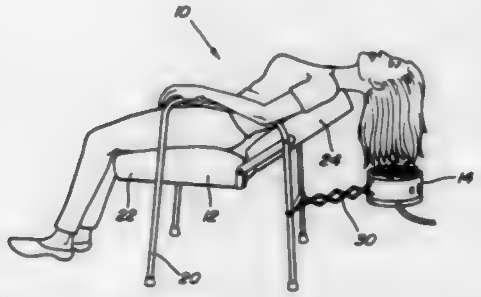
1. A vernier calipers incorporated height gauge made by incorporating a vernier calipers with a marking knife, a connecting rod, a locating block, and a bottom block, wherein: said bottom block comprises an elongate groove on the thereof top, which receives a stationary jaw of the vernier calipers, two spaced screw holes located on one side of said bottom block and perpendicularly extending to said elongate groove, into which two screws are threaded to fasten the stationary jaw of the vernier caliper in said elongate groove; said locating block comprises a side notch on a first side thereof, into which the vernier of the vernier calipers is inserted, an outside flange projecting into said side notch, which retains the vernier of the vernier calipers within said side notch, a first screw hole extending to said slae notch from a second side of said locating block, into which a screw is threaded to fasten the vernier of the vernier calipers to the locating block within the side notch, and an end notch on a third side of said locating block with a screw hole located within said end notch; said connecting rod comprises a bottom notch on one side thereof having a screw hole located in said bottom notch, and a countersink through hole near a top end thereof through which a screw is threaded into the screw hole on said end notch of said locating block to fasten said connecting rod to said locating block; said marking knife comprises a front end terminated to a bevel face for marking, and a rear end terminated to an extension indentation with a through hole located thereon, said extension indentation being inserted into the bottom notch on said connecting rod and fixed thereto by threading a screw through the through hole on said extension indentation into the screw hole on the bottom notch of said connecting rod.



5,313,716
MULTI-POSITION HAIR DRYER

Sandra S. Wolfe, 3635 Vincent Rd., North Street, Mich. 48049

Filed Jan. 27, 1993, Ser. No. 10,065
Int. Cl.^{5} F26B *19/00*
U.S. Cl. 34—90 **17 Claims**



1. An apparatus for drying hair, said apparatus comprising:

means for supporting an individual such that the hair of said individual hangs vertically, extending generally away from the head of said individual;

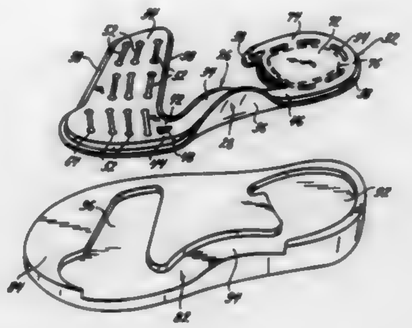
means for drying said hair, said drying means disposed below the head of said individual and operable to direct air flow upward through said hair; and

means for positioning said drying means, said positioning means operable to locate said drying means below the head of said individual.

5,313,717
REACTIVE ENERGY FLUID FILLED APPARATUS PROVIDING CUSHIONING, SUPPORT, STABILITY AND A CUSTOM FIT IN A SHOE

Bernie Allen, Wayland; Douglas E. Clark, Amesbury, both of Mass.; Christopher J. Edington, Derry, N.H.; Rui Parracho, Peabody, and Eric Swartz, Malden, both of Mass., assignors to Converse Inc., North Readings, Mass.

Filed Dec. 20, 1991, Ser. No. 810,844
Int. Cl.^{5} A43B *13/20*
U.S. Cl. 36—28 **13 Claims**



1. A reactive energy fluid cushioning and stabilizing apparatus on a shoe sole, the apparatus comprising:

a shoe sole having forward and rearward ends and a medial side and a lateral side extending between the forward and rearward ends of the shoe sole, the medial and lateral sides extending around the forefoot area of the shoe sole adjacent the sole forward end, a heel area of the shoe sole adjacent the sole rearward end, and an arch area of the shoe sole between the forefoot and heel areas;

at least one hollow bladder on the shoe sole, the bladder having a flexible first wall and a flexible second wall enclosing an interior volume of the bladder therebetween;

a fluid filling the interior volume of the bladder, portions of the fluid being caused to flow from one area of the bladder interior volume to a second area of the bladder interior volume in response to a force being exerted on the bladder;

a plurality of clefts formed in the first wall of the bladder, each cleft extending from the first wall down into the bladder interior volume and through the fluid to the second wall, each cleft having a bottom joined to the second wall thereby connecting the first wall in a spaced relation to the second wall with the fluid filling the interior volume therebetween and thereby forming each of the clefts as an indentation in the first wall of the bladder, the plurality of clefts being arranged in at least one line across the bladder forming a fold line of indentations across the first wall of the bladder that facilitates folding the bladder at the fold line, and the line of clefts extending through the interior volume of the bladder separating the first area of the interior volume from the second area of the interior volume with adjacent clefts in the interior volume having spacings therebetween, the spacings functioning as flow restrictions that limit the rate of fluid flow through the spacing from the one area of the interior volume to the second area of the interior volume;

each of the clefts having a set length extending across the first and second walls and through the interior volume of the bladder, the clefts being arranged end to end in a line across the bladder forming a fold line through the bladder between the first area and the second area of the bladder interior volume and enabling the first area to be folded over the second area at the fold line, the first area of the bladder being configured as a first arch bladder with a configuration complementary to an upper arch area on a medial side of a foot, the configuration of the firs arch bladder positioning it adjacent the medial side of the shoe

VOL 1162
ISS 4
MY 24
1994
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sole and preventing it from extending across the show sole to the lateral side of the shoe sole, and the second area of the bladder being configured as a second arch bladder with a configuration complementary to a lower arch area on an underside of a foot, the configuration of the second arch bladder positioning it adjacent the first arch bladder and preventing the second arch bladder from extending forward adjacent the forefoot area of the shoe sole or rearward adjacent the heel area of the shoe sole, where together the first and second arch bladders are relatively positioned to engage in surface contact along the medial side and an underside of a foot arch and provide a custom fit, support and cushioning to the foot arch.

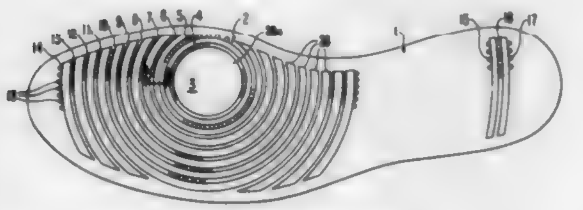
5,313,718
ATHLETIC SHOE WITH BENDABLE TRACTION PROJECTIONS

Thomas A. McMahon, Wellesley, Mass., and Gordon A. Valiant, Lake Oswego, Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Continuation of Ser. No. 639,409, Jan. 10, 1991, abandoned, which is a continuation of Ser. No. 254,839, Oct. 7, 1988, abandoned. This application Jan. 13, 1993, Ser. No. 3,692

Int. Cl.⁵ A43B *23/28*

U.S. Cl. 36—59 C **2 Claims**



1. A sole for an athletic shoe comprising:
an outsole member having a plurality of traction projections extending outwardly therefrom, said plurality of traction projections including traction projections arranged concentrically about a pivot point located in the ball portion of said outsole member;
a plurality of concentric rings secured to said outsole member to define a ground engaging surface, said concentric rings being oriented relative to said concentric traction projections such that said concentric traction projections are movable between a first position extending outward of said ground engaging surface to provide traction against a ground surface material when said sole is moved in generally linear translational motion and a second position inward of said ground engaging surface and substantially out of contact with the ground surface material to minimize traction when said sole is moved about in generally pivoting motion; and
wherein said traction projections include notches for facilitating movement of said traction projections to the second position inward of said ground engaging surface, said notches formed in an outer cylindrical surface of said columns and extending in a direction substantially perpendicular to a tangent of a groove at positions of respective traction projections.

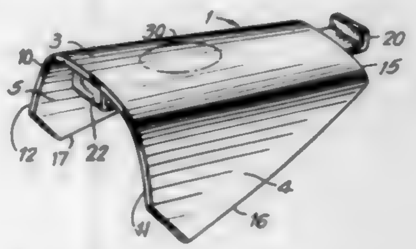
5,313,719
SHOE SHIELD

Terence L. Koethe, 1021 Oakwood Dr., Keller, Tex. 76248-4002
Continuation of Ser. No. 641,605, Jan. 15, 1991, abandoned. This application Apr. 27, 1993, Ser. No. 53,956

Int. Cl.⁵ A43B *5/00;* **A43C** *13/14*

U.S. Cl. 36—72 R **5 Claims**

1. A utility shield for a laced shoe comprising:
an upper guard portion for covering substantially the entire lacings of the shoe including the knottable rear end lace portion thereof;
first and second substantially identical leg portions extending from opposing longitudinal side edges of said upper guard portion, a substantially channel-shaped shell, having inner and outer surfaces, for extending vertically downwardly along a substantial portion of the sides of the upper of the shoe, to a region above the sole, and for covering that portion of the laces and lacing holes of the shoe not covered by the upper guard portion;
first and second fastening means located at the front and rear of the utility shield, respectively, for connecting the utility shield and shoe and at least one of said fastening means releasably connecting the utility shield and shoe for access to the shielded portion of the shoe;
the first fastening means comprising a tab extending from the front of the upper guard portion, said tab comprising a member having a body portion extending generally parallel to the upper guard and having a channel therein and a leg portion extending upwardly from the front end of the body portion, whereby the frontmost loop of the shoe lace may be positioned in the channel when the tab is inserted under the frontmost lace loop; said tab being disengageable from the frontmost lace loop by lifting said lace loop and rearwardly pulling said utility shield;
the second fastening means comprises an elongated clip extending from the rear of the utility shield upper guard portion downward and extending substantially parallel to said inner surface of said guard whereby said clip may be longitudinally slid between the shoelace folds and the tongue of the shoe by being longitudinally inserted under the rear portion of the lace structure, and being easily detachable by rearwardly pulling said utility shield, once the first fastening means is detached, the second fastening means being hidden from view when the utility shield is in place on the shoe.



5,313,720
SECURING DEVICE PARTICULARLY FOR SKI BOOTS

Giuseppe De Bortoli, Montebelluna; Claudio Zorzi, Paderno Di Ponzano, and Luca Gallina, Caerano S. Marco, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

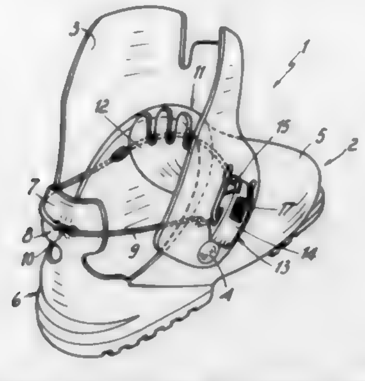
Filed Jul. 6, 1992, Ser. No. 909,495

Claims priority, application Italy, Jul. 22, 1991, TV91A000074

Int. Cl.⁵ A43B *5/04*

U.S. Cl. 36—117 **3 Claims**

1. A securing device in combination with a boot comprising a shell and at least one quarter connected to said shell, the securing device comprising a rear flap at a heel region of the boot and an internal foot presser at a foot instep region of the boot, the securing device further comprising a traction element and a lever device, said lever device comprising a lever body with a longitudinal axis and an end pivotally connected to said boot, said lever device further comprising a guide element arranged away from said end thereof, said traction element comprising a first end portion, a second end portion, and a middle portion extending between said end portions, said first end portion being arranged at a first lateral portion of said boot, said middle portion extending from said first portion and engaging over said rear flap, said middle portion further extending from said rear flap and adjacent to a second lateral portion of said boot opposite to said first lateral portion, said middle portion further extending from said second lateral portion and engaging over said internal foot presser and extending back to said first lateral portion of the boot at which said second end portion of the traction element is arranged, thereby said traction element extending in a substantially 360 degree extension from said first lateral portion over said rear flap and past said second lateral portion and over said internal foot instep presser and back to said first lateral portion, said



end of said lever body of said lever device being pivotally connected to said boot at said first lateral portion thereof, one of said end portions of said traction element being connected to said first lateral portion, said middle portion of said traction element extending from said one of said end portions of said traction element and being slidably guided over said guide element of said lever device and further slidably guided through at least one hole in said lateral portion, and the other of said end portions of said traction element being connected to said first lateral portion of said ski boot.

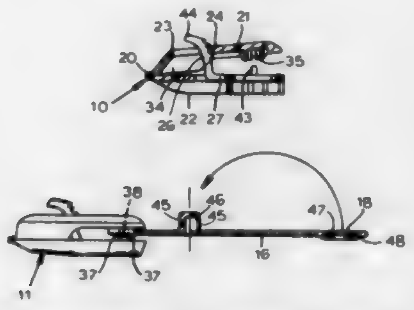
5,313,721
POCKET CLIP FOR CARD CASES, IDENTIFICATION BADGES AND THE LIKE

Gerhard Filden, Kriehubergasse 31, A-1050 Vienna, Austria

Filed Aug. 28, 1992, Ser. No. 937,966

Int. Cl.⁵ A44C *3/00*

U.S. Cl. 40—1.6 **19 Claims**



18. A clip-on identification assembly, comprising:
a clip for releasable engagement with a fabric and having upper and lower elongated clip members formed unitarily with one another of a plastic and joined at rear ends of said members by a plastic film hinge, said members being foldable about said hinge in a clamshell orientation and having substantially the same outline, means for locking said members releasably together, and a stud on said upper member; and
a strap formed with a hole fitted onto said stud and adapted to be bent around a portion of a card holder for receiving an identification card, said strap being provided with a post formed with a plurality of uprights and spaces between said uprights and with an aperture formed with a number of inward projections equal to a number of said spaces and receivable therein upon fitting of said aperture onto the post of said strap.

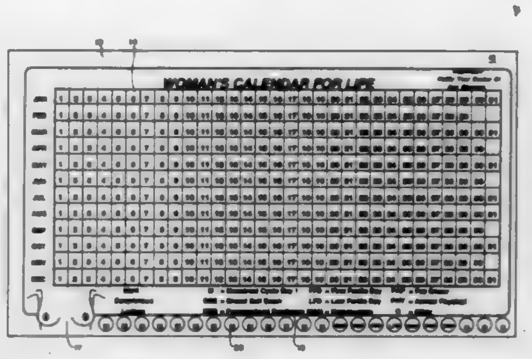
5,313,722
WOMAN'S CALENDAR

Susan Ackerman, 10211 Green Holly Ter., Silver Spring, Md. 20902

Filed Aug. 8, 1991, Ser. No. 742,341

Int. Cl.⁵ G09D *3/04*

U.S. Cl. 40—110 **7 Claims**



1. A woman's calendar for use in a shower, comprising
a sheet of material having a waterproof surface,
said surface having permanent markings defining an array of rectangles representing all the days of the year,
a set of movable markers which can be placed on the array, each marker bearing a symbol corresponding to a particular health event, and
a permanent legend marked on the calendar, the legend showing the correspondence between each of said symbols and said health events,
wherein said sheet has a ferromagnetic component, and said markers are magnetic.

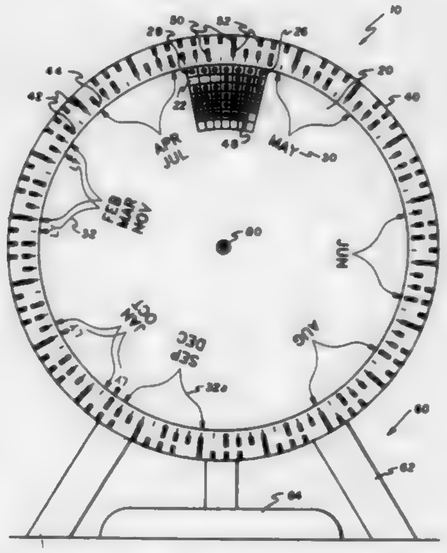
5,313,723
PERPETUAL CALENDAR

Scott A. Cregg, P.O. Box 127, Brewster, Kans. 67732

Filed Jan. 8, 1993, Ser. No. 2,169

Int. Cl.⁵ G09D *3/08*

U.S. Cl. 40—113 **17 Claims**



1. A calendar comprising:
a first disk having a window and indicia, said indicia being

VOL
162
ISS
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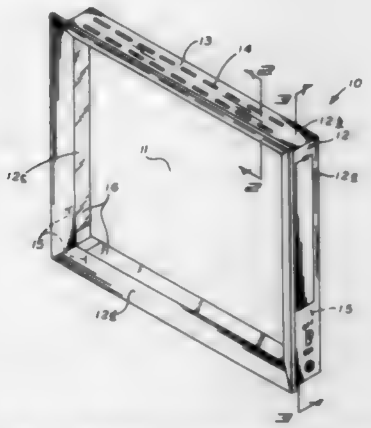
adjacent to said window and indicating each day of a week, said first disk including;
month specifying means for specifying a predetermined month, and
year selecting means, responsive to said month specifying means, for selecting, with respect to the predetermined month, a predetermined year from a list of a plurality of years; and
a second disk, coupled concentrically to and rotatable relative to said first disk, which includes;
year table means containing said list of a plurality of years arranged so that said year selecting means can select the predetermined year, and
day grid means listing dates from 1 to 31, said day grid circumferentially drawn about said second disk when said second disk is rotated relative to said first disk, said window being superimposed over the day grid, whereby
when said month specifying means specifies the predetermined month and said year selecting means selects the predetermined year with respect to the predetermined month by means of said year table, said indicia and said window automatically define a calendar period corresponding to the predetermined month in the predetermined year, said calendar period appearing through said window.

5,313,724
PICTURE FRAME ILLUMINATION APPARATUS

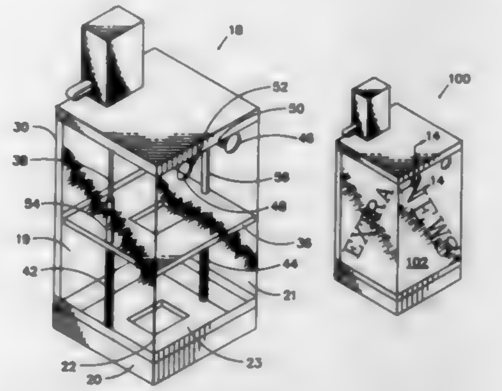
Sheila J. Warner, 323 Nordina St., Redlands, Calif. 92373
Filed Jul. 12, 1991, Ser. No. 729,322
Int. Cl.⁵ G09F *13/18*
U.S. Cl. 40—152.2 **1 Claim**



1. A picture frame illumination apparatus, comprising,
a central support plate, the central support plate including a plurality of edges, the plurality of edges include a top edge, a bottom edge, a first side edge, and a second side edge, and
a housing mounted fixedly to the central support plate extending forwardly thereof, with the housing mounted coextensively to each edge of the support plate, the first edge including a first housing member, the top edge including a second housing member, the second edge including a third housing member, and the bottom edge including a fourth housing member, each housing member in communication relative to an adjacent housing member, and
the second housing member including a top plate, the top plate including a plurality of vent openings directed therethrough to direct heat interiorly of the housing, and
each housing member including an illumination bulb mounted coextensively within each housing member, each housing member further including a transparent lens in contiguous and coextensive communication with each edge of the central support plate, whereupon illumination of each illumination bulb directs illumination onto the central support plate through each respective transparent lens, and
wherein each illumination bulb is cylindrical, and
wherein each illumination bulb is rotatably mounted within each respective housing member, and
wherein each illumination bulb is mounted coaxially with an axle member, each axle member is rotatably mounted within a support housing, and each axle member includes a rotary dial projecting exteriorly of each housing member, whereupon rotation of the dial effects rotation of the axle and the illumination bulb, and
wherein each illumination bulb includes a first opaque semi-cylindrical covering, a transparent second semi-cylindrical covering, and a third semi-cylindrical covering, and
wherein each covering defines an arc of one hundred twenty degrees about each illumination bulb.

5,313,725
CHANGEABLE DISPLAY NEWSPAPER VENDING MACHINE

Terry L. DeVassie, 5808 La Paz Pl., Westerville, Ohio 43081
Filed May 22, 1992, Ser. No. 886,854
Int. Cl.⁵ G09F *7/00*
U.S. Cl. 40—312 **15 Claims**



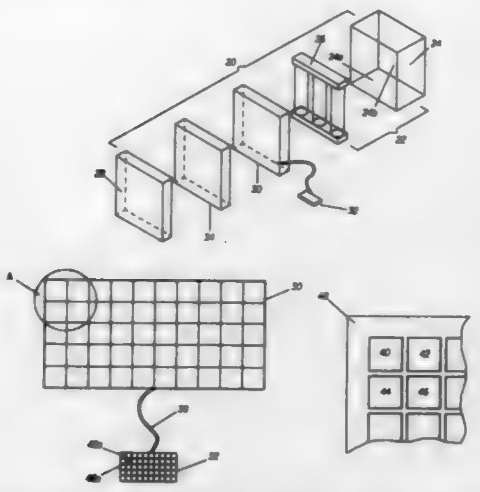
1. An improved newspaper display rack comprising:
a housing three transparent sidewalls;
a fourth sidewall having an opening and a door mounted in the opening for access to the interior of the housing; and
a display placard having three generally planar panels, hingedly connected at adjoining edges and removably supported in the newspaper rack against the three transparent sidewalls, the display placard being sufficiently flexible to permit it to be bent and inserted into the newspaper rack in the absence of creases and breakage of the placard, being sufficiently resilient to return the panels to generally planar and being sufficiently water resistant to avoid significant deterioration from moisture.

5,313,726
PROGRAMMABLE LIGHT MODULATOR FOR VIEWING TRANSPARENT FILM PRINTS

Zvi Yaniv, Farmington Hills; Lionel Robbins, Bloomfield Hills, and Clive Catchpole, Birmingham, all of Mich., assignors to Advanced Technology Incubator, Inc., Farmington Hills, Mich.
Filed Dec. 1, 1992, Ser. No. 988,309
Int. Cl.⁵ G02B *27/02*
U.S. Cl. 40—361 **7 Claims**

1. An apparatus for viewing transparent film prints, said apparatus comprising:
a back light assembly including a light source and a light diffusing means, said light diffusing means operatively disposed on a first side of said light source and adapted to provide a uniform distribution of light thereacross;

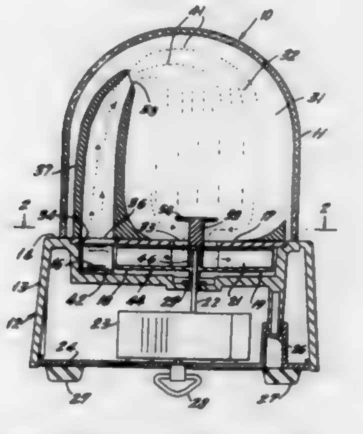
a programmable array including at least one liquid crystal light valve adapted to operate in either an opaque or transparent mode, said liquid crystal light valve array being operatively disposed between said light source and said light diffusing means, and adapted to selectively prevent light emanating from said light source from reaching said light diffuser;



an optical element operatively disposed between said programmable array and said diffuser to reduce optical artifacts caused by said programmable array; and
means for switching said at least one light valve between the opaque and transparent mode, said switching means comprising a touch sensitive panel.

5,313,727
DECORATIVE KINETIC DEVICE

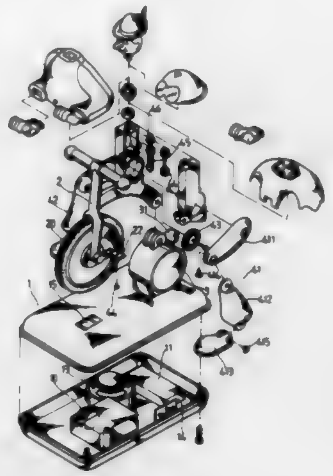
Joseph E. Murray, Jr., Malden, Mass., assignor to Merton Company, Ltd., Hong Kong, Hong Kong
Filed Nov. 25, 1992, Ser. No. 981,240
Int. Cl.⁵ G09F *19/00, 19/08*
U.S. Cl. 40—410 **19 Claims**



1. A decorative kinetic device, comprising:
a base having an internal pumping chamber;
a transparent dome mounted on the base above the pumping chamber, the dome containing a fluid and a plurality of small particles;
the pumping chamber having spaced inlet and outlet holes communicating with the dome;
an impeller mounted in the pumping chamber to circulate the fluid and the particles from the dome through the inlet hole through the pumping chamber and back to the dome through the outlet opening;
means for supporting a decorative object mounted for rotation in the dome; and
means for simultaneously rotating the impeller and the supporting means.

5,313,728
ACTION DOLL

Chen F. Tien, P.O. Box 82-144, Tiapei, Taiwan
Filed Aug. 10, 1992, Ser. No. 926,933
Int. Cl.⁵ G09F *19/08*
U.S. Cl. 40—420 **1 Claim**



1. An action doll comprising:
a base in which are mounted a transmission mechanism and a battery chamber, said transmission mechanism including a motor electrically connected with said battery chamber, a gearing driven by said motor, and a friction wheel connected with said gearing;
a bicycle having a front wheel formed with threads engaged with said friction wheel and a time clock at a hind part of said bicycle, said time clock being electrically connected with said motor and provided with a knob for controlling said motor and including means for producing music; and
a doll having two legs with feet engaged with pedals of the front wheel of said bicycle, one of said legs being engaged with a ratchet wheel which is in turn engaged with a driving gear train for rotating a head of said doll;
whereby actuation of the motor will rotate the front wheel and its associated pedals, which, in turn, will move the feet of the doll, resulting in a rotation of the head of the doll through the gear train.

5,313,729
LED DISPLAY UNIT

Hiroo Sakai; Shingo Otobe; Hideo Tamura, and Toshimi Kamikawa, all of Kanagawa, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Apr. 21, 1992, Ser. No. 871,756
Claims priority, application Japan, May 2, 1991, 3-40111
Int. Cl.⁵ G09F *3/04*
U.S. Cl. 40—452 **5 Claims**

1. An LED display unit comprising:
a printed circuit board;
a plurality of LEDs packaged on said printed circuit board;
a resin by which portions of said LEDs except for light-emitting sections thereof are sealed;
an attaching plate;
a case in which said LEDs having the portions thereof sealed by said resin are received, a plurality of said cases being arranged on said attaching plate to form a large-sized display panel with each case having a rear face and four legs projecting from four corners of the rear face of

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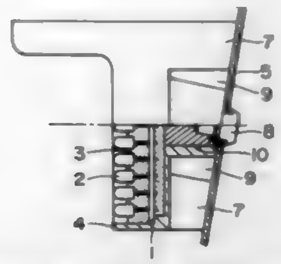
the case with at least a pair of said legs securing said case and said attaching plate to one another; and
a connector for each said case for wiring to said printed circuit board;

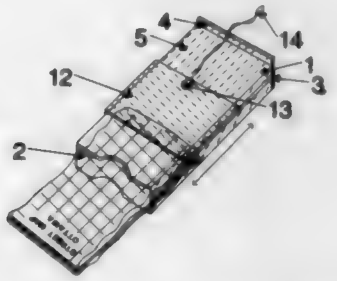


the rear face of each said case being spaced from said attaching plate, each case being configured such that spaces are extant between said attaching plate and said rear face and between said legs and said wiring connector.

5,313,730
MAP HOLDER

Dale K. Tiller, P.O. Box 8180, Ottawa, Ontario K1G 3H7, Canada

Filed Dec. 3, 1992, Ser. No. 985,117
Int. Cl.⁵ G09F *3/18*
U.S. Cl. 40—642 **7 Claims**



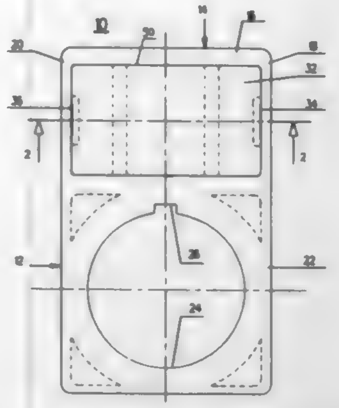
1. A portable map holder comprising a substantially rigid elongate sleeve in the form of a shallow rectangular box having an open end through which a folded map can be inserted, said sleeve having side walls and a top wall made of transparent material to expose a map inserted therein, and a transparent cursor mounted on said sleeve for slidable movement therealong over said transparent top wall, said cursor incorporating a lens for magnifying inscriptions on a map inserted in said sleeve and visible through said top wall.

5,313,731
PLATE SUPPORT FOR ELECTRIC CONTROL AND SIGNALING UNITS, PERMITTING INSERTION OF A PLATE INTO AND SEPARATION AND REMOVAL OF THE PLATE FROM THE PLATE SUPPORT

Florino Falchi, Sangano, Italy, assignor to CGE Compagnia Generale Elettromeccanica SpA, Milan, Italy

Filed Dec. 8, 1992, Ser. No. 987,154
Claims priority, application Italy, Dec. 17, 1991, MI91 U 01107
Int. Cl.⁵ G09F *3/18*
U.S. Cl. 40—642 **3 Claims**

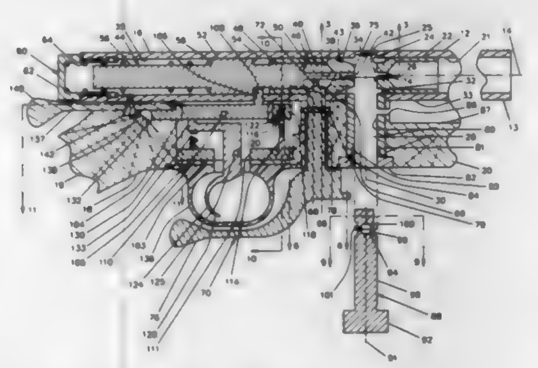
1. A plate support for supporting a display pate for electric control and signaling units, the support comprising a substantially planar frame portion having a seat for receiving said plate from a front side of said frame portion and two side walls, said seat having a shape mating a shape of the plate, said frame portion having side protrusions for supporting edges of the plate in said seat; and a planar table portion adjacent to and formed integrally with said frame portion, said planar table portion being of the same thickness as said frame portion and having a hole for insertion of a ring nut of a respective electric control and signaling member, said frame portion having at a side thereof opposite to said front side, two intermediate support members positioned between said side walls and spaced from each so as to leave therebetween, at a central portion of said frame, a space which allows bending of the plate when the plate is pressed by a finger of the user to cause disengagement of said edges of the plate from said side protrusions and release of the plate without use of any tool.



5,313,732
MUZZLE LOADING RIFLES

Ralph D. Peifer, R.R. 2, Box 155-A, Nokomis, Ill. 62075

Filed Dec. 22, 1992, Ser. No. 995,140
Int. Cl.⁵ F41A *19/00*
U.S. Cl. 42—51 **15 Claims**



13. A gun comprising in combination:
a receiver having an outer wall and an axial bore,
a hammer axially movable within said receiver from a first cocked position to a second fired position,
spring means for urging said hammer from said cocked position to said fired position, and
cam means for moving said hammer from said fired position to said cocked position, and
said cam means rotatable about an axis perpendicular to a central axis of said receiver.

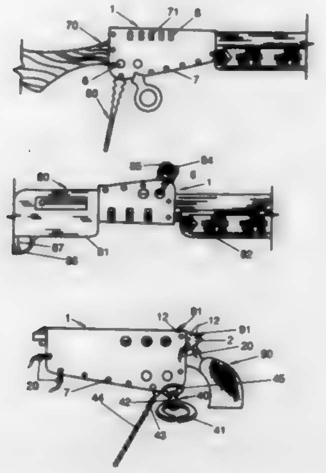
5,313,733
QUICK RELEASE SAFETY DEVICE FOR FIREARMS

Ronald A. Meade, Rte. 5, Box 756, Gloucester, Va. 23061

Filed Oct. 28, 1992, Ser. No. 967,374
Int. Cl.⁵ F41A *17/00, 35/02*
U.S. Cl. 42—70.11 **20 Claims**

1. An externally attached cover in combination with a friction release device for forming a safety device for firearms comprising:

a shaped essentially flat cover having a central section and a first side and a second side capable of being bent from said central section such that said first side and said second side can be positioned essentially parallel to each other;
a frictionally operated release device;
said frictionally operated release device having an elongated carrier means with a first end and a second end and a series of friction protrusions extending from said elongated carrier means between said first end and said second end;
both said first side and said second side of said cover being provided with a sized aperture for reception of said protrusions of said frictionally operated securing device;



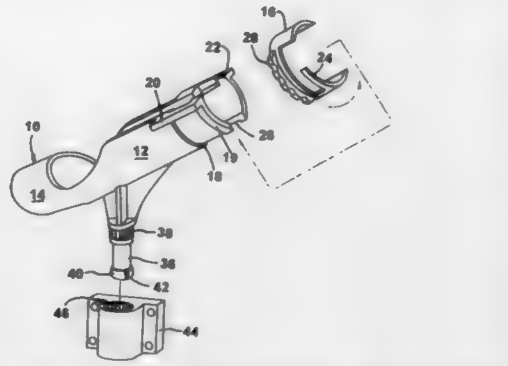
said friction protrusions extending from said elongated carrier being sized and shaped to be larger than said sized apertures in said cover first side and second side to create an interference fit;
the materials of said cover and said protrusions and the shape of said protrusions and said sized apertures and the amount of interference between said protrusions and said sized apertures being selected so as to require a predetermined force to engage and disengage said frictionally operated release device into and from said cover sized apertures.

5,313,734
FISHING ROD HOLDER HAVING A FLEXIBLE CLAMP FOR CASTING AND SPINNING REELS

Joseph M. Roberts, Alameda, Calif., assignor to Attwood Corporation, Lowell, Mich.

Continuation of Ser. No. 956,442, Oct. 2, 1992, Pat. No. 5,231,785, which is a continuation of Ser. No. 814,971, Dec. 23, 1991, abandoned. This application Apr. 21, 1993, Ser. No. 50,901
The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.
Int. Cl.⁵ A01K *97/10;* **F16M** *13/00*
U.S. Cl. 43—21.2 **9 Claims**

1. A fishing rod holder comprising a generally elongated, cylindrical holster for receiving a rod, said holster including an outer radial surface and an elongated slot extending lengthwise of said elongated holster for receiving the handle of a rod, said slot defined by opposite edges of said surface extending lengthwise of said holster;
an arcuate clamp slidably and rotatably mounted on said outer radial surface at one end of said holster;
a protrusion means at said one end of said holster for normally preventing the sliding of said clamp lengthwise off said one end of said holster;
said arcuate clamp having spaced ends providing a gap therebetween spaced a distance less than the space between said opposite sides of said radial surface, said clamp being flexible for flexing over said protrusion when assembling said clamp on said holster;
a first flange located on said holster at one edge of said slot and having a portion extending over and spaced a distance from the outer surface on which said clamp is slidably and rotatably mounted thereby providing a first opening between said portion of said first flange and said outer surface on which said clamp is slidably and rotatably mounted;
a second flange located on said holster at the other edge of said slot and having a portion thereof extending over and spaced a distance from said outer radial surface over which said clamp is slidably and rotatably mounted and providing a second opening between said portion of said second flange and the outer surface on which said arcuate clamp is slidably and rotatably mounted;

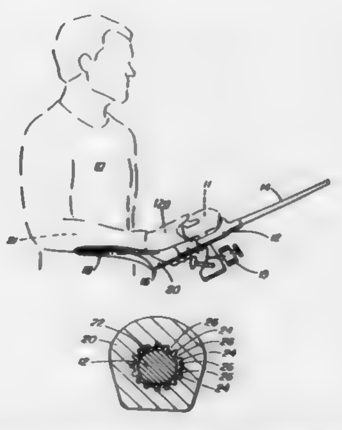


said clamp being rotatable on said outer surface from a first position in which the gap is aligned with said slot for receiving said rod to a second position where a portion of the clamp extends over said slot for holding a rod therein; and
means for stopping the rotation of said clamp in said first position wherein said ends of said arcuate clamp extend through said openings whereby said clamp is self-retained when assembled on said holster without a need for a separate fastener.

5,313,735
ROTATABLE HANDLE EXTENSION FOR FISHING RODS AND THE LIKE

Desmond J. Latouche, 1315 Patricia Blvd., Kingsville, Ontario, Canada N9Y 2R3

Continuation-in-part of Ser. No. 940,086, Sep. 3, 1992, abandoned. This application Apr. 20, 1993, Ser. No. 49,993
Claims priority, application Canada, Mar. 2, 1992, 2062162
Int. Cl.⁵ A01K *87/00*
U.S. Cl. 43—25 **8 Claims**



1. A system for fixing and reversibly adjusting relative rotation between two coaxial tubular members, comprising:

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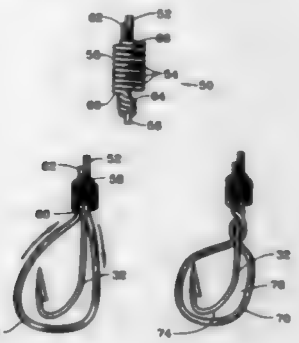
a shaft fashioned to fit closely overtop of an inner tubular member, the shaft being solidly affixed to said member;
a plurality of generally identical equally-spaced longitudinal splines extending radially outwards from the shaft;
an outer tube formed to closely receive and closely fit overtop the inner tubular member;
a plurality of generally identical longitudinal splines along the inside surface of the outer tube; said splines on the outer member being fashioned to co-operate with the splines extending radially outwards from the shaft; and
reversible means of preventing longitudinal separation between the inner and outer tubular members;
whereby the outer tube can be placed coaxial with, and at a desired angle of rotation relative to, the inner tubular member, and overtop the inner member, and fixed both rotationally and longitudinally relative to the inner member by said means of preventing longitudinal separation;
and whereby the outer tube can be moved to a new angle of rotation relative to the inner tubular member by disengaging the means of preventing longitudinal separation; separating the inner and outer tubes longitudinally; rotating the outer relative to the inner tubular member to a new angle of rotation; placing the outer tube overtop and coaxial with the inner member; and re-engaging the means of preventing longitudinal separation.

5,313,736
FLEXIBLE LINE COUPLING METHOD AND APPARATUS

Howard Rosenberg, 3661 State Rd. 84, Fort Lauderdale, Fla. 33312, and Eric Kuritzky, 346 E. Kaley St., Orlando, Fla. 32806

Filed Oct. 19, 1992, Ser. No. 962,742
Int. Cl.^{5} A01K *91/04*
U.S. Cl. 43—44.83 **4 Claims**

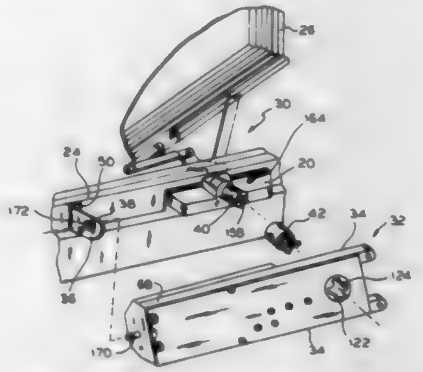


1. A fishing hook permitting ready coupling of a fishing line, said fishing hook comprising: a one piece shank having a straight length with a first end formed into a spiral formation defined by at least three tightly spaced circular revolutions about a centerline of the straight length creating an aperture having an inner surface with a proximal opening disposed at one end of the aperture and a distal opening at the opposite end of the aperture, the aperture extending parallel to said centerline of the straight length for maintaining an untied portion of a fishing line in a frictionally engaged fixed position; and a second end of said shank depends downwardly from said distal opening into a U-shaped bend ending in a sharpened tip;
whereby said aperture is available for knotless tying of a fishing line by insertion of a line through the proximal end of said aperture and reinserting a portion of the fishing line into and through said distal opening of said aperture forming a loop depending from said distal end, the loop is twisted in front of said shank to form a first loop wherein the free end of said shank is inserted through the first loop, the loop is twisted to form a second loop where the free end of the shank is inserted through the second loop, the loop is then twisted in front of said shank to form a third loop wherein the free end of said shank is inserted through, whereby the fishing line inserted in said proximal end is pulled taunt to cause said first, second, and third loop to conform to, and fictionally engage, at least a portion of the straight length of said shank.

5,313,737
POWERED WINDOW OPERATOR DRIVE

Thomas J. Midas, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.

Filed Feb. 18, 1993, Ser. No. 19,243
Int. Cl.^{5} E05F *11/00*
U.S. Cl. 49—324 **16 Claims**



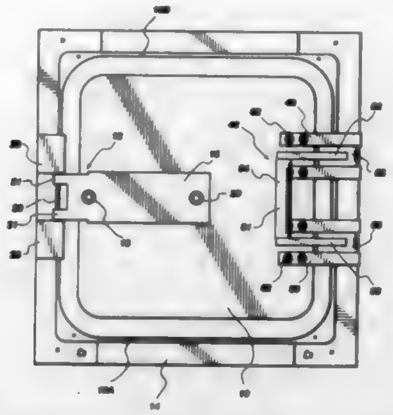
1. For use with a window having a fixed frame and a movable sash, and a manually driven window operator mounted to said frame and including an operator shaft rotatable to drive a linkage mechanism fastened to said sash to selectively move the sash relative to said frame to open or close the window, a motorized operator drive comprising:
a housing having a motor end and an opposite output end;
a motor mounted in said housing at the motor end and having an output shaft;
a gear set mounted in said housing including an input gear driven by said motor shaft and an output gear at the output end;
an adapter, in use, operatively engaged with both said output gear and said operator shaft to rotate said operator shaft in response to energization of the motor;
a bracket fixedly mountable to the window frame; and
means for resiliently mounting said housing motor end to said bracket to provide isolation between the drive and the window.

5,313,738
CLOSURE FOR DOORS USED WITH SMALL AND MEDIUM SIZED PRESSURE VESSELS

Bhabesh K. Thakar, Henrietta; Maurice Gilbert, Canaseraga; Charles O. Hancock, Fairport, and Charles H. Feathers, Hilton, all of N.Y., assignors to MDT Corporation, Torrance, Calif.

Filed Jan. 22, 1991, Ser. No. 644,086
Int. Cl.^{5} E05B *65/06*
U.S. Cl. 49—394 **19 Claims**

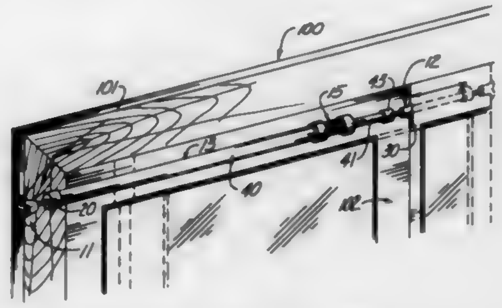
1. Structure for securing a door in sealing relationship with the opening to a chamber of a pressurized vessel comprising:
hinge structure connecting a first edge of said door to a corresponding first side of said opening through linkage structure providing a surface parallel to and opposing said opening which contacts said first edge to restrain movement of said door in a direction transverse the plane of said opening; and
latch structure releasably connecting a second edge of said door to a corresponding second side of said opening through a mechanism which has an engagement condition in which first and second structural components are coupled to effect a latching force to hold said door in position, said first and second components being mutually adapted so that said latching force increases in response to increasing differentials in pressure between the inside and outside of said pressurized vessel.



5,313,739
SLIDING DOOR CLOSURE SYSTEM

Nancy K. Nelson, and Dennis H. Nelson, both of 1834 S. Peach St., Meford, Oreg. 97501

Filed Apr. 12, 1993, Ser. No. 44,655
Int. Cl.^{5} E05D *15/06*
U.S. Cl. 49—404 **5 Claims**



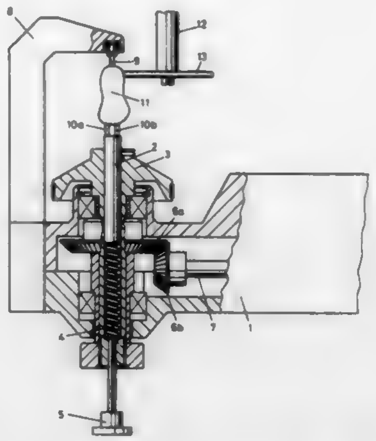
1. A sliding door closure system for a sliding door assembly, including a pair of sliding doors mounted within a door frame; wherein, the closure system comprises:
a telescoping housing unit, including an inner housing member and an outer housing member relatively movable with respect to one another wherein one end of the housing unit is operatively associated with the door frame and the other end of the housing unit is operatively associated with one of said sliding doors; and
a spring biasing unit, including a plurality of helical spring members connected in an end to end fashion wherein the front end of the first of said plurality of spring members is operatively attached to the outer housing member and the rear end of the last of said plurality of spring members is operatively attached to the inner housing member.

5,313,740
SCANNING DEVICE AND USE THEREOF

Stefan Eidenbenz, Zürich, and Claude Nowak, Wettingen, both of Switzerland, assignors to Mikrona Technologie AG, Spreitenbach, Switzerland

Filed May 8, 1991, Ser. No. 699,820
Claims priority, application Switzerland, May 16, 1990, 1656/90
Int. Cl.^{5} B24B *17/00*
U.S. Cl. 51—100 R **7 Claims**

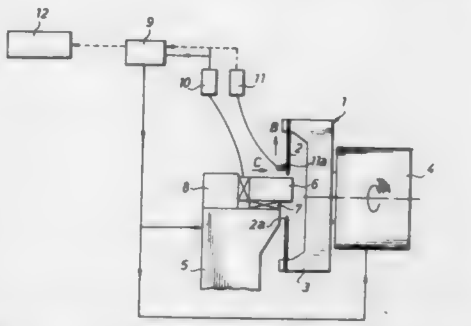
1. A scanning device for scanning a moulding which has at least one first holding part for fastening the moulding, a tool for cutting a blank, said tool cuts along a circular line of a particular diameter, a scanner having a scanning edge of exactly the same diameter as said circular line, and a second holding part which extends towards the first holding part for fixing the moulding, said scanning edge of the scanner having a recess therein that is of a depth necessary to receive at least half of said second holding part therein.



5,313,741
METHOD OF AND AN APPARATUS FOR SLICING A SINGLE CRYSTAL INGOT USING AN ID SAW SLICING MACHINE THEREIN

Kohei Toyama, Fukushima, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Japan

Filed Sep. 13, 1991, Ser. No. 759,541
Claims priority, application Japan, Sep. 14, 1990, 2-242440
Int. Cl.^{5} B24B *49/16;* **B28D** *1/04*
U.S. Cl. 51—165.77 **14 Claims**



1. An improved method of using an ID saw slicing machine having a blade which is rotated at high speeds for slicing a single crystal ingot in a direction normal to the axis of the ingot to obtain wafers, wherein the cutting load which the blade of the ID saw slicing machine imposes upon the single crystal ingot is continually detected in terms of three vector elements along three mutually perpendicular directions including said slicing direction throughout the slicing operation, and that, when the magnitude of that vector element of the cutting load which extends in the slicing direction exceeds a predetermined value, the feed rate of the ingot to the blade is decreased and, at the same time, the rotational speed of the blade is increased in accordance with a predetermined control pattern.

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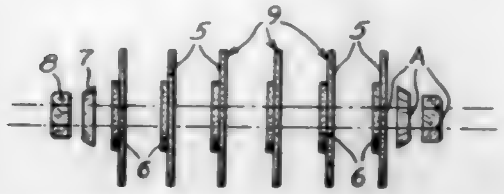
5,313,742
HIGHLY RIGID COMPOSITE SHAPED ABRASIVE CUTTING WHEEL

Robert F. Corcoran, Jr., Oakham, and Srinivasan Ramanath, Holden, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Jan. 11, 1991, Ser. No. 640,174
Int. Cl.⁵ B24D *5/02*
U.S. Cl. 51—206 R **5 Claims**

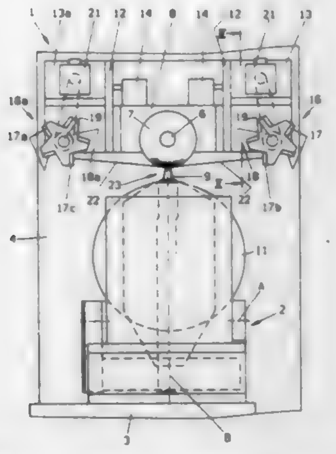


1. A monolithic abrasive cutting wheel comprising an inner section and an outer section, said inner section being substantially thicker than said outer section; at least said outer section comprising abrasive grain and a bond therefor, and a thickness of from about 0.001 inch to about 0.098 inch; wherein said abrasive is selected from the group consisting of diamond, cubic boron nitride, silicon carbide, fused aluminum oxide, sintered alumina, filament shaped sintered aluminum oxide, silicon nitride, boron carbide, and mixtures thereof; and wherein said abrasive is coated with a silane.

5,313,743
COOLING APPARATUS FOR GRINDING MACHINES

Werner Peschik, Börnsen, Fed. Rep. of Germany, assignor to Blohm Maschinenbau GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 1, 1992, Ser. No. 939,075
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1991, 4129402
Int. Cl.⁵ B24B *55/02*
U.S. Cl. 51—266 **21 Claims**

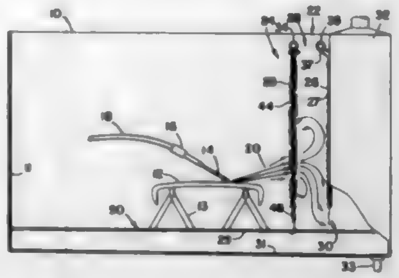


1. Apparatus for supplying coolant to a location of contact between a workpiece and a material removing tool operating in a machine, said apparatus comprising:
nozzle supporting means including at least one mobile carrier;
a plurality of different coolant discharging nozzles provided on said at least one carrier, said at least one carrier being translationally and rotatably movable between a plurality of different positions at which one selected nozzle of said plurality of nozzles can be directed toward and can discharge a coolant stream against said location; and
means for supplying coolant to said nozzles.

5,313,744
WATER SCREEN FOR BLAST MEDIA DUST CONTAINMENT

James D. Shank, Jr., Vestal, N.Y., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Feb. 3, 1993, Ser. No. 13,073
Int. Cl.⁵ B24B *1/00*
U.S. Cl. 51—317 **25 Claims**

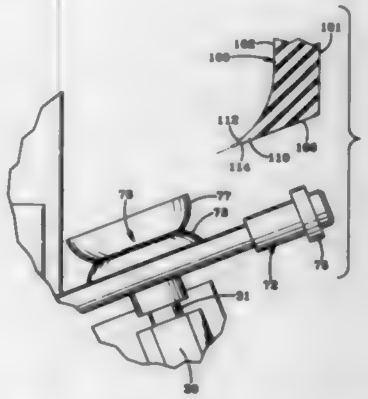


15. A process for removing coatings or other contaminants from a solid surface comprises contacting said surface with a highly pressurized stream comprising a fluid carrier and a particulate abrasive, removing the dust caused by said abrasive contacting said solid surface by passing the stream of pressurized fluid and particulate abrasive deflected from said surface into contact with a dust containment system comprising a water screen including a downwardly flowing water curtain in the path of said deflected stream, a rearward wall spaced from said water screen and in the path of said deflected stream which initially passes through said water curtain, and removing said particulates from the space between said water screen and said rearward wall.

5,313,745
TREAD EDGE GRINDING METHOD AND APPARATUS

Carl L. Mace, Jr., Rockwall, Tex.; William A. Rex, Mogadore, and Lawrence E. Chlebina, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 21, 1993, Ser. No. 6,915
Int. Cl.⁵ B24B *1/00*
U.S. Cl. 51—326 **17 Claims**

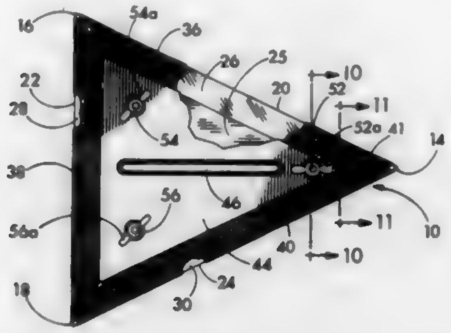


1. A method for removing material from and shaping an edge of a precured tread, the method comprising the steps of:
a) placing the edge of the tread in a V-shaped groove of a grinding wheel;
b) rotating the grinding wheel while it is in contact with the tread edge;
c) moving the tread and grinding wheel relative to one another, the movement being in a direction causing the edge of the tread to be ground to move through the groove in the grinding wheel.

5,313,746
TRIANGULAR SANDING APPLIANCE

Gerald E. Zarriello, 4814 Humboldt Ave. North, Minneapolis, Minn. 55430

Continuation of Ser. No. 621,787, Dec. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 312,770, Feb. 17, 1989, abandoned. This application Feb. 19, 1993, Ser. No. 20,233
Int. Cl.⁵ B24D *17/00*
U.S. Cl. 51—358 **13 Claims**

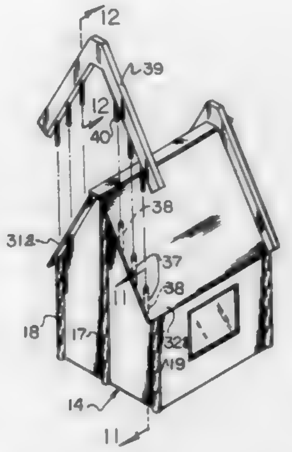


1. An improved hand sanding appliance comprising,
a sanding pad having a flat lower sandpaper supporting surface of triangular outline;
three linear edges defining the periphery of said pad, said three linear edges being joined at three intersections;
at least two upwardly facing beveled surfaces that are inclined at an oblique angle extending from each of the linear peripheral edges of the pad centrally thereof and intersecting the lower surface at an acute angle;
a sheet of sandpaper having a triangularly-shaped central portion with three linear edges corresponding to the linear edges of the pad and flaps at the linear edges of the sheet;
each of the flaps being folded with respect to the central portion along one edge of the central portion;
the beveled surfaces being distributed around at least two linear edges of the pad so as to provide an inclined support for each of said flaps during use and the beveled surfaces present a sharp linear edge over which the sandpaper is folded;
a handle connected to the appliance for supporting and controlling the movement of said appliance;
at least one point with a triangularly-shaped cross-section at the intersection between the linear edges of the pad, at least two points being less than 90° as seen in plan view;
each triangularly-shaped point providing an acute projection on the linear periphery of the pad;
each triangularly-shaped point being bounded on the sides by portions of the beveled surfaces, said portions of the beveled surfaces being inclined upwardly proceeding toward the center of the point;
the beveled surfaces intersect at the top of each triangularly-shaped point along an inclined line of intersection proceeding outwardly and downwardly toward a tip portion of the point and at an acute angle to the lower surface;
the sandpaper sheet includes a flat bottom portion contacting the bottom surface of the point and a pair of said flaps being folded upwardly and extending obliquely up the sides of the triangularly-shaped point and having upper free edges that are proximate to one another along said inclined line of intersection between the beveled surfaces, whereby the sandpaper flaps provide support and stability for the portion of the sheet below the point; and
a rigid backing plate for supporting the pad, wherein the pad is constructed from a slightly resilient material having a flat upper surface, said backing plate being connected to said flat upper surface with the triangularly-shaped points and the linear edges extending unsupported outwardly beyond the rigid backing plate at least a distance equal to the beveled surfaces that are inclined at an oblique angle from each of the linear peripheral edges such that the elasticity of the points and linear edges permits the points and the linear edges to yield when the appliance is tilted with respect to a surface being sanded.

5,313,747
COLLAPSIBLE AND EXTENSIBLE PLAYHOUSE

Donn L. Sakihara, 1342 F Wilder Ave., Honolulu, Hi. 96822

Filed Oct. 19, 1992, Ser. No. 962,909
Int. Cl.⁵ F04B *1/346*
U.S. Cl. 52—64 **1 Claim**



1. A collapsible and extensible playhouse, comprising,
a front wall spaced from and parallel a rear wall, the front wall having a front wall first side and a front wall second side spaced from the front wall first side, the rear wall having a rear wall first side spaced from and parallel a rear wall second side, and
a first end wall, the first end wall having a first end wall first side and a first end wall second side, the first end wall first side arranged in interdigited communication with the front wall second side, including a first corner hinge at a first intersection of the front wall second side and the first end wall first side, the rear wall first side arranged in interdigited securement to the first end wall second side to define a second corner hinge, and
a second end wall having a second end wall first side and a second end wall second side, with the second end wall first side arranged in interdigited communication and securement to the rear wall second side defining a third corner hinge, and
the second end wall second side arranged in interdigited communication with the front wall first side to define a fourth corner hinge, with each corner hinge arranged in a parallel relationship relative to one another, and
the first end wall having a first end wall intermediate hinge intermediate and parallel the first corner hinge and the second corner hinge, with the second end wall having a second end wall intermediate hinge intermediate the third corner hinge and the fourth corner hinge, and
a first roof plate and a second roof plate, with the first roof plate hingedly mounted to the second roof plate at a first roof hinge, and
a second roof hinge hingedly mounting the roof plate to the rear wall, and
a third roof hinge hingedly mounting the first roof plate to the front wall, wherein the first roof hinge, the second roof hinge, and the third roof hinge are arranged parallel relative to one another, and are orthogonally oriented relative to the first corner hinge, the second corner hinge, the third corner hinge, and the fourth corner hinge, and
the first end wall and the second end wall each include a plurality of spaced wall bores directed therein, and the first roof plate and the second roof plate each include a plurality of apertures directed therewithin, and each of the

VOL 162
ISS 4
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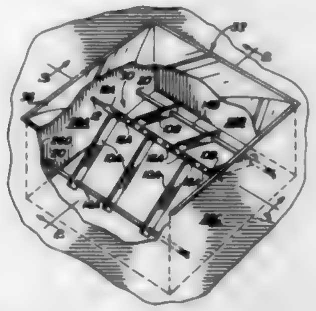
roof apertures is arranged for alignment with one of said wall bores, and at least one crown rib, the at least one crown rib includes a plurality of ferrous metallic rib rods fixedly mounted to the crown rib, and wherein the crown rib is arranged to overlie the first roof plate and the second roof plate, and each of the wall bores includes a magnetic plug therewithin in magnetic adherence to each of the ferrous metallic rib rods when the at least one crown rib is arranged in contiguous communication with the first roof plate and the second roof plate, with each of the rib rods extending through one of said roof apertures and one of said wall bores.

5,313,748
SECURITY DEVICE FOR SKYLIGHTS AND OTHER VENTS, SHAFTS OR WELLS

Richard M. Hughes, Jr., 71-866 Eleanora La., Rancho Mirage, Calif. 92270

Filed Mar. 24, 1993, Ser. No. 36,992
Int. Cl.^{5} E04B *7/18*
U.S. Cl. 52—200 **10 Claims**



1. A security device to discourage breaking and entry through vents, shafts, wells and other points of access, said device comprising:

a. a multitude of armature means for obstructing access, said armature means having an elongated connector head for receiving a hinge support means said armature means having a base hole means for receiving a base support means said armature means being of substantially equal dimensions and form;

b. at least one hinge support means of sufficient length to span interior distance between opposite sidewalls of said point of access, said hinge support means being of sufficient diameter to be received through said head of said armature means;

c. a plurality of base support means of sufficient length for anchoring to opposite sidewalls, said base support means being received through said base hole of said armature means, said base support means being secured to said sidewalls on a plane different of said hinge support means within said shaft;

d. a means for securing said base support means to said opposite sidewalls.

5,313,749
REINFORCED STEEL BEAM AND GIRDER

Mitchel A. Conner, 3220 Stonehenge Dr., St. Charles, Mo. 63303

Filed Apr. 28, 1992, Ser. No. 875,628
Int. Cl.^{5} F04C *3/10*
U.S. Cl. 52—223.12 **1 Claim**

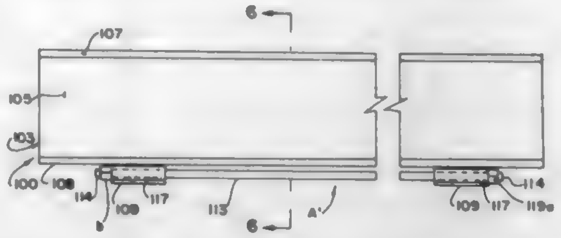
1. A reinforced steel beam for use in building structures comprising:

a steel structural beam; and,

an attachment secured to said beam for transmitting an upwardly directed moment to said beam, the attachment including

a first and a second transmitting member each comprising a T-member, each having at least one longitudinal bore therethrough, each said transmitting member being substantially shorter than the length of said beam; said transmitting members being spaced apart and secured to said beam near the ends thereof;

a first compression plate held against a first end of said transmitting member and a second compression plate held against a second end of said transmitting member;

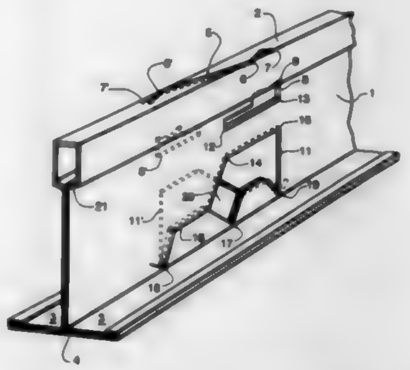


and a tensioned member carried by said transmitting member and extending through said attachment and through said longitudinal bores, said tensioned member being secured to said compression plates, said tensioned member being substantially parallel to and below said beam's longitudinal axis, whereby said tensioned member creates said upwardly directed moment.

5,313,750
FIRE-RATED RUNNER

Sandor A. Frecska, Lancaster, Pa., and Gale E. Sauer, Sinclairville, N.Y., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 6, 1992, Ser. No. 864,315
Int. Cl.^{5} E04B *9/08*
U.S. Cl. 52—232 **3 Claims**



1. A fire expansion section for a ceiling runner wherein:

(a) the ceiling runner has two ends, a vertical web member having at its upper end a bulb-shaped element with two spaced side walls, a two piece bottom wall and a top wall, and at its lower end oppositely positioned flanges on either side of the web to support ceiling boards, said web member consisting of two side-by-side pieces of metal, each piece integral with and connected at the bottom of the web to one of the oppositely positioned flanges and integral with and connected at the top of the web to one of the bottom wall pieces of the bulb; and

(b) said fire expansion section being located between the two ends of the ceiling runner and said section comprising:

(1) a slit cut in the top wall of the bulb-shaped element without the removal of metal;

(2) a first rectangular cutout in one piece of the metal of the web at the top of the web adjacent the bulb bottom wall near and below one end of the slit and a second rectangular cutout similarly located in the other piece of metal of the web near and below the other end of the slit;

(3) three evenly spaced apart cuts in the web near the flangges, the center cut at its position near the flange being V-shaped with the point of the V-shape positioned near the flange to form a notch, the center cut being cut through both pieces of metal forming the web to form an opening in the web less than 50% of the sum of the rectangular cutout area in each piece of metal in the web, on one side of the web the cut on the right side of the center notch as viewed facing said one side being cut through only said one piece of metal forming the web with the cut located below the rectangular cutout on said one side of metal, on the other side of the web the cut on the right side of the center notch as viewed facing said other side being cut through said other piece of metal forming the web and positioned in the same manner as the cut on the said one side of the web; and

(4) the upper ends of the three cuts being connected by a severance of the metal above the cuts.

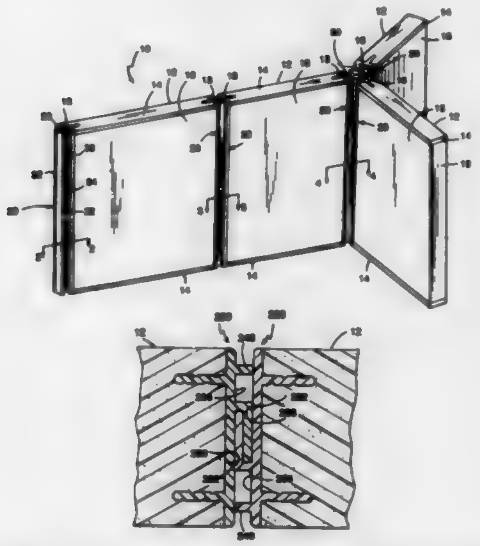
5,313,751
INTERLOCKING STRUCTURAL MEMBERS WITH EDGE CONNECTORS

Waldemar E. Wittler, 25 Harbourside Rd., North Quincy, Mass. 02171

Continuation of Ser. No. 695,592, May 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 630,067, Dec. 19, 1990, Pat. No. 5,097,643. This application Jan. 19, 1993, Ser. No. 7,355

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.^{5} E04H *3/00;* **E04C** *2/10;* **A47G** *5/00*
U.S. Cl. 52—238.1 **32 Claims**



1. An edge connector for connecting panel members at their adjacent edges, comprising:

a base extending transversely between edges of said base;

a support wall integral with said base extending away from said base on one side thereof, said support wall extending generally parallel to said base edges and being positioned between the transverse center of said base and one edge of said base;

a tongue integrally connected at one end to said support wall and extending from said support wall to a free end thereof spaced away from said base and positioned between said support wall and the other edge of said base, said tongue and said base defining a recess therebetween to receive a tongue of a mating connector,

at least one protrusion or bead integral with and extending away from an outwardly facing surface of said connector on said one side of said base to engage a detent or groove n a surface of a mating connector, sand

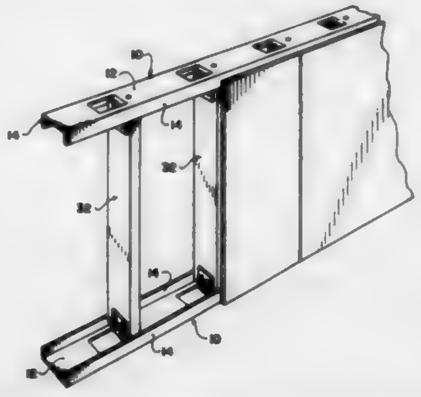
at least on detent or groove in an outwardly facing surface of said connector on said one side of said base to receive a protrusion or bead on a surface of a mating connector,

said detent or grove spaced transversely of said base from said protrusion or bead.

5,313,752
WALL FRAMING SYSTEM

Michael A. Hatzinikolas, Edmonton, Canada, assignor to Fero Holdings Limited, Edmonton, Canada

Filed Jan. 7, 1992, Ser. No. 817,508
Claims priority, application Canada, Jan. 11, 1991, 2034081
Int. Cl.^{5} E04B *2/58*
U.S. Cl. 52—243 **12 Claims**



1. A wall between a floor and a ceiling, comprising:

floor and ceiling rails adapted to be secured to the floor and ceiling respectively, at least one of the rails having a plurality of connector plates projecting substantially vertically therefrom and a plurality of substantially vertical slots in each connector plate;

a plurality of substantially vertical studs;

coupling means coupling the studs to the rails, the coupling means including slip joint means coupling the studs to the connector plates for relative vertical movement of the studs on the connector plates, the slip joint means comprising

  a plurality of insert members, each insert member engaging slidably in a respective one of the slots in the connecting plates and extending between the associated connecting plate and stud and thereby spacing the stud from the connecting plate, and

  fastener means connecting each insert member to the stud; and

wall panels secured to the studs;

whereby relative vertical movements of the rails are accommodated by the slip joints.

5,313,753
CONSTRUCTION WALL PANEL AND PANEL STRUCTURE

Wallace D. Sanger, 11333 Acme Rd., West Palm Beach, Fla. 33414

Continuation-in-part of Ser. No. 750,511, Aug. 27, 1991, abandoned, and a continuation-in-part of Ser. No. 874,414, Apr. 27, 1992, abandoned, and a continuation-in-part of Ser. No. 3,396, Jan. 12, 1993, abandoned. This application Feb. 19, 1993, Ser. No. 20,303

Int. Cl.^{5} E04B *1/00*
U.S. Cl. 52—251 **27 Claims**

1. A prefabricated panel for forming walls and roofs of buildings, comprising:

a concrete planar portion having a first face and a second face,

at least one concrete rib projecting from said first face end having a rib outer face,

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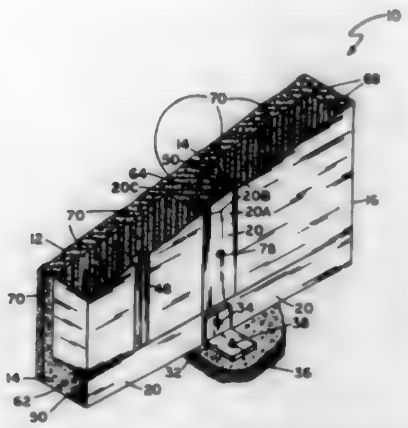
at least one block of insulating material fitted adjacent to said first face and said at least one rib,

a metal stud member adapted to receive drywall anchoring



fasteners comprising a metal sheet secured substantially parallel to and spaced apart from said rib outer face with rib connecting and spacing means,

anchoring means for securing said panel to a foundation.

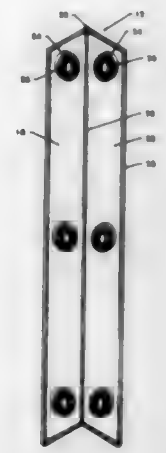
5,313,754
MAGNETIC CORNER PROTECTOR

William I. Jensen, Sheridan, Mont., assignor to Manufacturing Technologies, Inc., Sheridan, Mont.

Filed Jan. 28, 1993, Ser. No. 10,581

Int. Cl.⁵ E04B *1/00*

U.S. Cl. 52—255 **5 Claims**



1. A protective guard for a structural corner or corner edge having metal beading or metal backing, comprising:

an injection molded, elongated resilient body having a first and second elongated portions for engaging and covering the structural corner edge having metal beading or metal backing,

a plurality of living hinges integrated and connecting the first and second elongated portions of the injection molded, elongated resilient body,

a plurality of oriented, multiple pole ceramic magnets integrated into the first and second elongated portions of the injection molded, elongated resilient body,

a continuous edge border integrated into the injection molded, elongated resilient body, which edge border supports the injection molded, elongated resilient body in such alignment that the plurality of magnets are in close proximity to but not contact with the structural corner or corner edge having metal beading or metal backing.

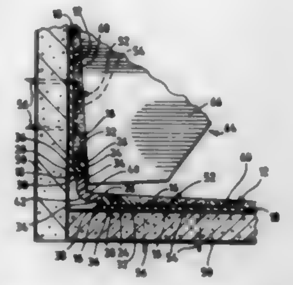
5,313,755
DRYWALL CORNER-FINISHING ACCESSORY

Joseph M. Koenig, Jr., Lincolnwood, Ill., assignor to Trim-Tex, Inc., Lincolnwood, Ill.

Filed Apr. 20, 1993, Ser. No. 49,705

Int. Cl.⁵ E04B *1/00*

U.S. Cl. 52—255 **8 Claims**



1. A drywall corner-finishing accessory comprising three integrally joined, elongate strips, namely two relatively rigid, lateral strips and a relatively pliable, middle strip, each lateral strip having a broad portion with a distal edge and a proximal edge and having a rib with a distal edge and a proximal edge merging with the proximal edge of the broad portion of such lateral strip, the middle strip having two opposite edges and a generally uniform thickness substantially between the opposite edges and being joined at each of the opposite edges to the rib of one of the lateral strips at the distal edge of the rib thereof, the accessory being flexible along the middle strip, between the opposite edges of the middle strip, selectively to define a stepped, inside corner, in which the ribs are directed inwardly so as to constitute means for guiding a tool used to apply drywall-finishing material over the lateral strips, in which the middle strip has a concave surface stepped inwardly from the broad portions of the lateral strips and curved substantially between the ribs of the lateral strips, and in which the relatively pliable, middle strip serves as an expansion joint, and to define a stepped, outside corner, in which the ribs are directed outwardly so as to constitute means for guiding a tool used to apply drywall-finishing material over the lateral strips, in which the middle strip has a convex surface stepped outwardly from the broad portions of the lateral strips and curved substantially between the ribs of the lateral strips, and in which the relatively pliable, middle strip serves as an expansion joint.

5,313,756
SUN DECK AND FRAME THEREFOR

Bill Ways, 24 Harjolyn Drive, Etobicoke, Ontario, Canada M9B 3T9, and Lancelot Obery, 152 Morton Way, Brampton, Ontario, Canada L6Y 2P8

Filed Sep. 28, 1992, Ser. No. 952,816

Int. Cl.⁵ E04B *1/00*

U.S. Cl. 52—263 **11 Claims**

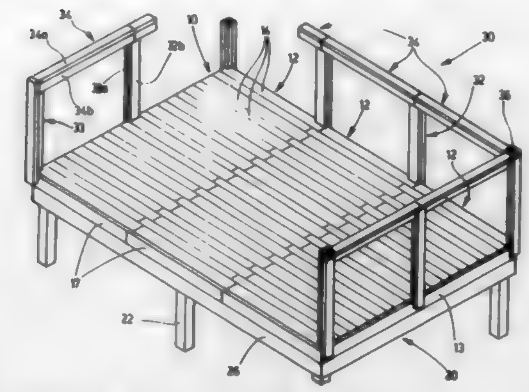
1. A deck structure comprising:

a floor comprising at least one floor section, having floorboards, secured to orthogonal joists, and

a supporting frame including legs supporting a beam, the beam comprising a pair of opposed boards with an adjustable gap therebetween and the legs having an upper portion of substantially uniform thickness, and

securing means or adjusting the gap between the opposed boards extending through the beam adjacent to at least one leg,

whereby the upper portion of at least one leg may be slidably engaged between the opposed boards such that when the securing means is tightened the leg is frictionally engaged between the opposed boards so that the frame is temporarily supported on the leg and the beam may be moved relative to the leg by sufficient force to overcome the frictional engagement thereof.



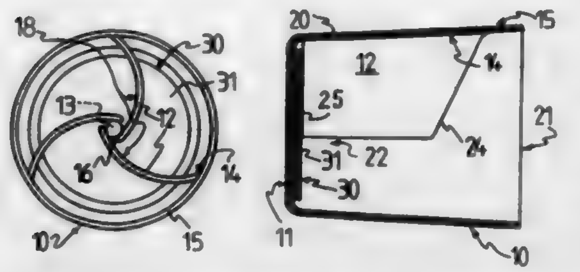
5,313,757
REINFORCING BAR PROTECTION CAP

Kurt E. Schnepf, 20 The Boulevard, Montrose, Victoria, 3567, Austral, Australia

Continuation of Ser. No. 727,562, Jul. 9, 1991, abandoned. This application Mar. 11, 1993, Ser. No. 29,923

Int. Cl.⁵ B65D *59/06*

U.S. Cl. 52—301 **14 Claims**



1. A reinforcing bar protection cap for location over the exposed end of a concrete reinforcing bar so as to protect against injury to workers, the protection cap including:

a load spreading cap which in use is arranged to be located over the exposed end of the bar so that contact with the end of the bar from the general axial direction is intercepted by the load spreading cap;

at least two retaining members for engagement with the reinforcing bar so as to locate and retain the load spreading cap at the end of the bar;

a support portion for the load spreading cap, the support portion generally surrounding the end of the bar in use,

the retaining members being operatively connected to the support portion and arranged to contact and to bear against the bar at points located lengthwise of the bar, the retaining members being resiliently movable so as to contact the bar so that the contact points are along respective contact lines which are substantially parallel to the axis of the bar so that there is no significant inclination of the contact lines in the axial direction which would otherwise cause a tendency of the bar protection cap to creep along the bar and disengage from the end thereof;

the load spreading cap including a substantially impenetratable metal disc against which in use the end of the reinforcing bar bears, the metal disc strongly resisting piercing of the load spreading cap by the end of the bar upon the occurrence of an extremely applied substantial magnitude impulse loading upon the load spreading cap.

5,313,758
CONSTRUCTION BOARD AND ITS MANUFACTURING METHOD

Tarmo Willman, Kaarina; Esko Brunila, Pargas; Bjarne Pelto, Pargas, and Lars Heselius, Pargas, all of Finland, assignors to Oy Partek AB, Pargas, Finland

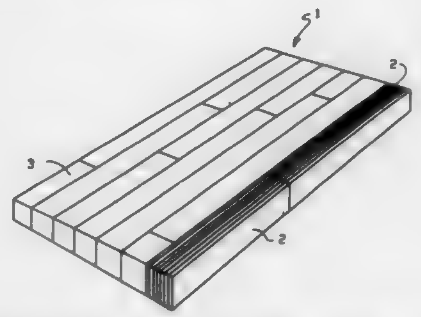
PCT No. PCT/FI89/00235, § 371 Date Aug. 16, 1991, § 102(e) Date Aug. 16, 1991, PCT Pub. No. WO90/07040, PCT Pub. Date Jun. 28, 1990

PCT Filed Dec. 15, 1989, Ser. No. 690,906

Claims priority, application Finland, Dec. 16, 1988, 885847

Int. Cl.⁵ B32B *7/00;* **E04C** *2/00*

U.S. Cl. 52—415 **13 Claims**



1. A longitudinally extending lamella board (1) having opposed main surfaces and constructed of a plurality of side by side lamella (4) of binder fixed mineral wool fibers having a first fibre orientation and defining a core for a sandwich element having a surface layer of sheet material on both main surfaces, the lamellas (4) extending in the longitudinal direction of the board and the first fibre orientation of the lamellas forming essentially a right angle to the main surfaces of the board, the improvement wherein at least some of the lamellas (4) consist of lamella pieces (2) having a longitudinal axis extending parallel to the longitudinal direction of said laminate board (1) and having side surfaces and opposing end surfaces, said pieces being shorter than the lamella board (1) and interconnected at said opposing end surfaces, and said pieces extending between said main surfaces of said board without any separate support structure between said main surfaces.

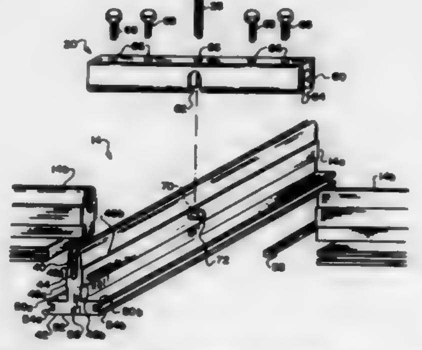
5,313,759
CLEANROOM CEILING SYSTEM

Francis H. Chase, III, 123 Winnisimet Dr., Tiverton, R.I. 02878

Filed Dec. 18, 1991, Ser. No. 809,969

Int. Cl.⁵ E06B *3/54*

U.S. Cl. 52—506.06 **14 Claims**



1. A suspended ceiling system comprising:

a plurality of frame members arranged to form a load-bearing framework, each of said members having a cross-section comprising a solid vertical portion and a solid horizontal portion in an inverted T-shape, the upper end of said vertical portion including a slot whose sides are

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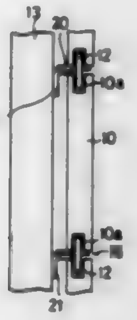
threaded and which extends along the length of the member;
- a plurality of threaded rods for suspending the framework from a structure; and
- cross dowel nuts disposed in said vertical portions, oriented transverse to the lengths of the frame members and extending through walls defining the slots, said rods extending vertically through said slots and threadedly engaging said cross dowel nuts.

5,313,760
BUILDING WALL CONSTRUCTION METHOD

Tadatsune Tojo, 588-21, Mizonokuchi, Takatsu-Ku, Kawasaki-shi, Kanagawa-Ken, Japan
Filed Apr. 29, 1992, Ser. No. 875,385
Claims priority, application Japan, Feb. 27, 1992, 75711
Int. Cl.⁵ E04G *21/14;* E04B *1/38*
U.S. Cl. 52—747 **4 Claims**

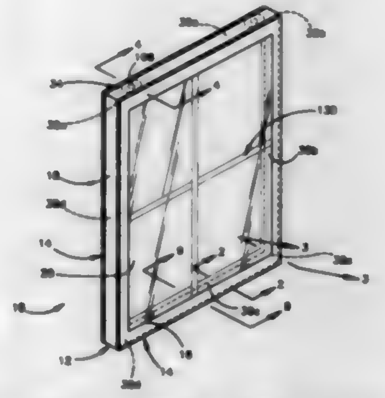


1. A building wall construction method, for forming a decorative wall by installing wall panels on a wall body, said wall panels having spaced holes in the upper and lower surfaces thereof, said method comprising the steps of:
- attaching fittings to a surface of the wall body at predetermined intervals in a vertical direction, sets of said fittings being aligned in a horizontal direction, said fittings being formed of L-shaped members having a pair of orthogonal, planar flanges, each of which is suitable for attachment to the wall body, the flanges of said fittings having unequal depth;
- fastening an elongated flat member to each horizontally aligned set of said fittings for traversing the wall body, each of said flat members being capable of supporting a plurality of the wall panels, said members having through holes extending through said members at predetermined horizontally spaced intervals;
- inserting nibs into said through holes of said elongated member, to extend from either side of said elongated member;
- inserting the nibs into the holes in the horizontal upper surface of a wall panel placed below the elongated member so as to retain the panel on the elongated member in generally vertical alignment with the elongated member; and
- inserting the nibs in the holes in the horizontal lower surface of a wall panel placed above the elongated member so as to retain the panel on the elongated member in generally vertical alignment with the elongated member and to form a decorative wall from the wall panels.

5,313,761
INSULATING GLASS UNIT

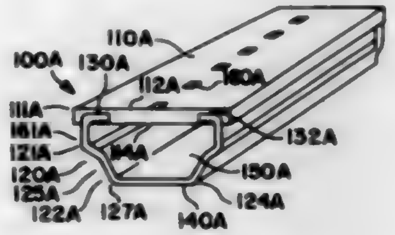
Edmund A. Leopold, Hudson, Ohio, assignor to Glass Equipment Development, Inc., Twinsburg, Ohio
Filed Jan. 29, 1992, Ser. No. 827,281
Int. Cl.⁵ E04C *2/54*
U.S. Cl. 52—788 **21 Claims**

1. A spacer assembly for an insulating glass unit comprising:
- a. a spacer frame having first and second opposite ends and comprising a plurality of spacer frame elements connected to form a polygonal spacer frame disposed generally in a plane with frame corners formed by spacer frame element junctures;
- b. each frame element defining a laterally extending outer peripheral wall and first and second lateral walls integral with said outer wall and extending inwardly therefrom generally parallel to said frame plane;
- c. said outer wall and said lateral walls extending substantially continuously about the spacer frame between said opposite ends; and
- d. connecting structure for joining said first and second spacer frame ends; said connecting structure comprising:
  - i. a connecting tongue continuous with and projecting from said first spacer frame end, said tongue defined by a tongue body continuous with said outer wall and first and second tongue stiffening walls continuous with said first and second lateral walls, respectively, said tongue body having a lateral extent less than the lateral extent of said outer wall and the distance said tongue stiffening walls extend from said tongue body being less than the distance said lateral walls extend from said outer wall;
  - ii. said second spacer frame end defining at least a tongue receiving structure forming a telescopic joint with said tongue, said tongue receiving structure comprising keeper structure for engaging said tongue stiffening wall edges when said tongue and second spacer frame end are telescoped together;
  - iii. said tongue and tongue receiving structure sized relative to each other to define said telescopic joint between the spacer frame ends with said tongue body and stiffening walls extending within said receiving structure.



5,313,762
INSULATING SPACER FOR CREATING A THERMALLY INSULATING BRIDGE

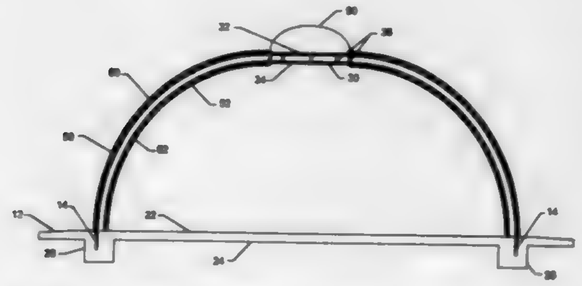
Guy Guillemet, Terrebonne, Canada, assignor to Bayomikas Limited, Quebec, Canada
Filed Dec. 26, 1991, Ser. No. 813,577
Int. Cl.⁵ E04C *2/54*
U.S. Cl. 52—790 **39 Claims**



1. An insulating spacer for creating a thermally insulating bridge between spaced apart panes of a multiple pane unit, the insulating spacer comprising:
- a top bridge member for contacting spaced apart panes of the multiple pane unit, the top bridge member being made of one of a synthetic resin material and a composite synthetic resin material and having an upper surface and a lower surface substantially parallel to the upper surface;
- a metallic first leg member and a metallic second leg member each being embedded into the top bridge member;
- a bottom bridge member substantially parallel to the top bridge member and which cooperates with each of the first and second leg members; and
- a channel portion defined by a configuration of the lower surface of the top bridge member, the first and second leg members and the bottom bridge member.

5,313,763
DOME-SHAPED STRUCTURE AND METHOD OF CONSTRUCTING SAME

John G. Oram, 790 Bateswood Dr., #19, Houston, Tex. 77079
Filed Jun. 24, 1992, Ser. No. 902,911
Int. Cl.⁵ E04B *1/32*
U.S. Cl. 52—80.2 **22 Claims**

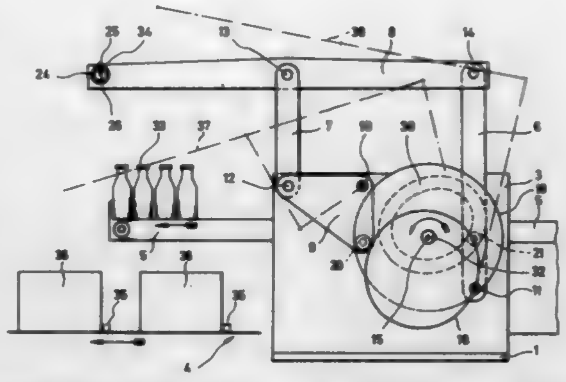


1. A dome-shaped structure comprising:
- a base foundation;
- a plurality of initially substantially straight flexible outer stringers, each said outer stringer having a first end and a second end wherein said first ends of said plurality of outer stringers are circumferentially spaced and attached to said base foundation;
- a plurality of initially substantially straight flexible inner stringers, each said inner stringer having a first end and a second end wherein said first ends of said plurality of inner stringers are circumferentially spaced and attached to said base foundation; and
- means for supporting said second end of said plurality of inner and outer stringers substantially centrally and inwardly located above said base foundation,
- wherein said base foundation and said means for supporting maintain said inner and outer stringers in a flexurally-stressed arcuate configuration and said circumferentially spaced inner stringers are located within the periphery formed by the circumferentially spaced outer stringers at said base foundation.

5,313,764
PACKING APPARATUS

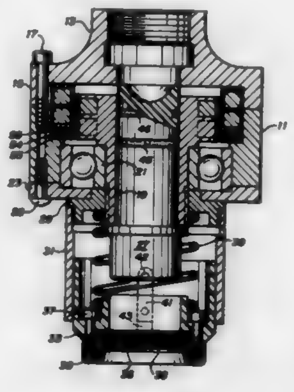
Hermann Kronseder, Regensburger Strasse 42, 8404 Woerth, Fed. Rep. of Germany
PCT No. PCT/EP91/01388, § 371 Date Oct. 23, 1992, § 102(e) Date Oct. 23, 1992, PCT Pub. No. WO92/02416, PCT Pub. Date Feb. 20, 1992
PCT Filed Jul. 24, 1991, Ser. No. 938,222
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1990, 4024335
Int. Cl.⁵ B65B *21/18*
U.S. Cl. 53—247 **16 Claims**

1. Apparatus for crating or uncrating a group of bottles with respect to cases adapted to hold a group of the bottles comprising a frame, an extension arm extending in a generally horizontal direction, a gripping head comprising a plurality of gripping elements for simultaneously gripping a group of bottles suspended from a free end of said extension arm, a first steering rod pivotally mounted at one end about a horizontal axis to the frame and pivotally connected at its opposite end at a first pivot point to the extension arm remote from its free end, a first rotary cam means for pivoting said first steering rod about its axis and cause essentially horizontal motion of said extension arm and gripping head, a second steering rod comprising two steering members pivotally connected at one end thereof relative to each other, with the opposite end of a second one of said members being pivotally connected to the extension arm at a second pivot point and the opposite end of a first one of said members being pivotally mounted about a horizontal axis to the frame and second rotary cam means for pivoting said first steering member of said second steering rod about its axis as said first steering rod is being pivoted about its axis for thereby simultaneously causing essentially vertical motion of said second steering member and of said extension arm and gripping head.



5,313,765
CAPPING MACHINE HEAD WITH MAGNETIC CLUTCH

Wendell S. Martin, Fort Smith, Ark., assignor to Anderson-Martin Machine Company, Ft. Smith, Ark.
Filed Nov. 4, 1991, Ser. No. 787,011
Int. Cl.⁵ B67B *3/20*
U.S. Cl. 53—317 **11 Claims**



5. A capper head incorporating a magnetic slip clutch comprising:
- A. a body;
- B. means for securing said body to a rotating capper machine spindle having an axis for rotation of said body;
- C. a cylindrical chuck driving element rotatably mounted in said body with an axis of rotation coaxial with said capper machine spindle axis;

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D. means for operatively connecting said body and said element and for reducing reverse torque induced rotation to avoid cap loosening, comprising:
  i. a magnet ring surrounding said element rotationally fixed with respect to said body and having a set of at least twenty-four permanent magnets therein with their North-South polar axes oriented radially and predetermined equal angular spacing therebetween; and
  ii. a plurality of permanent magnets positioned on said element with their North-South polar axes oriented radially and with angular spacing therebetween equal to or a multiple of said predetermined equal angular spacing, said set of at least twenty-four permanent magnets having peripherally alternating North and South polarity.

5,313,766
METHOD AND APPARATUS FOR ON DEMAND MANUFACTURING OF CUSTOM-SIZED BAGS CONFORMING TO THE VOLUME OF ARTICLES RECEIVED THEREIN AT A CHECK-OUT COUNTER

Renato Rimondi, Bologna, and Angelo Cappi, Moderna, both of Italy, assignors to Awax S.R.L., Vignola, Italy

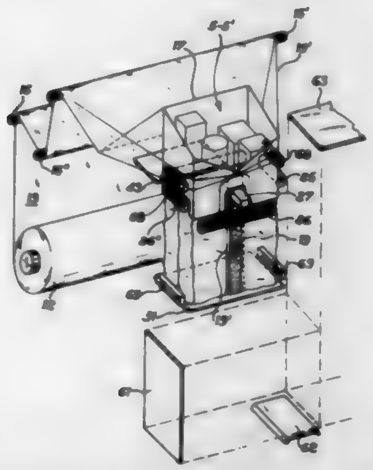
Continuation of Ser. No. 851,234, Mar. 13, 1992, abandoned, which is a continuation of Ser. No. 703,595, May 20, 1991, abandoned, which is a continuation of Ser. No. 568,544, Aug. 15, 1990, abandoned, which is a continuation of Ser. No. 90,964, Aug. 28, 1987, abandoned. This application Jan. 13, 1993, Ser. No. 5,864

Claims priority, application Italy, Feb. 23, 1987, 19462 A/87

The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.

Int. Cl.^{5} B65B *9/08, 9/20, 5/08, 59/02*

U.S. Cl. 53—451 **39 Claims**



1. A method for in-situ manufacturing of flexible bags at a check-out counter and for the packing of articles within the bags being formed at the counter, comprising the steps of:
bringing the lateral edges of a longitudinally continuous sheet of flexible, substantially nonstretchable material into joinable relationship with one another in association with a hollow former and joining the lateral edges of the film to produce a longitudinally continuous tubular wrapper;
transversely sealing the tubular wrapper to form a closed bottom of a bag being formed;
placing articles to be packed into the bag being formed through the interior of the hollow former;
longitudinally advancing the tubular wrapper to accommodate the articles being packed int eh bag being formed;
transversely cutting the tubular wrapper to detach the bag being formed from the longitudinally continuous wrapper at a point beyond the articles packed in the bag being formed and thereby forming the top of the bag;
transversely sealing the tubular wrapper at said bag-detaching transverse cut to close the top of the bag for preventing unintended loss of packed articles from within the bag; and
longitudinally cutting the tubular wrapper from said bag detaching transverse cut to a point intermediate the top and bottom transverse seals to provide a pair of handles unitarily on said bag and a protective envelope closing the bag between said handles for preventing the unintended loss of articles from within the bag.

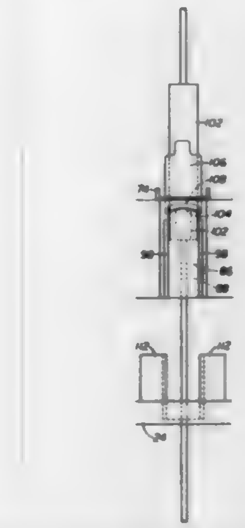
5,313,767
MULTIPLE PACKAGE FORMING AND FILLING MACHINE

Aliseo Gentile, 8011 Schneider, Manchester, Mich. 48158

Filed Apr. 9, 1992, Ser. No. 865,983

Int. Cl.^{5} B65B *7/06, 43/08*

U.S. Cl. 53—456 **20 Claims**



18. A method of forming and filling packages comprising the steps of:
placing a package blank in a tray spaced above a fixed die cavity, said die cavity having a plurality of apertures,
entrapping the center of the package blank between upper and lower reciprocable mandrels,
reciprocating the mandrels into the die cavity thereby drawing the package blank down into the die cavity,
momentarily hesitating the downward motion of the mandrels with the package blank folded within the die cavity,
reciprocating heat sealing means into the apertures thereby heat sealing a portion of the folded package blank together within the die cavity during the moment of hesitation to form an open top package,
resuming the downward motion of the mandrels to remove the package from the die cavity and place the package in a fixture,
withdrawing the mandrels from the package,
moving the fixture and package to a filling station and dosing the package with product, the package remaining in the fixture,
moving the fixture and package to a top sealing station, heat sealing the package top and ejecting the sealed package from the fixture.

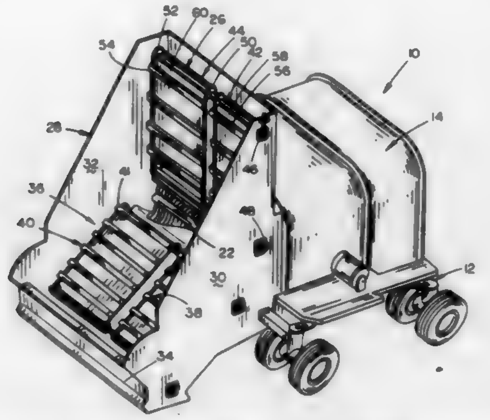
5,313,768
AGRICULTURAL BAGGING MACHINE

Steven R. Cullen, P.O. Box 642, Astoria, Oreg. 97103

Continuation of Ser. No. 815,942, Dec. 30, 1991, abandoned. This application Jan. 22, 1993, Ser. No. 7,506

Int. Cl.^{5} B65B *43/26*

U.S. Cl. 53—570 **3 Claims**



1. An agriculture bagging machine for bagging material into agricultural bags comprising,
a wheeled frame means having rearward and forward ends,
a tunnel means having an intake end for receiving silage and an output end adapter to receive the mouth of an agricultural bag,
a horizontally disposed rotor means at the intake end of said tunnel means for forcing silage into said tunnel means and into said bag,
a hopper means on said wheeled frame means for receiving silage,
said rotor means being in communication with said hopper means,
and a substantially vertically disposed chain feeder means positioned in said hopper means, said chain feeder means being positioned above and upstream of said rotor means for moving silage downwardly in said hopper means toward said rotor means,
said chain feeder means having a downstream lower end positioned closely adjacent said rotor means for moving silage downwardly into engagement with said rotor means.

5,313,769
ROW FOLLOWER ENCODER SUPPORT AND METHOD OF MOUNTING SAME ONTO AN AGRICULTURAL VEHICLE

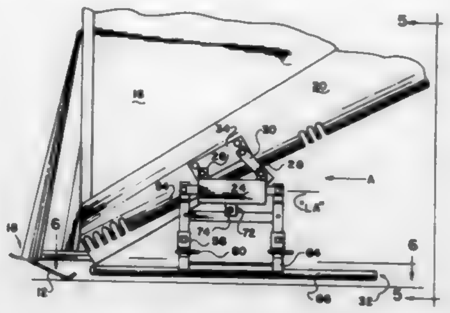
Ronny L. Barnes, O'Donnell, and H. Wayne Mathews, Denison, both of Tex., assignors to Gar-Bar Corporation, O'Donnell, Tex.

Filed Feb. 8, 1993, Ser. No. 14,806

Int. Cl.^{5} A01D *69/04*

U.S. Cl. 56—10.2 **9 Claims**

6. The method of mounting an encoder onto an agricultural vehicle which has a direction of travel, comprising:
a) sealing and encapsulating an encoder inside of a tubular body,
b) connecting said encoder to a stub shaft which extends from one end of an enclosed body,
c) rigidly attaching the enclosed body onto the vehicle,



d) aligning the stub shaft with the direction of travel,
e) extending row follower arms from the stub shaft.

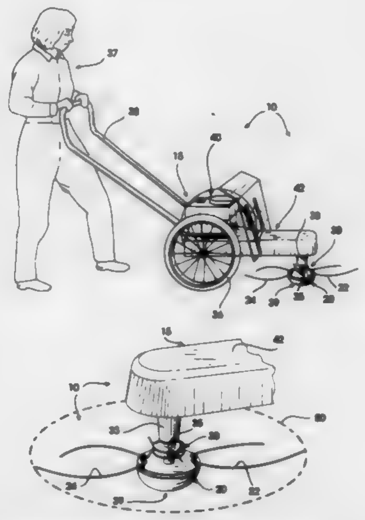
5,313,770
JAM-PROOF ROTARY WEED CUTTER

Odis B. Smothers, P.O. Box 145, Flippin, Ark. 72634

Filed Nov. 23, 1992, Ser. No. 980,201

Int. Cl.^{5} A01D *34/68*

U.S. Cl. 56—12.7 **17 Claims**



1. A rotary weed trimming tool comprising:
a rigid frame adapted to be held by a user;
a motor mounted to said frame for powering said tool;
a drive shaft driven by said motor;
a main rotatable spool secured to said drive shaft and spaced apart from said motor, said main spool supporting at least one outwardly projecting cutting filament forming a cutting plane; and,
an auxiliary rotatable spool secured on said shaft between said main spool and said motor, said auxiliary spool comprising:
  separate, spaced apart upper disk and lower disks defining a space therebetween;
  a plurality of peripheral orifices defined in each of said disks; and,
  guard filaments at least partially captivated within said orifices, said filaments creating two coaxial cone-shaped guard volumes, one guard volume extending upwardly from said disks and the other volume extending downwardly from said disk to said cutting plane to prevent jamming of said drive shaft.

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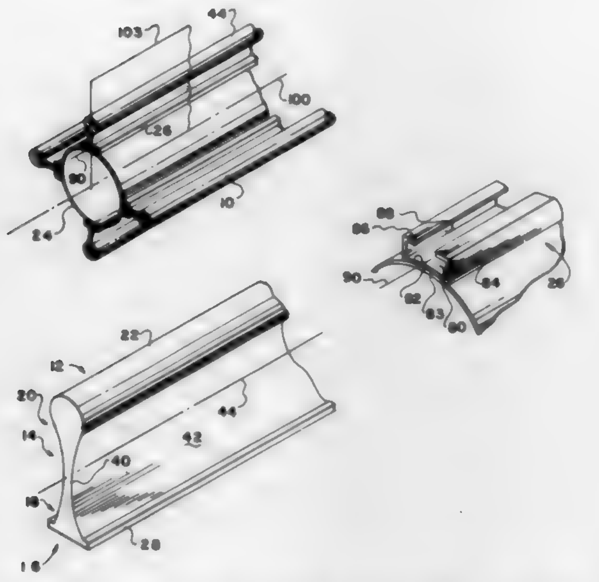
5,313,771
RUBBER BATT FOR A COTTON STRIPPER

L. D. France, deceased, late of Lubbock, Tex., and by L. D. France, legal representative, Rt. 3, Box 303, Slaton, Tex. 79364

Filed Jun. 25, 1992, Ser. No. 905,010
Int. Cl.^{5} A01D *46/12*
U.S. Cl. 56—33 **14 Claims**



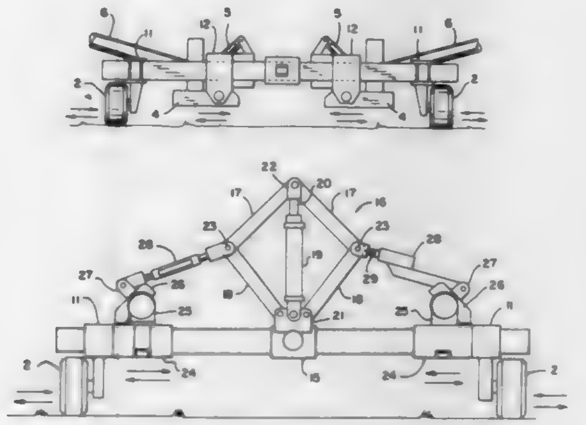
10. A cotton stripping machine for harvesting cotton bolls from associated cotton stalks on which the cotton bolls have grown, comprising:
- a harvesting shaft connected to said cotton stripping machine for rotation relative thereto;
- at least one batt body having a length and being connected to and along a length of said harvesting shaft for rotation therewith;
- each batt body comprising a foot adapted for connective engagement with said harvesting shaft, said foot being joined to said batt body along the length of said batt body;
- each batt body comprising a curvilinear shaped head opposite said foot, said head being joined to said batt body along the length of said batt body;
- said batt body being flared at points of joinder with said foot and said head so that a midsection of said body located between said head and said foot has a width narrower than said flared points of joinder and said head and said foot, thereby allowing said batt body to flex during use.

14. A structure for harvesting cotton bolls from the associated cotton stalks on which the cotton bolls have grown, comprising:
- a batt body having two opposing ends, a head end and a foot end;
- said body also having a length and two sides;
- a batt foot joined to said batt body at said batt body foot end;
- a batt head joined to said batt body at said batt body head end;
- said batt head having an exterior shape that is curvilinear;
- said batt foot having two toes;
- said toes being located, one each, on two sides of said foot;
- said toes extending outwardly from the foot;
- a channel strip capable of mating with said foot for connection to said foot along the length of said batt body; and
- said channel strip being designed for connection to a rotatable shaft.

5,313,772
RAKE COMPONENT SYSTEM AND METHOD

Carletto Tonutti, Tricesimo, Italy, assignor to Tonutti S.P.A., Italy

Continuation-in-part of Ser. No. 924,743, Aug. 4, 1992, Pat. No. 5,263,306, which is a continuation-in-part of Ser. No. 774,712, Oct. 19, 1991, Pat. No. 5,231,829. This application Feb. 26, 1993, Ser. No. 23,076
Int. Cl.^{5} A01D *78/14*
U.S. Cl. 56—377 **13 Claims**



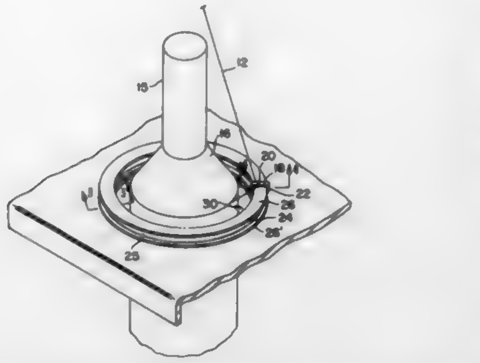
1. A method of assembling a crop rake, comprising the steps of:
- providing a tool bar;
- providing a three-point hitch assembly mountable to the tool bar;
- providing a pull-type hitch assembly mountable to the tool bar;
- providing a pair of rake assemblies mountable to the tool bar;
- providing a lifting and lowering assembly mounted to the tool bar and to the rake assemblies;
- mounting the rake assemblies to the tool bar, and mounting the lifting and lowering assembly to the tool bar and to the pair of rake assemblies for providing movement of the rake assemblies between a lowered working position and a raised transport position; and
- mounting one of the three-point hitch assembly and the pull-type hitch assembly to the tool bar between the rake assemblies for use in connecting the tool bar with the rake assemblies mounted thereto to a tractor.

13. A crop rake component system, comprising:
- a tool bar;
- a three-point hitch assembly mountable to the tool bar;
- a pull-type hitch assembly mountable to the tool bar;
- a pair of rake assemblies mountable to the tool bar;
- a lifting and lowering assembly mountable to the tool bar and to the rake assemblies;
- wherein the rake assemblies are mounted to the tool bar and the lifting and lowering assembly is mounted to the tool bar and to the rake assemblies for providing movement of the rake assemblies between a lowered working position and a raised transport position; and
- wherein one of the three-point hitch assembly and the pull-type hitch assembly is mounted to the tool bar between the rake assemblies for connecting the tool bar with the rake assemblies mounted thereto to a tractor.

5,313,773
COATINGS FOR SPINNING APPLICATIONS AND RINGS AND TRAVELERS COATED THEREWITH

Gerry E. Poquette, Denver, and Gary P. Groves, Gastonia, both of N.C., assignors to A. B. Carter, Inc., Gastonia, N.C.

Filed Jun. 24, 1992, Ser. No. 903,361
Int. Cl.^{5} D01H *7/52, 7/62*
U.S. Cl. 57—125 **12 Claims**

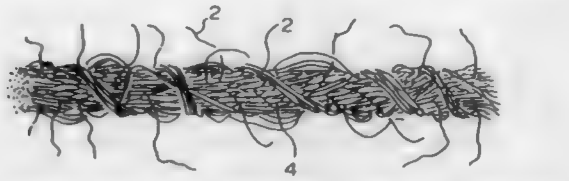


1. An improved traveler having high wear resistance and low friction characteristics for use on a ring in textile applications requiring winding of yarn onto rotating spindles, said ring defining at least one flange for receiving said traveler, said traveler having an intermediate portion and inturned horns defining a gap therebetween for sliding around said flange, said ring fixedly mounted to a ring rail and concentrically disposed about a rotating spindle having a bobbin mounted thereon for reciprocating vertically thereabout, said applications further having yarn fed from drafting rolls for threading through said traveler and winding onto said bobbin for tensioning and guiding said yarn onto said bobbin, the improvement comprising:
- a coating on the surface of said traveler, said traveler being constructed of a metal capable of undergoing a replacement reaction and said coating comprising copper selenide chemically deposited on said traveler by a replacement reaction between copper and said metal.

5,313,774
BLENDED SYNTHETIC SHORT FIBER YARN FABRIC

Mitsuo Matsumoto, Ibaraki; Nobuo Takahashi, Ikoma, and Yoshiyuki Sasaki, Takatsuki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 523,035, May 14, 1990, abandoned. This application Jul. 23, 1992, Ser. No. 919,627
Claims priority, application Japan, May 24, 1989, 1-128624
Int. Cl.^{5} D02G *3/22, 3/38*
U.S. Cl. 57—255 **2 Claims**



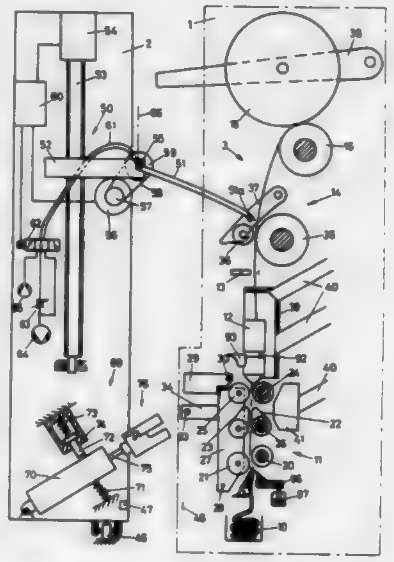
1. A blended synthetic staple fiber yarn fabric comprising blended synthetic staple fiber yarns having a high-grade cotton yarn-like touch and comprising a blend of a first group of extremely fine polyester staple fibers having a thickness of not more than 0.9 denier and a second group of super high modulus staple fibers comprising a para-type aromatic polyamide and having a thickness of not more than 1.0 denier and a Young's modulus of not less than 4000 kg/mm^2, said first fiber group and said second fiber group having an average length of at least 70 mm and being present in a blend ratio of said first fiber group to said second fiber group from 40:60 to 70:30 by weight.

5,313,775
APPARATUS AND METHOD FOR AUTOMATIC THREAD JOINING AND CLEANING IN A SPINNING MACHINE

Rolf Binder, Raterschen, and Martin Witschi, Schaffhausen, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jul. 11, 1991, Ser. No. 728,555
Claims priority, application Switzerland, Jul. 20, 1990, 02422/90
Int. Cl.^{5} D01H *13/26, 9/00*
U.S. Cl. 57—280 **33 Claims**

1. In a textile spinning apparatus comprising a spinning machine having a plurality of spinning stations, apparatus for automatically joining a thread and cleaning the machine comprising:
- a tube mechanism which performs operations for effecting both cleaning and thread joining at a spinning station,
- means for routing a flow of air through the tube mechanism and controlling the rate of air flow through the tube mechanism;
- first means for moving the tube mechanism to one or more selected thread joining positions on a spinning station including at least a position such that a thread end received and held within the tube mechanism via air suction flow through the tube mechanism;



- second means for moving the tube mechanism to one or more waste accumulation positions on the spinning station separate from the thread joining positions such that the selected waste accumulation positions on the spinning station are cleaned via controlled air flow through the tube mechanism; and
- wherein the means for routing and controlling the air flow includes means for selectively adjusting the rate or air flow through the tube mechanism to a rate predetermined for each selected position to which the tube mechanism is moved.

VOL 1162 ISS 4 MY 24 1994 UMI

5,313,776
PROCESS FOR MANUFACTURING AN ELASTIC BULK YARN

Rémy Humbrecht, Littau, and Wolfgang Morgenstern, Kriens, both of Switzerland, assignors to Rhone-Poulenc Viscosuisse SA, Emmenbrücke, Switzerland

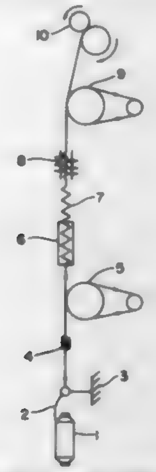
Continuation-in-part of Ser. No. 391,530, Jul. 13, 1989, abandoned. This application Nov. 20, 1991, Ser. No. 795,299

Claims priority, application Switzerland, Nov. 17, 1987, 4469/87

Int. Cl.^{5} D02G *1/02;* D01H *13/28*

U.S. Cl. 57—287 **1 Claim**

1. The method of manufacturing a friction-textured elastic yarn, which comprises twisting a single-component multifilament melt-spinnable polymer yarn selected from the group consisting of polyester, polyether ester, polyether ester amide and polyether amide yarns having an initial modulus of 80 to 150 cN/tex and a melting point of a least 200° C. at a speed of at least 200 m/min, heat-setting the twisted yarn at 160° to 190° C. to produce a fixated yarn, and friction-texturing said fixated yarn while at the same time subjecting said fixated yarn to a pretension of 0.5 to 3.0 cN/tex.



5,313,777
SPINNING PROCESS AND DEVICE FOR THE PRODUCTION OF A YARN

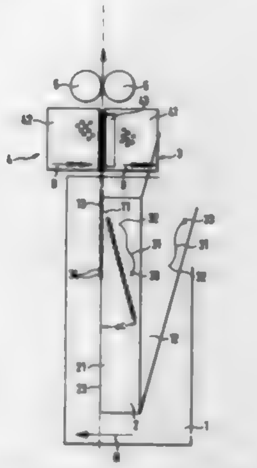
Johann Rottmayr, Reutlingen, and Werner Billner, Ingolstadt, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik AG, Ingolstadt, Fed. Rep. of Germany

Division of Ser. No. 666,043, Mar. 7, 1991, Pat. No. 5,241,813. This application Feb. 19, 1993, Ser. No. 19,771

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1990, 4007607

Int. Cl.^{5} D01H *4/04*

U.S. Cl. 57—400 **17 Claims**



1. An apparatus for spinning yarn from fibers, comprising:
- a perforated fiber collection surface for collecting fibers, said collection surface having a pre-determined pattern of perforations defined therein arranged along a main sense of orientation, said fiber collection surface adapted for being rotated at a pre-determined rotational speed;
- a suction insert disposed generally under said collection surface and adapted to draw air through said perforations moving across a defined suction zone, whereby fibers are drawn to said collection surface and held against said collection surface along said main sense of orientation as said fiber collection surface rotates through said suction zone;
- a suction edge forming a collection line for said fibers at a pre-determined angle relative to a perpendicular line to the direction of movement of said collection surface, said suction edge defining the furthest boundary of said suction zone relative the rotational direction of said fiber collection surface whereby as said fibers are carried past said suction edge they leave said collection surface due to centrifugal forces and are drawn back into said suction zone by said suction insert, said fibers thereby gathering along said suction edge forming a fiber accumulation along said collection line, said fiber accumulation thereby having a pre-twist imparted thereto from the interaction of said centrifugal forces and said suction forces, said main sense of orientation of said perforations forming a predetermined non-zero angle with said collection line; and
- a twisting element comprising a pair of friction rollers, said fiber accumulation being drawn through said twisting element by yarn draw-off means, said twisting element disposed in-line relative the direction of yarn draw-off between said collection line and said yarn draw-off means, said twisting element configured to impart a final twist to said fiber accumulation thereby forming yarn having a predetermined degree of twist from said fiber accumulation.

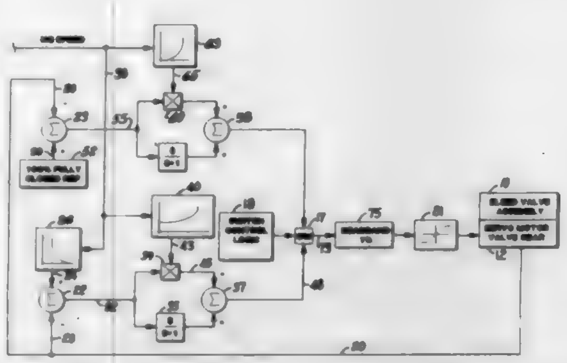
5,313,778
AUTOMATIC TURBINE ENGINE BLEED VALVE CONTROL FOR ENHANCED FUEL MANAGEMENT

David H. Sweet, Tequesta, Fla., and Charles W. Evans, Norfolk, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 10, 1992, Ser. No. 988,520

Int. Cl.^{5} F02C *9/18*

U.S. Cl. 60—39.02 **18 Claims**



1. A gas turbine engine bleed air control system for controlling a turbine engine compressor bleed valve in response to engine operating parameters, comprising:
- a normal bleed schedule;
- a fuel savings mode schedule;
- means responsive to the steady-state operation of said gas turbine engine above a threshold gas generator speed for providing an enable signal; and
- said bleed air control system replacing said normal bleed schedule with said fuel savings mode schedule in response to said enable signal.

5,313,779
SURGE PROTECTED GAS TURBINE ENGINE FOR PROVIDING VARIABLE BLEED AIR FLOW

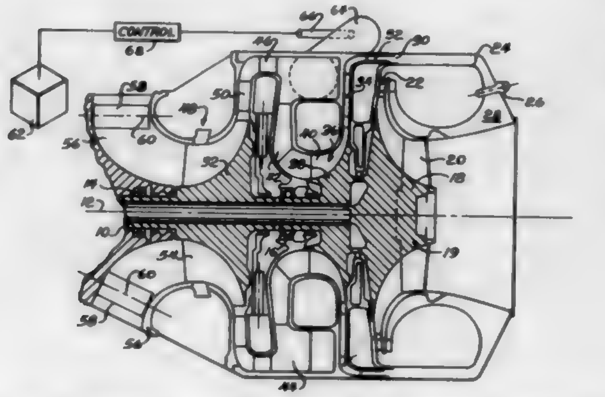
Colin Rodgers, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 197,626, May 23, 1988, Pat. No. 4,989,403. This application Dec. 7, 1989, Ser. No. 447,179

Int. Cl.^{5} F02C *3/08*

U.S. Cl. 60—39.07 **4 Claims**

1. A surge protected gas turbine engine for providing a variable flow of bleed air without operation near full load condition, comprising:
- a turbine wheel rotatable about an axis;
- a combustor for producing hot gases of combustion;
- means, including a nozzle, connecting said combustor and said turbine wheel such that hot gases of combustion impinge upon the turbine wheel to drive the same about said axis;
- a pair of rotary compressors coupled to said turbine wheel to be driven thereby, said rotary compressors each having an inlet and an outlet being connected in series to thereby define a first stage compressor and a second stage compressor;
- a vaned diffuser between said first and second stage compressors;
- means connecting said second stage compressor outlet to said combustor to provide compressed air thereto;
- means associated with at least said first stage compressor outlet for obtaining bleed air therefrom; and
- variable inlet guide vanes for said first stage inlet and selectively movable between open, closed and intermediate positions;
- said first stage compressor being a high specific speed, single stage, centrifugal compressor having blades with an inducer section and an impeller section and constructed so that inducer tip speeds exceed about Mach 1.0 and impeller blade tips have an angle of greater than 0° from the radial direction.



5,313,780
FREE-RIDING OIL TUBE DAMPER

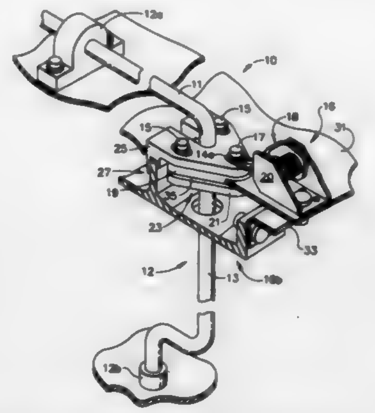
Charles L. Williams, Milford; John G. Buechler, Mason; Tod W. Miller, Cincinnati, and Steven J. Reilly, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 7, 1992, Ser. No. 986,216

Int. Cl.^{5} F02C *7/06*

U.S. Cl. 60—39.08 **20 Claims**

1. In a gas turbine engine, a turbine frame accessory tube damper system, comprising:
- a fluid carrying tube fixedly coupled between two points on said engine;
- mounting means coupled to said tube;
- a free-riding frictional damper coupled through said mounting means to said tube;
- wherein said free-riding damper comprises a damper arm dynamically mounted within a damper housing so as to allow relative motion between said damper arm and said damper housing.



5,313,781
GASIFICATION-COMBINED POWER PLANT

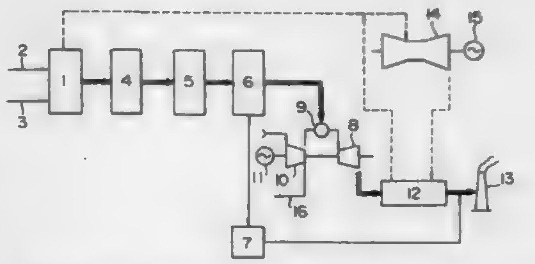
Hiromichi Toda; Shigeyasu Ishigami; Norihisa Kobayashi; Takaaki Furuya, all of Tokyo, and Jun Izumi, Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1992, Ser. No. 861,525

Claims priority, application Japan, Apr. 2, 1991, 3-096396

Int. Cl.^{5} F02C *3/28*

U.S. Cl. 60—39.12 **3 Claims**



1. A gasification-combined power plant which comprises:
- a gasification apparatus for partially oxidizing a carbon-containing fuel with an oxygen-containing gas at a high temperature and under a high pressure;
- a gas turbine driven by combustion of a high temperature fuel gas generated in said gasification apparatus; an exhaust heat recovery boiler for recovering heat from a high-temperature gas at an outlet of said gas turbine;
- a steam turbine driven by steam produced by heat recovered respectively at said gasification apparatus and said exhaust heat recovery boiler;
- a gas clean-up apparatus for purifying at a high temperature the high-temperature fuel gas generated by said gasification apparatus, said gas cleanup apparatus being positioned downstream from said gasification apparatus; a dust collector for removing char and dust from the fuel gas; and
- a gas separation apparatus for simultaneously removing substantially all of the trace gas components from the fuel gas by way of dry physical adsorption, said gas separation apparatus being positioned downstream from said dust collector, and comprising a plurality of adsorption towers with an adsorbent capable of selectively adsorbing trace gas components, a first conduit system to lead flue gas without trace gas components to a combustor of said turbine, and a second conduit system to lead trace gas

VOL
1162
ISS
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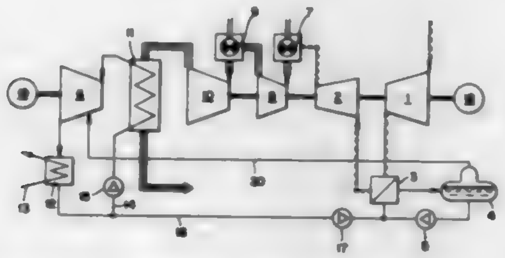
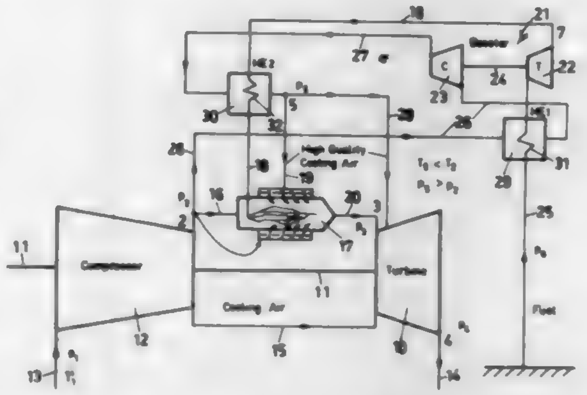
components desorbed from said adsorbent to a gas disposal apparatus, wherein the dry physical adsorption of said gas separation apparatus is carried out with a pressure swing adsorption method in which trace gas components are adsorbed by said adsorbent using high pressure conditions at the gasification apparatus, and desorbed and removed therefrom by pressure reduction.

5,313,782
COMBINED GAS/STEAM POWER STATION PLANT
Hans U. Frutschi, Riniken; Alfred Häussermann, Rieden, and Hans Wettstein, Fislisbach, all of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland
Continuation of Ser. No. 889,352, May 28, 1992, abandoned. This application Sep. 10, 1993, Ser. No. 127,444
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1991, 4118062
Int. Cl.^{5} F02C *6/18*
U.S. Cl. 60—39.17 **5 Claims**



1. A combined gas/steam power station plant, comprising:
a gas turbine group including a low pressure compressor driven by a low pressure turbine and a high pressure compressor driven by a high pressure turbine;
the low pressure compressor being connected upstream of the high pressure compressor, the high pressure compressor being connected upstream of the high pressure turbine, and the high pressure turbine being connected upstream of the low pressure turbine;
a first combustion chamber connected downstream of the high pressure compressor and upstream of the high pressure turbine for generating hot gas for driving the high pressure turbine;
a second combustion chamber connected downstream of the high pressure turbine and upstream of the low pressure turbine for generating hot gas for driving the low pressure turbine;
the low pressure compressor, low pressure turbine and second combustion chamber comprising a basic unit, and the high pressure compressor, high pressure turbine and first combustion chamber comprising a pressure increasing unit;
an exhaust heat boiler connected downstream of the low pressure turbine for generating steam from heat of the discharge of the low pressure turbine;
a steam turbine connected to the exhaust heat boiler for receiving steam from the boiler for driving the steam turbine;
an intercooler interposed between the low pressure compressor and the high pressure compressor for cooling compressed air before entry into the high pressure compressor; and,
an evaporator connected to the intercooler for generating steam from heat removed from the compressed air, said evaporator connected to the steam turbine independently of the exhaust heat boiler for delivering steam for driving the steam turbine.

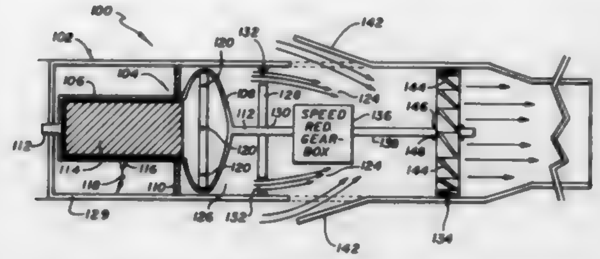
5,313,783
GAS TURBINE PLANT
Rolf Althaus, Flawil, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Mar. 4, 1993, Ser. No. 26,403
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1992, 4210544
Int. Cl.^{5} F02C *3/22*
U.S. Cl. 60—39.181 **3 Claims**



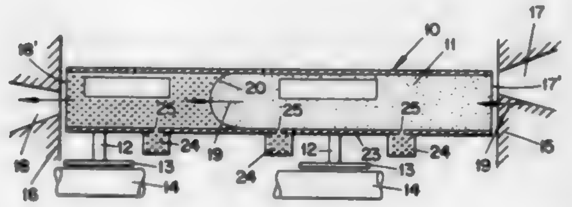
1. A gas turbine plant for operation by natural gas fed to the plant by a pressurized line, comprising:
a turbine;
a compressor having a compressed air outlet, the compressor being driven by the turbine;
a combustion chamber for supplying driving as to the turbine;
a first compressed air line branching off the compressor outlet and connected to the combustion chamber for supplying combustion air;
a second compressed air line branching off the compressor outlet;
a first heat exchanger for cooling compressed air located in the second compressed air line;
a booster compressor connected to the second compressed air line downstream of the first heat exchanger for further compressing the compressed air cooled in the first heat exchanger, the booster compressor being driven by a booster turbine driven by the pressurized natural gas;
a second heat exchanger, downstream of the booster compressor for further cooling the compressed cooling air from the booster compressor, wherein compressed cooling air leaving the second heat exchanger is at a lower temperature and higher pressure than air leaving the compressor;
a first cooling air line carrying compressed cooling air from the second heat exchanger to the combustion chamber; and,
a second cooling line branching from the first cooling line carrying compressed cooling air to the turbine.

5,313,784
SOLID FUEL PINWHEEL POWER PLANT AND METHOD
Ronald E. Loving, Simi Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Oct. 15, 1992, Ser. No. 961,305
Int. Cl.^{5} F02C *03/14*
U.S. Cl. 60—39.35 **7 Claims**

1. A low noise power plant for providing thrust to a missile comprising:
a housing;
a combustion chamber containing a solid fuel propellant for generating a pressurized gas;
a plenum integral with said combustion chamber for receiving said pressurized gas, said combustion chamber and said plenum forming an integral structure disposed in said housing and supported for revolving on a central axis within said housing;
a pinwheel turbine means disposed within and integral with said plenum, said pinwheel turbine means having exhaust passages for providing gas jets that provide rotation-inducing force for revolving said integral structure on said central axis;
means for coupling the revolving motion of said integral structure to a fan for generating thrust; and
a diffuser plate for directing said gas jets from said pinwheel turbine means to said fan.



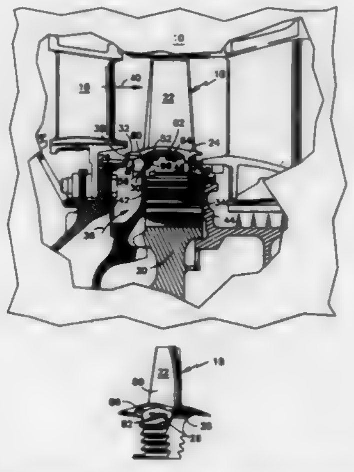
5,313,785
DYNAMIC PRESSURE MACHINE
Rolf Althaus, Flawil; Yau-Pin Chyou, Dottikon, and Erwin Zauner, Baden, all of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Mar. 29, 1993, Ser. No. 38,274
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1992, 4210543
Int. Cl.^{5} F02C *3/02*
U.S. Cl. 60—39.45 **4 Claims**



1. A dynamic pressure machine with integrated combustion, comprising:
a cellular wheel rotatably mounted between lateral sections on the air side and the gas side, the wheel provided with inlet and outlet openings;
a plurality of cells arranged on the wheel for a continuously recurring ignition and combustion process; and,
at least one hot gas pocket disposed on a wall of the cell, connected via an opening with the interior of the cell for the automatic ignition of an entering fresh gas mixture.

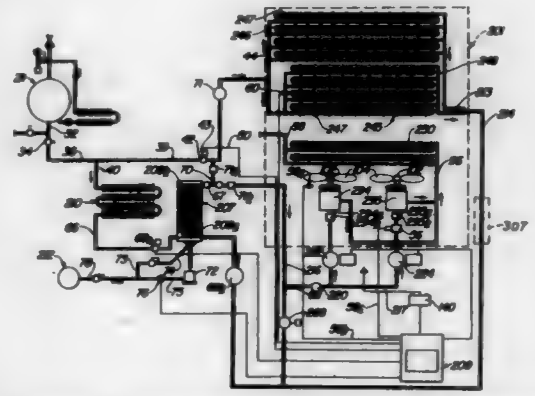
5,313,786
GAS TURBINE BLADE DAMPER
Wieslaw A. Chlus, Wethersfield; Michael Gonsor, Hebron; David P. Houston, and Paul D. Kudra, both of Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Nov. 24, 1992, Ser. No. 980,085
Int. Cl.^{5} F02C *3/00*
U.S. Cl. 60—39.75 **7 Claims**

1. A gas turbine engine having an axis, an upstream direction, a downstream direction, a disk, and a plurality of blades;
each blade having a airfoil, a blade platform, a neck a root, and each blade platform having an underside;
the root of each blade secured in said disk;
the neck of each blade having a cross-sectional area substantially a continuation in the shape of the airfoil;
the platform of each blade having a cantilevered upstream portion with a radius underblade filet having a surface thereunder fairing into the neck, and having a concave blade side platform edge and a convex blade side platform edge parallel to each other;
an integrated damper and windage cover comprising:
an elongated damper having a contact portion and a windage cover portion having a surface;



said contact portion contacting the underside of two adjacent blade platforms;
said windage cover portion cantilevered from an upstream end of said contact portion, shaped with the same curvature as said underblade filet, located between adjacent blades with the windage cover portion surface in alignment with the surface of said underblade filet on adjacent blades, and with said windage cover portion free of contact with said platforms.

5,313,787
REFRIGERATION TRAILER
Patrick S. Martin, Dallas, Tex., assignor to General Cryogenics Incorporated, Dallas, Tex.
Division of Ser. No. 841,590, Feb. 25, 1992, Pat. No. 5,199,275, which is a continuation-in-part of Ser. No. 651,206, Feb. 6, 1991, Pat. No. 5,090,209, which is a continuation-in-part of Ser. No. 591,386, Oct. 1, 1990, Pat. No. 5,069,039. This application Feb. 12, 1993, Ser. No. 17,796
Int. Cl.^{5} F25B *41/04*
U.S. Cl. 62—222 **11 Claims**



1. A control system for a cryogenic refrigeration system in which liquid CO_2 delivered through an evaporator, to a fluid driven motor, absorbs heat to cool a stream of air discharged

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into the cargo compartment, the evaporator being configured to transfer a quantity of heat to the quantity of CO_2 flowing through the evaporator from air flowing adjacent thereto, comprising:

(a) flow control means between the evaporator and the fluid driven motor;
(b) temperature sensing means generating a signal indicating the temperature of CO_2 delivered to the fluid driven motor; and
(c) a heater between the evaporator and the fluid driven motor and associated with said flow control means and said temperature sensing means, said heater maintaining entropy of CO_2 flowing to said fluid driven motor to permit isentropic expansion of the CO_2 through the motor while preventing transformation of the CO_2 to a solid state.

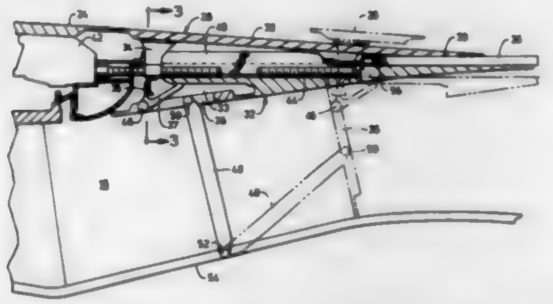
5,313,788
THRUST REVERSING ARRANGEMENT FOR A LONG DUCT MIXED FLOW EXHAUST TURBOFAN ENGINE

Jack D. Wright, Mason, and Joe E. Ellis, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 741,368, Aug. 7, 1991, abandoned. This application Mar. 26, 1993, Ser. No. 38,565

Int. Cl.^{5} F02K *3/02*

U.S. Cl. 60—226.2 **12 Claims**



1. In a high by-pass fan jet propulsion power plant of the type including a core engine, said by-pass fan, and a long duct nacelle structure formed by a forward fixed cowl structure surrounding a forward portion of said fan, an intermediate translatable cowl member surrounding an aft portion of said fan and a rear fixed cowl structure surrounding the remainder of said core engine, said long duct nacelle structure surrounding the entire length of said core engine for forming a long by-pass duct therewith, and creating a mixed exhaust flow for the by-pass air and the core engine exhaust gasses, a thrust reversing arrangement for reversing the fan flow in said by-pass duct, comprising:

said intermediate translatable cowl member including an inner and outer translatable cowl members axially mounted between said forward and rear fixed cowl structures;
blocking door means,
a dual arm means pivotally coupling an intermediate portion of said blocking door means to said inner and outer translatable cowl members, said dual arm means being fixedly connected to said inner and outer translatable cowl members, for pivotally deploying said blocking door means in a continuously controlled manner into said by-pass duct during thrust reversal for blocking the air flow in said by-pass duct and diverting said air flow through an opening created by the translation of inner and outer translatable cowl members to the outside of said long duct nacelle structure during thrust reversal;
means for pivotally coupling said blocking door means to radially inner wall of said by-pass duct and retaining said blocking door means in aid deployed position during said thrust reversing operation,
a single actuating mechanism fixedly coupled to said inner and outer translating cowl members and said dual arm means for simultaneously and axially moving said inner and outer cowl members over said rear fixed cowl structure into a deployed position of said inner and outer translating cowl members and driving said blocker door means in a continuously controlled manner for pivotally deploying said blocker door means in said fan duct to its deployed position against and substantially perpendicular to the inner wall of said by-pass fan duct, and
a common operating means comprising said dual arm means and said common operating means being fixedly coupled to a tie bracket means and said inner translatable cowl member for axially translating said inner and outer cowl members over a portion of said rear fixed cowl structure and uncovering thereby said opening to the outside of said long duct nacelle structure wherein said dual arm means is directly connected to said inner translatable cowl member and is indirectly connected to said outer translatable cowl member.

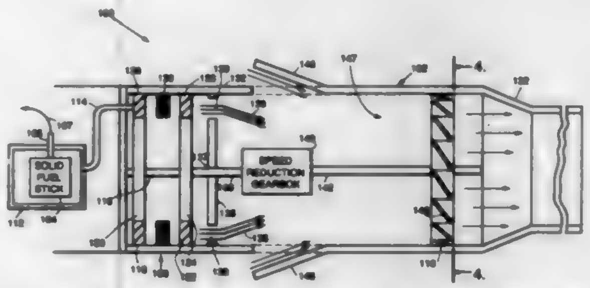
5,313,789
SOLID FUEL TURBINE POWER PLANT AND METHOD

Ronald E. Loving, Semi Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 28, 1992, Ser. No. 889,734

Int. Cl.^{5} F02K *5/00*

U.S. Cl. 60—246 **9 Claims**



1. A low noise solid fuel power plant for providing thrust to an aeronautical missile comprising:

a solid fuel propellant for generating a pressurized gas;
a turbine for converting said pressurized gas to rotary motion;
a drive shaft rotated by said turbine for transferring said rotary motion;
a diffuser plate surrounding said drive shaft and having a passageway formed therethrough for directing said pressurized gas away from said turbine;
a vent flap for admitting ambient air into said missile;
a chamber within said missile for mixing said ambient air with said pressurized gas; and
a fan connected to said rotating drive shaft for generating thrust.

5,313,790
ENDOTHERMIC FLUID BASED THERMAL MANAGEMENT SYSTEM

Kevin P. Barr, Torrance, Calif., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

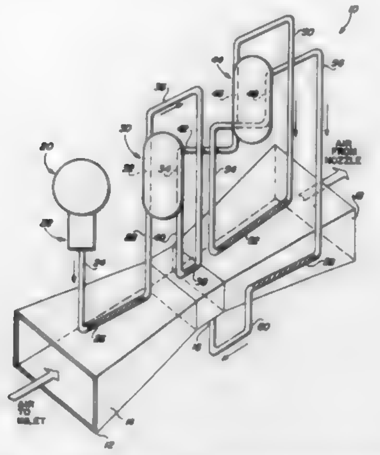
Filed Dec. 17, 1992, Ser. No. 992,951

Int. Cl.^{5} F02C *3/20*

U.S. Cl. 60—267 **6 Claims**

1. A thermal energy management system for a propulsion engine mounted on an aircraft operable at high Mach numbers, said aircraft having a source of endothermic fuel in a liquid state, and said engine having combustor for combusting said endothermic fuel, comprising:

a preheater receiving a flow of said pressurized endothermic fuel from said source;
a first reactor receiving said flow from said preheater;
a first reheater receiving said flow from said first reactor; and



a first heat source receiving said flow from said first reheater, and delivering said flow to said combustor, said first heat source being in heat exchange relation with said first reactor.

5,313,791
METHOD FOR DETECTING CATALYST MALFUNCTIONS

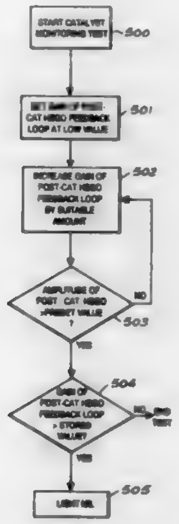
Douglas R. Hamburg, Birmingham, and Jeffrey A. Cook, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 724,399, Jun. 28, 1991, abandoned. This application Apr. 7, 1993, Ser. No. 44,524

Claims priority, application European Pat. Off., Jun. 22, 1992, 92305697; Japan, Jun. 23, 1992, 165033

Int. Cl.^{5} F01N *3/20*

U.S. Cl. 60—274 **11 Claims**


START CATALYST MONITORING TEST
500
501
CAT HEGO FEEDBACK LOOP AT LOW VALUE
INCREASE GAIN OF POST-CAT HEGO FEEDBACK LOOP BY SUITABLE AMOUNT
502
NO
503
YES
504
NO
END TEST
YES
505

1. A method of detecting catalyst malfunction in a vehicle using an exhaust gas oxygen sensor downstream of the catalyst including the steps of:

providing a feedback loop to control air-fuel ratio as a function of the signal from the exhaust gas oxygen sensor;
increasing feedback loop gain by altering operating parameters of the feedback loop until a desired characteristic of an output of the exhaust gas oxygen sensor is achieved; and
establishing catalyst malfunction as a function of the output of the exhaust gas oxygen sensor and the feedback gain.

5,313,792
EXHAUST GAS PURIFICATION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

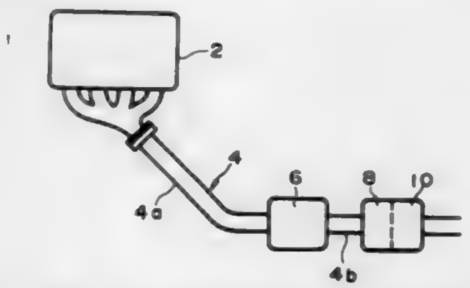
Kenji Katoh, Shizuoka; Satoshi Iguchi, Mishima, and Tetsuro Kihara, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 18, 1992, Ser. No. 947,663

Claims priority, application Japan, Sep. 20, 1991, 3-268706

Int. Cl.^{5} F01N *3/10*

U.S. Cl. 60—301 **10 Claims**



1. An exhaust gas purification apparatus for an internal combustion engine comprising:

an internal combustion engine capable of fuel combustion at lean air-fuel ratios;
an exhaust conduit, an upstream end of which is connected to the internal combustion engine, wherein exhaust gas from the internal combustion engine enters the exhaust conduit at the upstream end and travels through the exhaust conduit to a downstream end thereof;
an NO_x reducing transition metal/zeolite first catalyst installed in the exhaust conduit and including a transition metal deposited on a zeolite carrier;
a three-way second catalyst installed downstream of the transition metal/zeolite catalyst in the exhaust conduit, wherein the three-way second catalyst is capable of oxidizing NO into NO_2; and
an NO_2 reducing noble metal-type third catalyst installed downstream of the three-way catalyst in the exhaust conduit and including a noble metal deposited on a carrier.

5,313,793
TORQUE CONVERTER HAVING AXIAL TYPE REACTOR

Malcolm E. Kirkwood, Livonia, and Michael E. Fingerman, Labelle, both of Mich., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Sep. 24, 1992, Ser. No. 950,862

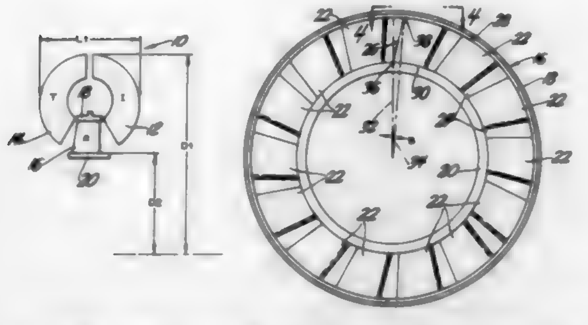
Int. Cl.^{5} F16D *33/00*

U.S. Cl. 60—361 **13 Claims**

1. A torque converter (**10**) for an automobile or the like comprising:

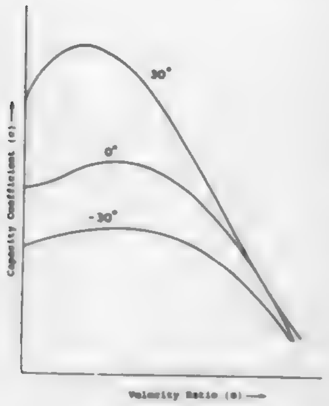
an impeller (**12**), a turbine (**14**) and an axial type reactor (**16**), the turbine (**14**) being disposed adjacent the impeller (**12**) at one end and the reactor (**16**) being disposed between the impeller (**12**) and the turbine (**14**) at the other end so that the impeller (**12**), the turbine (**14**) and the reactor **16** form a toroid;
the reactor (**16**) having an outer core ring (**18**), an concentric inner shell ring (**20**) and a plurality of circumferentially spaced reactor blades (**22**) that are connected to the core ring (**18**) and the shell ring (**20**) at their opposite ends;
each of the reactor blades (**22**) having a leading edge (**26**) facing the turbine (**14**) that slants toward the turbine in the radially inward direction so that the leading edge (**26**) and

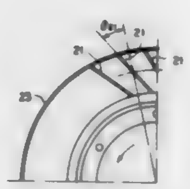
the inner shell ring (20) form a slant angle A that is more than about 60 degrees but less than 90 degrees, and
each of the reactor blades (22) being slanted in the circumferential direction so that radial lines (32) and (34) intersecting respective connection points (36) and (38) of the leading edge (26) with the inner shell ring (20) and the outer core ring (18) form a central angle B excluding zero degrees.



5,313,794
FLUID COUPLING

Takashi Hara, Chiryu; Koji Maeda, Anjo; Kunio Morisawa, Toyota, and Ryoji Habuchi, Nishikamo, all of Japan, assignors to Aisin Aw Co., Ltd., Japan
Filed Jun. 8, 1992, Ser. No. 893,421
Claims priority, application Japan, Jun. 7, 1991, 3-162499
Int. Cl.^{5} F10D *33/00*
U.S. Cl. 60—365 **1 Claim**

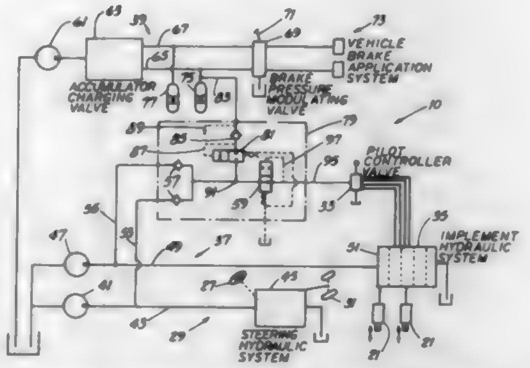




1. A fluid coupling without an inner core, comprising:
a pump impeller for connection to an output shaft of a vehicle engine, said pump impeller having a plurality of pump blades;
a turbine runner for connection to a vehicle transmission to establish a fluid coupling in cooperation with said pump impeller, said turbine runner having a plurality of turbine blades, said apparatus having no inner core for guiding flow of fluid between said pump impeller and said turbine runner; and
said blades of at least one of said pump impeller and said turbine runner being inclined at a negative angle θ—of approximately 30°, in the direction of forward rotation, with respect to radial lines of said pump impeller and said turbine rubber.

5,313,795
CONTROL SYSTEM WITH TRI-PRESSURE SELECTOR NETWORK

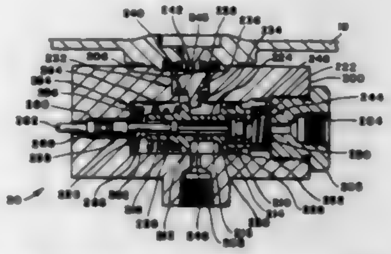
Donnell L. Dunn, Wausau, Wis., assignor to Case Corporation, Racine, Wis.
Filed Dec. 17, 1992, Ser. No. 992,436
Int. Cl.^{5} F16D *31/02*
U.S. Cl. 60—413 **4 Claims**


VEHICLE BRAKE APPLICATION SYSTEM
ACCUMULATOR CHARGING VALVE
BRAKE PRESSURE MODULATING VALVE
PILOT CONTROLLER VALVE
IMPLEMENT HYDRAULIC SYSTEM
STEERING HYDRAULIC SYSTEM
10

1. In a control system having first, second and third sources of fluid at differing pressures, the improvement comprising:
a tri-path pressure selector network connected to the first and second sources;
and wherein:
the third source includes first and second accumulators; and,
a pressure-sensing device connects the network and the third source only when the second accumulator is at a pressure in excess of about 600 p.s.i.

5,313,796
REMOTE COMPENSATION VALVES FOR A MASTER CYLINDER IN A BRAKE SYSTEM

Donald A. Crumb, and Robert K. Wilson, both of Granger, Ind., assignors to AlliedSignal Inc., Morristown, N.J.
Filed Jul. 16, 1993, Ser. No. 93,113
Int. Cl.^{5} B60T *13/20*
U.S. Cl. 60—549 **5 Claims**

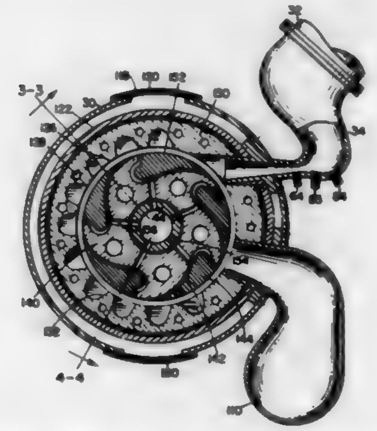


1. A brake system having a brake booster responsive to an input force for developing an output force to move pistons in a master cylinder and immediately pressurize fluid therein which is communicated through remote first and second compensation valves to activate wheel brakes of a vehicle and effect a brake application, each of said remote first and second compensation valves comprising:
a housing having a bore therein with an inlet port, a compensation port and an outlet port;
a piston located in said bore having a first land separated from a second land by a groove, said second land separating said inlet port from said compensation port and said outlet port, said piston having a axial bore therein that extends from a first end to a second end and at least one radial bore that extends from said axial bore to said groove to connect said inlet port with said groove, said axial bore having a first diameter separated from a second diameter by a shoulder;

a tilt valve located in said compensation port having a pin that extends through said bore in said housing and into said groove in said piston;
a poppet valve having a stem located in said first diameter and a head attached to said stem and located in said second diameter of said axial bore of said piston;
first spring means for urging said head of said poppet valve toward said shoulder on said piston;
second spring means for urging said piston toward said inlet port to bring said first land into engagement with said pin on said tilt valve and initiate communication of fluid between a source of fluid and said bore through said compensation port; and
a movable stop pin retained in said housing with a first end external to said housing and a second end extending into said axial bore of said piston, said second spring means urging a annular flange on said movable stop pin into engagement with said housing to define an operational position whereby movement of said piston by pressurized fluid from the master cylinder in overcoming said second spring moves said first land out of engagement with said tilt valve pin to allow said tilt valve to interrupt communication of fluid from said source through said compensation port and bring said stem into engagement with said second end of said movable stop pin to initiate communication of pressurized fluid from said inlet port to the outlet port to effect a brake application, said second spring means in the absence of said pressurized fluid moving said piston to bring said first land into engagement with said tilt valve and reestablish communication of fluid from said source through said compensation port and move said stem out of engagement with said second end of the movable stop pin to allow said first spring means to seat said head on said shoulder in said axial bore and interrupt communication from the inlet port to said outlet port, said movable stop responding to a manual input force applied to said first end to overcome said second spring means and bring said second end into engagement with said stem of said poppet valve and move said head off said shoulder to establish fluid communication between said inlet port and said compensation port.

5,313,797
EXHAUST GAS TURBINE POWERED SYSTEM FOR TRANSFORMING PRESSURE INTO ROTATIVE MOTION

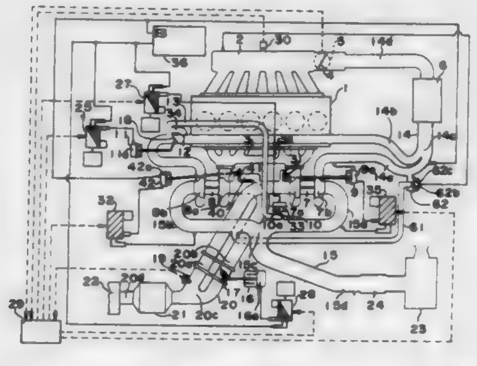
Howard Bidwell, 120 Maple St., Rm. 207, Springfield, Mass. 01103
Filed Mar. 1, 1993, Ser. No. 24,286
Int. Cl.^{5} F02G *1/00*
U.S. Cl. 60—597 **1 Claim**



1. In a power cogenerator for exploiting the exhaust gases of an internal combustion engine emating from the outboard terminus of the engine exhaust as the fluid medium for transforming pressure into a rotative motion, the combination of:
a closed circular housing having a cylindrical chamber and being slotted for the passage thereinto of ambient air,
an open-ended hollow air-conducting driven shaft being extendable through and centrally of the housing with openings therein for the passage of ambient air from within the driven shaft to the housing interior,
bearings on opposite sides and outboard of the housing for journalling the driven shaft in rotative motion relative to the housing,
a circular stator disposed inwardly of and circumadjacent the housing and provided with a plurality of equispaced inwardly-facing pockets,
a stator side wall on each side of and connected to the stator and extending toward the driven shaft,
a turbo-type power-generating inner rotor of generally cylindrical shape circumscribing the driven shaft,
a plurality of equispaced outwardly-facing pockets on the rotor,
a vane nestably seated in each pocket of the rotor and extending laterally across the rotor width,
a rotor side wall on each side of the rotor and extending toward the driven shaft and being fixed thereto,
each vane being fixed to the respective rotor side wall at each extremity thereof for the driving of the driven shaft,
the stator circumscribing and being in a spaced relationship with the rotor for defining a circular expansion path between the stator and rotor,
an inlet opening in the housing for the inlet of engine exhaust gases into the circular expansion path between the stator and rotor,
an exhaust venturi coupled to the outboard terminus of the engine exhaust and the inlet opening,
a discharge opening in the housing for the outlet of engine exhaust gases from the circular expansion path,
means for feeding ambient air into the housing and through the driven shaft.

5,313,798
CHARGING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE WITH A DUAL TURBOCHARGER SYSTEM

Mamoru Yoshioka; Kunihiko Nakata, both of Susono; Akira Kotani, Toyota, and Makoto Makino, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1992, Ser. No. 924,551
Claims priority, application Japan, Aug. 2, 1991, 3-216521; Oct. 4, 1991, 3-284097; Oct. 8, 1991, 3-287204
Int. Cl.^{5} F02B *37/12*
U.S. Cl. 60—600 **2 Claims**



1. A charging control apparatus for an internal combustion engine with a dual turbocharger system comprising:
a multi-cylinder internal combustion engine having at least one air intake and at least one exhaust outlet, wherein the engine includes first and second groups of cylinders;
an exhaust manifold connected with the at least one engine

exhaust outlet, the exhaust manifold including a first portion connect to the first group of the cylinders and a second portion connected to the second group of the cylinders, the first portion and the second portion of the exhaust manifold being joined to each other with a connecting conduit;

a first turbocharger and a second turbocharger arranged in parallel with each other, each said turbocharger including a turbine and a turbine driven compressor, the turbines being connected to the engine exhaust outlet with the exhaust manifold and the compressors being connected to the air intake of the engine;

an air intake line including a first intake conduit connected with the first turbocharger compressor and a second intake conduit connected with the second turbocharger compressor, the air intake line being connected with the engine air intake;

an exhaust line including a first exhaust conduit connected with the first portion of the exhaust manifold, in which the first turbocharger turbine is installed, a second exhaust conduit connected with the second portion of the exhaust manifold, in which the second turbocharger turbine is installed;

an intake switching valve installed downstream of the second turbocharger compressor in the second intake conduit for opening and closing the second intake conduit, and an exhaust switching valve installed in the second exhaust conduit for opening and closing the second exhaust conduit, a one-turbocharger-operation where only the first turbocharger operates being produced when both the intake switching valve and the exhaust switching valve are closed, a two-turbocharger-operation where both the first turbocharger and the second turbocharger operate being produced when both the intake switching valve and the exhaust switching valve are open;

means for determining whether an instant engine operation is at a predetermined high engine speed and at a predetermined high throttle valve opening speed; and

means for opening the exhaust switching valve at once when the means for determing determines that the instant engine operation is at said predetermined high engine speed and said predetermined high throttle valve opening speed.

5,313,799

MAGNETIC ICE CUBE

Israel Siegel, 2980 Point East Dr., #D-612, N. Miami Beach, Fla. 33160

Filed Nov. 6, 1992, Ser. No. 972,953

Int. Cl.^{5} F25D *5/00*

U.S. Cl. 62—4 **10 Claims**

1. A sorption temperature changer consisting of a heat exchange chamber,

a liquid in said chamber,

an air vacuum in said liquid chamber to lower the boiling point of said liquid,

a second chamber,

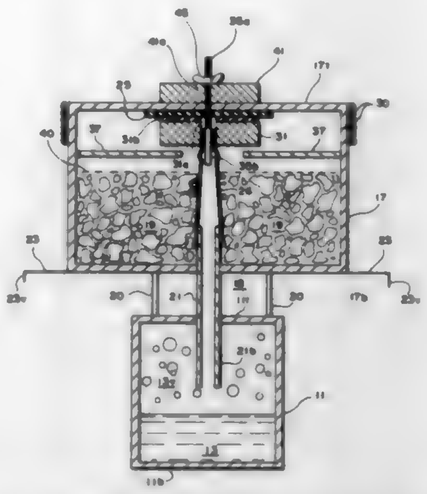
a desiccant in said second chamber,

a communication between said liquid and said desiccant chambers,

a magnetic mechanism to open and close said communication between the chambers,

said magnetic mechanism includes at least one magnet and one magnet responsive body,

said components of said magnetic mechanism adapted to travel towards and away from each other to close and open said communication,



and means to minimize the distance of said travel required for changing the opening and closing states of said communication.

5,313,800

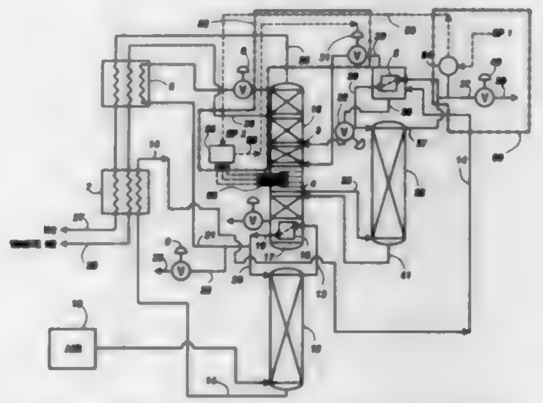
PROCESS FOR MAXIMIZING THE RECOVERY OF ARGON FROM AN AIR SEPARATION SYSTEM AT HIGH ARGON RECOVERY RATES

Henry E. Howard; Dante P. Bonaquist, both of Grand Island; William M. Canney, Williamsville, and William A. Nash, Grand Island, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Feb. 1, 1993, Ser. No. 11,605

Int. Cl.^{5} F25J *3/04*

U.S. Cl. 62—22 **14 Claims**



1. A process for maximizing the recovery of argon at high argon recovery rates from an air separation system having a high and low pressure distillation column containing multiple distillation stages of rectification with the high pressure column providing a nitrogen rich reflux fluid to wash the rising vapors in the low pressure distillation column and having a separate sidearm column for argon recovery comprising the steps of:

introducing an oxygen enriched fluid into said low pressure column at a feed point where comparable oxygen-nitrogen equilibrium exists;

withdrawing a fluid feedstream from said low pressure column at a location where the argon content is relatively high for use as an input feedstream to said argon sidearm column;

identifying each stage of rectification within said low pressure column between said feedstream location and said feed point which exhibits a relatively high sensitivity to process changes in said air separation system;

selecting at least one of said identified stages of rectification which exhibits high sensitivity to process changes for monitoring the composition of said input feedstream to said argon sidearm column;

formulating a model defining the relationship between the nitrogen content in said feedstream and a compositional variable in said low pressure column at said selected stage of rectification;

measuring the compositional variable at said selected stage of rectification;

computing the concentration of nitrogen in said input feedstream to said argon sidearm column from said model in accordance with the value of said measured compositional variable; and

controlling the operation of said process in response to said computation of nitrogen in said input feedstream.

5,313,801

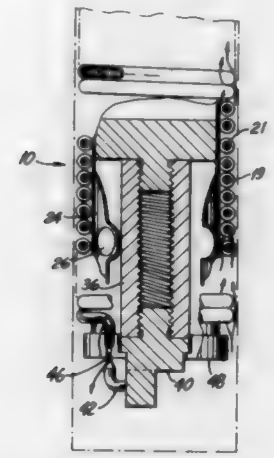
CRYOSTAT THROTTLE

Glenn Bonney, Macungie, Pa., assignor to APD Cryogenics, Inc., Allentown, Pa.

Filed Jul. 7, 1992, Ser. No. 909,777

Int. Cl.^{5} F25B *19/02*

U.S. Cl. 62—51.2 **19 Claims**



1. A cryostat, comprising:

refrigerant inlet means;

heat exchanger means for receiving refrigerant from said refrigerant inlet means;

support means for supporting said heat exchanger on said cryostat;

a throttle mechanism mounted within said support means;

valve means including a valve closure means mechanism connected to said throttle mechanism for throttling said refrigerant from said heat exchanger means and seat valve means for throttling said refrigerant from said heat exchanger means, said valve closure means cooperating with said valve seat means; and

at least one access port formed through said support means for allowing said refrigerant throttled through said valve means to flow through said access port and access said throttle mechanism.

5,313,802

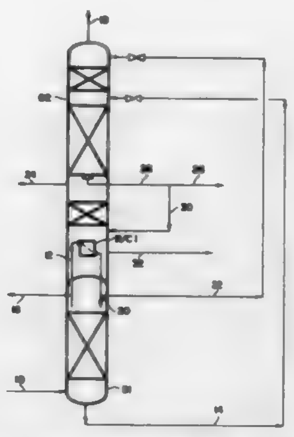
PROCESS TO PRODUCE A KRYPTON/XENON ENRICHED STREAM DIRECTLY FROM THE MAIN AIR DISTILLATION COLUMN

Rakesh Agrawal, Emmaus, and Steven L. Feldman, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 16, 1993, Ser. No. 17,554

Int. Cl.^{5} F25J *3/04*

U.S. Cl. 62—22 **7 Claims**



1. In a process for the cryogenic distillation of an air feed using a multiple column distillation system comprising a high pressure column and a low pressure column wherein:

(a) at least a portion of the air feed is fed to the high pressure column in which the air feed is rectified into a high pressure nitrogen overhead and a high pressure crude liquid oxygen bottoms;

(b) at least a portion of the high pressure crude liquid oxygen bottoms is fed to the low pressure column in which the high pressure crude liquid oxygen bottoms is rectified into a low pressure nitrogen overhead and a low pressure liquid oxygen bottoms; and

(c) at least a portion of the low pressure liquid oxygen bottoms is boiled in a sump located in the bottom of the low pressure column;

a method to produce a stream enriched in krypton and xenon directly from the low pressure column comprising:

(i) withdrawing an oxygen-enriched vapor stream and an oxygen-enriched liquid stream from a withdrawal point located at least one equilibrium stage above the sump;

(ii) returning the oxygen-enriched liquid stream to a return point located between the sump and the low pressure column's initial equilibrium stage; and

(iii) withdrawing the krypton/xenon enriched stream from the bottom of the sump.

5,313,803

AIR CONDITIONING SYSTEM FOR HUMAN-OCCUPIED SPACES

Rüdiger Detzer, Büseck, Fed. Rep. of Germany, assignor to Kesslertech GmbH, Giessen, Fed. Rep. of Germany

Filed Sep. 8, 1992, Ser. No. 940,922

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1991, 4130648; Sep. 14, 1991, 4130650; Sep. 14, 1991, 4130651

Int. Cl.^{5} F25D *17/06;* **F24F** *3/16;* **B01D** *46/24*

U.S. Cl. 62—89 **20 Claims**

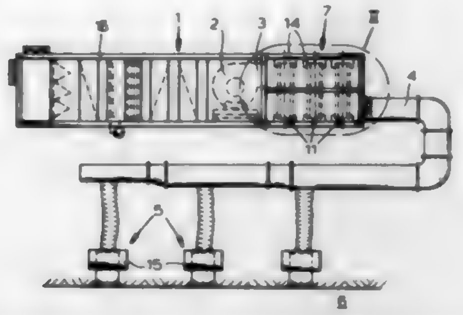
1. An air conditioning system for a space adapted to be occupied by people, comprising:

a central air conditioning unit for conditioning room air, said central air conditioning unit having a blower for displacing treated room air;

at least one duct connected to said blower and communicating with said space for delivering the treated room air to said space;

at least one outlet passage communicating with said duct and provided with an air outlet opening into said space for delivering said treated room air thereto; and

between said blower and said outlet passage, at least one filter unit traversed by the treated room air, said filter unit comprising at least one suspended material filter and at least one sorption filter for removing contaminants from air, said filters in said filter unit being constructed and arranged to form a sound barrier in which said filters function as sound barrier elements.



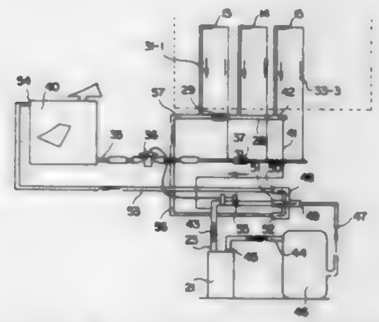
5,313,804
DIRECT EXPANSION GEOTHERMAL HEAT PUMP

Glenn A. Kaye, Petitcodiac, Canada, assignor to Maritime Geothermal Ltd., Canada

Filed Apr. 23, 1993, Ser. No. 53,050

Int. Cl.^{5} F25B *13/00*

U.S. Cl. 62—160 **18 Claims**



1. A loop system for use in combination with a "DX" heat pump system comprising:

a) three loops, a first loop including a dual purpose suction/-hot gas line and a liquid line, and second and third loops, said second and third loops each including a suction line and a liquid line, each loop being adapted to be buried underground in heat exchange relationship with earth;

b) a refrigerant vapor header provided with a check valve;

c) means connecting said suction/hot gas line of said first loop to said refrigerant vapor header downstream of said check valve;

d) means connecting said suction lines of each of said two other said loops to said refrigerant vapor header upstream of said check valve;

e) a liquid line header provided with an electric solenoid valve;

(f) means connecting said liquid line of said first loop to said liquid line header upstream of said electric solenoid valve;

and g) means connecting said liquid lines of each of said other two loops to said liquid line header downstream of said electric solenoid valve.

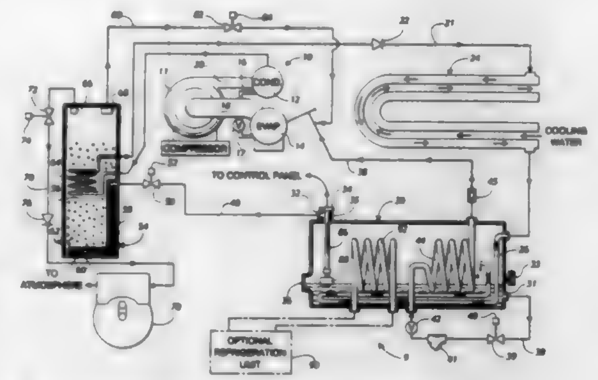
5,313,805
APPARATUS AND METHOD FOR PURGING A REFRIGERATION SYSTEM

William S. Blackmon, and John G. Blackmon, both of Charlotte, N.C., assignors to Carolina Products, Inc., Charlotte, N.C.

Filed Mar. 8, 1993, Ser. No. 27,708

Int. Cl.^{5} F25B *43/04*

U.S. Cl. 62—195 **15 Claims**



15. A purge refrigeration system comprising:

a condenser;

an evaporator;

a compressor communicating between said condenser and said evaporator;

an expansion line communicating between said condenser and said evaporator;

a purge means for drawing refrigerant and non-condensable gasses from said condenser, substantially separating the refrigerant and non-condensable gasses, venting the non-condensable gasses to the atmosphere, and discharging refrigerant to said evaporator, and including a gas separation tank; and

a multipurpose heat means for utilizing waste heat from said condenser, for heating said gas separation tank, and for providing additional condensation of refrigerant drawn from said condenser.

5,313,806
INTEGRAL AIR CONDITIONER OF WHICH AN INDOOR UNIT AND AN OUTDOOR UNIT ARE CONNECTED WITH VIBRATION DAMPERS

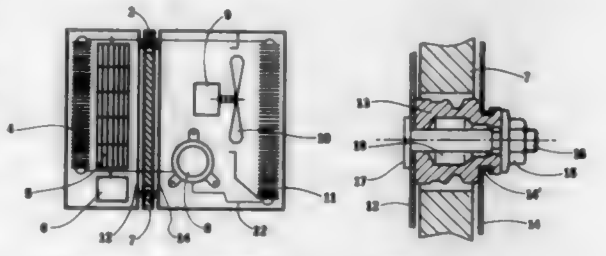
Chun Feng, Vocational University of Zigong City, Sichuan Province, China

Filed Jan. 4, 1993, Ser. No. 233

Claims priority, application China, Jan. 9, 1992, 92214040.5; Jun. 11, 1992, 92108170.7

Int. Cl.^{5} F25D *19/00*

U.S. Cl. 62—295 **7 Claims**



1. An integral air conditioner, comprising:

an indoor unit including an indoor motor, an indoor cross-flow blower, an indoor heat exchanger, and an indoor unit wall panel;

an outdoor unit including an outdoor motor, a compressor, an outdoor fan, an outdoor heat exchanger, and an outdoor unit wall panel mounted in parallel to said indoor unit wall panel;

a sound absorbing plate in close proximity and parallel to said indoor unit wall panel and said outdoor unit wall panel;

means for transmission of refrigerant, which are connected between said indoor unit and said outdoor unit without adjustable connectors; and

elastic connecting means comprising bolts and rubber vibration absorption members connecting said indoor unit wall panel with said outdoor unit wall panel to form a unitary air conditioner body and inhibit transmission of vibrations from the outdoor unit to the indoor unit.

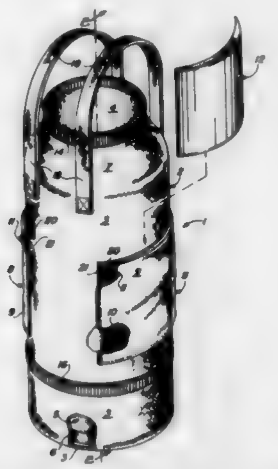
5,313,807
INSULATED HOLDER WITH COOLER POCKET

Michelle L. Owen, 5091 Hot Wells Rd., Boyce, La. 71409

Filed Apr. 12, 1993, Ser. No. 47,267

Int. Cl.^{5} F25D *3/08*

U.S. Cl. 62—457.3 **16 Claims**



1. An insulated holder for receiving and cooling a container, comprising a flexible enclosure shaped to receive the container, at least one pocket means provided in said enclosure, refrigerant capsule means containing frozen refrigerant removably inserted in said pocket means for cooling the container and pocket closure means provided on said pocket means and outer closure means provided on said enclosure for engaging said pocket closure means and removably enclosing said refrigerant capsule means in said pocket means.

5,313,808
PORTABLE REFRIGERANT RECYCLING UNIT FOR HEAT EXCHANGE WITH SEPARATE RECOVERY UNIT

Carmelo J. Scuderi, 173 Prospect St., Springfield, Mass. 01107

Filed Mar. 11, 1993, Ser. No. 30,589

Int. Cl.^{5} F25B *43/04*

U.S. Cl. 62—475 **14 Claims**

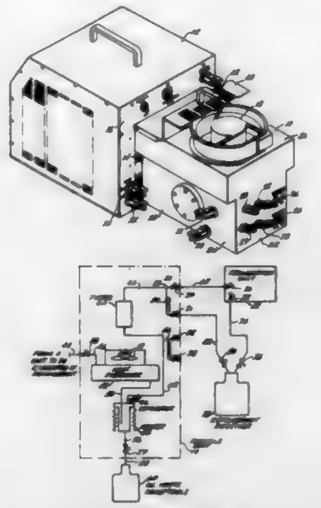
1. A refrigerant recycle unit for use with a separate refrigerant recovery unit for recycling and recovering compressible refrigerant from a refrigeration system, the refrigerant recovery unit having refrigerant recovery input and output means, the refrigerant recovery output means delivers the recovered refrigerant to a refrigerant receiver, the refrigerant recovery unit discharges heat when recovering the refrigerant, said refrigerant recycle unit comprising:

refrigerant input means for receiving the refrigerant from the refrigeration system;

heat receiving means for receiving the heat discharged from the separate refrigerant recovery unit;

heat exchanger means for transferring the heat from said heat receiver means to the refrigerant from said refrigerant receiver to vaporize the refrigerant;

oil separator means downstream from said heat exchanger means for separating oil from the vaporized refrigerant;



filter means downstream from said oil seperator means for filtering the vaporized refrigerant; and

refrigerant output means for presenting the vaporized refrigerant from said filter means to the refrigerant recovery input means.

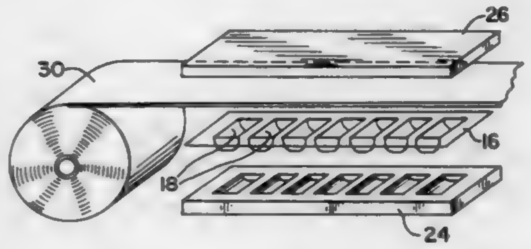
5,313,809
INSULATING WRAP

Gary S. Isaacson, 56 Lincoln Rd., Sudbury, Mass. 01776, and Lansing A. Old, 607 Lowell Rd., Concord, Mass. 01742

Continuation of Ser. No. 837,393, Feb. 19, 1992. This application Jul. 2, 1993, Ser. No. 85,685

Int. Cl.^{5} F25D *3/08;* **A61F** *7/00*

U.S. Cl. 62—530 **11 Claims**



1. A method of forming an insulated wrap comprising the steps of:

providing a die having a plurality of cavities, each of said cavities having evacuation means associated therewith,

said cavities being provided in a linearly aligned disposition;

placing a flexible thermoformable film over said die and overlying said plurality of cavities, said thermoformable film being formed by a film layer of 1 mil of thermoforming nylon coextruded to 3 mils of linear low density polyethylene,

evacuating said cavities thereby to thermoform said film and create a film having multiple pouches formed therein,

filling said pouches with a eutectic chemical compound which is designed to maintain and stabilize temperature, said eutectic chemical compound consisting of a solution of potassium chloride,

overlying said pouch-filled film with an insulating sealing film,

said insulating sealing film consisting of a layer of 1/16 inch of polyolefin foam co-extruded to 3 mils of linear low density polyethylene,

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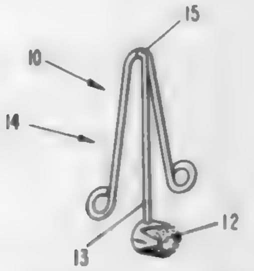
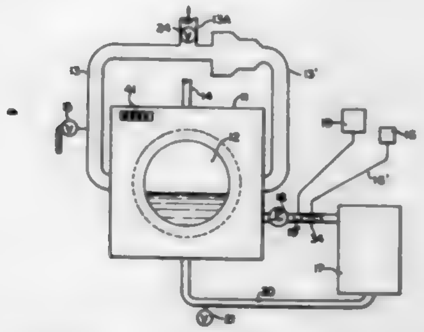
providing a heat sealing die from below the film and simultaneously providing a pressure plate from above the film whereby the top insulated sealing film is sealed to the underlying thermoformed and filled film by means of heat from below and pressure from above thereby to encapsulate the eutectic chemical compound consisting of potassium chloride contained within the pouches and creating an insulating wrap,
and providing fastening means on said insulated wrap such that said wrap may be fastened about the desired item to achieve temperature maintenance.

5,313,810
NECKWEAR KNOT ENHANCER
Melvin R. Koven, P.O. Box 52, Chama, N. Mex. 87520
Continuation of Ser. No. 626,820, Dec. 13, 1990, Pat. No. 5,134,861. This application Jul. 31, 1992, Ser. No. 923,335
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.⁵ A44C *25/00*
U.S. Cl. 63—2 **17 Claims**



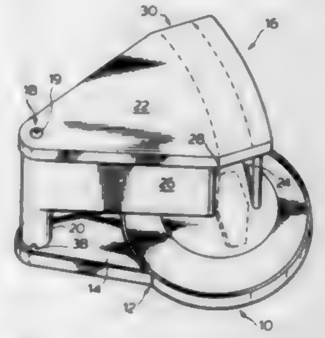
1. A support for a neckwear knot display device comprising:
a downwardly extending anterior portion comprising means for attaching a display device;
a downwardly extending posterior portion in parallel position to said anterior portion and frictionally engaging a neckwear knot; and
a connecting portion rigidly and inelastically disposed between said anterior portion and said posterior portion.

5,313,811
APPARATUS FOR TREATMENT OF DYED GARMENTS AND FABRICS WITH OXIDIZING GASES
Eric Wasinger, Adamsville, Tenn., and David Hall, Auburn, Ala., assignors to Eric Wasinger, San Antonio, Tex.
Filed Mar. 10, 1992, Ser. No. 848,875
Int. Cl.⁵ D06F *35/00*
U.S. Cl. 68—5 C **16 Claims**



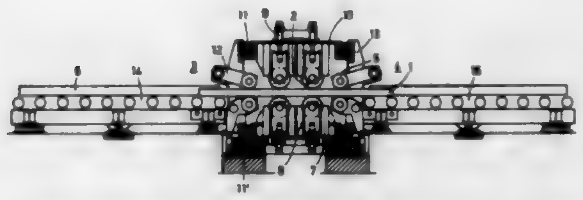
1. An apparatus for laundering and selectively treating a garment or fabric with an oxidizing gas in combination with a liquid or steam which comprises:
a housing having a chamber, said chamber having a barrel mounted for rotation therein,
means associated with said barrel for rotating said barrel in said chamber,
door means on said housing for placing said garment or fabric into said chamber,
means associated with said housing for selectively introducing either a controlled amount of oxidizing gas and steam into said chamber or a controlled amount of oxidizing gas and an aqueous liquid into said chamber, said means having a venturi which mixes said oxidizing gas and said liquid, and
pipe means associated with said chamber for recirculating an oxidizing gas through and into said chamber,
means for removing liquid from said chamber, and
control means for selectively causing a cycle of a laundering operation to be performed.

5,313,812
DOOR LOCK SECURITY SYSTEM
Sigurd T. Eklund, 61 Slalom Drive, Moonstone, Ontario, Canada L0K 1N0 , and Rainer A. Eklund, 7272 Bendigo Circle, Mississauga, Ontario, Canada L5N 1Z5
Filed Sep. 11, 1992, Ser. No. 944,110
Int. Cl.⁵ E05B *13/02*
U.S. Cl. 70—416 **8 Claims**



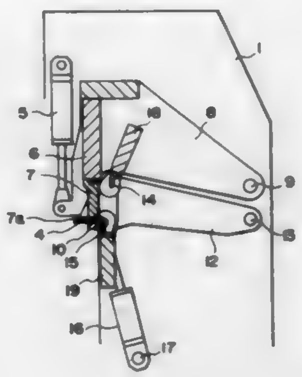
1. In combination, a door lock having a removable, inside faceplate, an interior rotatable lock spindle extending through the faceplate, and a lock handle extending from the spindle, being shaped, non-circular section having a major lateral dimension and a minor lateral dimension, said handle being rotated on actuation of the lock, from a first unlocked position to a second, locked position;
a lock handle immobilizing device for installation with said lock, said immobilizing device having a baseplate, the baseplate having a substantially planar first portion for installation in secured relation beneath said lock faceplate, said base plate having an aperture therein for passage of said spindle therethrough, a second portion of said baseplate extending outside said lock faceplate, said baseplate being selectively rotatably positionable beneath said lock faceplate to orient said second portion in predetermined angular relation from said lock handle;
said baseplate second portion having pivot means thereon; and
a locking plate pivotally mounted thereto for pivotable displacement of said locking plate substantially parallel with said faceplate, said locking plate having a locking passage therein, for arcuate displacement of said locking passage over at least a portion of said lock handle in containing, immobilizing relation therewith, whereby, in use, with said baseplate selectively pre-positioned relative to said lock handle when in said locked position and non-rotatably secured by said faceplate, and with said handle in said second, locked position, said locking plate may be pivotally rotated about said pivot means to displace said locking passage in aligned relation over at least a portion of said lock handle, to immobilize said handle against rotation thereof.

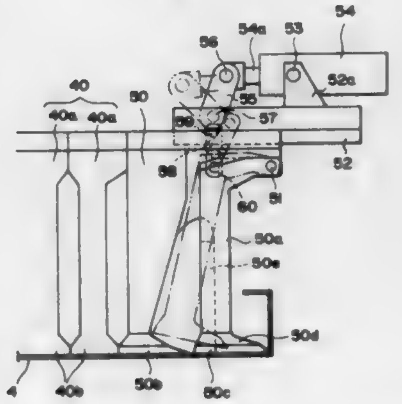
5,313,813
UPSETTING PRESS FOR REDUCING THE WIDTH OF ROLLNG STOCK WITH INTERNALLY COOLED RETAINING ROLLS AND DRIVER ROLLS
Gerhard Heitze, Netphen, and Ulrich Meinhardt, Hilchenbach, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 744,458, Aug. 12, 1991, abandoned. This application Sep. 25, 1992, Ser. No. 951,376
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1990, 4025389
Int. Cl.⁵ B21B *27/08*
U.S. Cl. 72—201 **1 Claim**



1. An upsetting press for reducing the slab width of rolling stock in hot-rolled wide strip roughing mills, comprising:
tool carriers disposed on either side of the slab edge to accommodate pressing tools so that the tools face one another;
at least one height-adjustable retaining roll (2) above and at least one height-adjustable retaining roll (2) below the slab (1) in a region between the pressing tools;
a plurality of driver rolls (5) arranged in inlet and outlet regions (3, 4) of the upsetting press above and below the slab;
means for internally cooling the retaining rolls (2) and driver rolls (5), the cooling means including cooling ducts (20–23) disposed in each retaining roll (2) and in each driver roll (5), which cooling ducts include axially true inlet and outlet ducts (22,23) and a plurality of horizontal ducts (21), which horizontal ducts extend peripherally in a circumferential region of the retaining and driver rolls (2, 3) and essentially parallel to pull-off surfaces (24) of the retaining and driver rolls, the cooling ducts further including connecting ducts (20) arranged between the inlet or outlet ducts (22,23) and the horizontal ducts (21), at least each retaining roll (2) having an internal hub part (17), which is provided with bearing journals (16), and an external, hollow, cylindrical roller (18), which is connectable with the hub part, ring grooves (19) being provided on one of an external portion of the hub part and an internal portion of the roller (18), the connecting ducts (20) branching off the ring grooves to one of the horizontal ducts (21) and the inlet and outlet ducts (22,23), the inlet and outlet ducts for at least each driver roll (5) are constructed as a spaced double pipe (27), which is opposite a driven side of the driver rolls (5) and extends axially true, an inner pipe (28) of the double pipe being the inlet duct and an outer pipe (29) of the double pipe being the outlet duct, which is connected in each case by the connecting ducts (20) with the horizontal ducts (21), the retaining rolls (2) and the driver rolls (5) having bearing housings with cap pieces (25) which point to a surface of the slab; and
additional cooling means for internally cooling the bearing housings and cap pieces which point to the slab surface, both of the cooling means including a coolant supply, the coolant supply of the cooling means for the retaining rolls (2) and for the driver rolls (5) being connected with the coolant supply of the additional cooling means for the bearing housing and cap piece (25).

5,313,814
BENDING MACHINE
Makoto Yamamoto, and Tsuyoshi Matsumoto, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Oct. 27, 1992, Ser. No. 967,985
Int. Cl.⁵ B21D *5/04*
U.S. Cl. 72—319 **20 Claims**





17. A bending machine for bending a workpiece, said machine comprising:
a frame;
a table;
a ram movably mounted on said frame;
an upper die group fastened to said ram and acting in cooperation with said table to secure therebetween a workpiece to be bent, said upper die group having two end portions;
a bending blade movably mounted on said frame for bending said workpiece secured between said upper die group and said table;
at least one of the two end portions of said upper die group having an opening die body disposed thereat;
at least one opening die actuator;
at least one opening die, the upper portion of said at least one opening die being rotatively fastened to a respective opening die body, wherein each said opening die can be rotated by a respective one of said at least one opening die actuator to a first position prior to the respective opening die contacting the workpiece to be bent, each opening die being maintained at its said first position by the respective opening die actuator while the workpiece is being bent, and so that each said opening die can be slightly separated from the workpiece by the respective opening die actuator after the workpiece has been bent and then rotated by the respective opening die actuator from said first position to a second position so that each opening die can thereafter be further separated from the workpiece without interference with the workpiece.

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5,313,815

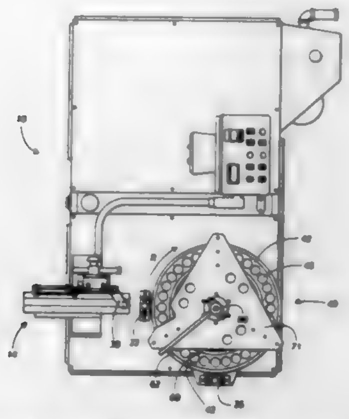
APPARATUS AND METHOD FOR PRODUCING SHAPED METAL PARTS USING CONTINUOUS HEATING

Roger A. Nichting, Denver; Norman H. Nicholas, Lakewood, both of Colo., and Kenneth P. Young, Uzwil, Switzerland, assignors to Amax, Inc., New York, N.Y.

Filed Nov. 3, 1992, Ser. No. 970,613

Int. Cl.^{5} B21J *1/06*

U.S. Cl. 72—364 **16 Claims**



1. A method for heating by electrical induction and forming a metal element, comprising the steps of:

a) positioning said metal element within a first location in a space defined by two concentrically-positioned, electrically-energized solenoid coils connected by an electrical bridge, said pair of solenoid coils defining an arcuate path not passing under said electrical bridge;

b) moving said metal element through said arcuate path defined by said coils from said first location to a second location while current is passing through said coils and heating said metal element by electrical induction, such that said metal element is heated to semi-solid form but does not pass under said electrical bridge; and

c) withdrawing said metal element from said second location and forming said element with a semi-solid forming technique.

5,313,816

FORGING MACHINE WITH STROKE ADJUSTMENT MEANS

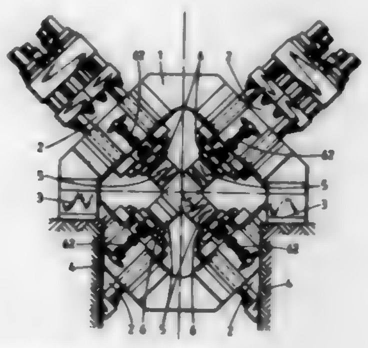
Peter Schubert, Kaarst, and Hans-Albert Schubert, Dusseldorf, both of Fed. Rep. of Germany, assignors to SMS Hasenclever GmbH, Fed. Rep. of Germany

Filed Dec. 30, 1992, Ser. No. 998,592

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1991, 4143176

Int. Cl.^{5} B21J *7/02*

U.S. Cl. 72—402 **4 Claims**



1. A forging machine comprising:

a machine frame defining a system axis extending therethrough;

a plurality of forging rams slidably mounted in said frame and disposed radially with respect to said system axis and distributed angularly within a common working plane transverse to said system axis;

a plurality of pressure fluid piston and cylinder units radially disposed on said machine frame, the cylinder of each unit driving a respective one of said rams and having a stroke corresponding to the required ram stroke and a defined stroke end position;

a respective crosshead supporting the piston of a respective piston and cylinder unit and adjustably supported for movement relative to said machine frame toward and away from said system axis for adjusting said stroke end position of a respective one of said cylinders of said piston and cylinder units;

means for mounting a die on each ram;

a flange associated with a cylinder of a respective one of said piston and cylinder units for movement with said ram;

a ring extending around each of said rams at a position between said flange and said system axis;

means for connecting said ring to a respective adjustable crosshead for movement therewith; and

at least one ram return piston and cylinder unit disposed and acting between said ring and flange for returning a respective ram after a stroke thereof.

5,313,817

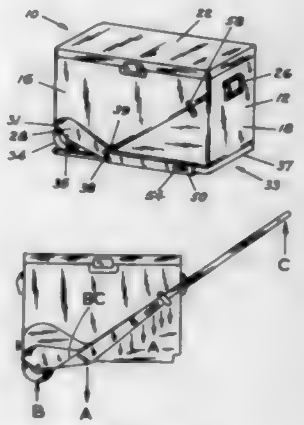
WHEELABLE, STORABLE COOLER

Larry L. Meinders, 1406 Sussex Dr., Ocean Springs, Miss. 39564

Filed May 7, 1993, Ser. No. 59,113

Int. Cl.^{5} F25D *3/08*

U.S. Cl. 62—457.1 **7 Claims**



1. A wheelable cooler, comprising:

a cooler body, generally boxlike in form, having side walls, end walls, a bottom wall and a lid;

wheelgear means for moving the cooler, including

- a pair of wheels;
- a handle, generally U-shaped in form, with coplanar, generally parallel extension arms extending from a crossbar;
- a pair of fender assemblies, each including
  - a fender body adapted to accept one of said wheels;
  - a mounting member extending from said fender body at a selected angle thereto, adapted to accept a said handle extension arm therein;
  - wherein each said extension arm is slidably carried in a said mounting member, with said extension arms movable between a retracted position wherein said extension arms are substantially fully inserted into said mounting members, and an extended position in which said extension arms are only partially inserted into said mounting members;
- means for locking said extension arms in said retracted and extended positions; and
- a support pivot aperture extending through said fender assembly at a point between said wheels and said extendable handle, at the juncture between said fender body and said mounting member;

a support rod joining said fender assemblies, extending through each said fender assembly support pivot aperture and carrying said cooler body;

latch means carried on said cooler body for engaging said extension arms and maintaining the same in said extended position.

5,313,818

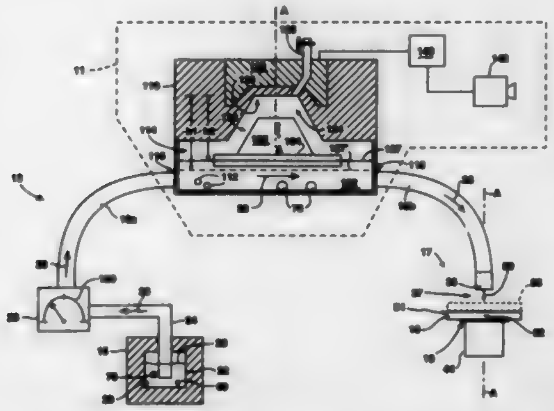
CONTAMINANT MONITOR FOR A FLOWING LIQUID

Anthony Sayka; Christopher D. Reynes, both of San Antonio; Bradley G. Williams, Castroville, and Gerardo F. Martinez, San Antonio, all of Tex., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Nov. 12, 1992, Ser. No. 976,060

Int. Cl.^{5} G01N *7/14*

U.S. Cl. 73—19.1 **17 Claims**



1. A method for detecting bubbles in a liquid prior to applying said liquid to a surface of a workpiece comprising the steps of:

flowing a liquid through a low restrictive chamber that has a chamber ceiling, wherein said liquid is a viscous liquid used as a spin-on-coating for a workpiece;

allowing bubbles in said liquid to escape from said liquid and to join a gaseous volume within said chamber located between a surface of said liquid and said chamber ceiling;

sensing said gaseous volume within said chamber to determine whether said liquid contains bubbles; and

applying said liquid to a surface of a workpiece.

5,313,819

QUANTIFICATION OF BLAST FURNACE SLAG IN A SLURRY

Arthur H. Hale, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 10, 1993, Ser. No. 15,204

Int. Cl.^{5} G01N *7/00*

U.S. Cl. 73—19.01 **9 Claims**

1. A method to determine the concentration of blast furnace slag in a slurry sample comprising the steps of:

acidifying the slurry sample;

determining the concentration of sulfides in the acidified sample;

establishing a correlation between the concentration of blast furnace slag in the slurry and the concentration of sulfide in the acidified slurry; and

determining, based on the correlation of concentration of blast furnace slag with the concentration of sulfides in the acidified slurry, the concentration of blast furnace slag in the sample.

5,313,820

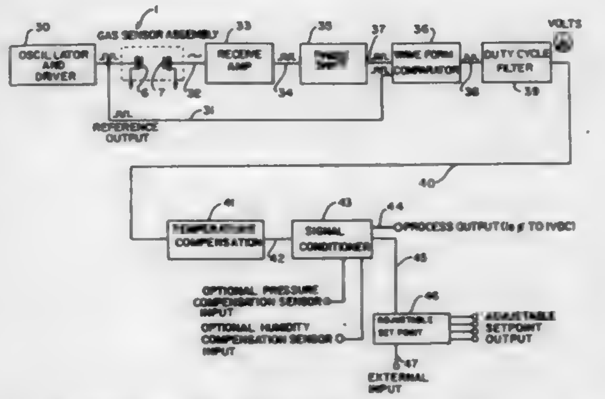
ULTRASONIC GAS MEASURING DEVICE

Alonzo C. Aylsworth, St. Peters, Mo., assignor to Puritan Bennett Corporation, St. Louis, Mo.

Continuation of Ser. No. 781,819, Oct. 23, 1991, abandoned, which is a division of Ser. No. 444,048, Nov. 30, 1989, Pat. No. 5,060,514. This application Mar. 1, 1993, Ser. No. 24,785

Int. Cl.^{5} G01N *31/00*

U.S. Cl. 73—24.01 **10 Claims**



1. An ultrasonic gas measuring device for continuously monitoring the gas including a housing means, said housing means having a gas inlet and a gas outlet provided therethrough for passage of a gas to be measured, ultrasonic means provided within the housing means, said ultrasonic means having a transmitter and a receiver disposed at spaced locations at opposite positions of the housing means for transmission of its ultrasonic waves along the length of the passing gas, electronic means operatively associated with the housing means to measure the concentration of gas flowing therethrough, said electronic means including a receive amplifier which functions to detect and generate in cooperation with the ultrasonic means a signal corresponding to a concentration of a gas passing through and along the length of the housing means, said electronic means also including an oscillator and driver and generating a reference signal corresponding to the electronic signal delivered to the ultrasonic means, and electronic phase shift means electrically connected with the receive amplifier and effecting a shift of the first said generated signal to furnish a phased relationship between the generated signal and the reference signal, and signal conditioner means providing for revision of the generated signal due to one of temperature, pressure, and humidity compensation, wherein a larger span for comparison between the reference signal and the signal corresponding to the concentration of the gas provides greater accuracy in the measurement of the percentage of concentration of the passing gas.

5,313,821

UNIFORM AND QUANTITATIVE EVALUATION OF AROMA EMITTING SUBSTANCES

Karen L. Bott, Kenner, and Peter B. Johnsen, Metairie, both of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

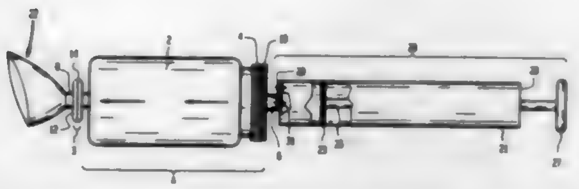
Filed Sep. 12, 1991, Ser. No. 758,068

Int. Cl.^{5} G01N *1/22, 33/02*

U.S. Cl. 73—23.34 **23 Claims**

1. A hand held sampling device for containing a sample of an aroma-emitting substance for evaluation of the aroma in a non-continuous manner, which device is comprised of:

(a) a container means provided with: (i) a cavity of sufficient size to contain a sample of the aroma-emitting substance; (ii) a resealable opening of sufficient size to permit said sample to pass into said cavity; (iii) an inlet of sufficient size to permit entry of a carrier gas, wherein said inlet is positioned at a point on said container means such that it directs said carrier gas through said sample, and wherein said inlet is sealingly connectable to a gas delivery means; and (iv) an outlet of sufficient size to permit said carrier gas, to pass from said cavity; and



(b) a filtering means positioned across said outlet so that said gas passes through said filtering means.

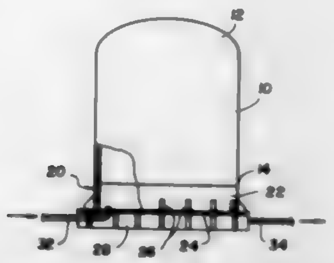
5,313,822
METHOD AND APPARATUS FOR PRESSURE TESTING LARGE VESSELS

William J. Bees, Wadsworth, and Dennis K. McDonald, Massillon, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 725,845, Jul. 3, 1991, abandoned. This application Jul. 13, 1992, Ser. No. 911,371

Int. Cl.⁵ G01M *3/02*

U.S. Cl. 73—37 **18 Claims**



1. A method of pressure testing a large vessel, comprising:

fabricating or dividing the vessel into a first portion having one closed end and an opposite open end, and a second portion having one closed end and an opposite open end;

attaching a first base enclosure to the open end of the first portion for closing the open end of the first portion;

attaching a second base enclosure to the open end of the second portion for closing the open end of the second portion;

separately pressure testing the first and second portions of the vessel;

subsequently disconnecting the first and second base enclosures from the first and second portions respectively for reopening the open ends of the first and second portions; and

connecting or reconnecting the first and second portions of the vessel at their open ends for assembling the vessel.

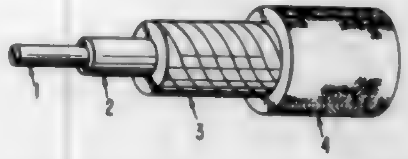
5,313,823
ELECTRICAL CABLE LEAK DETECTION SYSTEM

Samuel Berkman, Sun Lakes, and Jack A. Sahakian, Phoenix, both of Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 1,377, Jan. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 897,466, Jun. 11, 1992, abandoned. This application Mar. 10, 1993, Ser. No. 29,074

Int. Cl.⁵ G01M *3/16*

U.S. Cl. 73—40 **7 Claims**



1. An electrical cable for detecting the presence of liquids containing a surfactant which comprises:

a central electrical conductor,

a water-impermeable plastic insulation covering said conductor,

a water-resistant, surfactant-free yarn wrapped closely around the insulation-covered conductor, said yarn comprising a polymeric material,

a second electrical conductor surrounding the yarn-wrapped, insulated central conductor, said second electrical conductor being water permeable.

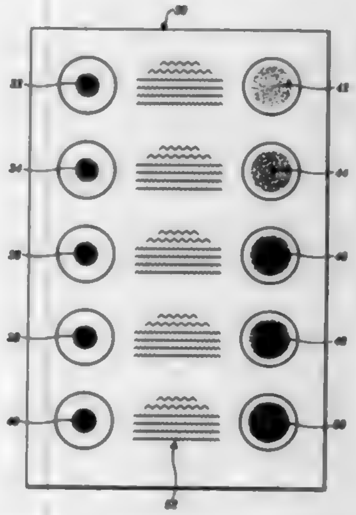
5,313,824
LUBRICATING OIL ANALYSIS METHOD AND KIT

William R. Herguth, Vallejo, Calif., and Peter Yates, Seattle, Wash., assignors to Herguth Laboratories, Vallejo, Calif.

Filed Sep. 30, 1992, Ser. No. 954,116

Int. Cl.⁵ G01N *33/28*

U.S. Cl. 73—53.05 **12 Claims**



1. A test kit for the analysis of lubricating oil, comprising:

a test medium capable of absorbing the oil;

a plurality of comparative visual indicia depicting at least two different conditions of lubricating oil disposed upon said test medium; and

a descriptive text corresponding to said comparative visual indicia.

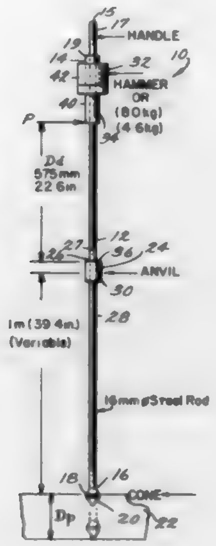
5,313,825
DUAL MASS DYNAMIC CONE PENETROMETER

Steve L. Webster, Vicksburg, and Thomas P. Williams, Port Gibson, both of Miss., assignors to The United States of Americas as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1992, Ser. No. 880,264

Int. Cl.⁵ G01N *3/42*

U.S. Cl. 73—81 **13 Claims**



1. A dynamic cone penetrometer for measuring soil shear strength comprising:

an elongated cylindrical rod having a tip end and a handle end;

an anvil portion mounted to the rod at a selected distance from the handle end;

a penetrometer tip secured to the tip end of the rod and having a conical free end for engaging the soil; and

a two weight drop hammer having a cylindrical through bore and being slidably mounted on the rod at the handle end for striking the anvil with a selected force when released from a fixed distance above said anvil, said hammer comprising a first weight portion including a cylindrical core portion of a first diameter and support portion extending radially therefrom and a second weight portion having a through bore and being sleevable over the core for engaging the support portion and fastener means for releasably securing the second weight portion from the first weight portion so that drop measurements may be performed with the first weight portion for relatively weak soils and with the first and second weights secured together for relatively strong soil.

5,313,826
ENGINE MISFIRE, KNOCK OR ROUGHNESS DETECTION METHOD AND APPARATUS

Robert D. Klauber; Erik B. Vigmostad; Frederick P. Sprague, and Joseph V. Mandarino, all of Fairfield, Iowa, assignors to Sensortech L.P., Fairfield, Iowa

PCT No. PCT/US91/09280, § 371 Date Jun. 10, 1993, § 102(e) Date Jun. 10, 1993

Continuation-in-part of Ser. No. 625,222, Dec. 10, 1990, and a continuation-in-part of Ser. No. 720,240, Jun. 24, 1991, Pat. No. 5,269,178. This PCT application Dec. 10, 1991, Ser. No. 74,861

Int. Cl.⁵ G01M *15/00*

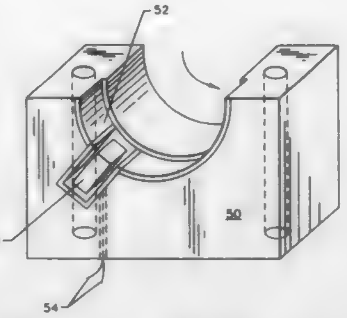
U.S. Cl. 73—118.1 **13 Claims**

1. An apparatus for detecting variation in torque in a rotating power transmitting member, said apparatus comprising:

a magnetostrictive sensing means which produces a signal related to the torsional stress in the power transmitting member;

a means for sensing rotational speed of the power transmitting member,

a filter having at least one of a tunable highpass frequency, a tunable lowpass frequency, and a tunable center frequency, and



signal processing means cooperating with said rotational speed sensing means and said filter for tuning at least one of the highpass frequency, the lowpass frequency, and the center frequency of said filter responsive to the rotational speed of the power transmitting member so that spatial Fourier components of said signal relative to rotation angle of the power transmitting member are passed by said tunable filter substantially independent of the rotational speed of the power transmitting member.

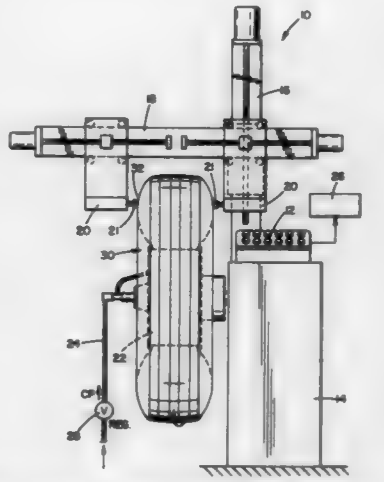
5,313,827
METHOD AND APPARATUS FOR DETECTING PLY DEFECTS IN PNEUMATIC TIRES

Albert J. Yovichin, N. Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 28, 1992, Ser. No. 952,066

Int. Cl.⁵ E01C *23/00;* G01M *17/02*

U.S. Cl. 73—146 **13 Claims**



5. An apparatus for detecting defects in a pneumatic tire comprising

(a) a base unit (14) having a rotatable mandrel (22) mounted thereon, said mandrel being adapted for holding a tire,

(b) support means for supporting displacement sensors in the proximity of said tire attached to said base, said support means comprising a vertical support strut (16) attached to said base unit (14) and cross support (18) attached to said vertical support (16),

(c) displacement sensor means (20,20*a*) attached to said support means wherein support strut (16) is geared so that said cross support (18) moves up and down, and said cross support (18) has slides so that said sensor means can move

VOL 162 ISS 4 MY 24 1994 UMI

laterally independently such that said sensor means can be moved up and down and side to side into the proximity of a tire sidewall when said tire is mounted on said mandrel, and

(d) means for inflating said tire on said mandrel to a specific pressure and maintaining said pressure constant during testing.

5,313,828

MULTI-COMPONENT MEASURING DISC WHEEL

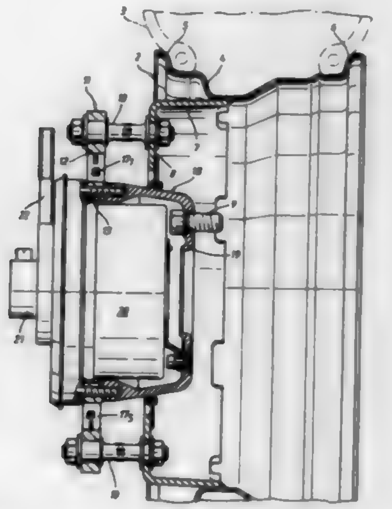
Horst Kötzle, Albershausen; Bernd Oelmann, Stuttgart; Ulrich Schäfer, Fellbach, and Gerhard Schwarz, Deizisau, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 9, 1992, Ser. No. 958,190

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1991, 4133418

Int. Cl.⁵ G01M *17/02*

U.S. Cl. 73—146 **5 Claims**



1. A multi-component measuring disc wheel coupled to vehicles through wheel fastening bolts comprising:

a rim ring, having a rim flange, carrying a vehicle tire and an angle-section ring fastened in the rim ring, the angle-section ring having an auxiliary flange which is at right angles to the angle section ring axis and is located axially approximately at the position of the rim flange of the rim ring facing away from the vehicle, an inner edge of the auxiliary flange having a larger diameter than an outer circle formed around the wheel fastening bolts,

an annular measuring disc;

a plurality of stud bolts arranged parallel to the axis and having a circular cross-section, said stud bolts holding the annular measuring disc at a distance from the auxiliary flange on the side of the multi-component measuring disc wheel facing away from the vehicle, an inner edge of the measuring disc having a smaller diameter than the inner edge of the auxiliary flange and having a larger diameter than the outer circle formed around the wheel fastening bolts;

wherein the plurality of stud bolts are equipped with strain gauges and are designed to be substantially identical to one another and to act as axial measuring cross-sections, the plurality of stud bolts are evenly distributed on a common pitch circle, are fastened in a torsionally stiff manner both in the measuring disc and in the auxiliary flange and are positively secured against rotation;

wherein the measuring disc has a number of radially extending measuring webs, having opposing flat sides, which can be divided by four without any remainder, the measuring webs extend between an outer ring of the measuring disc closed in the peripheral direction and a closed inner ring of the measuring disc, are designed to be substantially identical to one another and are also equipped with strain gauges,

a pot-shaped wheel adaptor bolted axially to the inner edge of the measuring disc, the wheel adaptor compensates for the difference between the axial distance of the measuring disc and a normal axial position of a bolt-on flange of a conventional wheel disc of a conventional vehicle wheel, the wheel adaptor matches in a bolt-on region the bolt-on flange of the conventional wheel disc,

a rotating to stationary signal transmission device, having a rotating and a stationary part, located at least partially within or on the pot-shaped wheel adaptor and rotatably mounted in or on the wheel adaptor; and

a rotational position sensor, having a stationary part, for the multi-component measuring disc wheel, the stationary part of the signal transmission device and of the rotational position sensor being fixed in a defined position on the vehicle in the rotational direction of the multi-component measuring disc wheel by a linkage compensating for at least one of the suspension and steering motions of the multi-component measuring disc wheel;

wherein the strain gauges applied to the axial stud bolts and the radial measuring webs are applied in such a position in each case and with respect to their alignment and are connected into associated electrical measuring bridge circuits in such a manner that isolated electrical signals can be obtained with respect to the following components:

vertically directed wheel loads extending radially through the wheel center,

horizontally directed longitudinal forces, extending radially through the wheel center,

eccentric side forces acting on a wheel contact surface and directed transversely to the plane of the wheel,

eccentric braking forces directed parallel to the rolling direction of the vehicle wheel,

wherein the radially extending measuring webs of the measuring disc are used for determining the forces acting eccentrically at the wheel contact surface of the multi-component measuring disc wheel, such as the braking force and the side force, and are equipped in two different ways with a number of the strain gauges;

whereby, for isolated recording of the braking force directed parallel to the plane of the wheel, a peripheral bending load on the measuring webs is determined and, in consequence, the strain gauges are applied in each case to the opposing flat sides in the peripheral direction of at least some of the measuring webs at the radial position of maximum bending load, wherein the strain gauges are aligned with their measurement sensitivity parallel to the side edges and the measuring webs selected for this purpose are evenly distributed over the periphery of the measuring disc, and

whereby, for isolated recording of the side force directed transversely to the plane of the wheel, an axial shear load on the measuring webs is determined and, in consequence, shear strain gauges are applied in each case to the opposing flat sides in the peripheral direction of all the measuring webs, the shear strain gauges being arranged crosswise and extending with their measurement sensitivity at an angle of 45° to the side lines,

wherein the stud bolts are used for determining a total resultant of the components directed parallel to the plane of the wheel, namely the vertical wheel load, the horizontal longitudinal force and the braking force, it being possible to resolve the total resultant into its vertical component corresponding to the wheel load and into its horizontal component corresponding in magnitude to the sum of the longitudinal force and the known braking force so that the wheel load and the longitudinal force can be determined, and

wherein for the elimination by measurement techniques of the effect of the side force and of the torque effect of the braking force, all the stud bolts are equipped with shear strain gauges in a non-axisymmetrical manner at four peripheral regions which have the same cartesian location in each case in reference to a selected peripheral position of the multi-component measuring disc wheel which can be continually detected by means of the rotational position sensor, it being possible to determine the total resultant quoted in terms of magnitude and, in reference to the selected peripheral position, radial direction by these shear strain gauges.

5,313,829

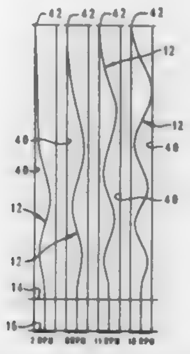
METHOD OF DETERMINING DRILLSTRING BOTTOM HOLE ASSEMBLY VIBRATIONS

Paul R. Paslay, Houston, and Yih-Min Jan, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 3, 1992, Ser. No. 816,993

Int. Cl.⁵ E21B *47/00, 45/00*

U.S. Cl. 73—151 **12 Claims**



1. A method for determining the occurrence of whirling of at least a portion of an elongated drillstring during rotation of said drillstring in a well bore, said method comprising the steps of:

placing sensor means on said drillstring at a predetermined point in relation to said portion of said drillstring for operation during the rotation of said drillstring to measure longitudinal displacement of said drillstring at said predetermined point;

determining at least one lateral critical speed of said portion of said drillstring based on selected ones of the physical features of said portion of said drillstring including the length of said portion of said drillstring;

determining the mode shape of the lateral displacement of said portion of said drillstring resulting from said whirling at said critical speed;

determining the change in length of said drillstring as a result of said lateral displacement of said portion of said drillstring; and

comparing said change in length of said drillstring with said longitudinal displacement of said drillstring at said predetermined point derived from measurements with said sensor means.

5,313,830

ASSESSMENT OF AIR INGRESS TO STEAM SYSTEMS

Charles H. Goode, Horsham, United Kingdom, assignor to Furness Controls Limited, East Sussex, England

Filed Sep. 17, 1992, Ser. No. 946,874

Claims priority, application United Kingdom, Sep. 18, 1991, 9119949

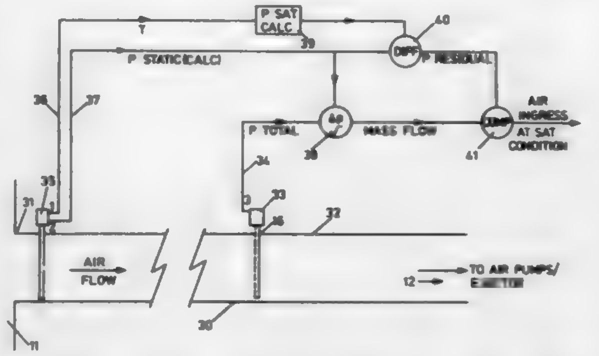
Int. Cl.⁵ G01F *1/46, 15/00*

U.S. Cl. 73—198 **8 Claims**

1. Apparatus for assessing the ingress of air into a steam system which comprises at least a steam condenser having an exit, a vacuum pump arrangement for maintaining the exit under a partial vacuum, and pipework connecting the exit to the vacuum pump arrangement, the apparatus comprising a pitot probe positioned at a first monitoring point in said pipework past which the flow from the condenser to said vacuum pump arrangement passes, the pitot probe including means for sensing the total of the dynamic and static pressure of that entire flow;

a second probe positioned at a second monitoring point adjacent said exit from the condenser, the second probe sensing the static pressure and temperature at said second monitoring point; and

derivation means for deriving an indication of the amount of air flowing past said first monitoring point from said total pressure, and the static pressure and temperature at said second monitoring point.



5,313,831

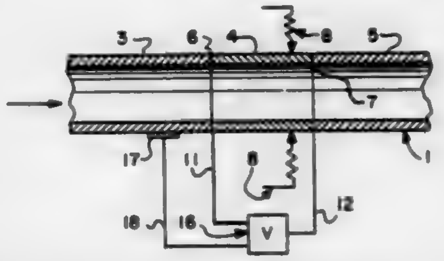
RADIAL JUNCTION THERMAL FLOWMETER

Paul Beckman, 944 Henrietta Ave., Huntingdon Valley, Pa. 19006

Filed Jul. 31, 1992, Ser. No. 922,245

Int. Cl.⁵ G01F *1/68*

U.S. Cl. 73—204.24 **17 Claims**



1. A thermal flowmeter to measure the rate of flow of a fluid in a conduit having an interior surface, comprising a first upstream radial junction thermocouple, a second downstream radial junction thermocouple, a heat source to supply substantially constant output heat to at least one of said radial junction thermocouples and to said fluid in said conduit, said heat source being positioned with respect to said first and second radial junction thermocouples to supply more heat to one of said thermocouples than the other, means to detect and measure the differential electrical output between said thermocouples, said differential output being mathematically related to said rate of flow of said fluid, each of said radial junction thermocouples being a circumferential junction of thermoelectrically dissimilar metals forming at least part of said interior surface of said conduit through which said fluid flows, and forming a complete circumferential boundary surrounding said fluid.

5,313,832

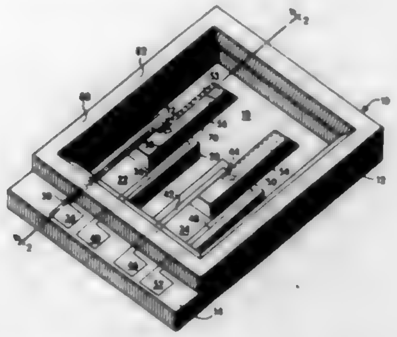
COMPOSITE MASS AIR FLOW SENSOR

Craig H. Stephan, Ann Arbor, and Margherita Zanini-Fisher, Bloomfield Township, Oakland County, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1991, Ser. No. 812,396

Int. Cl.^{5} G01F *1/68*

U.S. Cl. 73—204.26 **11 Claims**



1. A mass air flow sensor comprising:

a generally planar glass substrate having an upper surface, a lower surface and an air flow opening formed therethrough perpendicular to the plane of the substrate;

a first silicon member having a bottom surface, a portion of the first silicon member extending over the air flow opening and a portion of the bottom surface of the first silicon member being bonded at a bonding site to an underlying portion of the upper surface of the glass substrate; and

an electrically heatable element comprising a resistive film on the first silicon member.

5,313,833

MILK FLOW METER

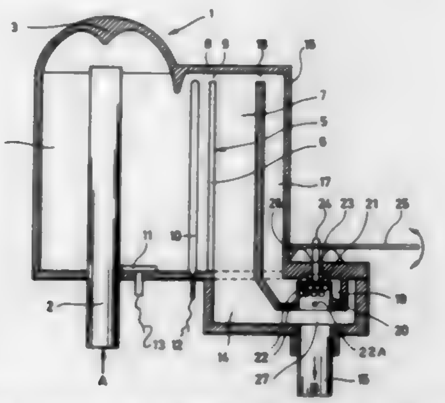
Tilman Hoefelmayr, Niederteufen, Fed. Rep. of Germany, assignor to Bio-Melktechnik Hoefelmayr & Co., Niederteufen, Switzerland

Filed May 27, 1992, Ser. No. 890,012

Claims priority, application Fed. Rep. of Germany, May 28, 1991, 4117475

Int. Cl.^{5} G01F *1/20*

U.S. Cl. 73—215 **17 Claims**



1. A milk flow meter comprising a measuring chamber connected to a milk supply conduit, a discharge chamber having means therein defining a milk sump at a lower end thereof, calibrated passageway means for providing a fluid connection between said measuring chamber and said discharge chamber, a milk suction conduit connected to said milk sump, means defining a rinsing conduit connected in fluid circuit with and extending between at least one of said measuring chamber and said discharge chamber at a first end thereof and said milk sump at a second end thereof, said first end being oriented adjacent an upper end of said measuring chamber and said discharge chamber, respectively, and an adjustment means selectively controllable between a first condition and a fluid restricting second condition for controlling a flow of a rinsing liquid between said at least one measuring chamber and said discharge chamber and said milk sump, said first condition providing a nearly unobstructed fluid path between said at least one of said measuring chamber and said discharge chamber and said milk sump, said second condition providing a restricted flow between said at least one of said measuring chamber and said discharge chamber and said milk sump and a nearly unobstructed path between said rinsing conduit and said milk sump.

5,313,834

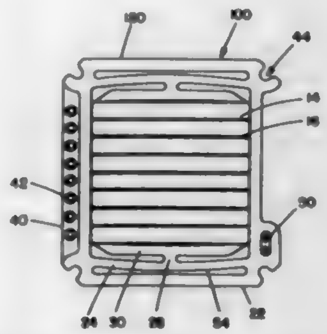
PHASED ARRAY SONIC TRANSDUCERS FOR MARINE INSTRUMENT

Maurice Lagace, Peterborough, N.H., assignor to Airmar Technology Corporation, Milford, N.H.

Filed Sep. 21, 1992, Ser. No. 948,231

Int. Cl.^{5} G01F *23/00*

U.S. Cl. 73—290 V **20 Claims**



1. A phased array transducer for generating and receiving sonic vibratory forces comprising:

a) an array of transducer elements separated by spacer members disposed along the length of the elements;

b) a transducer assembly frame for holding the array, with a flexible member formed in a sidewall of the frame for applying a compressive force in a direction transverse to the length dimension of the elements and spacer members.

5,313,835

INTEGRATED MONOLITHIC GYROSCOPES/ACCELEROMETERS WITH LOGIC CIRCUITS

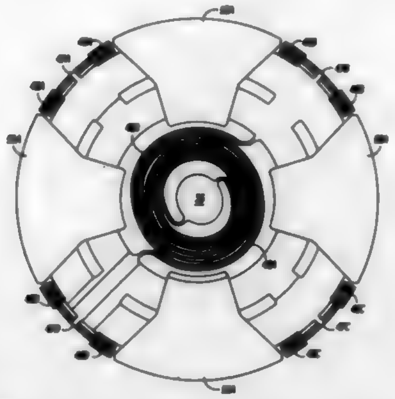
William C. Dunn, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1991, Ser. No. 810,045

Int. Cl.^{5} G01P *9/04*

U.S. Cl. 73—505 **11 Claims**

1. An inertial guidance system comprising gyroscopic apparatus providing three gyroscopic outputs, each of the three gyroscopic outputs being indicative of rotational movement of the system about a different one of three mutually orthogonal axes, the apparatus being formed on a semiconductor substrate, and control circuitry formed on the same semiconductor substrate and electrically connected to the gyroscopic apparatus for controlling the gyroscopic apparatus and receiving the three gyroscopic outputs.



5,313,836

SEMICONDUCTOR SENSOR FOR ACCELEROMETER

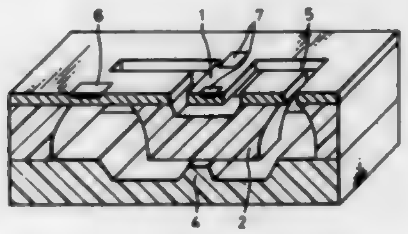
Tetsuo Fujii, Toyohashi; Susumu Kuroyanagi, Anjo, and Yoshitaka Gotoh, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 553,090, Jul. 17, 1990, abandoned. This application Dec. 23, 1992, Ser. No. 996,474

Claims priority, application Japan, Jul. 17, 1989, 1-184331

Int. Cl.^{5} G01P *15/08*

U.S. Cl. 73—517 R **15 Claims**



1. A semiconductor sensor for an accelerometer, comprising:

a solid member;

a beam portion, formed by a thin beam portion and a thick beam portion connected to each other and supported on said solid member by at least one end of said thin beam portion, said thin beam portion serving as a stress generating region;

said thick beam portion integrally extending from another end of said thin beam portion, serving as a load receiving region, said thick beam portion being provided with at least one grooved portion on at least one main surface thereof to form a partially thin portion;

a semiconductor strain sensing device formed on said thin beam portion and detecting a strain value generated in said thin beam portion in response to acceleration applied to said thin beam portion; and

at least one stopper provided on a same plane as a plane of said thin beam portion, said stopper having a first portion which is separated from said thin beam portion and is arranged adjacent a center of gravity of said thick beam portion to restrict a range of displacement of said thick beam portion, and arranged in a direction so that a longitudinal axis of said first portion is perpendicular to a direction in which said thick beam portion is integrally extended, so that said stopper crosses over said thick beam portion; and said stopper also having second portions provided on both ends of said stopper and connected to a portion of said solid member, said second portions being provided on the same plane as the plane of said thin beam portion, so that both end portions of said first portion of said stopper are fixedly supported on said solid member with said second portions, to thereby restrict the range of displacement of said thick beam portion.

5,313,837

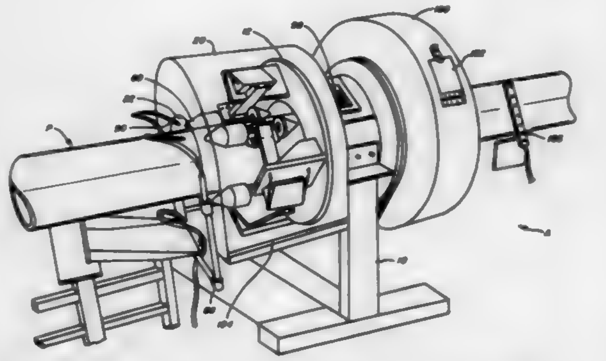
ULTRASONIC THICKNESS GAGE FOR PIPE

John Haynes, Houston, Tex., assignor to ICO, Inc., Houston, Tex.

Filed Sep. 26, 1991, Ser. No. 766,645

Int. Cl.^{5} G01N *29/10, 29/26*

U.S. Cl. 73—622 **12 Claims**



1. An apparatus for testing tubular goods, comprising:

(a) a frame;

(b) sensing means mounted to said frame for detecting flaws in a tubular and for sending an output signal, said sensing means comprising at least one ultrasonic sensor, a movably mounted holder for said ultrasonic sensor, and a shoe mounted to said holder;

(c) computing means on said frame hardwired to said sensing means to process said output signal of said sensing means and deliver a second output signal;

(d) means for rotating said sensing means and computing means in tandem on said frame;

(e) means on said frame for allowing a takeoff of said second signal and for supplying power as said sensing means and computing means are rotated, said means for allowing a takeoff of said second signal and for supplying power comprising a slip ring assembly;

(f) a tubular to be inspected, said tubular being centrally located on said frame such that said means for rotating can rotate said sensing means and said computing means around the outer surface of said tubular;

(g) at least one fluid outlet directed at the outer surface of said tubular; and

(h) a lead roller mounted to said holder.

5,313,838

BENT TUBE INSPECTION PROBE WITH A ROTARY INSPECTION HEAD

Christian Goudard, Epinay sur Orge; Bernard Stockmann, Genevieve des Bois, and Jacky Viard, Orsay, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 29, 1991, Ser. No. 784,375

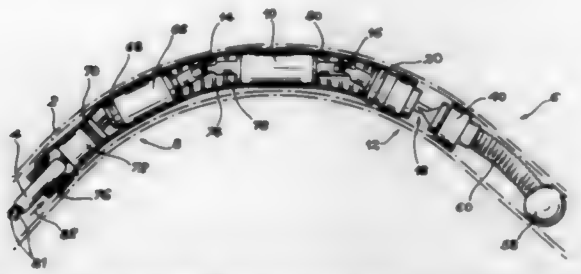
Claims priority, application France, Oct. 31, 1990, 90 13530

Int. Cl.^{5} G01N *29/24*

U.S. Cl. 73—623 **10 Claims**

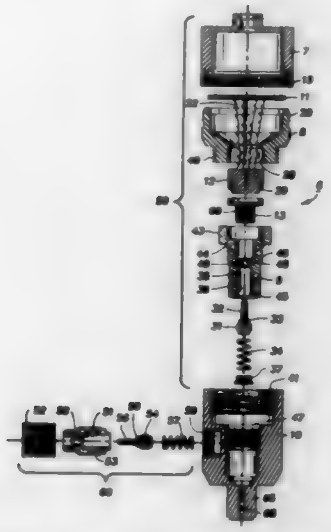
1. Bent tube inspection probe for ultrasonically inspecting a tube said probe comprising a cable having electrical conductors and a probe head fixed to one end of the cable, with said probe head comprising: an inspection head, means for transmitting and receiving tube inspection signals; support means for rotationally mounting said inspection head (18); a motor for rotating said inspection head relative to said support means; an

encoder connected to the motor for detecting the presence of faults in said tube and a rotary collector positioned between the motor and said support means to ensure a mechanical connection between the motor and the inspection head and to transmit electrical control signals for controlling the transmitting and receiving means and electrical signals from said transmitting



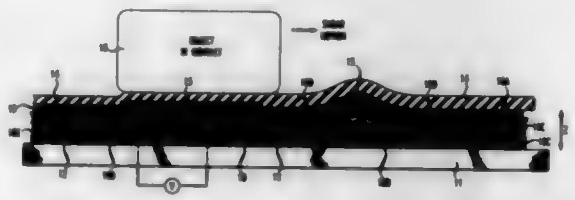
and receiving means, with said probe further comprising articulated mechanical connections disposed between the motor and the rotary collector and between the rotary collector and the inspection head and a sheath flexible in flexion and rigid in torsion for joining said support, to said motor and to said rotary collector to prevent relative circumferential displacement thereof.

5,313,839
TRANSDUCER ASSEMBLY AND METHOD
Ralph G. Ridenour, 626 Lexington-Ontario Rd., Mansfield, Ohio 44903
Filed Aug. 31, 1992, Ser. No. 938,887
Int. Cl.⁵ G01L *9/00*
U.S. Cl. 73—756 14 Claims



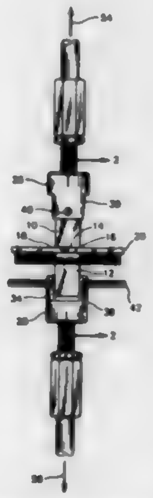
1. A transducer assembly having a first end thereof for assembly with a manifold or the like by heat sealing comprising:
a transducer housing having a first opening at a first end thereof;
cartridge means in said transducer housing;
said cartridge means including a main valve body and a pressure-to-electrical-signal transducer and each with sealing means to seal with said transducer housing;
said main valve body insertable in said transducer housing and carrying sealing means to seal therewith;
said pressure-to-electrical-signal transducer mountable in said transducer housing and carrying sealing means to seal therewith;
said first opening communicating with said transducer through said main valve body for applying pressure to the transducer; and
said sealing means being readily removable from said transducer assembly; and means to head seal said first end of said transducer assembly to a manifold or the like without heat damage to any of the internal components of the transducer assembly.

5,313,840
TACTILE SHEAR SENSOR USING ANISOTROPICALLY CONDUCTIVE MATERIAL
Li-Han Chen, Summit, and Sungho Jin, Millington, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Oct. 30, 1992, Ser. No. 969,626
Int. Cl.⁵ G01L *1/00*
U.S. Cl. 73—763 10 Claims



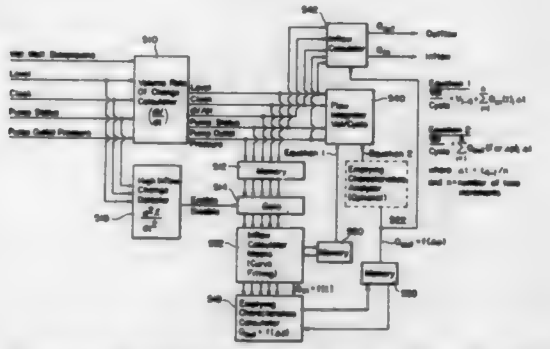
1. A sensor capable of detecting shear force comprising:
an array of conductive electrical contacts disposed on a non-conducting substrate;
a layer of anisotropically conductive material disposed overlying said array of contacts; and
a conductive cursor attached to an elastomeric layer movable in response to the application of shear force, said cursor positioned and dimensioned to interconnect at least a pair of said electrical contacts through said anisotropic conductive material.

5,313,841
DIE ADHESION TESTING METHOD AND APPARATUS
Francis W. Layher, San Diego, Calif., assignor to Quantum Materials, Inc., San Diego, Calif.
Filed Jul. 9, 1992, Ser. No. 911,176
Int. Cl.⁵ G01N *3/08*
U.S. Cl. 73—827 20 Claims



1. A coupling assembly for coupling the surfaces of a semiconductor chip and its supporting carrier substrate to a tensile testing machine for testing the strength of a bond between the chip and the carrier substrate, comprising in combination:
a semiconductor chip and a substrate, said chip bonded to a supporting surface of said substrate,
a pair of connector blocks, each having a bonding end, with a substantially planar bonding face for bonding to the surface of one of said chip and said substrate and a connector end with detachable connecting means for mounting in a tensile testing machine.

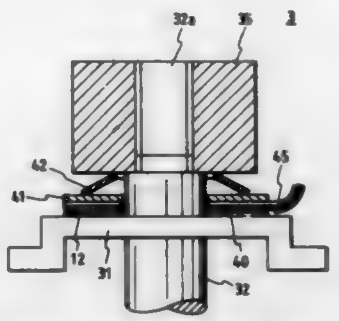
5,313,842
PUMP STATION FLOWMETER WITH SUDDEN HIGH INFLOW CHANGE DETECTOR
Lawrence B. Marsh, Buckeystown, and John D. Wright, Gaithersburg, both of Md., assignors to Marsh-McBirney, Inc., Frederick, Md.
Filed Jan. 2, 1992, Ser. No. 815,756
Int. Cl.⁵ G01F *3/38*
U.S. Cl. 73—861 13 Claims



1. Apparatus for determining the emptying characteristics of a wet well system (4), including a source of liquid (2) discharging into the wet well to fill the same, pump means (8) for pumping liquid out of the wet well, a source of pump status signals, means for generating a clock signal, and level sensing means for producing level signals corresponding with the level of the liquid at any given time;
the improvement which comprises:
(a) volume rate of change calculator means (310, 410, 510) for calculating a signal corresponding with the volume rate of change relative to time (dV/dt);
(b) emptying characteristics calculator means (318, 418, 518) for calculating the emptying characteristics of the system as a function of said volume rate of change level, clock and pump status signals;
(c) memory means (320, 420, 520) for storing said emptying characteristics;
(d) gate means (314, 414, 514) operable between enabled and disabled conditions for connecting said volume rate of change calculator means with, and disconnecting said volume rate of change calculator means from, said emptying characteristics calculator means, respectively; and
(e) sudden high inflow change detector means (316, 416, 516) for operating said gate means to the disabled condition when the rate of inflow into the wet well suddenly changes above a predetermined value.

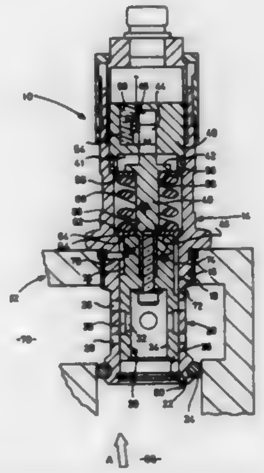
5,313,843
KARMAN VORTEX FLOW METER
Michihiko Tsuruoka; Wataru Nakagawa; Osamu Kashimura; Naohiro Konnose, and Hiromi Suzawa, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Continuation-in-part of Ser. No. 647,225, Jan. 29, 1991, Pat. No. 5,197,336. This application Apr. 8, 1992, Ser. No. 865,208
Claims priority, application Japan, Jan. 29, 1990, 2-18451; Jan. 10, 1991, 3-136884
Int. Cl.⁵ G01F *1/32*
U.S. Cl. 73—861.24 12 Claims

1. A Karman vortex flow meter for measuring the flow rate of a fluid under test, in a pipeline containing the fluid and having a longitudinal axis along which the fluid flows, comprising:
a vortex detector having a detector axis generally perpendicular to the longitudinal axis of the pipeline, said vortex detector including:
a post aligned with said detector axis;
a detector flange substantially coaxial with and at least partially surrounding said post, said detector flange having a flexible surface orthogonal to the post;



a columnar force receiving part axially aligned with the post and extending from the bottom of said post into the pipeline, said receiving part shaped for producing a Karman vortex when inserted into the pipeline, wherein the Karman vortex applies a force to the force receiving part;
a balance weight aligned with and at least partially surrounding said post, said balance weight movable along the axis of said post; and
a strain detecting element pushed against and secured to said detector flange by a disk spring interposed between said balance weight and said strain detecting element.

5,313,844
FLOW TRANSDUCER
George Kadlicko, Mississauga, Canada, assignor to Micro Hydraulics Inc., Ontario, Canada
Filed Jun. 10, 1992, Ser. No. 896,172
Int. Cl.⁵ G01F *1/26*
U.S. Cl. 73—861.54 10 Claims



1. A flow transducer to measure the rate of flow of a fluid in a conduit, said transducer including a body to be inserted in said conduit and having a sleeve serving as a fixed barrier to flow in the conduit, a piston slidable within said sleeve and having first and second fluid reaction surfaces, one of which is subjected to fluid pressure acting in one direction on one side of said sleeve and the other of which is subject to fluid pressure acting in the opposite direction on the opposite side of said sleeve, a first and second set of apertures formed in said sleeve and spaced apart in the direction of movement of the piston, a

port in said piston and movable to overlie one or other of said sets of apertures and thereby define an orifice for fluid flow from one side of said sleeve to the other, biasing means acting between said piston and said body to bias said piston to a predetermined position in which said port is axially located between said apertures and flow past said sleeve is prevented, and a signal generating means associated with said piston to provide a signal indicative of the position thereof relative to said predetermined position, said biasing means comprising a coil spring located within a cavity in said body, said cavity including a pair of axially spaced abutment surfaces co-operating with said coil spring to inhibit axial movement of said spring beyond said abutment surfaces, said piston extending through said spring and being engageable with opposite ends thereof whereby axial movement of said piston in either direction from said predetermined position causes one end of said spring to engage an adjacent abutment surface and the opposite end of said spring to be engaged by said piston to compress the spring and causing said signalling means to provide a signal indicative of the rate of flow of fluid through said conduit.

5,313,845

STRAIN DETECTOR

Kiyoshi Hayashi; Susumu Ootera; Hiroshi Sato, and Yoshihiko Utsui, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

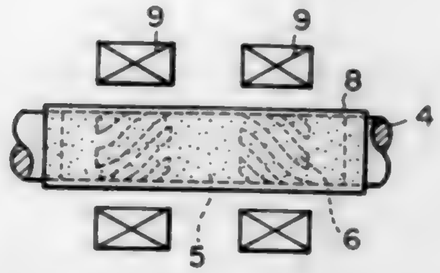
Filed May 30, 1990, Ser. No. 530,695

Claims priority, application Japan, May 31, 1989, 1-137937; May 31, 1989, 1-137938; May 31, 1989, 1-137939

The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.

Int. Cl.⁵ G01L *3/02*

U.S. Cl. 73—862.334 **7 Claims**



1. A strain detector, comprising:
a driven member, made of a soft magnetic material having a high permeability, for receiving an external force;
a magnetic shielding layer made of a non-magnetic or diamagnetic material having a high electric conductivity and selectively formed on a surface of said driven member;
a magnetic layer formed on a portion of the surface of said driven member at which said magnetic shielding layer is not formed;
a protecting layer formed on surfaces of said magnetic layer and said magnetic shielding layer; and
a detecting coil provided corresponding to said magnetic layer for detecting a variation in permeability of said magnetic layer corresponding to a strain of said magnetic layer by an external force applied to said driven member.

5,313,846

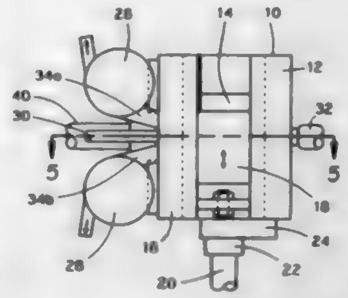
SAMPLE INTRODUCTION VALVE FOR SPECTROMETERS WITH SHUTTLE VALVE

David A. March, West Groton; Peter G. Brown, Westford, and David A. Hotham, Danvers, all of Mass., assignors to Leeman Labs Inc., Lowell, Mass.

Filed Jun. 10, 1991, Ser. No. 712,696

Int. Cl.⁵ G01N *35/00*

U.S. Cl. 73—864.81 **2 Claims**



1. A sample introduction valve for spectrometers comprising in combination:
a. a valve body;
b. a shuttle slideably mounted in said body said shuttle having a by-pass chamber and a pair of spaced apart transverse passageways disposed therein;
c. a first sample chamber for receiving an aerosol spray;
d. a second sample chamber for receiving an aerosol spray, each of said chambers having a first outlet port aligned with one of said transverse passageways and a second outlet port aligned with said by-pass chamber;
e. a drain pipe disposed in said valve body aligned with said by-pass chamber; and
f. a sample outlet pipe connected to said spectrometer disposed in said valve body aligned with said transverse passageways when said shuttle is in a first position a fluid connection from said first sample chamber to said outlet is created and a fluid connection from said second sample chamber to said by-pass chamber to said drain is also created; and when said shuttle is in a second position, a fluid connection from said second sample chamber to said outlet is created and a fluid connection from said first sample chamber to said by-pass chamber to said drain is also created.

5,313,847

BOTTLE INSPECTING MACHINE

Stephen M. Giometti, Horseheads, N.Y., assignor to Emhart Industries, Inc., Towson, Md.

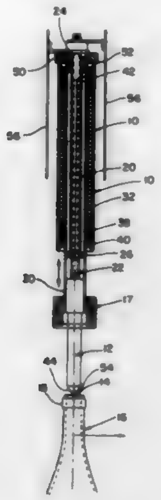
Filed Jan. 17, 1991, Ser. No. 642,404

Int. Cl.⁵ G01B *3/46*

U.S. Cl. 73—865.8 **2 Claims**

1. A machine for gaging the inner diameter and outer diameter of a bottle opening comprising
telescoping gage means including inner plug gage means and outer ring gage means,
said plug gage means including a plug gage tube with a plug gage at one end,
said ring gage means including a ring gage tube with a ring gage at one end, means for supporting said plug gage tube for axial displacement within said ring gage tube, including a first annular collar secured to the inner diameter of said ring gage tube and a second annular collar secured to the outer diameter of said plug gage tube and a first spring located between said plug and ring gage tubes and compressively located between said collars,
a driving tube, open at the top thereof,
ball and socket means located within said driving tube at one end thereof and having a hole extending therethrough for slidably receiving said ring gage tube,

a pair of annular cooperating taper bearings, one of said taper bearings being located within said driving tube at the other end thereof and the second of said taper bearings being secured to the outer diameter of said ring gage tube and,
a second spring located between said driving tube and said ring gage tube and compressively located between said ball and socket means and said second taper bearing so that said ring tube will normally be maintained in coaxial relation with said driving tube by said spring forcing said annular taper bearings into concentric relation to one another but said ring tube can be tilted relative to said driving tube about the center of said ball and socket means.



5,313,848

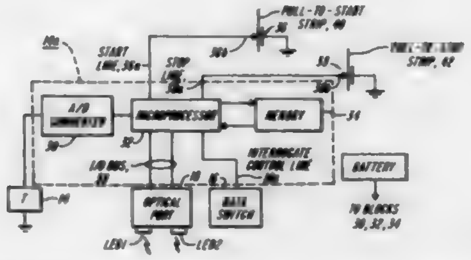
DISPOSABLE ELECTRONIC MONITOR DEVICE

Ernest M. Santin, Beverly; William A. Tout, North Andover; Peter M. Nunes, Newburyport; John W. Vanderpot, Rockport, and Donald W. Berrian, Topsfield, all of Mass., assignors to Sensitech, Inc., Beverly, Mass.

Filed Oct. 18, 1991, Ser. No. 778,777

Int. Cl.⁵ G01D *1/00, 1/04, 1/10;* **G01K** *7/00*

U.S. Cl. 73—866.2 **12 Claims**



1. Apparatus for monitoring an externally applied parameter, comprising
a housing enclosing:
A. a sensor having a characteristic that varies in a predetermined manner with variation of said parameter;
B. a monitoring and output network including:
i. means coupled to said sensor for generating a signal representative of variations of said characteristic over time,
ii. first storage means for storing values associated with selected portions of said signal, said selected portions including other than the most recent portion of said signal, and
iii. selectively operative means for generating an output signal representative of selected ones of said stored values; and
C. a power supply in operable communication with said sensor and said network.

5,313,849

DEVICE FOR TEMPORARILY HOLDING PRESSURE SENSOR IN PLACE WITHIN SPARK PLUG ATTACHING HOLE OF CYLINDER HEAD

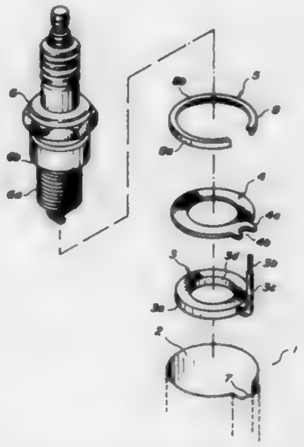
Shigeru Miyata; Yoshiaki Matsubara, and Takao Kojima, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Apr. 17, 1992, Ser. No. 870,473

Claims priority, application Japan, Apr. 25, 1991, 3-125208; Apr. 26, 1991, 3-038832

Int. Cl.⁵ G01D *21/00;* **G01L** *7/00, 9/00*

U.S. Cl. 73—866.5 **32 Claims**



1. A device for temporarily holding a pressure sensor in place within a spark plug attaching hole of a cylinder head prior to installation of a spark plug, comprising:
an annular body installed in the spark plug attaching hole and engageable with the pressure sensor for restraining movement of the pressure sensor within the spark plug attaching hole; and
resilient means connected to said annular body and resiliently deformed to attach itself to a circumferential wall of the spark plug attaching hole for thereby supporting said annular body on the circumferential wall of the spark plug attaching hole.

5,313,850

EARTH/GYRO POWER TRANSDUCER

Rodger C. Finvold, 4126 Quapaw Ave., San Diego, Calif. 921176, and Paul E. Humphrey, 7665 Central Ave., Lemon Grove, Calif. 92045

Filed Sep. 8, 1992, Ser. No. 872,513

Int. Cl.⁵ G01C *19/18, 19/00*

U.S. Cl. 74—5.9 **27 Claims**

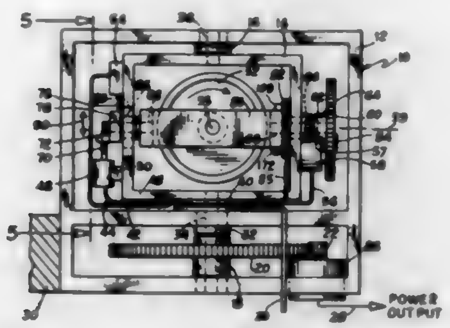
1. A planetary inertial power source comprising:
(a) a gyroscope comprising:
(i) a rotor with a rotor axis;
(ii) inner gimbal member having an inner gimbal axis and journalling said rotor to rotate about said rotor axis;
(iii) an angularly space-stable outer gimbal member journalling said inner gimbal member to rotate about said inner gimbal axis, said outer gimbal member having an outer gimbal axis orthogonal to said inner gimbal axis;
(b) a frame member orientationally fixed to the earth such that the outer gimbal axis is substantially parallel to the earth's polar axis and journaling said outer gimbal to rotate about said outer gimbal axis;
(c) a power transducer coupled between two of said mem-

VOL
1162
ISS
4
MY
24
1994
UMI

bers such that relative motion between the spatially rotating earth and the space-stable outer gimbal generates a gyroscopic precessionally-derived reaction torque that drives said power transducer to produce output power; and,

(d) re-precessing means for providing reorientational torques about an axis in an equatorial plane and about the polar axis.

21. A method of extracting energy from a gyroscope system using the rotation of the earth comprising:



(a) with a gyroscope having at least one inherently angularly spatially stable gimbal member and being journalled in a frame member, fixing said frame member non-angularly-displaceably to the earth such that as the earth rotates precession torques on the gyroscope rotor spin axis cause said at least one gimbal member to precess in said frame member; and

(b) with a mechanical energy transducer coupled between two of said members, transducing power and energy from the relative motion and precession-inducing torque therebetween and outputting same as a net positive energy output from the system.

5,313,851

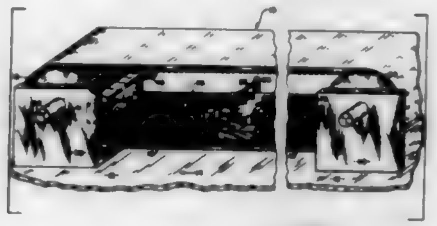
REUSABLE MASS PROPULSION SYSTEM

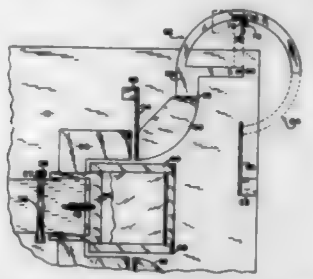
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Donald E. Joslin, P.O. Box 583, Kings Beach, Calif. 96143

Filed Feb. 21, 1992, Ser. No. 840,726

Int. Cl.^{5} F16H *33/20*

U.S. Cl. 74—84 R **10 Claims**





1. Apparatus for developing a propulsion force comprising; a first and second drive gear, mounting means to mount said gears to a host vehicle, means to drive at least one of said gears, a continuous flexible connecting member, said connecting member being in communication with said gears to provide a continuous linear motion, a first mass, a mounting means for said first mass, said mounting means allowing said first mass to reciprocally travel in a linear direction between a first and second position on said last named mounting means, means to engage and dis-engage said first mass with said connecting member, means to mount said mounting means for said first mass, in a parallel relationship with said connecting member, an elastic member, said elastic member having a first and second end, said first end having means to be affixed to said first mass, said second end having means to be affixed to said means to mount said gears to a host vehicle, a second pair of masses, said second pair of masses being substantially in the form of wedge shaped quarter circles having first and second edges said edges joining at their apex, means to mount said second pair of masses at their apexes to said host vehicle on a plane substantially 90 degrees to said linear direction of said reciprocal travel of said first mass, said last named mounting means holding said second pair of masses in a suspended state, a third pair of masses, said third pair of masses being substantially in the form of wedge shaped quarter circles, having first and second edges, said edges joining at their apex, means to pivotably mount said third pair of masses at their apexes to said host vehicle on a plane substantially 90 degrees to said linear direction of said reciprocal travel of said first mass, said third pair of masses having a first and t second position, said first position of said third pair of masses allowing said first edges of said third masses to be in a touching relationship with said second edges of said second pair of masses, said third masses having most of their mass on their said first edges, resilient stop means for said third pair of masses when said third pair of masses reach their said second position, said second position being substantially one quarter turn from said first position, said resilient stops being capable of exerting enough return force to said third pair of masses to return said third pair of masses to their said first positions, dampening means, said dampening means being in communication with said third pair of masses, said dampening means allowing said third pair of masses to freely move from their said first position to their said second position, said dampening means partially restraining said third pair of masses on their return to their said first position,

whereby,

when said first mass is engaged with said connecting member between said gears, said first mass travels in a non-accelerating linear direction corresponding to the direction in which said host vehicle is traveling assuming a tensioned first position by stretching said elastic member between said first mass and said host vehicle whereupon, when said first mass is released from said connecting member, said first mass is accelerated in the opposite direction in which said host vehicle is traveling imparting thrust to said host vehicle, said first mass then striking said first edges of said second pair of masses when it reaches its maximum acceleration thus imparting its force to said second pair of masses, said second masses imparting said force through their, said second edges to said first edges of said third pair of masses, said third masses being rotated on their axis thus imparting by centrifugal force a second thrust to said host vehicle, said third pair of masses upon reaching their said second position striking their said second edges against said resilient stops thus imparting a third thrust to said host vehicle, said third pair of masses then being returned to their said first positions by force from said resilient stop,

and,

during the return of said third pair of masses to their said first positions said dampening means imparts a forth thrust to said host vehicle.

5,313,852

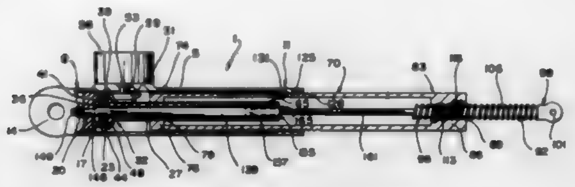
DIFFERENTIAL LINEAR ACTUATOR

Aldo Arena, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Long Island, N.Y.

Filed Nov. 6, 1992, Ser. No. 972,543

Int. Cl.^{5} F16H *29/02, 1/20*

U.S. Cl. 74—89.15 **15 Claims**



1. A differential linear actuator comprising:

an actuator housing having a first end, adapted to fixedly mount said actuator housing to a support structure, and an open second end,

an elongated drive sleeve mounted within said housing for rotation about a longitudinal axis, said drive sleeve including an axially splined outer surface;,

means for rotatably driving said drive sleeve;

an intermediate actuator member concentrically mounted between said actuator housing and said drive sleeve, said intermediate actuator member including a first end portion, an intermediate portion and a second end portion, said first end portion including an internally splined section intermeshingly engaged with the splined outer surface of said drive sleeve such that rotation of said drive sleeve by said drive means causes rotation of said intermediate actuator member and said second end portion extending axially out of the open second end of said actuator housing;

first axial shifting means interconnected between the intermediate portion of said intermediate actuator member and said actuator housing for causing said intermediate actuator member to be axially shifted relative to said housing upon rotation of said intermediate actuator member;

an elongated output member adapted to be secured, at one end thereof, to a linearly movable element, said output member being concentrically mounted with respect to said intermediate actuator member; and

second axial shifting means interconnected between said second end portion of said intermediate actuator member and said output member for causing said output member to be axially shifted, in a direction opposite to the axial shifting direction of said intermediate actuator member, upon rotation of said intermediate actuator member.

5,313,853

FLAT SPRING BIASED SHIFTER

Bruce E. Olmsted, and Stanley A. Tjapkes, both of Fruitport, Mich., assignors to Grand Haven Stamped Products Company, Div. of JSJ Corporation, Grand Haven, Mich.

Filed Dec. 14, 1992, Ser. No. 992,243

Int. Cl.^{5} F16H *59/04;* G05G *9/053*

U.S. Cl. 74—473 P **36 Claims**

1. A shifter for an automotive transmission comprising:

an elongated, pivotable shift stick having an upper end and a lower end, said upper end being manually actuatable and said lower end having means for changing the drive ratio of the transmission when said shift stick is pivoted;

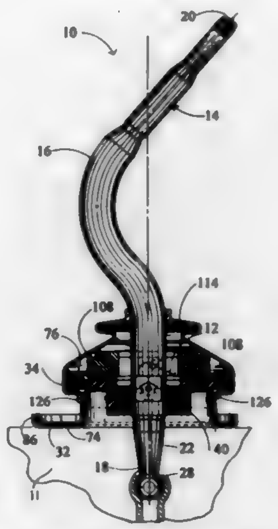
a base for mounting said shifter on the transmission;

means for pivotally mounting said shift stick on said base for movement about first and second axes orthogonal to each other;

at least one washer-like spring having an aperture therein through which said lower end of said shift stick extends, said at least one washer-like spring being normally planar in an unstressed condition but being resiliently compressible into a curvilinear cross-sectional shape;

retainer means for retaining said at least one washer-like spring on said base;

means for compressing said at least one washer-like spring along said first axis into said curvilinear cross-sectional shape; and



means associated with said shift stick for engaging said at least one washer-like spring along said second axis orthogonal to said first axis to resiliently flex said at least one washer-like spring about said first axis as said shift stick is moved from a predetermined position thus causing said at least one washer-like spring to spring bias said shift stick to return to the predetermined position.

5,313,854

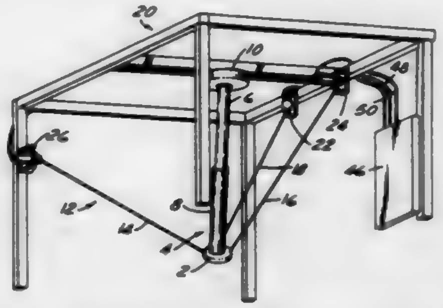
LIGHT WEIGHT ROBOT MECHANISM

Hadi A. Akeel, Rochester Hills, Mich., assignor to Fanuc Robotics North America, Inc., Auburn Hills, Mich.

Continuation of Ser. No. 830,888, Feb. 4, 1992, abandoned. This application May 7, 1993, Ser. No. 59,176

Int. Cl.^{5} G05G *11/00;* B25J *11/00*

U.S. Cl. 74—479 BF **13 Claims**



1. An object positioning mechanism adjustable with respect to a work space adaptable for working on a large workpiece such as a commercial aircraft or the like, comprising:

a structure surrounding said work space;

a pivot block adapted to be fixed with respect to said structure;

an object flange spaced from said pivot block and adapted to hold a tool for working on said workpiece;

a collapsible element having first and second members movable linearly with respect to each of other;

the first member being pivotally connected to the pivot

VOL
162
ISS
4
MY
24
1994
UMI

block and the second member being affixed to the object flange;
a plurality of anchor blocks each being independently mountable on said structure with respect to the pivot block and the work space;
a plurality of actuators, each mounted on a respective one of the anchor blocks; and
tensile means including a plurality of tensile portions, at least two of said tensile portions connected at one end thereof to the object flange and at the respective other ends thereof to a respective one of the actuators, each of the actuators being energizable to change the length of its respective tensile portion by selectively pulling on its respective tensile portion whereby the tensile portions in cooperation with said collapsible element exert forces on the object flange that provide a state of force equilibrium, and wherein the anchor blocks are mountable on said structure with respect to the pivot block and each anchor block is mounted independently of each other anchor block to minimize the loading on the actuators in relation to the applied forces acting on the mechanism.

5,313,855
SYSTEM FOR THE OPEN-LOOP CONTROL OF A MOTOR VEHICLE

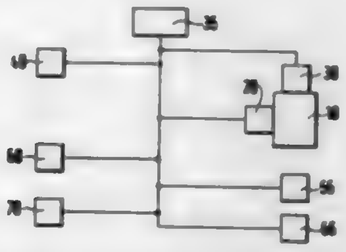
Jürgen Bräuninger, Stuttgart; Herbert Schramm, Leonberg-Höfingen; Volker Kadelbach, Freiberg; Josef Wirz, Erdmannhausen; Thomas Küttner, Stuttgart; Dieter Seher, Ilsfeld, and Wolfgang Flögel, deceased, late of Esslingen, all of Fed. Rep. of Germany by Roland Flögel, Katharina Flögel, heirs, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 11, 1991, Ser. No. 757,683

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1990, 4028809

Int. Cl.⁵ F16H *59/74*

U.S. Cl. 477—111 **17 Claims**



1. A system for the open-loop control of a power-regulating positioning unit in a motor vehicle, comprising:
a drive slip control unit coupled to the positioning unit, the drive slip control unit providing a first control signal for influencing the position of the positioning unit;
means for providing a second control signal for influencing the position of the positioning unit, the means for providing coupled to the positioning unit, the second control signal dependent upon a driver request; and
an automatic transmission control unit coupled to the positioning unit, the automatic transmission control unit providing a third control signal for influencing the position of the positioning unit, the third control signal having a greater influence on the positioning unit than the first and second control signals during a first predetermined period of time.

5,313,856
MULTISTAGE TRANSMISSION AND SHIFTING PROCESS THEREFOR

Arthur Schneider, Braunschweig, and Christian Klarhoefer, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

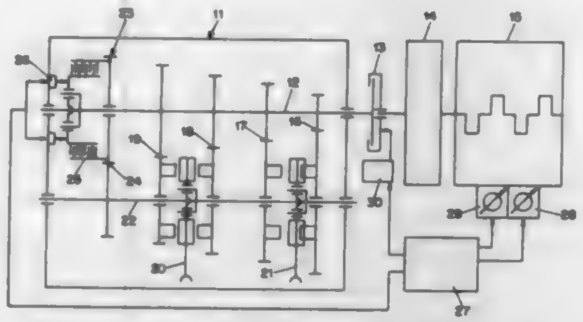
PCT No. PCT/EP90/02217, § 371 Date Jul. 14, 1992, § 102(e) Date Jul. 14, 1992, PCT Pub. No. WO91/13271, PCT Pub. Date Sep. 5, 1991

PCT Filed Dec. 17, 1990, Ser. No. 910,172

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 4006357

Int. Cl.⁵ F16H *61/08*

U.S. Cl. 477—80 **15 Claims**



1. A method of shifting a vehicle transmission having a transmission input shaft connectable to a drive motor, a transmission output shaft, a plurality of gear stages, each including a pair of gear wheels supported on the transmission input shaft and the transmission output shaft, respectively, one of each pair of gear wheels being fixed on its supporting shaft and the other of each pair of gear wheels being supported as a loose wheel on its supporting shaft and being connectable thereto by a coupling device for the purpose of engaging the corresponding gear, and at least one additional gear stage comprising applying torque from the transmission input shaft at least partly through the additional gear stage to the transmission output shaft in order to relieve a previously engaged gear stage and vary the speed of the transmission input shaft, disengaging the previously engaged gear stage by disconnecting the loose wheel thereof from the corresponding transmission shaft, synchronizing the speed of the transmission input shaft to a synchronous speed for a next gear stage to be engaged by controlling the change of speed of the transmission input shaft in accordance with a speed gradient value which is a function of at least one operating characteristic of the drive motor and engaging the next gear stage to be engaged by connecting the loose wheel thereof to the corresponding transmission shaft.

5,313,857
OPENER/CLOSURE FOR SCREW TYPE CONTAINER CAPS

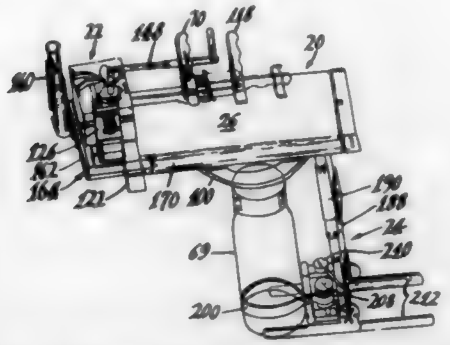
Richard Weisband, 3938 E. Grant Rd. #262, Tucson, Ariz. 85712

Filed Apr. 21, 1993, Ser. No. 49,355

Int. Cl.⁵ B67B *7/18*

U.S. Cl. 81—3.31 **15 Claims**

1. A opener/closure for containers having twist cap closures comprising:
a substantially rectangular housing having side and end flanges and an open bottom;
a pair of interconnected jaws slidably mounted within said housing for sliding movements between and parallel with said side flanges and selectively toward and away from each other and said end flanges;
said jaws having cap gripping edges facing each other:
a handle secured to one of said jaws for manually moving said jaws simultaneously toward or away from each other whereby said gripping edges of said jaws are effective to grip or release container twist caps positioned between said jaws; and



means for simultaneously rotating said housing and said jaws for loosening or tightening a container twist cap.

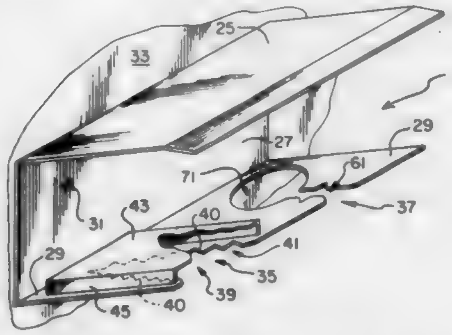
5,313,858
RUBBER STOPPER REMOVER

Robert R. Stitt, Arvada, Colo., assignor to Midwest Research Institute, Kansas City, Mo.

Filed Mar. 8, 1993, Ser. No. 28,691

Int. Cl.⁵ B67B *7/16*

U.S. Cl. 81—3.55 **9 Claims**



1. Device for removing a rubber stopper from its installed position in the end of a glass tube, said rubber stopper having a generally cylindrical stem and a flange top, said device including:
a. a support web adapted to be fastened to a wall surface;
b. a splash guard extending generally horizontally and outwardly from said support web;
c. a lower plate extending outwardly from said support web and spaced a predetermined distance below said splash guard, and having an outer edge, said plate having an opening extending inward from said outer edge, said opening characterized by first and second spaced-apart tapered opposing edges that converge toward each other to a narrowed portion of narrowly spaced edges;
d. an opening larger than said flange top, in said lower plate, inward of, and adjoining said narrowly spaced edges.

5,313,859
REMOVER FOR CHILD RESISTANT CLOSURE

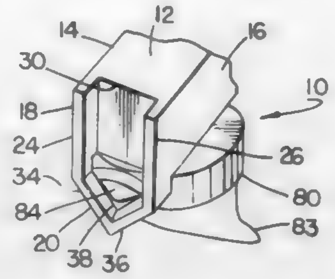
Gage Garby, and Jeffery T. Ballas, both of Boulder, Colo., assignors to Senetics, Inc., Boulder, Colo.

Filed Mar. 26, 1993, Ser. No. 38,578

Int. Cl.⁵ B67B *7/44*

U.S. Cl. 81—3.55 **16 Claims**

1. A device for removing from a container a cap having a top portion and a peripheral skirt, the peripheral skirt having one side with a radially extending protrusion and an opposite side wherein the protrusion of the cap is v-shaped with a first edge extending upwardly and in a first circumferential direction around the cap and a second edge extending upwardly and in a second circumferential direction opposite the first circumferential direction, the device comprising: a body with one end having a notch to receive the protrusion and a free end opposite the notch end and a length therebetween, wherein the notch includes a first wall to engage said first edge and a second wall to engage said second edge the length of the body being such that when the notch receives the protrusion on said one side of the peripheral skirt the free end overhangs the opposite side of the peripheral skirt so that urging the free end toward the container pivots the body to urge the notch end away from the container to pry the cap off the container.



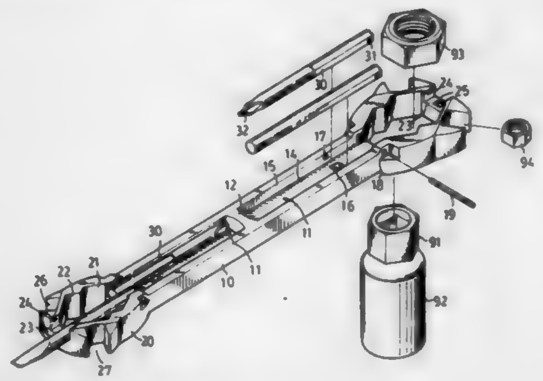
5,313,860
COMPOUND TOOL

Mou T. Liou, No. 25, Lane 86, Tawei Rd., Tali Hsiang, Taichung Hsien, Taiwan

Filed Nov. 3, 1992, Ser. No. 970,796

Int. Cl.⁵ B25P *1/00*

U.S. Cl. 81—437 **6 Claims**



1. A tool comprising:
an elongated body having two ends;
a head portion having a first end integral with at least one of said ends of said elongated body and having a second end which is a free end with a notch formed therein with first retaining means formed in said notch, said head portion defining a first plurality of engaging surfaces for driving objects;
said elongated body having a groove extending along a portion of the length of the body, said groove defining a storing compartment;
a second retaining means formed in said storing compartment;
two holes formed in said body adjacent said first end of said head portion and disposed on either side of the groove;
a pin element having opposite ends accommodated in a respective one of said two holes; and
a screwdriver shank mounted to the pin element for pivoted rotation thereabout between a working position in which the screwdriver shank is received within said notch and retained within said notch by said first retaining means, and a storage position in which the screwdriver shank is received within said storing compartment and retained in said storing compartment by said second retaining means.

VOL
162
ISS
4
MY
24
1994
UMI

5,313,861
WORKPIECE EXCHANGING SYSTEM

Yoshiaki Ikeda, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

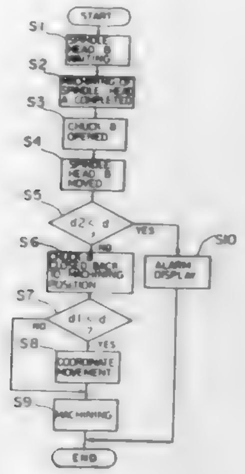
PCT No. PCT/JP90/01620, § 371 Date Aug. 12, 1991, § 102(e) Date Aug. 12, 1991, PCT Pub. No. WO91/08851, PCT Pub. Date Jun. 27, 1991

Continuation of Ser. No. 741,529, Aug. 12, 1991, abandoned. This PCT application Dec. 11, 1990, Ser. No. 972,354

Claims priority, application Japan, Dec. 15, 1989, 1-325600

Int. Cl.⁵ B23B *1/00*

U.S. Cl. 82—1.11 **2 Claims**



1. A workpiece exchanging method for a CNC lathe having at least two spindle heads, comprising the steps of:

(a) machining a workpiece using a first spindle head;

(b) moving a second spindle head toward the first spindle head while loading a servo motor controlling the second spindle head to a torque limit;

(c) detecting an error of the servo motor when said moving of the second spindle head in step (b) is completed;

(d) determining whether the workpiece is clamped by a chuck mounted at the second spindle head;

(e) machining the workpiece using the second spindle head when the error is not greater than a first allowable value;

(f) shifting the workpiece relative to the spindle heads in dependence upon the error when the error is more than the first allowable value and is less than a second allowable value;

(g) displaying an alarm and stopping the CNC lathe when the error is more than the second allowable value; and

(h) machining the workpiece using the second spindle head after said shifting in step (f).

5,313,862
APPARATUS FOR CUTTING

Kjell Johansson, Falkenberg, Sweden, assignor to Core Link AB, Falkenberg, Sweden

PCT No. PCT/SE91/00366, § 371 Date Nov. 23, 1992, § 102(e) Date Nov. 23, 1992, PCT Pub. No. WO91/17855, PCT Pub. Date Nov. 28, 1991

PCT Filed May 21, 1991, Ser. No. 952,720

Claims priority, application Sweden, May 22, 1990, 9001835-9

Int. Cl.⁵ B26D *1/18*

U.S. Cl. 83—156 **6 Claims**

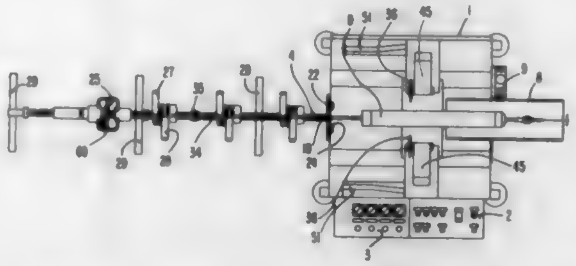
1. An apparatus for cutting a cylindrical sleeve (7) as the sleeve (7) is continuously displaced in its longitudinal direction, during continuous manufacture of the sleeve (7), the apparatus comprising:

a longitudinal slide (30) which is displaceable synchronously with the sleeve (7) during rotation and movement of the sleeve in its longitudinal direction;

a knife (36);

a cross slide (39,43) having the knife (36) mounted thereon, the cross slide (39,43) being reciprocal transversely of the longitudinal direction of the sleeve (7), and thereby transversely of the direction of movement of the longitudinal slide (30), for impressing the knife (36) into the wall of the sleeve (7) during longitudinal displacement of the longitudinal slide (30) and the sleeve (7), for cutting a desired length of the sleeve (7), the cross slide (39,43) having a forward, knife-carrying section (43,44) and a rear section (39,40) guiding the reciprocal movement during the longitudinal displacement;

a piston and cylinder assembly (41,42) interconnecting the cross slide sections (43, 44; 39,40) with one another, for fixing the mutual position of the sections and for disengaging the sections (39,40; 43,44) from one another after movement a predetermined distance in towards the longitudinal axis of the sleeve (7);



a plurality of rails (37) having the cross slide sections (39,40; 43,44) mounted thereon for the movement transversely of the longitudinal axis of the sleeve (7);

a plate member (52) having a guide groove (51) extending therealong, the guide groove over at least a part of its length being angled obliquely relative to the sleeve (7); and

a guide pin (50) extending from the rear section (39,40) into the guide groove (51) to reciprocate in the guide groove (51) during movement of the longitudinal slide (30) synchronously with the sleeve (7) and back to its starting position.

5,313,863
APPARATUS FOR FORMING SLITS

Kintaro Aihara, Chiba, and Tadashi Honda, Tokyo, both of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

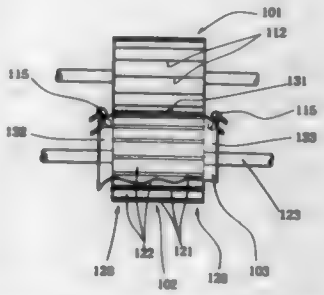
PCT No. PCT/JP91/00599, § 371 Date Jan. 20, 1992, § 102(e) Date Jan. 20, 1992, PCT Pub. No. WO91/17026, PCT Pub. Date Nov. 14, 1991

PCT Filed May 1, 1991, Ser. No. 778,863

Claims priority, application Japan, May 1, 1990, 2-111837

Int. Cl.⁵ B26D *1/40, 7/14;* **B26F** *1/20*

U.S. Cl. 83—171 **14 Claims**



1. A slit forming apparatus for forming slits in the lateral direction of a strip-shaped material, said strip-shaped material having a main central portion and side margin portions, which apparatus comprises a first rotating member having a rotation axis and a periphery and rotating in a first direction, a second rotating member having a rotation axis, said first rotating member having blades for forming lateral slits only in said main central portion, said blades having a longitudinal extension and being located on said periphery of said first rotating member such that said longitudinal extension is parallel to said rotation axis, said second rotating member having a peripheral surface and a backing portion for backing said main central portion and rotating in a second direction opposite to said first direction, said blades penetrating said strip-shaped material when said first rotating member rotates and said strip-shaped material passes between said first rotating member and said second rotating member, said second rotating member having recessed portions for receiving said blades when they penetrate said main portion; and conveying means for conveying said strip shaped material by pulling only said side margin portions in a third direction to separate said side margin portions from said first rotating member and to position said side margin portions at an angle with respect to said main central portion wherein said third direction is diagonal to said rotation axis of said second rotating member such that said main central portion passes between said first rotating member and said second rotating member and is pressed portions said backing portion, a tension along a part of said peripheral surface of said second rotating member is applied to said side margin portions, and the longitudinal movement of said strip-shaped material is controlled.

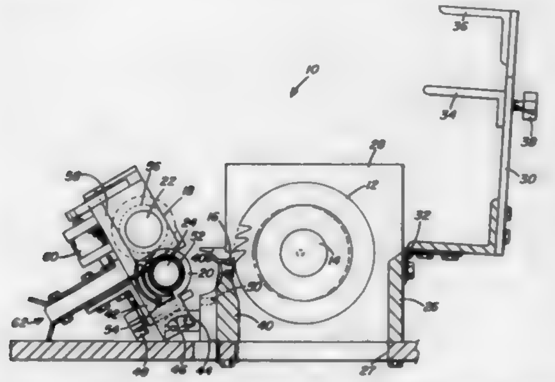
5,313,864
PLASTIC STRAND PELLETIZER

Anthony R. Forgash, Bay City, and Henry E. Richardson, Gladwin, both of Mich., assignors to The Conair Group, Inc., Pittsburgh, Pa.

Filed Oct. 26, 1992, Ser. No. 966,300

Int. Cl.⁵ B26D *7/00*

U.S. Cl. 83—349 **17 Claims**



15. A strand pelletizer for pelletizing extruded plastic strands comprising a helical cutter, a bed knife, upper and lower feed rolls each mounted in mounting means comprising bearing blocks for feeding strands to said helical cutter and a housing forming a cutting chamber around said helical cutter, said bed knife and said upper and lower feed rolls;

said housing including a cover, an end wall and a base;

said housing cover being pivotably secured to said housing base so that said cover may be pivoted away from said base to provide access to said helical cutter and a portion of said mounting means for said upper feed roll;

a threaded hand knob for selectively locking said housing cover in a closed operating position relative to said base;

said upper and lower feed rolls each journaled for rotation in said bearing blocks;

said housing end wall retaining said upper feed roll bearing blocks and said lower feed roll bearing blocks and being slideably and pivotably mounted to said base to provide access to said feed rolls for maintenance and cleaning;

said upper feed roll bearing blocks being slideably mounted within said end wall;

said lower feed roll bearing blocks being bolted to said housing end wall;

threaded hand knobs for selectively locking said housing end wall in a vertical operating position relative to said base;

said base having an upwardly projecting mounting means for fixedly positioning said bed knife relative to said helical cutter;

an inlet to said cutting chamber to direct plastic strands between said upper and lower feed rolls;

said upper and lower feed rolls being positioned to feed said plastic strands over said bed knife when said housing end wall is locked in its vertical operating position.

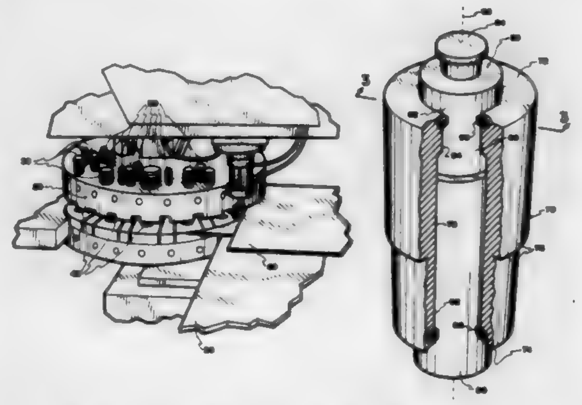
5,313,865
TURRET STATION RESTORATION APPARATUS

Richard D. Layton, North Salt Lake, Utah, assignor to Advanced Turret Engineering Co., Bountiful, Utah

Filed Oct. 13, 1992, Ser. No. 960,045

Int. Cl.⁵ B26F *1/00;* **F16C** *29/02*

U.S. Cl. 83—635 **5 Claims**



1. A facilely reparable and maintainable turret table toolholder guide station comprising:

a vertical bore centrally inaccessible in which a toolholder having predetermined diameter is generally concealed and reciprocably guided, said bore comprising a cylindrical wall of at least one predetermined diameter in which at least two generally concealed grooves are horizontally disposed; wherein said cylindrical wall forming the vertical bore comprises a stepped bore comprising an upper cylindrical section having a first diameter and a lower cylindrical section having a second diameter, said first and second diameters being of essentially different longitudinal lengths to accomodate the stepped configuration of the toolholder and

at least two shape-retaining removable toolholder generally concealed guide annular wear strips one disposed in each groove and each having a predetermined diameter less than the adjacent diameter of the cylindrical wall and substantially the same as the adjacent diameter of the toolholder thereby providing a substantially continuous contact only between each replaceable annular wear strips and the toolholder.

5,313,866
GUITAR STAND

Kevin M. Smith, Mound, Minn., assignor to Guitar & Light Fabrication, Mound, Minn.

Filed Oct. 30, 1992, Ser. No. 968,983

Int. Cl.⁵ G10D *3/00*

U.S. Cl. 84—327 **7 Claims**

1. A stand for a guitar, said guitar including a guitar neck and a guitar base, said guitar neck extending above said guitar base and including a tuning head, whereby said guitar is supported alongside stage amplification equipment, comprising:

VOL 162
ISS 4
MY 24 1994
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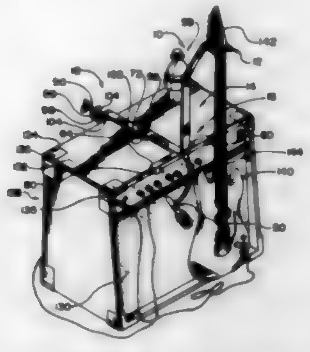
yoke means for holding said tuning head;

support means operably coupled to said yoke means for balancing said guitar against said stage amplification equipment, said support means including a generally upright arm, a base and a front brace, said upright arm including an upper and lower portion, said upper portion



including a front plate and back plate, said front plate operably joined to said back plate at an angle of less than 90°; and

clamp means operably, detachably, adjustably coupled to said support means for adjustably attaching said support means to said stage amplification equipment.

5,313,867

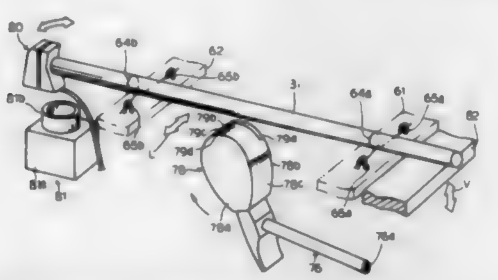
GLOCKENSPIEL EQUIPPED WITH HAMMER HEADS DIFFERENT IN HARDNESS FOR CHANGING TONE COLOR

Norishige Terada, and Shinsuke Irisa, both of Shizuoka, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 24, 1992, Ser. No. 981,179

Int. Cl.^{5} G10D *13/08*

U.S. Cl. 84—404 **11 Claims**



1. A glockenspiel comprising:

a) a keyboard implemented by a plurality of keys;

b) a tuned sound bar array implemented by a plurality of tuned sound bars respectively associated with said plurality of keys;

c) a key action mechanism having a plurality of key action sub-mechanisms respectively linked with said plurality of keys;

d) a hammer mechanism having a plurality of hammer sub-mechanisms respectively linked with said plurality of key action sub-mechanisms for striking said plurality of tuned sound bars when said keys are selectively depressed, each of said plurality of hammer sub-mechanisms comprising a hammer body, and a plurality of hammer heads different in hardness and provided on a surface of said hammer body for selectively being brought into abutting engagement with the associated tuned sound bar when the associated key is depressed; and

e) a shifting mechanism driven by a player and operative to change relatively relation between said hammer body and said associated tuned sound bar so as to allow said plurality of hammer heads to be selectively brought into abutting engagement with said associated tuned sound bar.

5,313,868

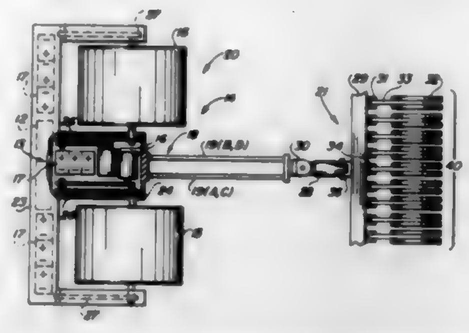
TRANSPORT PLATFORM AND MINE EXPLODER

Daniel Wolf, 4020 Hunnicutt St., San Diego, Calif. 92109

Filed Nov. 2, 1992, Ser. No. 970,306

Int. Cl.^{5} F41H *11/12*

U.S. Cl. 89—1.13 **18 Claims**



1. A tractor system for exploding anti-personnel mines comprising:

a frame; and

first, selected, mobile support means for supporting said frame for movement over varied terrain;

said first support means being structured to create a broad ground contacting area to so distribute the weight of said tractor system over the surface of said terrain such that ground pressure force concentrations created by passage of said first support means are generally insufficient in magnitude to trigger an anti-personnel mine disposed in said terrain; and

means coupled to said frame for transporting auxiliary equipment over said terrain for exploding said anti-personnel mine.

5,313,869

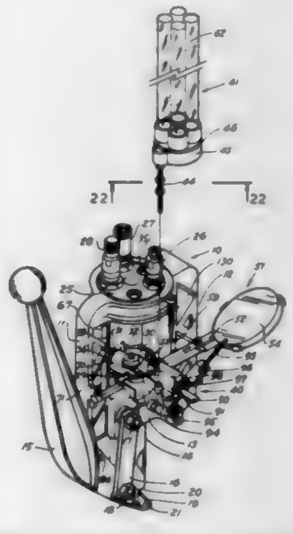
SHELL RELOADER

Richard J. Lee, Hartford, Wis., assignor to Lee Precision, Inc., Hartford, Wis.

Filed Dec. 10, 1992, Ser. No. 988,814

Int. Cl.^{5} F42B *33/02*

U.S. Cl. 86—25 **15 Claims**



1. An ammunition case reloader comprising:

a frame,

a member on the frame for supporting a plurality of reloading tools at angularly spaced apart stations,

a ram mounted to said frame for moving alternately upwardly toward said tools and downwardly away from said tools,

a shell plate carrier mounted to the ram and a shell plate mounted to the carrier for being indexed rotationally in angular steps,

an operating lever mounted for swinging alternately downwardly and upwardly, and means for operatively coupling the lever to the ram such that swinging the lever downwardly moves the ram upwardly to an uppermost position wherein a case on said shell plate engages a tool and swinging the lever upwardly moves the ram and the shell plate thereon downwardly to a lowermost position for the shell plate to move downwardly through an indexing position after the ram moves through more than a majority of the distance from its said uppermost to its said lowermost position,

a shell plate indexer member supported from the ram for being driven in one direction to engage the shell plate and turn it through one angular step under the influence of said lever when the lever has swung upwardly far enough to move said shell plate downwardly to said indexing position, and

means for retracting said indexer member oppositely from said one direction to a reset condition in response to said ram moving to said uppermost position under the influence of said lever moving downwardly.

5,313,870

DOUBLE PISTON PROPULSION UNIT

Robert O. Clark, Tonbridge, United Kingdom, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Hants, England

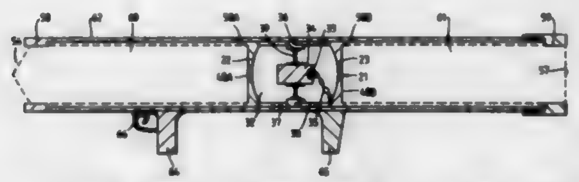
PCT No. PCT/GB91/01661, § 371 Date Apr. 23, 1993, § 102(e) Date Apr. 23, 1993, PCT Pub. No. WO92/06344, PCT Pub. Date Apr. 16, 1992

PCT Filed Sep. 27, 1991, Ser. No. 39,143

Claims priority, application United Kingdom, Sep. 27, 1990, 9021060

Int. Cl.^{5} F41A *1/10*

U.S. Cl. 89—1.701 **10 Claims**



1. A double piston propulsion unit for a recoilless mass/-countermass projectile launch system comprising:

two pistons of substantially equal mass arranged in a back-to-back relationship;

a propellant charge disposed between the two pistons, wherein each piston comprises a hollow cylinder with a closed outer end and an open inner end; and

a circumferential rupturable connecting means for joining together said open inner ends of the pistons such that the pistons together form a vessel enclosing said propellant charge, the hollow cylinder of each piston comprising a piston skirt.

5,313,871

HYDRAULIC CONTROL SYSTEM UTILIZING A PLURALITY OF BRANCH PASSAGES WITH DIFFERING FLOW RATES

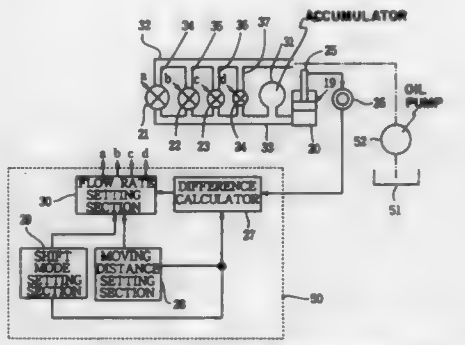
Hitoshi Kaneko, and Shunichi Ichikawa, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 12, 1992, Ser. No. 850,362

Claims priority, application Japan, Jul. 17, 1991, 3-202436

Int. Cl.^{5} F15B *13/16*

U.S. Cl. 91—361 **4 Claims**


ACCUMULATOR
OIL PUMP
FLOW RATE SETTING SECTION
DIFFERENCE CALCULATOR
SHIFT MODE SETTING SECTION
MOVING DISTANCE SETTING SECTION
a
b
c
d

1. A hydraulic control system for controlling an actuator having a cylinder and a piston, the hydraulic control system having an oil pump, a first passage communicated with an oil reservoir through the oil pump, a second passage communicated with the cylinder of the actuator, comprising:

a plurality of branch passages connected in parallel between the first and second passages;

an electromagnetic valve provided in each branch passage for controlling flow rate of oil passing therethrough;

means for changing the flow rate in each branch passage;

detecting means for detecting moving distance of the piston and for producing a digital distance signal representing a detected moving distance;

flow rate control means responsive to the digital distance signal from the detecting means for producing digital control signals for operating said electromagnetic valves in such a manner that ratios among the flow rates at every branch passage becomes 2^n, thereby moving the piston a desired distance at controlled speeds,

wherein n equals 0, 1, 2, 3.

5,313,872

END OF STROKE CUSHION FOR A LINEAR HYDRAULIC MOTOR

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Apr. 28, 1993, Ser. No. 54,531

Int. Cl.^{5} F15B *15/22*

U.S. Cl. 91—407 **3 Claims**

1. A linear hydraulic motor, comprising:

a piston-cylinder unit having a cylinder body reciprocally slidable on a piston rod, said piston rod having a piston head defining a working chamber within the cylinder body, and said piston rod being tubular and having a plurality of sidewall ports;

a radially expandable annular valve ring normally snugly surrounding the piston rod, wherein during axial movement of the cylinder body relative to the piston rod, the valve ring will move axially relative to the sidewall ports in the piston rod;

wherein pressure introduction to said working chamber through the tubular piston rod causes oil to flow through the sidewall ports of the piston rod and against the valve ring, to radially expand the valve ring, and allow the oil flow to move into the working chamber such that when said chamber expands, said cylinder body and said valve ring will move axially relative to the sidewall ports, successively uncovering the ports during movement; and

wherein removal of fluid from said working chamber will

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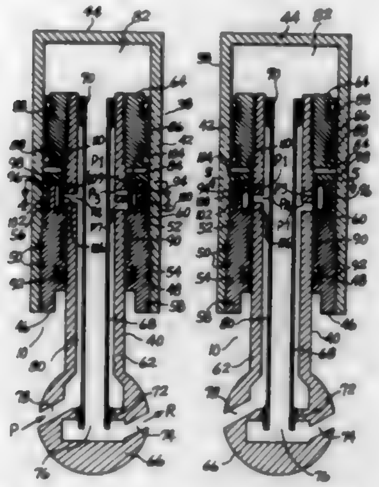
cause oil movement out from the chamber, through the sidewall ports into the tubular piston rod such that when the linear motor approaches the end of its stroke the valve ring will close in succession the sidewall ports in the piston rod which allow oil flow out from the working chamber.



5,313,873
DEVICE FOR CONTROLLING THE FLOW OF FLUID TO A FLUID UNIT

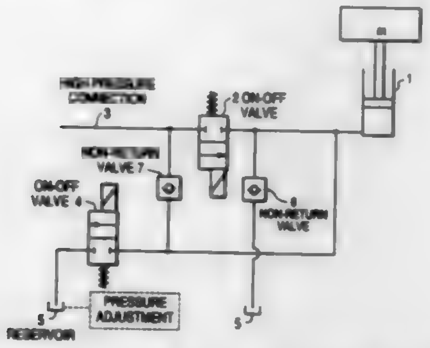
Heinz Gall, Herrenberg, and Kurt Sean, Wernau, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 9, 1992, Ser. No. 959,101

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1991, 4133892

Int. Cl.^{5} F15B *13/044*

U.S. Cl. 91—429 **4 Claims**



1. A device for controlling the flow of hydraulic fluid from a high-pressure source to a fluid-actuable unit, comprising a supply conduit operatively connected with the high-pressure source, means including an on/off valve substantially without any throttling effect located in the supply conduit for permitting an average supply velocity to be adjusted by cyclic opening and closing of the on/off valve with a ratio between periods of the cyclic opening and closing to cause a transfer of kinetic energy to the fluid-actuatable unit, and a non-return valve means operatively arranged in an unthrottled manner between the fluid-actuatable unit and one of a low-pressure connection and low-pressure reservoir for preventing a flow to one of the low-pressure connection and low-pressure reservoir and in a location where high flow velocities occur when the on/off valve is open so that dynamic vacuum peaks occurring after the closing of the on/off valve are of sufficient magnitude to open the non-return valve means and to continue the transfer of kinetic energy to the fluid-actuatable unit.

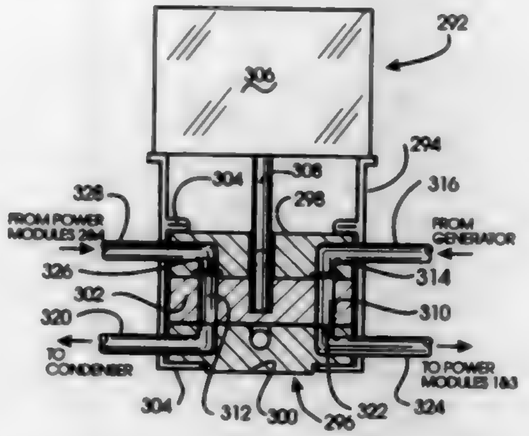
5,313,874
HIGH EFFICIENCY POOL HEATING SYSTEM AND POWER UNIT

David Lackstrom, Medina, Ohio, assignor to R & D Technologies, Inc., West Willington, Conn.

Continuation-in-part of Ser. No. 821,391, Jan. 16, 1992, Pat. No. 5,205,133. This application Oct. 13, 1992, Ser. No. 959,859

Int. Cl.^{5} F15B *13/00*

U.S. Cl. 91—459 **11 Claims**



1. A power unit for compressing gaseous fluids, comprising:
a body, said body having a first enclosed chamber and a second enclosed chamber;
a first piston movable in said first chamber;
a first rolling diaphragm extending across said first chamber, said first rolling diaphragm supported on said first piston, said first rolling diaphragm separating a first side and a second side of said first chamber;
a second piston movable in said second chamber;
a second rolling diaphragm extending across said second chamber, said second rolling diaphragm supported on said second piston, said second rolling diaphragm separating a front side and a back side of said second chamber;
connecting rod means for connecting said first and second pistons:
first valve means for alternatively admitting and exhausting pressurized first working fluid from said first side of said first chamber;
and
second valve means for enabling a compressible fluid to alternately enter and exhaust from said front side of said second chamber, whereby said fluid in said second chamber is compressed;
sensor means for sensing the position of said first and second piston means;
wherein said valve means comprises a rotatable valve element having at least one fluid passage extending therethrough, said element including opposed facing surfaces;
said value means further including a pair of abutting surfaces in abutting relation of said facing surfaces, said valve element positioned between said abutting surfaces;
a first one of said abutting surfaces including a first fluid opening in fluid communication with said pressurized working fluid, and a second one of said abutting surfaces including a further fluid opening in fluid communication with said first side of said first chamber, said fluid openings in said abutting surfaces in fluid communication through said fluid passage in said valve element when said element is in a first rotational position, whereby pressurized working fluid is delivered to said first side of said first chamber;
a stepper motor in driving connecting with said valve element and moving said valve element to said first rotational position responsive to said sensing means.

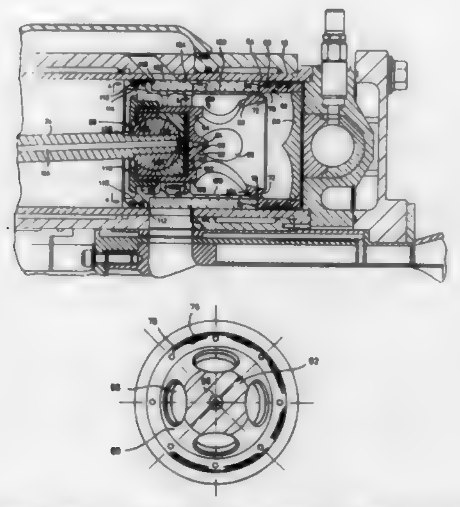
5,313,875
PISTON WITH SUPPORT MEMBER AND BEARING

George Kadlicko, Mississauga, Canada, assignor to 814405 Ontario Ltd., Canada

Filed Nov. 12, 1992, Ser. No. 975,426

Int. Cl.^{5} F01B *31/10*

U.S. Cl. 92—157 **8 Claims**



1. A piston for an internal combustion engine comprising a crown, a cylindrical wall extending around the crown and depending therefrom, at least one circumferential groove in said cylindrical wall to carry a piston ring for sealing against a wall of a cylinder containing said piston, a cylindrical support member disposed radially inwardly of said cylindrical wall and extending axially along said piston to an annular skirt portion having at least one circumferential groove therein to carry a piston ring for sealing against said cylinder wall, a bearing support connected to said cylindrical wall and located within said support member to accommodate a bearing for connecting said piston to a connecting rod and a cylindrical bearing member formed from a bearing material located on said support member and extending between said cylindrical wall and said skirt, said cylindrical bearing member having a radially outer surface engagable with said cylinder wall to support said piston for sliding movement within said cylinder.

5,313,876
SPAGHETTI COOKING SYSTEM

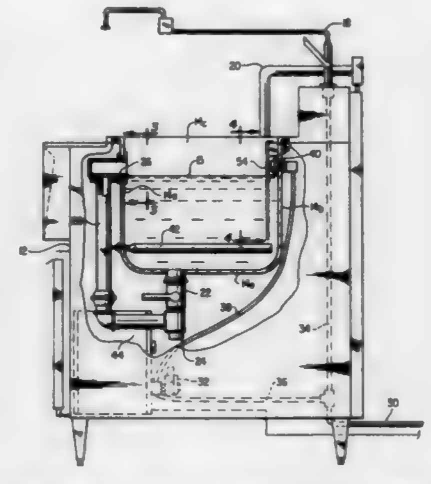
Robert L. Hilger; John R. Davis, both of Shreveport, and John A. Meister, Haughton, all of La., assignors to The Frymaster Corporation, Shreveport, La.

Filed May 17, 1991, Ser. No. 702,773

Int. Cl.^{5} A47J *27/00*

U.S. Cl. 99—330 **8 Claims**

1. A system for preparing pasta comprising:
a cooking vat for holding a supply of water having a drain including a valve for draining water from the vat and an overflow weir defining a maximum water level in the vat at which point water flows over the weir by gravity into a waste drain,
electrical heating means disposed near the bottom of the vat for heating water in the vat,
means for adding water to the vat from a supply of water under pressure including an electrically operated fill valve,
high level detecting means for detecting a normal high water level which is below the level of the overflow drain,
low level detecting means for detecting a low water level which is above the electrical heating means,
temperature sensing means for detecting when the temperature of the water in the vat is at a simmer temperature below boiling temperature, and
control means responsive to the high level detecting means, the low level detecting means, and the temperature detecting means, said control means including manual input means for selecting an "on" mode, a boil mode, a simmer mode, a skim mode, and a selectable duration cook mode, and for
automatically opening the fill valve whenever the system is in the "on" mode and the high level detecting means is not detecting the normal high water level,
opening the fill valve when in the skim mode to add water to the vat and overflow the weir,
turning the heating means on continuously during the boil mode unless the low level detecting means is detecting the low water level,
activating the heating means for maintaining the temperature of the water at the simmer temperature during the simmer mode unless the low level detecting means detects the low water level or the temperature sensing means detects the simmer temperature, and
timing the duration of the cook mode in response to a manual start time input, wherein the timing includes providing a first signal at a beginning of the cook mode and a second signal at the end of the cook mode.



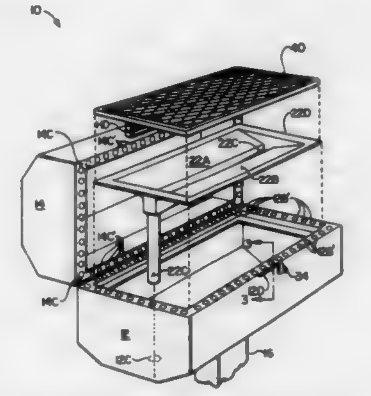
5,313,877
BARBECUE GRILL WITH CONTROLLED HEAT DISTRIBUTION

Robert B. Holland, 247 Summerwinds Dr., Cary, N.C. 27511

Filed Sep. 21, 1993, Ser. No. 125,023

Int. Cl.^{5} A47J *27/00, 37/00*

U.S. Cl. 99—446 **14 Claims**

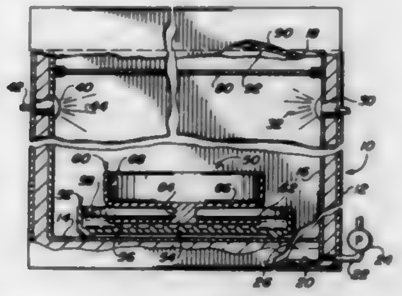


1. A barbecue grill for cooking food comprising;
(a) A lower housing having an upper and a lower portion;
(b) heating means for providing cooking heat located within said lower housing;

(c) food supporting means supported by said lower housing and located within the upper portion thereof and above said heating means;
(d) an upper housing or hood adapted to enclose said lower housing and having an upper and a lower portion;
(e) a grease collecting drip pan positioned beneath said food supporting means in said lower housing and adapted to be sealingly supported by said lower housing around the entire perimeter thereof so as to prevent heat flow therearound into said upper housing;
(f) grease drainage means positioned within said housing and fluidly communicating with said drip pan for disposal of grease outside of said lower housing; and
(g) a plurality of apertures provided adjacent at least a portion of the perimeter of the upper portion of said lower housing and adapted to facilitate heat flow from said lower housing into said upper housing.

5,313,878
MICROWAVE OVENWARE APPARATUS, HYDRATING MICROWAVE OVENS AND MICROWAVE WATER PURIFIER

Clifford C. Strait, Jr., 939 S. 48th St. #209, Tempe, Ariz. 85281
Filed Jan. 22, 1992, Ser. No. 901,993
Int. Cl.⁵ H05B *6/80*
U.S. Cl. 99—475 **7 Claims**

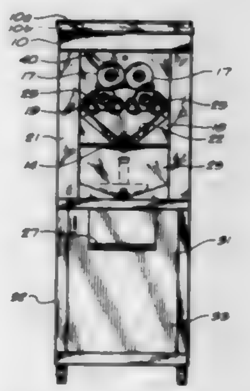


1. Microwave oven apparatus for cooking food, comprising, in combination:
a microwave oven having top means;
walls extending downwardly from the top means;
a bottom for receiving dish elements;
the top means, bottom, and walls defining an interior space for cooking food placed therein by microwave energy;
means for providing moisture in the interior space for the food being cooked, including mister means for misting the interior space;
a condensing surface disposed below the top means on which moisture vaporized by microwave energy may condense;
filter means spaced downwardly from the condensing surface through which moisture may pass upwardly, but preventing any moisture condensing above the filter means from dropping onto the food being cooked.

5,313,879
JUICE EXTRACTING MACHINE

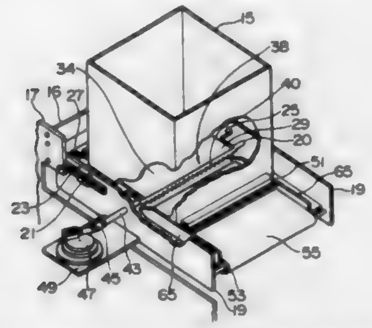
Walter O. Otto, rua Estilac Leal, 160 a, 174 A, Guarulhos, Sao Paulo, Brazil
Filed Nov. 27, 1992, Ser. No. 982,660
Claims priority, application Brazil, Apr. 8, 1992, PI 9201383
Int. Cl.⁵ A23N *1/00*
U.S. Cl. 99—504 **13 Claims**

1. An improved juice extracting machine of the type used to extract juice for citric fruits comprising:
an upper structure housing a gear box connected to a motor reducer assembly, said motor reducer assembly having a toothed axle engaged with a first gear, said first gear transferring a rotary movement to a second gear positioned thereabove, said second gear transferring said rotary movement by an intermediary gear to a third gear, said third gear being axially engaged with a fourth gear, said fourth gear being smaller than said third gear, said fourth gear drivingly connected to a vertically positioned pinion;
a feeding cone positioned inside a fruit receptacle located over said upper structure, said third gear being mechanically engaged with a fifth gear, said fifth gear transmitting movement to a chain by a first toothed wheel axially engaged with said fifth gear, said chain being engaged to a second toothed wheel, said second toothed wheel mechanically connected to a worm horizontally positioned within a screen, a tightener of said chain positioned between said first toothed wheel and said second toothed wheel;
said second and third gears drivingly connected to upper cylindrical heads aligned side by side at a front face of said gear box, said upper cylindrical heads movable in correspondence with a pair of prismatic heads arranged side by side at a plane below said upper cylindrical heads, said upper cylindrical heads and said lower prismatic heads being mechanically connected to said first, second, third and fifth gears by a set of axles which transfix the front face of the gear box;
a protector closing a front face of the upper structure, said protector receiving said upper cylindrical heads and said lower prismatic heads and a diverter plane, a screen being positioned at a lower end of said diverter plane, said worm being positioned over said screen, said protector having a conduit formed by an inner wall, said protector having a cutout area for receiving a juice reservoir below said screen, said juice reservoir having an inclined plane therein, said reservoir having a cock attached to a front wall, said reservoir having a rear wall positioned opposite said front wall, said reservoir receiving a manually driven agitator therein, said agitator having a blade fixedly connected to a vertical rod, said rod being folded on a side of a cutout formed on a support in said reservoir, said rod having an end portion transfixing a rectangular cutout formed on said front wall of said reservoir;
a lower structure connected to said upper structure, said lower structure having an inner compartment for receiving a container therein, said lower structure having a front gate covering said inner compartment, a pair of direction ducts received with sides of said lower structure, said direction ducts directly aligned with said conduits of said protector;
a tray affixed to said container and said lower structure, said tray having a grid over which said juice reservoir is positioned; and
a collector positioned at said worm, said collector being fixed to a lower face of said gear box, said collector having a pipe aligned with said container.



5,313,880
APPARATUS FOR DIVIDING BREAD DOUGH OR THE LIKE

Michio Morikawa, and Koichi Hirabayashi, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Tochigi, Japan
Filed Apr. 9, 1993, Ser. No. 45,963
Claims priority, application Japan, Apr. 17, 1992, 4-032842; Apr. 17, 1992, 4-125738; Apr. 17, 1992, 4-125739
Int. Cl.⁵ A21C *5/00, 7/01, 15/04;* **A23P** *1/00*
U.S. Cl. 99—537 **19 Claims**

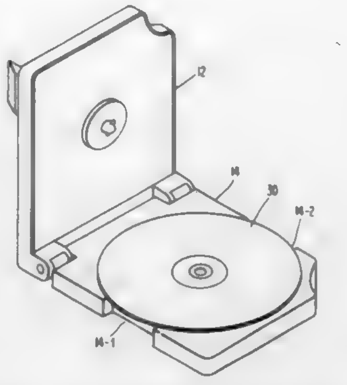


1. An apparatus for dividing plastic dough material comprising:
a hopper for dough material, the bottom of which is constituted by a first dough-supporting member, a second dough-supporting member, a dough-cutting member, and a dough material outlet,
said first dough-supporting member being movable back and forth, and comprising a flat upper surface, a bottom surface, a horizontal forward edge, and a rearward edge, said forward edge extending perpendicular to the direction of movement of said member,
said dough-cutting member comprising a saw blade means, and being, at said forward edge of said first dough-supporting m ember, flush therewith,
a drive means for reciprocating said saw blade means in the longitudinal direction while said first dough-supporting member is moved in its advancing direction,
said second dough-supporting member being movable in the same direction and in synchronization with said first dough-supporting member, being provided with a flat upper surface positioned at a level lower than the upper surface of said first dough-supporting member, thereby forming said dough material outlet between said second dough-supporting member and said cutting member, and
a drive means for moving said first and second dough-supporting members back and forth.

5,313,881
COMPACT DISC MARKING APPARATUS

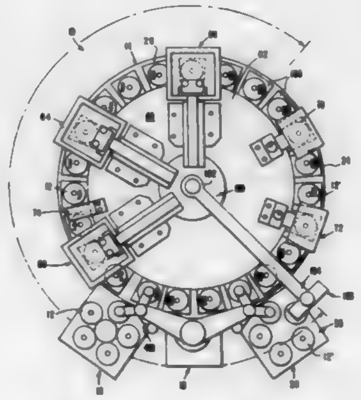
William T. Morgan, 136 Woodland Dr., Lansdale, Pa. 19446
Filed Jan. 6, 1993, Ser. No. 1,254
Int. Cl.⁵ B41F *19/02*
U.S. Cl. 101—4 **14 Claims**

1. A compact disc marking apparatus, comprising:
(a) a top portion;
(b) a bottom portion comprising a top surface for receiving a compact disc, a die receiving recess formed in said top surface for receiving a die bearing identifying marks, a through-hole coaxially aligned with said die receiving recess, a bottom surface opposite said top surface, and a recess formed in said bottom surface coaxially aligned with said through-hole;
(c) a pivot coupling said bottom portion to said top portion; and
(d) a locking handle coupled to said top portion so as to be movable to and from a position in axial alignment with said through-hole when said apparatus is in a closed condition, said locking handle comprising a lever member and an engaging/compression means for engaging said bottom portion and applying a compression force to compress the disc against a die in said die receiving recess to cause the identifying marks to be formed in the compact disc.



5,313,882
MULTICOLOR PRINTING SYSTEM FOR THE SILK-SCREEN PRINTING OF COMPACT DISCS

William M. Karlyn, 602 Chestnut St., Lynnfield, Mass. 01940; Frederick C. Pink, 14 Mile Stretch Rd., Biddeford Pool, Me. 04006; William L. Lamarre, 119 Water St., Unit 63, Beverly, Mass. 01915, and Edward J. Berry, 157 Newton St., Revere, Mass. 02151
Continuation of Ser. No. 665,242, Mar. 6, 1991, Pat. No. 5,165,340. This application Nov. 16, 1992, Ser. No. 977,123
Int. Cl.⁵ B05C *21/00;* **B41F** *17/00*
U.S. Cl. 101—126 **6 Claims**



1. System for the printing of a plurality of compact discs each defining a centrally disposed circular-shaped opening comprising in combination:
(a) a horizontally disposed annular-shaped member defined by a center point and predetermined inner and outer diameters and having top and bottom planar parallel surfaces, said annular-shaped member being rotatable about its center point for transport of the compact discs in a predetermined plurality of spaced-apart locations and in a predetermined circular-defined path to at least one printer location for printing of a suitable color on a compact disc and from said location for further processing;
(b) a plurality of disc fixtures being provided on the top planar surface of said annular-shaped rotatable member at said predetermined spaced-apart locations and corresponding in number thereto. each for receiving and supporting one of said plurality of compact discs in horizontal disposition;
(c) means providing vacuum being operatively associated

with said transport member for providing vacuum to each said disc fixture for holding of each said compact disc on said rotatable annular transport member while being transported in said circular-defined path from a loading position to an unloading position;

(d) means for supporting a plurality of screen printers whereby each printer is provided in operative association with the top surface of said rotatable transport member and in predetermined spaced-apart angular dispositions with respect to one another;

(e) a plurality of screen printers being located in predetermined spaced-apart locations on said support means each comprising a horizontally disposed screen frame facing outwardly from the center point of the horizontally disposed rotatable transport member, a screen being provided in said frame and a squeegee in operative combination with the screen whereby the squeegee in operation will move in radial fashion inwardly and outwardly a predetermined distance across a compact disc to be printed; and

(f) registration means being provided in operative combination with each of said plurality of compact disc fixtures each comprising an elongated vertically upright, circular-shaped registration pin defining an exposed rounded upper end for intrusion into the circular-shaped opening of a compact disc as such is being loaded onto the transport member for centering of the compact disc and at a predetermined spot at the disc location just prior to actuating the vacuum to that disc fixture, said registration means each being located on the bottom surface of the rotatable member and operatively connected thereto.

5,313,883

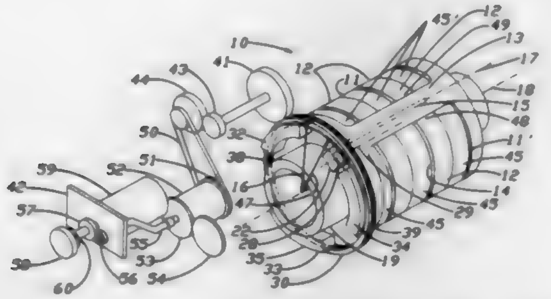
PRINTING PRESS WITH A DYNAMIC EXPANSION BAND ADJUSTING MECHANISM

Phillip D. DiGenova, Hinsdale, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 15, 1993, Ser. No. 48,341

Int. Cl.⁵ B41F *13/24*

U.S. Cl. 101—247 **47 Claims**



1. In a printing press having a running cylinder with a rotary axis, an outer diameter and expansion bands for changing the effective outer diameter of the running cylinder, the improvement being a dynamic expansion band adjustment mechanism for moving the expansion bands while the running cylinder is rotating about the rotary axis, comprising:

a cylinder adjusting member having an inner surface with an inner diameter and an outer surface with an outer diameter mounted for rotation about the rotary axis of the running cylinder, the inner diameter of the cylindrical adjusting member being substantially the same as the outer diameter of the running cylinder;

means mounted to the running cylinder at a location within the inner diameter of the cylindrical adjusting member for adjusting the expansion bands in response to relative rotary movement between the cylindrical adjusting member and the running cylinder; and

means including a member located without the other diameter of the running cylinder and engageable with the outer surface of the cylindrical adjusting member for rotating the cylindrical adjusting member about the rotary axis relative to the running cylinder.

5,313,884

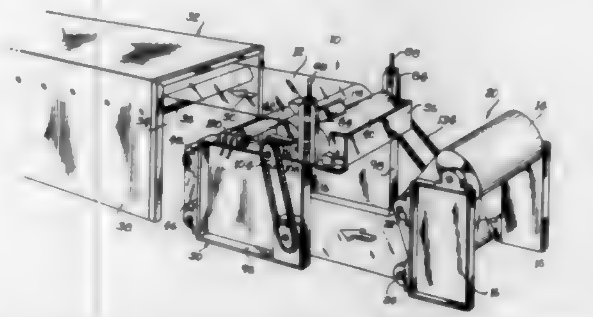
REVERSE ROLLER COATING APPARATUS

Stanley Lerner, Glencoe, and Steven B. Winter, Highland Park, both of Ill., assignors to Color Communications, Inc., Chicago, Ill.

Filed Apr. 2, 1992, Ser. No. 862,406

Int. Cl.⁵ B41F *1/46, 31/14*

U.S. Cl. 101—348 **10 Claims**



1. Apparatus for coating a webbing with a liquid coating material, the apparatus comprising:

a feed roller with an outer surface about which a webbing is adapted to be at least partially wound;

means for rotating the feed roller;

a transfer roller adjacent the feed roller, the transfer roller having an outside surface from which the liquid coating material is transferred to a reservoir formed between the fed roller and the transfer roller;

means for rotating the transfer roller in the same direction as the rotation of the feed roller;

supply means for supplying the liquid coating material to the outside surface of said transfer roller;

a doctor blade adjacent the transfer roller surface, downstream of said supply means and spaced upstream from the reservoir for limiting the thickness of the liquid coating material passing in a downstream direction underneath the doctor blade; and

locating means for locating said feed roller adjacent the outside surface of said transfer roller so as to bring webbing wound about said outer surface of said feed roller into contact with the liquid coating material in the reservoir; the surface speed of the transfer roller relative to the surface speed of the feed roller being such that the liquid coating material being carried to the reservoir by the transfer roller is sufficient to deposit on the webbing a coating of preselected thickness.

5,313,885

APPARATUS AND METHOD FOR A SEE THROUGH INK STAMP WITH DETACHABLE DIES

Jeffrey M. Winston, 658 W. Shore Dr., Anacortes, Wash. 98221

Continuation of Ser. No. 840,628, Feb. 21, 1992, abandoned, which is a continuation of Ser. No. 481,557, Feb. 16, 1990, abandoned. This application Aug. 4, 1992, Ser. No. 925,810

Int. Cl.⁵ B41K *1/56*

U.S. Cl. 101—405 **10 Claims**

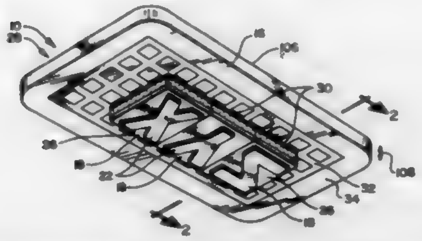
1. An apparatus for stamping ink images on image carrying material, comprising:

a. a substantially transparent handle having at least one substantially rigid and planar surface;

b. at least one printing die of arbitrary size and shape having a printing surface and a second surface opposite the printing surface, where means for holding ink in a pattern are formed on each printing surface; and

c. reusable attachment means by which said printing die is able to be manually attached to, manually detached from, and manually reattached to said planar surface of said handle without substantially degrading: (a) the printing die; and (b) the ability of the attachment means to detach and reattach the printing die, where the attachment means further attaches the printing die to the handle in a manner that allows an end user to adjust said printing die in an unlimited number of arbitrary orientations relative to said handle, where the attaching means comprises magnetic substance imbedded in one of the printing die and the handle and a magnetically attractable substance imbedded in the other of the printing die and handle; wherein

both (i) a substantial portion of the second surface on the printing die; and (ii) at least a portion of the image carrying member are visible through the handle.



5,313,886

ELECTRONIC METHOD OF POSITIONING A REGISTER MARK SENSOR OF A SHEET PRINTING MACHINE

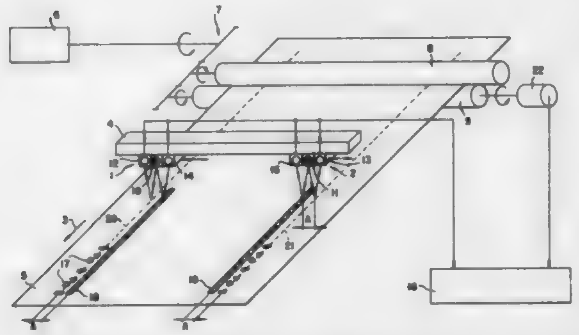
Tobias Müller, Hirschberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 7, 1993, Ser. No. 73,104

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1992, 4218764

Int. Cl.⁵ B41F *13/24*

U.S. Cl. 101—486 **4 Claims**



1. A method for positioning a register mark sensor in a sheet printing machine, wherein a register mark sensor is moved in direction perpendicular to the direction of the movement of the sheet for detecting a register mark arrangement on the sheet, wherein the register mark sensor is moved until it is positioned in a defined scanning position relative to the register mark arrangement, the method of which comprises the steps of:

(a) placing on the sheet a preliminary register mark, a given known distance A, perpendicular to the direction of the movement of the sheet, from a given register mark line, and

(b) after printing at least one sheet, positioning the preliminary mark sensor in relation to the preliminary mark.

5,313,887

PYROTECHNIC DEVICE

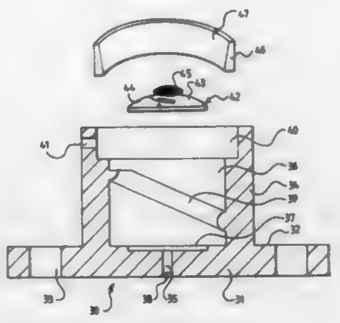
Nigel Morris, Louth, England, assignor to J.E.M. Smoke Machine Company, United Kingdom

Filed May 23, 1991, Ser. No. 704,039

Claims priority, application United Kingdom, May 23, 1990, 9011559

Int. Cl.⁵ F42B *3/00*

U.S. Cl. 102—331 **14 Claims**



1. Pyrotechnic device comprising:

a receptacle;

the receptacle containing a charge of pyrotechnic material and means to initiate the charge;

the receptacle being sealed, but having part thereof provided with lines or areas of relative mechanical weakness operative to rupture on activation of the pyrotechnic material;

the lines or areas of relative mechanical weakness being located to define regions which lie between said lines or areas of mechanical weakness;

the regions being connected to the rest of the receptacle by material not intersected by a line or area of mechanical weakness; and

the regions being deflected subsequent to rupturing of the lines or areas of relative mechanical weakness so as to open the receptacle,

the receptacle thus opening with no parts or fragments becoming separated from the rest of the receptacle.

5,313,888

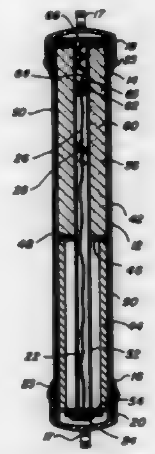
PULL-WIRE IGNITER FOR FLARES

Brian D. Martin, 15255 W. Maple Ave., Golden, Colo. 80401

Filed May 5, 1992, Ser. No. 878,617

Int. Cl.⁵ F42B *4/00, 4/26;* **C06C** *9/00*

U.S. Cl. 102—334 **25 Claims**



1. A hand held pyrotechnic signalling device for producing a bright flame or generating smoke, said device comprising;

a) a hollow tubular body means, said body means having a means within said body means to separate said body means into two end sections, a first end section being of sufficient length to serve as a hand gripping area for the device and a second end section being filled with a suitable burnable pyrotechnic composition, said composition being filled to form an exposed end which is recessed a predetermined distance within the second end section of the body means, the exposed end of the pyrotechnic composition being at least partially covered with a primer mixture for igniting said composition;

b) an elongated hollow center tube means is positioned coaxially within said body means whereby a central passageway is provided through at least the composition filled second end section of the body means;

c) a pull-wire igniter means is arranged in conjunction with said center tube means, said pull-wire igniter means includes a pull-wire means for initiating the pull-wire igniter means, said pull-wire means being arranged to extend through the center tube means and have sufficient length to extend beyond the end of said first end section of said body means; and

d) said pull-wire igniter means having a section of shrink tubing arranged to at least partially cover the pull-wire igniter means to isolate the pull-wire means from the composition and primer mixture to prevent premature ignition of the pull-wire igniter means and said composition.

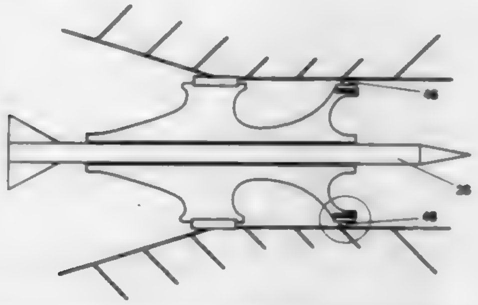
5,313,889
STABILIZATION BAND/RING ASSEMBLY FOR ALIGNING A PROJECTILE IN A GUN TUBE

Stephen A. Wilkerson, Street; Robert P. Kaste, North East, and Bruce P. Burns, Churchville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 4, 1993, Ser. No. 33

Int. Cl.^{5} F42B *14/06*

U.S. Cl. 102—439 **4 Claims**



1. Apparatus for automatically aligning and seating a projectile concentrically in a gun tube, comprising in combination:

the gun tube having a bore,

a shell casing for the gun tube,

a sabot mounted on the shell casing and having a double ramp assembly,

the assembly having a front ramp section with a front bore-rider portion and a rear ramp section with a rear bore-rider portion,

the front bore-rider portion having more clearance spacing within the gun tube than the rear bore-rider portion,

this additional clearance spacing permitting the projectile within the gun tube to seat slightly out of alignment, and this additional clearance spacing being taken up by incorporating an interface means on the front bore-rider portion for maintaining the alignment of the projectile as it travels down the gun tube, wherein the interface means on the front bore-rider portion comprises a series of radially and outwardly projecting ellipsoidal shaped protrusion members.

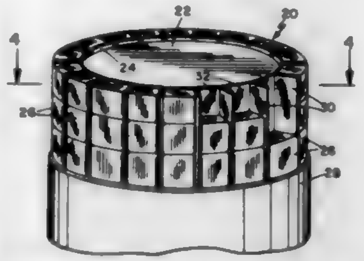
5,313,890
FRAGMENTATION WARHEAD DEVICE

Jaime H. Cuadros, Hacienda Heights, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Apr. 29, 1991, Ser. No. 692,847

Int. Cl.^{5} F42B *12/32*

U.S. Cl. 102—496 **9 Claims**



1. A fragmentation warhead device, comprising:

a central cylindrical core comprising an explosive charge;

a sleeve of fabric material surrounding the cylindrical core, the sleeve having larger cross-sectional dimensions than the core and having an inner cylindrical surface fitting closely around the outer surface of the central core, and a series of spaced, radially outwardly directed pleats formed at spaced intervals around the periphery of said cylindrical surface to define a plurality of spaced, longitudinally extending channels between adjacent pairs of pleats, each pleat comprising a double fold of material having inner faces with no intervening material between the faces;

a plurality of preformed fragments positioned in said channels between adjacent pleats around the outside of the sleeve; and

retaining means for retaining the fragments against the sleeve prior to detonation of the explosive charge.

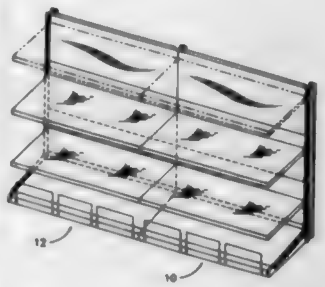
5,313,891
BEVERAGE AISLE UNIT

J. Marshall Suttles, Elberton, Ga., assignor to The Mead Corporation, Atlanta, Ga.

Filed Dec. 16, 1991, Ser. No. 807,984

Int. Cl.^{5} A47B *9/00*

U.S. Cl. 108—108 **20 Claims**



1. An aisle unit for display of beverages and like merchandise, and suitable for stand-alone assembly or end-to-end assembly with adjacent units, comprising in combination:

a pair of parallel-spaced posts, each post comprising a pair of unitary upright members in opposing, spaced, relation to each other, the upright members having upper and lower ends, a first base member fixed to and extending outwardly from the lower ends of said upright members, and a discrete, unitary spacer means, having a vertical series of slots in equally spaced increments, connected from one to the other of the upright members of each pair of said upright members, and, with said upright members, forming a recess; and

shelves disposed in vertically spaced relation between said upright members, each of said shelves having brackets with inwardly projecting hook portions substantially completely inserted in the recesses formed between the upright members of the posts and interengaging selected ones of the slots in the spacer means of the posts.

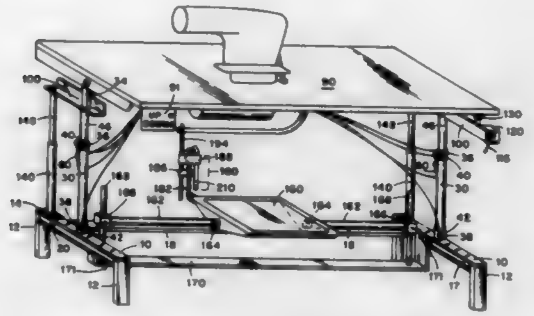
5,313,892
TABLE WITH HEIGHT AND TILT ADJUST

William A. Tice, 6711 Maynardville Hwy., Knoxville, Tenn. 37918

Filed Oct. 21, 1991, Ser. No. 781,483

Int. Cl.^{5} A47B *9/00*

U.S. Cl. 108—147 **3 Claims**



1. A pneumatically adjustable table for presenting a work surface and allowing a worker to vary the height of the work surface relative to the worker by using a compressed air supply, comprising:

a generally planar tabletop defining a plane having an orientation with respect to horizontal and having a work surface, a bottom surface, a front edge, a back edge, a left edge and a right edge;

a generally vertical support member disposed for movement in a generally vertical direction, up and down;

a pneumatic drive mechanism for moving said support member at least in an upwardly direction;

conduit means for supplying compressed air from the air supply to said pneumatic drive mechanism;

control means for controlling the supply of air from the air supply to said conduit means for selectively causing the pneumatic drive mechanism to move to support member; and

means for attaching said support member to said tabletop said tabletop moveable between at least raised and lowered positions by said support member in response to said control means, said plane defined by said tabletop substantially maintaining said orientation with respect to horizontal in said raised and lowered positions;

said table further comprising an adjustable foot treadle system for use in manipulating an apparatus located on said tabletop that adjusts to changes in said tabletop height, said adjustable foot treadle system comprising:

a foot treadle;

a first rod having first and second ends and a length;

a second rod having first and second ends and a length, disposed parallel to said first rod, said first rod attached to said foot treadle at said first end, said second end of said first rod extending upwardly toward said tabletop, said length of said first rod insufficient for said second end of said first rod to each said tabletop and said first end of said second rod extending downwardly, parallel to said first rod, toward said foot treadle, said second end of said second rod extending upwardly, beyond said second end of said first rod, and connected to the apparatus located on said tabletop; and

an adjustable linkage means attached to said first rod and slidably disposed to said second rod for allowing the second rod to slidably adjust without changing position of said foot treadle and for locking said first and second rods in place.

5,313,893
DESK

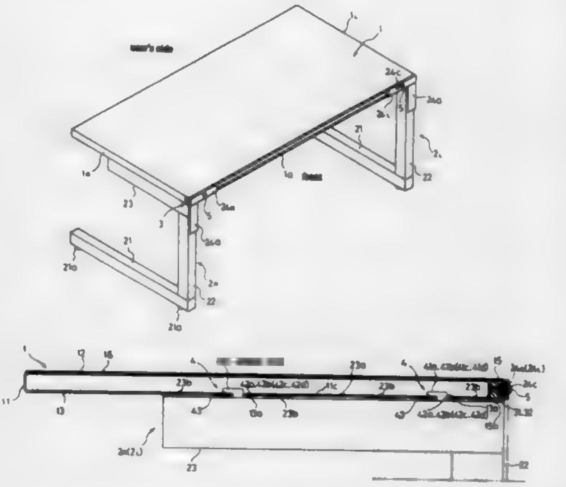
Shinichi Kaneda, Nara; Shouji Tamaki, Osaka, and Osamu Sakai, Ashiya, all of Japan, assignors to Kokuyo Co., Ltd., Osaka, Japan

PCT No. PCT/JP91/00630, § 371 Date Jan. 8, 1993, § 102(e) Date Jan. 8, 1993, PCT Pub. No. WO92/20257, PCT Pub. Date Nov. 26, 1992

PCT Filed May 13, 1991, Ser. No. 971,853

Int. Cl.^{5} A47B *5/00*

U.S. Cl. 108—152 **21 Claims**



1. A desk characterized by comprising a top plate, legs, tapered engaging means and claw-type engaging means; wherein the top plate has rigidity; each of the legs is provided with an upwardly facing surface adapted to be in contact with a under surface of the top plate, and at a upper end of said leg an arm extending along a front edge of the top plate; the tapered engaging means comprises a concavely tapered surface formed in either one of the front edge of the top plate and the arm of each of the legs, and a convex surface formed on the other of the front edge and the arm, the tapered engaging means being so constructed that the concavely tapered surface and the convexly tapered surface can be brought into close contact with each other by sliding each of the legs relative to the top plate; the claw-type engaging means comprises claws formed on either one of the under surface of the top plate and a upwardly facing surface of each of the legs, and claw-receiving holes formed in the other of the under surface and the upwardly facing surface, the claw-type engaging means being so constructed that the claws can be brought into engagement in the holes by inserting the claws into the holes and sliding each of the legs relative to the top plate; and when the engaging means are engaged, the arm is securely fixed by a fastener to the front edge of the top plate.

5,313,894
STRUCTURE OF INCINERATOR PLANT

Shiro Ishikawa, Kiryu, Japan, assignor to Kankyouhozen Kotobuki-Seisakusyo Co., Ltd., Gunma, Japan

Filed Nov. 24, 1992, Ser. No. 981,120

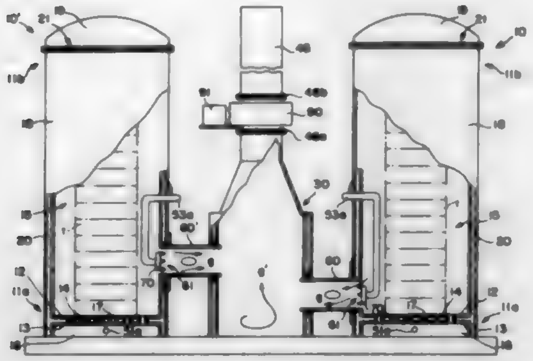
Claims priority, application Japan, Jul. 23, 1991, 3-057499[U]; Mar. 13, 1992, 4-012677[U]; May 12, 1992, 4-031037[U]

Int. Cl.^{5} B09B *3/00*

U.S. Cl. 110—235 **4 Claims**

1. An incinerator plant comprising a combustion furnace disposed between a primary incinerator having an openable waste charging port at its top and adapted to burn charged wastes therein, and a secondary incinerator adapted to burn charged wastes therein, said combustion furnace adapted to burn combustion gases generated in said primary and second-

ary incinerators, said primary incinerator being connected to said combustion furnace through a first passageway, and said secondary incinerator being connected to said combustion furnace through a second passageway in a position off an extension line of said first passageway, and openable doors on said primary and secondary incinerators and combustion furnace, said doors arranged in a row on the same side, and in one direction intersecting at right angles with a direction in which said combustion furnace and said primary and secondary incinerators are arranged.



5,313,895
METHOD OF INHIBITING FORMATION OF UNBURNED SUBSTANCES IN REFUSE INCINERATOR, AND REFUSE INCINERATOR

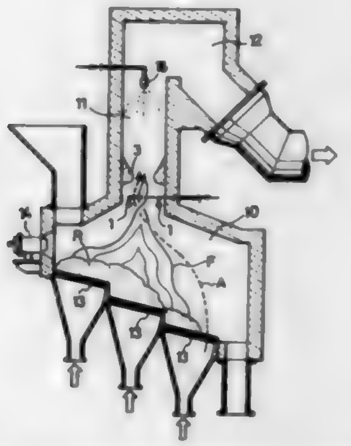
Yoshitoshi Sekiguchi; Kunio Saski, both of Kyoto; Noboru Okigami, Osaka; Kohei Hamabe, Nara; Kazuo Ieyama, Osaka, and Mamoru Knodo, Nara, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Continuation of Ser. No. 795,871, Nov. 19, 1991, abandoned. This application Mar. 5, 1993, Ser. No. 27,574

Claims priority, application Japan, Nov. 22, 1990, 2-319887; Nov. 22, 1990, 2-319888

Int. Cl.⁵ F23G *5/00*

U.S. Cl. 110—346 5 Claims



1. In a method for incinerating refuse in a refuse incinerator comprising:

i) a primary combustion chamber, and

ii) a secondary combustion chamber positioned above the primary combustion chamber and in communication therewith;

the improvement comprising inhibiting the formation of unburned substances in the incinerator by injecting into a constricted portion of the primary combustion chamber, adjacent to the secondary combustion chamber having a constricted portion, at least one mixing fluid selected from the group consisting of air, water, water vapor, an inert gas and a combustion exhaust gas, wherein the mixing fluid is ejected from at least three locations and directed toward a phantom circle targetially thereof.

5,313,896
SYSTEM FOR EMBROIDERING MACHINE

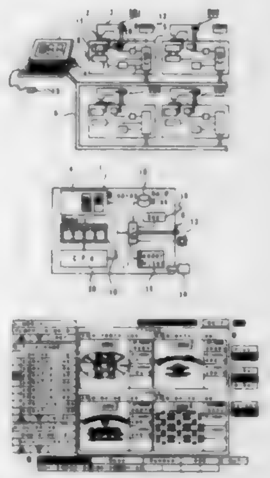
Tadaaki Hashiride, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 21, 1992, Ser. No. 947,793

Claims priority, application Japan, Sep. 20, 1991, 3-241668

Int. Cl.⁵ D05B *21/00*

U.S. Cl. 112—121.12 6 Claims



5. A system for embroidering comprising:

a plurality of embroidering machines for embroidering any one of a number of different patterns on different clothes simultaneously, each of said plurality of embroidering machines further comprising:

an embroidery frame;

a frame motor for moving said frame in X and Y directions;

a needle motor for a needle;

memory means for storing embroidering data; and

control means for controlling said frame motor and needle motor in accordance with said embroidering data;

display means;

input means having a keyboard and a means for inputting coordinates on a screen of said display means;

register memory means for storing a plurality of embroidering patterns, image data and embroidering data;

main control means for;

(a) dividing a screen of said display means into multiple screens in accordance with a number input by said input means,

(b) reading image data corresponding to said embroidering patterns selected by said input means from said register memory means,

(c) displaying said image data on said multiple divided screens of said display means, and

(d) sending embroidering data corresponding to said selected embroidering patterns to said memory means of said embroidering machine.

5,313,897
SEWING OPERATION ROBOT

Kuniaki Katamine, and Kaoru Kimura, both of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denki, Fukuoka, Japan

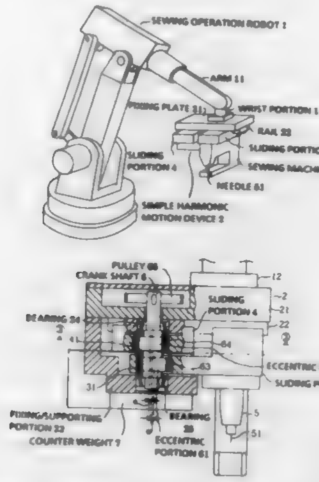
PCT No. PCT/JP92/00004, § 371 Date Aug. 24, 1992, § 102(e) Date Aug. 24, 1992, PCT Pub. No. WO92/12283, PCT Pub. Date Jul. 23, 1992

PCT Filed Jan. 8, 1992, Ser. No. 938,173

Claims priority, application Japan, Jan. 11, 1991, 3-13956

Int. Cl.⁵ D05B *21/00*

U.S. Cl. 112—121.14 3 Claims



1. A sewing operation robot wherein a sewing machine for performing sewing operations is fixed on a wrist portion of said robot, said robot including means for controlling the position and attitude of said wrist portion, and comprising a simple harmonic motion device for putting said sewing machine in a simple harmonic motion, said simple harmonic motion device being provided between said wrist portion and said sewing machine.

5,313,898
AUTOMATIC SEWING APPARATUS

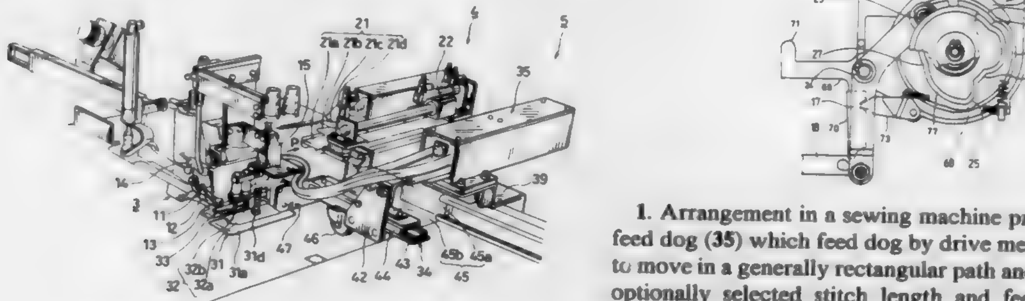
Shinji Ishibashi, Shimane, Japan, assignor to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan

Filed Jul. 13, 1992, Ser. No. 912,901

Claims priority, application Japan, Jul. 11, 1991, 3-171069

Int. Cl.⁵ D05B *35/02*

U.S. Cl. 112—141 11 Claims



1. An automatic sewing apparatus useful for sewing together a pair of first edges of two overlapped bodies, each of said overlapped bodies having been formed by sewing together a pair of second edges of two pieces of overlapped cloth, the sewn pair of second edges of each of the overlapped bodies intersecting the first edge of the respective overlapped body, each of the pairs of second edges forming a corner at the intersection with the first edge, the two overlapped bodies being layered one above the other with the sewn pairs of second edges extending away from each other and the first edge and the sewn pair of second edges of one of the overlapped bodies being directly above the first edge and the sewn pair of second edges of the other overlapped body, the apparatus comprising:

sewing means for sewing the first edges;

a table for supporting the bodies to be sewn by the sewing means, the bodies to be sewn being fed along the table to the sewing means; and

sewn edge fold-down means for folding down said sewn pair of second edges at the corner of one of the bodies on top of the bodies in the direction of feeding the cloth to the sewing means, and for folding said sewn pair of second edges at the corner of the other body beneath the bodies in the opposite direction, before the first edges are sewn by said sewing means.

5,313,899

Patent Not Issued For This Number

5,313,900
FEED DIRECTION AND STITCH LENGTH CAM FOR ZIGZAG SEWING MACHINE

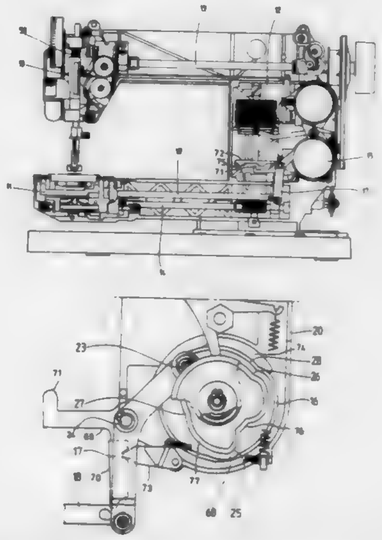
Karl I. F. Rendahl, and Börje G. S. Törnqvist, both of Huskvarna, Sweden, assignors to Husqvarna Sewing Machines Aktiebolag, Sweden

Filed Aug. 6, 1992, Ser. No. 926,685

Claims priority, application Sweden, Aug. 9, 1991, 91023234

Int. Cl.⁵ D05B *27/22, 27/24*

U.S. Cl. 112—316 5 Claims



1. Arrangement in a sewing machine provided with a cloth feed dog (**35**) which feed dog by drive means (**45,46**) is caused to move in a generally rectangular path and is adjustable for an optionally selected stitch length and feeding direction and provided with means for lowering to a position in which the feeding is inhibited, characterized in that the arrangement comprises a control means (**15**) rotatably connected to a cam disk (**16**) which operates actuating means to adjust the feed dog to selected positions, said cam disk having positions corresponding to lowering of the feed dog as well as reversing the feeding direction, and the cam disk also having a zone for controlling the stitch length, said control mean having a conical portion (**30**) which in response to an axial movement of the control means operates said actuating means to provide a temporary reversal of the feeding direction.

5,313,901

FEED DEVICE FOR SEWING MACHINE

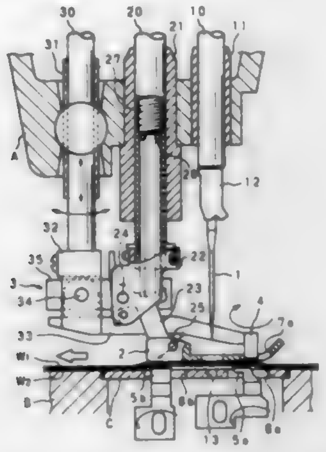
Hisao Fujii, Toyonaka, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1993, Ser. No. 7,083

Claims priority, application Japan, Mar. 23, 1992, 4-024474[U]

Int. Cl.⁵ D05B *27/04*

U.S. Cl. 112—320 **18 Claims**



1. An upper feed apparatus for a sewing machine, comprising:

an upper feed dog for executing an operation for feeding material fabrics;

energizing means for generating an energizing force acting on said upper feed dog in the direction of the material fabrics; and

adjustment means for adjusting the magnitude of the energizing force acting on said upper feed dog independently of the height of the upper feed dog.

5,313,902

PATTERN DATA PROCESSING DEVICE FOR SEWING MACHINE

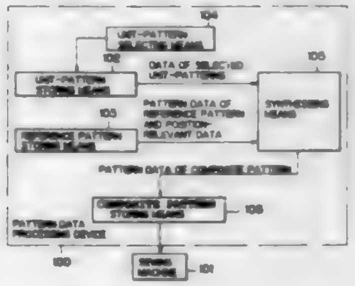
Yoshihisa Shoji, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

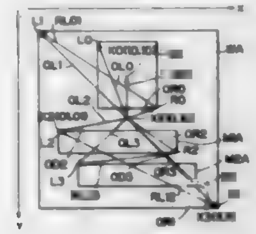
Filed Aug. 10, 1992, Ser. No. 926,405

Claims priority, application Japan, Aug. 8, 1991, 3-199504

Int. Cl.⁵ D05B *3/02*

U.S. Cl. 112—454 **28 Claims**


104
UNIT-PATTERN SELECTING MEANS
102
DATA OF SELECTED UNIT-PATTERN
106
UNIT-PATTERN STORING MEANS
103
PATTERN DATA OF REFERENCE PATTERN AND POSITION-RELEVANT DATA
SYNTHESIZING MEANS
REFERENCE PATTERN STORING MEANS
PATTERN DATA OF COMPOSITE PATTERN
COMPOSITE PATTERN STORING MEANS
108
PATTERN DATA PROCESSING DEVICE
100
SEWING MACHINE
101



14. A sewing machine for stitching, on a cloth, a desired composite-pattern in which a desired unit-pattern is placed at a predetermined position relative to a reference-pattern, the sewing machine comprising:

unit-pattern storing means for storing a plurality of unit-pattern data of a plurality of unit-patterns;

reference-pattern storing means for storing reference-pattern data of a reference-pattern and position data for the reference-pattern, the position data being indicative of a predetermined position at which the unit-pattern is to be placed relative to the reference-pattern;

unit-pattern selecting means for selecting unit-pattern data of a desired unit-pattern out of said unit-pattern storing means;

calculating means for synthesizing the selected unit-pattern and the reference-pattern, on the basis of the unit-pattern data selected by said unit-pattern selecting means, the reference-pattern data and the position data, to thereby obtain a composite-pattern in which the selected unit-pattern is placed at the predetermined position relative to the reference-pattern and for calculating composite-pattern data of the composite-pattern;

stitch forming means for forming stitches on a cloth in accordance with the composite-pattern data, to thereby form a stitch pattern corresponding to the composite-pattern in which the selected unit-pattern is placed at the predetermined position relative to the reference-pattern.

5,313,903

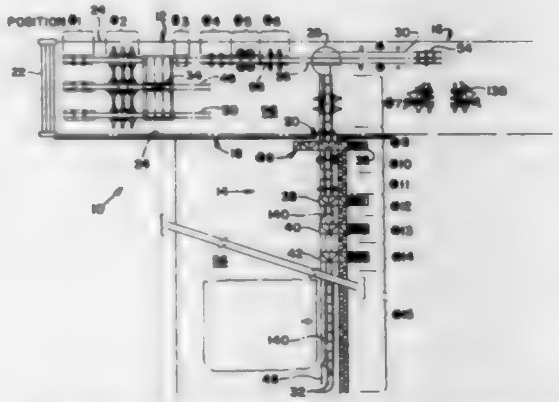
METHOD AND APPARATUS FOR FABRICATING DOUBLE-WALLED VESSEL HULL MIDBODY MODULES

Richard A. Goldbach; Frank E. McConnell, both of Norfolk, Va., and J. Richard Salzer, Sugar Land, Tex., assignors to Metro Machine Corp., Norfolk, Va. and Marinex International, Inc., Hoboken, N.J.

Filed Jul. 23, 1993, Ser. No. 95,178

Int. Cl.⁵ B63B *3/02*

U.S. Cl. 114—65 R **16 Claims**



1. A method for fabricating at least one subcomponent for a module of a double-walled vessel hull, comprising:

(a) providing a rollable bogie with chocks for supporting the lower edges of a plurality of upended hull plate panels in a predetermined spatial relation;

(b) disposing on said bogie a full complement of upended hull plate panels having lower edges thereof supported in respective ones of said chocks, said full complement including at least two wall panels for a same first wall of the hull, and at least one wall-interconnecting panel for connecting said first wall with a second wall of the hull, said two wall panels and one wall-interconnecting panel collectively having three substantially vertically extending longitudinal edges spatially juxtaposed adjacent one another at a respective T-joint creation site;

(c) providing at least two interior towers on said bogie, including one for each cell or partial cell that will be created by welding together said full complement of panels at each said T-joint creation site;

(d) rollingly advancing said bogie along a track into a work station which includes a full complement of exterior towers flanking said track so that each wall panel is sandwiched between a respective interior tower and a respective exterior tower;

(e) activating horizontally acting jacks on said interior and exterior towers to positionally adjust and hold said wall panels and each said wallinterconnecting panel, so that all three panel longitudinal edges at each T-joint creation site are uniformly spaced from one another;

(f) welding a T-joint at each T-joint creation site thereby uniting said full complement of plates into a subcomponent;

(g) deactivating said horizontally acting jacks on said exterior towers; and

(h) rollingly advancing said bogie with said subcomponent supported thereon along said track into a further work station.

5,313,904

SAIL BOOM CLAMP

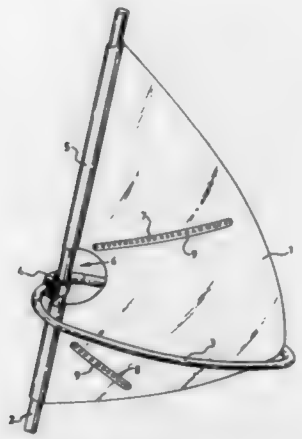
Klaus Schmidtkunz, Kassel, Fed. Rep. of Germany, and Raymond Vandijk, Paia, Hi., assignors to Neil Pryde Limited, Hong Kong

Filed Mar. 17, 1993, Ser. No. 48,325

Claims priority, application United Kingdom, Mar. 20, 1992, 9206137.3

Int. Cl.⁵ B63B *15/00*

U.S. Cl. 114—99 **11 Claims**



1. A sail boom clamp for connecting a boom to a mast, the clamp comprising a body having means to connect to the boom, opposing jaws pivotably mounted to the body, a releasable closure for closing the jaws together firmly to and around the mast, in which the closure means is anchored to the body and arranged to close the jaws by pulling a free end of the one jaw towards the body and towards the other jaw, and adjustment means arranged to support one of the jaws in different positions relative to the body to alter the effective separation between the jaws.

5,313,905

TWIN WING SAILING YACHT

Albert A. Calderon, 410 Fern Glen, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 699,311, May 9, 1991, Pat. No. 5,163,377. This application May 8, 1992, Ser. No. 880,645

Int. Cl.⁵ B63B *3/38*

U.S. Cl. 114—140 **33 Claims**

1. A twin wing yacht comprising:

a canoe;

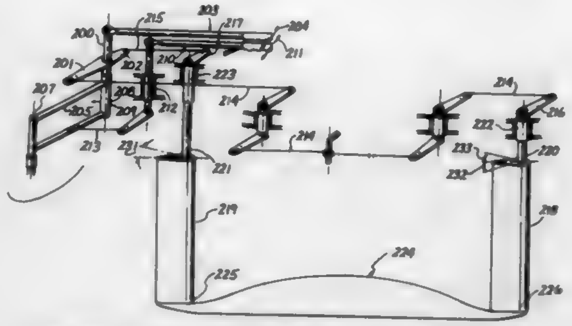
a ballast body;

a front wing extending generally downwardly from said canoe and having a lower end;

a rear wing extending generally downwardly from said canoe and having a lower end;

means associated with said front and rear wings for structurally supporting said ballast body from and between said lower ends of said wings;

said front wing having at least a rearward portion thereof articulated about a generally downwardly extending axis to form a first, front moveable control element;



said rear wing having at least a rearward portion thereof articulated about a generally downwardly extending axis to form a second, rear moveable control element;

means connected to said front and rear control elements for cyclic turning thereof; and

means connected to said front and rear control elements for collective turning thereof.

5,313,906

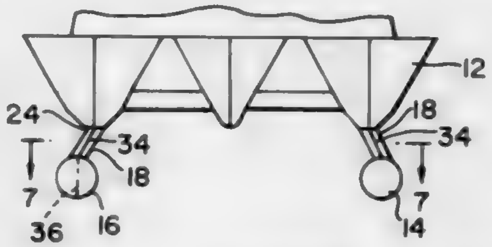
SMALL WATERPLANE TWIN HULL VESSEL

Manfred J. Zapka, Honolulu, Hi., assignor to Pacific Marine Supply Co., Ltd., Honolulu, Hi.

Filed Jun. 22, 1992, Ser. No. 903,014

Int. Cl.⁵ B63B *1/12*

U.S. Cl. 114—274 **42 Claims**



1. A marine SWATH vessel comprising a pair of hulls for providing buoyancy support for the vessel and adapted to be submerged below the water surface when the vessel is in operation; an upper hull platform adapted to be located above the design waterline of the vessel when the vessel is in operation; and at least two longitudinally spaced struts connected between each of said submerged hulls and said upper hull platform, said submerged hulls being arranged to define an acute angle between them whose vertex is rearward of the submerged hulls and located along the centerline of the vessel whereby said submerged hulls are toed out with respect to each other and effect the lift forces applied to the vessel; and wherein the angle defined between the centerline of the vessel and the centerline of the submerged hulls is greater than 0° and less than 5°.

5,313,907

EXTERNAL RAIL SYSTEM FOR BOAT

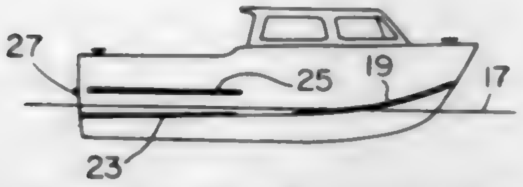
Christopher A. Hodges, 706 Greatplain Ave., Needham, Mass. 02192

Continuation-in-part of Ser. No. 855,354, Mar. 13, 1992, Pat. No. 5,205,235. This application Mar. 18, 1993, Ser. No. 33,330

The portion of the term of this patent subsequent to Apr. 27, 2010, has been disclaimed.

Int. Cl.⁵ B63B *1/32*

U.S. Cl. 114—290 19 Claims



1. An elongated rail for installation on an exterior surface of a boat, said rail having a cross-section comprising a bottom base, two side surfaces and a truncated top base wherein said top base joins said side surfaces, said rail having an exterior skin of material selected from the group consisting of a polymeric sheet and a fabric material covering said bottom base, said side surfaces and said top base, and enclosing an interior made of a polymeric foam material, said sheet or fabric in contact with said bottom base for adhesively and structurally bonding said rail to a portion of the exterior surface and said sheet or fabric having ends extending into said interior from said bottom base.

5,313,908

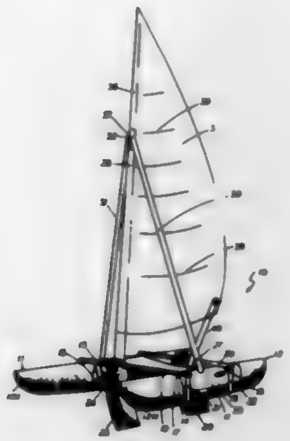
CAR TOPABLE CATAMARAN WITH COLLAPSIBLE FRAME AND UNIVERSAL TILLER/RUDDER-MAST DAGGERBOARD MOUNTING CONSTRUCTIONS

Daniel W. Kunz, 5903 Mount Eagle Dr. #1002, Alexandria, Va. 22303

Filed Oct. 5, 1990, Ser. No. 593,432

Int. Cl.⁵ B63B *7/00*

U.S. Cl. 114—354 34 Claims



1. In a catamaran having a collapsible frame and a pair of elongated pontoons spacedly secured to said collapsible frame, said frame includes fore and aft cross bar sub-frame members and a pair of longitudinally extending sub-frame members and a support platform supported on said frame, the improvement comprising each said longitudinally extending sub-frame member being molded and including:

a pontoon embracing longitudinal cavity which is the length of said longitudinally extending sub-frame member, and a pair of parallel longitudinal edges, one longitudinal edge at each side of said longitudinal cavity, respectively,

a first of said longitudinal edges having a slot therein and the other of said longitudinal edges having a shape complementary to said longitudinal slot,

whereby said pairs of longitudinal edges of said pair of molded sub-frame members, respectively, can interfit and said concavities face each other to form a storage space for said pontoons and said fore and aft tubular sub-frame member when not in use.

5,313,909

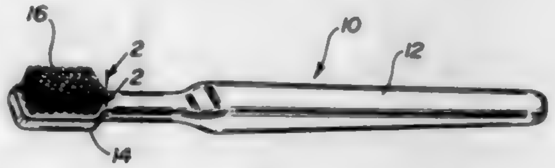
BRUSH FILAMENTS

Mingchih M. Tseng, Hingham, and Philip J. Sweeney, Brockton, both of Mass., assignors to Gillette Canada Inc., Kirkland, Canada

Filed Nov. 5, 1992, Ser. No. 971,784

Int. Cl.⁵ G01D *13/00;* A46B *9/06*

U.S. Cl. 116—208 6 Claims



1. A toothbrush including a handle associated with a head having at least one tuft securely affixed in or attached to the head, said tuft including a plurality of filaments comprised of a first colored core region and a second colored sheath region which extends along at least a portion of the outer surface of the filament and further extends inwardly into a portion of the cross-sectional area for a distance equivalent to about 10 percent or less of the filament diameter, wherein said second colored sheath region is bound to said first colored region, and wherein the sheath region and the core region are comprised of nylon.

5,313,910

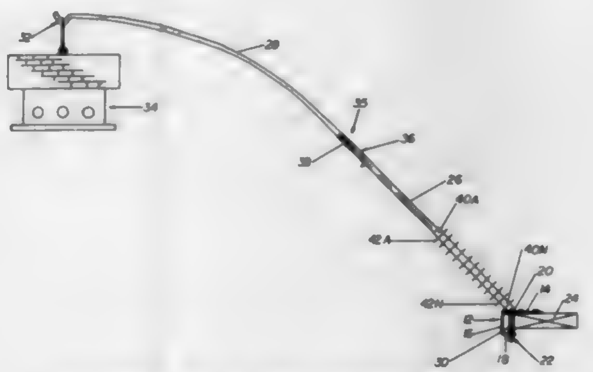
BIRD FEEDER SUPPORT SYSTEM

Byd Wittman, 5440 Teal Cir., Shorewood, Minn. 55331

Filed Mar. 3, 1993, Ser. No. 25,612

Int. Cl.⁵ A01K *39/00;* E04B *1/72*

U.S. Cl. 119—57.9 4 Claims



1. A bird feed support system comprising:

a. a U-shaped bracket means for engaging over a deck railing and including two opposing holes;

b. an upper support member with a slight degree of curvature and including a plug at a lower end thereof;

c. a continuous lower support member having a socket at an upper end thereof which receives said plug of said upper support member;

d. a stem at a lower end of said lower support member engaging into said opposing holes of said bracket means, said lower support member extending upwardly from said stem at an angle to the horizontal; and

e. a hook at an upper end of said upper support member for engaging a bird feeder.

5,313,911

METHOD FOR CONTROLLING AQUATIC PARASITES

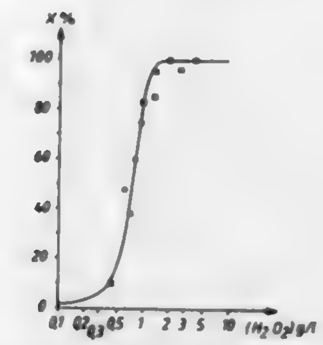
Jan M. Thomassen, Bådalen, and Odd I. Lekang, Oslo, both of Norway, assignors to Eka Nobel AB, Bohus, Sweden

Filed Oct. 20, 1992, Ser. No. 963,693

Claims priority, application Sweden, Oct. 24, 1991, 9103113-8

Int. Cl.⁵ A01K *61/00*

U.S. Cl. 119—231 9 Claims



1. A method for controlling parasites in fish breeding, comprising supplying the water in which fish are maintained in a fish breeding facility with hydrogen peroxide or a hydrogen peroxide-producing substance, in an amount sufficient to provide an H_2O_2 content in the water above about 1.2 but below about 2.9 g per liter.

5,313,912

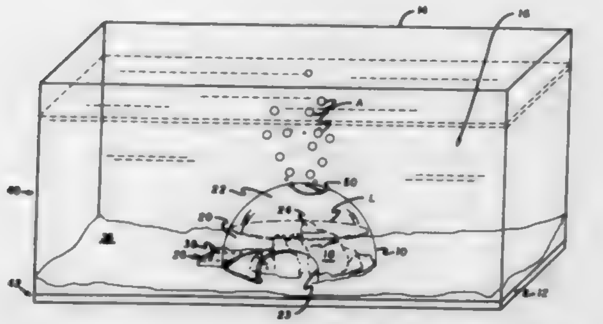
AQUARIUM HAVING SUBMERGED DRY DISPLAY AREA

Robert L. O'Dell, 2897 Pinyon, Apt. No. 1, Grand Junction, Colo. 81501

Filed Dec. 11, 1992, Ser. No. 991,487

Int. Cl.⁵ A01K *63/00*

U.S. Cl. 119—246 14 Claims



8. An aquarium accessory for providing habitat to amphibious animals in an aquarium containing water comprising:

a clear receptacle having lateral wall means defining a doorway therein and an interior thereof, said doorway communicating between aquarium water and said receptacle interior, said receptacle and said interior thereof being visible to an observer outside the aquarium, said receptacle further including a receptacle flange extending radially outwardly and configured so said receptacle is maintained in place in the aquarium by placing at least one object having weight on said receptacle flange, said receptacle flange exhibiting perforations and configured so water contained within the aquarium flows through said perforations;

whereby said receptacle is submerged in the aquarium water and partially fills therewith, thus defining a wet zone and a dry zone within said receptacle interior, each said zone having a volume, an amphibious animal thereby gaining access to said wet and dry zones through said doorway, and being visible while occupying said dry zone, the amphibious animal being confined within said receptacle.

5,313,913

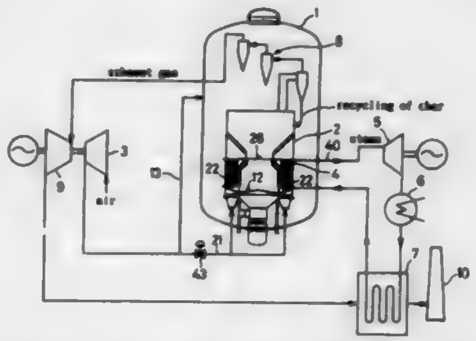
PRESSURIZED INTERNAL CIRCULATING FLUIDIZED-BED BOILER

Takahiro Ohshita; Shuichi Nagato, both of Yokohama; Norihisa Miyoshi, Sodegaura, and Seiichiro Toyoda, Tokyo, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed May 28, 1993, Ser. No. 69,686

Int. Cl.⁵ B09B *3/00;* F22B *1/00*

U.S. Cl. 122—4 D 10 Claims



1. A pressurized internal circulating fluidized-bed boiler for use in a combined-cycle electric generating system, comprising:

a pressure vessel;

a combustor disposed in said pressure vessel;

a primary fluidized bed incinerating chamber having an air diffusion device provided at the bottom of said combustor and adapted to inject fluidizing air upwardly under a mass flow that is at least greater at one side than that at another side;

an inclined partition wall provided above a portion of said air diffusion device where the mass flow is greater so as to interfere with the upward flow of the fluidizing air and thereby to deflect the air towards a portion above said another side of said air diffusion device where the mass flow is smaller;

a thermal energy recovery chamber partitioned from said primary incinerating chamber by said inclined partition wall;

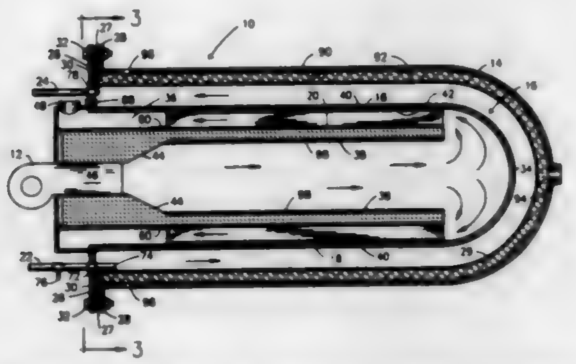
a heat transfer surface means provided in said thermal energy recovery chamber for a passage of a heat receiving fluid therethrough; and

an air diffuser provided at a lower portion of said thermal energy recovery chamber;

wherein said thermal energy recovery chamber is communicated at upper and lower portions thereof with said primary fluidized bed incinerating chamber, a moving bed is formed above the portion of said air diffusion device where the injected mass flow is smaller so that a fluidizing medium descends and diffuses within the moving bed, and a circulating fluidized bed is formed above the portion of said air diffusion device where the mass flow of the fluidizing air is greater so that said fluidizing medium is actively fluidized and whirled towards a position above said moving bed and a part of said fluidizing medium is introduced into said thermal energy recovery chamber beyond an upper portion of said inclined partition wall, the formation of said moving bed and said circulating fluidized bed is effected by regulation of the amount of air injected upwardly from said air diffusion device and regulation of the fluidizing air injected from said air diffuser in said thermal energy recovery chamber causes the fluidizing medium within said recovery chamber to descend in a state of a moving bed for circulation.

5,313,914
POTABLE HOT WATER STORAGE VESSEL AND DIRECT-FIRED HEAT EXCHANGER

Donald E. Woollen, 11610 104th La., North, Largo, Fla. 34643
Continuation-in-part of Ser. No. 785,004, Oct. 30, 1991, Pat. No. 5,207,212. This application Nov. 24, 1992, Ser. No. 980,636
Int. Cl.^{5} F24H *1/00*
U.S. Cl. 122—136 R **12 Claims**



1. In a potable hot water storage vessel apparatus containing a combustion chamber, a removable liner for an inner surface of the storage vessel and an outer shell around the combustion chamber, the improvement comprising

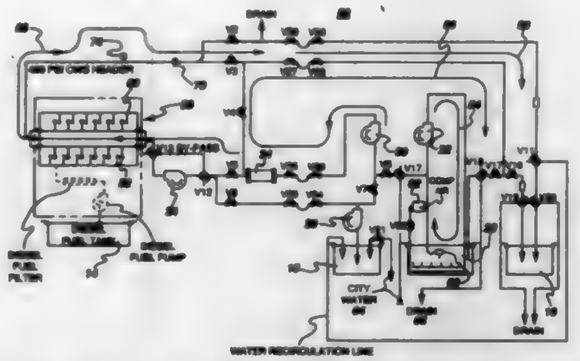
a first flange integral with the outer shell around the combustion chamber,
a second flange integral with a removable plastic storage vessel liner,
a third flange integral with the storage vessel,
the first flange containing openings for a water inlet and outlet fixture,
the first, second and third flanges being firmly secured together while the storage vessel is operational, but being capable of rapid disassembly,
a heat generating means including the combustion chamber installed within an opening in the first flange and sealed to the first flange, and
the apparatus being devoid of internal piping passing through the storage vessel or liner.

5,313,915
COAL SLURRY FUEL SUPPLY AND PURGE SYSTEM

Robert E. McDowell, Fairview, Pa.; Steven L. Basic, Hornell, N.Y., and Russel M. Smith, North East, Pa., assignors to General Electric Company, Erie, Pa.
Filed Oct. 27, 1992, Ser. No. 968,081
Int. Cl.^{5} F02B *45/00*
U.S. Cl. 123—23 **20 Claims**

1. A coal slurry fuel supply and purge system for a locomotive engine having fuel injection means, the system comprising:

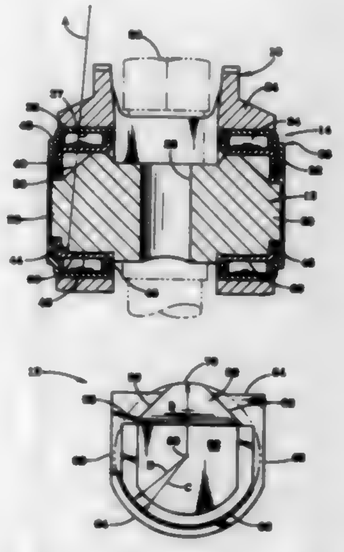
slurry fuel supply means;
first slurry fuel recirculation means, fluidly connected with the slurry fuel supply means, for recirculating slurry in the slurry fuel supply means during engine operation;
purge fluid supply means;
purge fluid pump means, fluidly connectable with the purge fluid supply means;
slurry fuel pump means, fluidly connected to the slurry fuel supply means;
thermal exchange means, fluidly connected with the slurry fuel pump means;
fluid drain means, fluidly connectable with the purge fluid pump means, for draining purged fluid;
fluid pressure generating means, fluidly connectable to the thermal exchange means and the purge fluid pump means, for supplying slurry fuel under pressure to the fuel injection mans;



fluid passage means, fluidly connected to the fuel injection means, for providing fluid flow back to the slurry supply means or the fluid drain means; and
control means, operatively coupled to valve means for selectively controlling the valve means to supply the slurry fuel to the fuel injection means or to purge the slurry fuel from the fuel injection means during predetermined engine operating states.

5,313,916
ROCKER ARM ASSEMBLY

Richard F. Murphy, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.
Filed Jul. 30, 1993, Ser. No. 100,589
Int. Cl.^{5} F01L *1/18*
U.S. Cl. 123—90.39 **18 Claims**

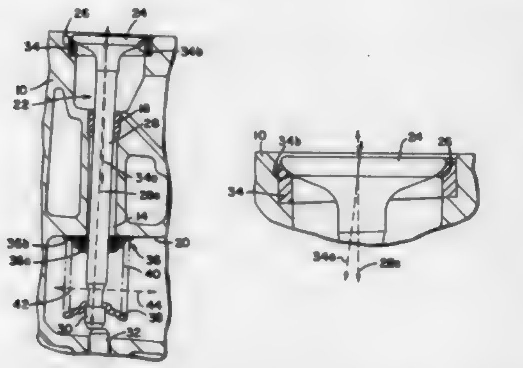


1. A rocker arm assembly for mounting about a stud means, the rocker arm assembly comprising:

a rocker arm;
a bearing support member having two support arms extending in opposite directions along an axis, the bearing support member being adapted for mounting about the stud means;
two bearing cups, one bearing cup extending over each support arm and engageable with the rocker arm; and
rolling members within an annulus formed between the bearing support member and the bearing cups such that the rocker arm is free to oscillate rotatably with respect to the bearing support member;
at least one support arm having a curved surface wherein a distance between the curved surface and said axis increases and then decreases along a direction of said axis such that a radial load is distributed along the length of the rolling members when misalignment of elements of the rocker arm assembly occurs.

5,313,917
SELF-ALIGNING VALVE ASSEMBLY

John Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Aug. 18, 1993, Ser. No. 108,433
Int. Cl.^{5} F01L *3/08, 3/10*
U.S. Cl. 123—90.67 **13 Claims**



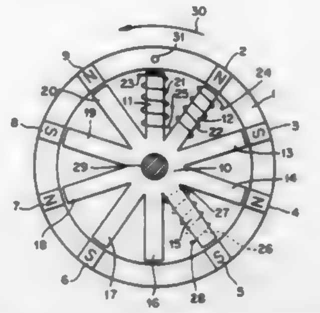
1. A self-aligning valve assembly for an engine valve, comprising:

an engine block, including
  a valve guide aperture;
  a block surface disposed adjacent to said aperture;
  a valve seat for said valve, said valve seat having a longitudinal axis;
wherein said valve includes
  a valve head having a seating surface that engages said valve seat;
  a valve stem that is at least partially disposed within said guide aperture, said valve stem being movable in both a direction parallel to said longitudinal axis and in a non-parallel direction to said longitudinal axis;
a guide member that engages said valve stem and that is movable along said block surface in said non-parallel direction in conjunction with the movement of said valve stem in said non-parallel direction;
a spring; and a retainer, that retains said spring.

5,313,918
FLYWHEEL MAGNETO ARRANGEMENT

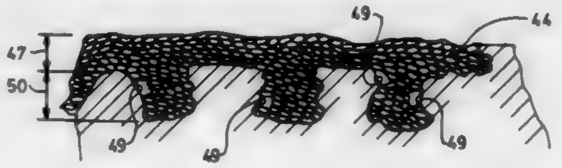
Anders Agren, Åmål, Sweden, assignor to SEM AB, Amal, Sweden
PCT No. PCT/SE90/00561, § 371 Date Mar. 2, 1992, § 102(e) Date Mar. 2, 1992, PCT Pub. No. WO91/03644, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 3, 1990, Ser. No. 838,405
Claims priority, application Sweden, Sep. 11, 1989, 8902977
Int. Cl.^{5} F02P *1/00*
U.S. Cl. 123—149 D **5 Claims**

1. An arrangement in flywheel magnetos, in particular for multiple cylinder combustion engines, wherein a magneto flywheel cooperates with a multi-pitched magnet core carrying windings, characterized in that the number of core pitches (11–20) forms an integer, and half of said number forms an odd number, and the magnet poles, having alternating polarity, are arranged in groups such that the pole pitching within the groups coincides with said core pitching, and such that adjacent core portions, one pitch apart, carry upon each, a control winding connected to a circuit for sensing voltage polarity sequence, to create distributed trigger signals for each respective engine cylinder.



5,313,919
LOW FRICTION RECIPROCATING PISTON ASSEMBLY

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County; Daniel M. Kabat, Oxford, and David A. Yeager, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 001,693, Jan. 7, 1993, Pat. No. 5,239,955. This application Jun. 14, 1993, Ser. No. 76,225
The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.
Int. Cl.^{5} F22B *5/00*
U.S. Cl. 123—193.4 **13 Claims**



1. A low-friction piston construction for use in an oil-fed cylinder bore wall, comprising:

(a) means providing a piston crown extending substantially across the entire cross-section of said cylinder bore wall and for sliding movement therein;
(b) a circumferentially extending skirt wall depending from said piston crown; and
(c) reciprocating force transmitting means connected to an interior of at least one of said skirt wall and crown, said skirt wall having portions thereof relieved in a radially inward direction, at least the unrelieved portions of said skirt wall having a solid film lubricant coating on its exterior thereof consisting of graphite, molybdenum disulfide, boron nitride, and epoxy resin, said resin comprising a polymer base that provides a supply of at least one of water vapor and hydrocarbon to the graphite component and is effective to attract an oil film thereonto.

5,313,920
CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Souichi Matsushita, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Oct. 26, 1992, Ser. No. 966,226
Claims priority, application Japan, Oct. 28, 1991, 3-281527
Int. Cl.^{5} F02D *41/38;* **F02B** *17/00*
U.S. Cl. 123—295 **17 Claims**

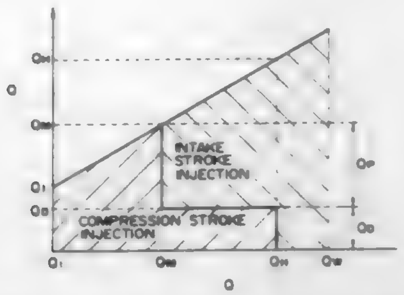
1. A control device for an internal combustion engine having a cylinder and a spark plug, said control device comprising:

a fuel feeding means for feeding an amount of fuel into the cylinder, the fuel feeding means feeding a part of the amount of fuel into the cylinder during an intake stroke to form an air-fuel premixture, and feeding the remaining part of said amount of fuel into the cylinder during a compression stroke to form an air-fuel mixture around the spark plug for ignition;

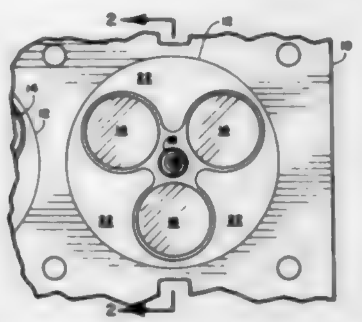
a pressure detecting means for detecting a pressure in the cylinder;

a combustion state determining means for determining a combustion state in the cylinder on the basis of the pressure detected by the pressure detecting means; and

a fuel feeding control means for controlling a ratio of the part of the amount of fuel to be fed into the cylinder during the intake stroke to the amount of fuel to be fed into the cylinder on the basis of the combustion state determined by the combustion state determining means so that a good state of combustion is obtained.



5,313,921
HIGH EFFICIENCY COMBUSTION CHAMBER SYSTEM
James J. Feuling, 2521 Palma, Ventura, Calif. 93003
Filed Dec. 23, 1992, Ser. No. 995,785
Int. Cl.^{5} F02P *15/02*
U.S. Cl. 123—310 **27 Claims**



1. An improved combustion chamber system for use with internal combustion engine having at least one piston and a cooperating cylinder head forming a combustion chamber therebetween, which comprises:

three valves in the head at the combustion chamber, the valves substantially uniformly arranged around the axis of the cylinder;

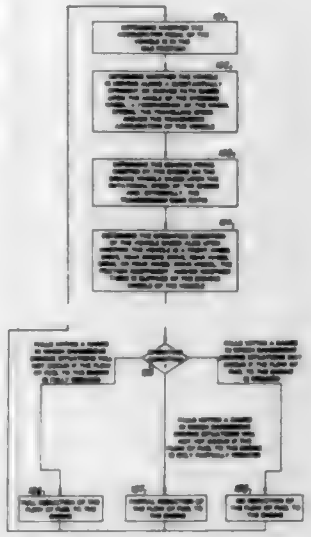
two of the valves having substantially equal areas and adapted to act as intake valves;

the third of the valves having an area substantially equal to, or slightly greater than, the area of one of the intake valves, the third valve being adapted to act as an exhaust valve;

said piston having a generally planar surface adjacent to said head forming one wall of the combustion chamber; and

at least one spark plug for igniting an air/fuel mixture in the combustion chamber said spark plug located entirely within said head without extending below the plane of the piston generally planar surface at any point during engine operation.

5,313,922
METHOD FOR CONTROLLING A FLOW OF FUEL TO AN ENGINE OF A VEHICLE DURING OVERRUN OPERATION
Herbert Demel, Bad Wimpfen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Continuation of Ser. No. 839,036, Feb. 18, 1992, abandoned, which is a continuation of Ser. No. 623,193, Dec. 6, 1990, abandoned. This application Jan. 5, 1993, Ser. No. 522
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942862
Int. Cl.^{5} F02D *33/00*
U.S. Cl. 123—333 **11 Claims**



1. A method of controlling a flow of fuel to an internal combustion engine of a vehicle, comprising the steps of:

determining whether an accelerator pedal of the vehicle is in an idle position;

determining whether a rotational speed of the engine is greater than a predetermined threshold value;

determining whether the vehicle is moving along a substantially straight or curved path by sensing, for example, at least one of an angle of a steering wheel of the vehicle, speeds of vehicle wheels, and a transverse acceleration of the vehicle;

determining whether the vehicle is in overrun operation as a function of whether the accelerator pedal of the vehicle is in the idle position and of whether the rotational speed of the engine is greater than the predetermined threshold value; and

controlling the flow of fuel to the engine, during overrun operation of the vehicle, as a function of whether the vehicle is moving along a substantially straight or curved path.

5,313,923
CONTROL APPARATUS FOR FUEL PUMP
Shigeru Takeuchi, Gamagori; Junji Sugiura, and Katsunori Michiyama, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Apr. 20, 1992, Ser. No. 871,224
Claims priority, application Japan, Apr. 24, 1991, 3-094441
Int. Cl.^{5} F02M *37/04*
U.S. Cl. 123—497 **6 Claims**

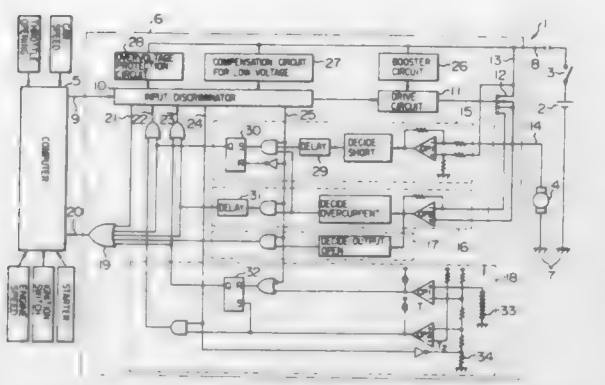
1. A fuel-pump control apparatus to be installed in a vehicle having a body, comprising:

a battery having a first electrode connected to said body and a second electrode for supplying power;

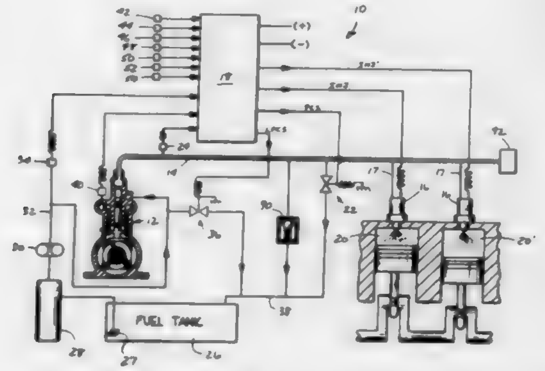
a fuel pump receiving said power from said second electrode;

a computer, having a signal output line, operating to selectively produce either one of a stop signal of a potential equal to that of said body and a drive signal of a potential equal to that of said body and a drive signal of a different potential from said stop signal on said output line; and

a semiconductor device having a first power terminal connected to said second electrode through a first conductor, a second power terminal connected to said fuel pump through a second conductor, and a control terminal connected to said signal output line, said semiconductor device being turned on to supply power through said first and second power terminals when said drive signal is received through said control terminal, being turned off to interrupt said power supply when said stop signal is received through said control terminal and being turned off when at least one of said second conductor and said signal output line of said computer has a potential substantially equal to that of said body.



5,313,924
FUEL INJECTION SYSTEM AND METHOD FOR A DIESEL OR STRATIFIED CHARGE ENGINE
Jose F. Regueiro, Rochester Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Mar. 8, 1993, Ser. No. 28,891
Int. Cl.^{5} F02M *39/00*
U.S. Cl. 123—456 **1 Claim**



1. An electrically controlled high pressure fuel injector system for an internal combustion engine having plural cylinders and a crankshaft, comprising:

a low pressure fuel supply line connected to a supply of fuel;

a high pressure pump connectable to said low pressure fuel supply line and said supply of fuel;

a high pressure common rail coupled to said high pressure pump to receive pressurized fuel from said high pressure pump and the fuel supply;

a plurality of electrically controlled fuel injectors, each coupled to said common rail and responsive to an injector signal to selectively supply fuel from said common rail directly into one of the cylinders;

a first pressure regulator coupled to said common rail, said pressure regulator being responsive to a pressure control signal to vary the fuel pressure in said common rail;

a pressure sensor coupled to said common rail to generate a pressure signal indicative of the measured pressure of fuel in said common rail;

a load sensor which generates a load signal indicative of the position of a control mechanism that controls the engine output;

a speed sensor which generates a speed signal indicative of engine speed;

a shaft position sensor which generates a shaft position signal indicative of the angular position of the crankshaft;

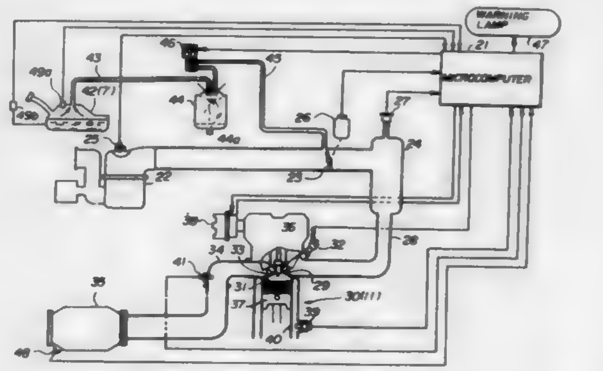
a sequencing sensor which generates a sequence signal that is indicates which of said fuel injectors is to receive the next injection signal;

an electronic control unit coupled to control said pressure regulator and each of said fuel injectors, said electronic control unit being responsive to said load sensor, speed sensor, shaft position sensor, and sequencing sensor to generate the injection signals and being responsive to said load sensor, speed sensor, and pressure sensor to generate the pressure control signal;

a second pressure regulator attached to said low pressure fuel supply line and coupled to said electronic control unit, said second pressure regulator being responsive to a low pressure control signal generated by said electronic control unit to vary the pressure of fuel in said low pressure fuel supply line; and

a second pressure sensor coupled to said low pressure fuel supply line to supply a low pressure signal to said electronic control unit indicative of the measured pressure of fuel in said low pressure fuel supply line, said electronic control unit being responsive to the low pressure signal to generate the low pressure control signal.

5,313,925
APPARATUS FOR DETECTING MALFUNCTION IN FUEL EVAPORATIVE PRURGE SYSTEM
Takayuki Otsuka, Susono; Nobuaki Kayanuma, Gotenba; Kouichi Osawa; Hironori Okamizu, both of Susono, and Chikao Kunimasa, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 771,445, Oct. 4, 1991, Pat. No. 5,230,319. This application May 13, 1993, Ser. No. 62,351
Claims priority, application Japan, Oct. 5, 1990, 2-267889; Jan. 18, 1991, 3-4687
Int. Cl.^{5} F02M *37/04*
U.S. Cl. 123—520 **5 Claims**



1. An apparatus for detecting a malfunction in an evaporated fuel purge system provided in an internal combustion engine, comprising:

purge means for performing alternately a purging mode and a purge cutting mode, fuel vapor from a fuel tank being adsorbed in an adsorbent in a canister when said purge cutting mode is performed by said purge means, and when said purging mode is performed by said purge means the adsorbed fuel vapor in the adsorbent being purged into an intake passage of the internal combustion engine;

detection means for detecting an air-fuel ratio of the fuel vapor being purged into the intake passage so that a change in the air-fuel ratio of the fuel vapor, from a time when the purge cutting mode is performed to a time when the purging mode is performed by said purge means immediately after said purge cutting mode has been performed, is detected;

malfunction discrimination means for determining whether there is a malfunction in the evaporated fuel purge system, by comparing said change in said detected air fuel ratio of the fuel vapor detected by said detection means with a predetermined value;

fuel vapor detection means for detecting a fuel vapor pressure in the fuel tank; and

purge cut time varying means, coupled to said purge means, said purge cut time varying means determining a purge cut time, during which said purge cutting mode is continuously performed by said purging means, said purge cut time being varied by said purge cut time varying means in response to said fuel vapor pressure in the fuel tank detected by said fuel vapor detection means, wherein the purge cut time is determined based on the fuel vapor pressure of the fuel tank detected by said fuel vapor detection means.

5,313,926

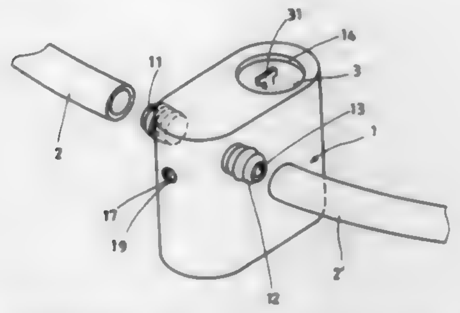
SUPPLEMENTAL EMISSION CONTROL DEVICE FOR A GASOLINE ENGINE

Fu-Kuo Lin, 2F, No. 128, Liow Tang Street, Sanchorng, Taipei, Taiwan

Filed May 7, 1993, Ser. No. 57,815

Int. Cl.⁵ F02M *23/00*

U.S. Cl. 123—587 **1 Claim**



1. A supplemental emission control device for a gasoline engine comprising:

a housing having first and second hose connectors affixed to opposed side walls thereof;

a pair of first and second air hoses having first ends attached to said first and second hose connectors, respectively, and second ends attached to an air intake manifold and a carburetor, respectively;

a transverse through opening formed in said housing for connecting said first and second hose connectors in fluid communication with each other;

an air intake chamber formed in said housing, said air intake chamber having an open upper end for passage therein of ambient air;

a control chamber formed in said housing, said control chamber in fluid communication with said air intake chamber and said transverse through opening;

valving means disposed in said control chamber for drawing said current of ambient air into said air intake chamber and said control chamber, said valving means having a piston slidably disposed in said control chamber and a piston rod extending upwardly from said piston;

biasing means for moving said piston in a downwardly directed displacement to seal a lower air passage formed in a bottom wall of said control chamber, said biasing means disposed about said piston rod within said control chamber;

air flow regulating means formed in said housing for controlling a volume of said ambient air flowing into said transverse through opening, said air flow regulating means including an opening formed in said housing in fluid communication with said control chamber and said transverse through opening, and a screw member threadably received by said bore; and,

filtering means mounted in said intake chamber for removing contaminants in said air, said filtering means including a removable sponge filter and a handle member affixed to an upper end of said sponge filter for facilitating removal and replacement of said sponge filter from said air intake chamber.

5,313,927

IGNITION COIL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

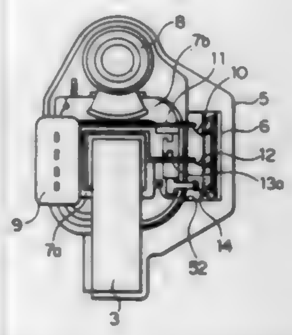
Tado Takaishi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 699,402, May 13, 1991, Pat. No. 5,186,154. This application Sep. 16, 1992, Ser. No. 945,394

Claims priority, application Japan, Jun. 11, 1990, 2-149838

Int. Cl.⁵ F02P *3/02*

U.S. Cl. 123—634 **4 Claims**



1. An ignition coil device for an internal combustion engine, comprising:

a molded resin casing;

an iron core having a leg extending within said molded resin casing;

a primary winding and a secondary winding wound on said leg of the core extending within said molded resin casing, said primary winding and said secondary winding being accommodated within said molded resin casing;

a control circuit for controlling primary current flowing through said primary winding;

a connector for exterior electrical connection; and

an interior wiring, said connector being electrically coupled to said primary winding and said secondary winding via said interior wiring,

wherein said leg of the core is disposed between the control circuit and the connector, and all of said interior wiring is routed around an outside of said leg of the core such that the interior wiring is unaffected by magnetic flux of the core.

5,313,928

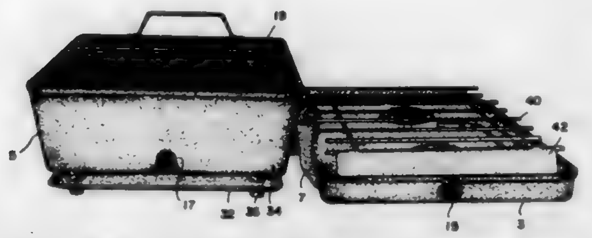
PORTABLE CAMP STOVE AND BARBECUE GRILL

Aubrey Rodgers, Surrey; Kenneth P. Hope, and Norman B. Hope, both of Princeton, all of Canada, assignors to Firelight Leisure Products Ltd., Princeton, Canada

Continuation-in-part of Ser. No. 348,461, May 4, 1989, Pat. No. Des. 326,792, which is a continuation-in-part of Ser. No. 892,806, Jun. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 823,002, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 378,998, Jul. 12, 1989, abandoned. This application Jun. 9, 1992, Ser. No. 895,362

Int. Cl.⁵ F24C *5/20*

U.S. Cl. 126—38 **20 Claims**



1. A portable combination camp stove and barbecue adapted for use on a supporting surface, comprising:

a) a first housing having a top wall and four side walls forming an open bottom and provided with a gas stove burner element;

b) a second housing having a bottom wall and four side walls forming an open top and provided with a gas barbecue burner element and adapted for hingedly co-operating with said first housing to form the casing of a unit able to be hingedly opened and closed;

c) fuel supply means for providing a supply of fuel to said stove and barbecue burner elements;

d) regulator means for controlling the supply of fuel to said stove and barbecue burner elements;

e) a first grate adapted for sitting above said barbecue burner element in said second housing;

f) a heating transferring plate adapted for removable mounting in said second housing between said first grate and said barbecue burner element and having an extended upwardly-facing surface;

g) means for supporting said heat transferring plate above said barbecue burner element;

h) means for supporting said first grate above said barbecue burner element;

i) a second grate adapted for sitting above said stove burner element;

j) means for supporting said second grate above said stove burner element; and

k) heat shielding means having an upper surface and a lower surface and adapted to be positioned between said bottom wall of said second housing and said supporting surface, said heat shielding means comprising upper and lower heat insulating spacer means adapted to bear respectively against the upper and lower surfaces thereof for supporting said second housing above said supporting surface;

wherein said second housing is adapted to be supported by said upper heat insulating spacer means above and spaced from the upper surface of said heat shielding means, wherein said heat shielding means is adapted to be supported by said lower heat insulating spacer means such that the lower surface thereof is above and spaced from said supporting surface, wherein said first and second grates, said heat shielding means and said heat transferring plates are adapted to fit within said first and second housings when closed, wherein said heat shielding means comprises a planar sheet of heat shielding material extending over an area comparable to the area of said bottom wall, wherein said bottom wall is provided with one or more apertures adapted to permit the passage of air to the interior of said second housing from an area between said bottom wall and said heat shielding means when said barbecue burner element is in operation and said heat shielding means is in position between said bottom wall and said supporting surface.

5,313,929

ARRANGEMENT OF AT LEAST ONE GAS BURNER IN A MOLDED PART OF A BRITTLE-FRIABLE MATERIAL FOR EXAMPLE FOR COOKING UNITS

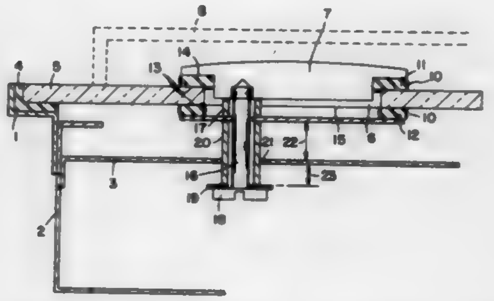
Jürgen Thürk, Schornsheim; Martin Taplan, Ingelheim; Roland Dudek, Mainz; Stefan Hubert, Wiesbaden, and Dietrich Busch, Bacharach, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Oct. 9, 1992, Ser. No. 958,261

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1991, 4133409

Int. Cl.⁵ F24C *3/00*

U.S. Cl. 126—39 B **25 Claims**



1. A burner arrangement useful in cooking units, wherein at least one gas burner is mounted in a supporting frame and surrounded by a molded part of a brittle-friable material having a topside; wherein each gas burner extends through an opening in the molded part of the brittle-friable material up to and beyond the topside of the molded part, and wherein, between the molded part and each gas burner, an elastic junction and sealing device is provided with a junction and sealing element in firm contact and in liquid-tight engagement with a marginal zone of the opening and with at least one junction surface formed by the gas burner; the improvement comprising the gas burner (7) being carried by a molded part (5), the molded part (5) being in the form of a plate made of a brittle-friable material, locking means (16 or 35) for fixing the gas burner (7) to the molded part (5) and retaining means (3) secured to the frame (2) beneath the molded part (5) and spaced from the molded part (5), the retaining means (3) being out of direct mechanical contact with the molded part (5), the gas burner (7) and the locking means (16 or 35); wherein the retaining means will support the gas burner (7) upon breakage of the molded part (5) while allowing the burner (7) to move and twist with respect to the molded part (5) under normal circumstances whereby stresses in the molded plate (5) due to the thermal and mechanical loading by the burner (7) are minimized.

5,313,930

AIR INTAKE FOR FURNACE

Matthew Kujawa, Danville, and Timothy J. Waterman, Carmel, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

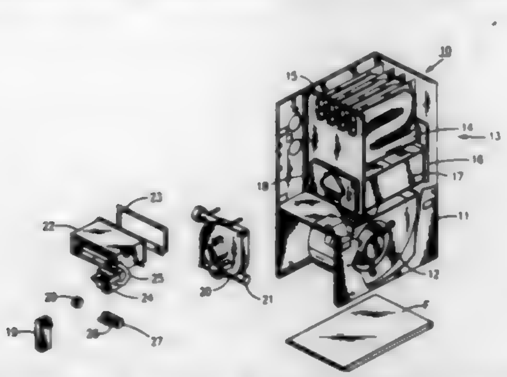
Filed Jul. 9, 1993, Ser. No. 89,661

Int. Cl.⁵ F24H *3/00*

U.S. Cl. 126—116 R **5 Claims**

1. An air intake shoe for a direct vent, condensing furnace of the type in which a combustion air duct brings outside combustion air to the furnace, said intake shoe is coupled to said combustion air duct to supply combustion air to a burner box that contains at least one gas burner, a heat exchanger receives hot combustion products from the burner, an inducer coupled

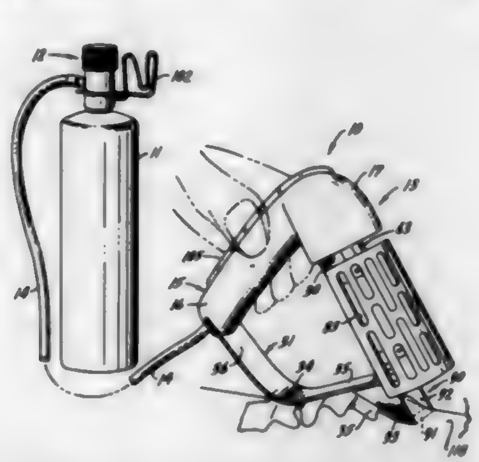
to a discharge side of the heat exchanger exhausts the combustion products into an exhaust vent duct and induces a flow of said combustion air from said combustion air duct through said intake air shoe and said burner box, and a drain line is coupled to said air intake shoe to drain condensate therefrom; wherein said air intake shoe comprises a tray portion having a bottom wall and side walls and a top opening that fits an intake opening in the burner box, and a tube portion having left and right generally cylindrical end portions one of which is connected to said combustion air duct and the other of which is coupled to said drain line, and a central portion therebetween from which said tray portion protrudes radially, said central portion having a generally cylindrical wall that is contiguous with the bottom wall of the tray portion but which opens to the tray portion to permit combustion air to flow to the burner box, and has a lip dispensing below said top opening, such that when said furnace is installed in an inverted, downflow orientation with said top opening facing downward atop said burner box, said lip traps condensate in said shoe and channels it to said drain line.



5,313,931
ONE HAND FIXED TEMPERATURE COATING REMOVER

Richard D. Coulcher, Jr., Rochester; Alan A. Hyde, Byron, and Michael L. Ridley, Holley, all of N.Y., assignors to Newell Operating Company, Freeport, Ill.

Filed Nov. 20, 1991, Ser. No. 795,405
Int. Cl.⁵ B26B *27/00*
U.S. Cl. 126—401 4 Claims



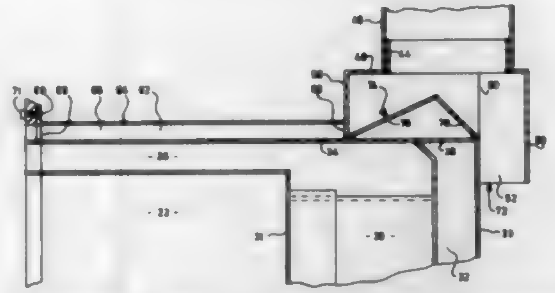
1. A stripping device for removing coatings such as paint from surfaces to which said coatings are adhered, said device including

means for scraping a coating from its underlying surface,
flame means for softening the coating to be removed prior to this removal by the scraping means,
means for directing a flame generated by the flame means onto the coating to be removed at a location in advance of the scraping means
whereby the scraping means is not heated by contact with the flame generated by the flame means,
means for maintaining the flame means and the scraping means in the same relative position with respect to each other and with respect to the coating surface as the flame means and the scraping means are moved together across the coated surface,
the flame means, the scraping means and the means for maintaining the flame means and the scraping means in the same relative position with respect to one another being mechanically connected to each other to form a unitary structure
whereby the stripping device may be moved across the coated surface to be scraped by one hand of an operator,
the scraping means providing one of two contact points between the unitary structure and the coated surface,
the means for maintaining the flame means and the scraping means in the same relative position including a rigid frame member which provides a base structure for the scraping means and the flame means,
handle means for grasping the stripping device, said handle means being secured to the frame member,
means for regulating the flow of a supply of fuel gas to create a heating flame,
means for controlling the flow of gas fuel between on and off conditions, and
means for igniting the gas fuel,
said controlling and igniting means being carried by the handle means and under the control of the operator's hand while said operator's one hand grasps the handle means and moves the stripping device over a coated surface to remove coating from said coating surface.

5,313,932
HOOD FOR FIREPLACE

Heinz H. Rieger, Toronto, and Colin Adamson, Mississauga, both of Canada, assignors to 729819 Ontario Limited, Canada

Filed Nov. 18, 1992, Ser. No. 978,116
Claims priority, application Canada, Nov. 12, 1992, 2082791
Int. Cl.⁵ F24B *1/188, 1/189*
U.S. Cl. 126—531 55 Claims

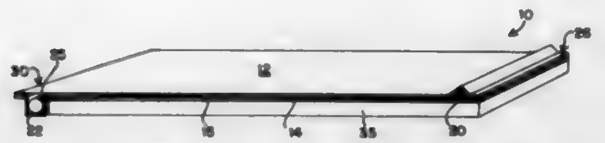


1. A fireplace having a housing including a combustion chamber having a front face to be directed into a room, a base, a top spaced from said base, a pair of side walls extending between said top and said base at opposite edges thereof and a rear wall extending between said side walls and said top and base at a location spaced from said front face, an exhaust duct extending from said combustion chamber at a location adjacent to the intersection of said top and rear wall to allow egress of combustion products from said combustion chamber and terminating at a manifold positioned outside said combustion chamber and operable to connect said chamber to a flue, said manifold having an exhaust outlet to direct combustion products into said flue, a baffle extending across said exhaust outlet and spaced form both said outlet and said exhaust duct to prevent direct passage of combustion products form said exhaust duct to said flue, said manifold further including a pair of inlets to supply dilution air to said flue, one of said inlets being connected to an aperture provided in said front face to receive dilution air therefrom and the other of said inlets receiving balance air from a location remote from said front face.

5,313,933
SOLAR COLLECTOR WITH FIBER MATERIAL ABSORBER LAYER

Thomas E. Gocze, 360 Center St., Bangor, Me. 04401

Filed Aug. 5, 1992, Ser. No. 926,165
Int. Cl.⁵ F24J *2/28, 2/36*
U.S. Cl. 126—674 26 Claims



1. A solar collector for converting solar radiation to heat energy over a specified surface area and for collecting the heat energy comprising:

a glazing first layer for receiving and passing incident solar radiation over the specified surface area;
an impervious backing layer spaced from the glazing first layer;
an absorber layer sandwiched between the glazing first layer and backing layer, said glazing first layer and backing layer contacting the absorber layer on opposite sides across said surface area of the solar collector to avoid condensation and fogging on the inside surface of the glazing first layer;
said absorber layer comprising a layer of woven or nonwoven fabric fiber material having radiation absorbing surfaces defining capillary channels and spaces in the absorber layer between the glazing first layer and backing layer, said absorber layer of fabric fiber material being formed with a radiation absorbing color and defining a relatively high surface area to volume ratio trickle feed absorber surface through the absorber layer;
said solar collector being constructed with a collecting orientation having an open top end and an open bottom end communicating with the absorber layer;
a heat transfer fluid inlet channel coupled to the open top end communicating with the absorber layer for trickle feeding heat transfer fluid by gravity through the capillary channels and spaces of the absorber layer, and a heat transfer fluid outlet channel coupled to the open bottom end for delivering heated fluid;
said first glazing layer and backing layer defining the walls of a circulating manifold contacting and confining the absorber layer and heat transfer fluid between the heat transfer fluid inlet and outlet channels.

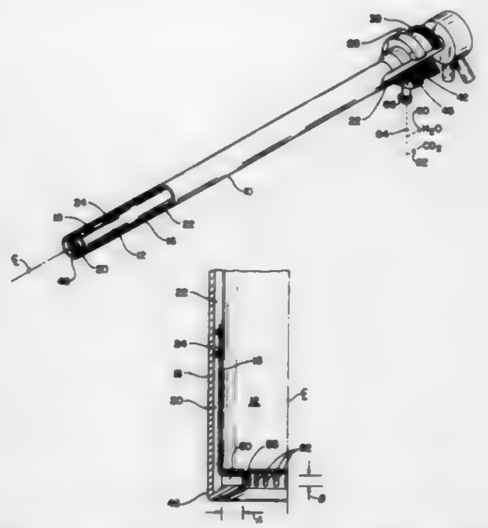
5,313,934
LENS CLEANING MEANS FOR INVASIVE VIEWING MEDICAL INSTRUMENTS

Bruce E. Wilta, North Palm Beach; J. Michael Teets, Hobe Sound, and Gregory D. Wilta, Palm Beach Gardens, all of Fla., assignors to Desmed Group Inc., Palm Beach Gardens, Fla.

Filed Sep. 10, 1992, Ser. No. 943,315
Int. Cl.⁵ A61B *1/00*
U.S. Cl. 128—4 12 Claims

1. Apparatus for cleansing the lens of a viewing camera used in biological observation by penetration into the cavity of living beings, the camera having an elongated tube housing fibre optics for producing a lighted area from a light source and a image relay for a television camera, a lens at the distal end of said elongated tube, the improvement comprising:

a tubular member concentrically mounted around said elongated tube and being spaced therefrom to form a longitudinal passageway,
a cuff portion extending beyond the distal end of said elongated tube to reduce lens contact with body parts to inhibit opaque fluids from obscuring visibility, said cuff portion including fluid passage means in fluid communication with said longitudinal passageway and being laterally disposed relative thereto and defining at least one discharge port at the end of said fluid passage means for directing fluid in a lateral direction, said cuff portion including a bottom wall surface extending below said fluid passage means for redirecting the flow of fluid in said longitudinal passageway and to flow into said fluid passage means to discharge from said discharge port and flow laterally in a direction to scrub the surface of the lens mounted at the distal end of said elongated tube,
said discharge port being sized to coalesce and direct the flow of fluid to form a sheet of fluid, and
means for admitting fluid into said longitudinal passageway whereby the flow of fluid formed into a sheet is directed over the lens on demand of the operator.



5,313,935
APPARATUS FOR COUNTING THE NUMBER OF TIMES A SURGICAL INSTRUMENT HAS BEEN USED

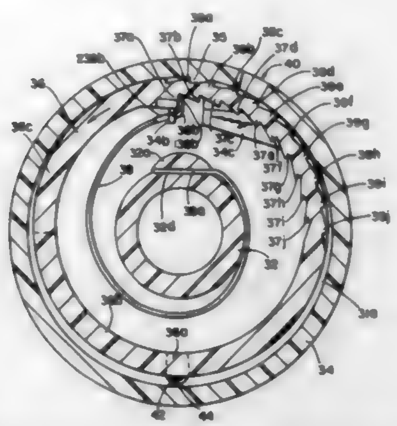
Jurgen A. Kortenbach, Miami Springs; George Nunez, Miami, and Charles R. Slater, Fort Lauderdale, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 16,596, Feb. 11, 1993, and a continuation-in-part of Ser. No. 998,951, Dec. 31, 1992, and a continuation-in-part of Ser. No. 999,228, Dec. 31, 1992. This application Aug. 17, 1993, Ser. No. 107,456
Int. Cl.⁵ A61B *1/00*
U.S. Cl. 128—4 19 Claims

1. An apparatus for counting the number qf times a surgical instrument has been sterilized, said apparatus comprising:

a) a housing having an inner hub portion and an outer cylindrical portion, said outer cylindrical portion having an inwardly extending tooth and an indication means;
b) a ratchet wheel having a plurality of inner teeth, a plurality of outer teeth, and outer incremental indicia, said ratchet wheel being located between said inner hub portion and said outer cylindrical portion of said housing such that one of said plurality of outer teeth is engaged by said inward extending tooth and one of said incremental indicia is indicated by said indication means; and
c) a bimetallic member having a free end and a fixed end, said free end engaging one of said plurality of inner teeth and said fixed end being attached to said inner hub portion of said housing, wherein
a sterilization heating and cooling cycle causes said bimetallic member to engage a next one of said inner teeth and to

advance said ratchet wheel past said inward extending tooth so that a next one of said incremental indicia is



indicated by said indication means, and said inward extending tooth prevents said ratchet wheel from returning to a previous position.

5,313,936
INDUSTRIAL ENDOSCOPE APPARATUS

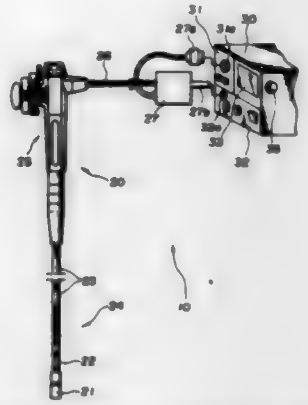
Atsushi Miyazaki, Hachioji, and Seiji Kimura, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 10,994

Claims priority, application Japan, Apr. 20, 1992, 4-99560

Int. Cl.⁵ A61B *1/04*

U.S. Cl. 128—6 **9 Claims**



1. An industrial endoscope apparatus comprising:

an endoscope which is to be inserted into an inspection portion;

a control device for controlling said endoscope;

a light source device for supplying an illumination light to a distal end portion of said endoscope;

a monitor for displaying an image of an object, wherein the display of the image on said monitor is controlled by said control device;

a casing in which said control device, said light source device and said monitor are contained within one unit; and

a fixing means for detachably fixing said monitor to said casing.

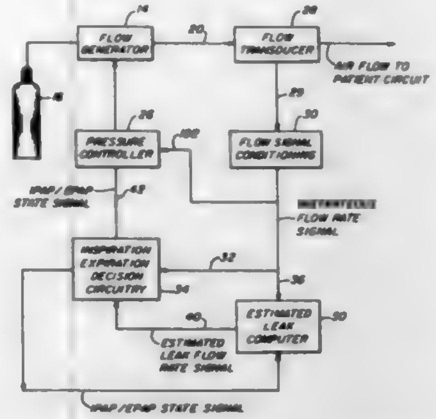
5,313,937
LEAK COMPENSATION METHOD AND APPARATUS FOR A BREATHING SYSTEM

Ronald J. Zdrojkowski, Pittsburgh, Pa., assignor to Respironics Inc., Murrysville, Pa.

Division of Ser. No. 411,012, Sep. 22, 1989, Pat. No. 5,148,802. This application Jun. 19, 1992, Ser. No. 901,506

Int. Cl.⁵ A61M *16/00*

U.S. Cl. 128—202.22 **17 Claims**



1. In a system for providing breathing gas flow from a source for breathing by a person in alternating inspiratory and expiratory breathing cycles wherein said breathing gas flow includes a patient supply flow component and a leak flow component, a method of compensating for said leak flow component comprising the steps of:

continually determining the instantaneous flow rate and the average flow rate of such breathing gas flowing between such a source and the airway of such a person;

continually comparing said instantaneous flow rate and said average flow rate to determine the flow rate of said leak flow component; and

in response to said comparing step, adjusting the flow rate of breathing gas flow from said source to such a person to compensate for said leak flow component.

5,313,938
VALVED RESUSCITATION PUMP HAVING SECRETION REMOVAL MEANS

Allan S. Garfield, 2 Lockerbie Court, East St. Kilda, Victoria 3183; Noam White, Balaclava; Max S. de Vriend, Caulfield, and David J. Cook, E. St. Kilda, all of Australia, assignors to Allen Samuel Garfield, East St. Kilda, Australia

Filed Sep. 15, 1992, Ser. No. 944,929

Claims priority, application Australia, Jun. 18, 1986, PH6459

Int. Cl.⁵ A62B *7/00, 9/02*

U.S. Cl. 128—205.16 **15 Claims**

1. A cardiopulmonary resuscitating pump for pumping gas into and waste out of a patient, comprising:

a portable housing having a top wall adapted to be hand held in use, a bottom wall having a substantially planar undersurface adapted to rest on the chest of a patient, and a first side wall structure extending therebetween, said first side wall structure configured for successively moving between a contracted position and an expanded position in response to the application and release of external pressure applied manually to said top wall, application of external pressure to said top wall while said side wall is in said contracted position being transmitted to the patient via the bottom wall to effect simultaneous cardiac massage and ventilation;

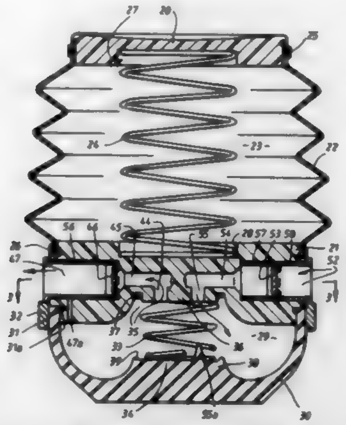
a gas chamber defined within said walls and having a gas inlet and a gas outlet;

a waste chamber defined within said walls and having a waste inlet and a waste outlet;

an oropharyngeal airway in fluid connection with said gas outlet and said waste inlet;

valve means within said housing for permitting flow in only one direction through each of said gas inlet, said gas outlet, said waste inlet, and said waste outlet;

said valve means directing, during each movement of said first side wall structure to said contracted position, gas flow from said gas chamber into said oropharyngeal airway via said gas outlet and waste flow from said waste chamber via said waste outlet;



said valve means directing, during each movement of said first side wall structure to said expanded position, gas flow into said gas chamber via said gas inlet and waste flow from the patient into the waste chamber from said oropharyngeal airway via said waste inlet; and

an additional valve means in said waste inlet to ensure that said waste inlet is closed during each movement of said first side wall structure to said contracted position.

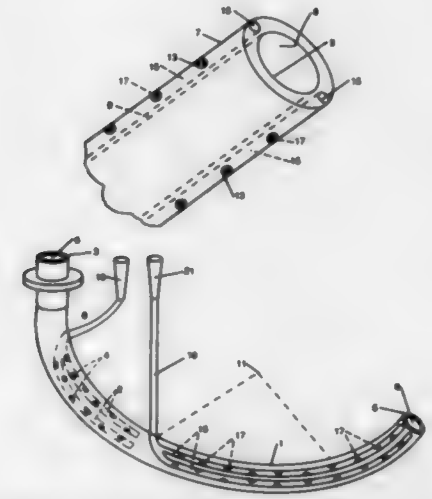
5,313,939
ENDOTRACHEAL ™ TUBE FOR TOPICAL SUBSTANCE DELIVERY AND ASSOCIATED METHOD OF USE

René M. Gonzalez, Pittsburgh, Pa., assignor to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Oct. 11, 1991, Ser. No. 775,721

Int. Cl.⁵ A61M *16/10, 15/00, 11/00;* **A62B** *9/06*

U.S. Cl. 128—207.14 **42 Claims**



1. An apparatus for topical targeted delivery of a substance to the surrounding internal body tissues and walls of a patient's upper airway which comprises:

a tube member having (a) a proximal open end, a distal open end, and a central lumen for oxygenating or ventilating the lungs of the patient, said central lumen disposed between said proximal open end and said distal open end, and (b) an annular outer surface having a plurality of openings therein, and an annular inner surface, said openings of said annular outer surface extending over at least a portion of the axial extent of said annular outer surface of said tube member positioned to be surrounded by internal body tissues and walls of the patient's upper airway when inserted into the patient's upper airway; and

at least one substance delivery means in communication with said tube member, each said substance delivery means including at least two conduit members disposed generally at least in part between said annular inner surface and said annular outer surface, wherein said conduit members extend over said portion of the axial extent of said annular outer surface of said tube member positioned to be surrounded by internal body tissues and walls of the patient's upper airway when inserted into the patient's upper airway, a plurality of conduit member perforations extending over each said conduit member in substantial alignment with said openings of said annular outer surface of said tube member to facilitate communication therebetween for allowing the substance travelling through said conduit members to flow from within said conduit members by passing through said conduit member perforations and said openings of said annular outer surface of said tube member to be delivered to said surrounding internal body tissues and walls of said airway, and supply means having a first end in communication with said conduit members, for delivering said substance to said conduit members.

5,313,940
PHOTO-ELECTRIC PULSE WAVE MEASURING PROBE

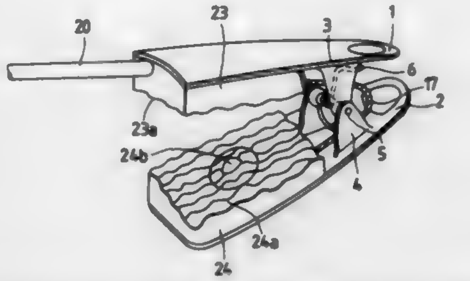
Masayoshi Fuse; Cheng T. Xie, and Takuo Aoyagi, all of Tokyo, Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed May 14, 1992, Ser. No. 882,960

Claims priority, application Japan, May 15, 1991, 3-043357[U]

Int. Cl.⁵ A61B *5/00*

U.S. Cl. 128—633 **11 Claims**



1. A photo-electric pulse wave measuring probe for use with a living tissue, comprising:

a pair of supporting members each having first and second ends and being pivotally coupled together at their first ends, said pair of supporting members being adapted to be clamped to said living tissue;

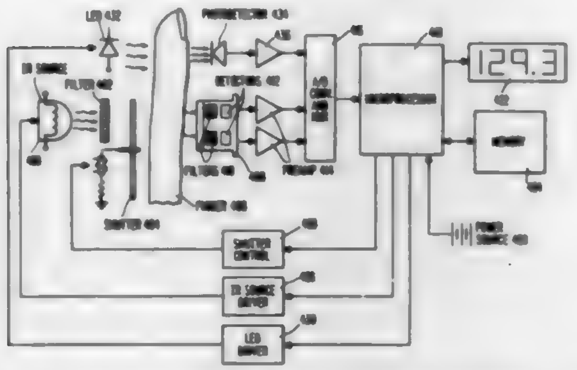
a light-emitting element and a light-receiving element provided on said supporting members adjacent said second ends of said supporting members, said second ends of said supporting members being opposite to said first ends; and

holding means coupled to at least one of said supporting members for holding a living tissue clamped by said supporting members,

wherein said holding means includes an uneven region, said uneven region being formed in at least one of said supporting members, said uneven region having a plurality of alternating convex and concave portions adapted for receiving said living tissue, whereby fluid flowing in said living tissue having been received in said holding means is substantially unrestricted by said alternating convex and concave portions of said uneven region.

5,313,941
NONINVASIVE PULSED INFRARED SPECTROPHOTOMETER

James R. Braig, 6147 Chelton Dr., Oakland, Calif. 94611, and Daniel S. Goldberger, 644 College Ave., Boulder, Colo. 80302
Filed Jan. 28, 1993, Ser. No. 10,634
Int. Cl.^{5} A61B *5/00*
U.S. Cl. 128—633 26 Claims



1. A noninvasive pulsed infrared spectrophotometer for measuring the concentration of at least one predetermined constituent of a patient's blood, comprising:

an infrared source which emits broadband pulses of infrared light including n different wavelengths of at least 2.0 μm, said pulses of infrared light containing energy at each of said n wavelengths being differentially absorbed by said at least one predetermined constituent whereby each predetermined constituent readily absorbs pulses of infrared light at one of said n wavelengths and minimally absorbs pulses of infrared light at another of said n wavelengths, and which directs said pulses of infrared light through an arterial blood vessel of the patient;

at least one infrared detector which detects light at said n wavelengths which has passed through said arterial blood vessel of the patient and has been selectively absorbed by said at least one predetermined constituent and which outputs at least one detection signal;

synchronizing means for synchronizing the application of said pulses of infrared light from said infrared source to said arterial blood vessel of the patient with the systolic and diastolic phases of a cardiac cycle of the patient, said synchronizing means including a cardiac monitor and means responsive to an output of said cardiac monitor for modulating said pulses of infrared light so that said infrared light passes through said arterial blood vessel of the patient only during diastolic and systolic time intervals respectively occurring during the systolic and diastolic phases of said cardiac cycle of the patient; and

means for determining the concentration of said at least one predetermined constituent of the patient's blood from said at least one detection signal.

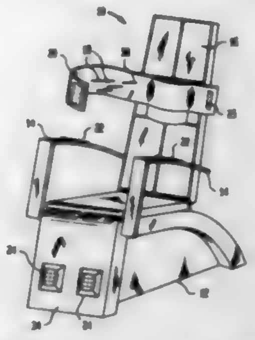
5,313,942
ELECTRODE SYSTEM AND METHOD FOR EKG TESTING

Yakov Platzker, 90 Hayarden St., Ramat Gan, Israel
Filed May 19, 1992, Ser. No. 885,374
Claims priority, application Israel, May 20, 1991, 98188
Int. Cl.^{5} A61B *5/02*
U.S. Cl. 128—639 18 Claims

17. An electrode system for reducing the set-up time for electrode placement on parts of the body in medical diagnostic testing (EKG) comprising in combination:

support structure means for supporting the body;

a first plurality of electrodes supported by said support structure means, wherein said first plurality of electrodes is enclosed in a flexible strap attached at one end thereof to said support structure means, for placement of said flexible strap across the chest, said flexible strap comprising layers of flexible material formed with slots therein, each of said slots having a contact being movable therein in adjustable fashion, said strap being vertically adjustable, enabling said contact to be placed in an optimal location; and

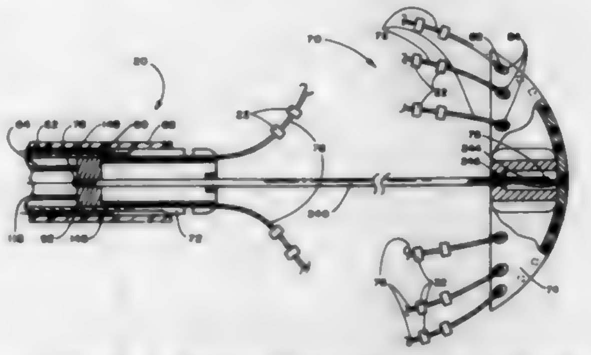


a second plurality of electrodes each fixedly mounted at a location on said support structure means, said second plurality of electrodes being mounted for contacting the arms and

such that when the body is supported by said support structure means, said first and second plurality of electrodes contact the body and enable rapid electrical connection thereto for diagnostic testing.

5,313,943
CATHETERS AND METHODS FOR PERFORMING CARDIAC DIAGNOSIS AND TREATMENT

Russell A. Houser, Pleasanton; Stuart D. Edwards, Los Altos, and Thomas F. Kordis, Sunnyvale, all of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.
Filed Sep. 25, 1992, Ser. No. 951,739
Int. Cl.^{5} A61B *5/042, 17/36*
U.S. Cl. 128—642 8 Claims

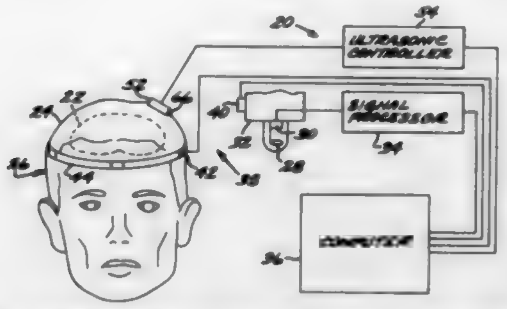


1. A probe for cardiac diagnosis and treatment comprising:

a catheter having a distal end for insertion into a heart chamber, means on the distal end of the catheter comprising an array of radially extending splines, each spline having a proximal end and a distal end and supporting at least one electrode, a fluid flow conduit extending through the catheter for conducting fluid from an external source through the catheter distal end, and valve means at the catheter distal end for preventing fluid flow from the heart chamber into the conduit while permitting the fluid flow through the conduit into the heart chamber wherein the distal ends of the splines are connected to an end cap, and wherein the fluid flow conduit extends through the end cap.

5,313,944
MEASUREMENT OF INTERNAL BODY STRUCTURE DURING BIOMAGNETOMETRY

Christopher Crowley, San Diego; D. Scott Buchanan, Escondido, and Waldo S. Hinshaw, Burlingame, all of Calif., assignors to Biomagnetic Technologies, Inc., San Diego, Calif.
Filed Sep. 21, 1992, Ser. No. 948,386
Int. Cl.^{5} A61B *5/05*
U.S. Cl. 128—653.1 18 Claims



1. A biomagnetometer that measures a magnetic field produced by a source organ within the body of a subject, comprising:

means for measuring a magnetic field produced by a source organ, the means for measuring being external to the body and including a magnetic field sensor;

first position measuring means for measuring the location of the magnetic field sensor relative to the body of the subject, the first position measuring means including a first position sensor;

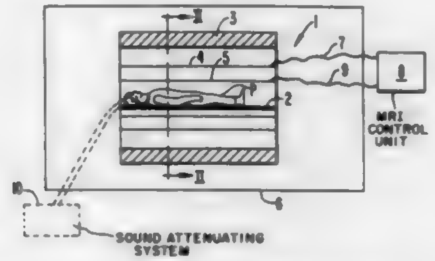
means for determining the internal structure of the body relative to the means for determining, the means for determining being external to the body and including a structure-locating sensor;

second position measuring means for measuring the location of the structure-locating sensor relative to the magnetic field sensor, the second position measuring means including a second position sensor; and

a computer that controls the means for measuring, the means for determining, the first position measuring means, and the second position measuring means.

5,313,945
ACTIVE ATTENUATION SYSTEM FOR MEDICAL PATIENTS

Paul Friedlander, Randallstown, Md., assignor to Noise Cancellation Technologies, Inc., Linthicum, Md.
Filed Jun. 11, 1990, Ser. No. 543,854
Int. Cl.^{5} A61B *5/055*
U.S. Cl. 128—653.2 24 Claims



1. A patient diagnosing apparatus comprising:

patient accommodating means for holding a patient in a predetermined position in an ambient environment:

diagnosing means operatively coupled to and surrounding said patient accommodating means, for diagnosing a medical condition of the patient, said diagnosing means generating undesirable acoustic noise in an area of the patient during a diagnosis operation: and

active noise cancellation means, adapted to be coupled to the patient for canceling the undesirable acoustic noise generated by said diagnosing means in said area of the patient, said active noise cancellation means comprising:

first non-magnetic, nonmetallic flexible sound propagating means for carrying said undesirable acoustic noise, and

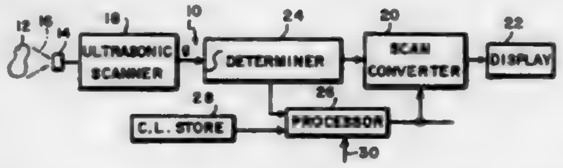
noise detection means, for detecting the undesirable acoustic noise in the area of the patient and located remotely from said patient accommodating means and adapted to be coupled to the patient through said first non-magnetic, non-metallic flexible sound propagating means so that detection of the undesirable acoustic noise does not interfere with operation of said diagnosing means, and

second non-magnetic, non-metallic flexible sound propagating means, for carrying counternoise waves, and

counternoise speaker means, for generating and transmitting said counternoise waves to the patient based upon the detected undesirable acoustic noise, to cancel the undesirable acoustic noise in the area of the patient, said counternoise speaker means adapted to be located remotely from said patient accommodating means and adapted to be coupled to the patient through said second non-magnetic, non-metallic flexible sound propagating means so that transmission of said counternoise waves does not interfere with operation of said diagnosing means.

5,313,946
METHOD AND APPARATUS FOR THE CHARACTERIZATION OF TISSUE OR OTHER STRUCTURE

Hewlett E. Melton, Jr., Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 9, 1991, Ser. No. 639,486
Int. Cl.^{5} A61B *8/00*
U.S. Cl. 128—660.02 20 Claims



1. A system for the characterization of a structure comprising:

means for ultrasonically scanning the structure to be characterized, said scanning means generating output signals corresponding to pulse echo signals received during such scan by the scanning means for selected points in the structure; and

means responsive to said output signals for determining the correlation length for said structure, said correlation length being measurable characteristic of the structure.

5,313,947
CW AND PULSED DOPPLER DIAGNOSTIC SYSTEM

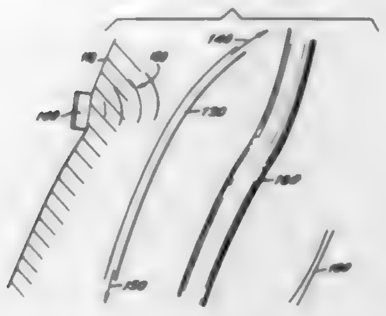
Alexander J. Micco, Lakewood, Colo., assignor to University Patents, Inc., Westport, Conn.
Continuation-in-part of Ser. No. 699,676, Feb. 8, 1985, Pat. No. 4,819,652. This application Sep. 22, 1988, Ser. No. 247,715
Int. Cl.^{5} A61B *8/06*
U.S. Cl. 128—661.09 21 Claims

15. A system for indicating the frequency spectrum of Doppler shift frequencies of fluid flow, comprising

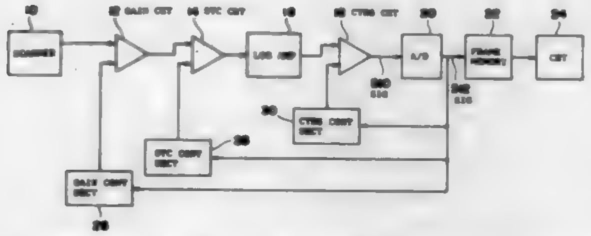
means for producing a pulse train of pulses having an instantaneous frequency related to Doppler shift frequency of flowing fluid;

means for producing a voltage that varies as an inverse function of the time interval between the pulses of the pulse train of pulses applied thereto,

an output circuit,
first means responsive to the pulses of said stream of pulses for sampling the voltage output of said voltage producing means,
second means responsive to the pulses of said stream of pulses for applying input pulses to said voltage producing means subsequent to the sampling thereof by said first means; and
timing means comprising means for applying the voltage output of said voltage producing means to said output circuit substantially immediately prior to the application of input pulses to said voltage producing means by said second means,
said first means comprising means for inhibiting the sampling of said voltage output between the time of application of said input pulses to said voltage producing means and the occurrence of the next pulse of said stream of pulses,
whereby the output of said output circuit comprises a signal corresponding to the frequency spectrum of Doppler shift frequencies of said fluid flow.

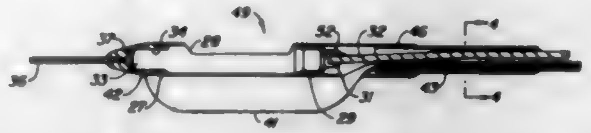


5,313,948
ULTRASONIC DIAGNOSTIC APPARATUS
Masaru Murashita, and Toshiyuki Matsunaka, both of Mitaka, Japan, assignors to Aloka Co., Ltd., Japan
Filed Nov. 25, 1992, Ser. No. 982,304
Claims priority, application Japan, Nov. 28, 1991, 3-314942; Mar. 9, 1992, 4-050503; Sep. 29, 1992, 4-259446; Sep. 29, 1992, 4-259447
Int. Cl.^{5} A61B *8/13*
U.S. Cl. 128—662.02 **36 Claims**



1. An ultrasonic diagnostic apparatus, comprising:
an ultrasonic transducer for transmitting and receiving ultrasonic waves to and from a body to by examined; and
control means for automatically determining optimum image conditions on the bases of a first histogram formed from echo signals from the ultrasonic waves received by said ultrasonic transducer and a second, predetermined reference histogram corresponding to the optimum image.

5,313,949
METHOD AND APPARATUS FOR INTRAVASCULAR TWO-DIMENSIONAL ULTRASONOGRAPHY
Paul G. Yock, San Francisco, Calif., assignor to Cardiovascular Imaging Systems Incorporated, Sunnyvale, Calif.
Continuation of Ser. No. 826,260, Jan. 24, 1992, which is a continuation of Ser. No. 649,048, Feb. 1, 1991, abandoned, which is a continuation of Ser. No. 290,533, Dec. 23, 1988, Pat. No. 5,000,185, which is a continuation-in-part of Ser. No. 834,893, Feb. 28, 1986, Pat. No. 4,794,931. This application Feb. 1, 1993, Ser. No. 14,906
Int. Cl.^{5} A61B *8/12*
U.S. Cl. 128—662.06 **18 Claims**

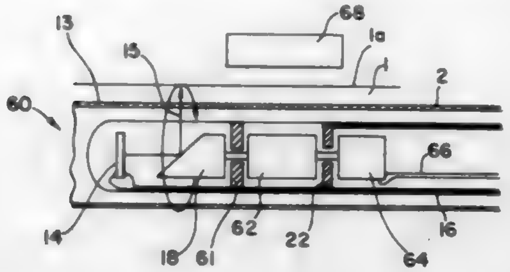


1. A catheter apparatus suitable for imaging the wall of a vessel in the vascular system of a patient, said catheter apparatus comprising:
an elongate tubular element exhibiting a size and flexibility sufficient to permit both introduction of said tubular element into the vessel and subsequent advancement of said tubular element through the vessel to the location of the vessel wall where imaging is desired, said tubular element including a proximal extremity, said tubular element also including a distal extremity, at least a portion of which is substantially transparent to ultrasonic energy;
ultrasonic energy generating means disposed within said distal extremity of said tubular element for generating ultrasonic energy and for propagating the ultrasonic energy so generated through said energy transparent portion of said distal extremity toward the wall of the vessel;
electrical circuit means carried by said tubular element and connected to said ultrasonic generating means for supplying power thereto; and
drive means disposed within said tubular element and connected to said ultrasonic generating means for rotating said ultrasonic generating means such that ultrasonic energy therefrom is directed around the circumference of the vessel wall, said drive means including an elongate flexible drive cable structure which is fabricated at least in part from stainless steel, said drive cable structure also exhibiting a size and flexibility sufficient to permit both introduction of said tubular element into the vessel and subsequent advancement of said tubular element through the vessel to the location of the vessel wall where imaging is desired.

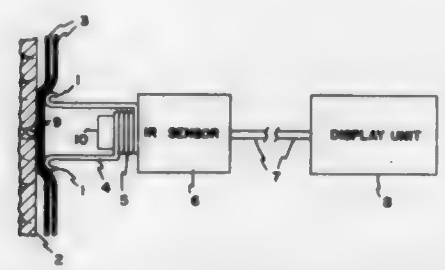
5,313,950
ULTRASONIC PROBE
Hiroshi Ishikawa; Kazuhiro Watanabe; Kenji Kawabe, and Takaki Shimura, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 23, 1993, Ser. No. 21,228
Claims priority, application Japan, Feb. 25, 1992, 4-38235; Feb. 28, 1992, 4-43949
Int. Cl.^{5} A61B *8/12*
U.S. Cl. 128—662.06 **13 Claims**

1. An ultrasonic probe comprising:
a tube extending in a predetermined direction for insertion into an object under examination;
a transmitter-receiver disposed in said tube so that at least a part thereof is capable of at least one of two movements, one movement being in said predetermined direction, the other movement being rotary around an axis coinciding with said predetermined direction, said transmitter-receiver transmitting ultrasonic waves into said object and receiving the waves reflected back by said object;

a rotor mounted in said tube for causing at least part of said transmitter-receiver to perform at least one of said two movements; and a stator located outside said object for driving said rotor.

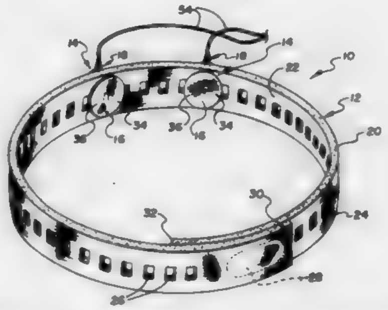


5,313,951
DEVICE AND A METHOD TO MEASURE THE INFRARED RADIATION OF THE HUMAN BODY
Shi Zhao, 706 Bldg. 12, Yue Tan Bei Jie, Beijing, China 100045
Filed Jul. 16, 1991, Ser. No. 731,733
Claims priority, application China, Jul. 19, 1990, 90216396.5; Nov. 29, 1990, 90109472.2
Int. Cl.^{5} A61B *6/00*
U.S. Cl. 128—664 **1 Claim**



1. A device for measuring an IR radiation flux density of a human body, comprising:
an IR sensor having a plastic case, and an IR sensing element disposed in the plastic case, the plastic case having a detecting opening;
a display unit electrically connected to an output terminal of said IR sensor through a cable wherein one end of the cable connects to the display unit, and an other end of the cable connects to the output terminal;
a test mount, with a first end of said mount being connected to the plastic case of said sensor, and a second end of said mount having leg means for making contact with a human body covering, the leg means including at least two legs;
wherein each of the legs of said test mount is tightly pressed against the covering on a tested person's body, bringing the human body covering between said legs into close contact with skin of the human body and forming a tightly pressed test area between said pressing legs, and in said tightly pressed test area said human body covering being in uniform contact with said human body skin to enable thermal resistance of said human body covering to remain constant;
wherein said tightly pressed test area should be at least larger than an area of a field of view projected on said test area through the detecting opening by said sensing element of said sensor and, in order to maintain a background temperature of said test area and enable said test area to acquire radiated heat while losing heat through radiation, said detecting opening of said IR sensor is normally located on the same axis as said tightly pressed test area, and an axial distance between said IR sensor and said tightly pressed test area should be at least greater than three cm;
an external thread on an outer wall at a neck of the detecting opening of the plastic case being connected to a thread in the first end of said mount; and
said mount being made of a thin metal strip covered on an outside with plastic material, with the first end of said mount being coiled into a spiral form with its inner diameter matching with the external thread on the outer wall of said detecting opening, and extremities of the legs at the second end of said mount being bent either inward or outward.

5,313,952
ELECTRODE ATTACHMENT APPARATUS
Richard W. Hoch, 1017 Park Ave., Mahtomedi, Minn. 55115
Filed Sep. 23, 1992, Ser. No. 949,434
Int. Cl.^{5} A61B *5/0408*
U.S. Cl. 128—644 **4 Claims**

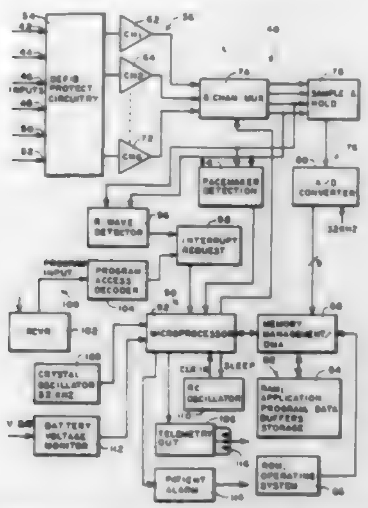


1. An electrode belt assembly kit for positioning an electrically conductive electrode against a body member of a patient, comprising:
an electrode pad having a body member engaging surface and a receptacle element operably connected to the pad and extending opposite the body engaging surface, the receptacle element defining therewithin a probe element receiving channel;
a web belt having a length sufficient to detachable encircle the body member, the belt including an inner surface, an oppositely facing outer surface and a plurality of apertures extending through the belt from the inner surface to the outer surface, each aperture being adapted for removably receiving the receptacle element in a form fit;
a lead probe having an elongated probe element extending therefrom and adapted for detachable insertion into the probe element receiving channel; and
an outer surface engaging support element defining a plane generally parallel to the probe element and being rigidly connected to the lead probe,
wherein the receptacle element of the electrode pad is insertable through a selective one of the apertures with the body member engaging surface disposed overlying the inner surface of the belt, and the outer surface engaging support element overlying and being in engagement with the outer surface of the belt when the probe element is received within the probe element receiving channel to hold the electrode pad receptacle element in the selective aperture.

5,313,953
IMPLANTABLE CARDIAC PATIENT MONITOR
Barry M. Yomtov, and Paul E. Kreyenhagen, both of Bellevue, Wash., assignors to InControl, Inc., Redmond, Wash.
Filed Jan. 14, 1992, Ser. No. 820,580
Int. Cl.^{5} A61B *5/0432*
U.S. Cl. 128—696 **80 Claims**

78. A cardiac monitor for monitoring the physiology of a human heart, said monitor being fully implantable beneath the skin of a patient and comprising:
electrode means for establishing electrical contact with the heart;

sensing means coupled to said electrode means for sensing each heart beat of the heart;
data generating means coupled to said sensing means for generating electrocardiogram data for each heart beat sensed by said sensing means;
processing means for processing said electrocardiogram data for each heart beat to generate characterizing data indicative of the physiology of the heart; and



memory means coupled to said data generating means and to said processing means for storing said generated electrocardiogram data for each heart beat and said characterizing data,
said processing means including accessing means for obtaining said electrocardiogram data for each said heart beat from said memory means for processing said electrocardiogram data for each said heart beat.

5,313,954
APPARATUS FOR SHOCKWAVE TREATMENT

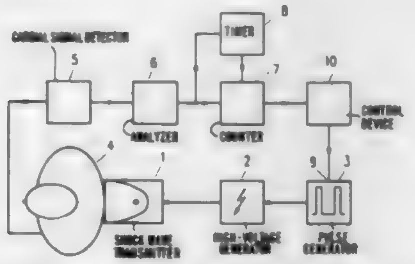
Werner Schwarze, Stockach, and Joachim Voss, Munich, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1993, Ser. No. 29,251

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1992, 4207489

Int. Cl.^{5} A61B *5/024*

U.S. Cl. 128—702 **10 Claims**



1. An apparatus for shockwave treatment of a patient, comprising:
a shockwave generator for generating successive shockwaves in the patient;
detecting means for detecting a cardiac signal corresponding to cardiac action in the patient;
an analyzer means, coupled to said detecting means, for detecting occurrences of extrasystoles in the detected cardiac signal;
frequency determining means fed by said analyzer means for determining a frequency of occurrence of the extrasystoles; and
control means responsive to said frequency determining means for controlling the shockwave generator in dependence upon the determined frequency of occurrence of the extrasystoles.

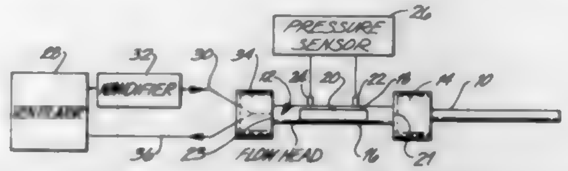
5,313,955
PULMONARY FLOW HEAD

Jerome A. Rodder, 775 Sunshine Dr., Los Altos, Calif. 94022

Filed Oct. 30, 1992, Ser. No. 969,796

Int. Cl.^{5} A61B *5/08, 5/087*

U.S. Cl. 128—725 **10 Claims**



1. For use in a pulmonary gas flow system having a flow head for measuring gas flow in the pulmonary system, and a patient gas delivery tube connected to an upstream end of the flow head, in which the flow head includes an elongated open-ended tubular breath transmission passage, an elongated open-ended inside tube mounted axially inside the breath transmission passage to provide a constriction to gas flow in the passage, a pair of axially spaced-apart outlet ports in the side of the breath transmission passage arranged to produce a pressure drop across the outlet ports in response to constricted gas flow in the breath transmission passage, and a patient gas delivery tube coupled to the upstream end of the breath transmission passage for directing the flow of patient gas through the passage the improvement in which the inside tube has an inside tube inside diameter and an inside tube outside diameter and the patient gas delivery tube has a delivery tube inside diameter which is substantially the same size as the inside tube inside diameter sufficient to produce a smooth flow of gas through the passage with a stable measured gas pressure drop across the outlet ports of the flow head.

5,313,956
APPARATUS FOR MEASURING THE TRANSPORT TIME OF NERVE SIGNALS

Evert Knutsson, and Lennart Gransberg, both of Djursholm, Sweden, assignors to Dorsograf AB, Malmo, Sweden

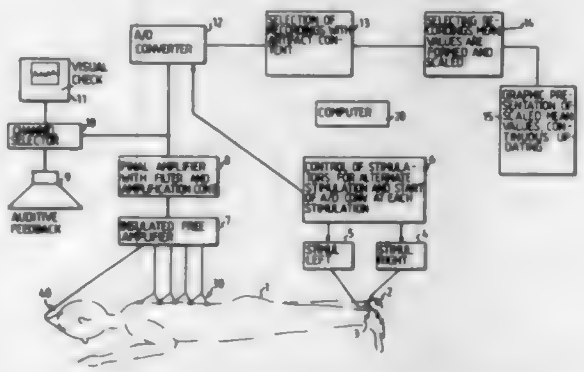
PCT No. PCT/SE91/00822, § 371 Date Aug. 4, 1992, § 102(e) Date Aug. 4, 1992, PCT Pub. No. WO92/10134, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 3, 1991, Ser. No. 915,994

Claims priority, application Sweden, Dec. 4, 1990, 9003853-0

Int. Cl.^{5} A61B *5/05*

U.S. Cl. 128—741 **20 Claims**


A/D CONVERTER
12
SELECTION OF RECORDINGS WITH ARTIFACT CONTENT
13
SELECTING RECORDINGS MEAN VALUES ARE FORMED AND SCALED
14
VISUAL CHECK
11
COMPUTER
20
GRAPHIC PRESENTATION OF SCALED MEAN VALUES CONTINUOUS UPDATING
15
CHANNEL SELECTOR
10
FINAL AMPLIFIER WITH FILTER AND AMPLIFICATION CONT.
8
CONTROL OF STIMULATORS FOR ALTERNATE STIMULATION AND START OF A/D CONV. AT EACH STIMULATION
6
AUDITIVE FEEDBACK
9
INSULATED FREE AMPLIFIER
7
STIMUL LEFT
5
STIMUL RIGHT
4
40
30
1
2
3

1. An apparatus for measuring the transport time of nerve signals of a patient, said apparatus comprising:

(a) a plurality of stimulating electrodes capable of transmitting an electrical signal to the patient;
(b) a plurality of detecting electrode-pairs adapted for attachment to the patient's skin;
(c) amplifying means connected to said electrode-pairs capable of amplifying the electrical signals detected by said electrode-pairs;
(d) an A/D-converter capable of receiving the amplified electrical signals generated by said amplifying means;
(e) a computer capable of processing the amplified electrical signals received by said A/D-converter and storing said signals as numerical sequences at specific time points;
(f) means for excluding select numerical sequences;
(g) means for summating the numbers in the numerical sequences that are not excluded in step (f);
(h) means for determining the mean values for said summated numbers; and
(i) means for signalling the output signals of said amplifying means to the patient's consciousness.

5,313,957
GUIDE WIRE MOUNTED PRESSURE TRANSDUCER

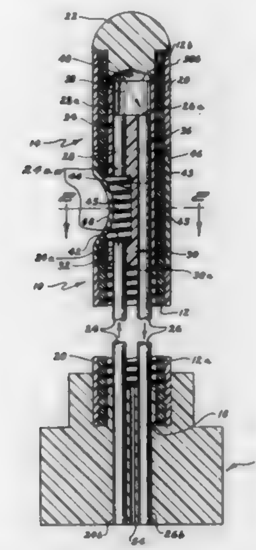
Richard L. Little, New Hope, Minn., assignor to MedAmicus, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 461,178, Jan. 5, 1990, Pat. No. 5,005,584. This application Apr. 8, 1991, Ser. No. 682,661

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.^{5} A61B *5/00, 5/02;* **A61M** *25/00;* **G01L** *7/08*

U.S. Cl. 128—748 **20 Claims**



1. A transvenously-insertable guide wire and physiological pressure transducer assembly comprising:
an elongated guide wire comprised of multiple coils of wire defining an elongated tubular passage, said guide wire being sufficiently flexible to traverse a patient's vascular system and having a proximal end and a distal end;
first and second fiber optic paths extending longitudinally within said tubular passage of said guide wire and defining a light transmitting circuit, said first fiber optic path adapted to be a light transmitter for transmitting light from an external source and said second fiber optic path adapted to be a transmitter for returning light signals, each of said fiber optic paths having a proximal end portion and a distal end; and
a pressure transducer mounted on said guide wire at the proximal end portions of said fiber optic paths, said transducer comprising;
a housing wholly contained and restrained within said guide wire between said proximal and distal ends thereof and receiving and holding said proximal end portions of said fiber optic paths in predetermined positions for light transmission therethrough;
a gap in said proximal end portions of said fiber optic paths of the light transmitting circuit within said housing through which light passes;
an opening in the side of said guide wire adjacent to said gap and said housing and in fluidic communication with said gap; and
a flexible membrane on said guide wire disposed in covering relation to said opening, said membrane having a pressure responsive segment extending over said opening and exposed to pressure exterior of said housing on its outer surface and to pressure inside of said housing on its inner surface, said pressure responsive segment of said membrane being movable transversely across said gap in response to changes in pressure exterior of said housing to change light transmission through said proximal end portions of said fiber optic paths.

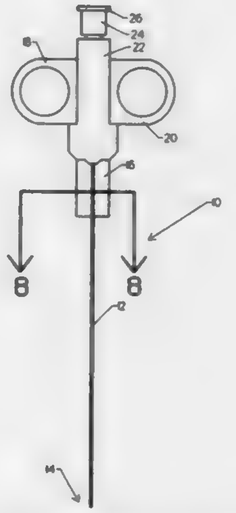
5,313,958
SURGICAL BIOPSY INSTRUMENT

Alberto Bauer, Via Guercino 56,, Cento, Italy 44042

Filed Apr. 22, 1993, Ser. No. 51,649

Int. Cl.^{5} A61B *10/00*

U.S. Cl. 128—754 **5 Claims**



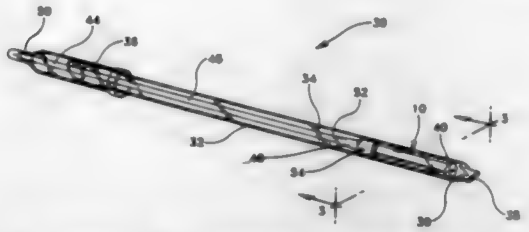
1. In an apparatus for surgically removing tissue samples of different sizes including, a canula having a central lumen, a stylet slidably mounted within said lumen and having a sample holding notch adjacent a distal end, and a control assembly connected to the canula and the stylet for controlling relative movement between the canula and the stylet during tissue sample removal, the improved apparatus for selecting tissue sample size comprising:
a. a tissue sample size selector means connected to the canula and slidably mounted for axial movement in the control assembly, whereby proximal movement of the selector means causes proximal movement of the canula relative to the stylet notch;
b. detent means mounted on the control assembly for releasibly holding the selector means in any one of a plurality of selectable tissue sample size settings;
c. a spring biased against the proximal axial movement of the selector means; and
d. manual release means for selectively releasing the selector means from the detent means following placement of the stylet for tissue sample removal, whereby the spring causes distal axial movement of the canula relative to the stylet to cut a tissue sample of a selected size into the notch.

5,313,959
DEVICE AND METHOD FOR BREAKING AN AMPOULE
James F. Monthony, Baltimore, and Dwight Livingston, Towson, both of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Apr. 21, 1993, Ser. No. 50,521

Int. Cl.⁵ A61B *10/00*

U.S. Cl. 128—759 **16 Claims**



1. An apparatus for collecting and transporting biological specimens comprising:

an elongated tube having an open end and an opposite closed end;

a specimen collector disposed within said tube comprising a cap, a shaft connected to said cap and a swab connected to said shaft;

a guard arrangement disposed within said tube and located adjacent said closed end of said tube, comprising two rigid, movable and opposing members wherein each member comprises a forward end, a rearward end, and at least one sidewall comprising an inner surface, outer surface and an edge; a gap between said opposing edges of said members; and a cavity between said opposing inner surfaces of said members; and

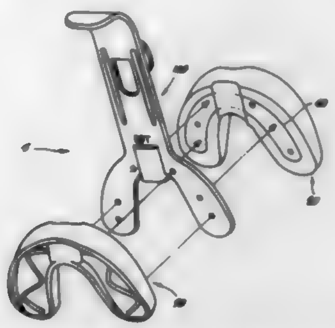
an ampoule associated with said cavity of said guard arrangement such that when said members of said guard arrangement are compressed said ampoule is ruptured.

5,313,960
APPARATUS AND METHOD FOR REDUCING SNORING AND METHOD OF MAKING SAME
Barbara R. Tomasi, Hailey, Id., assignor to Marc S. Bernstein, Los Angeles, Calif.

Filed Nov. 4, 1992, Ser. No. 971,336

Int. Cl.⁵ A61F *5/56;* **A61C** *5/14*

U.S. Cl. 128—848 **20 Claims**



1. An oral appliance for reducing snoring comprising:

an upper mouthpiece portion having a rigid structural core and a relatively soft impression tray portion which may be conformed to fit a person's upper teeth;

a lower mouthpiece portion having a rigid structural core and a relatively soft impression tray portion which may be conformed to fit the person's lower teeth;

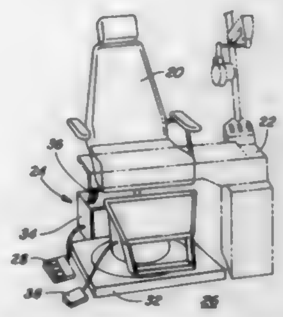
a holder element to which the upper and lower mouthpiece portions are attachable so as to position the upper mouthpiece portion at a slight forward offset relative to the lower mouthpiece portion, the upper and lower mouthpiece portions being conformed to fit the person's respective upper teeth and lower teeth while being attached to the holder element, wherein once the upper and lower mouthpiece portions are conformed, they are detachable from the holder element and reattachable to each other without the offset.

5,313,961
MOVABLE MEDICAL EXAMINATION CHAIR
William B. McKee, 11324 Hubbell, Livonia, Mich. 48150

Filed Mar. 24, 1992, Ser. No. 856,537

Int. Cl.⁵ F16M *13/00*

U.S. Cl. 128—897 **12 Claims**



1. A movable base for supporting a patient examination chair comprising:

a first member for supporting an examination chair including a platform and a plurality of first member wheels supporting said platform;

a guide track carried by said first member, said guide track being generally U-shaped with two laterally spaced guide flanges, said guide flanges extending downwardly with respect to said floor; and

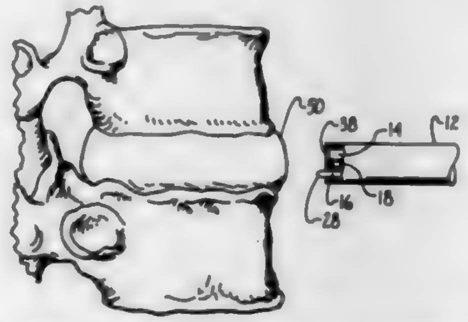
a floor track adapted to be rigidly mounted to a floor, said guide track being slidingly received on said floor track to control movement of said first member, said floor track being generally U-shaped with two laterally spaced floor flanges, said floor flanges extending upwardly with respect to said floor, one of said floor and guide flanges being received laterally outwardly of the other.

5,313,962
METHOD OF PERFORMING LAPAROSCOPIC LUMBAR DISCECTOMY
Theodore G. Obenchain, 12002 Royal Birkdale Row, #A, San Diego, Calif. 92128

Continuation-in-part of Ser. No. 780,865, Oct. 18, 1991. This application Mar. 1, 1993, Ser. No. 24,517

Int. Cl.⁵ A61B *17/36*

U.S. Cl. 128—898 **17 Claims**



1. A method of performing a laparoscopic lumbar discectomy comprising:

creating an incision through the abdominal wall and into the preperitoneal space of a patient;

dissecting said peritoneal lining from said abdominal wall and instilling a pharmaceutically acceptable gas into said preperitoneal and retroperitoneal space while relocating said peritoneal lining toward the midline of said abdomen thereby expanding said space;

inserting a surgical apparatus comprising an endoscope and surgical means suitable for performing a lumbar discectomy into said space until said surgical apparatus approaches the anterior aspect of a vertebral body; and

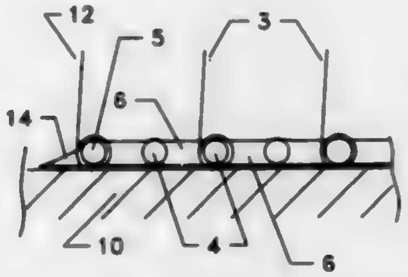
removing disc tissue utilizing said surgical apparatus.

5,313,963
HAIRPIECE BASE
Brian G. Rennex, 431 Muddy Branch Rd., #101, Gaithersburg, Md. 20878

Filed Feb. 13, 1992, Ser. No. 846,243

Int. Cl.⁵ A41G *5/00*

U.S. Cl. 132—54 **16 Claims**



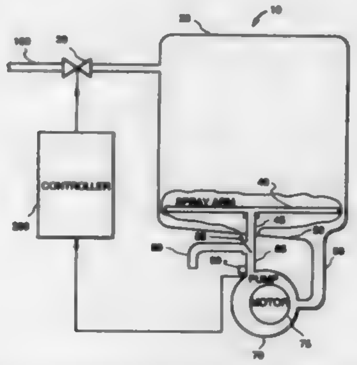
1. A hairpiece comprising a base to which hairs are affixed and an attachment means for affixing the base to the scalp, wherein said base comprises a mesh and elastomer composite section with mesh strands interwoven among each other, thereby defining voids between said strands and binder regions occupying at least a portion of said voids, wherein the thickness of said binder regions is uniformly and substantially equal to or slightly greater than the thickness of the mesh strands thereby minimizing the overall thickness of the base.

5,313,964
FLUID-HANDLING MACHINE INCORPORATING A CLOSED LOOP SYSTEM FOR CONTROLLING LIQUID LOAD
Mark E. Dausch; Vivek V. Badami, both of Schenectady, and Walter Whipple, III, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 877,300, May 1, 1992, abandoned. This application Sep. 23, 1993, Ser. No. 126,139

Int. Cl.⁵ A47L *15/46;* **D06F** *33/02*

U.S. Cl. 134—57 D **9 Claims**



1. A machine for washing food handling items with a liquid comprising:

a frame for containing food handling items to be washed;

means for providing a liquid to said frame;

means for distributing said liquid in said frame;

a sensor for detecting liquid pressure oscillations in said liquid as said liquid is distributed; and

a controller, responsive to said sensor, for shutting off flow of liquid through said liquid providing means when the detected liquid pressure oscillations substantially cease, said controller comprising a microprocessor incorporating a fuzzy logic feedback control algorithm adapted to process:

an elapsed time for distributing said liquid,

an amplitude of the detected liquid pressure oscillations, and

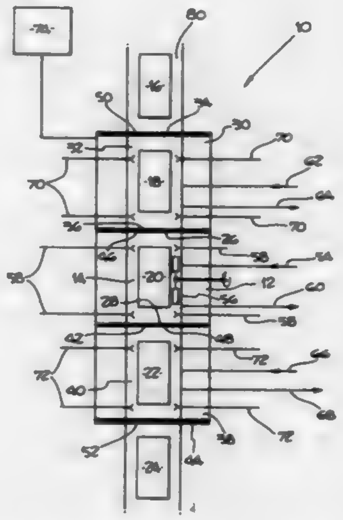
an average slope of the detected liquid pressure oscillations to control said liquid providing means.

5,313,965
CONTINUOUS OPERATION SUPERCRITICAL FLUID TREATMENT PROCESS AND SYSTEM
Edward J. Palen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 1, 1992, Ser. No. 891,138

Int. Cl.⁵ B08B *3/02*

U.S. Cl. 134—61 **7 Claims**



1. A system for continuously processing items using supercritical fluid comprising:

a main process vessel comprising walls defining a supercritical fluid processing zone, said main process vessel further comprising an inlet through which said items are introduced into said supercritical fluid processing zone and an outlet through which said items are removed from said supercritical fluid processing zone;

an entry airlock comprising walls defining an entry airlock zone, said entry airlock further comprising an inlet through which said items are introduced into said entry airlock zone and an outlet connected to said main process vessel inlet through which said items are passed from said entry airlock zone to said supercritical fluid processing zone;

an exit airlock comprising walls defining an exit airlock zone, said exit airlock further comprising an inlet connected to said main process vessel outlet through which said items are passed from said supercritical fluid processing zone to said exit airlock, and an outlet through which said items are removed from said exit airlock;

main process vessel seal means operable between open and closed positions for selectively sealing said inlet or outlet of said main process vessel;

entry airlock seal means operable between open and closed positions for selectively sealing said inlet or outlet of said entry airlock;

exit airlock seal means operable between open and closed positions for selectively sealing said inlet or outlet of said exit airlock;

main process vessel pressure means for continuously pressurizing said supercritical fluid processing zone with supercritical fluid;

entry airlock pressure means for selectively pressurizing said entry airlock zone with supercritical fluid when said inlet and outlet of said entry airlock are sealed;

means for monitoring the extent to which said item has been processed with supercritical fluid in said entry airlock;

exit airlock pressure means for selectively pressurizing said exit airlock with supercritical fluid when said inlet and outlet of said exit airlock are sealed;

transport means for moving said items through said entry airlock zone, said main process vessel and said exit airlock zone; and

means for controlling the operation of said main process vessel seal means, said entry airlock seal means, said exit airlock seal means, said entry airlock pressure means and said exit airlock pressure means to provide transport of said items through said entry airlock, main process vessel and exit airlock without depressurizing said supercritical fluid processing zone.

5,313,966
IMMERSION CLEANING DEVICE

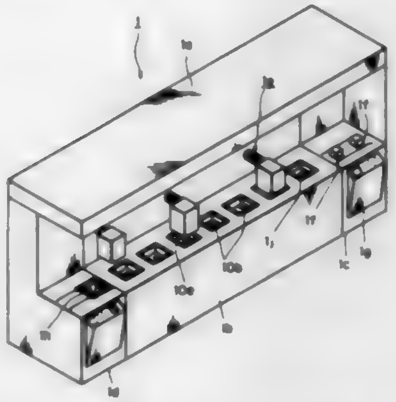
Masaaki Sadamori, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1991, Ser. No. 727,761

Claims priority, application Japan, Jul. 31, 1990, 2-201408

Int. Cl.^{5} B08B *3/04*

U.S. Cl. 134—76 **4 Claims**



1. An immersion cleaning device, comprising:

a plurality of concave portions each housing a chemical bath containing a respective chemical for immersion therein of a workpiece;

first exhaust means to exhaust an inside of each of the concave portions;

transportation means provided with a holding portion for holding said workpiece while said workpiece is moved to selected ones of said chemical baths, said holding portion also being movable for taking said workpiece into and out of said selected chemical baths;

controller means for controlling operation of said transportation means and said holding portion thereof; and

an enclosure body of a fixed and predetermined shape and size selected to enclose said workpiece and said holding portion, said enclosure body being disposed in engagement with said holding portion so as to be moved therewith to said selected chemical baths by said transportation means.

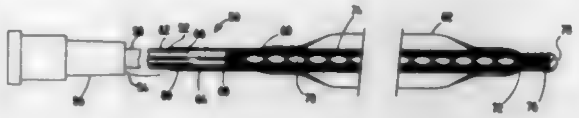
5,313,967
HELICAL GUIDEWIRE

Glen L. Lieber, Poway; Ronald J. Solar, San Diego; Erich H. Wolf, Vista, and Mauricio L. Fugoso, Jr., Chula Vista, all of Calif., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 24, 1992, Ser. No. 919,484

Int. Cl.^{5} A61M *25/00*

U.S. Cl. 128—772 **23 Claims**



1. A torque transmitting medical guidewire comprising:

a shaft with a distal end and a proximal end;

a helical wire having a proximal end and a distal end constructed from a generally flat, rectangular member having an edge, twisted around the wire's longitudinal axis so that the edge forms a helix such that torque applied to the wire at the proximal end is transmitted to the distal end, the proximal end of the helical wire being fixedly mounted to the distal end of the shaft;

a means for rotating the helical wire; and

a coil surrounding the helical wire, the coil having a distal end and a proximal end, the proximal end of the coil being fixedly mounted near the distal end of the shaft proximal to the helical wire.

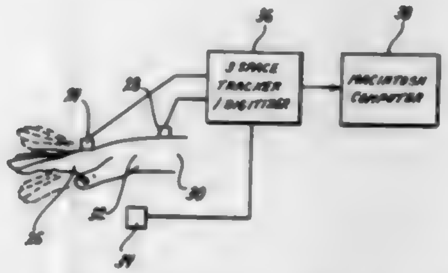
5,313,968
JOINT RANGE OF MOTION ANALYZER USING EULER ANGLE

Samuel E. Logan, and Paul G. Groszewski, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Filed Apr. 23, 1990, Ser. No. 512,868

Int. Cl.^{5} A61B *5/11*

U.S. Cl. 128—782 **4 Claims**



1. In an electronic device having means for measuring the range of motion of a wrist, said wrist permitting angular movement through a plurality of orthogonal planes, said orthogonal planes comprising a substantially azimuthal plane corresponding to radial-ulnar deviation, a substantially elevational plane corresponding to flexion-extension, and a substantially axial plane aligned with the forearm corresponding to supination-pronation, the improvement comprising sensor means for directly, electronically measuring the angular range of motion of said wrist through each of said orthogonal planes of movement, said sensor means having means for generating an output comprised of angular data relating to said wrist, and means for measuring angular movement through more than one of said orthogonal planes at the same time, said sensor means comprising a pair of sensors, each of said sensors being adapted for placement on opposite sides of said wrist, the device having means for detecting a change in angular orientation with respect to each of said sensors from a common source.

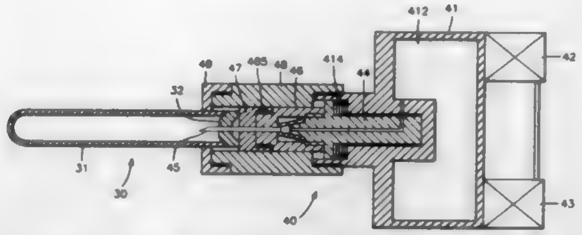
5,313,969
INSTANT PRESSURE-REDUCING PROCESS AND DEVICE FOR A BLOOD-GATHERING TUBE

Ch'ing-Lung Hsieh, 6F-3, No. 20, Wu-Chyuan-Er Rd., Shin Juang City, Taipei County, Taiwan

Filed Dec. 8, 1992, Ser. No. 987,175

Int. Cl.^{5} A61B *5/00*

U.S. Cl. 128—764 **12 Claims**



1. A blood-gathering tube and a pressure-reducing device, wherein said blood-gathering tube comprising a tube body and an elastic cork, a first end of said tube body being open and a second end being closed, a radially central part of said elastic cork being thinner than the periphery of said elastic cork to facilitate penetration by a needle, said elastic cork being tightly nested into said first end of said tube body so as to hermetically seal the interior of said tube body from the exterior, and wherein said pressure-reducing device comprises:

a vacuum body having a vacuum chamber maintained at a low pressure, said vacuum body having an air pipe connected to the interior of said vacuum chamber;

a vacuum pump connected to said vacuum chamber, for maintaining the low pressure in said vacuum chamber;

a sliding socket pipe disposed at least partially in said vacuum body for relative movement with respect thereto, said sliding socket pipe having an internal air passage which can be selectively aligned with said air pipe in said vacuum body;

a hollow needle mounted to said sliding socket pipe, said hollow needle having a central air passage which communicates with the internal air passage of the sliding socket pipe, said hollow needle being capable of piercing said elastic cork when said elastic cork is forced against said needle, wherein penetration of said needle past said elastic cork results in communication between the inside of said hollow needle and the interior of said tube body, and wherein alignment of said internal air passage with the elastic cork, results in the reduction of pressure in the tube body, to the low pressure in the vacuum chamber.

5,313,970
AUTOMATICALLY SQUEEZABLE WATER COLLECTOR OF UMBRELLA

Mei-Yueh Hung, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (104), Taiwan, Taiwan

Filed Nov. 16, 1993, Ser. No. 152,375

Int. Cl.^{5} A45B *25/28*

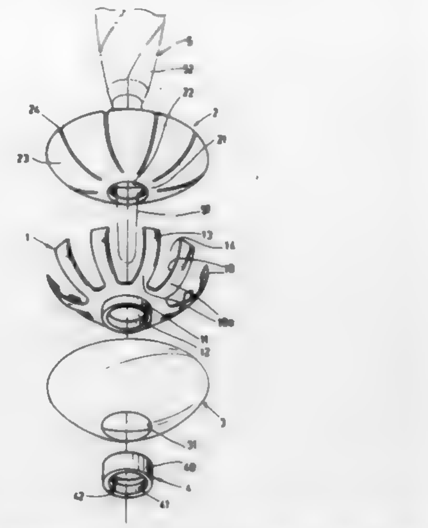
U.S. Cl. 135—15.1 **7 Claims**

1. A water collector of umbrella comprising:

a catcher member made of elastic materials and secured on a tip portion of an umbrella by a retainer fixed in a central portion of said catcher member;

an absorbent lining made of water-absorbing materials secured on an inner surface of said catcher member; and

a flexible web member circumferentially disposed about and secured on an outer surface of said catcher member, whereby upon opening of a wet umbrella having rainwater previously drained and collected in said catcher member and absorbed by said absorbent lining, said absorbent lining with the rainwater absorbed therein will be squeezed and automatically removed as clamped and sandwiched in between an opened umbrella cloth as resiliently urged by a tensioning spring provided in the umbrella, and said catcher member secured with said flexible web member.



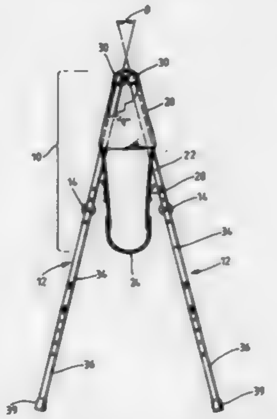
5,313,971
CRUTCH SLING LEG SUPPORT APPARATUS AND METHOD

Jim L. Upshaw, 1715 Channel Rd., Austin, Tex. 78746

Filed Sep. 15, 1992, Ser. No. 945,005

Int. Cl.^{5} A61H *3/02*

U.S. Cl. 135—68 **18 Claims**



1. A leg support for use in combination with a pair of crutches, each crutch having a horizontal support member secured to one end of a vertical support member, said vertical support member extending from said horizontal support member and terminating at a distal end, said leg support comprising:

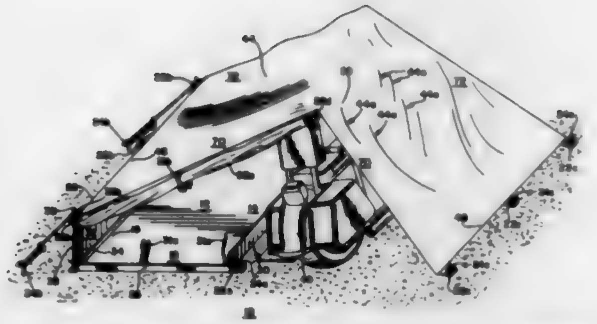
a sling support so dimensioned to hold the horizontal support members of each of the crutches tightly together such that the distal ends of the vertical support members may be spaced apart, resulting in an A-frame structure; and

a sling suspended from said sling support to a position below said horizontal support members and configured to serve as a leg support.

5,313,972

TENT ASSEMBLY FOR VEHICLES AND PEOPLE

John Goldberg, 236 Oak St., Carpentersville, Ill. 60110
Filed Mar. 19, 1991, Ser. No. 672,525
Int. Cl.^{5} E04H *15/06*
U.S. Cl. 135—88 **23 Claims**



1. A tent assembly for sheltering a personal riding vehicle and at least a person comprising:

a floor section having a first side and a second side opposed from said first side, said first side being positioned on the ground adjacent a first side of the vehicle and said second side being spaced from said first side a distance so as to permit a person to lay thereon generally parallel to said first side of the vehicle;

means for securing said floor section to the ground;

a wall section having both a bottom edge and a top edge, said bottom edge being connected to said second side of said floor section and extending generally upwardly from said floor section;

means for supporting said wall section in a substantially vertical position;

a roof section having a first side and a second side opposed from said first side, said first side of said roof section being connected to said top edge of said wall section, said roof section being spaced from said floor section and extending from said first side of said roof section over the vehicle so as to substantially cover both said floor section and the vehicle, said roof section having an intermediate portion abutting the vehicle disposed between said first side of said roof section and said second side of said roof section, said intermediate portion generally conforming to the shape of the uppermost portion of the vehicle, with the vehicle providing support for said intermediate portion;

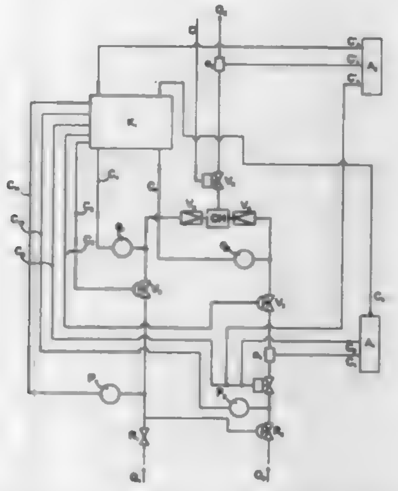
means for securing said second side of said roof section to one of a second side of the vehicle and the ground; and

two storm flaps each having a first end and a second end opposed to said first end, one said storm flap being connected at said first end to an end of said roof section adjacent said first side of said roof section and extending generally downward to about said floor section and said other storm flap being connected at said first end to an opposed end of said roof section and extending generally downward to about said floor section, both said flaps including means for attaching each to said wall section, to said floor section, and to the vehicle.

5,313,973

INSTALLATION FOR THE SUPPLY OF OXYGEN TO HOSPITALS AND THE LIKE

Francisco B. Fabregat, Boadilla del Monte, Spain, assignor to Dessarollos, Estudios & Patentes, S.A., Madrid, Spain
Continuation of Ser. No. 295,806, Jan. 11, 1989, Pat. No. 4,991,616. This application Oct. 2, 1990, Ser. No. 591,607
Claims priority, application Spain, Jan. 11, 1988, 8800056
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.^{5} A61M *16/12*
U.S. Cl. 137—3 **26 Claims**

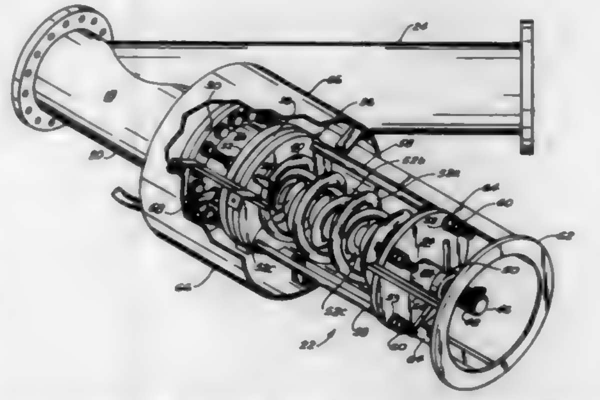


1. An installation for the supply of oxygen comprising an oxygen source; an oxygen generating unit; a means for mixing oxygen simultaneously supplied by said oxygen source and said oxygen generating unit to said means in a desired proportion, said means being separate from said oxygen source and oxygen generating unit; and means for preventing oxygen from said oxygen generating unit from entering said oxygen source.

5,313,974

PIPELINE PRESSURE RELEASE APPARATUS AND METHOD

Elmer E. Sawyer, Bowling Green; Sanford Glover, Bartow, and Wayne Alderman, Mulberry, all of Fla., assignors to Impacto Enterprises, Inc., Bartow, Fla.
Filed Feb. 3, 1993, Ser. No. 14,825
Int. Cl.^{5} 251 *332*
U.S. Cl. 137—12 **17 Claims**



12. A method of relieving pressure from within a pipeline system conveying fluid subject to pressure build up surges comprising the steps of:

(a) providing said pipeline system with a primary pump and a plurality of booster pumps downstream thereof;

(b) providing upstream of each of said booster pumps a pressure relief apparatus in the pipeline, said pressure relief apparatus having:

(i) a first branch in angular relation, commencing at its first end portion, to said pipeline for diverting fluid flow, and;

(ii) a second branch which at its first end portion is substantially in line with said pipeline for directing the movement of pressure build up surges from said pipeline, said second branch having provided at its other end portion a spool piece secured to the pipeline, said spool piece having an opening therethrough sized for pressure release and venting to the atmosphere;

(c) installing a face plate assembly across said opening, said face plate assembly being sized and configured, and movable to a first position, to block said opening;

(d) biasing said face plate assembly against any force created by pressure build up surges in said pipeline to said first position, said spool piece thereby blocking said opening;

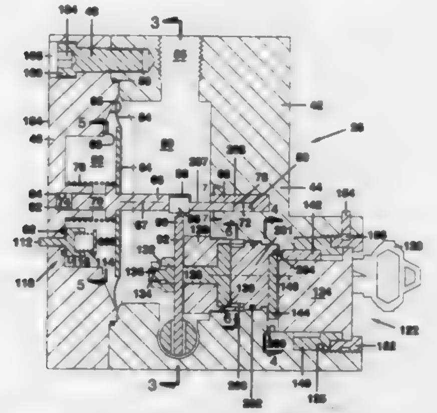
(e) adjusting the bias of said face plate assembly against said spool piece, whereby when the force created by pressure build up surges against said face plate assembly exceeds said preselected bias, said opening is unblocked and pressure is released; and,

(f) surrounding at least a portion of said spool piece and a portion of said face plate assembly with a blast shield, said blast shield being configured to deflect said pressure build up surges released from the pipeline when said opening is unblocked.

5,313,975

GAS LOCKOUT SYSTEM

Spencer M. Nimberger, Houston, Tex., assignor to Precision General, Inc., Houston, Tex.
Filed Mar. 18, 1993, Ser. No. 33,024
Int. Cl.^{5} F17D *1/06;* **F16K** *35/00*
U.S. Cl. 137—14 **22 Claims**



1. A method of supplying a combustible gas to one or more burners of gas consuming equipment each positioned within an enclosure, the gas being supplied from a storage vessel positioned exterior of the enclosure and passing through a distribution line extending to the one or more gas consuming equipment, the method comprising:

regulating high pressure gas from the storage vessel to output low pressure gas to the gas distribution line;

sensing gas pressure within the distribution line;

automatically closing the gas distribution line within the enclosure in response to one of a sensed low gas pressure level and a sensed high gas pressure level;

automatically preventing reopening of a closed gas distribution line in response to the subsequent upstream gas pressure changes within the distribution line;

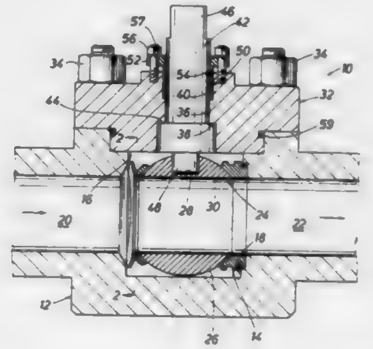
normally preventing closing of the gas distribution line when gas pressure through the distribution line is above the low gas pressure level and below the high gas pressure level; and

providing a security control member for restricting to selected personnel the reopening of the gas distribution line.

5,313,976

TOP ENTRY BALL VALVE AND METHOD OF ASSEMBLY

Marvin E. Beasley, Houston, Tex., assignor to Keystone International Holdings, Corp., Houston, Tex.
Filed Jul. 26, 1993, Ser. No. 96,225
Int. Cl.^{5} F16K *5/20, 25/00, 43/00*
U.S. Cl. 137—15 **10 Claims**



7. A method of assembling a top entry floating ball valve comprising the following steps:

providing a valve body having a valve chamber communicating with opposed inlet and outlet flow passages and an upper opening providing access to said chamber, said valve chamber defining opposed wall surfaces about said inlet and outlet flow passages;

providing an annular recess in said wall surface about said outlet flow passage and providing a beveled area in the opposed wall surface of said valve chamber about said inlet flow passage;

inserting a downstream metal seat within the annular recess in said valve chamber;

next inserting a ball closure member having an outer spherical surface within said valve chamber in contact relation to said downstream seat;

providing an upstream metal seat having an inner spherical surface generally conforming to the outer spherical surface of said ball valve member;

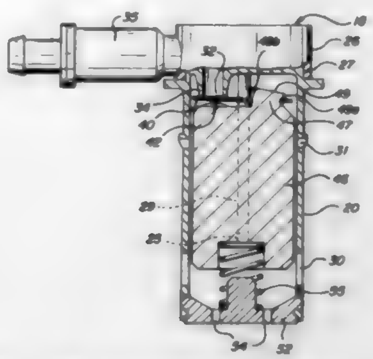
then placing said upstream seat on the outer spherical surface of said ball closure member and moving said upstream seat along said outer spherical surface into axial alignment with said inlet flow passage with said beveled area adapted to receive a portion of said upstream seat during such movement; and

then inserting a washer-type spring in said valve chamber through said upper opening for sliding along the planar wall surface of said valve chamber against said upstream seat for frictionally compressing said spring between said upstream seat and said planar wall surface resulting in urging said ball closure member into sealing relation with said downstream seat.

5,313,977
FLUID-RESPONSIVE VENT CONTROL VALVE WITH PEEL-AWAY OPENING ACTION

Rudolph Bergsma, Ann Arbor, and Lindsey E. Waldorf, Whitmore Lake, both of Mich., assignors to G. T. Products, Inc., Ann Arbor, Mich.

Filed Nov. 12, 1992, Ser. No. 974,655
Int. Cl.^{5} F16K *17/36*
U.S. Cl. 137—43 **20 Claims**



1. A liquid- and gravity-responsive rollover vent control valve for mounting on a fuel tank to selectively vent fuel vapor from the tank to a vapor trap such as a carbon canister, the valve comprising:

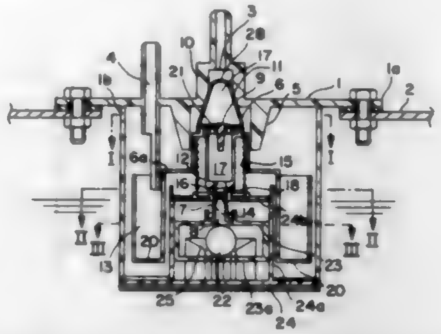
- a hollow valve body having a fuel vapor inlet communicating with the tank interior and a fuel vapor vent outlet communicating with the vapor trap;
- valve means associated with the vent outlet, the valve means movable between an open venting position and a closed non-venting position;
- fuel level responsive control means in the hollow valve body connected to the valve means to open and close the valve means in response to the level of liquid fuel in the tank; wherein,
- the valve means include lever means extending radially from the vent outlet and connected to the control means at a point spaced radially from the vent outlet to amplify the opening force applied to the valve means by the control means, the lever means connected to the control means by lever actuator means, the lever actuator means comprising an axial guide defining a first axial range of travel for the lever means relative to the control means, the lever actuator means further comprising a contact element defining a second pivotal range of travel for the valve means relative to the control means, the contact element including two contact points of varying height relative to the control means to limit the second pivotal range of travel of the lever means relative to the control means.

5,313,978
VENTILATION LINE OPENING/CLOSING MEANS OF FUEL TANK

Hiroshi Takaki, and Shinya Shimada, both of Soja, Japan, assignors to Om Industrial Co., Ltd., Okayama, Japan

Filed Aug. 30, 1993, Ser. No. 114,330
Claims priority, application Japan, Aug. 31, 1992, 4-232005
Int. Cl.^{5} F16K *17/36*
U.S. Cl. 137—43 **3 Claims**

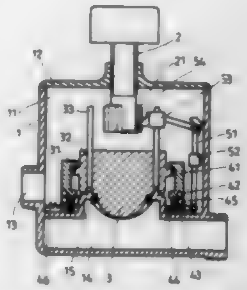
1. A ventilation line opening/closing means of a fuel tank, comprising a float valve provided in a ventilation line for introducing gas of the fuel tank into a canister so as to control ventilation, wherein a spring is provided to close a vent shut-off valve during a stop of an engine, and a fuel receiving portion including escape holes in the bottom is formed in a float which is integral with the vent shut-off valve so that return fuel from the engine is introduced into the fuel receiving portion during operation of the engine, thereby opening the vent shut-off valve, withstanding the force of said spring.



5,313,979
FOUNTAIN FAUCET

Wen-Chang Wang, No. 208-13, Shang Lun Tsun, Jen Te Hsiang, Tainan Hsien, Taiwan

Filed Apr. 20, 1993, Ser. No. 48,910
Int. Cl.^{5} F16K *15/18, 31/14, 31/24, 31/53*
U.S. Cl. 137—390 **5 Claims**

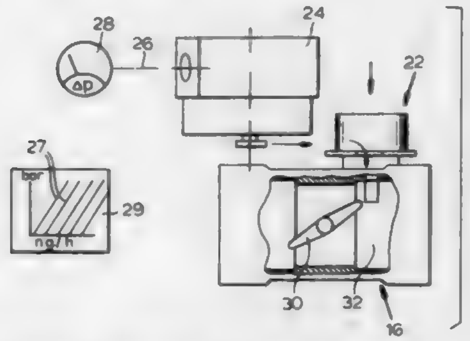


1. A fountain faucet for automatically shutting off the water flow from a pipe comprising a housing defining a water chamber and having an inlet communicating the water chamber and an outlet communicating the water chamber through an opening, guiding means disposed in the water chamber, a buoyant closure member mounted on the guiding means for a movement along an axial direction between a closed position where water flow through the opening to the outlet is blocked and an open position where the water chamber is in communication with the outlet, a flange member integrally formed on an outer circumference of the buoyant closure member, a valve seat made of a resilient material and mounted around the opening communicating the water chamber and outlet for a water-tight closure between the buoyant closure member and opening, a control member operably movable along the axial direction between a first position to engage and retain the buoyant closure member in its closed position and a second position allowing the buoyant closure member to move freely between its closed and open positions when the control member is out of engagement with said closure member and having a spindle threadingly engaged in a top wall of the housing with a first end protruding outwardly from the top wall of the housing for mounting an operating knob and a second end extending inwardly into the water chamber, a first annular member surrounding the buoyant closure member and formed with axially spaced internal flange members on an internal circumference thereof for engaging the flange member on the buoyant closure member and movable substantially axially between a first position where the buoyant closure member is placed in its closed position and a second open position, release means disposed in the water chamber and having a pinion mounted on the second end of the spindle and an actuating device including a post disposed parallel to the spindle, a holder attached to an inner side wall of the housing for supporting the post in an axially turnable condition, an arm with a first end extending radially inwardly towards the spindle and a second end hinged to a first end of the post for a swinging movement between a first position where the first end of the arm extends into a space between two adjacent teeth of the pinion and a second position where the first end of the arm is disengaged from the adjacent teeth of the pinion and positioned above the pinion a second annular member mounted on a circular rail under the first annular member allowing a rotary movement between a first position and a second position and supporting the first annular member when the first annular member is placed in its first position, magnets respectively secured in the first and second annular members for retaining the first annular member in its first position by a magnetic attraction force generated between the magnets in the first and second annular members when the second annular member is placed in its first position and the magnetic attraction force is interrupted when the second annular member is shifted into its second position and away from the first annular member and means interconnecting a second end of the post opposite to the first end thereof and the second annular member for shifting the second annular member from its first position into its second position when driven by the actuating device which is driven to rotate by the control member when the arm is placed in its first position.

5,313,980
METHOD OF AND VALVE FOR CONTROLLING FLOW IN A HYDRONIC SYSTEM

Bengt A. Carlson, 377 Glenbrook Rd., Unit 7, Stamford, Conn. 06906

Filed Apr. 6, 1993, Ser. No. 43,831
Int. Cl.^{5} F16K *37/00*
U.S. Cl. 137—557 **9 Claims**



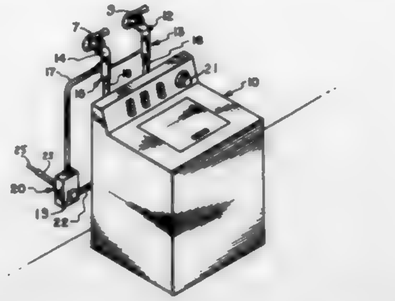
1. A hydronic balancing valve comprising:

- a valve body defining a longitudinally extending flow passage;
- a valve element in the passage movable through a plurality of positions each corresponding to a different flow cross section of the passage, whereby flow is in each position of the valve flow accelerated in zones upstream and downstream of the element in the passage;
- a pitot element mounted on the body and extending into one of the zones of the flow passage and having in the one zone an upstream port directed longitudinally in one direction and a downstream port directed longitudinally in an opposite direction, the pitot element being formed with pitot flow passages opening at the ports and having opposite outlet ends opening at a face of the pitot element; and
- valve means associated with the pilot flow passages for selectively blocking flow from the respective outlet ends, the face being adapted for releasable connection to a differential pressure meter.

5,313,981
LIQUID CONTROL APPARATUS

Miguel Gonzalez, 227 W. Janss Rd. - #250, Thousand Oaks, Calif. 91360

Filed Jun. 7, 1993, Ser. No. 71,953
Int. Cl.^{5} F16K *11/24*
U.S. Cl. 137—595 **3 Claims**



1. In combination with an appliance, said appliance having operation means, said electrical operation means including a plug which is to connect with an electrical conductor which extends from a source of electricity which is to operate said electrical operation means, activation of said electrical operation means causes operation of said appliance, at least one liquid supply pipe located remote from said appliance, a hose interconnecting said pipe and said appliance, said electrical operation means being manually positionable in an activated position and a deactivated position, with said electrical operation means located in said deactivated position no liquid is permitted to flow through said pipe and said hose into said appliance, with said electrical operation means being located in said activating position liquid is permitted to flow through said pipe and said hose into said appliance, a liquid control apparatus comprising:

- a valve mounted between said hose and said pipe, said valve being movable between a closed position and an open position, with said valve in said closed position no liquid can flow through said hose into said appliance, with said valve in said open position liquid is capable of flowing through said hose into said appliance; and
- an actuation device mounted between said plug and said electrical conductor, said actuation device being connected to said valve, upon activation of said electrical operation means said actuation device to cause said valve to move from said closed position to said open position permitting liquid to flow into said appliance, said actuation device including sensing means for sensing conducting of electrical energy to said electrical operation means, upon said sensing means sensing the conducting of electrical energy to said electrical operation means said actuation device causing said valve to move from said closed position to said open position.

5,313,982
GAS SUPPLY PIPING DEVICE FOR A PROCESS APPARATUS

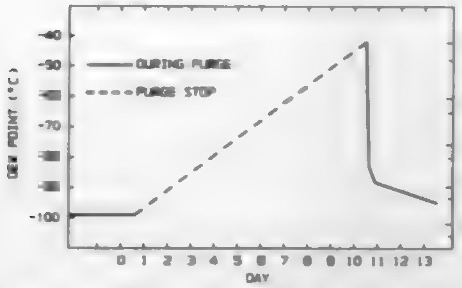
Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, Japan; Fumio Nakahara; Tuyosi Satoh, both of Sendai, and Masaru Umeda, Tokyo, all of Japan, assignors to Tadahiro Ohmi, Miyagi, Japan

Continuation of Ser. No. 922,370, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 465,226, Mar. 5, 1990, abandoned. This application Sep. 13, 1993, Ser. No. 121,174
Claims priority, application Japan, Jul. 8, 1988, 63-171383
Int. Cl.^{5} B08B *9/02*
U.S. Cl. 137—597 **5 Claims**

2. A gas supply piping system for supplying a plurality of process gases to a process apparatus, said system comprising;

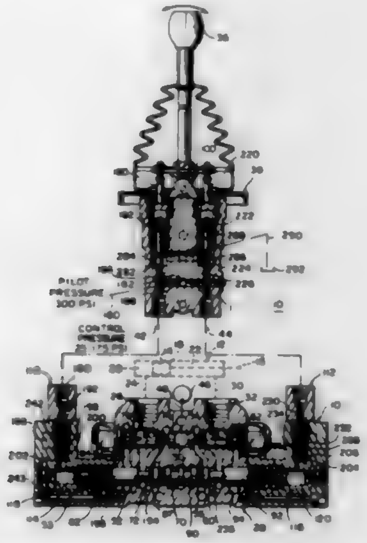
- at least two gas supply pipelines connected to a gas source;
- a first exhaust pipeline;

a purge gas pipeline connected to one end of said first exhaust pipeline;
a process apparatus pipeline communicating with a process apparatus via a connection valve;
at least one valve block comprising at least four valves interconnected to form a loop circuit and defining four valve interconnection points, said interconnection points respectively connected in order to a first of said gas supply pipelines, said purge gas pipeline, a second of said gas supply pipelines, and said process apparatus pipeline; and
a second exhaust pipeline connected to said process apparatus pipeline between said interconnection points and said connection valve.



5,313,983
REMOTE HYDRAULIC CONTROL SYSTEMS

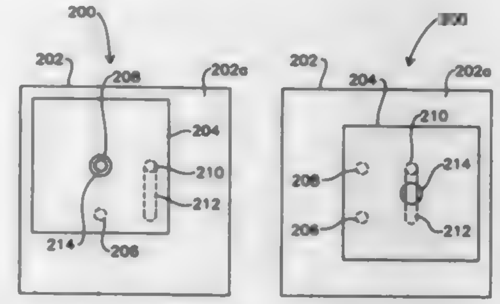
Alvin S. Rost, Fridley, and John M. Schurman, Brooklyn Park, both of Minn., assignors to Dana Corporation, Toledo, Ohio
Filed Mar. 29, 1993, Ser. No. 37,824
Int. Cl.⁵ F15B *13/042*
U.S. Cl. 137—625.6 16 Claims



1. In a remote control system for operating a hydraulically driven device with a main control valve having therein a valve spool with end faces thereon; wherein the main control valve includes chambers on opposite ends of the valve spool each connected to a source of pilot hydraulic fluid pressurized to a first pressure level for moving the valve spool upon application of pilot hydraulic fluid at the first pressure level to control the hydraulically driven device, and wherein a remote controller selects which chamber will be pressurized by the hydraulic fluid, the improvement comprising:
a hydraulic actuator in communication with each of the chambers, each hydraulic actuator including; an actuator piston having a piston face of a selected area to which the pilot hydraulic fluid is applied at a second pressure level less than the first pressure level; a valve movable by the actuator piston from a first position wherein the valve blocks flow of pilot hydraulic fluid at the first pressure level to the chamber in communication with the actuator and a second position wherein the valve permits flow of the pilot hydraulic fluid at the first pressure level to the chamber, and means for bleeding the pilot hydraulic fluid applied at the second level past the actuator piston when the actuator piston is in the second position.

5,313,984
MULTI-FLUID, VARIABLE SEQUENCE, ZERO DEAD VOLUME VALVE AND SYSTEM

Gerald A. Garwood, Jr., and Scott M. Taylor, both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Filed Sep. 24, 1992, Ser. No. 951,645
Int. Cl.⁵ F10K *11/00*
U.S. Cl. 137—625.48 22 Claims

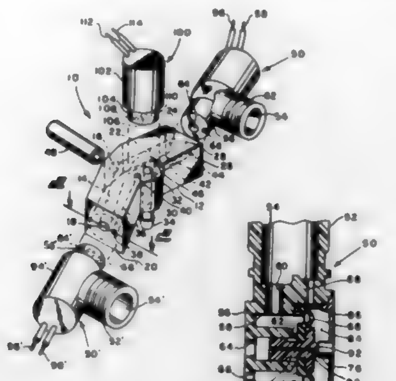


1. A valve comprising:
a first valve member having a first port, a second port which is spaced from the first port in a first direction and a third port which is spaced from the first port in a second direction; and
a second valve member which sealingly and slidingly engages with the first valve member and has a fourth port;
the second valve member being movable relative to the first valve member in the first direction between a first position in which the fourth port communicates with the first port and a second position in which the fourth port communicates with the second port; and in the second direction between the first position and a third position in which the fourth port communicates with the third port;
the first valve member further having an elongated fifth port having a labyrinth shape and formed with a break such that the fourth port crosses the fifth port when moving between the first and third ports and when moving between the second and third ports and such that the fourth port can cross said break without communicating with the fifth port.

5,313,985
MODULAR VALVE ASSEMBLY

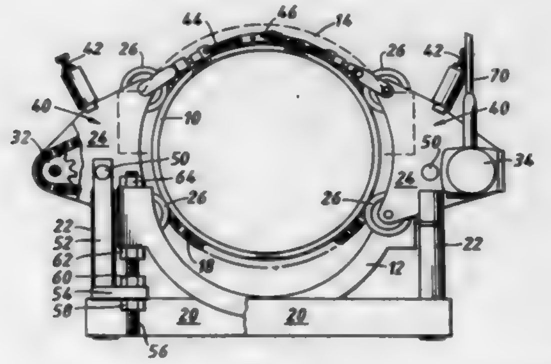
Richard A. Donner, Hanover Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Division of Ser. No. 938,191, Aug. 31, 1992, abandoned. This application Sep. 2, 1993, Ser. No. 115,726
Int. Cl.⁵ F16K *43/00*
U.S. Cl. 137—884 7 Claims

1. A method of making a valve comprising:
(a) providing a manifold formed of non-metallic material having a plurality of inlets communicating with an outlet and an auxiliary passage therethrough;
(b) providing a plurality of valves operators, each having a non-metallic body with an inlet, outlet, and an electromotor operable for controlling flow between said inlet and outlet;
(c) positioning one of said operators on said manifold with the outlet thereof communicating with one of said manifold inlets and the inlet thereof communicating with said auxiliary passage and securing and sealing said operator to said manifold by non-metallic weldment.



5,313,986
METHOD FOR POSITIONING COMPONENTS ON A CYLINDRICAL MEMBER

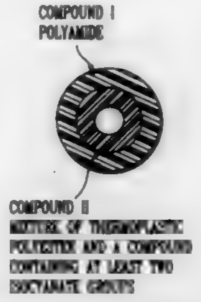
Dennis W. Jude, Corbridge, United Kingdom, assignor to British Gas plc, London, England
PCT No. PCT/GB91/01412, § 371 Date Apr. 6, 1992, § 102(e) Date Apr. 6, 1992, PCT Pub. No. WO92/03680, PCT Pub. Date Mar. 5, 1992
PCT Filed Aug. 20, 1991, Ser. No. 852,174
Claims priority, application United Kingdom, Aug. 20, 1990, 9018253
Int. Cl.⁵ F16L *55/16*
U.S. Cl. 138—99 3 Claims



1. A method of positioning first and second part-circular components against a cylindrical member using a carriage which can execute circular traversing movements about the cylindrical member, said carriage being driven during said traversing movements by sprockets engaging a stationary chain encircling said cylindrical member, said method comprising the steps of: effecting support of the first component upon the carriage, moving the carriage and the first component about the cylindrical member, and placing the second component on the cylindrical member in the position previously occupied by the first component.

5,313,987
MULTILAYER PLASTIC PIPE COMPRISING AN OUTER POLYAMIDE LAYER AND A LAYER OF A MOLDING FORMED FROM A MIXTURE OF THERMOPLASTIC POLYESTER AND A COMPOUND HAVING AT LEAST TWO ISOCYANATE GROUPS

Stefan Röber, Marl; Joachim Mügge, Haltern; Roland Feinauer, Marl; Hans Jadamus, Marl; Hans-Dieter Herrmann, Marl, and Hans Ries, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany
Filed Apr. 16, 1993, Ser. No. 47,030
Claims priority, application Fed. Rep. of Germany, May 12, 1992, 4215608
Int. Cl.⁵ F16L *09/14*
U.S. Cl. 138—137 11 Claims



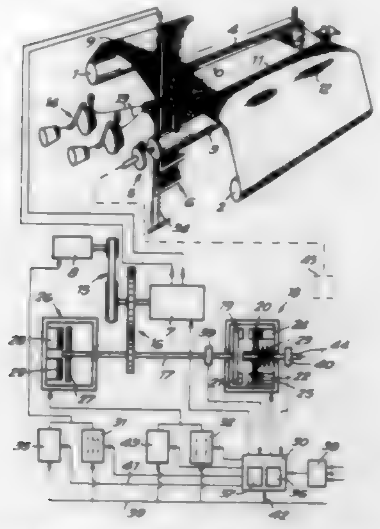
1. A multilayer plastic pipe comprising
I) at least one outer layer comprising polyamide and
II) at least one layer of a molding formed from a mixture of
  a) 99 to 60% by weight of a linear partially crystalline thermoplastic polyester and
  b) 1 to 40% by weight of a compound having at least two isocyanate groups,
wherein the isocyanate groups originating from component IIb being contained in component II in a concentration between 0.03 and 3% by weight, adhesively bonded together.

5,313,988
METHOD AND DEVICE FOR DRIVING A WEAVING MACHINE DURING SLOW MOTION

Walter Bilcke, Geluveld-Zonnebeke; Ludo Faes, Roesbrugge-Poperinge, and Chris Noppe, Meulebeke, all of Belgium, assignors to Picanol N.V., naamloze venootschap, Ypres, Belgium
Filed May 26, 1992, Ser. No. 887,939
Claims priority, application Belgium, May 23, 1991, 09100490
Int. Cl.⁵ D03D *51/00, 51/14*
U.S. Cl. 139—1 E 21 Claims

1. A method of driving a weaving machine in slow motion, said weaving machine including a main drive motor, and parts which are driven by the main drive motor, comprising the steps of:
controlling excitation of the main drive motor during slow

motion in response to a load exerted on the drive motor by weaving machine parts which are driven by the main



motor and in response to positions of said parts which are driven by the main drive motor.

5,313,989

SLIDE FASTENER WITH CONTINUOUS COUPLING COIL WOVEN INTO THE SUPPORT TAPE

Alfons Fröhlich, Essen, Fed. Rep. of Germany, assignor to Opti Patent-, Forschungs- und Fabrikations-AG, Allmeind, Switzerland

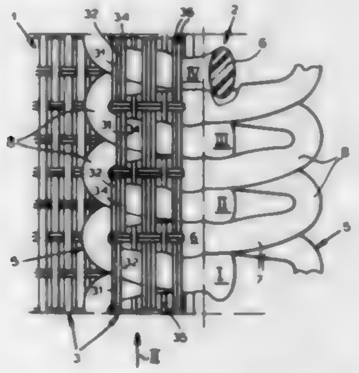
Division of Ser. No. 894,707, Jun. 5, 1992, Pat. No. 5,251,675. This application Feb. 23, 1993, Ser. No. 21,243

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1991, 4120030

The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

Int. Cl.⁵ D03D *13/00*

U.S. Cl. 139—384 B **5 Claims**



1. A woven-tape slide-fastener half with a plastic monofilament coupling row woven therein, comprising:

a woven tape having a multiplicity of double wefts interwoven with warps, the double wefts being formed by a continuous weft yarn defining in the tape a ground weft; and

a continuous plastic monofilament coupling row woven into said tape along a longitudinal edge thereof, said coupling row being comprised of coupling elements having:

spaced apart coupling heads formed by bends of the plastic monofilament,

a pair of shanks extending rearwardly from each of said heads as a monofilament double weft so that projections of each shank on a plane of the tape are substantially superimposed, and

respective connecting bights along a rear of the row connecting each of said shanks to a shank of an adjoining coupling element,

each of said pair of shanks overlying a double weft of said ground weft,

a further double weft of said ground weft being disposed between pairs of shanks of successive coupling elements without passing over said row,

the warps in a region of said row including a plurality of binding warp yarns passing in part over said elements,

the further double wefts being drawn up from said plane to a region of an upper shank of the respective pair by at least one of said binding warp yarns to form a bracing loop of said weft yarn between the pairs of shanks of said coupling elements,

said binding warp yarns including a first group comprised of a plurality of said binding warp yarns so interwoven in said tape as always to pass under double wefts of the ground weft, over at least two coupling elements of the row and then under a pair of shanks and the double weft of the ground weft underlying same,

said binding warp yarns including a second group comprised of at least one binding warp yarn in succession, passing over the double wefts of the ground weft between the coupling elements, and under a pair of shanks and the double weft of the ground weft underlying same, and

each pair of shanks and an underlying double weft of the ground weft beneath which a binding warp yarn of the first group passes also being underpassed by a binding warp yarn of the second group, the binding warp yarn of the first group having a pattern of high/low/high/low/low/low or high/low/high/low/-low/low/high/low in passing over two or three coupling elements, the binding warp yarns of the first group having a binding warp yarn insertion ratio of substantially 1.25:1 to 1.35:1, and at least one binding warp yarn of said second group having a binding warp yarn insertion ratio of 2.50:1 to 3:50:1.

5,313,990

METHOD AND APPARATUS FOR FILLING CONTAINERS WITH LIQUID MATERIAL

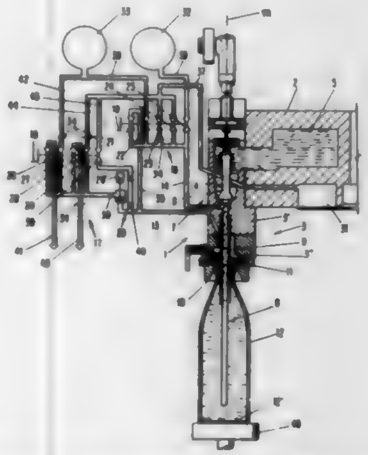
Ludwig Clüsserath, Bad Kreuznach, Fed. Rep. of Germany, assignor to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Oct. 16, 1992, Ser. No. 962,308

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1991, 4134366; Apr. 25, 1992, 4213737

Int. Cl.⁵ B67C *3/06*

U.S. Cl. 141—6 **42 Claims**



1. A method of filling a container with liquid material using a filling element that has a liquid flow valve, said method including the steps of:

bringing said container into a sealing position with said filling element;

in a preliminary pressurizing phase, rinsing and at least partially pre-pressurizing said container with an inert gas;

in a subsequent filling phase, with said liquid flow valve in an open state, filling said container with said liquid material, whereby return gas that is displaced from said container by entering liquid material is at least for a time withdrawn via a return gas path of said filling element into a return gas channel, and whereby in said preliminary pressurizing phase said rinsing as well as said at least partial pre-pressurizing of said container is effected using, as said inert gas, said return gas from said return gas channel;

in a preliminary treatment phase that precedes said preliminary pressurizing phase, treating the interior of said container with a sterilization medium to displace air out of said interior of said container; and

withdrawing said displaced air, as well as sterilization medium that is displaced out of said interior of said container by said rinsing with an inert gas during said preliminary pressurizing phase, to at least one of the atmosphere and a channel that is independent of said return gas channel.

5,313,991

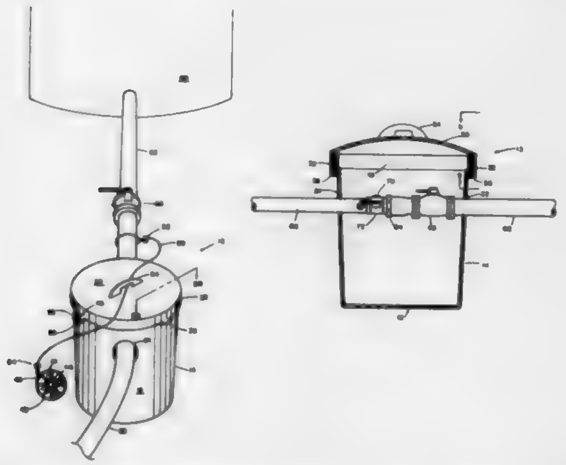
APPARATUS FOR CONTAINING OIL AND WASTE SPILLS AT A LOADING AND UNLOADING LINE CONNECTION

Bill D. Murray, and Jack G. Brewer, both of Chickasha, Okla., assignors to Pollution Control, Inc., Chickasha, Okla.

Filed Feb. 2, 1993, Ser. No. 19,168

Int. Cl.⁵ F16L *55/00*

U.S. Cl. 141—86 **18 Claims**



1. An apparatus for containing oil and waste spills, the apparatus comprising:

(a) a container for collecting the oil and waste, said container having a bottom and an upstanding sidewall, whereby the oil and waste are retained in said container as they are spilled,

(b) said container having first and second openings for receiving loading and unloading lines and joined connectors therein;

(c) a cover for closing said container;

(d) a closing means for closing the opening used in receiving the unloading line when the unloading line is not received within said container; and

(e) a releasing means for releasing gas from said container, said releasing means is located in said closing means.

5,313,992

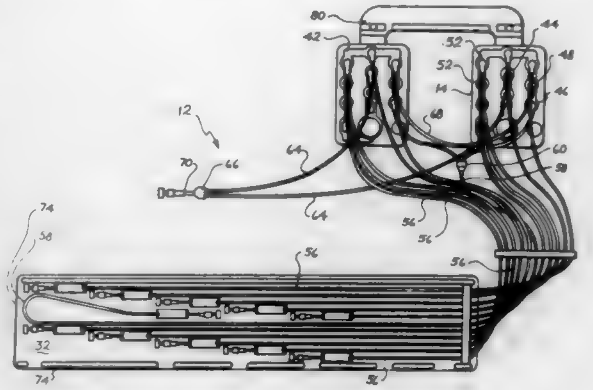
TRANSFER TUBING SET FOR COMPOUNDING SOLUTIONS

Richard W. Grabenkort, Barrington, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 11, 1992, Ser. No. 989,422

Int. Cl.⁵ B65B *1/04, 3/04*

U.S. Cl. 141—104 **8 Claims**



1. A fluid transfer tubing set assembly for transferring individual fluids from multiple supply containers to a single receiving container, the assembly comprising:

a flow path including a pumping component and a tubing component, the pumping component comprising at least two pumping diaphragm cassettes operable with a positive displacement pump apparatus and each cassette having a fluid outlet port at one end, a flush fluid inlet port at the other end, a fluid recirculation port and at least one supply fluid inlet port between said outlet port and said flush fluid inlet port, the tubing component having a plurality of individual fluid inlet conduits for fluidly connecting a supply container to a fluid inlet port, a fluid outlet conduit for fluidly connecting said fluid outlet port with said receiving container, a fluid recirculation conduit for fluidly connecting each fluid recirculation port with each other recirculation port so as to allow fluid flow through the fluid recirculation conduit and the fluid outlet conduit in selectively alternate directions, and a coupling means fluidly coupling the fluid outlet conduits of said at least two cassettes so as to allow recirculation from the receiving container sequentially though the flow path of each cassette;

and packaging means for initially holding and organizing the tubing component prior to connection.

5,313,993

TONER CONTAINER AND RECEIVING APPARATUS THEREFOR

Kenneth D. Corby; Michael W. Didas; Satyan R. Kalyandurg; Purnendu S. Ojha, all of Rochester; Michael E. Baister, Pittsford; Suzanne M. Lenhard, Scottsville, and David M. Gaudino, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

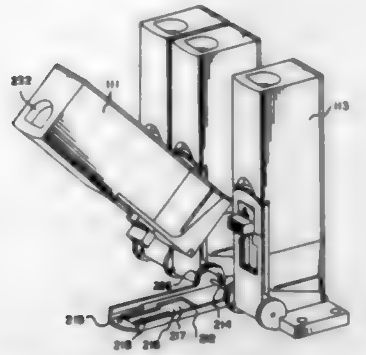
Filed Dec. 3, 1992, Ser. No. 985,074

Int. Cl.⁵ B65B *1/04, 3/00*

U.S. Cl. 141—364 **27 Claims**

22. A receiving apparatus for receiving a toner container, said receiving apparatus comprising:

means defining a sump for receiving toner including a top wall generally covering said sump, said top wall having an outside horizontal surface and an opening for the vertical passage of toner into said sump, and box-shaped, vertical walls extending upward from the horizontal surface and entirely surrounding said sump opening for receiving a complimentary box-shaped base on a received toner container there around.



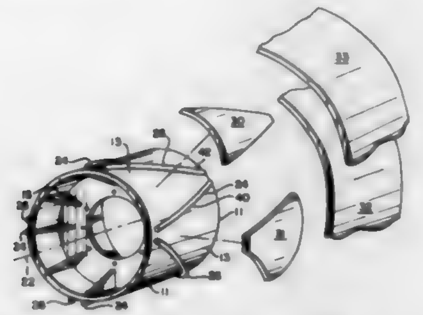
5,313,994
SOLID RUBBER WHEEL AND TIRE ASSEMBLY WITH ANGLED CROSS BARS

Giles A. Hill, III; Giles A. Hill, Jr., both of Idabel, Okla., and Duane S. Birdsong, DeQueen, Ark., assignors to Southeast Tire Company, Idabel, Okla.

Filed May 15, 1992, Ser. No. 884,425

Int. Cl.^{5} **B60C** *7/08, 7/24*

U.S. Cl. 152—323 **12 Claims**



1. A wheel and solid rubber tire comprising:

a) a circular mounting disk having an axis perpendicular through the center of said circular mounting disk;

b) a wheel rim rigidly affixed circumferentially around said circular mounting disk and having a cylindrical surface extending from one end of the rim to another end axially aligned about said axis of said circular mounting disk;

c) a first plurality of angled cross ribs each having top and bottom edges and rigidly affixed at the bottom edges to said cylindrical surface of said wheel rim substantially continuously thereacross at a positive angle from the one end of the wheel rim to the other end and evenly spaced circumferentially therearound;

d) a second plurality of angled cross ribs, each having top and bottom edges and rigidly affixed at said bottom edges to said cylindrical surface of said wheel rim substantially continuously thereacross and each interposed between said first plurality of angled cross ribs at a negative angle from one end of the wheel rim to the other end evenly spaced circumferentially therearound;

e) one or more base layers of even thickness rubber bonded to said cylindrical surface interposed between said angled cross ribs; and

f) multiple additional layers of even thickness rubber bonded to said one or more base layers with each of the multiple additional layers bonded to a next one of said multiple additional layers so that a solid rubber tire is formed bonded to said wheel rim.

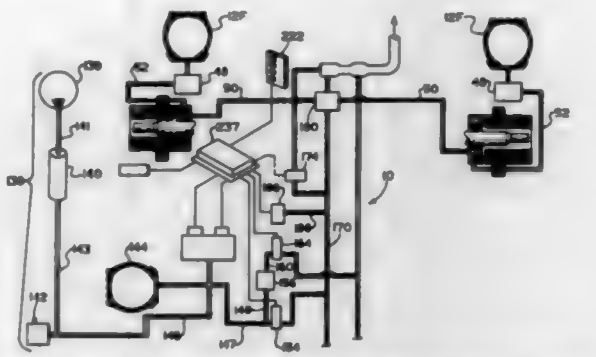
5,313,995
CENTRAL TIRE INFLATION SYSTEM

Gary R. Schultz, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 67,745, Jun. 29, 1987, abandoned. This application Jan. 24, 1990, Ser. No. 469,719

Int. Cl.^{5} **B60C** *23/00*

U.S. Cl. 152—416 **3 Claims**



1. A central tire inflation system for sensing and maintaining selected air pressures in tire chambers of tire assemblies mounted for rotation at opposite ends of at least one axle assembly supporting a chassis of a vehicle controlled by an operator; the system comprising:

an air source for providing pressurized air at pressure at least equal to normally maximum tire chamber air pressure;

selector means including means selectively activatable by the operator for preselecting one of several desired tire chamber air pressures;

a control circuit including means automatically operative several times per hour to activate a pressure check mode to compare tire pressure signals from a sensing means with a preselected tire pressure, and automatically operative to activate inflation and steady-state modes respectively in response to the sensed tire pressure being less than or within predetermined limits of the preselected tire pressure;

an air circuit for connecting the air source to each tire chamber, the air circuit including rotary seal means connecting non-rotatably mounted parts of the air circuit with rotatably mounted parts of the air circuit for communicating air therebetween;

a control valve secured to each tire assembly, each control valve having a first port connected to one of the rotatably mounted parts of the air circuit, a second port connected to the tire chamber of the associated tire assembly, and valving means movable to a position blocking air communication between the ports in response to the air circuit being vented to atmosphere and movable to a position unblocking the air communication between the ports in response to pressurization of the air circuit;

valve means operative in response to the automatic activation of the steady-state mode by the control circuit means to vent the air circuit to atmosphere for moving the valving means of the control valves to the blocking positions, the valving means operative in response to activation of the check mode to momentarily connect the air source to the air circuit to pressurize the air circuit and move the valving means of the control valves to the unblocking positions for establishing air pressure in the air circuit at the sensing means representive of tire pressure, and the valve means operative in response to automatic activation of the inflation mode by the control circuit means to again connect the air source to the air circuit for increasing the tire pressure; characterized by:

switch means manually activated by an operator during vehicle operation in hazard zones for automatically increasing the frequency of activating the check modes by the control circuit means, for automatically more quickly detecting low tire pressure conditions, and for automatically more quickly activating the inflation modes to prevent flat tire conditions within the air capacity of the air supply.

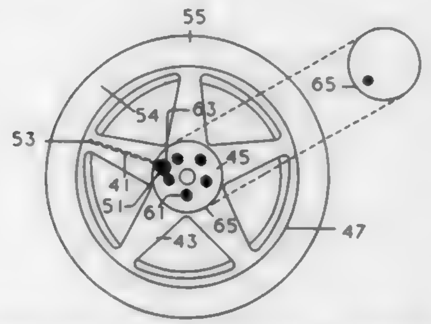
5,313,996
WHEEL HAVING SPOKE-INTEGRATED TIRE INFLATION PASSAGEWAY

Paul Bragg, 794 Boc Cir. NW., Palm Bay, Fla. 32907

Filed Mar. 2, 1992, Ser. No. 844,501

Int. Cl.^{5} **B60B** *1/00*

U.S. Cl. 152—427 **10 Claims**



1. A wheel supporting a tubeless tire on a vehicle, said tubeless tire having an exterior tread surface for contact with a road surface and an opposite, interior wall surface which is bounded by rim-engageable edge portions of said tubeless tire, said rim-engageable edge portions having diameters sized to enable said tubeless tire to fit upon a rim of said wheel, said wheel comprising:

a hub mountable upon a wheel support axle and having an air supply port with which an air supply valve may be coupled for supplying air through said air supply port;

a rim configured to engage said respective rim-engageable edge portions of said tubeless tire, so that said rim and said interior wall surface of said tubeless tire define an interior tubeless tire cavity that is inflated by air supplied thereto, said rim having an air inflation port which, with said tubeless tire being mounted on said rim, opens into said interior tubeless tire cavity; and

a plurality of spokes which join said hub with said rim and locate said rim radially of said hub, and wherein one of said spokes includes an inflation passageway in the form of a hollow bore therethrough, said hollow bore extending from said air supply port of said hub to said air inflation port of said rim, said hollow bore having its dimensions bounded by surrounding material of said one of said spokes through which said hollow bore passes, such that interior dimensions of said inflation passageway from said air supply port of said hub to said air inflation port of said rim are interior dimensions of said hollow bore, and wherein said one of said spokes is integrally joined with said rim so that an air-tight seal is established between said hollow bore and said air inflation port of said rim.

5,313,997
TIRE VALVE STEM STABILIZING AND SUPPORTING DEVICE

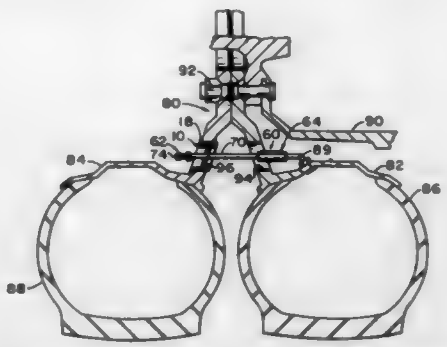
Donald R. Bias, Columbia Station, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 12, 1992, Ser. No. 974,913

Int. Cl.^{5} **B60C** *29/02;* **F16L** *5/02*

U.S. Cl. 152—427 **21 Claims**

1. A resilient device for insertion into an access opening through a dual wheel, having a bevelled area adjacent the circumference of the access opening, to support an elongated valve stem means which projects through said opening, said device comprising a tubular body portion adapted to be easily removably secured in said access opening in said dual wheel, wherein said tubular body portion has a bevelled shape substantially corresponding to the shape of said access opening and including means for frictional securement in said access opening, said tubular body portion further having an outer end with an radially outwardly projecting lip thereon for engaging a wheel adjacent said access opening and having resilient means projecting inwardly from said tubular body portion for supporting said elongated valve stem means, said resilient means having a width less than the width of said tubular body portion, whereby said device can be easily positioned on said valve stem means and inserted into said access opening to support said valve stem means intermediate its ends.



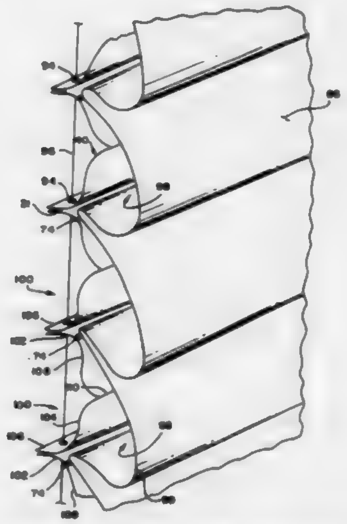
5,313,998
EXPANDABLE AND COLLAPSIBLE WINDOW COVERING

Wendell B. Colson; Paul G. Swiszcz, both of Boulder; Jim Anthony, Denver, all of Colo., and Cees M. Jansen, Woudrichem, Netherlands, assignors to Hunter Douglas Inc., Upper Saddle River, N.J.

Division of Ser. No. 597,466, Oct. 15, 1990, Pat. No. 5,158,632. This application May 14, 1992, Ser. No. 868,340

Int. Cl.^{5} **A47H** *23/00*

U.S. Cl. 160—84.1 D **12 Claims**



1. An expandable and collapsible window covering, comprising:

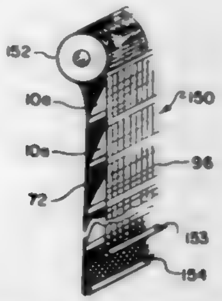
an expandable and collapsible pleated panel having a plurality of alternating oppositely directed spaced pleats; and

a fabric sheet attached to said pleated panel along spaced apart joint lines extending transversely across the width of said pleated panel at spaced intervals with respect to said pleats of said pleated panel to form a plurality of stacked, transverse closed cells, said joint lines being spaced from said pleats to define discrete panel portions therebetween, the longitudinal direction of the individual cells being transverse to the direction of expansion and collapse of the window covering; and wherein each cell contains at least two adjacent pleats and

the length of said fabric sheet between adjacent points of attachment is greater than the longitudinal spacing of said points of attachment with the window covering in the expanded condition.

5,313,999
FABRIC LIGHT CONTROL WINDOW COVERING

Wendell B. Colson, and Paul G. Swiszcz, both of Boulder, Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.
Continuation-in-part of Ser. No. 602,998, Oct. 24, 1990, abandoned. This application May 17, 1991, Ser. No. 701,165
Int. Cl.^{5} E06B *9/08*
U.S. Cl. 160—121.1 **29 Claims**



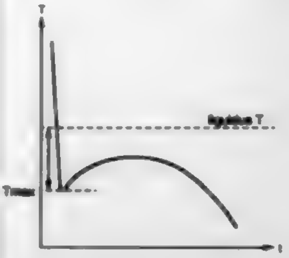
1. A window covering comprising a first sheet of relatively translucent material, a second sheet of relatively translucent material disposed parallel to said first sheet, and a plurality of relatively opaque strips of material, each strip having edge portions bonded to said first sheet and said second sheet, respectively, whereby central portions of said strips form vanes which, in a first closed position of said window covering are substantially planar and extend substantially parallel to the first and second sheets effective at least partially to block transmission of light and, in a second open position of said window covering, extend generally transverse to said first and second sheets, effective to transmit light between said vanes, wherein said first and second sheets have a different physical appearance, wherein, said first and second sheets are each sheer fabrics formed of threads defining interstices therebetween, the interstices of one sheet being of a different size and/or shape and/or of a different orientation from those of the other sheet such that when the sheets are in overlying relation in the window covering the appearance of a moire effect is avoided when light is viewed through both the fabric sheets.

5,314,000
METHOD OF CONTROLLING GRAIN SIZE DISTRIBUTION IN INVESTMENT CASTING

Hsin-Pang Wang, Rexford, and Erin M. Perry, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed May 3, 1993, Ser. No. 56,273
Int. Cl.^{5} B22D *27/20*
U.S. Cl. 164—4.1 **5 Claims**

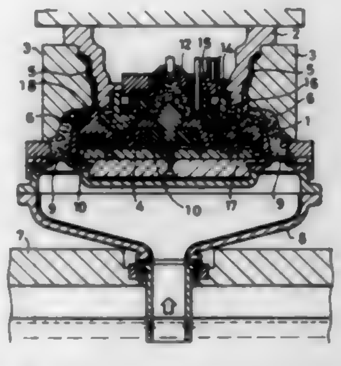
1. A method for controlling grain size distribution of an actual cast part made from a liquid metal including an inoculant wherein said method comprises the steps of:

a) coating a first and a second location on the inner surface of a sample mold with a predetermined concentration of said inoculant, said first and second locations corresponding to first and second regions of different thicknesses on a sample part to be cast in said sample mold;
b) casting said sample part in said sample mold from said liquid metal;
c) determining a grain size distribution of said first and second regions of said sample cast part;
d) repeating steps a) through c) using a mold generally identical to said sample mold for at least one other inoculant concentration;
e) determining an inoculant concentration for said first region and a different inoculant concentration for said second region from said grain size distribution of said sample parts determined from step c) such that said grain size distribution of corresponding first and second regions of an actual cast part is controlled;
f) repeating steps a) and b) using an actual mold generally identical to said sample mold for an inoculant concentration for said first location and a different inoculant concentration for said second location equal, respectively, to the inoculant concentrations of said first and second regions determined from step e) to make said actual cast part such that said grain size distribution of said actual cast part is controlled.



5,314,001
METHOD OF CASTING VEHICLE WHEEL

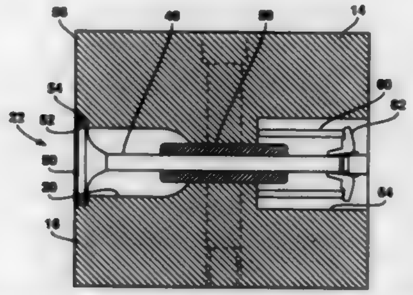
Akio Hidaka; Tsutomu Terajima; Yuu Haga; Shigemitsu Nakabayashi, and Akihiro Okumura, all of Sayama, Japan, assignors to Honda Giken Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 821,370, Jan. 16, 1992, abandoned. This application May 28, 1993, Ser. No. 68,261
Claims priority, application Japan, Feb. 27, 1991, 3-033122; Feb. 28, 1991, 3-034308
Int. Cl.^{5} B22D *18/04, 27/04*
U.S. Cl. 164—125 **5 Claims**



1. A method of casting a vehicle wheel by using mold means, said mold means comprising a lower mold and an upper mold which together form a cavity for molding therein a disk portion of the vehicle wheel, and split molds which form a cavity for molding therein a rim portion of the vehicle wheel by enclosing the lower and upper molds, said method comprising water-cooling, out of the lower and the upper molds, one mold that forms that external side of the vehicle wheel which faces an outside of a vehicle when mounted thereon, and forcibly air-cooling rib-forming portions which are provided on the other mold that forms an internal side of the vehicle wheel to form ribs on the internal side of the vehicle wheel, said air-cooling being carried out by means of air flowing through air-cooling passages formed in said other mold, said air-cooling passages including at least one passage which extends along the length of the rib-forming portions, the air-cooling passages being inside said other mold and free from communication with said cavities.

5,314,002
VACUUM VALVE APPARATUS FOR DIE CASTING

Russell J. VanRens, Milwaukee, Wis., and Donald L. Lessard, Antioch, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of Ser. No. 874,629, Apr. 27, 1992, Pat. No. 5,203,396. This application Apr. 19, 1993, Ser. No. 49,766
Int. Cl.^{5} B22D *17/14, 17/20*
U.S. Cl. 164—305 **24 Claims**



1. A vacuum valve apparatus for use in a die casting means, the die casting means being of the type which utilizes a source of vacuum pressure and a die body having internal surfaces which define an internal die cavity for making a casting, said apparatus comprising:

a valve body adapted to be mounted to the die body, said valve body having at least one face that is generally coextensive with an internal surface of the die cavity, said valve body having a first internal port means adapted to receive a valve means, a second internal port means communicating said first port means to the source of vacuum pressure, said first port means terminating at said one face and being in communication with said die cavity;

an openable and closeable valve means housed in said first internal port means of said valve body and communicating said first port means with the die cavity when said valve means is open and isolating the first port means from the die cavity when said valve means is closed;

said valve body having at least two body components that are separable from one another along a split line, said split line being located along at least said first internal port means, so that separating said valve body components enables any casting material to be removed from said first and second internal port means.

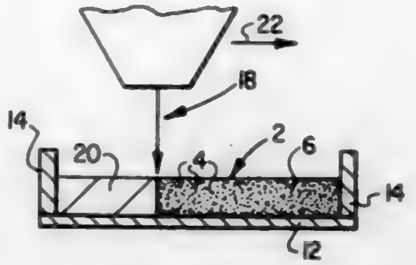
5,314,003
THREE-DIMENSIONAL METAL FABRICATION USING A LASER

Colin A. Mackay, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.
Filed Dec. 24, 1991, Ser. No. 813,960
Int. Cl.^{5} B22D *23/06*
U.S. Cl. 164—494 **37 Claims**

1. A method for forming three-dimensional metal articles comprising the steps of:

obtaining a mixture of metal powder in a temperature equalization and unification vehicle;

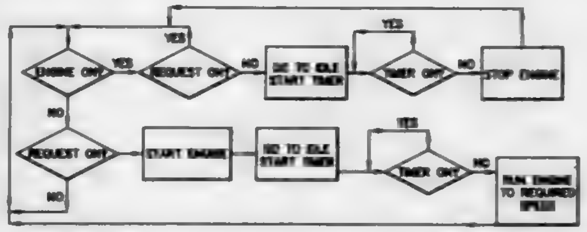
forming a thin layer of said mixture; and



irradiating said thin layer wherein said metal powder melts and forms a solid metal film.

5,314,004
THERMOSTAT FOR A VARIABLE CAPACITY HVAC AND METHOD FOR PROVIDING A RAMPING SET POINT ON A SETBACK THERMOSTAT

Rolf L. Strand, Crystal, and Daniel T. Uhrich, Mayer, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed May 28, 1993, Ser. No. 68,867
Int. Cl.^{5} F25B *29/00*
U.S. Cl. 165—2 **4 Claims**



1. A setback thermostat for a gas engine heat pump, and a method for controlling the gas engine heat pump, said thermostat providing a load signal to a gas engine heat pump controller, the gas engine heat pump controller increasing or decreasing the gas engine heat pump's operating level relative to said load signal, the thermostat ramping said temperature up when an increase in the setpoint occurs the method comprising the steps of:

A. determining if a programmed setpoint change has occurred;
B. when a programmed setpoint change has occurred monitoring the load signal;
C. decreasing the ramp rate if auxiliary heat is turned on; and
F. returning to step A.

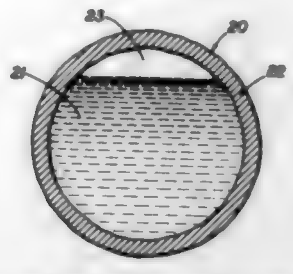
5,314,005
PARTICULATE HEATING/COOLING AGENTS

Reuven Dobry, 87 Rolling Wood Dr., Stamford, Conn. 06905
Filed Nov. 25, 1991, Ser. No. 797,403
Int. Cl.^{5} F23D *20/00*
U.S. Cl. 165—10 **4 Claims**

1. Particulate heating/cooling agents comprising:

(a) a solid carrier material which is porous, liquid absorbent and centrally hollow; and
(b) a substance disposed in said carrier material which is

liquid at a predetermined elevated operating temperature and which is retained in the carrier material by physical



containment and capillary forces, said substance including a relatively non-volatile component.

5,314,006
SHEET METAL HEATING PACKAGE FOR REGENERATIVE HEAT EXCHANGERS AS WELL AS A METHOD AND APPARATUS FOR MANUFACTURE OF PROFILED METAL SHEETS FOR SUCH SHEET METAL HEATING PACKAGES

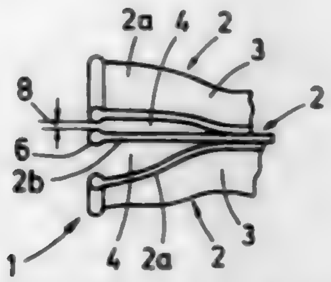
Simon Kaastra, V-Dinxperlo, Netherlands, and Gerd Köster, Reichshof-Odenspiel, Fed. Rep. of Germany, assignors to Apparatebau Rothemühle Brandt & Kritler Gesellschaft mit beschränkter Haftüng, Wendenm, Fed. Rep. of Germany

Filed Jul. 13, 1992, Ser. No. 912,457

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1991, 4122949

Int. Cl.⁵ F28D *19/04*

U.S. Cl. 165—10 **8 Claims**



1. A sheet metal heating package 1 for regenerative heat exchangers, comprising a plurality of superimposed metal sheets 2 and 2*a* or 2 and 2*b*, respectively, comprising a profiling 3 or a profile shape B having embossments as well as flow channels 4 between said sheets, every sheet of which is provided with a coating 5 serving as surface protection, characterized in that the profiling of the metal sheets 2 or 2*a*, 2*b* across a border strip comprises a profile height that is less than the height of the profiling 3 adjacent to the border edges 6 and along all border edges 6 of adjacent superimposed sheets 2 and 2*a* or 2 and 2*b* in the region of profiling 3 there is a minimum distance 8 between adjacent sheets.

5,314,007
AIR COOLER FOR LPG VEHICLES

Gary M. Christenson, 1924 Continental St., Costa Mesa, Calif. 92627

Filed Sep. 3, 1993, Ser. No. 115,758

Int. Cl.⁵ B60H *1/32;* **F25D** *7/00*

U.S. Cl. 165—43 **2 Claims**

1. In apparatus having both a liquid petroleum gas internal combustion engine cooled by circulating liquid through a heat exchanger and a human-occupied compartment, a system for providing cooling to the compartment from the heat of vaporization of the liquid petroleum fuel being used, comprising the combination of:

an air-fluid heat exchanger in the human-occupied compartment, and

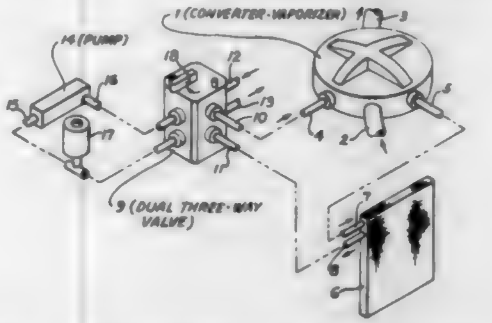
a converter in which liquid petroleum gas is expanded to the vapor phase and heated to above the ambient atmospheric dew point by fluid on its way to said air-fluid heat exchanger prior to being ducted to the internal combustion engine, the cooled fluid emerging from said converter being connected to said air-fluid heat exchanger inlet port, and

a centrifugal pump moving the fluid from the outlet port of said air-fluid heat exchanger to said converter through a dual three-way valve discussed below, and

an air-separator vessel located above said centrifugal pump, containing the fluid being pumped and connected to the inlet side of said centrifugal pump, and

a dual three-way valve operated by a common rotary shaft, the first three-way valve being always connected to the fluid-inflow port of said converter and alternatively connected to either the discharge port of said centrifugal pump as a first alternative or to the higher-pressure portion of the engine coolant circulating system as a second alternative, and the second three-way valve being always connected to the fluid-outflow port of said air-fluid heat exchanger and alternatively connected to either the inlet side of said centrifugal pump as a first alternative or to the lower-pressure portion of the engine coolant circulating system as a second-alternative, the common rotary shaft ensuring that the both three-way valves are positioned toward either the first alternative given above or the second alternative given above.

whereby when said dual three-way valve is in the first alternative position heat of vaporization is supplied only from the human-occupied compartment and when said valve is in the second alternative position the heat of vaporization is supplied in part from the liquid circulating within the engine-cooling system and in part from the human-occupied compartment, in both positions providing cooling to the compartment.



5,314,008
FLUID-COOLED JACKET FOR AN AIR-SWEPT DISTRIBUTOR

Juan A. Garcia-Mallol, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed May 22, 1992, Ser. No. 886,894

Int. Cl.⁵ F23K *3/00;* **F28F** *3/12*

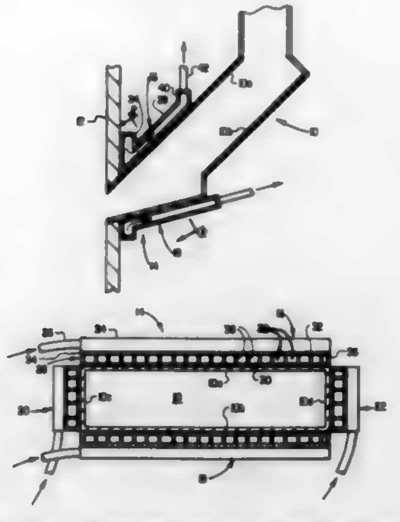
U.S. Cl. 165—47 **1 Claim**

1. A fluid-cooled jacket for cooling a particulate material distributor, said jacket comprising:

a plurality of hollow panels surrounding and positioned in heat exchange relation with said distributor for removing heat from said distributor, each of said panels comprising:

a plurality of partitions disposed within said panels and defining therewith a plurality of discrete channels aligned along the longitudinal axis of said distributor for receiving a cooling fluid;

an inlet header registering with each of said panels for passing said fluid simultaneously and independently through each of said panels in a single, common direction opposite the flow of said particulate material through said distributor; and



an outlet header registering with each of said panels for receiving said fluid from each of said panels.

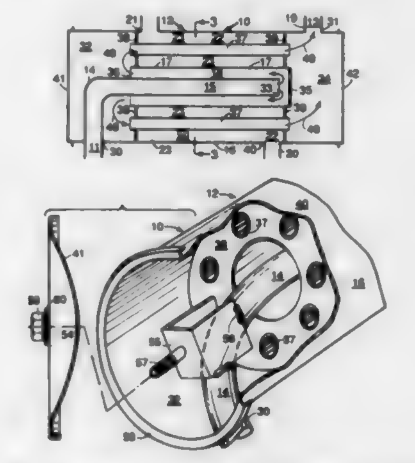
5,314,009
EXHAUST GAS RECUPERATOR

Jan B. Yates, Reynoldsburg, Ohio; David W. Procknow, Wauwatosa, Wis.; Brett J. Peterson, and Gary D. Goplen, both of Stoughton, Wis., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 8, 1992, Ser. No. 958,221

Int. Cl.⁵ F16D *65/14;* **F16F** *9/30, 9/50*

U.S. Cl. 165—72 **10 Claims**



1. Heat exchange apparatus 10 for receiving exhaust gas 11 from an engine into an enclosure 12, having a side wall 40 extending substantially parallel to the lengthwise direction of the enclosure 12 and opposite end walls 41,42 closing off opposite ends of the sidewall 40 to define a chamber therein, at a first temperature and delivering the gas 11 at a lower second temperature to a location 13 spaced from the engine, comprising

A. means 14 for conveying the gas 11 into the enclosure 12 through the side wall 40 in the proximity of a first end wall 41 and thence in a lengthwise direction toward the opposite second end wall 42 through a first confined region 15 spaced from the exterior 16 of the enclosure 12;

B. means 17 for further conveying the gas 11 in the opposite lengthwise direction back toward the first end wall 41 through a second confined region 18 in the enclosure 12 spaced from the exterior 16 of the enclosure 12 and substantially surrounding the first confined region 15;

C. means 19 for further conveying the gas 11 out of the enclosure 12 through the side wall 40 to the location 13 spaced from the engine;

D. means 20,21 for conveying liquid 22 into (20) and out of (21) the enclosure 12 through the side wall 40 at temperatures lower than the first temperature via a third confined region 23 in the enclosure 12 substantially surrounding the second region 18 and spaced from the first end wall 41; and

E. means for removing the first end wall 41 from, and reattaching it to, the side wall 40;

F. whereby the temperatures in the liquid 22 and at the exterior 16 of the enclosure 12 are maintained well below the first temperature and the interior of the apparatus can be made accessible for inspection, cleaning, or other purpose, when not in operation, by removing the first end wall 41; and

G. wherein the side wall 40 has a substantially flat rim 58 at its end contiguous with the first end wall 41, the first end wall 41 has an opening 54 through its center, a threaded stud 57 is securely attached to a fixed member 55 in the enclosure 12 and protrudes through the opening 54 when the first end wall 41 is placed against the rim 58, a sealing washer 60 is placed on the protruding end of the stud 57, and a threaded nut 59 is tightened on the stud 57 against the sealing washer 60 and the end wall 41 to press the contiguous outer surface portion of the end wall 41 into fluid tight contact with the rim 58 of the side wall 40; and wherein the means E for removing the first end wall 41 from, and reattaching it to, the side wall 40, comprises the threaded stud 57, sealing washer 60, and threaded nut 59.

5,314,010
HEAT PIPE AND METHOD OF MANUFACTURING THE SAME

Masuji Sakaya, Narashino; Ryuichi Okiai, Yotsukaido; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

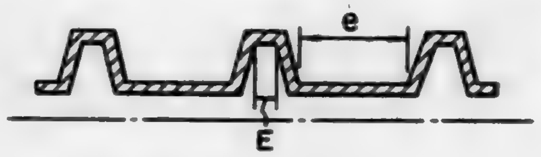
Division of Ser. No. 523,046, May 14, 1990, Pat. No. 5,113,932, which is a division of Ser. No. 365,531, Jun. 13, 1989, Pat. No. 4,953,632, which is a division of Ser. No. 282,025, Dec. 7, 1988, abandoned, which is a continuation of Ser. No. 663,201, Feb. 28, 1991, Pat. No. 5,054,196. This application Oct. 7, 1991, Ser. No. 773,365

Claims priority, application Japan, Dec. 9, 1987, 62-309669; Apr. 27, 1988, 63-102422; Apr. 27, 1988, 63-102423; Apr. 27, 1988, 63-102424

The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.

Int. Cl.⁵ F28D *15/02*

U.S. Cl. 165—104.26 **5 Claims**



1. A heat pipe comprising:

a pipe having mating edges of a metal tape shaped in the form of a pipe;

a wick layer on an inner surface of said pipe; and

trapezoid-shaped projecting surface portions formed on an outer surface portion of said pipe, and projecting in a predetermined direction.

5,314,011
HEAT PIPE

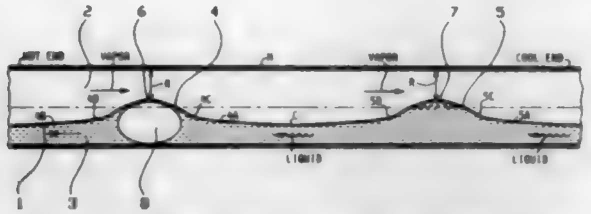
Bernhard Leidinger, Mülheim; Ruediger Meyer, and Klaus P. Nickel, both of Bremen, all of Fed. Rep. of Germany, assignors to ERNO Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Jun. 17, 1993, Ser. No. 79,323

Claims priority, application Fed. Rep. of Germany, Jun. 17, 1992, 4219781

Int. Cl.⁵ F28D *15/02*

U.S. Cl. 165—104.26 **5 Claims**



1. A heat pipe having a first pipe end with a higher temperature and a second pipe end with a temperature lower than said higher temperature, comprising a hollow conduit closed at both ends, a divider wall dividing said hollow conduit into a first channel for conveying a heat exchange fluid in its vapor state from said first pipe end to said second pipe end and a second channel for conveying said heat exchange fluid in its liquid state from said second pipe end to said first pipe end, said divider wall comprising bulges therein reaching into said first channel for forming flow restrictions in said first channel for said vapor and for forming an increased flow cross-sectional area in said second channel for said liquid, said bulges being spaced by a lengthwise spacing in said hollow conduit, said divider wall further comprising through bores in said bulges for interconnecting said first and second channels.

5,314,012
APPARATUS FOR EFFECTING HEAT EXCHANGE BETWEEN A LIQUID AND A PARTICULATE MATERIAL

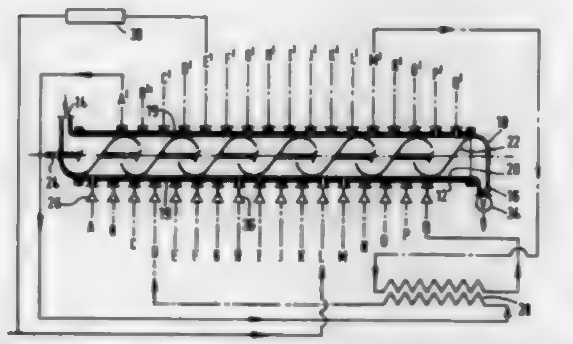
Richard W. E. Mosse, London, and Nicholas K. Franklin, Hitchin, both of England, assignors to Beckswift Limited, London, England

Filed Nov. 20, 1992, Ser. No. 980,611

Claims priority, application United Kingdom, Nov. 22, 1991, 9124863

Int. Cl.⁵ A23L *1/00;* **A47J** *37/00*

U.S. Cl. 165—111 **18 Claims**



16. A method of heating or cooling a particulate material comprising the steps of:

conveying the particulate material through a chamber by means for a mechanical conveyor whilst said particulate material is immersed in a heat exchange liquid,

withdrawing some of said liquid from an upper part of the chamber at each of a plurality of points spaced longitudinally with respect to the conveyor, and

reintroducing said withdrawn liquid into a lower part of said chamber at each of a plurality of points spaced longitudinally with respect to the conveyor to heat or cool aid particulate material, and to suspend said material in said upwardly flowing liquid.

5,314,013
HEAT EXCHANGER

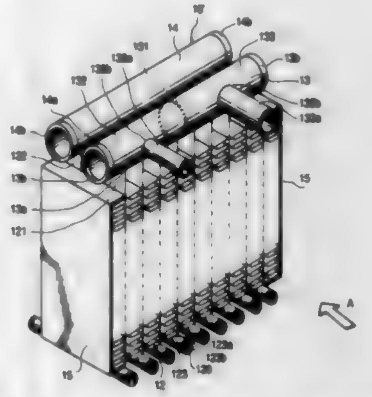
Kenichi Tanabe, Takasaki, Japan, assignor to Sanden Corporation, Isesaki, Japan

Filed Mar. 16, 1992, Ser. No. 851,455

Claims priority, application Japan, Mar. 15, 1991, 3-015392[U]; Mar. 15, 1991, 3-015395[U]

Int. Cl.⁵ F28D *1/047*

U.S. Cl. 165—176 **2 Claims**



1. An evaporator for use in a refrigeration circuit comprising:

first and second header pipes disposed substantially in parallel to each other; and

a plurality of communicating members for providing communication between an interior space of the first header pipe and an interior space of the second header pipe, each of the plurality of communicating members including a first portion which communicates with the interior space of the first header pipe, a second portion which communicates with the interior space of the second header pipe, and a third portion which communicates between the first portion and the second portion,

wherein the first, second and third portions of each communicating member extend along a plane which is parallel to a flow direction of a fluid which passes an exterior surface of the evaporator, and wherein the first portion, the second portion, and the third portion of at least one of the plurality of communicating members comprise a first flat pipe, a second flat pipe, and a cylindrical pipe connected to one end of each of the first and second flat pipes, respectively.

5,314,014
PACKER AND VALVE ASSEMBLY FOR TEMPORARY ABANDONMENT OF WELLS

Andrew J. Tucker, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Sugar Land, Tex.

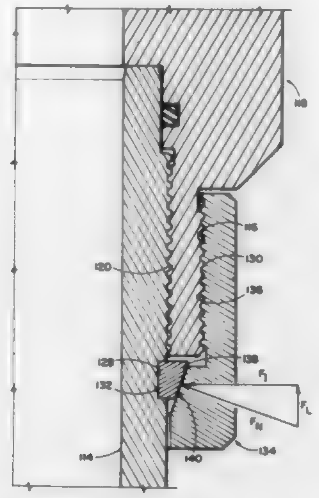
Filed May 4, 1992, Ser. No. 883,632

Int. Cl.⁵ E21B *33/12, 34/12*

U.S. Cl. 166—124 **9 Claims**

1. In a packer assembly for the temporary abandonment of a well which assembly is set by rotation in a first direction and retrieved by rotation in a second direction opposite said first direction and including a threaded connector mandrel having threads in a first thread hand and threaded connector means for connecting said threaded connector mandrel of said packer assembly to a valve assembly having matching threads in said first thread hand, the improvement which comprises circumferential groove means on an outer cylindrical surface of said mandrel for receiving a retainer ring within said groove means and extending radially outwardly into compressive engagement with a locking collar means having threads of a second thread hand opposite said first thread hand in coupling engagement with matching threads of said second thread hand on said connector means.

9. In a valve assembly for temporary abandonment of a well which valve assembly comprises a lower valve portion and a threaded valve-actuating subassembly maintaining said lower valve portion in an open position when said threaded valve-actuating subassembly is in place and allowing said lower valve portion to move into a closed position upon rotation in a first, removal direction to remove said threaded valve-actuating subassembly, the improvement which comprises stop means comprising longitudinally abutting lugs on each of said threaded valve actuating subassembly and said lower valve portion, said stop means limiting relative rotation of said valve-actuating subassembly and said lower valve portion in a second, makeup rotational directional.



5,314,015
STAGE CEMENTER AND INFLATION PACKER APPARATUS

Steven G. Streich; John T. Brandell; Richard L. Giroux, all of Duncan, and Lee W. Stepp, Comanche, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 31, 1992, Ser. No. 923,735

Int. Cl.⁵ E21B *33/127, 34/14*

U.S. Cl. 166—184 **44 Claims**

1. A cementing tool apparatus for use in a well bore, said apparatus comprising:

a mandrel having an inner passage defined therethrough and having an outer surface;

inflatable packing means, connected to said mandrel, for sealingly engaging the well bore;

inflation passage means for providing communication between said inner passage in said mandrel and said packing means when opened;

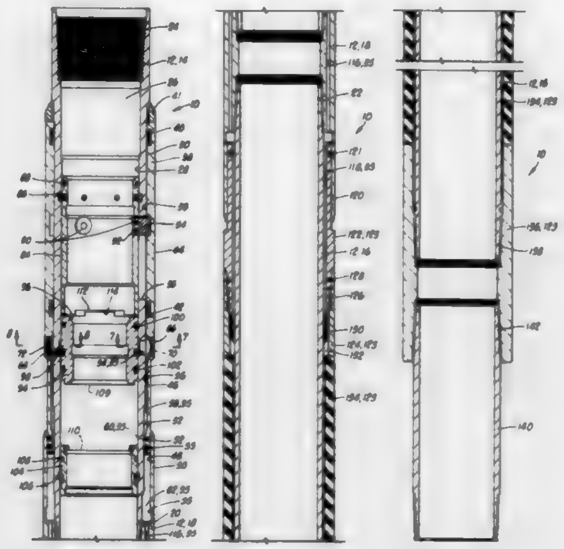
an opening sleeve slidably received in said mandrel and movable between a closed position wherein said inflation passage means is closed and an open position wherein said inflation passage means is open;

pressure relief means upstream of said packing means for opening in response to a predetermined pressure after inflation of said packing means and thereby placing said inner passage in said mandrel in communication with a well annulus;

an outer closure sleeve slidably received about said outer surface of said mandrel and movable between an open position wherein said pressure relief means provides communication between said inner passage and said well annulus when said pressure relief means is open and a closed position wherein communication between said inner passage and said well annulus is prevented;

an inner operating sleeve slidably received in said mandrel and movable between first and second positions relative to said mandrel; and

interlocking means operably associated with both said operating sleeve and said closure sleeve for transferring a closing force from said operating sleeve to said closure sleeve and thereby moving said closure sleeve to its closed position as said operating sleeve moves from its first position to its second position.



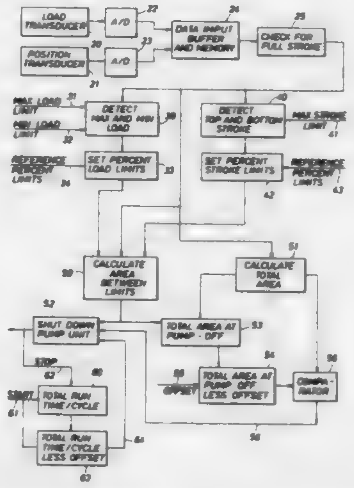
5,314,016
METHOD FOR CONTROLLING ROD-PUMPED WELLS

Cleon L. Dunham, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 19, 1993, Ser. No. 64,603

Int. Cl.⁵ E21B *43/00;* **F04B** *49/02, 49/06*

U.S. Cl. 166—250 **7 Claims**



1. A method for controlling a rod pumped well having a pumping unit located at the surface and disposed to reciprocate the rod string, said method comprising:

a controller, said controller being disposed to monitor at least one parameter of the pumping unit;

using said at least one parameter to determine when the well has pumped-off;

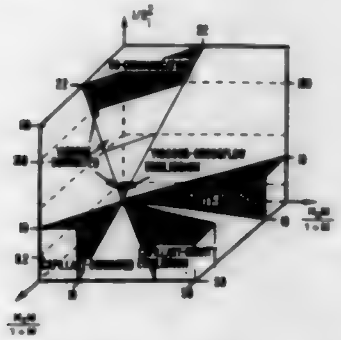
stopping the pumping unit when the controller determines the well has pumped-off;
measuring the run time the pumping unit has run between starting of the pumping unit and stopping of the pumping unit in response to pump-off;
restarting said pumping unit after a predetermined time period;
stopping said pumping unit after a time period that is a predetermined percentage of the measured run time; and
periodically measuring a new run time by allowing the well to pump-off and controlling the stopping of the pumping unit after a time period that is a predetermined percentage of the new measured run time.

5,314,017

METHOD OF ASSISTING THE RECOVERY OF PETROLEUM IN VERTICALLY FRACTURED FORMATIONS UTILIZING CARBON DIOXIDE GAS TO ESTABLISH GRAVITY DRAINAGE

David S. Schechter, E. Palo Alto; Dengen Zhou, Mountain View, and Franklin M. Orr, Jr., Stanford, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 5, 1992, Ser. No. 957,043
Int. Cl.⁵ E21B *43/16, 47/00, 47/10*
U.S. Cl. 166—252 **7 Claims**



1. A method of assisting the recovery of petroleum from a vertically fractured petroleum containing reservoir of the Spraberry type wherein the value of the inverse Bond number is less than 0.2 comprising injecting CO_2 gas into said formation at a pressure approaching the miscibility pressure of said CO_2 and said petroleum in order to lower the interfacial tension between the CO_2 and the petroleum; continuing to inject the CO_2 into and up the vertical fractures in said formation, contacting petroleum in said formation adjacent said vertical fractures to dissolve CO_2 into said petroleum in order to lower the interfacial tension between the CO_2 and the petroleum to establish a gravity drainage zone of petroleum in said vertical fractures in said formation and recovering petroleum from said gravity drainage zones of said formation.

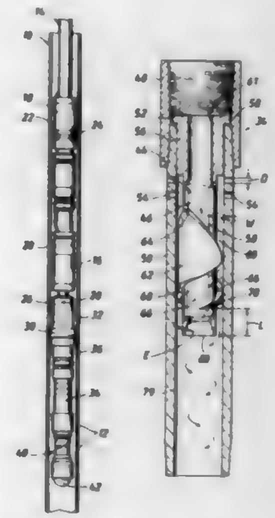
5,314,018

APPARATUS AND METHOD FOR SEPARATING SOLID PARTICLES FROM LIQUIDS

Delwin E. Cobb, 14321 Lost Meadow La., Houston, Tex. 77079

Filed Jul. 30, 1992, Ser. No. 921,715
Int. Cl.⁵ E21B *43/38*
U.S. Cl. 166—265 **17 Claims**

11. In a downhole tool string positioned within a well bore and having a tubular body for removing fluids from the well; a separation device connected to said tubular body adjacent the lower end thereof for separating solid particles from liquids so that the separated solid particles are not removed from the well; said separation device comprising:
an outer tubular member and a concentric inner tubular member defining an annulus between said inner and outer members;
a fluid inlet passage in said outer tubular member extending to said annulus;
means blocking fluid flow upwardly from said annulus; and
guide means in said annulus between said tubular members and below said fluid inlet passage for directing solid particles received from said fluid inlet passage downwardly in a helical motion for settling of said solid particles below said inner tubular member with the separated liquid flowing upwardly from the lower end of said inner tubular member through said inner tubular member to a surface location, the cross sectional area of the helical path along the spiral means as measured at right angles to the helical flow path decreasing between the upper end and the lower end of said guide means.



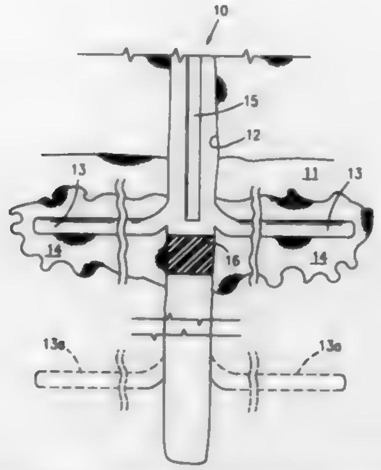
17. A method for separating solid particles from liquids in well fluids of a bore hole for the pumping of the separated liquids from the bore hole; said method comprising the following steps:
providing a separation device adjacent the lower end of a downhole pipe string with the separation device having concentric inner and outer tubular members for defining an annulus therebetween;
providing a fluid inlet in said outer tubular member in fluid communication with said annulus to permit the flow of well fluids with entrained solid particles through said fluid inlet into said annulus;
providing guide means in said annulus below said fluid inlet extending about said inner tubular member in a downward spiral path;
directing said well fluids from said fluid inlet along said guide means in a spiral path about said inner tubular member to impart a helical motion to said well fluids for movement to a separation chamber below said inner tubular member;
collecting solid particles separated from said well fluids adjacent the bottom of said separation chamber;
pumping the liquid in said well fluids separated from said solid particles upwardly through said inner tubular member;
providing a separate gas passage for said inner tubular member in fluid communication with said annulus and extending upwardly to a surface location;
removing gas from said well fluids at a position adjacent the lower end of said inner tubular member for flow into said gas passage for removal from said bore hole; and
providing check valve means in said separate gas passage to block a reverse flow of gas from said inner tubular member for maintaining an amount of gas below said check valve means.

5,314,019

METHOD FOR TREATING FORMATIONS

Mehdi M. Honarpour, Highland Village, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 6, 1992, Ser. No. 925,536
Int. Cl.⁵ E21B *33/138, 43/22*
U.S. Cl. 166—270 **8 Claims**



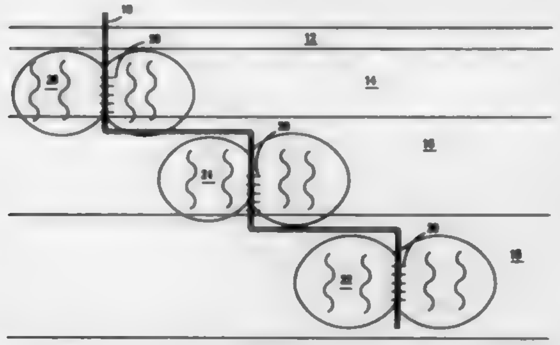
1. A method for treating a formation having zones of varying permeabilities to improve the sweep efficiency of a drive fluid through the formation wherein a wellbore traverses the formation, said method comprising:
forming at least one radial bore outward from said wellbore into one of said zones having a relatively high-permeability;
injecting an aqueous gelant solution into said formation through said at least one radial bore whereby said gelant solution flows into said high-permeability zone of said formation; and
shutting-in said wellbore for a time sufficient for said gelant solution to set to form a flow-blocking gel within said high-permeability zone of said formation to restrict further flow through said high-permeability zone while allowing flow through the less permeable of said zones to thereby improve the sweep efficiency of subsequently injected fluids.

5,314,020

TECHNIQUE FOR MAXIMIZING EFFECTIVENESS OF FRACTURING IN MASSIVE INTERVALS

Alfred R. Jennings, Jr., and Ibrahim S. Abou-Sayed, both of Plano, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 11, 1992, Ser. No. 943,645
Int. Cl.⁵ E21B *43/26, 43/30*
U.S. Cl. 166—281 **6 Claims**



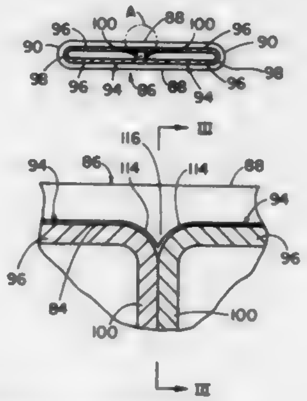
1. A method for maximizing the effectiveness of fracturing in a formation containing laminated massive productive intervals comprising:
a) drilling a wellbore into said formation which wellbore has an opening to the surface and contains a first and a second spaced apart vertical sections that communicate with at least one substantially horizontal section;
b) perforating the second vertical section which is furthermost from said opening and deeper in the formation than the first vertical section thereby causing it to be in fluid communication with a first laminated productive interval of said formation;
c) conducting a hydraulic fracturing operation through perforations in said second vertical section thereby creating a hydraulic fracture in said first laminated productive interval which is located deepest in said formation;
d) directing a solidifiable liquid mixture into said second vertical section where it remains for a time sufficient to form a solid within said fracture and perforated vertical section;
e) perforating the first vertical section of said wellbore that is located in a second laminated productive interval above said first interval;
f) fracturing hydraulically into said second interval through perforations in said first section thereby creating a fracture in said second interval which fluidly communicates with the second perforated interval; and
g) causing the solid in step d) to liquidfy thereby establishing fluid communication with the wellbore via the first and second laminated productive intervals.

5,314,021

HEAT EXCHANGER WITH A PLURALITY OF RANGES OF TUBES, IN PARTICULAR FOR A MOTOR VEHICLE

Michel Potier, Rambouillet, and Philippe Le Gauyer, Paris, both of France, assignors to Valeo Thermique Moteur, Le Mesnil-Saint-Denis, France

Filed Mar. 18, 1992, Ser. No. 853,640
Claims priority, application France, Mar. 20, 1991, 91 03411
Int. Cl.⁵ F28D *1/053;* **F28F** *9/04*
U.S. Cl. 165—153 **1 Claim**



1. A heat exchanger comprising:
a plurality of rows of tube members, each tube member having an end portion, each tube end portion having a cross-sectional area;
a closed manifold for containing a heat exchange fluid, said manifold having a wall portion which is constituted by a collecting plate having a plurality of holes, each of said holes defining a lip, each hole receiving the respective end portions of two of said tube members, each tube member of said two tube members in a respective hole having a wall member directly abutting a wall member of said other tube member in said respective hole, wherein each said hole has two straight, parallel edges and two semi-circular edges, together defining for the hole a generally oblong cross section, each tube end portion being generally oblong in cross-sectional area having a pair of parallel longitudinal wall members, a first semi-circular end wall

member, a second substantially flat transverse wall member which defines one of said directly abutting tube wall members, said end portions of said tubes being deformed to engage said respective lip wherein each of said abutting second, substantially flat transverse wall members further include a pair of arcuate corner wall portions, each corner wall portion of each respective tube member in a hole being directly adjacent to a corner wall portion of the abutting wall member of another tube member in the hole and defining a space between abutting wall members of the tube members in a hole, said collecting plate further including a plurality of beak-shaped projection members, each projection member defining part of the contour of the corresponding hole substantially filling each said space defined between abutting tube wall members in a hole.

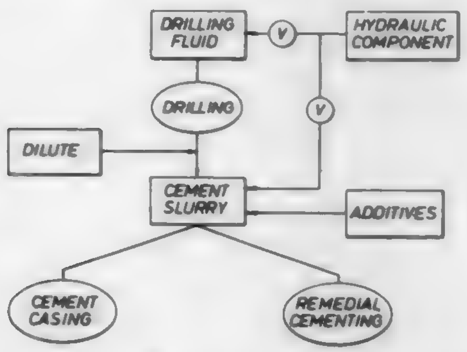
5,314,022
DILUTION OF DRILLING FLUID IN FORMING CEMENT SLURRIES

Kenneth M. Cowan, Sugar Land; Arthur H. Hale, and James J. W. Nahm, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 22, 1992, Ser. No. 965,142

Int. Cl.^{5} E21B *33/14;* **C09K** *7/02*

U.S. Cl. 166—293 **30 Claims**



21. A method for drilling and cementing a well, comprising:

combining constituents comprising water, clay and a first portion of a cementitious material to produce a drilling fluid;

thereafter utilizing said drilling fluid in a well drilling operation to form a borehole with a drill string, thus producing a used drilling fluid;

removing said drill string and inserting a casing;

introducing additional water to said used drilling fluid;

passing said used drilling fluid down said borehole and up into an annulus formed by said borehole and said casing; and

gradually adding additional cementitious material to gradually transition from a drilling fluid to a cementitious slurry.

5,314,023
METHOD FOR SELECTIVELY TREATING WELLS WITH A LOW VISCOSITY EPOXY RESIN-FORMING COMPOSITION

Terry R. Dartez, 101 S. Maraist, Kaplan, La. 70548, and Roy K. Jones, 4620 Raccoon Dr., Baytown, Tex. 77521

Filed Jan. 19, 1993, Ser. No. 5,784

Int. Cl.^{5} E21B *33/138*

U.S. Cl. 166—295 **10 Claims**

1. A well treating method for selectively plugging a permeable zone in a subterranean formation comprising the steps of:

preparing a low viscosity epoxy resin-forming composition consisting essentially of a low viscosity epoxy material obtained by reacting epichlorohydrin and 2,2-bis(4-hydroxyphenyl) propane and a single liquid polyamide hardener by mixing the low viscosity epoxy material with the liquid polyamide hardener for ambient temperature curing of the epoxy material;

introducing the low viscosity epoxy resin-forming composition via a well bore into the permeable zone; and

curing said epoxy material to form solid resin which substantially plugs said permeable zone.

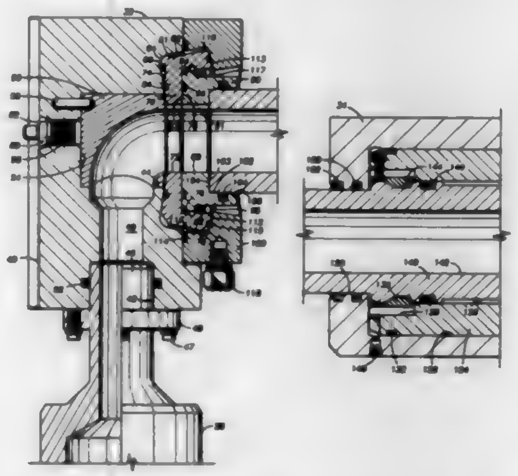
5,314,024
ANGULAR AND RADIAL SELF-ALIGNING COUPLING

Tony A. Rodgers, and Stephen J. Walker, both of Houston, Tex., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 10, 1992, Ser. No. 927,804

Int. Cl.^{5} E21B *17/02*

U.S. Cl. 166—347 **8 Claims**



1. A coupling for connecting a first fluid line to a second fluid line, comprising:

a first connector having a first flow bore therethrough with an outlet, said first flow bore being in fluid communication with the first fluid line, said first connector having a convex annular surface extending around said outlet;

a first plate mounted on said first connector and having an aperture therethrough communicating with said first flow bore, said first plate having an annular concave surface matingly engaging said convex annular surface, said first plate also having a bearing surface;

a second plate disposed on said first plate and having a hole therethrough in fluid communication with said first flow bore, said second plate having a bearing face engaging said bearing surface, said bearing surface having a larger outer diameter than said bearing face, said second plate also having a stab bore communicating with said hole;

a second connector having a second flow bore therethrough and a cylindrical member having a portion of said second flow bore therein and moveable to an extended position to be received within said stab bore for communicating said second flow bore with said first flow bore, whereby upon angular misalignment of said cylindrical member with said first flow bore, said first plate slides angularly on said convex surface for facilitating angular alignment, and upon radial misalignment of said cylindrical member with said first flow bore, said second plate moves radially on said bearing surface of said first plate for radially aligning said cylindrical member with said first flow bore.

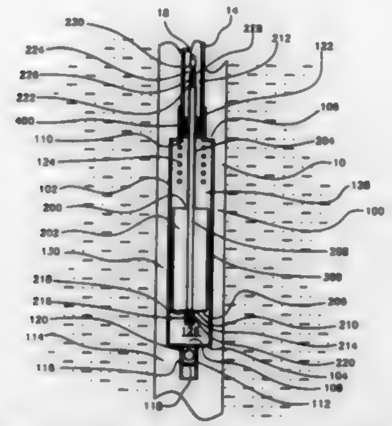
5,314,025
FLUID PUMPING APPARATUS AND METHOD OF PUMPING FLUID

Ronald A. Priestly, Longview, Tex., assignor to Fluid Master, Inc., Kilgore, Tex.

Filed Nov. 12, 1992, Ser. No. 975,686

Int. Cl.^{5} E21B *43/00;* **F04B** *7/04, 21/02*

U.S. Cl. 166—369 **18 Claims**



17. A method of pumping fluid from a well extending from the surface into the ground, through a string of hollow production tubing extending through the well bore, using a reciprocating pumping apparatus disposed in the well bore, connected to the production tubing and activated by a pump driver, such pumping apparatus having an elongate hollow body stationary in relation to the well bore and connected at its upper end to the lower end of the production tubing, a piston of slightly smaller cross-sectional dimension than the inner dimension of said body and having a lower face, disposed in the body in tightly fitting sliding relation and dividing the body into a lower chamber and an upper chamber, a piston shaft of substantially smaller cross-sectional dimension than the piston, connected at its lower end to the piston in coaxial relation, extending upward from the piston through the upper end of the body in fluid-tight sliding relation therewith and into the production tubing and connected at its upper end to the pump driver, a fluid conduit extending longitudinally through the piston and piston shaft, a one-directional fluid inlet valve at the lower end of the body to allow fluid to flow into the lower chamber of the body, a one-directional lower control valve at the lower end of the fluid conduit to allow fluid to flow into the conduit, and a one-directional upper control valve at the upper end of the fluid conduit to allow fluid to flow from the conduit into the production tubing, comprising the steps of

lifting the piston and the piston shaft in the body of the pumping apparatus through the full upstroke of the pumping apparatus, with the lower fluid control valve and the upper fluid control valve closed and with the fluid inlet valve open, drawing fluid into the lower chamber of the body;

closing the fluid inlet valve and initiating lowering of the piston and piston shaft in the body of the pumping apparatus, opening the lower fluid control valve and the upper fluid control valve to open a fluid passageway from the lower chamber of the body through the fluid conduit and into the production tubing;

continuing lowering of the piston and piston shaft in the body of the pumping apparatus through the full downstroke of the pumping apparatus, forcing fluid from the lower chamber through the fluid conduit and into the production tubing;

closing the lower fluid control valve and the upper fluid control valve and initiating raising of the piston and piston shaft in the body of the pumping apparatus, opening the fluid inlet valve and beginning to draw fluid into the lower chamber of the body of the apparatus; and

repeating the above steps to continue forcing fluid into the production tubing on each downstroke of the pumping apparatus and produce fluid from the production tubing.

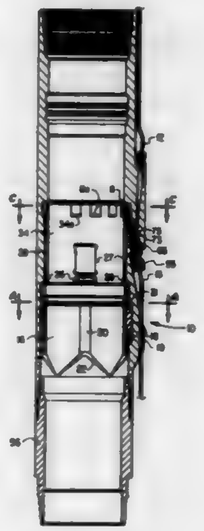
5,314,026
LANDING NIPPLE

Jimmie R. Williamson, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Mar. 4, 1992, Ser. No. 846,795

Int. Cl.^{5} E21B *34/14, 34/10*

U.S. Cl. 166—386 **49 Claims**



1. A safety valve landing nipple comprising:

a nipple profile sub,

a landing nipple housing connected to said nipple profile sub,

a rotary member positioned inside said landing nipple housing, wherein said rotary member contains a means for engagement by a means for rotating said rotary member,

a bore in said landing nipple housing to which is connected a first control line on one end and a safety valve control line on the other end; and

a means responsive to rotation of said rotary member for closing communication in said bore between said first control line and said safety valve control line so that communication between said first control line and an insert safety valve in said landing nipple housing is achieved.

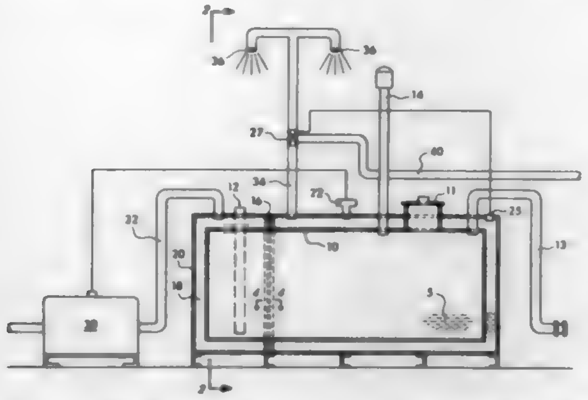
18. A method of closing communication within a landing nipple between a first control line and a safety valve control line and opening communication between said first control line and an insert safety valve in a housing of the landing nipple, which comprises the steps of:

placing a means for rotation within a nipple profile sub and rotary member; and

rotating said rotary member an amount sufficient to cause a means for closing communication between said surface control line and said safety valve control line within a bore in said housing of said landing nipple to move in such a way so as to form a metal to metal seal with a means for connecting said first control line an d said safety valve control line so as to open communication between said first control line and said insert safety valve.

5,314,027
FIRE SUPPRESSION SYSTEM FOR A DOUBLE WALLED STORAGE TANK

Donald A. Wood, 2651 S. Cherokee St., Denver, Colo. 80223
Filed Feb. 12, 1993, Ser. No. 16,857
Int. Cl.^{5} A62C *37/11*
U.S. Cl. 169—60 **10 Claims**

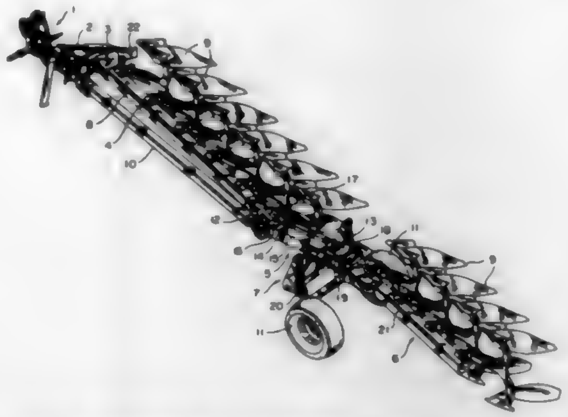


1. A fire suppression system for a double walled storage tank comprising:
- an inner tank for containing a flammable liquid;
- an outer tank having an outer surface and an inner surface separated from said inner tank by a defined space;
- temperature sensing means for detecting combustion of said flammable liquid;
- means controlled by said temperature sensing means for delivering a flow of coolant into said space in the event combustion of said flammable liquid is detected;
- an outlet allowing said flow of coolant to exit said space through said outer tank;
- spray means associated with said outlet for spraying said flow of coolant on said outer surface of said outer tank;
- a sensor for detecting leakage of said flammable liquid from said inner tank into said space;
- a pipe for directing said flow of coolant to a remote location; and
- a valve controlled by said sensor for either directing said flow of coolant to said spray means if not leakage of flammable liquid has been detected, or directing said flow of coolant to said remote location through said pipe if leakage of said flammable liquid has been detected.

5,314,028
ADJUSTING DEVICES FOR A SEMI-MOUNTED PLOUGH

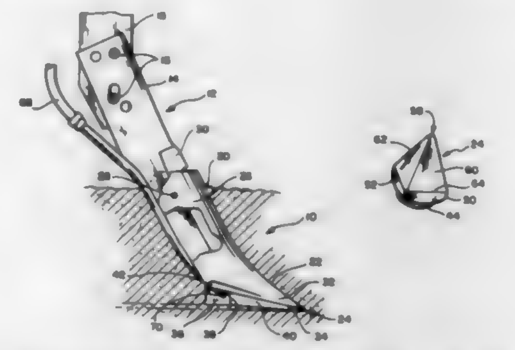
Øivind Mong, Kleppe, Norway, assignor to Kverneland Klepp AS, Kverneland, Norway
Filed Jan. 6, 1993, Ser. No. 1,525
Claims priority, application United Kingdom, Jan. 23, 1992, 9201495
Int. Cl.^{5} A01B *49/00, 3/28*
U.S. Cl. 172—219 **5 Claims**

1. A semi-mountable plough comprising:
- an elongate plough frame having a front portion, a rear portion, and an intermediate portion interconnecting the front and rear portions:
  - a plurality of plough bodies mounted on the front and rear portions of the plough frame;
  - a ground wheel supporting said intermediate portion;
- positioning means at the front end of the front frame portion to adjust the front end laterally in order to vary the ploughing width; and,
- means for adjusting in which the intermediate frame portion includes a parallelogram linkage having a front connection to the rear end of the front portion and a rear connection to the front end of the rear portion, said linkage being adjustable to, and lockable in different angular positions while maintaining the longitudinal axes of the front and rear frame portions parallel to each other.



5,314,029
PYRAMIDAL SHAPED, HARDENED INSERT FOR AN AGRICULTURAL TOOL

Don C. Rowlett, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jun. 15, 1992, Ser. No. 898,631
Int. Cl.^{5} A01C *23/00*
U.S. Cl. 172—699 **17 Claims**



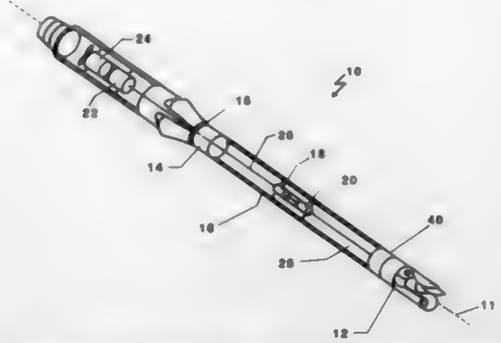
1. A pyramidal shaped insert of a refractory hard metal for use as a leading penetrating element of an agricultural tool including a soil opener member useful for applying material beneath the surface of the ground, whereby said insert inhibits wear of the agricultural tool and contributes to proper soil flow as the soil opener member cuts a slice in the soil, said insert comprising:

a) a boss member of a generally frustoconical shape including a circular bottom and an outwardly curved side surface extending upwardly from said circular bottom and terminating in a flange, and

b) a penetrating tip having four nonparallel triangular sides, each triangular side having a common leg with a bordering triangular side and a third leg contiguous said flange, said triangular sides converging to a common vertex, such that the insert wears sharp as the soil passes the triangular sides and the leg of each triangular side contributes to proper soil flow as the soil opener member cuts a slice in the soil.

5,314,030
SYSTEM FOR CONTINUOUSLY GUIDED DRILLING

Carl R. Peterson, Boxford, Mass., and Peter J. Maloney, Inkster, Mich., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Aug. 12, 1992, Ser. No. 928,935
Int. Cl.^{5} E21B *7/08, 47/024*
U.S. Cl. 175—26 **45 Claims**



29. A method of drilling in a desired direction comprising the steps of:

(a) providing a rotating drilling shaft driven by a motor,

(b) providing a tight stabilizer mounted on a stiff section of said drilling shaft at a location spaced substantially above a steerable bit to provide a known pivot point for deflection that enables correction of the drilling direction by said steerable bit,

(c) drilling in the desired direction by using said steerable bit mounted on the end of said drilling shaft, said steerable bit utilizing multiple fluid jets for providing preferential flushing at a selected region,

(d) detecting deviation of said shaft from said desired direction during rotation of said shaft, while drilling, using an orientation sensor located on said rotating drilling shaft, said sensor producing control signals dependent upon said detected deviation, and

(e) regulating said jets of fluid using fluid modulation means for achieving directional drilling by said preferential flushing, said fluid modulation means being responsive to said signals from said sensor detecting deviation of said shaft from said desired direction.

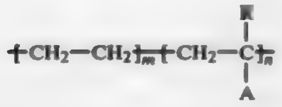
5,314,031
DIRECTIONAL DRILLING PLUG

Arthur H. Hale, Houston; Kenneth M. Cowan, Sugar Land, and James J. W. Nahm, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Oct. 22, 1992, Ser. No. 964,813
Int. Cl.^{5} E21B *7/06, 33/13*
U.S. Cl. 175—61 **5 Claims**

1. A method for directionally drilling a well, comprising:
preparing a cementitious slurry comprising:

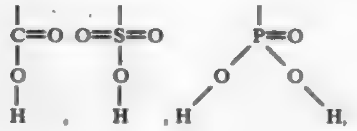
(a) a cementitious component selected from blast furnace slag and proton acceptor metal compound; and

(b) an activator wherein, when said cementitious component is said blast furnace slag, said activator is an alkaline agent, and when said cementitious component is said metal compound, said activator is a phosphorus acid or one of a polymer component of the formula:

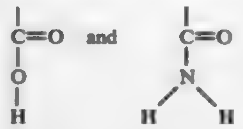


$$\lbrack CH_2-CH_2 \rbrack_m \lbrack CH_2-\overset{R}{\underset{A}{C}} \rbrack_n$$

wherein A is



or a mixture of



and wherein R and H or a 1-10 carbon atom alkyl radical and the ratio of m to n is within the range of 0.1 to 100:1;

(c) a water source selected from water, brine, seawater, water base drilling fluid, and water emulsion drilling fluid; and

drilling the borehole with a universal fluid containing a minor quantity of the cementitious slurry, and depositing a settable filter cake on the wall of the borehole;

displacing the slurry in the wellbore to a location therein where said direction of drilling is to be changed;

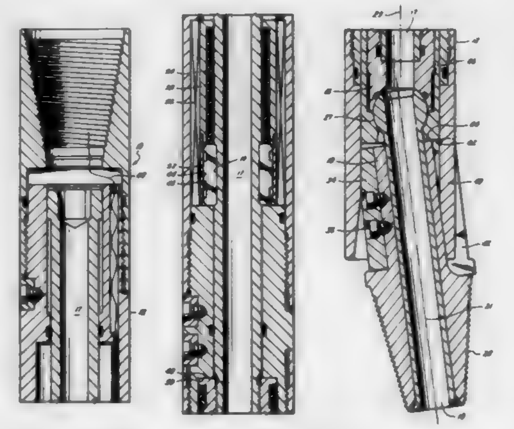
allowing the filter cake to set and the slurry to solidify and form a plug across a soft formation wherein it is otherwise difficult to achieve the correct angle and direction when drilling;

drilling a pilot hole in said plug in the desired new direction of drilling; and

continuing the direction of drilling of said wellbore by way of said pilot hole in said cement plug.

5,314,032
MOVABLE JOINT BENT SUB

Ronald E. Pringle, Houston, and Arthur J. Morris, Magnolia, both of Tex., assignors to Camco International Inc., Houston, Tex.
Filed May 17, 1993, Ser. No. 61,953
Int. Cl.^{5} E21B *7/08*
U.S. Cl. 175—74 **13 Claims**



1. A movable joint bent sub for attachment in a well conduit for use in deviated drilling of a well comprising,
- an elongate housing having a bore therein and having first and second ends, the first end having connecting means for attachment in a well conduit,
- a mandrel telescopically movable in the bore,
- a movable body having first and second ends, said first end of said movable body having connecting means for attach-

ment in the well conduit, said second end of said movable body pivotally connected to the mandrel and slidable into the second end of the housing, and

coacting cam surfaces on the body and the housing for pivoting the second end of the body when the mandrel is telescopically moved in the bore.

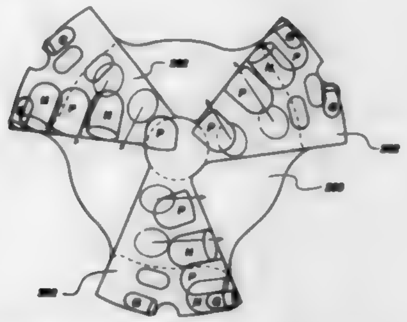
5,314,033
DRILL BIT HAVING COMBINED POSITIVE AND NEGATIVE OR NEUTRAL RAKE CUTTERS

Gordon A. Tibbitts, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 18, 1992, Ser. No. 837,035

Int. Cl.^{5} E21B *10/46*

U.S. Cl. 175—431 **20 Claims**



1. A drill bit for rotationally drilling a borehole in a subterranean formation comprising:

a bit body having a face for contacting said formation disposed on its exterior surface;

a first plurality of cutters distributed on said face of said bit, each of said first plurality of cutters having a cutting surface established at an effective negative rake angle relative to the direction of rotation of said bit;

a second plurality of cutters distributed on said face of said bit, each of said second plurality of cutters having a cutting surface established at an effective positive rake angle relative to the direction of rotation of said bit; and

each of said first plurality of cutters being cooperatively paired adjacent at least one of said second plurality of cutters.

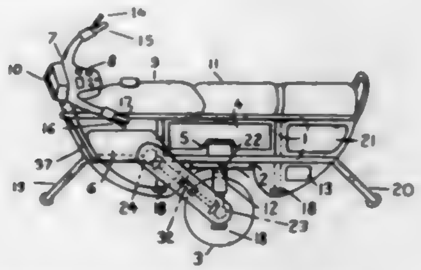
5,314,034
POWERED MONOCYCLE

Nandan R. Chittal, 10/6, Sahajivan, Barve Nagar, Bombay 400084, India

Filed Nov. 14, 1991, Ser. No. 791,846

Int. Cl.^{5} B62D *21/00*

U.S. Cl. 180—21 **5 Claims**



1. A powered monocycle which comprises:

a vehicle frame defining at least a lower end, a top front end and front and rear portions;

engine assembly means attached to said vehicle frame;

a tyred wheel means;

suspension means rotatably connecting said tyred wheel means to said lower end of said vehicle frame;

transmission assembly means attached to said vehicle frame for transmitting power from said engine assembly means to said wheel means;

gyro flywheel means attached to said vehicle frame;

means attached to said vehicle frame for spinning said gyro flywheel means at a desired speed; and

handle bar assembly means pivotally attached to said vehicle frame at said top front end, said handle bar assembly means comprising a headlight, instrument panel means and handgrip means.

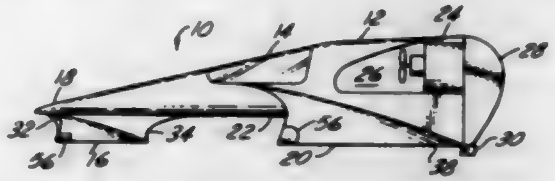
5,314,035
SURFACE EFFECT VEHICLE

Harry L. Schoell, 2698 SW. 23rd Ave., Ft. Lauderdale, Fla. 33312

Filed Aug. 10, 1992, Ser. No. 926,312

Int. Cl.^{5} B60V *1/08, 1/11*

U.S. Cl. 180—119 **2 Claims**



1. A surface effect vehicle for use on water and other surfaces, comprising:

a vehicle having a body with a nose section, a cockpit and an aft section;

a pair of lifting scoop means mounted on said body, where said lifting scoop means includes a first scoop means mounted on said nose section and a second scoop means mounted on said aft section, said first scoop means having one-half the area of said second scoop means to provide initial lift of said nose section;

said first scoop means and said second scoop means each having a delta shape with an apex facing said aft section, and an arched leading edge at the broadest width of said delta shape facing said nose section;

a pusher type engine with a propeller mounted on said body to move said surface effect vehicle, and a rudder mounted behind said engine to turn said vehicle, where said pair of lifting scoop means collect air under said delta shape to lift and support said vehicle over a surface to allow said vehicle to move on a cushion of air;

said first scoop means and said second scoop means having a height and width at said leading edge in a ratio of about 1:7, where 1 represents the height;

said first scoop means and said second scoop means each having a length extending along said body, starting at said leading edge, and said width at said leading edge in a ratio of about 3:7, where 3 represents the length;

said first scoop means is separated from said second scoop means by a ratio of about 4:7 where 4 is measured from said leading edge of said first scoop means to said leading edge of said second scoop means, and 7 is the width of said leading edge of said second scoop means;

said first scoop means and said second scoop means each having an angle of attack of about 16 degrees from the horizontal measured from the rear of said scoop means to said arched leading edge to provide lift-off for said vehicle;

said first scoop means having a movable louver means to open and close to regulate the height said vehicle travels over a surface;

said second scoop means having at least one pair of louver means to open and close to regulate the height said vehicle travels over a surface;

said first scoop means and said second scoop means having tips, and non-trip appendage means extending from said tips at an upward angle to the horizontal to provide lift-off to part said vehicle from a surface;

said appendage means having an upward angle to the horizontal of about 30 degrees;

said body is supported on said first scoop means and said second scoop means above a surface when said scoop means are in contact with the surface.

5,314,036
STEERING ANGLE SENSOR

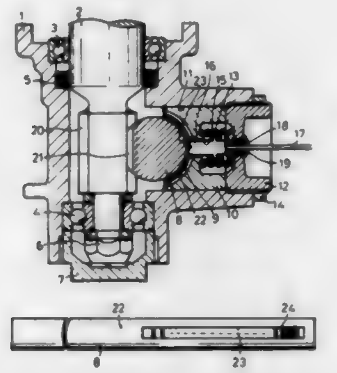
Shinji Kato, Aichi; Soya Takagi, Toyota; Akio Sato, Toyota; Mizuho Sugiyama, Toyota, and Yuji Yokoya, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 3, 1992, Ser. No. 816,726

Claims priority, application Japan, Jan. 21, 1991, 3-5191

Int. Cl.^{5} B62D *3/12, 5/04;* **G01D** *5/12;* **G01R** *33/06*

U.S. Cl. 180—147 **8 Claims**



1. A steering angle sensor for a vehicle, comprising:

a steering gear box having a steering rack bar for changing the steering angle of wheels subjected to a steering operation in a vehicle,

a signal pattern formed as a plurality of discrete spots on said steering rack bar and having detectable electromagnetic characteristics, said pattern extending along the length of said steering rack bar, wherein a longitudinal density of said spots changes progressively in a direction of measurement extending along the length of said pattern, and

a signal detector, provided at a position opposing said steering rack bar for sensing said steering angle of the wheels subjected to a steering operation by said steering rack bar, reading said signal pattern and detecting the absolute position of said steering rack bar.

5,314,037
AUTOMOBILE COLLISION AVOIDANCE SYSTEM

David C.-H. Shaw, and Judy Z.-Z Shaw, both of 3312 E. Mandeville Pl., Orange, Calif. 92667

Filed Jan. 22, 1993, Ser. No. 8,367

Int. Cl.^{5} B62D *1/24;* **B60T** *7/16*

U.S. Cl. 180—169 **20 Claims**

1. A collision avoidance system for a roadway vehicle comprising:

at least one laser radar unit being mounted on at least one of the vehicle's four sides, including the front side, rear side, right side or left side, wherein each laser radar unit includes:

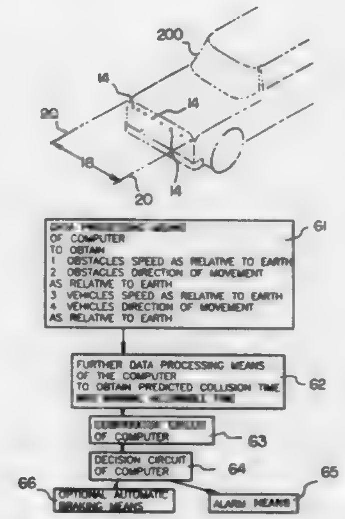
a transmitter means for transmitting laser radar signals;

a highly directional receiver means for receiving reflected laser radar signals by an obstacle from the said transmitted laser radar signals, and generating a first electronic signal thereof;

means for processing said first electronic signal to determine the distance and relative speed in radial direction of said detected obstacle as relative to said vehicle, and generating a second electronic signal representing said detected distance and said detected relative speed thereof;

a steering wheel rotation sensor for determining the degree of steering angle and generating a third electronic signal thereof;

an outside condition input means with a plurality of night light selector, and a driver's condition selector, wherein the selectors can be either manually selected by the vehicle user or automatically selected by branch circuits from the windshield wiper and the headlight, to match the ongoing road condition, light condition and driver's condition respectively, and the selectors can generate fourth, fifth and sixth electronic signals representing the ongoing road condition, light condition and driver's condition respectively;


200
14
20
18
14
20
14
OF COMPUTER
TO OBTAIN
1 OBSTACLES SPEED AS RELATIVE TO EARTH
2 OBSTACLES DIRECTION OF MOVEMENT AS RELATIVE TO EARTH
3 VEHICLES SPEED AS RELATIVE TO EARTH
4 VEHICLES DIRECTION OF MOVEMENT AS RELATIVE TO EARTH
61
FURTHER DATA PROCESSING MEANS OF THE COMPUTER TO OBTAIN PREDICTED COLLISION TIME
62
OF COMPUTER
63
DECISION CIRCUIT OF COMPUTER
64
66
OPTIONAL AUTOMATIC BRAKING MEANS
ALARM MEANS
65

a speed sensor functionally connected with a speedometer, wherein the speed sensor can generate a seventh electronic signal for the system-equipped vehicle's speed;

a computer receiving input information from the first, second, third, fourth, fifth, sixth and seventh electronic signals, wherein the computer can process the received information and determine when a collision is imminent; and

alarm means functionally connected to the computer for producing an alarm upon receipt of a signal from the computer indicating a determination by the computer that a collision is imminent.

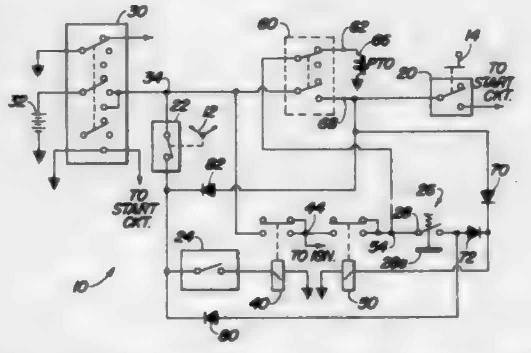
5,314,038
INTERLOCK CIRCUIT FOR TRACTOR PTO

Rudolph A. Peterson, Jr., Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jan. 25, 1993, Ser. No. 7,431

Int. Cl.^{5} B60K *28/10*

U.S. Cl. 180—214 **12 Claims**



1. In a vehicle having an engine and a connected to the engine through a transmission with selectable forward and reverse drive modes, a power take off (PTO) selectively driv-

able by the engine to power a driven accessory and a PTO switch for activating and deactivating the PTO, an interlock circuit connected to the engine, the interlock circuit comprising:

a sensor responsive to contact of the vehicle with an obstacle for providing a contact indication;

a transmission switch responsive to the selected drive state of the transmission;

means connecting the transmission switch and the sensor for disengaging the PTO in response to the presence of a contact indication and for shutting down the engine when the transmission is in a preselected state and the contact indication is present; and

means for permitting the engine to recover from shut down when the contact indication is present when the transmission is shifted from the preselected state.

5,314,039
DRIVE ASSEMBLY FOR A FOUR WHEEL DRIVE VEHICLE, HAVING A DISCONNECTABLE VISCOUS COUPLING

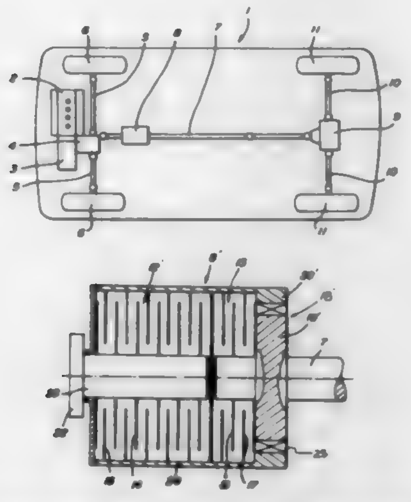
Michael Höck, Brühl, Fed. Rep. of Germany, assignor to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

Continuation of Ser. No. 602,188, Oct. 22, 1990, Pat. No. 5,174,408. This application Dec. 22, 1992, Ser. No. 994,925

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934913

Int. Cl.^{5} B60K *17/346*

U.S. Cl. 180—248 **1 Claim**



1. A drive assembly for a four wheel vehicle, comprising:

a front axle with wheels which are driven permanently; a rear axle with wheels which are driven by a viscous coupling arranged in a longitudinal driveline; a freewheeling unit connected along the driveline in series with a viscous coupling so that during forward driving the freewheeling unit allows the rear wheels to rotate faster than the front wheels; a second viscous coupling connected along the driveline in parallel with the freewheeling unit, said second viscous coupling having a torque transmitting capacity no greater than that of the first viscous coupling; and a housing, the first and second viscous couplings, together with the freewheeling unit, being accommodated in the housing.

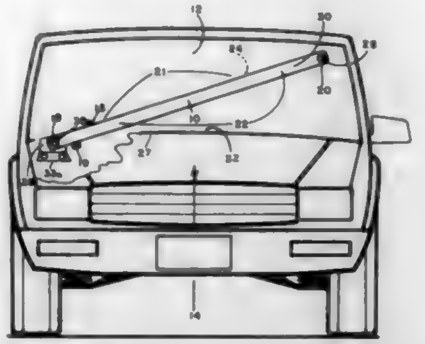
5,314,040
AUTOMOBILE ANTI-THEFT DEVICE

Jose C. Rivera, 216 S. Dakota, Laredo, Tex. 78041

Filed Mar. 5, 1992, Ser. No. 847,786

Int. Cl.^{5} B60R *25/00*

U.S. Cl. 180—287 **4 Claims**



1. A device to help prevent the theft of vehicles having a window thereon, the device comprising:

a broad, flat strap, having a first end and a second end, and a body portion with an inner and outer surface thereon;

attachment means for pivotally attaching the first end of the strap near the base of the window, and

lock means for releasably locking the second end of said strap to the window;

wherein the outer surface of said strap contains an appropriately worded message to alert public of the unauthorized use of the vehicle, said strap being stowable in a first position across the base of the window and visible in a second, locked position, diagonal across the face of the window; and

wherein said lock means further comprises means for shattering the window if said lock means is forcibly tampered with.

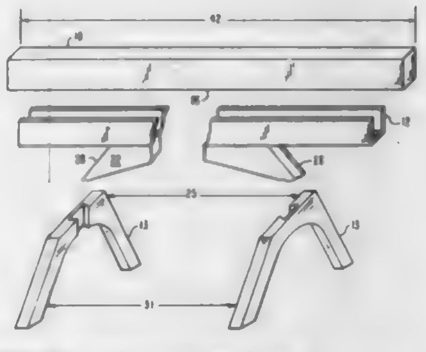
5,314,041
SAWHORSE

Jeffrey Jerrow, 645 Old Four Bridges Rd., and William R. Jerrow, 645 Four Bridges Rd., both of Chester, N.J. 07930

Filed Jul. 6, 1992, Ser. No. 908,974

Int. Cl.^{5} F16M *11/00*

U.S. Cl. 182—181 **15 Claims**



1. A sawhorse apparatus comprising:

at least one unitary, molded cross beam/support leg interface having a three sided, upwardly open channel that extends longitudinally along the top of the interface and having at least one interlocking dovetail or "T" rail joint member extending downwardly along an incline adjacent the bottom of the interface; and

a plurality of support leg devices each having opposed inclined faces with a downwardly extending groove in only one of said faces which slidably interfaces with said joint member of said cross beam/support leg interface.

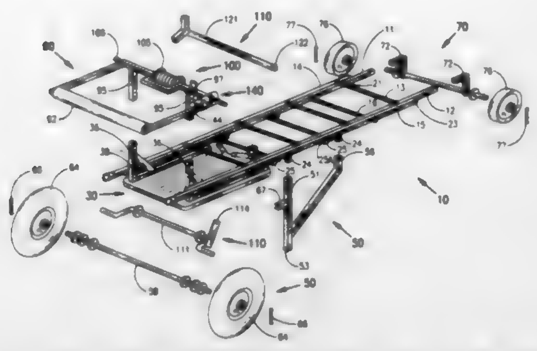
5,314,042
TREE STAND-TRANSPORT VEHICLE

Joseph B. Adams, 4408 SW. Maple La., Claremore, Okla. 74017

Filed Aug. 20, 1992, Ser. No. 933,104

Int. Cl.^{5} A01M *31/02*

U.S. Cl. 182—187 **19 Claims**



1. A rearrangable assembly having a tree stand configuration and an equipment transport configuration comprising:

a ladder substantially horizontally disposed in the transport configuration and substantially vertically disposed in the stand configuration;

a platform hingedly connected at an edge thereof to a rearward end of said ladder for rotation to a substantially horizontal disposition in the stand and transport configurations;

removable steering frame means at said rearward end of said ladder;

detachable means for locking said platform to said ladder in said stand and transport configurations; and

main wheeled carriage means connected by removable pins to and beneath said ladder at a transverse position slightly rearwardly of a midpoint of said ladder for traversing the assembly over land in the transport configuration, said means being detachable from said ladder in the stand configuration by removal of said pins.

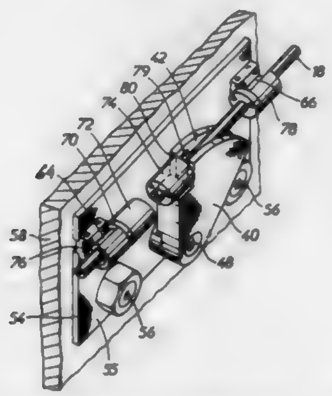
5,314,043
ELEVATOR AIR CORD TIGHTENING DEVICE

Jean-Michel A. Evezard, and Christophe J. Taudou, both of Gien, France, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 15, 1993, Ser. No. 92,174

Int. Cl.^{5} B66B *13/08*

U.S. Cl. 187—51 **9 Claims**



8. A device for adjusting the tension of a cable forming a loop, characterized by;

a support having a relatively accessible first surface and a relatively inaccessible second surface;

a holder on the second surface for holding a first end of the air cord;

a tensioning means on said second surface for holding a second end of said air cord such that the tension of said loop of air cord may be adjusted by moving said second end towards said first end; and

means communicating between the first and second surfaces for manipulating the tensioning means to move said second end towards said first end.

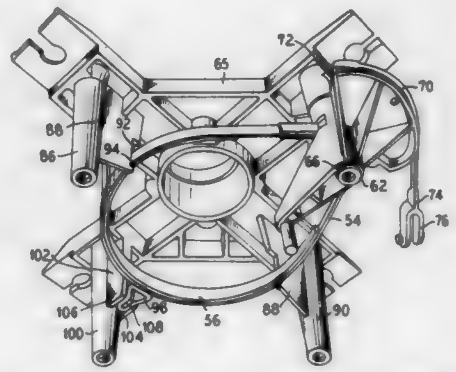
5,314,044
BRAKE BAND RETAINER MECHANISM

Brenner M. Sharp, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 31, 1992, Ser. No. 923,394

Int. Cl.^{5} F16D *51/00*

U.S. Cl. 188—77 R **21 Claims**



18. A retainer mechanism for a brake band engageable and disengageable with a brake drum, comprising:

at least two fixed support walls positioned to support said brake band in two perpendicular directions when said brake band is in a disengaged position, and at least a one-piece resilient member positioned to directly engage an outer surface of said brake band when said band is in a disengaged position.

5,314,045
FLUID CONNECTING ASSEMBLY

Gerald Fenn, Pfersdorf, and Robert Pradel, Röthlein-Heidenfeld, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 694,653, May 2, 1991, abandoned. This application Dec. 29, 1992, Ser. No. 998,873

Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014469

Int. Cl.^{5} H16F *9/43*

U.S. Cl. 188—322.21 **10 Claims**

3. A fluid connecting assembly in combination with a piston unit,

wherein the piston unit comprises a cylinder having a longitudinal axis and defining a cavity therein, the cylinder including two axially spaced end walls, a piston axially moveable in the cavity, a piston rod coupled to the piston and extending axially out of the cavity through at least one of the end walls, the cylinder having an external circumferential face about the longitudinal axis, at least a part of the external circumferential face being shaped as a convex, substantially cylindrical face portion about the longitudinal axis, and an opening through the convex cylindrical face portion connecting with the cavity, the opening having an opening axis substantially perpendicular to the longitudinal axis;

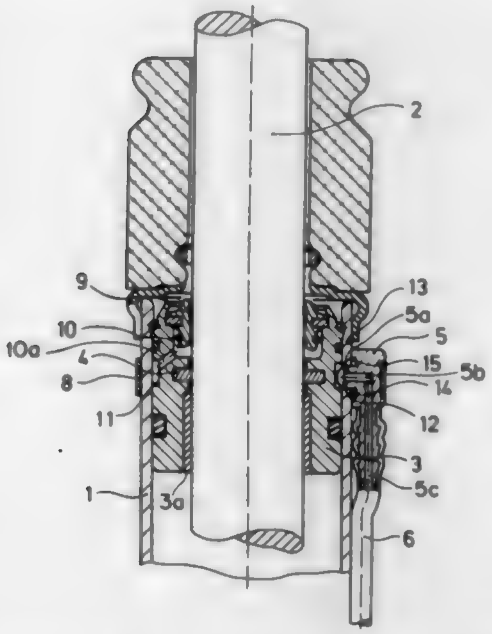
wherein the fluid connecting assembly comprises:

a connecting member having a substantially concave face portion against the convex cylindrical face portion of the cylinder and generally conforming in shape therewith, the connecting member having a fluid channel with a first end adjacent the concave face portion in substantial axial alignment with the opening through the convex cylindrical face portion, and the connecting member having a closed loop groove in the concave face portion around the opening axis;

a closed loop sealing member in the closed loop groove, the closed loop sealing member being in sealing engagement with both the convex cylindrical face portion of the cylinder and the closed loop groove of the connecting member, the concave face portion of the connecting member having a circumferential and axial extend sufficient to enclose the closed-loop groove but extending in circumferential direction over substantially less than the full circumference of the circumferential face; and

means for urging the connecting member against the convex cylindrical face portion to radially compress the closed loop sealing member between the closed loop groove and the convex cylindrical face portion;

the urging means including a clamping band separate from both the piston unit and the connecting member, the clamping band surrounding both the cylinder and the connecting member and being in substantially radial engagement with the circumferential face of the cylinder outside of the circumferential extent of the connecting member and with a radially outer engagement face of the connecting member substantially opposite the concave circumferential face portion in the direction of the opening axis, the clamping band being free of fluid conducting faces,



the clamping band being in substantial alignment with the opening through the convex cylindrical face portion along the opening axis,

the fluid channel being substantially L-shaped within the connecting member, one leg of the L-shaped channel begin in substantial alignment with the opening along the opening axis and terminating in the first end, and the other leg of the L-shaped channel being substantially parallel to the longitudinal axis of the cylinder, outside the circumferential face of the cylinder and terminating in a second end directed substantially parallel to the longitudinal axis, and

the connecting member having an annular projection adjacent the first end of the fluid channel and around the opening axis and engaging into the opening.

5,314,046
EXPANDABLE CONTAINER WITH INTERNAL MANUAL OPERATION SYSTEM

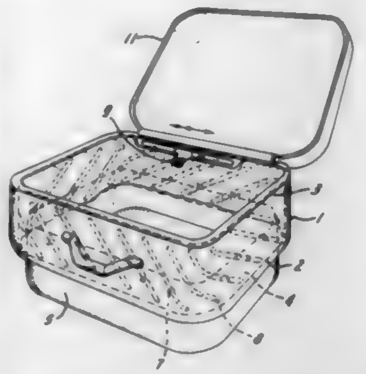
Fabio Pedrini, via Zamboni no. 1, Bologna, Italy

Filed Mar. 13, 1992, Ser. No. 850,514

Claims priority, application Italy, Mar. 15, 1991, BO91A000082

Int. Cl.⁵ A45C *7/00*

U.S. Cl. 190—105 **8 Claims**



1. An expandable container with an internal manual operating system, comprising:

a hollow outer body with a substantially parallelepiped cross-sectional configuration;

a hollow inner body that fits inside the outer body;

an annular band connected in sliding relation within said outer body and placed between the inner and outer hollow bodies, said annular band including at least one angled slot;

pin means connected with said hollow inner body for engaging with said at least one angled slot;

moving means connected with said annular band for sliding said annular band within said hollow outer body to cause said container to expand and contract; and

a lid hinged to the outer body to close the container.

5,314,047
CABLE GUIDE FOR HOISTING DEVICES

Erik Nielsen, Köpenhamn, Denmark, assignor to Bromma Conquip AB, Vallingby, Sweden

PCT No. PCT/SE90/00616, § 371 Date Mar. 2, 1993, § 102(e) Date Mar. 2, 1993, PCT Pub. No. WO92/05102, PCT Pub. Date Apr. 2, 1992

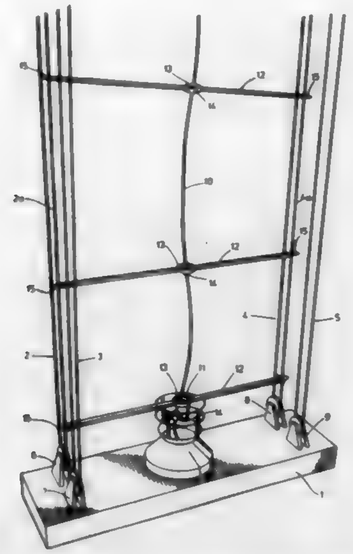
PCT Filed Sep. 26, 1990, Ser. No. 977,393

Int. Cl.⁵ H02G *11/00*

U.S. Cl. 191—12 R **6 Claims**

1. Arrangement for hoisting devices to keep a cable means substantially vertically stretched between a derrick means and a hoisting device for handling containers, characterized in that a set of brackets (**12***a*, **12***b*, **12***c*) is extended between and glidably fixed to two opposed hoisting cords (**2***a*, **4***a*) which extend between the hoisting device and the derrick bridle, that the brackets (**12**) have a ring (**13***a*, **13***b*, **13***c*) approximately at their centre, through which ring the cable (**10**) is running, that the cable (**10**) is equipped with a set of elements (**14***a*, **14***b*) fixed to the cable (**10**) at a distance from each other, the elements having an increasing diameter for each element from the top downwards and that the rings (**13***a*, **13***b*, **13***c*) on the brackets (**12***a*, **12***b*, **12***c*) being placed on top of each other have an increasing inner diameter for each bracket from the top downwards so that each ring (**13***a*, **13***b*, **13***c*) one by one is stopping

the passage of a predetermined element (**14***a*, **14***b*) through a top of a predetermined corresponding ring, whereby each element (**14**) at a hoisting of the cable (**10**) is lifting its corresponding bracket (**12**).



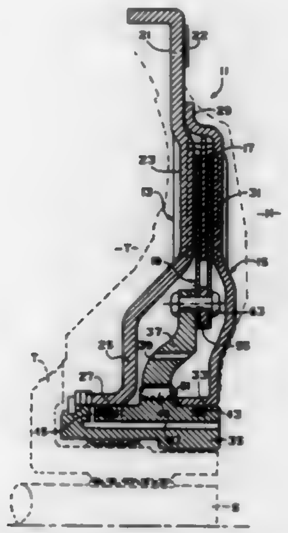
5,314,048
REDUCED COST VISCOUS COUPLING BY-PASS ELEMENT FOR A TORQUE CONVERTER

Edward J. Bojas, Marshall; Robert J. Kyle, and Leo M. Weeks, both of Battle Creek, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 853,560, Mar. 18, 1992, Pat. No. 5,172,796. This application Dec. 18, 1992, Ser. No. 993,221

Int. Cl.⁵ F16H *45/02;* **F16D** *35/00, 47/06*

U.S. Cl. 192—3.29 **23 Claims**



1. A viscous coupling for use as a bypass element in a torque converter assembly (T) including a torque converter housing (H) and an output shaft (S); said viscous coupling being of the type including an annular housing assembly adapted to be positioned within the torque converter housing, and having axially spaced, radially-extending first and second annular side wall members defining an annular viscous chamber therebetween adapted to contain viscous fluid; said annular housing assembly defining a radially-extending annular clutching surface adapted for clutching co-action with a confronting surface of the torque converter housing (H); an annular clutch assembly disposed within said viscous chamber and including an annular, radially-extending clutch portion adapted for viscous clutching co-action with one of said first and second side wall members, and an axially-extending clutch hub portion adapted to be drivingly associated with the output shaft (S) of the torque converter assembly; characterized by:

- (a) said annular clutch portion of said clutch assembly including first and second annular, radially-extending clutch plates disposed adjacent, and adapted for viscous clutching co-action with an adjacent surface of said first and second annular side wall members, respectively;
- (b) said first and second clutch plates being drivingly associated with said axially-extending clutch hub portion, whereby rotation of said clutch plates results in rotation of said clutch hub portion;
- (c) said annular housing assembly further comprising an annular radially-extending housing plate disposed axially between said first and second clutch plates, and adapted for viscous clutching co-action with at least one of said first and second clutch plates; and
- (d) said housing plate including a first plurality of portions in operable engagement with said first annular side wall member, and a second plurality of portions in operable engagement with said second annular side wall member, said first and second pluralities of portions being disposed within said annular viscous chamber.

17. A method of assembling and filling a viscous fluid coupling including first and second annular side wall members, said first side wall member having a reservoir-defining portion and said second side wall member having a radially outer peripheral portion; an annular clutch assembly including an axially-extending clutch hub portion and first and second clutch plates drivingly associated with said clutch hub portion; said viscous fluid coupling further including an annular radially-extending housing plate disposed axially between said first and second clutch plates for viscous clutching co-action therewith in response to the presence of viscous fluid, said housing plate including a first plurality of portions and a second plurality of portions, the method comprising:

- (a) positioning said first side wall member with said reservoir-defining portion oriented downwardly;
- (b) locating said clutch hub portion in sealing engagement with said reservoir-defining portion of said first side wall member;
- (c) positioning said first clutch plate onto said first side wall member, and in driving engagement with said clutch hub portion;
- (d) positioning said housing plate above said first clutch plate with said first plurality of portions in engagement with said first side wall member;
- (e) positioning said second clutch plate onto said housing plate, and in driving engagement with said clutch hub portion;
- (f) subsequent to step (b), introducing a predetermined volume of viscous fluid into said reservoir-defining portion of said first side wall member;
- (g) positioning said second side wall member above said second clutch plate, in sealing engagement with said clutch hub portion, in engagement with said second plurality of portions, and with said outer peripheral portion of said second side wall member in engagement with said first side wall member.

5,314,049
SHIFTER PARK POSITION BRAKE-TRANSMISSION INTERLOCK

Paul D. Nordstrom, Redford, Mich., assignor to Dura Mechanical Components, Inc., Troy, Mich.

Filed Nov. 24, 1992, Ser. No. 980,718

Int. Cl.⁵ B60K *41/28*

U.S. Cl. 192—4 A **20 Claims**

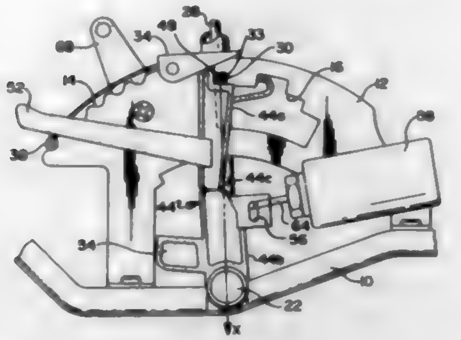
15. In a transmission shifter having a shift gate defining a locking notch, a shift lever movable along said gate into and

out of alignment with said notch, and a locking pin carried by the lever for movement along a path on the lever into and out of said notch, the improvement comprising

a blocking arm movable into and out of a normal blocking position in the path of pin movement and having an outer surface engageable by the locking pin, and

an actuator for moving the blocking arm,

said blocking arm having a movable hinge which lies to one side of the locking pin path when the locking arm is in blocking position to prevent movement of the blocking arm out of blocking position by a force exerted by the blocking arm outer surface by the locking pin,



said blocking arm being movable by the actuator to move the hinge to the other side of the locking pin path to enable a force exerted by the locking pin to pivot the blocking arm on the hinge to move the blocking arm surface along said path to disengage the locking pin as the locking arm is moved out of blocking position by the actuator.

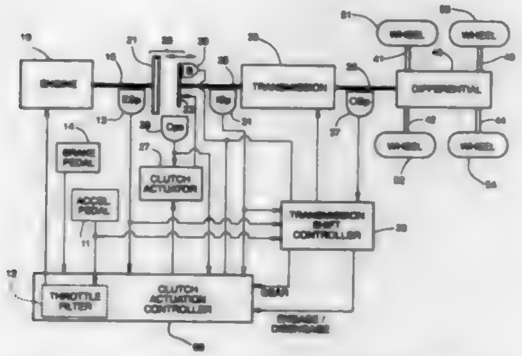
5,314,050
CLUTCH MODE CONTROL LOGIC

James Slicker, West Bloomfield; Joseph S. Mazur, Livonia, and Michael T. Breen, Garden City, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 9, 1992, Ser. No. 987,772

Int. Cl.⁵ F16D *43/22*

U.S. Cl. 477—171 **10 Claims**



1. In a vehicle having a gear transmission including an input-shaft driven through a friction clutch by an engine that is controlled by an accelerator pedal, and having a clutch actuation controller for actuating the friction clutch, wherein the friction clutch has engageable parts which initially touch and then progressively increase in torque transfer during actuation; a method of establishing a mode of clutch control during clutch engagement comprising the steps of:

generating a pedal position signal;

measuring engine speed and input shaft speed;

detecting a touch point when the engageable parts of the clutch initially touch;

detecting a minimum pedal position signal indicating that the pedal has been actuated;

after touch point occurs and the minimum pedal signal is present, establishing a creep mode for pedal position below a first pedal threshold and a startup mode for pedal position above the threshold; and

controlling clutch actuation in accordance with the established mode.

5,314,051
FRICTION CLUTCH FOR A MOTOR VEHICLE, AND AN ELASTIC DIAPHRAGM FOR SUCH A CLUTCH

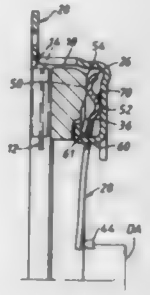
Eric Marie, Amiens, and Pierre-Marie Deroo, Villers Bocage, both of France, assignors to Valeo, Paris, France

Filed Jun. 29, 1993, Ser. No. 83,171

Claims priority, application France, Jul. 1, 1992, 92 08107

Int. Cl.⁵ F16D *13/44*

U.S. Cl. 192—89.22 **8 Claims**



1. A friction clutch comprising: a cover plate; a pressure plate; and a resilient diaphragm between the said cover plate and pressure plate, the said diaphragm having a frustoconical shape in a free state and comprising an outer peripheral portion of substantially annular shape and a series of resilient fingers extending radially inwardly from the said outer peripheral portion, the said fingers having free ends, the cover plate, pressure plate and diaphragm defining an axis of the clutch, the said free ends of the diaphragm fingers being arranged for cooperation with a clutch manoeuvring member displaceable parallel to the said clutch axis, the said outer annular peripheral portion of the diaphragm having two opposed faces, the pressure plate defining a first engagement element in facing relationship with the diaphragm, and the cover plate having an internal face defining a second engagement element in facing relationship with the diaphragm,

wherein the said outer annular peripheral portion of the diaphragm defines a first annular rib and a second annular rib radially inward of the first annular rib and concentric therewith, the said ribs projecting axially and defining respective convexities oriented in opposite directions, the said first and second engagement elements being surface portions of the pressure plate and cover plate respectively, with each said rib cooperating with a respective one of the said surface portions, whereby the said outer annular peripheral portion, of the diaphragm has a profile substantially in a form of a letter S or Z in its cross section taken through an axial plane thereof.

5,314,052
PROGRESSIVE DRY FRICTION CLUTCH PLATE

Philippe Henrion, Limoges, France, assignor to Valeo, Paris, France

Filed Mar. 11, 1992, Ser. No. 849,519

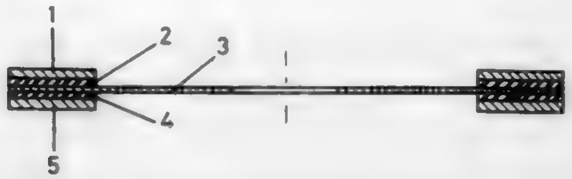
Claims priority, application France, Mar. 12, 1991, 91 02966

Int. Cl.⁵ F16D *13/68*

U.S. Cl. 192—107 C **9 Claims**

1. A dry friction clutch plate for applying progressive transmission of engine torque through a motor vehicle drive train through selective application of compressive forces to at least

one ring-shaped support plate, the clutch plate comprising two flat ring-shaped friction pads secured on opposite sides of the ring-shaped support plate at periphery thereof, a flat resilient ring-shaped compression element of a porous material inserted between said pads, the porous material being a predetermined porosity and uniformly distributed between said pads, the support plate being disposed between said friction pads, said compression element predetermined porosity imparting sufficient resiliency to said compression element to absorb the selectively applied motor vehicle drive train compressive forces for the progressive transmission of the engine torque therethrough.



5,314,053
TORQUE TRANSMISSION DEVICE

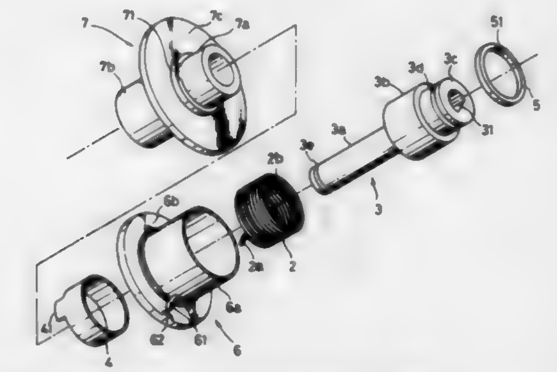
Kohzoh Nishimura, Akashi, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 30, 1992, Ser. No. 983,485

Claims priority, application Japan, Dec. 5, 1991, 3-321918

Int. Cl.⁵ F16D *13/12*

U.S. Cl. 192—41 S **8 Claims**



1. A torque transmission device comprising:

an input shaft;

an output shaft;

transmission means having an input portion frictionally connected to the input shaft and an output portion frictionally connected to the output shaft, the transmission means being rotatable together with the input shaft and the output shaft to transmit the torque of the input shaft to the output shaft, the transmission means further having an input end portion and an output end portion;

fixing means for fixing the output end portion of the transmission means on the output shaft, the fixing means being selectively placeable in either a free state in which said fixing means freely rotates over an outside surface of the output shaft in a circumferential direction thereof or a fixed state in which said fixing means is fixedly fitted on the outside surface of the output shaft;

stopping means, operable to be engageable with the input end portion of the transmission means at a predetermined engaging position, for halting the rotation of the transmission means so as to stop the output shaft at a predetermined rotational position, and to allow the input shaft to idly rotate to interrupt the transmission of torque from the input shaft to the output shaft; and

a desired phase relationship between the engaging position of the input end portion of the transmission means and the predetermined rotational position of the output shaft being adjusted by fixing the output end portion of the transmission means on a desired position of the output shaft with the fixing means.

5,314,054
BUFFER APPARATUS AND DRIVING SYSTEM

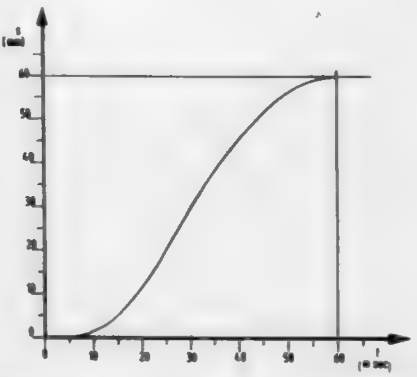
Gerardus J. C. van Laar, Scherpenzeel, Netherlands, assignor to EBM Techniek B.V., Scherpenzeel, Netherlands

Filed Apr. 13, 1992, Ser. No. 868,026

Claims priority, application Netherlands, Apr. 15, 1991, 9100655

Int. Cl.⁵ B65G *1/133*

U.S. Cl. 198—347.1 **15 Claims**



1. An apparatus for buffering or temporarily storing articles, comprising:

a feed for the articles;

at least one endless flexible member movable past the feed;

doglike elements which engage the articles and between which the articles are transported, and which elements are movable together with the flexible member;

one or more guide members for guiding the flexible member during changes of direction;

a discharge for discharging an article from between two doglike elements; and

means for diminishing impact to the articles, wherein the guide members are movable relative to feed and/or discharge, wherein the impact diminishing means includes a drive member for an electric motor, whereby beginning and end of the linear movement is substantially impact free, wherein the electric motor is driven according to the formula $s(t)=at+b\sin(\omega t+\phi)$, wherein $s(t)$ is the path covered in the transporting direction as a function of time t, and a, b, ω and ϕ are constants.

5,314,055
PROGRAMMABLE RECONFIGURABLE PARTS FEEDER

Steven J. Gordon, Boston, Mass., assignor to Intelligent Automation Systems, Inc., Cambridge, Mass.

Continuation of Ser. No. 573,418, Aug. 25, 1990, abandoned. This application Aug. 25, 1992, Ser. No. 935,644

Int. Cl.⁵ B65G *43/08*

U.S. Cl. 198—395 **5 Claims**

1. A vision-based parts feeding apparatus for feeding parts to a manipulator, said apparatus comprising:

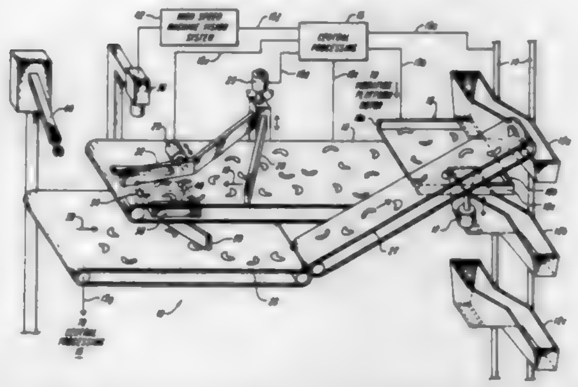
means for delivering a plurality of parts of a first part type to a vibratory platform,

said vibratory platform constructed and arranged to randomly disperse said parts by means of vibration,

conveyor means adjacent said platform for transporting said parts along a path towards a staging area as said parts are dispersed from said platform, said transporting occurring at a substantially higher speed than said dispersing on said vibratory platform,

guide means disposed along said path of said conveyor means for assisting in separating said parts and orienting said parts, including parts carried on said conveyor means in a single layer, into an orientation suitable for grasping by said manipulator,

said staging area positioned subsequent to said guide means and comprising means for obtaining image information about a part in the staging area, said part being separated by the feeding apparatus from other parts being fed,



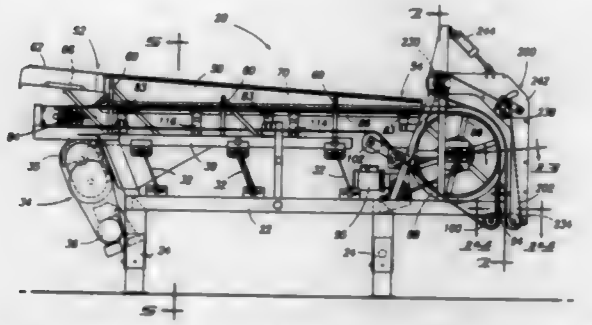
processing means coupled to said image obtaining means for processing said image information to determine the orientation or identification of said part, and

means for acting on said part responsive to the information obtained concerning the orientation or identification of said part.

5,314,056
HIGH-SPEED VIBRATORY ALIGNMENT AND SINGULATION CONVEYOR

Walter L. Davis, Milton-Freewater, Oreg., and James E. Anderson, Walla Walla, Wash., assignors to Key Technology, Inc., Walla Walla, Wash.

Filed Mar. 23, 1993, Ser. No. 35,844
Int. Cl.⁵ B65G *47/24*
U.S. Cl. 198—396 43 Claims



1. A vibratory feed device for producing a high-speed single-file stream of food articles, the feed device comprising:

a guide trough extending longitudinally from a receiving end to a discharge end, the trough having inclined and transversely-opposed sidewalls;

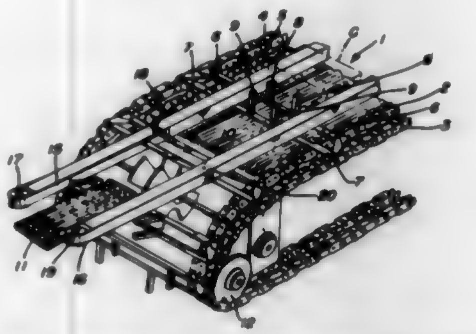
an endless feed belt which travels longitudinally through the guide trough from the receiving end to the discharge end, the feed belt having upwardly extending outer portions which are slidably supported on the inclined sidewalls of the guide trough, the feed belt forming a concave conveyor surface for conveying food articles through the guide trough; and

a vibratory drive connected to vibrate the guide trough and the supported outer portions of the feed belt.

5,314,057
FLIGHT BAR PATH HAVING A LARGE RADIUS

Rodney K. Calvert, Dunwoody; Alton J. Fishback, Austell, and George R. Van Horne, Atlanta, all of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 19, 1993, Ser. No. 6,055
Int. Cl.⁵ B65G *47/34*
U.S. Cl. 198—483.1 2 Claims

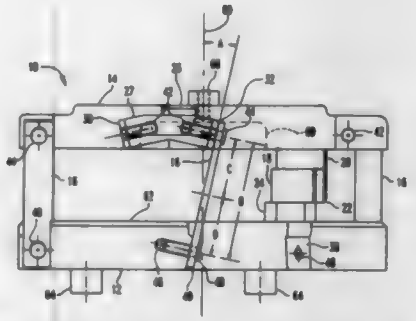


1. A carton conveying system having flight bars mounted on movable chains so that transfer of the flight bars from their working reach to their return reach is provided with a ramp for passing the chains around a large radius of curvature which in turn causes the chains to move out of the path of movement of the cartons and also requires a large gap between the flight bars and an outfeed conveyor which gap is bridged by a rotatable support wheel movable in synchronism with said chains and which engages oncoming cartons and conveys such cartons onto the outfeed conveyor, cutaway areas provided in said rotatable support wheel for receiving flight bars as they proceed along said ramp and about said rotatable support wheel, and guide means disposed on opposite sides of the path of movement of the cartons while the cartons are supported and moved by said rotatable support wheel.

5,314,058
VIBRATORY DRIVE UNIT

S. Neal Graham, 365 Beechwood Dr., Noblesville, Ind. 46060

Filed Jan. 21, 1993, Ser. No. 7,255
Int. Cl.⁵ B65G *27/32*
U.S. Cl. 198—753 9 Claims



1. A bidirectional vibrating base for use with vibratory feeder bowls and parts separators comprising:

a base member;

a top member adapted for mounting a vibratory driven device thereon;

means for biasing said top member in alternative first or second biases relative to said base member, said means for biasing including means for supporting said top member approximately level above said base member;

means for rotating said top member in alternative first or second directions of rotation relative to said base member;

means for changing the bias of said means for biasing between said first bias and said second bias; and

means for changing the direction of rotation of said means for rotating between said first direction of rotation and said second direction of rotation;

wherein said means for rotating is operable with said means for biasing in said first direction of rotation and said first bias to vibrate said top member in a first driven direction, and wherein said means for rotating is operable with said means for biasing in said second direction of rotation and said second bias to vibrate said top member in a second driven direction;

wherein said means for biasing includes spring means for biasing said top member relative to said base member;

wherein said spring means for biasing includes a spring member attached between said top member and said base member;

said means for changing the bias includes first upper and lower spring mount pads and second upper and lower spring mount pads and means for alternatively attaching said spring member between said first upper and lower spring mount pads and between said second upper and lower spring mount pads, said spring member being attached between said first upper and lower spring mount pads corresponding to said first driven direction and being attached between said second upper and lower spring mount pads corresponding to said second driven direction;

wherein said means for supporting includes a plurality of said spring members attached between said top member and said base member; and

said means for changing the bias includes first pluralities of upper and lower spring mount pads and second pluralities of upper and lower spring mount pads and means for alternatively attaching said plurality of spring members between said first pluralities of upper and lower spring mount pads and between said second pluralities of upper and lower spring mount pads;

wherein said means for rotating includes pulsed electromagnetic means for intermittently rotating said top member relative to said base member,

wherein said pulsed electromagnetic means includes an electromagnetic coil having energized and deenergized states and operable with a striker plate; and said electromagnetic coil magnetically attracts said striker plate in said energized state to rotate said top member relative to said base member;

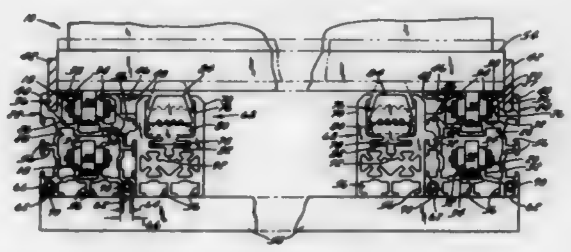
wherein said striker plate includes first and second sides corresponding to said first and second driven directions; and

said means for changing the direction of rotation includes means for attaching said electromagnetic coil adjacent to either of said first or second sides of said striker plate.

5,314,059
CONVEYOR FRAME FOR CHAIN CONVEYOR

Robert T. Clopton, Magnolia, Ky., assignor to Tekno, Inc., Cave City, Ky.

Filed Oct. 29, 1992, Ser. No. 968,584
Int. Cl.⁵ B65G *21/20*
U.S. Cl. 198—860.1 8 Claims



1. A conveyor frame, comprising:

an elongated frame member, defining parallel, elongated upper and lower chambers, each of said chambers including a pair of rails for receiving a chain, and each of said chambers defining left and right sides, a top, and a bottom, wherein the top of said upper chamber defines an elongated opening;

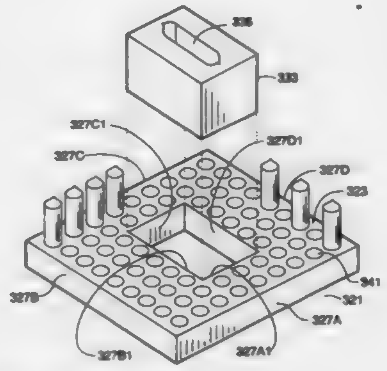
and wherein said frame defines at least one elongated guide-receiving slot which opens outwardly from its top, for receiving a vertical guide member, said guide-receiving slot having a substantially rectangular cross-section with a length in the direction in which it opens and a width at substantially right angles to the length;

and the height of said guide-receiving slot is at least twice its width.

5,314,060
COMMUNION APPARATUS

Eunice F. Cain, 520 Himes Dr., Euless, Tex. 76039

Continuation-in-part of Ser. No. 960,734, Oct. 14, 1992, Pat. No. 5,271,496. This application Dec. 30, 1992, Ser. No. 998,376
Int. Cl.⁵ B65D *85/08*
U.S. Cl. 206—216 1 Claim



1. A communion device, comprising:

a tray having a central opening for receiving a removable container and a plurality of bread receiving openings surrounding said central opening for receiving a plurality pieces of bread each of which is wrapped in a removable wrapper,

a plurality of pieces of bread located in said bread receiving openings,

each of said pieces of bread being wrapped in a removable wrapper,

a container to be removably supported in said central opening for receiving the wrappers after they have been removed from the bread.

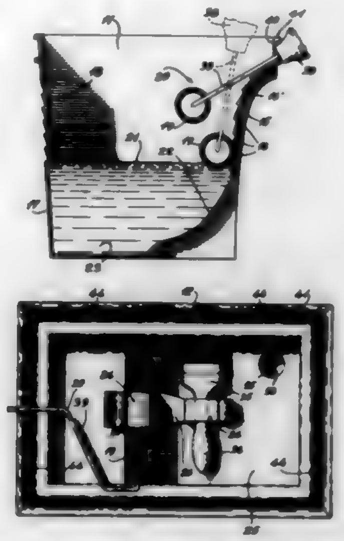
5,314,061
PAINT BUCKET WITH INNER PAINT IMPLEMENT ATTACHING MEANS

Verelk Bedrossian, 4324 8e Rue, Chomedey, Laval, Quebec H7W 2A1, Canada

Filed May 20, 1993, Ser. No. 63,664
Int. Cl.⁵ B65D *69/00*
U.S. Cl. 206—229 7 Claims

1. A paint bucket capable of holding one or more gallons of paint, said bucket comprising an open-top-end container, a lid engageable over said open-top-end, and attachment means on an inner surface of said lid for the retention of one or more paint applicating implement, said open-top-end container being a rectangular container having opposed parallel flat side walls, at least one said flat side wall having an uppermost side wall portion with a plurality of spaced transverse ribs projecting inwardly in said container to remove excess paint from a roller-type paint applicating implement, said side wall portion being an uppermost portion of one of said opposed side walls and being sloped outwardly of said one of said opposed side walls

in a top portion thereof, a concavely curved lower section disposed below said uppermost portion and terminating in the direction of an opposed parallel side wall to said one of said opposed side walls, said curved lower section having a flat inner face and directing excess paint disposed between said ribs to a top surface of paint contained in said container, said lid having a peripheral side edge, said side edge having engaging means for sealing engagement with a contour edge of said open-top-end container, a through slot in a top edge of said bucket for accommodating passage of a paint roller connecting rod.



5,314,062

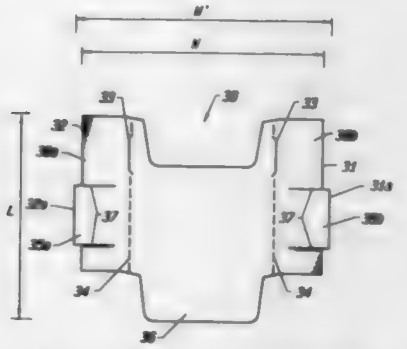
INNERFRAME AND APPARATUS FOR PRODUCING AN IMPROVED INNERFRAME

Tsun-Chuan Wu, Surabaya, Indonesia; Liem T. Pao, Singapore, Singapore, and Foo-Kong Wong, Surabaya, Indonesia, assignors to P.T.H.M. Sampoerna, India

Filed Jan. 16, 1991, Ser. No. 641,694

Int. Cl.^{5} B65D *85/10*

U.S. Cl. 206—268 **11 Claims**



1. A frame for insertion into a box container, the container having a bottom box panel a top lid box panel, opposing right and left side box panels and opposing front and back box panels, the frame for securely retaining a bundle of elongated members within the container, comprising:

a front frame panel portion defined by a left side and a right side, and a top and bottom margin;

a left side frame panel connected to said front frame panel along said left side of said front frame panel, said left side frame panel including a first, second and third free edges, said first free edge opposing said left side of said front frame panel at a distance D therefrom, and having a left side biasing portion formed therein, the biasing portion including a fourth, fifth and sixth free edges, said fourth free edge opposing said left side at a distance greater than D from said left side; and

a right side frame panel connected to said front frame panel along said right side of said front frame panel, said right side frame panel including a first, second and third free edges, said first free edge opposing said right side of said front frame panel at said distance D therefrom, and having a right side biasing portion formed therein, the biasing portion including a fourth, fifth, and sixth free edges, said fourth free edge opposing said right side at a distance greater than D from said right side;

wherein the frame is erected and inserted into the box so that said front frame panel is contiguous with the front box panel, said left frame panel is contiguous with the left side box panel, and the right frame panel is contiguous with the right side box panel.

5,314,063

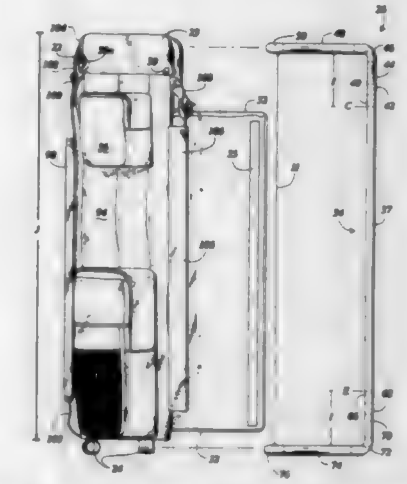
GOLF BAG HAVING EXTERNAL FRAME

R. David Lee, Springfield, and Andrew P. Cimini, Nashville, both of Tenn., assignors to Professional Bags, Inc., Springfield, Tenn.

Filed Dec. 29, 1992, Ser. No. 998,362

Int. Cl.^{5} A63B *55/00, 55/10*

U.S. Cl. 206—315.7 **9 Claims**



1. A gold bag for carrying by a golfer, comprising:

an elongate body having an exterior, an interior, an open upper end having a perimeter, a closed lower end, a width, a length, and a central longitudinal axis, said body defining a cavity along its interior between said upper end and lower end for receiving a plurality of golf clubs;

a rigid frame supportably associated with said body and positioned adjacent to the exterior of said body, said frame comprising:

a top frame portion positioned adjacent said upper end of said body,

a bottom frame portion positioned adjacent to said lower end of said body,

a spine having first and second longitudinal sides, said spine extending between and connecting said top and bottom portions of said frame and aligned substantially parallel to the length and central longitudinal axis of said body;

means for attaching said body to said frame; and

a secondary body portion having a first longitudinal edge opposite a second longitudinal edge, means for hingedly attaching at least a portion of the first longitudinal edge to said elongate body at a first attachment site on said elongate body adjacent the first side of said spine and means for releasably fastening at least a portion of said second longitudinal edge to said elongate body at a second attachment site on said elongate body adjacent the second side of the spine so that said secondary body portion is

hingedly positionable around said spine to sandwich said spine between said elongate body and said secondary body portion.

5,314,064

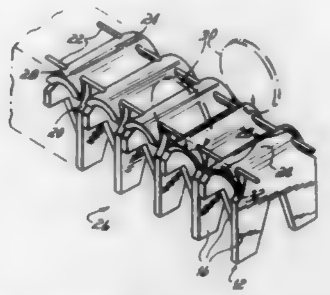
SHEET METAL CLIP

Thomas J. Wells, Carthage, Mo., and John D. Poffenberger, Cincinnati, Ohio, assignors to L&P Property Management Company, Chicago, Ill.

Filed May 3, 1993, Ser. No. 56,195

Int. Cl.^{5} B65D *71/00*

U.S. Cl. 206—340 **18 Claims**



1. A collated stack of sheet metal clips comprising:

a plurality of similarly oriented generally U-shaped clips, each said clip having an arcuate crown portion and spaced parallel leg portions depending from said crown portion, each said clip being juxtapositioned to a leg portion of an adjacent clip, each said clip having opposed lateral side edges;

a slot extending inwardly from each said side edge of each said leg portion, each said slot being obliquely angled with respect to said side edge; and

a plastic rope positioned within said slots and extending the length of the stack of clips.

11. A method of manufacturing a collated stack of sheet metal clips comprising the steps of:

forming a planar sheet metal blank into a generally U-shaped clip having an arcuate crown portion and spaced parallel leg portions depending from said crown portion, said clip having opposed side edges,

forming a slot in each side of said blank which extends inwardly from each said side edge and is obliquely angled with respect to said side edge;

aligning a plurality of said similarly oriented U-shaped clips such that each said clip is juxtapositioned to a leg portion of an adjacent said clip; and

inserting a plastic rope within said slots on each said side edge of said clips.

17. A method of manufacturing a collated stack of sheet metal clips comprising the steps of:

forming a planar sheet metal blank into a generally U-shaped clip having an arcuate crown portion and spaced parallel leg portions depending from said crown portion, said clip having opposed side edges, a slot extending inwardly from each said side edge;

aligning a plurality of said similarly oriented U-shaped clips such that each said clip is juxtapositioned to a leg portion of an adjacent said clip;

inserting a plastic rope within said slots on each said side edge of said clips; and

inserting an adhesive deposit into said slots after insertion of said ropes therein, said adhesive deposit retaining said ropes within said slots.

18. A method of manufacturing a collated stack of sheet metal clips comprising the steps of:

forming a planar sheet metal blank into a generally U-shaped clip having an arcuate crown portion and spaced parallel leg portions depending from said crown portion, said clip having opposed side edges, a slot extending inwardly from each said side edge;

aligning a plurality of said similarly oriented U-shaped clips such that each said clip is juxtapositioned to a leg portion of an adjacent said clip;

inserting a plastic rope within said slots on each said side edge of said clips; and

heating a thermally activated portion of said rope after said rope is inserted within said slots so as to retain said rope within said slots.

5,314,065

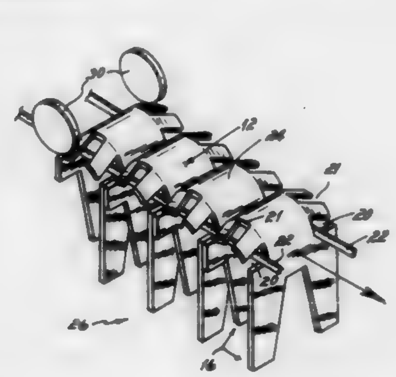
SHEET METAL CLIP

Donald B. Ayres, Skokie, Ill., and Thomas J. Wells, Carthage, Mo., assignors to L&P Property Management Company, Chicago, Ill.

Continuation-in-part of Ser. No. 56,195, May 3, 1993. This application Jul. 15, 1993, Ser. No. 92,336

Int. Cl.^{5} B65D *71/06*

U.S. Cl. 206—340 **7 Claims**



1. A collated stack of sheet metal clips comprising:

a plurality of similarly oriented generally U-shaped clips, each said clip having an arcuate crown portion and spaced parallel leg portions depending from said crown portion, each said clip being juxtapositioned to a leg portion of an adjacent clip, each said clip having opposed lateral side edges;

a side slot extending inwardly from each said side edge of each said leg portion;

a crown slot extending inwardly from a lateral side edge of said crown portion; and

a plastic rope positioned within said side slots and extending the length of the stack of clips.

6. A method of manufacturing a collated stack of sheet metal clips comprising the steps of:

forming a planar sheet metal blank into a generally U-shaped clip having an arcuate crown portion and spaced parallel leg portions depending from said crown portion, said clip having opposed side edges, a side slot extending inwardly from each said side edge of said clip and a crown slot extending inwardly from a side edge of said crown portion;

aligning a plurality of said similarly oriented U-shaped clips such that each said clip is juxtapositioned to a leg portion of an adjacent said clip;

inserting a plastic rope within said side slots on each said side edge of said clips; and

deflecting tabs extending from each lateral end of said crown portion of each said clip, said tabs being defined in part by said side slots in said spaced leg portions, and said crown slot, said tabs being deflected after insertion of said rope into said slots so as to retain said rope within said slots.

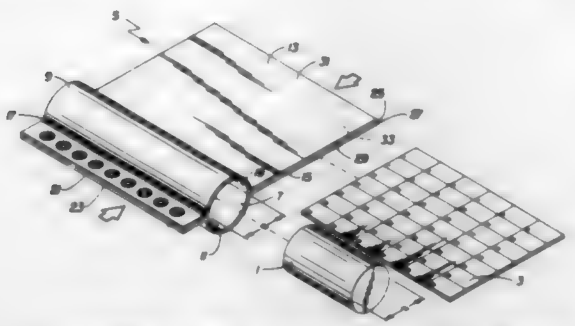
5,314,066
DISPLAY AND STORAGE PACKAGE

Timothy F. Gresh, Canton, Conn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1993, Ser. No. 3,335

Int. Cl.⁵ B65D *85/671*

U.S. Cl. 206—389 **2 Claims**



1. A combination of a film cassette containing a rolled filmstrip having a series of successively recorded images, an index print substantially larger than the film cassette and having rows of small-size positive images that match the recorded images, and a display and storage package, wherein said package comprises:

a normally flat pocket for the film cassette defined by respective opposite portions of a pair of superimposed flexible sheets, said opposite portions being joined to each other only along two parallel side edges of said pocket to leave opposite ends of the pocket open and being spaced apart to provide a width of the pocket when flat which is sufficiently greater than the width of the cassette to permit the opposite portions to be arched away from each other to expand the pocket to a diameter for receiving the cassette only through either one of said opposite ends by pushing inwardly against two parallel side edges of said sheets located outwardly of said side edges of the pocket to open both of the opposite ends; and

an envelope for the index print defined by respective opposite portions of said sheets which are different than said opposite portions of the sheets that define said pocket and being substantially larger than the pocket.

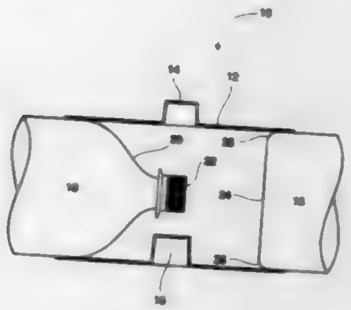
5,314,067
BOTTLE CONNECTION SYSTEM

Sara Strock, 765 Mohawk Hills Dr. Apt. C, Carmel, Ind. 46032

Filed Jan. 12, 1992, Ser. No. 897,803

Int. Cl.⁵ B65D *65/00*

U.S. Cl. 206—430 **8 Claims**



1. A connection system comprising:

a generally cylindrical container;

a cylindrical sleeve having an axis, radially inner and outer surfaces, and opposing ends, each opposing end sized to frictionally engage either end of the cylindrical container, the inner surface frictionally engaging the cylindrical container;

a projection extending orthogonally outward from the outer surface of the sleeve, the projection having a width less than the width of the sleeve and having an axis perpendicular to the axis of the sleeve;

a recess extending orthogonally inward from the inner surface of the sleeve, the recess having a width less than the width of the sleeve and having an axis perpendicular to the axis of the sleeve; and

the container further comprising a removable cap frictionally engagable with the recess of the cylindrical sleeve.

5,314,068
CONTAINER FOR A PLATE-LIKE ARTICLE

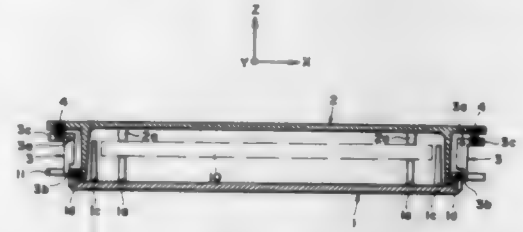
Hiroshi Nakazato; Gen Nakamura, and Satoshi Yoshinari, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1992, Ser. No. 911,055

Claims priority, application Japan, Jul. 12, 1991, 3-197354; May 28, 1992, 4-160049

Int. Cl.⁵ B65D *85/38*

U.S. Cl. 206—454 **14 Claims**



1. A container for containing therein a plate-like article such as a reticle, comprising:

a bottom member having a holding portion for holding the article in a substantially laid-down state;

an upper member to be mated with said bottom member to define a space above the upper surface of the article;

a pressing member for resiliently pressing in the space the article against said holding portion;

fixing means having an engaging member being supported by said upper member and being engageable with an end portion of said bottom member, said engaging member being effective to prevent upward opening motion of said upper member due to a reaction force of said pressing member; and

releasing means partially projectable into said fixing means to press said fixing means in the same direction as the direction of the opening motion of said upper member to thereby release said engaging member.

5. A cassette for storing therein a substrate to be used in a semiconductor device manufacturing process and for being mounted into an apparatus to be used in a semiconductor device manufacturing process, said cassette comprising:

a first cassette element having a supporting portion for supporting the substrate;

a second cassette element cooperable with said first cassette element to define a space in which the substrate is to be stored;

an engaging member supported by said second cassette element, said engaging member being engageable with an engagement provided on said first cassette element to prohibit separation of said first and second cassette elements from each other; and

disengaging means for disengaging said engaging member from said engagement in response to a force acting in a direction of separation of said first and second cassette elements from each other, wherein

at least one of said first and second cassette elements is made of a substantially transparent material, and said engaging member has a color different from said second cassette element.

6. A cassette for storing therein a substrate to be used in a semiconductor device manufacturing process and for being mounted into an apparatus to be used in a semiconductor device manufacturing process, said cassette comprising:

a first cassette element having a supporting portion for supporting the substrate;

a second cassette element cooperable with said first cassette element to define a space in which the substrate is to be stored, said second cassette element having a portion which is substantially transparent; and

an engaging member supported by said second cassette element, said engaging member being engageable with an engagement provided on said first cassette element to prohibit separation of said first and second cassette elements from each other, said engaging member having a color different from said second cassette element, wherein

at least one of said first and second cassette elements is made of an electrically conductive resin material.

5,314,069
PROCESS FOR OBTAINING A PACKAGE CONTAINING MUTUALLY REACTIVE PARTICULATE MATERIALS AND A PACKAGE CONTAINING SUCH MATERIALS

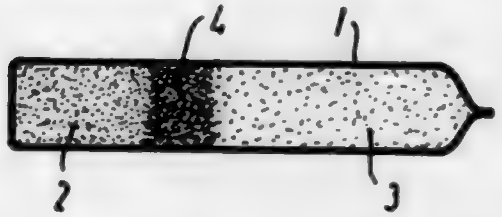
Kaj Nielsen, Tranbjerg, Denmark, assignor to Deltagraph A/S, Ringsted, Denmark

Continuation of Ser. No. 727,094, Jul. 9, 1991, abandoned, which is a division of Ser. No. 538,699, Jun. 18, 1990, Pat. No. 5,072,830, which is a continuation of Ser. No. 127,058, Dec. 1, 1987, abandoned, which is a continuation of Ser. No. 843,598, Mar. 25, 1986, abandoned. This application Nov. 13, 1992, Ser. No. 975,995

Claims priority, application Denmark, Mar. 28, 1985, 1406/85

Int. Cl.⁵ B65D *81/20, 81/32*

U.S. Cl. 206—524.8 **7 Claims**



1. A package of solid particulate photographic materials for use in the development of exposed photographic films which includes a sealed, evacuated envelope that defines a single chamber and at least three immobilized layers of solid particulate photographic materials contained in said envelope, at least two of said materials being mutually reactive and at least one of said materials being inert relative to said two which are mutually reactive, said layers of said at least two mutually reactive materials being separated by at least one intervening layer of said inert material.

5,314,070
CASE FOR FLEXIBLE BORESCOPE AND ENDOSCOPE INSERTION TUBES

Joseph A. Ciarlei, Marcellus, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

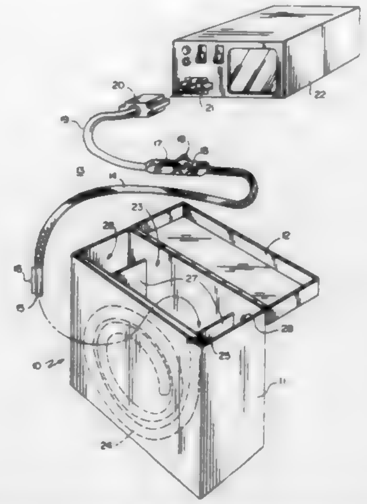
Filed Dec. 16, 1992, Ser. No. 991,135

Int. Cl.⁵ B65D *85/04*

U.S. Cl. 206—570 **13 Claims**

1. In combination, a borescope or endoscope which has an elongated flexible insertion tube that carries imaging optics at a distal end thereof; and a shipping and storage case for said borescope or endoscope comprising an enclosure for housing the borescope or endoscope, and a coil of tubular low friction material fixedly installed within the enclosure and having an open proximal end into which said insertion tube can be slidably received for storage and from which the insertion tube can be slidably withdrawn without removing the coil of tubular material from the enclosure.

9. A method of storing a borescope or endoscope of the type which has an elongated insertion tube of a predetermined outer diameter and carries imaging optics at its distal end comprising the steps of positioning the distal end of the insertion tube into an open proximal end of a coiled tube that is attached to a storage case having a housing for storing the borescope or endoscope therein, the coiled tube having an inner diameter at least slightly greater than the outer diameter of the insertion tube; and slidably inserting the insertion tube by pushing the insertion tube into said coiled tube.



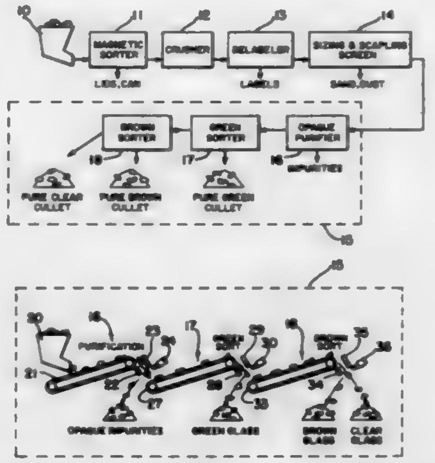
5,314,071
GLASS SORTER

Donald J. Christian; Chin-Hu Feng, both of Fremont; Jerry L. McComas, Sunnyvale, and Andrew K. Chang, Los Altos Hills, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 10, 1992, Ser. No. 988,556

Int. Cl.⁵ B03B *1/00;* **B07C** *5/342*

U.S. Cl. 209—4 **17 Claims**



1. An apparatus for the beneficiation of transparent material according to light transmitting properties of the transparent material, comprising:

a control module;

a first array of lamps, wherein the first array of lamps is electrically connected to the control module;

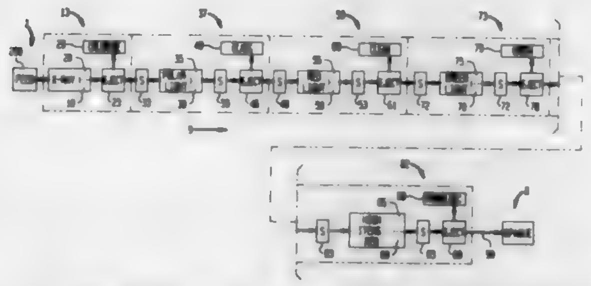
a first array of sensors electrically connected to the control

module and positioned opposed from the first array of lamps;
a means for conveying the transparent material to a position above the first array of lamps and the first array of sensors and directing the transparent material between the first array of lamps and the first array of sensors; and
an actuator means electrically connected to the control module for deflecting some of the transparent material dropped between the first array of lamps and the first array of sensors in response to the light transmitted from the first array of lamps through the transparent material to the first array of sensors.

5,314,072
SORTING PLASTIC BOTTLES FOR RECYCLING

Henry Frankel, Edison; Sergey Miroshnichenko, Highland Park, and Jonathan B. Whitlock, Warren, all of N.J., assignors to Rutgers, The State University, Piscataway, N.J.

Filed Sep. 2, 1992, Ser. No. 939,304
Int. Cl.^{5} B07C *5/342*
U.S. Cl. 209—44.1 **23 Claims**



1. A method of sorting bottles for recycling comprising the steps of
conveying a bottle via a conveying means to a first sensing area, determining whether said bottle is clear while said bottle is in said first sensing area and removing said bottle from said conveying means to a pile of clear bottles if said bottle is clear, and
if said bottle is not removed in said first sensing area, conveying the bottle via said conveying means to a second, separate sensing area, determining whether said bottle is colored while said bottle is in said second sensing area and removing said bottle from said conveying means to a pile of colored bottles if said bottle is colored.

5,314,073
PHOSPHATE FLOTATION USING SULFO-POLYESTERS

Mahendra K. Sharma, Kingsport, Tenn.; George J. O'Neill, Osaka, Japan, and Brij M. Moudgil, Gainesville, Fla., assignors to Eastman Kodak Company, Rochester, N.Y.

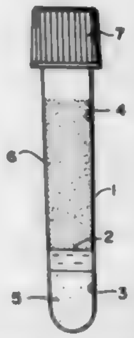
Filed May 3, 1993, Ser. No. 55,595
Int. Cl.^{5} B03D *1/016, 1/02*
U.S. Cl. 209—166 **19 Claims**

1. In a process for beneficiating a silicious phosphate ore by flotation, the process comprising the steps of conditioning an aqueous slurry of phosphate ore at a pH of from 7.5 to 10.5 with a fatty acid and a fuel oil and aerating the conditioned phosphate slurry to float the phosphate, the improvement comprising conditioning the aqueous phosphate slurry prior to aeration with a water dispersible sulfo-polyester having a glass transition temperature of 28° C. to 60° C., said sulfo-polyester consisting essentially of repeat units from:
(a) a dicarboxylic acid selected from the group consisting of aromatic dicarboxylic acids, saturated aliphatic dicarboxylic acids, cycloaliphatic dicarboxylic acids, and combinations thereof;
(b) a diol; and
(c) a difunctional sulfomonomer containing at least one sulfonate group attached to an aromatic nucleus wherein the functional groups are hydroxy, carboxy or amino, provided the difunctional sulfomonomer is present in an amount from 12 to 25 mole percent based on 100 mole percent dicarboxylic acid and 100 mole percent diol.

5,314,074
METHOD AND MEANS FOR DENSITY GRADIENT CENTRIFUGATION

Michael Inbar, Maskeret Batya; Gerald Slutzky, Jerusalem; Mordechai Radushetzky, Benyamin, and David Shitrit, Jerusalem, all of Israel, assignors to Eldan Technologies Co. Ltd., Jerusalem, Israel

Filed Nov. 3, 1992, Ser. No. 971,525
Claims priority, application Israel, Jan. 31, 1992, 100828
Int. Cl.^{5} B03D *1/00*
U.S. Cl. 209—208 **13 Claims**

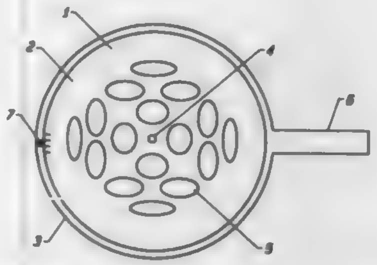


1. A method of performing density gradient centrifugation for the recovery of at least one solid matter component from a liquid dispersion, comprising providing a centrifugation vessel having a lower part and an upper part, charging a body of working fluid into the lower part and a body of said liquid dispersion into the upper part of the centrifugation vessel, sealing the vessel and subjecting it to centrifugation whereby a density gradient is established, and withdrawing said at least one solid matter component, wherein a snugly fitting layering insert is provided within said centrifugation vessel for supporting said body of liquid dispersion under regular gravity conditions and enabling bi-directional cross-flow during centrifugation, and wherein the insert comprises a disk having one or more narrow cuts or lines of weakness whereby the disk is divided into segments which yield under the action of centrifugal forces.

5,314,075
ADJUSTABLE POPCORN STRAINER

Caroline P. Nguyen, 980 Kiely Blvd., #119, and James M. Harrell, Jr., 990 Kiely Blvd., #E, both of, Santa Clara, Calif. 95051

Filed Feb. 16, 1993, Ser. No. 18,274
Int. Cl.^{5} B07B *1/49*
U.S. Cl. 209—680 **1 Claim**



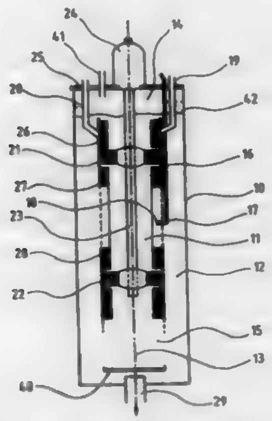
1. An Adjustable Popcorn Strainer for separating partially popped and unpopped popcorn from a batch of fully popped popcorn, comprising:
an outer strainer containing holes;

an inner strainer containing holes;
a handle connected to said outer strainer; and
a fastener which joins both said inner and said outer strainers allowing them to rotate with respect to each other such that the effective size of the holes can be reduced,
one of said inner and outer strainers comprising a scale and the other of said inner and outer strainers comprising a pointer so as to provide an indication of effective hole size.

5,314,076
INSTALLATION FOR THE MIXING OF TWO FLUID PHASES BY MECHANICAL STIRRING, NOTABLY FOR THE TREATMENT OF WATER BY TRANSFER OF OXIDIZING GAS, AND USE OF SUCH AN INSTALLATION

Christian La Place, Colombes; Nathalie Martin, Paris, and M. Michel Faivre, Acheres, all of France, assignors to Gie Anjou-Recherche, Maisons Laffitte, France

Filed Jan. 27, 1992, Ser. No. 825,944
Claims priority, application France, Feb. 4, 1991, 91 01352
Int. Cl.^{5} B01F *3/04;* **C02F** *1/78*
U.S. Cl. 210—205 **17 Claims**

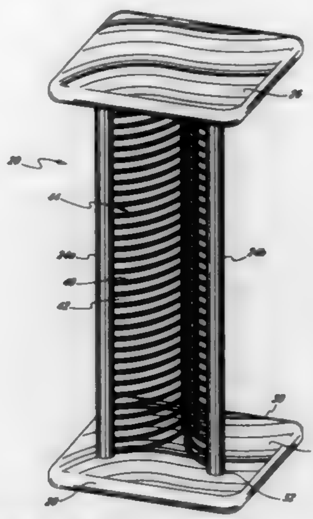


1. An installation for the mixing of a liquid, such as stored water, waste water and/or filtered water, with a treatment gas, wherein:
(a) said mixing installation comprises a vessel having an axis of symmetry and said installation further including means defining an inner concentric central chamber having an open top and open bottom within said vessel and fluid flow communication with said vessel through said open top and open bottom, and defining a peripheral chamber outside of said central chamber means and inside said vessel and a central chamber inside of said central chamber means, wherein the central chamber is provided with:
(i) at least two turbines rotatably mounted one above the other, the rotational axis of which is said axis of symmetry of the vessel;
(ii) counter-blades comprising plates fixed to an inner wall of the central chamber means according to a symmetrical distribution, so as to counter rotation of fluid induced by blades of the turbines, said counter-blades being placed in an axially alternating position with the turbines; said blades and said counter-blades comprising gratings of expanded metal having straps which give the blades and the counter-blades a transparency that is variable according to the incidence of the flow, of the liquid, during operation; and
(iii) means to add a treatment gas to the central chamber for mixing therein with the liquid.

5,314,077
STORAGE RACK

Yos S. Theosabrata, 377 S. Lemon Ave., Ste. E, Walnut, Calif. 91789

Filed Feb. 18, 1993, Ser. No. 19,064
Int. Cl.^{5} A47F *7/00*
U.S. Cl. 211—40 **14 Claims**



1. A storage rack, comprising:
a base;
a first upstanding column secured on said base;
a second upstanding column secured on said base;
a third upstanding column secured on said base, each of said columns defining a plurality of stations;
a plurality of support members, each of said plurality of support members being sized and shaped to extend between one of said plurality of stations defined by said first upstanding column and one of said plurality of stations defined by said third upstanding column and to extend between one of said plurality of stations defined by said second upstanding column and one of said plurality of stations defined by said third upstanding column, wherein said plurality of stations comprise a row of cavities, each of said row of cavities sized and shaped to receive and retain a portion of one of said plurality of support members.

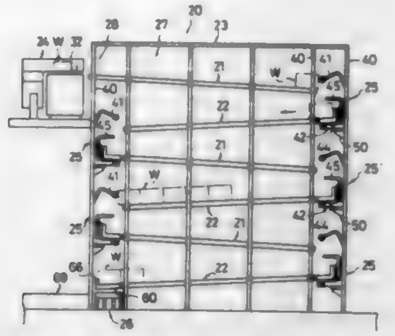
5,314,078
FIRST-IN FIRST-OUT ARTICLE STORAGE RACK APPARATUS

Akira Morikiyo, Tokorozawa; Toshio Kanbe, Hidaka; Shuichi Shinbo, Moroyama; Shigeru Yoshikawa, Tokorozawa; Yoshikazu Shimodaira, Abiko; Kazuya Ohminami, Hachioji, and Hitoshi Komuro, Saitama, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Sep. 8, 1992, Ser. No. 941,893
Claims priority, application Japan, Sep. 6, 1991, 3-079767
Int. Cl.^{5} A47F *1/04*
U.S. Cl. 211—59.2 **4 Claims**

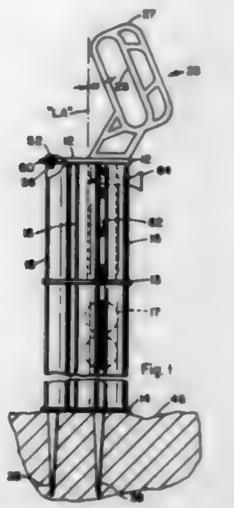
1. A first-in, first-out article storage rack apparatus including: an article storage rack comprising a first set of slant racks inclined downwardly in one direction, and a second set of slant racks inclined downwardly in the opposite direction, each slant rack having an upper end and a lower end, and the slant racks of said first and second sets being arranged alternately in a vertical column with the lower end of each slant rack, except for the lowermost slant rack, being vertically spaced from, and located above, the upper end of the next lower slant rack; article loading means for loading articles onto said slant racks; a plurality of conveyance direction changing means for transferring articles from the lower end of each slant rack except for the lowermost slant rack, to the upper end of the next lower

slant rack, each of the conveyance direction changing means providing an article-receiving lift frame movable vertically from a position adjacent to the lower end of each slant rack, except for the lowermost slant rack, to a position adjacent to the upper end of the next lower slant rack, and tiltable stopper means for impeding the flow of articles from the lower end of each slant rack, except for the lowermost slant rack, when the last-mentioned lower end has no lift frame adjacent to it; and an article delivery means for delivery of the articles stored on the slant racks.



5,314,079
CARRIER FOR GOLF CLUBS OR THE LIKE

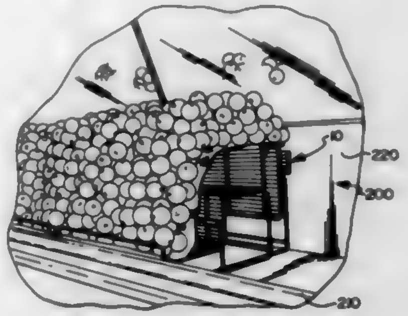
Michael R. Young, 9110 E. Country Walk, Wichita, Kans. 67206
Filed Mar. 9, 1993, Ser. No. 28,310
Int. Cl.^{5} A63B *55/00*
U.S. Cl. 211—70.2 **5 Claims**



1. An elongated carrier for golf clubs or the like having a longitudinal axis and adapted for substantially upright positioning on the ground, comprising upper, intermediate and lower support means, a plurality of substantially round tubular holders of semi-rigid plastic material, held in fixed, substantially parallel, juxtaposed relationship by said support means with the bottom ends thereof being affixed to said lower support means, said lower support means providing first floor means for said holders the bottom ends of which lie substantially in the same plane on said first floor means which is oriented substantially normal to said longitudinal axis of said carrier, spike means affixed to said lower support means and extending substantially axially and outwardly therefrom and adapted to penetrate into the ground to support said carrier in a substantially upright posture, handle means affixed to said upper support means and extending generally longitudinally of said carrier and outwardly from the outer surface of said upper support means, said handle means having a hand grip segment oriented at an angle with respect to said longitudinal axis of from about 5 degrees to about 35 degrees, said grip segment being positioned slightly forward of the center of gravity of said carrier in its loaded condition and thus adapted to lie substantially horizontally when the carrier is being supported by the hand of a user and is at an upwardly tilted attitude, wherein two of said holders are spaced apart slightly less than the diameter of a golf ball and are sufficiently flexible to be spread apart by golf balls forced therebetween, and wherein another of said holders is positioned inwardly of said two holders a distance which prevents insertion of the golf balls beyond the point where the said two holders are exerting holding pressure thereagainst, wherein a tee tote is provided longitudinally between two spaced holders and adapted to receive and hold golf tees which are forced thereinto, wherein said grip segment is provided with a pressure application surface oriented substantially normal to said longitudinal axis for contact by the palm of a users hand for forcing said spike means into the ground, and wherein said upper support means has a plate-like segment lying between two of said holders and in a plane substantially normal to said longitudinal axis, said segment having a recessed outer edge portion provided with an aperture for receiving the shank of a golf ball marker with a peripheral portion of the marker top extending laterally outwardly of the carrier into the concavity of the recessed outer edge portion for ease of gripping and removal thereof.

5,314,080
ADJUSTABLE DISPLAY RACK

Richard W. Wentworth, 4924 S. Logan St., Lansing, Mich. 48910
Filed Dec. 28, 1992, Ser. No. 997,241
Int. Cl.^{5} A47F *5/00*
U.S. Cl. 211—181 **18 Claims**



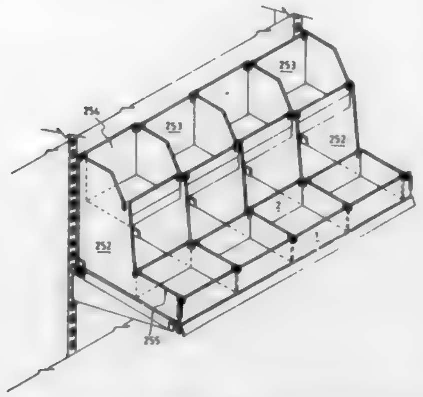
1. A multi-configurational display rack, comprising:
(a) a display rack body having two steps,
(b) an angle rack attachable to the display rack body to transform the display rack body from a two-step configuration to a sloped configuration, and
(c) means for attaching the angle rack to the display rack body.

5,314,081
RISER AND DIVIDER SYSTEM FOR A DISPLAY APPARATUS

Francis A. Carroll, Dublin, Ireland, assignor to Carroll Products and Designs Limited, Dublin, Ireland
Continuation of Ser. No. 640,193, Jan. 10, 1991, abandoned. This application Feb. 5, 1993, Ser. No. 13,994
Claims priority, application Ireland, Jan. 10, 1990, 88/90
Int. Cl.^{5} A47F *5/00*
U.S. Cl. 211—184 **13 Claims**

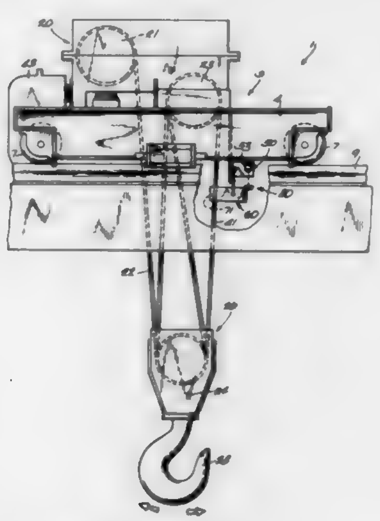
1. A riser and divider system for a display apparatus, including at least one riser and at least one divider, each of which comprises a rigid sheet of plastics material, and a connector for disengagably connecting together the riser and divider, the connector comprising securing means for permanent fixing the connector to one of the riser and divider and engaging means for disengagably connecting the connector to the other of the

riser and divider, further in which one of the riser and divider includes an integrally formed receiver element, said receiver element comprising a tongue, the securing means of the connector includes a socket fixable to the said receiver element tongue and the disengagable engaging means of the connector includes a clip element, further in which one of the riser and divider includes an integrally formed receiver element, said receiver element comprising a tongue, the securing means of the connector includes a socket fixable to the said receiver element tongue and the disengagable engaging means of the connector includes a clip element.



5,314,082
SENSING DEVICE FOR INDICATING IMPROPER ORIENTATION OF A HOIST LIFTING LINE

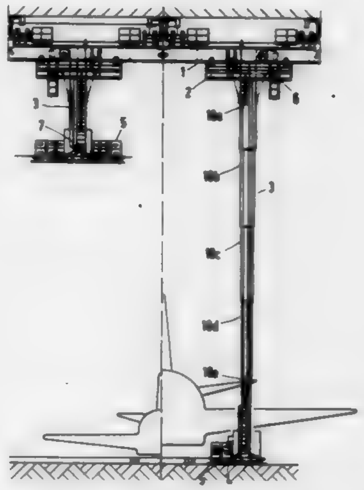
Jeffrey A. Konop, Grafton, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.
Filed Feb. 5, 1993, Ser. No. 14,325
Int. Cl.^{5} B66C *13/06*
U.S. Cl. 212—147 **16 Claims**



12. An overhead crane comprising
a frame,
means supporting said frame for horizontal movement,
a hoist mounted on said frame, said hoist including a lifting rope having a desired orientation,
a signal generating means for generating a reference signal, and
means supported by said frame independent of said lifting rope and said signal generating means for detecting a side pull condition of said lifting rope, said detecting means having a reference position when the lifting rope is at the desired generation, and said detecting means intercepting said reference signal when in said reference position.

5,314,083
TELESCOPIC TOWER

Fred Wiggershaus, Gevelsberg; Udo Steffen, Castrop-Rauxel, and Rudolf Erdmann, Gevelsberg, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany
Filed Aug. 13, 1986, Ser. No. 896,414
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528996
Int. Cl.^{5} B66C *17/06*
U.S. Cl. 212—213 **7 Claims**



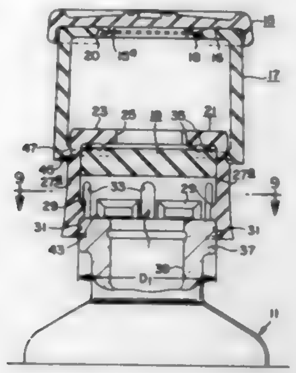
1. In a multi tube telescopic tower for suspension from an overhang trolley, crane, or the like wherein the lowermost tube of a plurality of tubes carries a work area or platform, the improvement comprising:
at least one (i) tube of the plurality of tubes of the telescopic tower being of multi part construction with a cross-section of a polygon, having corners accordingly, said (i) tube receiving another (ii) tube of the plurality of tubes and being received by a further (iii) tube of the plurality of tubes;
said one (i) tube having rail means in at least one of said corners, said rail means extending radially inwardly, as well as radially outwardly from said corner; and
rollers on the respective tubes (ii) and (iii) for cooperation with said rail means of said one (i) tube.

5,314,084
TWO PIECE ALL PLASTIC SEAL

Christopher M. Folta, Boyertown; John M. Anes, Glenmoore, and Homer J. Brown, Oreland, all of Pa., assignors to The West Company, Incorporated, Phoenixville, Pa.
Filed Aug. 21, 1992, Ser. No. 933,405
Int. Cl.^{5} B65D *41/58*
U.S. Cl. 215—249 **9 Claims**

1. A closure for use with a container having a discharge opening, comprising:
an inner cap having a top and a skirt depending axially therefrom, said skirt terminating in first engagement means for engaging said container adjacent said discharge opening to provide a first assembly position with said top spaced from said container by a first distance, said skirt including a plurality of circumferentially spaced slits;
a liner held by said skirt in a position proximate to said top and having a thickness less than said first distance to cooperate with said slits to define an air path for access to said discharge opening in said first assembly position;
an outer cap having a top and a dependant skirt including second engagement means on its terminal end for engaging the outside of said inner cap proximate its top in said first assembly position;

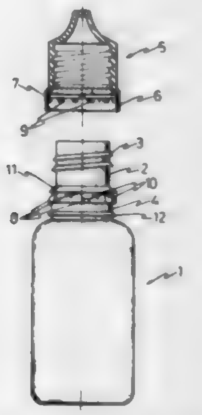
said first engagement means disengages upon application of a first axial force to move said inner cap and said liner to sealing engagement with said discharge opening; and



said second engagement means disengages upon application of a second greater force to thereby position said outer cap in surrounding relationship over said inner cap.

5,314,085
CONTAINER AND TAMPER-EVIDENT CLOSURE

Jose Collado Bonet, Paterna, Spain, assignor to Jose Collado Bonet, S.A., Silla, Spain
Filed Oct. 2, 1992, Ser. No. 956,725
Claims priority, application Spain, Oct. 4, 1991, 9102973
Int. Cl.⁵ B65D *41/34*
U.S. Cl. 215—252 **2 Claims**



1. A container and top having a ring seal, said ring seal is frangibly attached to said top and provides visible indication of tampering, said container having an opening in a generally upward direction, said container, top and ring seal comprising:

a neck of said container having an upper zone with a helical screw and a lower zone which is axially separated from said upper zone, said lower zone is smooth and has a larger diameter than said upper zone;

a serrated edge between said upper and lower zones, said serrated edge having teeth;

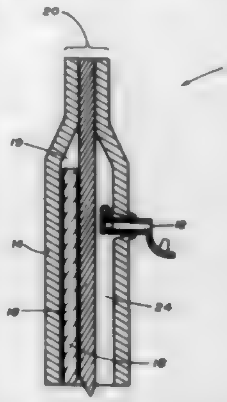
radial appendages on an inside surface of said ring seal, said radial appendages abutting said teeth of said serrated edge when said top and ring seal are installed on said container, said teeth of said serrated edge permitting said top and said ring seal to be turned in one direction, but resist turning of said top and said ring seal in the opposite direction;

a first annular projection on said neck above said teeth of said serrated edge, said first annular projection defining an oblique collar which permits passage of said ring seal when said top is being installed on said container, but which prevents reverse passage of said ring seal after installation, said first annular projection being above said ring seal after said top is installed on said container; and

a second annular projection on said lower zone of said neck, said second annular projection abutting said ring seal after said frangible attachment of said ring seal and said top is broken.

5,314,086
THERMAL REFLECTING INSULATABLE PAD

Robert Short, 105, 242 East 14th Street, Vancouver, B.C., Canada V5T 2M6
Continuation-in-part of Ser. No. 729,985, Jul. 15, 1991, abandoned. This application Mar. 11, 1993, Ser. No. 29,555
Int. Cl.⁵ B65D *25/08, 27/08*
U.S. Cl. 220—400 **8 Claims**



1. A flexible, thermal, reflective insulating pad comprising:

a) a first outer wall of flexible, transparent, air-impermeable material;

b) a second outer wall of flexible, transparent, air-impermeable material sealed or fused to said first outer wall around the perimeter thereof to form a pneumatically secure chamber;

c) a specularly, infra-red reflective layer in said chamber;

d) means for introducing air into said chamber;

e) said first and second outer walls fused together along parallel spaced apart lines along a length of said pad so as to form compartments in fluid communication with each other around the ends thereof; and

f) means for releasably connecting ends of said pad to each other;

wherein upon being deflated said pad can be rolled up so as to occupy a relatively small volume.

5,314,087
THERMAL REFLECTIVE PACKAGING SYSTEM

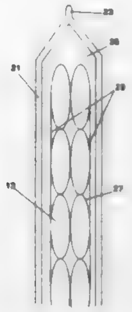
David B. Shea, Richmond, Va., assignor to Radiant Technologies, Inc., Richmond, Va.
Filed May 26, 1993, Ser. No. 66,840
Int. Cl.⁵ B61D *5/56*
U.S. Cl. 220—450 **13 Claims**

1. An improved insulating system for insertion into an outer shipping container whereby the thermal insulating characteristics of said container are increased so as to allow shipment of goods having elevated or decreased temperatures, with respect to an ambient temperature, with improved thermal retention within said shipping container, comprising:

an inner shipping container for insertion into said outer shipping container;

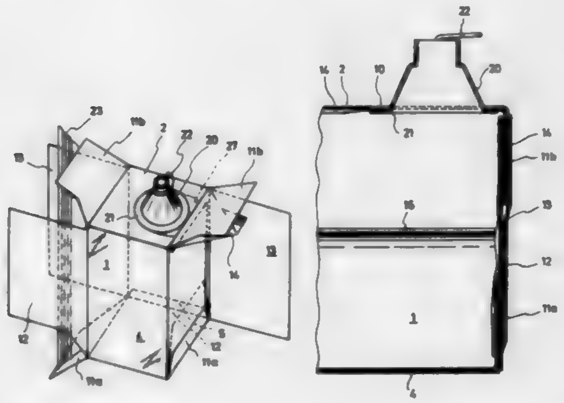
at least one spacer insert for insertion between a said outer shipping container and said inner shipping container, whereby a first pocket of air is provided in contact with at least a portion of an exterior surface of said inner shipping container; and,

an inner liner for insertion into said inner shipping container, said inner liner being comprised of a layer of thermal reflective radiant barrier material encased within a sealed air-tight pouch of durable material such that a second pocket of air is provided between an inner surface of said durable material and an outer surface of said radiant barrier material.



5,314,088
CARDBOARD PACKAGING FOR LIQUIDS

Erich Heuberger, Trugenhofen; Wolf-Dieter Knörrich; Joachim W. Dziallas, both of Heidenheim; George Plester, Essen, and Georg Troska, Herten, all of Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga. and Carl Edelmann GmbH, Heidenheim, Fed. Rep. of Germany
PCT No. PCT/EP91/01563, § 371 Date Apr. 22, 1992, § 102(e) Date Apr. 22, 1992, PCT Pub. No. WO92/03352, PCT Pub. Date Mar. 5, 1992
PCT Filed Aug. 16, 1991, Ser. No. 849,071
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1990, 4026562
Int. Cl.⁵ B65D *5/74, 5/56*
U.S. Cl. 220—465 **11 Claims**



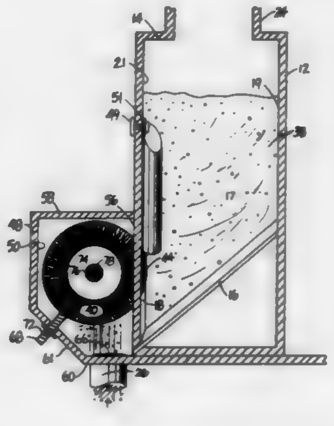
1. A substantially flat assembly for making a three-dimensional cardboard package for liquids including a cardboard box blank having fold lines defining walls of a cardboard box to be erected and a plurality of connecting flaps, an inner bag of flexible thermoplastic material, and a spout for withdrawing liquid from the package, said spout extending through an aperture in one of said walls of the box blank, said bag being securely bonded to the one wall containing said aperture, the improvement comprising attachment means on one or more of said flaps for detachably connecting the inner bag thereto while the box blank is being erected to form the three-dimensional package and thereafter when the box is fully erected being capable of releasing the inner bag from the flaps to permit the bag to collapse, said attachment means including apertures in said flaps connectable to a vacuum source of a box erecting machine.

5,314,089
Patent Not Issued For This Number

5,314,090
MATERIAL FEEDER

George R. Alexander, Frankton, Ind., assignor to Terronics Development Corporation, Elwood, Ind.
Filed Mar. 23, 1992, Ser. No. 855,784
Int. Cl.⁵ G01F *11/00*
U.S. Cl. 222—1 **36 Claims**

26. A method of delivering measured volumes of flowable material comprising the steps of placing a brush within the discharge opening of a hopper containing a material to be dispensed without deforming said brush, exposing a first portion of said brush to the material within said hopper, said brush occluding said opening, said first brush portion receiving therein a portion of said material from within said hopper, rotating said brush in said hole at speeds below that necessary to discharge said material from said brush by centrifugal force to move said first brush portion from within said hopper to



outside of said hopper and exposing a second brush portion to said material, discharging said material from said first brush portion exterior of said hopper, and repeating said exposing, rotating and discharging steps to reexpose said brush portions to said material and to discharge said material from said brush portions.

5,314,091

CONVERTIBLE BEVERAGE DISPENSER

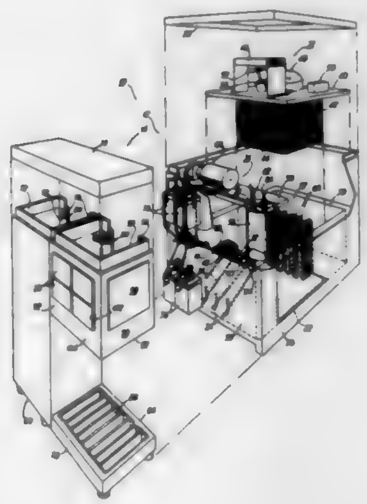
William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 709,529, Jun. 3, 1991, Pat. No. 5,190,188, which is a continuation-in-part of Ser. No. 527,229, May 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 129,032, Dec. 4, 1987, abandoned. This application Mar. 1, 1993, Ser. No. 22,706

The portion of the term of this patent subsequent to Mar. 2, 2008, has been disclaimed.

Int. Cl.^{5} B67D *5/56*

U.S. Cl. 222—129.1 **5 Claims**



1. A beverage dispenser comprising:

(a) a dispensing housing having a long front wall and a short side wall;

(b) a cup-receiving and beverage dispensing recess located at the corner intersection of said front wall and said side wall, said recess having a height substantially less than the height of said housing and being located intermediate the height of said dispenser, said recess having a pair of cup access openings, one in each of said front wall and said side wall;

(c) said recess including a bottom cup rest, a side splash plate and a beverage dispensing nozzle located adjacent the top of said recess;

(d) a front wall opening located above said recess in said front wall;

(e) a side wall opening located above said recess in said side wall;

(f) said front and side wall openings being substantially identical in size;

(g) a removable panel adapted to fit in either one of said openings;

(h) means for removably connecting said panel to either of said openings;

(i) said panel being removably connected to said side opening;

(j) a removable beverage dispensing button panel adapted to fit in either one of said openings;

(k) means for removably connecting said button panel to either of said openings; and

(l) said button panel being removably connected to said front opening.

5,314,092

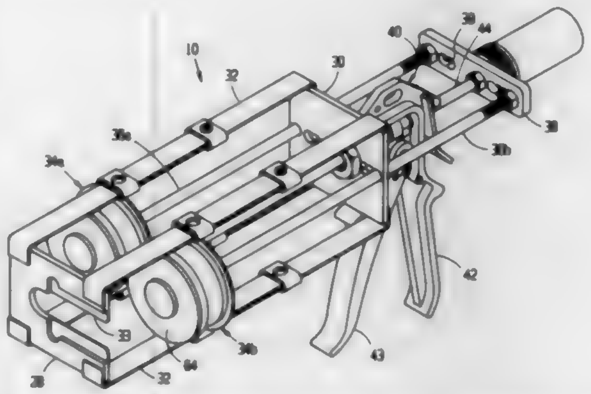
MATERIAL DISPENSING TOOL AND PLUNGER FOR CYLINDRICAL CARTRIDGES

Kenneth H. Jacobsen, 921 N. Quentin Rd., Palatine, Ill. 60067, and Louis F. Cole, 672 Constitution Dr., Unit 93-5, Palatine, Ill. 60074

Filed Feb. 5, 1993, Ser. No. 14,114

Int. Cl.^{5} B67D *5/52*

U.S. Cl. 222—137 **20 Claims**



14. A tool for dispensing material from two tubular cartridges each having a front closure wall with a nozzle and having an open rear end, a wiper slidable within the cartridge and closing the open end thereof, and a static mixing nozzle sealed over the cartridge nozzles and having a common outlet for the mixed cartridge materials, comprising the combination of

means for supporting the separate cartridges in parallel side-by-side relationship, a plunger sized to fit within the open end of each cartridge and against the wiper, an elongated rod supporting each plunger for axial movement within the cartridge, and a connecting member between the plunger rods allowing them to move only in unison;

a rear wall adjacent the open ends of the cartridges, a power mechanism on the rear wall and having a stationary handle and a movable trigger, and an elongated drive rod operatively coupled between the trigger and the connecting member, whereby trigger activation drives said drive rod and plungers in the direction toward the front closure walls;

the plunger rods being in parallel side-by-side relationship and defining a plane extended through the cartridges, and the drive rod being parallel to said plunger rods and aligned generally on said plane, minimizing offset couples generated between the plunger and drive rods; and

each of said plungers having a body with rear and front peripherical surfaces, rear and front radial shoulders at adjacent ends of the perpherical surfaces, and a conically ramped surface expanding from its smallest adjacent the front shoulder to its largest adjacent the rear shoulder; and an O-ring surrounding the ramped surface and movable between the radial shoulders, and said O-ring and ramped surface being sized with the O-ring against the rear shoulder operable to seat between the cartridge and ramped surface for sealing against rearward material leakage therepast and being sized with the O-ring against the front shoulder to be gapped from between the cartridge and ramped surface for cartridge venting and rearward plunger withdrawal from the cartridge.

5,314,093

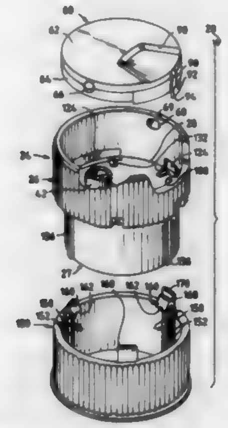
TOGGLE-ACTION DISPENSING CLOSURE WITH ROTATABLE LOCKING RING

Richard A. Gross, Oconomowoc, Wis.; John R. Nottingham, Moreland Hills, and Dale A. Panasewicz, Strongsville, both of Ohio, assignors to AptarGroup, Inc., Crystal Lake, Ill.

Filed Sep. 25, 1992, Ser. No. 951,871

Int. Cl.^{5} B67D *5/00*

U.S. Cl. 222—153 **12 Claims**



1. A toggle-action dispensing closure for an opening to a container, said closure comprising:

a body for engaging said container over said opening;

an actuator means on said body for occluding flow from said container when said actuator means is in a closed non-dispensing position and for permitting flow from said container when said actuator means is tilted to an open dispensing position, said actuator means including a top wall defining an actuating surface that can be pushed by a finger, said actuator means including a downwardly facing engaging surface below said top wall;

mounting means defined by said body and actuator means for pivotally mounting said actuator means on said body forwardly of said actuating surface to accommodate pivoting movement of said actuator means between said closed position and said open position in response to a force applied to said actuating surface while preventing substantial relative rotational movement between said body and actuator means about a central axis; and

a locking ring mounted on said body for rotation relative to said body and actuator means about said central axis, said ring defining an upwardly projecting and upwardly facing abutment surface whereby rotation of said ring to a first orientation carries said abutment surface into alignment with said actuator means engaging surface to prevent tilting of said actuator means to said open dispensing position and rotation of said ring away from said first orientation carries said abutment surface out of alignment with said engaging surface to permit tilting of said actuator means to said open dispensing position.

5,314,094

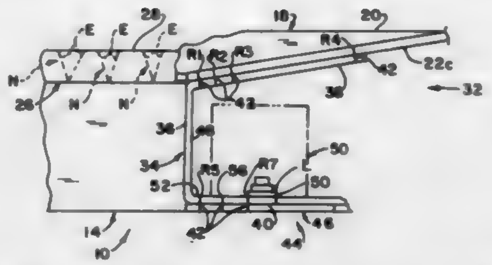
CLOTH FLUIDIZING MEMBRANE FOR HOPPER CAR OUTLET

Roger A. Dalske, Florissant; Dennis J. Schipper, and David M. Maechling, both of St. Charles, all of Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Filed Apr. 29, 1993, Ser. No. 55,685

Int. Cl.^{5} B65G *69/06*

U.S. Cl. 222—195 **15 Claims**



1. A limp, porous membrane of flexible sheet material for use with a fluidized outlet which is in communication with a container such as a hopper containing a pulverant, particulate lading which is fluidized and unloaded via said outlet, said outlet having a valve installed therein which, when open, allows fluidized lading to be unloaded through said outlet, said outlet having an outlet frame for securing said outlet to said hopper, an outlet opening in which said outlet valve is positioned, intersecting outlet walls extending between said frame and said opening, said membrane having an outer margin secured to said outlet frame;

boot means to which an inner margin of the membrane, defining an opening for the lading to flow through the membrane, is attached, said boot means being positioned at the top of an outlet pan; and,

means for securing said boot means to said outlet pan adjacent said outlet opening and including a ring means for locking said boot means in place whereby said opening in said membrane is secured adjacent said outlet opening for the lading to flow into said outlet through said valve.

5,314,095

DEVICE FOR THE METERING OF GRANULAR OR POWDERED PRODUCTS

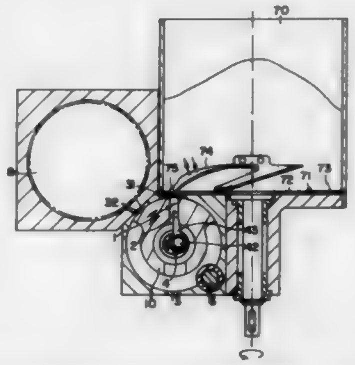
Michel Deal, Saint Remy En Rollat, France, assignor to Sedepro, Paris, France

Filed Jul. 2, 1991, Ser. No. 724,825

Claims priority, application France, Jul. 12, 1990, 90 09012

Int. Cl.^{5} G01F *11/20, 13/00*

U.S. Cl. 222—218 **13 Claims**



1. A metering device comprising a housing having admission and delivery ports, a body movable within the housing and

having a cylinder formed therein, at least one piston sweeping a given swept volume which piston slides within the cylinder, the cylinder moving between the admission port in which the products to be metered fill said swept volume and the delivery port, which is different from the admission port and in which the products to be metered are evacuated from said swept volume, said piston being scraped by said housing when the piston leaves the delivery port, and force-feed means above the admission port which force-feed means includes means to supply the products to be metered to the admission port and a head pressing with constant force in the direction of feeding of the cylinder providing controlled compaction of the products within the cylinder.

5,314,096

DUAL PURPOSE PUMP FOR PRESSURE VESSELS

Robert Feal, Leutenbach; Helmut Stelzmüller, Neuhausen, and Peter Janssen, Fellbach-Öffingen, all of Fed. Rep. of Germany, assignors to Alfred Karcher GmbH & Co., Winnenden, Fed. Rep. of Germany

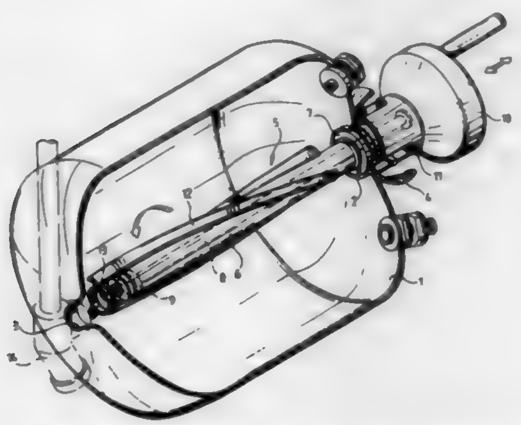
PCT No. PCT/EP91/00435, § 371 Date Nov. 13, 1992, § 102(e) Date Nov. 13, 1992, PCT Pub. No. WO91/14508, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 8, 1991, Ser. No. 923,993

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1990, 4009231

Int. Cl.⁵ B65D *83/00*

U.S. Cl. 222—401 **12 Claims**



1. A dual purpose pump for pressure vessels used for mixing and spraying a liquid, comprising:

a piston pump mounted in an interior portion of said pressure vessel;

said piston pump including a pump cylinder projecting into said interior of said pressure vessel, said pump cylinder being rotatable about a longitudinal axis thereof;

means for actuating said piston pump from the outside of said pressure vessel, said actuating means providing piston strokes to said piston pump for building up an increased pressure in said interior of said pressure vessel;

drive means for rotating said pump cylinder from the outside of said pressure vessel; and

a mixing element operatively connected to, and rotatable with said pump cylinder, said mixing element projecting into said liquid for mixing same.

5,314,097

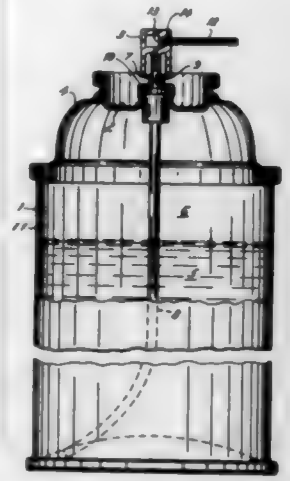
LONG DISTANCE MARKING DEVICES AND RELATED METHOD

Thomas J. Smrt, Marengo, and Walter S. Mierzwinski, Schaumburg, both of Ill., assignors to Fox Valley Systems, Inc., Cary, Ill.

Filed Apr. 23, 1990, Ser. No. 512,882

Int. Cl.⁵ B65D *83/00*

U.S. Cl. 222—402.1 **22 Claims**



1. A device for propelling a non-aerosolized liquid stream to long distances comprising

a container,

a liquid residing within said container,

a propellant residing within said container which remains gaseous when subjected to pressure within said container,

valve means comprising an inlet and an outlet for controlling the discharge of said liquid from said container, said valve means being biased in a closed position and being movable to an open position in response to external pressure thereto, wherein the inlet of said valve means is in communication with said container such that said liquid can flow from said container through said valve means, and

an actuator in communication with the outlet of said valve means such that said liquid can flow from the outlet of said valve means through said actuator and outwardly from said device, said actuator comprising a cylindrical tube having a length and an outlet at one end of said tube, wherein the inside diameter of said tube remains constant along its length and is equal to the diameter of the tube outlet from which the liquid exits the device,

wherein the combination of said valve means, said actuator, and said propellant cooperate to discharge said liquid from said container as a non-aerosolized liquid stream to a distance of from about ten to about twenty-five feet when said valve means is moved into the open position.

5,314,098

AUTOMATIC DOSING DISPENSER EMPLOYING ATMOSPHERIC VENT TO IMPROVE OPENING RELIABILITY

Joseph A. Milenkevich, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 24, 1993, Ser. No. 82,686

Int. Cl.⁵ B67D *5/64*

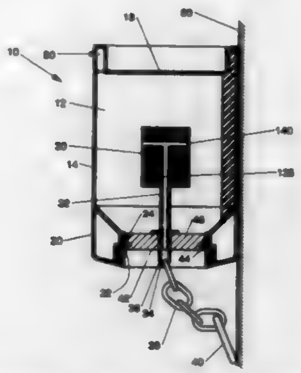
U.S. Cl. 222—463 **9 Claims**

1. An improved dispenser that permits reliably adding a predetermined quantity of fluid rinse additive to the rinse water in an automatic washing machine, said dispenser comprising:

(a) a container having an internal volume significantly greater than the volume of fluid additive to be dispensed to provide buoyancy and to prevent the dispenser becoming entangled within the articles being laundered;

(b) a filling/dispensing aperture disposed within the uppermost portion of said container for adding said fluid additive to said dispenser and for allowing rinse water to enter and exit said dispenser;

(c) a manually closable, centrifugally operable valve means for closing said filling/dispensing aperture in said container after said dispenser has been filled and for maintaining substantially all of said fluid additive within said dispenser throughout the wash cycle until said dispenser is subjected to a predetermined centrifugal force during the spin empty portion of the wash cycle, said predetermined centrifugal force being sufficient to cause said valve means to open, whereby said additive will be retained in said dispenser until it is flushed out by rinse water during the rinse portion of the laundry cycle; and



(d) said valve means further including a vent means within said container to vent the interior of said container to the atmosphere whenever said valve means is in its closed position, said vent means being positioned within said container so that it cannot be submerged in said fluid additive regardless of the orientation of said container so long as said valve means remains in its closed position.

5,314,099

CASTING SPOUT FOR METALLURGICAL VESSELS

Hans Butz, Duisburg; Gerd Diederich, Erpel; Hans-Juergen Ehrenberg, Duesseldorf; Dietmar Lohse, Wesel; Lothar Parschat, Ratingen, and Fritz-Peter Pleschiutschnigg, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/DE88/00172, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/06932, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 16, 1988, Ser. No. 415,320

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709188

Int. Cl.⁵ B22D *41/50*

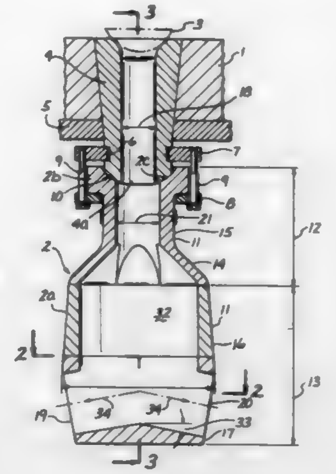
U.S. Cl. 222—606 **4 Claims**

1. Casting spout for metallurgical vessels arranged upstream of a mold for continuous casting of thin ingots, the casting spout being fastened to and extends down from a tundish and being provided for purposes of feeding molten steel into the mold, the improvement comprising:

the casting spout having an upper inflow end and a lower outflow end, an upper portion of the spout at the inflow end being configured as a round tubular shaft portion;

said casting spout having downstream from the tubular portion a conically widening portion but being conically widened down from the round shaft portion in a first vertical plane only, and being accordingly relatively narrow in a plane extending at right angles to said first plane; and

said casting spout being provided with a second still lower portion underneath the conically widened portion and having a rectangular cross section which extends over its height for a lengthwise cross section and terminates in an outflow area at said outflow end at a length-to-width ratio from 20:1 to 80:1 and a wall thickness of the second still lower portion of not more than 10 mm.



5,314,100

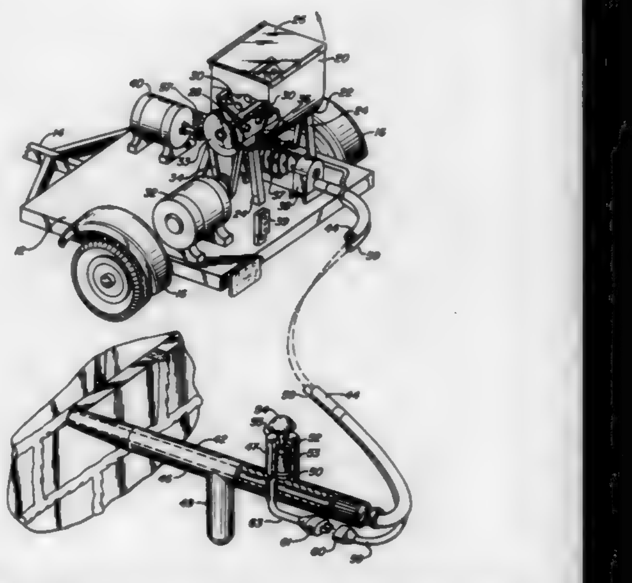
GROUT DELIVERY SYSTEM

Jim D. Deaver, P.O. Box 804, Templeton, Calif. 93465

Filed Sep. 25, 1992, Ser. No. 951,004

Int. Cl.⁵ F04B *17/06*

U.S. Cl. 222—626 **5 Claims**



1. A system for delivering grout to a grout application work area, comprising:

a grout storage hopper,

grout pumping means disposed below said hopper, said pumping means comprising a variable speed electric motor,

a passage means for conveying grout from said hopper to the pumping means, a flexible hose having one end thereof connected to the pumping means, whereby grout flows through said hose when the pumping means is operating,

a hand-held nozzle structure connected to the other end of said flexible hose for applying the flowing grout to the work area, said nozzle structure comprising a tubular flow duct, a first handle element projecting from said flow duct in a first direction, and a second handle element projecting from said flow duct in a second direction opposite to said first direction, whereby a person can grasp both handle elements for manipulating the nozzle structure, and

means for varying the speed of said pump motor to vary the grout flow rate through said nozzle structure, said motor speed-varying means comprising a potentiometric resistance in the first handle element, a pushbutton actuator slidably mounted in said first handle element, and an electrical slider carried by said pushbutton for traversing said potentiometric resistance in response to slidable movement of the pushbutton actuator, whereby a person holding the nozzle structure can vary the motor speed while observing the grout flow out of the nozzle structure.

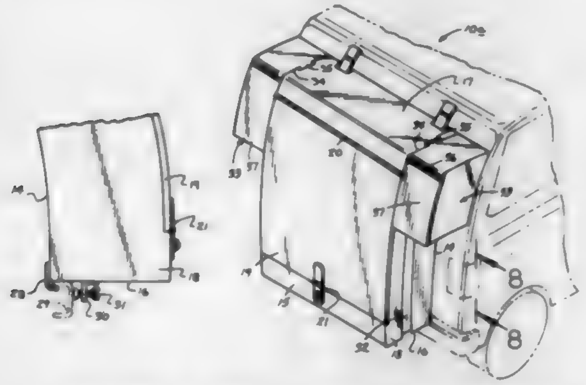
5,314,101
VAN STORAGE APPARATUS

Carter V. White, P.O. Box 427 Macedonia Rd., Ragland, Ala. 35131

Filed Mar. 1, 1993, Ser. No. 24,293

Int. Cl.⁵ B60R *9/00*

U.S. Cl. 224—42.03 A **2 Claims**



1. A van storage apparatus arranged for securement to a vehicular van, having a van rear door and a van rear bumper positioned in adjacency and below the rear door, wherein the apparatus comprises,

a container, the container having a container rear wall, a container front wall, a container bottom wall, a container top wall, and spaced container side walls, and

a container door having a door hinge pivotally mounting the container door to the container front wall, and

the container further including a container cavity accessed through the container door, wherein the container cavity includes a cavity floor and a plurality of shelf plates mounted within the cavity extending between the container side walls, and

mounting means for securement of the container to the van door and the van bumper, and

the mounting means includes a plurality of top wall openings directed through the container top wall in adjacency to the container rear wall, and each of the openings includes a support bracket extending therethrough, each support bracket having a hook portion for mounting to the van door, and each of the brackets includes a flexible strap positioned within the container for supporting a respective support bracket, and at least one first L-shaped bracket mounted to the container rear wall extending beyond the container rear wall and projecting in a spaced relationship in adjacency to the container bottom wall, and a second bracket fixedly and orthogonally mounted to the container bottom wall, having a threaded clamp rod threadedly directed in an orthogonal relationship relative to the second bracket, wherein the first L-shaped bracket and the second bracket are adapted to secure the van bumper therebetween.

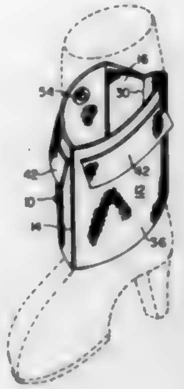
5,314,102
HANDBAG ASSEMBLY

Melinda S. Roy, Apt. 9Q, 529 W. 42nd St., New York, N.Y. 10036

Filed Sep. 19, 1991, Ser. No. 762,873

Int. Cl.⁵ A45F *4/00*

U.S. Cl. 224—151 **7 Claims**



1. A handbag, comprising:

an inner pocket,

an outer pocket, said inner and outer pockets each having a free side edge and a common side edge, each said pocket having an opening providing access to the interior of said pocket, the lower edges of said inner and outer pockets forming an oblique angle with the apex of said oblique angle at said common edge, the upper edges of said inner and outer pockets forming an oblique angle with the apex of said oblique angle at said common edge,

one of said pockets including first free side edge fastener means, the other of said pockets including second free side edge fastener means engageable with said first free side edge fastener means for fastening together the free edges of said inner and outer pockets to form a space between said pockets which comprises the interior compartment of said handbag with both pocket openings being accessible from the exterior of the handbag, and

complementary bottom edge fastener means attached to the lower portions of said inner and outer pockets for fastening the interior lower portions of said inner and outer pockets together to close the bottom of said interior compartment so that articles can be stored in said interior compartment, but whereby said first and second free side edge fastener means and said complementary bottom edge fastener means can be unfastened and said inner and outer pockets wrapped around a part of a wearer's body and secured in place on the wearer's body by said first and second side edge fastener means.

5,314,103
CONCEALABLE TISSUE BOX HOLDER

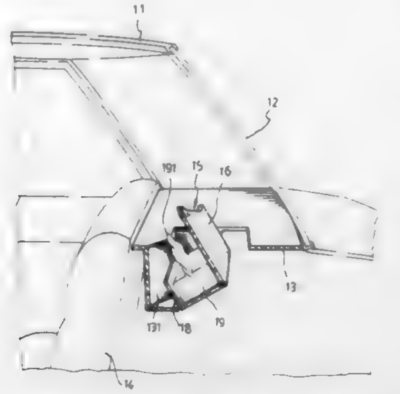
Kwan-Tao Li, 9F, No. 19, Lane 464, Tun Hua South Road, Taipei, Taiwan

Filed Aug. 12, 1992, Ser. No. 929,715

Int. Cl.⁵ B60R *7/00*

U.S. Cl. 224—282 **8 Claims**

1. A concealable tissue box holder for use in an automobile comprising a holder body with a surface panel to form a substantially open box for receiving therein a tissue box, said tissue box holder comprising means for pivotally securing said tissue box holder in a recess forced on a partition plate between a rear seat and a rear windshield of the automobile so as to be rotatable with respect to the partition plate between a concealed position where said tissue box holder is in the recess with the surface panel which is substantially complementary in shape and size to the recess covering said recess, and an open position where said tissue box holder is in an inclined position to expose the tissue box; said securing means comprising a pair of pin-like pivots in said recess and a pair of pin-receiving holes on the surface panel of said tissue box holder, said pin-receiving holes receiving the pin-like pivots to provide a pivotal engagement between said tissue box holder and said partition plate; said tissue box holder further comprising resilient securing means to secure the tissue box in the holder body of said tissue box holder.



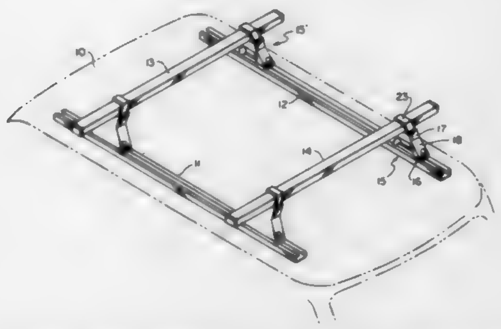
5,314,104
AUTO MOUNT FOR BICYCLE RACK

Douglas Lee, 8957 Sepulveda Blvd., Sepulveda, Calif. 91343

Continuation-in-part of Ser. No. 765,667, Sep. 26, 1991, Pat. No. 5,201,911. This application Apr. 8, 1993, Ser. No. 45,468

Int. Cl.⁵ B60R *9/00*

U.S. Cl. 224—321 **2 Claims**



1. A sports rack mountable on a roof of a vehicle having;

a curved roof with parallel rails extending longitudinally along said roof in fixed spaced-apart relationship said rails having an upwardly directed channel with inwardly directed flanges along said channel; said rack comprising;

a pair of crossbars for detachably carrying a sports article;

front and rear pairs of standoffs, each pair securing a crossbar to said parallel roof rails whereby said rack is critically located on said roof to accommodate the fixed distance between said parallel rails;

each of said standoffs includes a base portion and a rack portion integrally joined by an angular intermediate portion;

a pair of screw type anchor elements disposed beneath each said base portion and adapted to be slidably received in said channel and beneath said flanges of said rail;

each said rack portion having a yoke with a recess;

a hold-down member moveably carried in each said recess;

a fastener joining each said hold-down member to each respective recess;

securement fasteners joining each said base portion to each respective anchor elements;

an open-ended passageway carried on each hold-down member for insertably receiving a connection portion of said rack crossbar.

5,314,105
WIRE BONDING ULTRASONIC CONTROL SYSTEM RESPONSIVE TO WIRE DEFORMATION

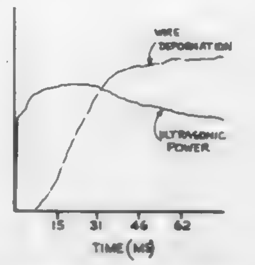
Farhad Farassat, Taufkirchen, Fed. Rep. of Germany, assignor to F & K Delvotec Bondtechnik GmbH, Oberhaching, Fed. Rep. of Germany

Filed Oct. 27, 1992, Ser. No. 967,410

Claims priority, application United Kingdom, Oct. 30, 1991, 9123047; Sep. 8, 1992, 9219029

Int. Cl.⁵ B23K *1/06, 20/10*

U.S. Cl. 228—102 **6 Claims**



1. A wire bonding apparatus for bonding a wire to a workpiece surface wherein the wire and/or the surface may have surface contamination which would interfere with the establishment of a good bond comprising

an ultrasonic transducer including a horn,

a bonding wedge secured to said horn for supporting a wire against the surface, whereby operation of said transducer will result in rapid displacement between the wire and the surface,

means for sensing the deformation of the wire,

means for determining when there is a sharp increase in the deformation of the wire,

means for operating said transducer at a high energy level until said determining means determines that there is a sharp increase in the deformation of the wire and for operating said transducer at a low energy level when said determining means determines that there is a sharp increase in the deformation of the wire.

5,314,106
METHOD FOR JOINING STEEL TO ALUMINUM ALLOY COMPONENTS OR TITANIUM ALLOY COMPONENTS, AND TURBOCHARGERS OBTAINED BY THE METHOD

Andrzej Ambroziak, Wroclaw, Poland; Rudolf Lison, Herzogenrath, and Rudolf Ricanek, Weilheim, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri AG, Baden, Switzerland

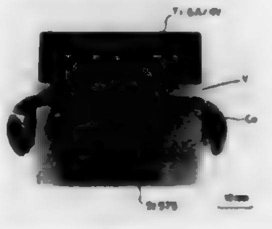
PCT No. PCT/CH92/00094, § 371 Date Mar. 16, 1993, § 102(e) Date Mar. 16, 1993, PCT Pub. No. WO92/20487, PCT Pub. Date Nov. 26, 1992

PCT Filed May 14, 1992, Ser. No. 960,351

Claims priority, application Fed. Rep. of Germany, May 16, 1991, 4116088

Int. Cl.⁵ B23K *20/12*

U.S. Cl. 228—114.5 **2 Claims**



1. A method for joining components of steel to those of a titanium alloy, comprising applying a copper layer to the steel by friction-welding and applying a vanadium layer to the

titanium alloy by friction-welding, removing a weld bead formed and joining the copper and vanadium surfaces to one another by friction-welding.

5,314,107

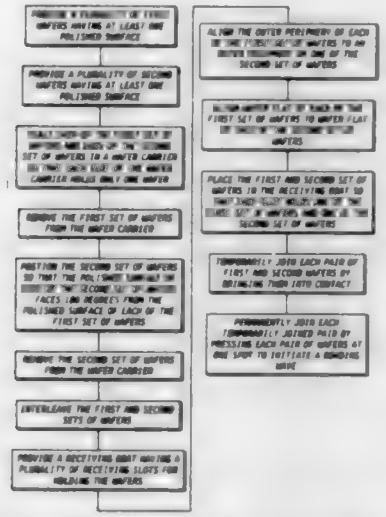
AUTOMATED METHOD FOR JOINING WAFERS

Frank S. d'Aragona; Raymond C. Wells, both of Scottsdale, and Sherry L. F. Helsel, Apache Junction, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1992, Ser. No. 999,342

Int. Cl.⁵ H01L *21/30*

U.S. Cl. 228—116 **13 Claims**


PROVIDE A PLURALITY OF SECOND WAFERS HAVING AT LEAST ONE POLISHED SURFACE
REMOVE THE FIRST SET OF WAFERS FROM THE WAFER CARRIER
REMOVE THE SECOND SET OF WAFERS FROM THE WAFER CARRIER
INTERLEAVE THE FIRST AND SECOND SETS OF WAFERS
PROVIDE A RECEIVING BOAT HAVING A PLURALITY OF RECEIVING SLOTS FOR HOLDING THE WAFERS
TEMPORARILY JOIN EACH PAIR OF FIRST AND SECOND WAFERS BY BRINGING THEM INTO CONTACT
PERMANENTLY JOIN EACH TEMPORARILY JOINED PAIR BY PRESSING EACH PAIR OF WAFERS AT ONE SPOT TO INITIATE A BONDING WAVE

8. An automated method for joining a number of first and second wafers in preparation for direct wafer bonding comprising the steps of:

providing a number of first wafers having one polished surface;

providing a number of second wafers having one polished surface;

providing a retainer having a number of receiving slots, each of the receiving slots including a first surface and a second surface, wherein the first and second surfaces meet to form an angle at a base of the slot;

placing the number of first and the number of second wafers in the number of receiving slots so that each of the polished surfaces of the number of first wafers is forced to contact one of the polished surfaces of the number of second wafers to form a temporarily joined pair of wafers; and

pressing each of the temporarily joined wafers at one spot to permanently join each of the temporarily joined pair of wafers with a bonding wave.

5,314,108

METHOD OF PRODUCING WELDED TUBE WITH EXCELLENT CORROSION-RESISTANT INNER SURFACE

Kazunori Takikawa, Mumazu, and Teruhisa Takahashi, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Limited, Sunto, Japan

Filed Dec. 2, 1992, Ser. No. 984,626

Claims priority, application Japan, Dec. 2, 1991, 3-343901

Int. Cl.⁵ B21D *39/00*

U.S. Cl. 228—144 **8 Claims**

1. A method of producing a welded tube with an excellent corrosion-resistant inner surface, in which at least one surface of a steel strip is coated with a first plate layer made of at least one selected from nickel, cobalt and alloys based on nickels and cobalt, the plated steel strip is formed into a welded tube with the plated surface being inside, a film-forming material of at least one selected from tin and tin-based alloys is inserted into the inside of the welded tube and the tube is then heat-treated at a temperature not lower than the melting point of the film-forming material by passing the tube through a continuous heating furnace having a non-oxidizing gas atmosphere therein so that the film-forming material as inserted into the welded tube is fused and spread over the first plate layer to form a second plate layer thereon, and the tube is finally cooled.

5,314,109

BRAZING ALLOY AND METHOD OF BRAZING

Farrokh Farzin-Nia, Inglewood, Calif., assignor to Ormco Corporation, Glendora, Calif.

Filed Apr. 26, 1993, Ser. No. 52,716

Int. Cl.⁵ C22C *30/02, 5/06*

U.S. Cl. 228—262.42 **14 Claims**

1. A method of joining at least two orthodontic and/or dental members together, comprising the steps of:

providing a brazing alloy containing at least about 50% by weight silver and at least about 20% by weight gold; and

brazing said at least two members together with said brazing alloy.

5,314,110

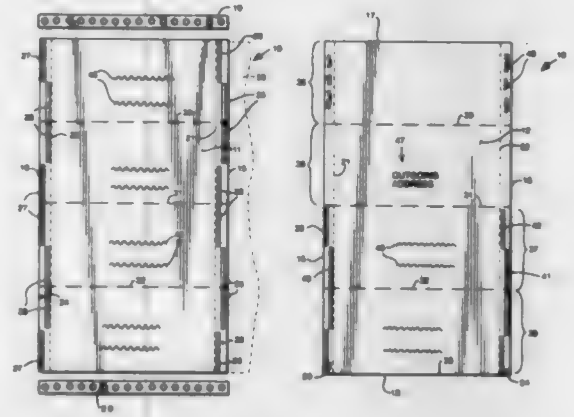
DOUBLE FOLD MAILER

Leo Lombardo, Manchester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jun. 1, 1992, Ser. No. 891,035

Int. Cl.⁵ B65D *27/10*

U.S. Cl. 229—92.1 **16 Claims**



1. An intermediate comprising:

a sheet of paper having a first face adapted to provide the majority of the interior of the mailer when constructed, and a second face adapted to provide the exterior of the mailer when constructed;

said sheet having first and second opposite parallel longitudinal edges, and opposite end edges;

first and second longitudinal lines of weakness formed in said sheet parallel to and adjacent, but spaced from, said first and second longitudinal edges, respectively, said lines of weakness defining, with said longitudinal edges, first and second longitudinal margin portions;

first and second longitudinal elongated patterns of adhesive disposed in said first longitudinal marginal portion of said first face, parallel to said longitudinal edges, and collectively covering substantially the entire distance between said opposite ends of said sheet;

third and fourth longitudinal elongated patterns of adhesive disposed in said second longitudinal marginal portion of said first face, parallel to said longitudinal edges, and collectively covering substantially the entire distance between said opposite ends of said sheet;

first, second and third fold lines formed in said sheet each perpendicular to said longitudinal edges, and dividing said sheet into, in sequence, first, second, third, and fourth panels of substantially equal size;

fifth and sixth elongated patterns of adhesive disposed in said first longitudinal marginal portion of said second face, parallel to said longitudinal edges, and collectively covering substantially the entire distance in the dimension of said longitudinal edges in said third and fourth panels;

seventh and eighth elongated patterns of adhesive disposed in said second longitudinal marginal portion of said second face, parallel to said longitudinal edges, and collectively covering substantially the entire distance in the dimension of said longitudinal edges in said third and fourth panels; and

wherein said sheet is devoid of adhesive extending along said end edges of said sheet between said longitudinal lines of weakness.

5,314,111

PACKAGING BOX AND SHEET FOR PACKAGING BOX

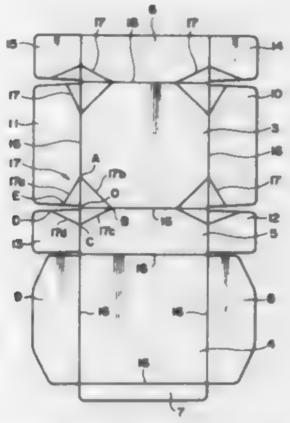
Yutaka Takaku; Toshihiro Suzuki; Jiro Wake; Kanji Motegi, and Masakatu Yanazawa, all of Fujisawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 17, 1992, Ser. No. 945,884

Claims priority, application Japan, Sep. 28, 1991, 3-277140; Jan. 21, 1992, 4-008768; Mar. 30, 1992, 4-074751; Mar. 30, 1992, 4-074758; Mar. 30, 1992, 4-103228; May 12, 1992, 4-123886; May 12, 1992, 4-123887

Int. Cl.⁵ B65D *85/67*

U.S. Cl. 229—110 **10 Claims**



1. A packaging box substantially comprising six sides including a top face and a bottom face, having at least one concaved section provided at a corner where three ridgelines meet, said concaved section being formed by folding said corner inward along three folding lines interconnecting said ridgelines.

5,314,112

FOLDER/PORTFOLIO AND ORIGAMI CONSTRUCTION FOR FORMING IT FROM A RECTANGULAR BLANK

Eric M. Jones, 134 Pelton Ave., Staten Island, N.Y. 10310

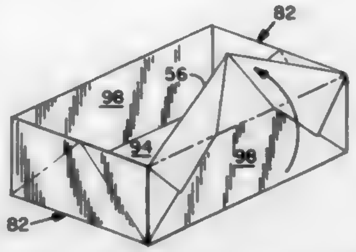
Filed Apr. 27, 1992, Ser. No. 874,390

Int. Cl.⁵ B65D *5/24*

U.S. Cl. 229—117.01 **20 Claims**

1. A portfolio, for storing flat sheet articles formed from a one-piece sheet material blank to provide a rectangular container comprising:

a) a bottom surface;
b) a pair of end walls hinged at a lower edge to said bottom surface;
c) a pair of side walls hinged at a lower edge to said bottom surface;
d) a pair of handle flaps each hinged at an upper edge thereof to an upper edge of a corresponding one of said side walls;
e) mechanical means for interlocking corner portions of said one-piece sheet material blank so as to maintain a mechanical alignment between said bottom surface, said side walls, said handle flaps and said end walls, said mechanical interlocking means including folded sections of each said corner portions which are frictionally engaged with each other and operatively engaged with folded sections of said handle flaps; and



f) means for permitting all of said walls to be simultaneously moved between erect and collapsed positions thereof while said corner portions are interlocked by said mechanical interlocking means;

all of said components a-f being defined in a one-piece sheet material blank.

5,314,113

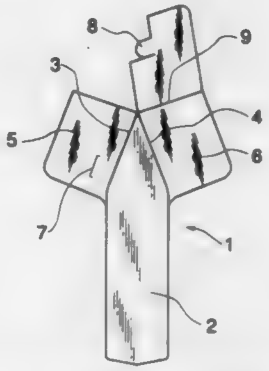
SUPPORT FOR CONSUMPTION OF ELONGATED FOODS

Fabio Irigoite, and Breno S. Mallmann, both of Porto Alegre, Brazil, assignors to Grupoutil Desenvolvimento de Produtos de/Utilidade Ltda., Porto Alegere, Brazil

Filed Sep. 29, 1992, Ser. No. 953,649

Int. Cl.⁵ B65D *5/46*

U.S. Cl. 229—117.12 **2 Claims**



1. A support for consumption of elongated foods, comprising:

a flexible and impermeable material element comprising a base of a substantially rectangular shape including a front section with a front edge; a first side edge and a second side edge connecting to a rear section with converging fold lines defining a vertex;

a first side wall extending upwardly from a first of said converging fold lines and a second side wall extending upwardly from a second of said converging fold lines, said first side wall including a cut slot and said second side wall including an indentation on a flap, a folding line provided in a middle section of said second side wall separating said flap from a remainder of said second side wall, said second side wall having a length approximately double a length of said first side wall, whereby said indentation is inserted in said cut slot.

5,314,114
FLIP-TOP RECLOSEABLE CARTON WITH POSITIVE CLOSURE ARRANGEMENT

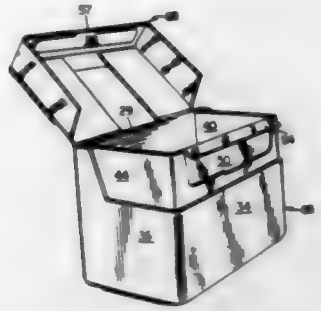
James L. Stone, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Dec. 14, 1992, Ser. No. 990,602

The portion of the term of this patent subsequent to Oct. 13, 2009, has been disclaimed.

Int. Cl.^{5} B65D *5/54, 5/56*

U.S. Cl. 229—225 **15 Claims**



1. A recloseable paperboard carton, comprising:

opposing top and bottom walls, opposing front and back walls, and opposing side walls;

wherein the side walls and front wall include inner and outer layers, an upper portion of the outer layers including an integral and continuous horizontal tea strip for opening up the carton from a sealed form to form a lid hingedly attached to a base section, and the inner layers being disposed adjacent to the upper portion of the outer layers; and

wherein the inner layer of the front wall includes a flap and a flap-receiving portion disposed in forcibly displaceable mutual engagement such that opening the carton lid exerts a force which disengages the mutual engagement between the flap and the flap-receiving portion, and reclosing the lid leads to snap re-engagement of the flap and the flap-receiving portion.

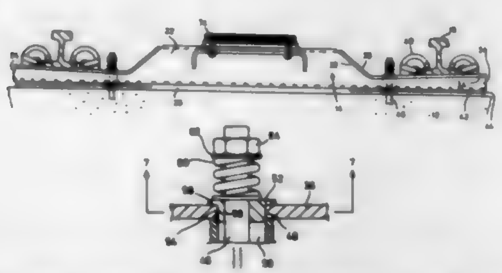
5,314,115
RAIL CROSS-TIE FOR LIM TRANSIT SYSTEM

Andranik Moucessian, Kingston, Canada, assignor to Bombardier Inc., Canada

Filed May 27, 1992, Ser. No. 889,526

Int. Cl.^{5} E01B *3/00*

U.S. Cl. 238—30 **24 Claims**



8. A guideway for a rail vehicle comprising a deck, a plurality of ties spaced apart generally parallel to one another transverse to the direction of movement of the vehicle along said guideway, each of said ties having a central portion and a pair of rail supporting portions located on opposite sides of said central portion, each of said rail supporting portions including an upwardly directed rail support pad with said central portion being elevated relative to said pads, said rail support pads being inwardly canted toward said central portion to provide a neck between said pads and said central portion, fastening means to secure each of said ties to said deck and including an anchor extending through an aperture formed in said neck and secured to said deck, a pair of rails, one supported on each of said pads, extending between the ties in said direction of movement and a reaction rail supported by and extending between said central portions of adjacent ties generally parallel to said rails.

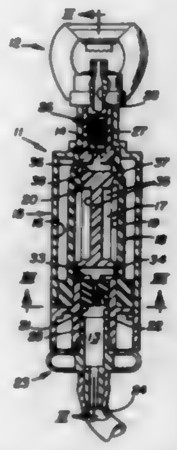
5,314,116
PULSATOR FOR IRRIGATION SYSTEMS AND THE LIKE

Richard G. Krauth, Fresno, and Steven P. Brunnengraeber, Clovis, both of Calif., assignors to Wade Manufacturing Co., Tualatin, Oreg.

Continuation of Ser. No. 822,998, Jan. 21, 1992, abandoned. This application Mar. 9, 1993, Ser. No. 28,406

Int. Cl.^{5} B05B *1/08*

U.S. Cl. 239—99 **20 Claims**



1. In a pulsator comprising a pulsator inlet for receiving pressurized liquid therein, a pulsator outlet adapted to discharge liquid in intermittent pulses therefrom, a mounting member, an elastomeric tube means, disposed on said mounting member and defining an expansible chamber therebetween, for movement from a normal contracted condition when the pressure of the liquid in said chamber falls below a predetermined level to an expanded condition when the pressure of the liquid in said chamber exceeds said level, and valve means for closing when said tube means is in its contracted condition and for intermittently opening when said tube means is in its expanded condition to discharge liquid from said chamber through said pulsator outlet in aid intermittent pulses in response to the pressure of the liquid in said chamber intermittently exceeding said level, and inlet means for continuously and unobstructively communicating liquid from said pulsator inlet and into said chamber when said tube means is in both its contracted condition closing said valve means and its expanded condition opening said valve means, including an annular clearance defined radially between said mounting member and said tube means in surrounding relationship relative to said pulsator inlet and wherein said valve means comprises said tube means engaging said mounting member in at least near line contact when said tube means is in its contracted condition closing communication of said chamber with said pulsator outlet, and slot means defined radially between said mounting member and said tube means to be continuously exposed to said chamber for continuously communicating liquid from said inlet means to an inlet side of said valve means.

5,314,117
FUEL NOZZLE GENERATING ACOUSTIC VIBRATIONS

Vitaly G. Pavljuk, ulitsa Lermontova, 14, kv. 188, Simferopol; Krarm P. Tsvetaev, ulitsa Revoljutsii, 3, kv. 3, Alupka; Jury Y. Dolgopolov, prospekt Pobedy, 48, kv. 25, Simferopol, and Alexandr I. Zhukov, ulitsa Sverdlova, 75, kv. 44, Yalta, all of

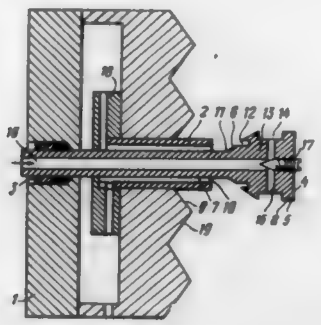
PCT No. PCT/RU92/00011, § 371 Date Sep. 30, 1992, § 102(e) Date Sep. 30, 1992

PCT Filed Jan. 20, 1992, Ser. No. 941,035

Claims priority, application U.S.S.R., Jan. 18, 1991, 4899373

Int. Cl.^{5} F23D *11/10;* **F02M** *67/00*

U.S. Cl. 239—102.1 **4 Claims**



1. A nozzle comprising a body (1) with a cylindrical sleeve (2) accommodating a tubular element (3) having an axially extending channel (16), at an end of which an acoustic head (5) is arranged with a surface (6) for generating acoustic vibrations; the nozzle body (1) supporting a reflecting surface (9); said tubular element (3) being arranged perpendicularly to said reflecting surface (9) so as to form an annular channel (10) between the internal surface of the sleeve (2) and the external surface of the tubular element (3); a radial channel (15) being formed in said acoustic head (5) and being in communication with said axial channel (16), characterized in that the nozzle is further provided with a device (18) associated with the nozzle body (1) for supplying a gas flow thereto, and a regulating element (17) arranged in said axial channel (16) in said tubular element; said surface (6) of said acoustic head being conically shaped and extending to an annular recess (12) provided in said acoustic head for generating acoustic vibrations; said reflecting surface (9) comprising a plurality of pyramids having lateral faces (19) joined to an outer cylindrical surface of the sleeve (2).

5,314,118
PIEZOELECTRIC CONTROLLABLE NOZZLE RESISTANCE FOR HYDRAULIC APPARATUS

Herbert Lembke, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Feb. 13, 1992, Ser. No. 834,774

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1991, 4104541; Oct. 30, 1991, 4135822

Int. Cl.^{5} F16K *31/02*

U.S. Cl. 239—102.2 **8 Claims**

1. A variable hydraulic nozzle resistance means adapted to supply at a hydraulic output a hydraulic signal in accordance with an electric input signal applied to an electric input thereof, said nozzle resistance means comprising:

a housing (2),

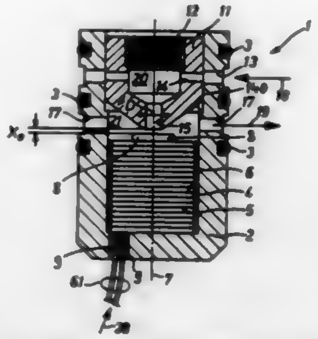
a piezoelectric means (5) for controlling the movement of a baffle plate (8) based upon the energization of said electrical signal,

a nozzle body (11) fixedly mounted within said housing, such that at least one bore (15) extending through said body has one end located adjacent to said baffle plate (8),

a second chamber (20) within said housing (2) and adapted to be connected to a fluid pressure source and further in communication with said bore (15),

a first chamber (21) within said housing separated from said second chamber (20) but in communication with said bore (15),

outlet means (17) in connection with said first chamber (21) to supply said hydraulic output signal (19) to a user, and wherein the distance X_o between the one end of said bore (15) ending in said first chamber (21) and the surface of the baffle plate (8) is reduced when the input signal is applied to said piezoelectric means, said reduction of distance being in accordance with the size of said electric input signal, so as to cause a respective variation of the hydraulic output signal (19).



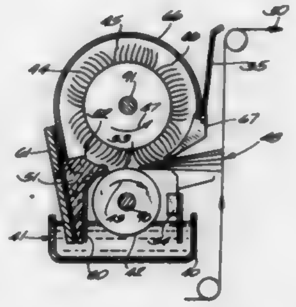
5,314,119
METHOD AND APPARATUS FOR APPLYING THIN COATINGS OF FLUID DROPLETS

Kenneth R. Watt, Huron, Ohio, assignor to Latanick Equipment, Inc., Huron, Ohio

Continuation-in-part of Ser. No. 869,757, Apr. 20, 1992, abandoned. This application Oct. 4, 1993, Ser. No. 130,841

Int. Cl.^{5} B05B *1/28, 3/02*

U.S. Cl. 239—220 **5 Claims**



1. In an apparatus for applying thin coatings of fluid droplets to an adjacent surface, said apparatus including a fluid container, a supply of fluid in said container, a pickup-roll rotating in said container whereby a film of said fluid is picked up on the surface of said pickup-roll, a rotatable brush-roll having bristles said brush-roll and said pickup-roll defining an entry nip, wherein the tips of the bristles pick up droplets of said fluid from the surface of said pickup-roll and project a spray pattern away from said rolls, said apparatus further comprising

a windage control device including a cross windage dam extending adjacent to the entry nip,

a brush windage knife supported adjacent to the entry nip to define a clearance between the windage knife and the tips of said bristles of said brush-roll, and

end cavity windage dams disposed perpendicularly to said cross windage dam adjacent the ends of said rolls,

5,314,120

DEVICE FOR APPLYING PLANT-PROTECTING COMPOSITIONS

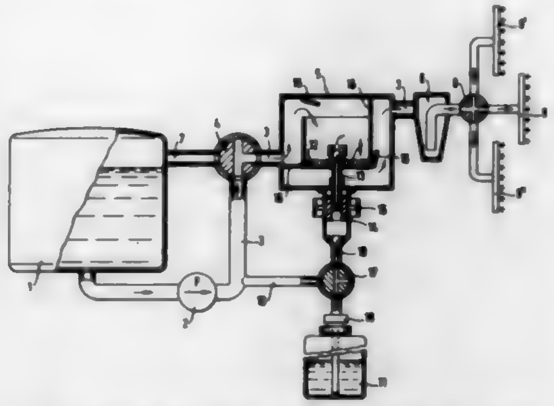
Karl L. Nau, Gross-Zimmern; Hans Raffel, Freinsheim, and Heinrich David, Wölfersheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 905,140, Jun. 23, 1992, abandoned, which is a continuation of Ser. No. 810,524, Dec. 18, 1991, abandoned, which is a continuation of Ser. No. 478,602, Feb. 12, 1990, abandoned. This application Jun. 18, 1993, Ser. No. 79,696

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904759

Int. Cl.⁵ B05B *7/30*

U.S. Cl. 239—310 **9 Claims**



1. An apparatus for applying a diluted liquid composition of predetermined concentration to a substrate, said apparatus comprising:

a tank which holds a carrier fluid;

a feed pump which pumps the carrier fluid from the tank through the apparatus;

a metering device through which all of the carrier fluid flows; and

a dosing device which is connected to said metering device and to a reservoir for a concentrated liquid composition, wherein said dosing device pumps the concentrated liquid composition from the reservoir directly into the carrier fluid in said metering device to form the diluted liquid composition;

said metering device having a drive element which moves in direct proportion to the amount of the carrier fluid flowing through said metering device and being driven only by the flow of the carrier fluid through said metering device, said drive element in turn providing all of the energy required to drive said dosing device;

said dosing device being connected to the drive element in a manner such that the amount of the concentrated liquid composition pumped into the carrier fluid is directly proportional to the amount of the carrier fluid pumped through said metering device;

the drive element being a movable piston which defines a moveable barrier between a first chamber and a second chamber in said metering device, said first chamber and said second chamber each comprising an inlet valve and an outlet valve;

each of said first and second chambers having a volume which increases and decreases relative to the motion of said movable piston, such that the volume of said second chamber will decrease as the volume of said first chamber increases and vice versa;

wherein, for each of said first and second chambers, said carrier fluid enters said chamber through its respective inlet valve, which is open as its volume increases, with its respective outlet valve being closed, and exiting through its respective outlet valve, which is open as its volume decreases, with its respective inlet valve being closed, the inlet valve of said second chamber being closed when the inlet valve of said first chamber is open, and the outlet valve of said second chamber being closed when the outlet valve of said first chamber is open, and vice versa, such that one of said first and second chambers is filling while the other is emptying, with the amount of carrier fluid passing through said metering device being equal to the product of volume of said chambers and the number of pumping cycles; and,

wherein said dosing device comprises a hollow metering piston with a return valve, said hollow metering piston being displaceable in a dosing chamber, wherein said hollow metering piston is connected to the drive element such that movement of the drive element results in proportional movement of said hollow metering piston, such that the dosing chamber fills with the concentrated liquid composition as said second chamber fills with the carrier fluid, and the concentrated liquid composition is pumped into said first chamber through the hollow metering piston as said first chamber fills with carrier fluid.

5,314,121

DISCHARGE DEVICE

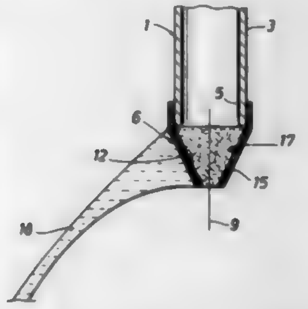
Grahame Y. Buss, and Wai L. Loh, both of Chester, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 12, 1991, Ser. No. 744,052

Claims priority, application United Kingdom, Aug. 29, 1990, 9018958

Int. Cl.⁵ B65B *3/22*

U.S. Cl. 239—553.3 **10 Claims**



1. A discharge device comprising a conduit having an outlet end and a porous permeable body having a central longitudinal axis, wherein said porous permeable body is joined to the outlet end of the conduit so that the central longitudinal axis of the porous permeable body extends in the direction of fluid flow through the outlet end during normal operation, wherein resistance to flow through the porous permeable body in the direction of its central longitudinal axis is larger than resistance to flow through the porous permeable body in a lateral direction; wherein the porous permeable body includes a core having pores and a side surface, and the core is connected to an annular layer having pores, and said annular layer is arranged around the side surface of the core, and wherein the permeability of the annular layer is smaller than the permeability of the core.

5,314,122

FUEL INJECTION VALVE

Martin F. Winter, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

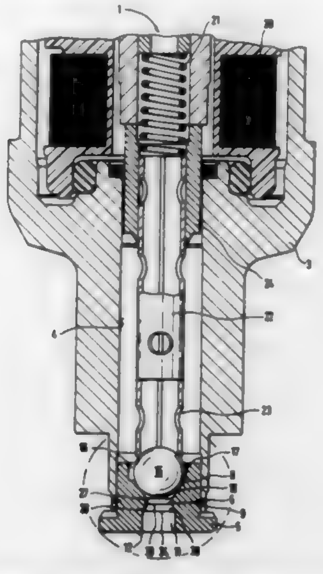
Filed Aug. 19, 1993, Ser. No. 109,035

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1992, 4239110

Int. Cl.⁵ F02M *61/18, 51/08, 69/04*

U.S. Cl. 239—585.1 **2 Claims**

1. A fuel injection valve having a valve housing, a valve seat body with a sealing seat, with which a valve closing member cooperates, wherein a conical taper is located downstream of the sealing seat and fuel is injected by means of a cylindrical injection conduit, the conical taper (10) is adjoined by a cylindrical conduit segment (9), at which a conical widening section (30) having a smallest opening (33) begins, and said conical widening section (30) merges at a largest opening (34) with the injection conduit (11), wherein the opening diameter of the largest opening (34) of the conical widening section (30) is larger than the opening diameter of the smallest opening (33) of the conical widening section (30) by at least 10% and at most 50% of the opening diameter of the smallest opening (33), and the opening angle of a wall (28) of the conical widening section (30) relative to a center axis of the conduit segment (9) amounts to from 20° to 30°, and the sum of the axial length of the conical widening section (30) and the axial length of the injection conduit (11) is at least 60% and at most 180% of the opening diameter of the smallest opening (33) of the conical widening section (30).



5,314,123

ELECTROSTATIC SPRAYING

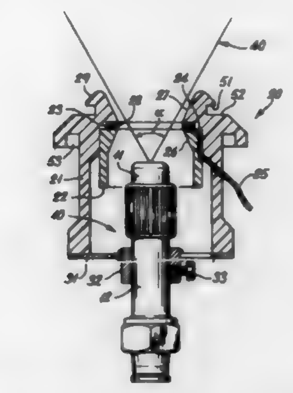
Paul C. H. Miller, Haynes, England, assignor to British Technology Group Ltd., London, England

Continuation of Ser. No. 839,698, Feb. 21, 1992, abandoned, which is a continuation of Ser. No. 634,187, Jan. 14, 1991, abandoned. This application Jan. 4, 1993, Ser. No. 550

Claims priority, application United Kingdom, Jul. 15, 1988, 8816906

Int. Cl.⁵ B05B *5/02*

U.S. Cl. 239—708 **8 Claims**



1. A spray arrangement comprising:

means for forming a spray of liquid droplets;

means for directing said spray of liquid droplets; and

means for applying an electrostatic charge to said liquid droplets;

wherein said applying means includes a spray-charging electrode and an insulating body supporting said spray-charging electrode;

wherein said insulating body includes a smoothly-constricted bore for allowing the free passage of spray therethrough, said constricted bore being formed at a smallest diameter region of said insulating body, with said electrode being housed within said insulating body at said constricted bore so that only an inward face of said electrode is exposed, said inward face defining an interior periphery of said bore, said inward face charging said spray as it passes through said constricted bore; and

wherein said body includes a surface outside of said constricted bore that slopes away from said bore so as to shed liquid that lands thereupon.

5,314,124

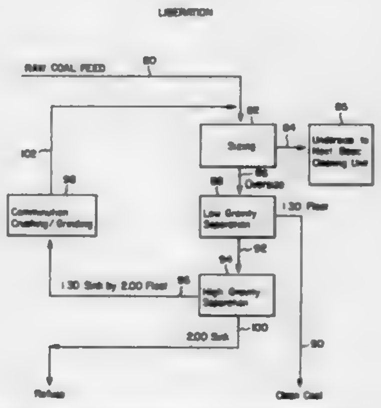
COAL CLEANING PROCESS

James K. Kindig, Boulder, Colo., assignor to Genesis Research Corporation, Carefree, Ariz.

Continuation-in-part of Ser. No. 492,312, Mar. 6, 1990, which is a continuation of Ser. No. 126,419, Nov. 30, 1987, abandoned. This application Oct. 15, 1991, Ser. No. 775,860

Int. Cl.⁵ B03B *5/32, 7/00;* **B04C** *5/00*

U.S. Cl. 241—20 **9 Claims**



1. A process for beneficiating coal comprising:

(a) providing a coal feed;

(b) dividing the coal feed into two fractions based on particle size;

(c) dividing the larger-particle-size fraction from (b) into three subfractions based on density, with the least dense subfraction comprising predominantly pure coal, with the densest subfraction comprising predominantly non-coal, and with the mid-density subfraction comprising a combination of coal and non-coal material;

(d) comminuting the mid-density subfraction from (c);

(e) combining the comminuted mid-density subfraction from step (d) with the smaller-particle-size fraction from step (b); and

(f) further beneficiating the combined fractions from step (e) to produce a clean coal product and a refuse stream.

5,314,125

GRINDING METHOD AND APPARATUS

Ietatsu Ohno, 7-26, 3-chome, Nishi-Shinjuku, Shinjuku-ku, Tokyo, Japan

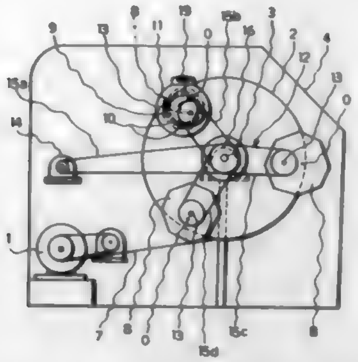
Filed Sep. 11, 1991, Ser. No. 757,561

Claims priority, application Japan, Sep. 21, 1990, 2-253570

Int. Cl.⁵ B02C *17/14*

U.S. Cl. 241—175 **13 Claims**

1. Apparatus for grinding or polishing particulate materials comprising a frame journalled about a central longitudinal axis, at least one grinding barrel each said grinding barrel being rotatably located within a supporting drum journalled on said frame for rotation in clockwise and counterclockwise directions about a second axis radially spaced from said central axis



and drive means for independently rotating said frame and each of said drums respectively, including means for selectively changing the direction of rotation of selected ones of said frame and said drums.

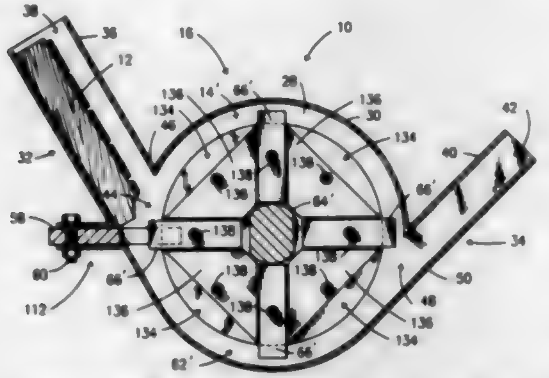
5,314,126
HAMMER MILL APPARATUS

Oscar E. Alvarez, Apr. 701, 5700 Mariner South, Tampa, Fla. 33609

Continuation-in-part of Ser. No. 833,792, Feb. 12, 1992, Pat. No. 5,205,501. This application Apr. 26, 1993, Ser. No. 52,566

Int. Cl.^{5} B02C *13/04, 13/26*

U.S. Cl. 241—189.1 **22 Claims**



1. A hammer mill apparatus to shred and chip pallets fed therethrough comprising a shredding rotor assembly rotatably disposed within a rotor housing including an entry portion and an exit portion formed therein, said shredding rotor assembly includes at least one rotor disc assembly having a plurality of hammer elements pivotally coupled to the periphery thereof being operatively connected to a rotor drive assembly and a corresponding plurality of hammer element control means each comprising a truncated triangularly shaped hammer element engagement means wherein each said hammer element control means is disposed in spaced relationship relative to the next adjacent hammer element control means to receive one of said hammer elements therebetween such that opposite sides thereof are disposed to engage the sides of adjacent hammer elements to limit the pivotal movement thereof, said rotor drive assembly including a drive motor and a rotatable rotor drive shaft to rotate said rotor disc assembly exerting centrifugal force on each plurality of hammer elements such that a line coincident with the longitudinal axis of each said hammer element extends through said rotatable rotor drive shaft whereby the outer end of each said hammer element engages pallets in said entry portion to shred and chip such pallets entering said rotor housing and discharges the reduced material from said exit portion.

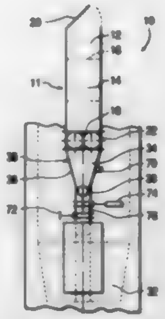
5,314,127
INFECTIOUS WASTE FEED SYSTEM

E. James Coulthard, York, Pa., assignor to Donlee Technologies, Inc., York, Pa.

Filed Jan. 25, 1993, Ser. No. 8,514

Int. Cl.^{5} F23K *1/00;* **B02C** *1/08*

U.S. Cl. 241—222 **20 Claims**



18. An infectious waste feed system for a combustor, the feed system comprising:

a receptacle for accepting waste materials;

means for comminuting the waste materials to a predetermined size, said comminuting means disposed to comminute waste materials accepted in the receptacle;

a trough disposed to receive the comminuted waste materials, the trough having a first end and a second end; and

feeding means disposed within the trough, said feeding means being movable in a first and a second direction within the trough for feeding the comminuted waste materials to the combustor; and

a feed duct including a first and a second end, the first end of the feed duct positioned adjacent the second end of the trough, the first end of the feed duct including a nonmovable shear edge projecting into the feed duct to cut off any projecting waste material as the material enters the feed duct.

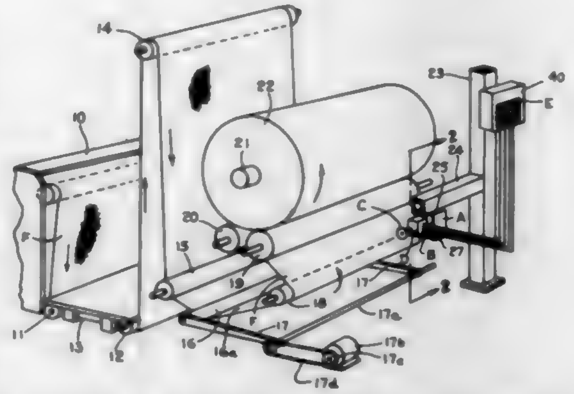
5,314,128
CLOTH MEASURING APPARATUS AND METHOD

William J. Alexander, III, Mauldin, S.C., assignor to Alexander Machinery, Inc., Mauldin, S.C.

Filed Jun. 8, 1990, Ser. No. 535,327

Int. Cl.^{5} B65H *18/20, 63/08*

U.S. Cl. 242—57 **4 Claims**



1. Apparatus for measuring the length of cloth moving from a loom in open width under a platform to a surface winder including a direction roll over which said cloth passes immediately prior to passing to a takeup roll comprising:

a support bracket;

an arm pivotally mounted upon said support bracket adjacent one end thereof so that another free end thereof is biased downwardly by gravity toward said cloth passing over said direction roll;

a wheel carried by said arm adjacent said free end rotated by engagement with said cloth passing over said direction roll in substantially tangential relation thereto;

a pulse generator carried by the arm adjacent the wheel actuated responsive to rotation thereof; and

a recording device receiving signals from said pulse generator.

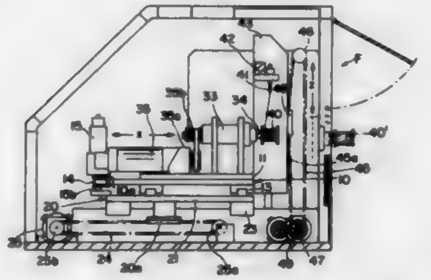
5,314,129
COIL WINDER WITH SPINDLEHEAD MOVABLE IN A HORIZONTAL PLANE

Antonio Rivara, Basiglio, Italy, assignor to Tekma Kinomat S.r.l., Caronno Pertusella, Italy

Filed Apr. 24, 1991, Ser. No. 690,804

Int. Cl.^{5} B21F *3/02*

U.S. Cl. 242—7.09 **3 Claims**



1. A coil winder comprising a plurality of rotary spindles each adapted to support a coil core, said spindles being rotatable about axes which are parallel to each other, a single support head supporting said plurality of spindles, a flyer for each said spindle, means for moving said support head relative to said flyers in each of two horizontal directions perpendicular to each other, said support head being carried by a first slide movable along one said horizontal direction and said first slide is mounted on a second slide movable along the other said horizontal direction perpendicular to the first said horizontal direction, and means for moving said slides selectively in said horizontal directions.

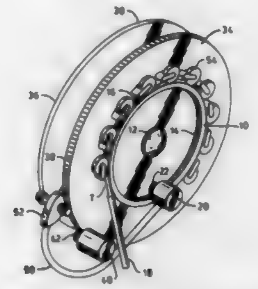
5,314,130
COMBINATION CAPSTAN AND STOWAGE REEL ASSEMBLY FOR ARRAYS TOWED BY SUBMARINES

Edwin H. Wood, North Franklin, and John P. Tullai, Salem, both of Conn., assignors to The United Stats of Americas as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 11, 1993, Ser. No. 75,369

Int. Cl.^{5} B65H *75/34*

U.S. Cl. 242—54 R **10 Claims**



1. A capstan and stowage reel assembly for arrays towed by submarines, the assembly comprising:

a capstan mounted for rotation about an axis, said capstan having an annular toothed wall and an annular external wall adapted to receive cable/array means thereon;

toothed capstan drive means engaged with said toothed wall to cause said rotation of said capstan;

a combination winch/stowage reel mounted for rotation about said axis, said reel having first and second circular flanges adapted to receive said cable/array means therebetween, said first flange having a toothed portion;

a reel drive means threadedly engaged with said toothed portion of said reel to cause said rotation of said first flange and thereby rotation of said reel; and

guide means extending from proximate said capstan to proximate said reel for facilitating transition of said cable/array means between said capstan and said reel.

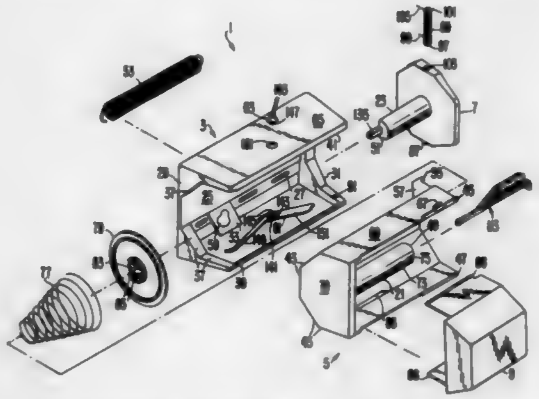
5,314,131
APPARATUS FOR DISPENSING ROLLED FLEXIBLE SHEET MATERIAL

Forrest S. McCanless, Oxford, and Bruce T. Boone, Acworth, both of Ga., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Jan. 4, 1993, Ser. No. 113

Int. Cl.^{5} B65H *16/02*

U.S. Cl. 242—55.3 **37 Claims**



1. An apparatus for storing and dispensing a plurality of rolls of flexible sheet material, comprising:

a housing defining a storage section and a dispensing section;

a storage mandrel for receiving and co-axially supporting within said storage section a reserve roll of sheet material;

a dispensing mandrel movable between a first position wherein a supply roll of sheet material may be co-axially rotatably supported within said dispensing section for dispensing material therefrom, and a second position for user withdrawal of a depleted roll core from the dispensing mandrel; and

transfer means for automatically transferring a reserve roll from a reserve position on the storage mandrel to a dispensing position on the dispensing mandrel, responsive to said dispensing mandrel substantially arriving at said first position after withdrawal of a depleted roll core.

5,314,132
METHOD FOR CHANGING SPOOLS AND APPARATUS THEREFOR

Masatoshi Ando; Hiromine Mochizuki, both of Hyogo, and Mitsuo Yamamoto, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Kanzaki Paper Mfg. Co., Ltd., both of Tokyo, Japan

Filed Mar. 12, 1992, Ser. No. 849,936

Claims priority, application Japan, Nov. 26, 1991, 3-311074; Nov. 26, 1991, 3-311075; Jan. 7, 1992, 4-018219

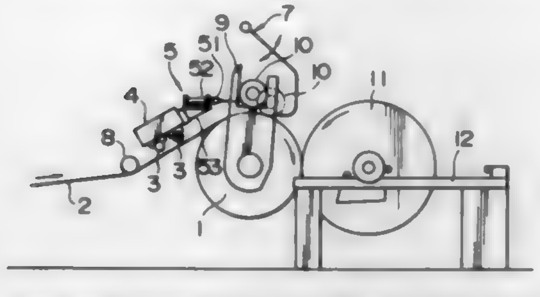
Int. Cl.^{5} B65H *18/16, 19/26, 19/28*

U.S. Cl. 242—56 R **9 Claims**

1. A method for changing spools in which a sheet continuously supplied to a reel drum is wound onto a new spool, comprising the steps of:

bringing the new spool from a waiting position into contact

with the reel drum at the time for replacing the spool, said drum having an upstream side forward of the point of contact with said spool and a downstream side past the point of contact with said spool;
cutting the center part of said sheet with two cutting devices along two approximately parallel cut lines to form a leading ribbon on the upstream side of said reel drum in the direction of sheet movement;
moving said cutting devices after forming said leading ribbon to the respective side edges of said sheet to cut said sheet along oblique lines on the upstream side of said reel drum in the direction of sheet movement;
applying a two-sided adhesive label to said leading ribbon on the upstream side of said reel drum whereby said label engages with said new spool upon movement of said sheet and becomes sandwiched between said ribbon and said spool for lifting and adhering said ribbon to said spool; and
cutting the lifted part of said leading ribbon by an independent cutting device at a location slightly downstream from the point where said new spool comes into contact with said sheet on the downstream side of said reel drum.



5,314,133
SUPPLY APPARATUS FOR COLOR-BEARING FILM

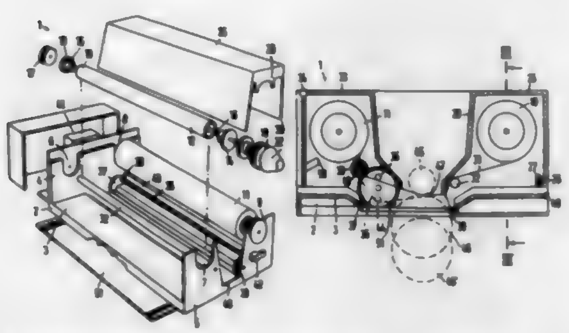
Helmut G. Sandner; Peter Ulrich, both of Rodgau; Robert N. Francois, Wehrheim, all of Fed. Rep. of Germany, and Michael Hawkins, Halifax, United Kingdom, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1992, Ser. No. 876,935

Claims priority, application Fed. Rep. of Germany, May 2, 1991, 4114314

Int. Cl.^{5} G03B *1/04*

U.S. Cl. 242—67.3 R **19 Claims**



5. Color-bearing film supply apparatus, comprising:
a supply roll for holding unused color film;
a waste roll for holding used color film;
a cassette-type, portable housing supporting the supply roll and the waste roll, such that when one end of an elongated sheet of the color-bearing film is wound on the supply roll and another end of the elongated sheet is wound on the waste roll, a length of the color-bearing film extend between the supply roll and the waste roll;
the housing having between the supply roll and the waste roll an opening at least as wide as the color-bearing film which permits free access to both sides of the color-bearing film;
a straight edge that operates on the length of the color-bearing film and deflects a travel path of the color-bearing film;
a color film feed guide having a bar extending perpendicularly to the direction of travel of the color film, the bar supported on both sides in first rotatable gears each supported rotatably in the housing, whereby axes of the first gears lie in a straight line and an actuating device is provided to rotate the first gears synchronously; and
means for shifting the feed guide between two positions to change the path of the color film at least in the area of the opening.

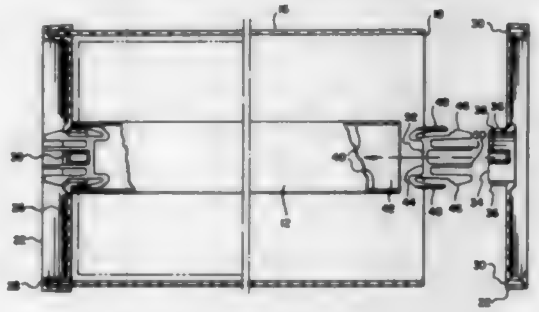
5,314,134
ANTI-CLOCKSPRINGING CASSETTE FOR A ROLL OF WEB MATERIAL AND METHOD

Clark E. Harris; Joel R. Shaw, both of Fairport; Thomas C. Healey, and Mark J. Morse, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1992, Ser. No. 979,515

Int. Cl.^{5} B65H *75/18;* **B65D** *85/60*

U.S. Cl. 242—71.1 **8 Claims**



1. A cassette for holding and dispensing a roll of photosensitive web material, said cassette comprising:
a web core rotatable about an axis and having an inner peripheral surface defining a core opening;
at least one end cap having a tubularly shaped hub member insertable into said core opening for rotatably supporting said web core, said hub member having an outer peripheral ramp radially spaced from said inner peripheral surface of said web core to form an annular gap therebetween;
a jacket encasing said web core and supported by said end caps; and,
anti-clockspringing means for securing said web core against rotation during shipping and handling, and for releasing said web core for rotation in a forward direction during web transport from said cassette, the anti-clockspringing means comprising:
a fork slidably mounted within at least one hub member each fork having at least one latch finger at one end, and at least one lock finger at the opposite end, said fork being further slidably movable between a core-locked position in which said latch finger latchingly engages said end cap and said lock finger is wedged into said annular gap between said hub member and said web core for locking web core from rotation, and a core-released position in which said latch finger is disengaged from said end cap and said lock finger is disengaged from said annular gap for allowing web core rotation.

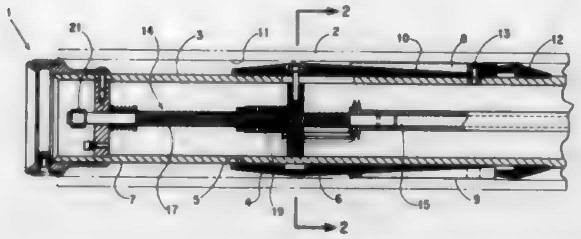
5,314,135
EXPANDABLE MANDREL

Albert W. Forrest, Jr., Chillicothe, and Mark R. Jones, Reynoldsburg, both of Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1991, Ser. No. 748,223

Int. Cl.^{5} B65H *75/18*

U.S. Cl. 242—72.1 **6 Claims**



1. A mandrel for mounting a tubular core for winding a web of sheet material, such mandrel being slidably positioned into the core and including:
a tube having an inner and outer cylindrical surface;
a pair of inner tapered elements positioned in spaced relationship with each other on the outer surface of the tube,
such inner elements each having a first cylindrical inner surface, a second tapered outer surface and an angle of taper therebetween, with such first inner surfaces being positioned in slidable contact with the outer cylindrical surface of the tube,
a pair of expandable outer tapered elements positioned in spaced relationship with each other in the axial direction and each in abutting contact with a respective inner element,
such outer elements each having a first cylindrical outer surface and a second tapered inner surface, with each of said second tapered surfaces being positioned in operative relationship with a respective second tapered outer surface of one of said inner elements and with the outer elements being adapted to be expanded outwardly,
means for connecting the inner and outer elements to the tube and means for restricting the axial and rotational movement of the outer elements with respect to the tube,
said core having an inner and outer cylindrical surface,
means in the form of a floating screw connected to the inner elements for moving such inner elements axially inwardly toward each other whereby sliding contact of the tapered outer surface of such inner elements with the tapered inner surfaces of the outer elements expands the outer elements radially outwardly in a uniform manner and moves their cylindrical outer surfaces into uniform contact with the inner surface of the core whereby to grip and mount the core for winding and
wherein such floating screw is also adapted to move the inner elements away from each other to release the gripping force of the outer elements with the core so that the mandrel can be removed from the core after completion of the winding operation.

5,314,136
STOP BRAKE FOR SUPPLY MANDREL

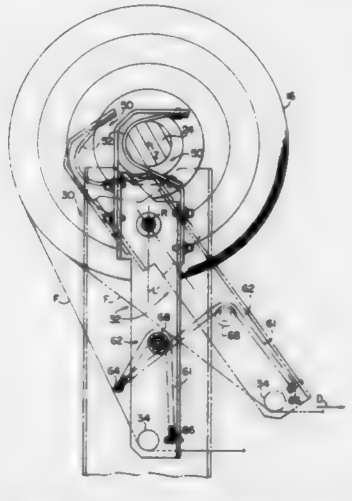
Robert M. Vaida, 132 Crystal Lake Rd., Ellington, Conn. 06029; Richard Kuchta, 67 Meadowwood Dr., Tolland, Conn. 06084, and Philip W. Cenedella, 88 North St., East Douglas, Mass. 01516

Filed May 31, 1991, Ser. No. 708,875

Int. Cl.^{5} B65H *23/08*

U.S. Cl. 242—75.4 **16 Claims**

1. A supply roll brake comprising:
a support;
at least one brake arm pivotally connected to said support for rotation about a pivot axis;
said at least one brake arm having a first end portion and an opposite second end portion with said pivot axis being interposed therebetween, said at least one brake arm being pivotal about said pivot axis between a first given orientation and a second different orientation;
holding means associated with said brake arm first end portion for gripping and holding a portion of a cylindrical surface against rotation when said brake arm is in said first given orientation relative to said support;
biasing means associated with said brake arm second end portion for urging said brake arm toward said first given orientation;
said holding means including a flexible strap;
said at least one brake arm at the first end portion thereof having means for attached said flexible strap to said at least one brake arm such that said flexible strap is connected to the first end portion of said brake arm so as to create a conformable pocket thereon opening toward said cylindrical surface and allowing the first end portion of said at least one brake arm to be moved away from said cylindrical surface as the at least one brake arm moves from said first given orientation to said second different orientation; and
means secured to said brake arm along said second end portion thereof for engaging with and directing sheet material away from a supply roll carried on said cylindrical surface and for causing said brake arm to be pivoted about said pivot axis away from said first given orientation and to said second different orientation in response to advancement of sheet material from the supply roll.



5,314,137
DEVICE FOR MAINTAINING BIASING STATE OF BIASING FORCE APPLICATION MEANS USED IN SEAT BELT RETRACTOR

Yoshiichi Fujimura, Shiga, and Shizutaka Matsuura, Hikone, both of Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Mar. 10, 1993, Ser. No. 29,406

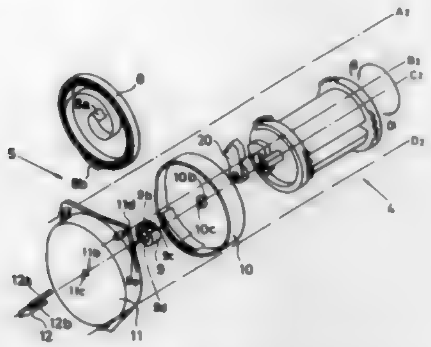
Claims priority, application Japan, Mar. 16, 1992, 4-058025

Int. Cl.^{5} B60R *22/34;* **B65H** *75/48*

U.S. Cl. 242—107 **2 Claims**

1. In a biasing force application means used in a seat belt retractor, which includes a bush fitted to a reel shaft so as to be unable to rotate relative to it, a spring casing for accommodating said bush, a cover for covering said spring casing, and a spring accommodated in said spring casing and retained at an inner end thereof by said bush and at an outer end thereof by said spring casing so that said reel shaft is biased by spring force from said spring so as to rotate in a direction for winding up a webbing,
a device for maintaining a biasing state of said biasing force

application means, said device comprising a pair of small holes formed in said spring casing, a predetermined number of grooves formed in said bush, a pair of small holes formed in said cover, and a rotation preventing member formed from an elastic material and having a pair of rotation preventing arms capable of piercing through said small holes and grooves, said rotation preventing member being attached to said biasing force application means in a state where said spring has been wound up by a predetermined amount so that said pair of rotation preventing arms pierce through said small holes of said spring casing, two of said grooves of said bush and said pair of small holes of said cover, thereby maintaining said spring in the wound-up state.



5,314,138

PRELOADER FOR USE IN A WEBBING RETRACTOR

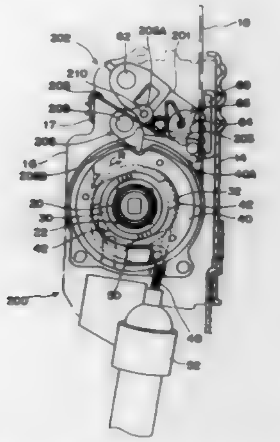
Yasutaka Watanabe; Kenji Matsui; Fuminori Teraoka, and Kohbun Tanaka, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Nov. 8, 1991, Ser. No. 789,285

Claims priority, application Japan, Nov. 27, 1990, 2-124731; Jul. 12, 1991, 3-054232

Int. Cl.⁵ B60R *22/46, 22/42*

U.S. Cl. 242—107.2 **6 Claims**



5. A preloader for use in a webbing retractor for retracting an occupant-restraining webbing onto a webbing takeup shaft so as to allow the webbing to be applied to the occupant with appropriate tightness, comprising:

a frame by which said webbing takeup shaft is rotatably held;

a rotatable drum disposed in spaced-apart relationship with said webbing takeup shaft for engaging said webbing takeup shaft;

a plate rotatably supported by said frame such that said rotatable drum is spaced apart from said webbing takeup shaft;

clamp means having an urging member for constantly urging said clamp means in a direction in which said clamp means clamps an intermediate portion of the webbing, said clamp means being disposed in a state in which said clamp means does not clamp the webbing being drawn out of said webbing takeup shaft, and said clamp means being adapted to prevent the drawing out of the webbing in a clamping state of said clamp means by clamping the intermediate portion of the webbing being drawn out of said webbing takeup shaft;

trigger means for permitting the movement of said clamp means in the webbing-clamping direction when said plate rotates; and

driving means for causing said rotating drum to deform and engage said webbing takeup shaft when the vehicle suddenly decelerates by applying a radial load to said drum and for rotating said drum and said take-up shaft in a webbing-taking-up direction, and

a shear pin operatively disposed between said trigger means and said clamp means, wherein said plate is rotated when said drum rotates and said shear pin is broken when a predetermined load or greater is applied to said shear pin by said drum via said plate.

5,314,139

TRANSFER TAIL HOLDING DEVICE

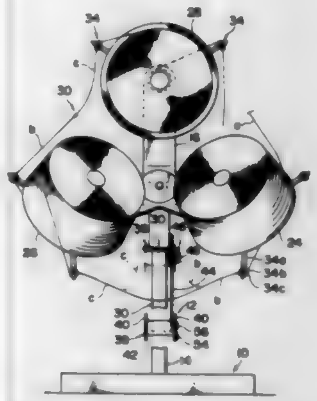
Kiyoaki Mori, Komatsu, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan

Filed Sep. 18, 1992, Ser. No. 947,137

Claims priority, application Japan, Sep. 20, 1991, 3-268585

Int. Cl.⁵ B65H *49/12*

U.S. Cl. 242—131 **11 Claims**



1. A combination of a weft feeding means for successively moving weft packages from a spare weft package position to a first weft package position for feeding the weft, and a transfer tail holding device for holding a transfer tail formed between the weft packages respectively in the first weft package position and the spare weft package position, said transfer tail holding device comprising:

a holding member positionable adjacent to a first position between the weft packages in the first and spare weft package positions and having a notch for receiving said transfer tail, and

a positioning means for selectively moving the holding member toward and away from the first position.

5,314,140

TAPE CARTRIDGE DRIVE BELT HAVING A LOW RATIO OF STATIC TO DYNAMIC FRICTION

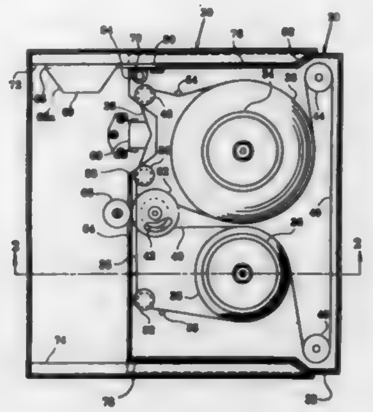
Gerhard Rotter, Mission Viejo, Calif., assignor to Athana Incorporated, Torrance, Calif.

Continuation-in-part of Ser. No. 662,755, Mar. 1, 1991, Pat. No. 5,203,519. This application Dec. 31, 1992, Ser. No. 999,306

The portion of the term of this patent subsequent to Apr. 20, 2010, has been disclaimed.

Int. Cl.⁵ B65H *20/06;* **G11B** *15/26*

U.S. Cl. 242—192 **3 Claims**



1. A tape cartridge comprising:

a first reel mounted for rotation around its axis;

a second reel mounted for rotation around its axis;

a flat elongate magnetic tape extending between said reels having at least one end of said tape convolutely wound on one of said reels;

tape guide means for bidirectionally moving said tape along a defined path from one of said reels to the other of said reels;

a closed loop elongate drive belt having a drive surface;

belt guide means supporting said drive belt for movement along a defined path maintaining an elongate portion of said drive surface in contact with an elongate portion of a surface of said tape;

said belt drive surface having an average surface roughness less than 7 microinches zero to peak and a frictional characteristic relative to said tape surface such that the ratio of static to dynamic coefficients of friction between said surfaces is less than 2.

5,314,141

CASSETTE LOADING DEVICE FOR ACCOMMODATING CASSETTES OF DIFFERENT SIZES IN A TAPE CASSETTE RECORDING AND/OR REPRODUCING APPARATUS

Masami Ishii; Osamu Murayama; Kenji Kasahara; Yoshimori Horiuchi, and Toshihiro Tokito, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 713,986

Claims priority, application Japan, Jun. 19, 1990, 2-160296; Jun. 19, 1990, 2-160297; Jun. 19, 1990, 2-160298

Int. Cl.⁵ G11B *15/66, 15/18*

U.S. Cl. 242—199 **20 Claims**

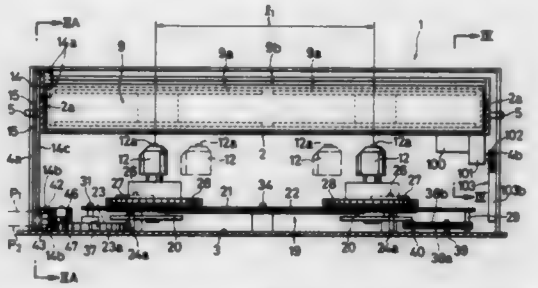
1. A tape cassette recording and/or reproducing apparatus capable of selective operation with a relatively large-sized cassette and a relatively small-sized cassette having relatively large and small widths, respectively, and containing respective pairs of rotatable reels which, in said large-sized cassette, have a first relatively large center-to-center distance and, in said small-sized cassette, have a second relatively small center-to-center distance, said apparatus comprising:

a cassette holder movable between a cassette receiving and discharging position and a loading position and being operative to receive a selected one of said relatively large-sized and small-sized cassette when in said cassette receiving and discharging position and to convey the selected cassette therewith to said loading position;

means guiding said cassette holder to move in a path having a horizontal portion extending from said cassette receiving and discharging position to an intermediate position and a vertical portion extending from said intermediate position to said loading position;

a pair of reel bases movable relative to each other for varying the center-to-center distance between said reel bases;

reel base adjusting means selectively driven in a first mode for moving said reel bases to first positions in which said center-to-center distance therebetween is equal to said first center-to-center distance so as to be engageable with the reels of a relatively large-sized cassette conveyed by said cassette holder to said loading position, and in a second mode for moving said reel bases to second positions in which said center-to-center distance therebetween is equal to said second center-to-center distance so as to be engageable with the reels of a relatively small-sized cassette conveyed by said cassette holder to said loading position, said reel base adjusting means completing movements of said reel bases to said first positions or said second positions thereof during movement of said cassette holder along said horizontal path portion to said intermediate position;



detecting means for detecting the size of a cassette received in said cassette holder in said cassette receiving and discharging position and which selects first and second conditions when detecting said relatively large-sized and relatively small-sized cassettes, respectively; and

drive means propelled by said cassette holder and movable with said cassette holder during movement of said cassette holder only between said cassette receiving and discharging position and said intermediate position and being responsive to said first and second conditions of said detecting means for driving said reel base adjusting means in said first and second modes, respectively, and thereby disposing said reel bases in said first and second positions, respectively, thereof when said cassette holder conveys a relatively large-sized cassette or a relatively small-sized cassette, respectively, to said loading position.

5,314,142

WING ROOT AEROFOIL FOR FORWARD SWEPT WINGS

Alison J. Rao, and Francis B. Ogilvie, both of Hatfield, Great Britain, assignors to British Aerospace Public Limited Company, London, England

Filed Mar. 18, 1992, Ser. No. 854,016

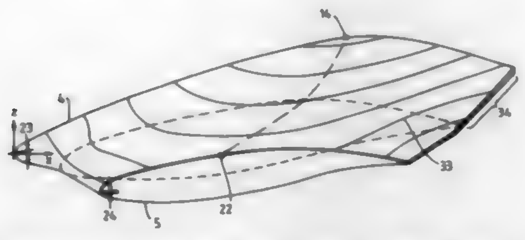
Claims priority, application United Kingdom, Mar. 19, 1991, 9105767

Int. Cl.⁵ B64C *21/00, 3/10, 3/44*

U.S. Cl. 244—35 A **4 Claims**

1. A swept forward wing for a transonic flight aircraft comprising an inner wing portion and an outer wing portion, said inner wing portion including a wing root section having a far aft maximum thickness position coupled with high camber in a region of said maximum thickness position, said wing root section further including a negatively cambered leading edge

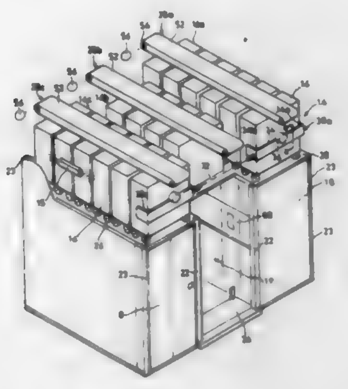
portion and a nose-down twist configured to suppress high leading edge velocities wherein the combination of thickness and camber forms aft of said leading edge region causes air flow to accelerate until a maximum velocity is reached aft of the 50 percent chord line on said wing and whereby steep recompression during transonic flight is alleviated by significant three dimensionality of the flow over said inner wing portion.

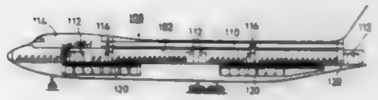


5,314,143
AIRCRAFT CABIN CONSTRUCTION

David Luria, Tel Aviv, Israel, assignor to Fuselage Engineering Services Ltd., Tel-Aviv, Israel

Continuation of Ser. No. 812,461, Dec. 23, 1991, abandoned.
This application May 12, 1993, Ser. No. 59,716
Claims priority, application Israel, Dec. 27, 1990, 96799
Int. Cl.^{5} B64D *11/04*
U.S. Cl. 244—118.1 **12 Claims**





1. An aircraft cabin construction comprising an outer fuselage wall enclosing a main passenger compartment extending longitudinally of the aircraft for a major portion of the length of the aircraft and including a ceiling spaced below the outer fuselage wall, a deck below said ceiling, and a plurality of passenger seats fixed to said deck under said ceiling;

characterized in that said cabin construction further includes:

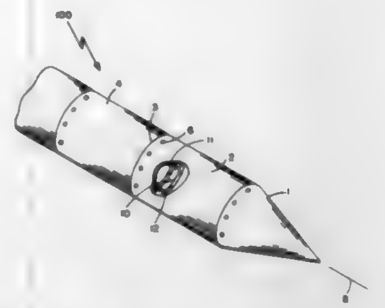
a storage compartment extending centrally through the space between said outer fuselage wall and said ceiling for a substantial part of the length of the main passenger compartment for storing article holders;

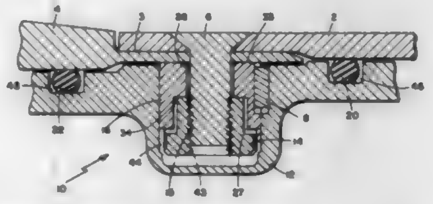
and a plurality of elevators at longitudinally-spaced locations along the length of said storage compartment, each of said elevators having a platform and a drive for lowering the article holders from said storage compartment to said deck, and for raising the article holders from said deck to said storage compartment.

5,314,144
THERMALLY COMPENSATING INSERT FASTENER

Frank K. Porter, Jr., Billerica; Eliot D. Nelson, Acton; Daniel R. Arimento, Westford, and Terence J. Reidy, Chelmsford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 18, 1991, Ser. No. 810,755
Int. Cl.^{5} B64C *1/12*
U.S. Cl. 244—132 **15 Claims**



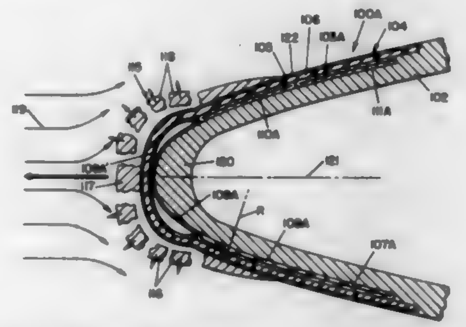


1. A fastener assembly comprising:
- (a) a cylindrical support structure with a bore provided partially therein, the bore having a wall surface with a slot;
- (b) a bushing, disposed within the bore of the cylindrical support structure, having an end and an outer surface with a slot therein, the bushing further having a bore with a first portion having a first diameter and a second portion having a second different diameter, the bushing further having a pair of tangs extending from the end;
- (c) a nut, partially disposed within the second portion of the bore of the bushing, having an outer surface with a pair of lugs disposed on the outer surface to engage the pair of tangs of the bushing; and
- (d) a pin disposed juxtapositional the slot of the wall surface of the cylindrical support structure and juxtapositional the slot of the bushing.

5,314,145
COMPRESSIBLE NOSE DYNAMIC DE-ICER

Richard L. Rauckhorst, III, North Canton, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1992, Ser. No. 998,283
Int. Cl.^{5} B64D *15/18*
U.S. Cl. 244—134 A **43 Claims**



1. A de-icer adapted for attachment to a substructure having an apex where the radius of curvature of the substructure is smallest, the de-icer having an outer surface subjected to an impinging airstream, comprising:

skin means for transferring tension from a first area of said skin means to a second area of said skin means upon deflection of said first area away from the substructure, said skin means overlying the substructure with said first area spaced to one side of the apex and said second area at the apex;

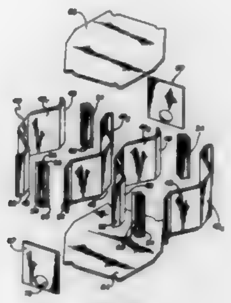
skin deflection means disposed beneath said skin means for deflecting said skin means away from the substructure;

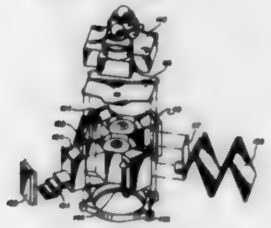
compressible means disposed beneath said second area for permitting deflection of said second area toward the substructure by compressing in response to tension transferred by said skin means from said first area to said second area upon deflection of said first area away from the substructure.

5,314,146
MULTI-MISSION SPACECRAFT BUS HAVING SPACE FRAME STRUCTURAL DESIGN

Gerald M. Chicoine, and G. Joseph Klupar, both of Mesa, Ariz., assignors to Spectrum Astro, Inc., Gilbert, Ariz.

Filed Mar. 13, 1992, Ser. No. 851,043
Int. Cl.^{5} B64G *1/22*
U.S. Cl. 244—158 R **13 Claims**





1. A multi-mission spacecraft bus which adapts a payload to a launch vehicle, comprising:

a space frame structure enclosing a plurality of internal cells and having a plurality of external mounting surfaces, said structure further comprising a plurality of longerons, and a plurality of half frame panels mating to said longerons, said half frame panels enclosing said cells;

a base plate enclosing a lower portion of said space frame structure and adapting to said launch vehicle; and

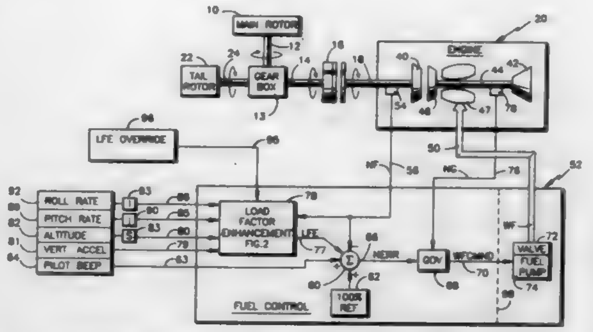
a top panel enclosing an upper portion of said space frame structure and adapting to said payload;

wherein said half frame panels comprise a center abutting surface, broad planar surfaces extended from either side of said center abutting surface, end abutting surfaces extending from said broad planar surfaces, and miter joint surfaces extending from said end abutting surfaces, said center abutting surface and said end abutting surfaces being substantially parallel to each other.

5,314,147
HELICOPTER ENGINE SPEED ENHANCEMENT DURING HEAVY ROTOR LOAD AND RAPID DESCENT RATE MANEUVERING

Frederick J. Ebert, Westport, and Robert W. Rice, Sandy Hook, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 27, 1991, Ser. No. 750,846
Int. Cl.^{5} B64C *11/44;* G05D *1/00*
U.S. Cl. 244—182 **7 Claims**



1. A control for a helicopter engine having a free turbine for normally driving the helicopter rotors at a rated speed, comprising:

means for providing an actual speed signal indicative of the rotary speed of the three turbine,

fuel valve means for metering fuel to said engine at a rate determined by a fuel command signal applied thereto; and

fuel controlling signal processing means connected for response to said actual speed signal, for providing a reference speed signal indicative of desired rotary speed of the free turbine which reference speed signal normally indicates said rated speed and which reference speed signal alternatively indicates a speed greater than said rated speed in response to high rotor load and high descent rate maneuvers, for providing, in response to said actual speed signal and said reference speed signal, a speed error signal indicative of the difference in turbine speed indicated by said actual speed signal and said reference speed signal, and for providing said fuel command signal to said fuel valve means indicative of a desired fuel flow rate as a function of said speed error signal;

characterized by:

a vertical accelerometer for providing a vertical acceleration signal indicative of acceleration of the helicopter in a direction substantially parallel to the rotary axis of the main rotor;

vertical descent rate means for providing a vertical descent rate signal indicative of the vertical descent rate of the helicopter;

threshold means responsive to said vertical descent rate signal for providing a variable threshold signal, the magnitude of said variable threshold signal being inversely related to the magnitude of said vertical descent rate signal; and

said fuel controlling signal processing means comprising means responsive to said vertical acceleration signal indicating positive vertical acceleration in excess of said variable threshold signal, for providing successively greater speed increasing increments to said reference speed signal to reach a predetermined reference speed signal indicating a reference speed in excess of rate speed, for providing said predetermined reference speed signal indicating a reference speed in excess of rated speed, for providing said predetermined reference speed signal for at least a predetermined time, and responsive to the lapse of said predetermined time and to said vertical acceleration signal indicating a positive vertical acceleration which is less than a predetermined threshold magnitude for providing successively greater decrements to said reference speed signal to reach a reference speed signal indicative of rated speed.

5,314,148

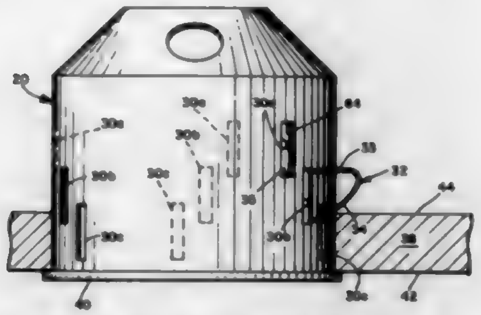
SPRING MOUNT FIXTURE HOUSING

Roy Jones, Whittier, Calif., assignor to CSL Lighting, Inc., Valencia, Calif.

Filed Dec. 16, 1992, Ser. No. 991,111

Int. Cl.⁵ G12B *9/00*

U.S. Cl. 248—27.3 **10 Claims**



1. A housing for installing electrical fixtures in a structural wall comprising:

a) a housing body having a longitudinal axis for mounting in an opening in the wall;

b) a peripheral flange about the mouth of said housing body;

c) at least one group of axially directed slots in said housing body and each slot being located at a different axial distance from said housing body mouth, each corresponding to a different anticipated wall thickness; and

d) at least one spring element having opposed extended arms and adapted, when compressed, to be inserted into one of said slots, of said group said opposed spring element arms, when expanded, adapted to bear on the housing body and on an inner surface of the wall, whereby the expanded spring exerts a force on the housing to hold said flange flush against the outer surface of the wall.

5,314,149

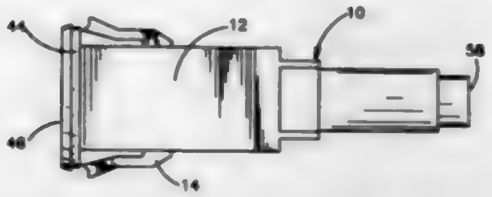
SNAP-IN MOUNT FOR HOUSING WITHIN PANEL

Kendall A. Pim, Cleveland Heights; Alfred J. Romanak, Broadview Heights, and Russell W. Moss, Richmond Heights, all of Ohio, assignors to Channel Products, Inc., Chesterland, Ohio

Continuation of Ser. No. 705,309, May 24, 1991, abandoned. This application Apr. 1, 1993, Ser. No. 41,784

Int. Cl.⁵ F16L *3/00*

U.S. Cl. 248—56 **6 Claims**



1. A housing which is receivable within an aperture in a panel and engageable with the panel comprising a body member having a flange portion adjacent one end thereof, and at least one arm member attached to said body member, said arm member being defined by an outer surface, an inner surface, and substantially parallel side surfaces interconnecting said outer and inner surfaces, said arm member having a first portion, a second portion, and a third portion, said first portion being attached to said body member, said second portion being outwardly directed from said body member and said third portion interconnecting said first and second portions, the longitudinal as of said third portion of said arm member being substantially parallel to the longitudinal as of said body member, said second portion of said arm member terminating in an outer end defined by a surface comprising a first surface portion adjacent said inner surface of said arm member and a second surface portion adjacent said outer surface of said arm member, said first surface portion being angularly directed toward said flange portion of said body member, and said second surface portion being angularly oriented with respect to said first surface portion, said first surface portion engaging the surface defining the aperture in the panel, said second surface portion acting as a mechanical stop by engaging the surface of the panel in response to movement of the housing within the panel.

5,314,150

SUPPORT STAND FOR GOLF BAG

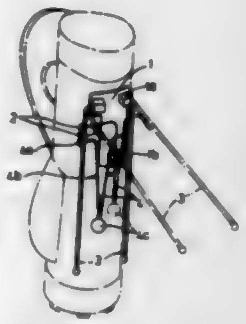
Maeng Seop, Hanyang Apt. 22-102, Songpa-Dong, Songpa-Ku, Seoul, Rep. of Korea

Filed Feb. 11, 1993, Ser. No. 16,759

Claims priority, application Rep. of Korea, Aug. 4, 1992, 14606/1992

Int. Cl.⁵ A63B *55/00*

U.S. Cl. 248—96 **7 Claims**



1. A support stand for a golf bag comprising:

upper and lower pivot arrangements mounted on upper and lower side portions of the golf bag, respectively;

a pair of legs pivotally mounted at upper ends thereof to said upper pivot arrangement, each of said legs having a slotted slide member adjacent said upper end; and

an actuating member for pivoting the legs between extended and retracted positions, the actuating member having a pair of upper portions which are slidably received within said slotted slide members, respectively, a pair of pivot elements each pivotally mounted to said lower pivot arrangement and a balance weight mounted to a lower end thereof;

wherein said balance weight is adapted to displace the upper portions of said actuating member within the slotted slide member of each leg, thereby pivoting the legs between extended and retracted positions.

5,314,151

PLASTIC BAG HANGER DEVICE

Candice Carter-Mann, 10628 E. Turquoise Ave., Scottsdale, Ariz. 85258

Filed Dec. 11, 1992, Ser. No. 989,354

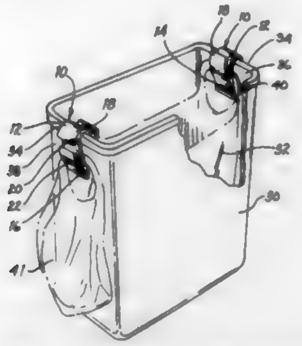
Int. Cl.⁵ B65B *67/04*

U.S. Cl. 248—100 **13 Claims**

1. A garbage bag hanger device for hanging plastic bags inside of a trash receptacle comprising:

a substantially inverted U-shaped clip member having first and second sides thereof and a middle portion defined by a topmost section of the substantially inverted U-shaped clip located between said first and second sides;

a first flange member projecting upwardly from said first side of said substantially inverted U-shaped member; and



a second flange member projecting downwardly from said middle portion nearest said second side of said substantially inverted U-shaped member.

5,314,152

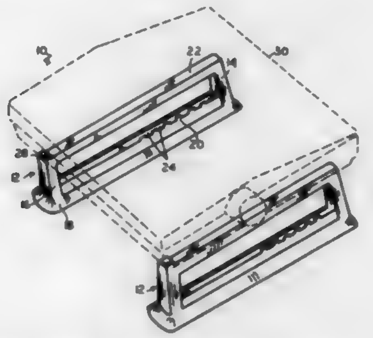
NESTABLE, STACKABLE PRINTER SUPPORT STAND

Gary J. Troy, Nottingham, and Edward L. Hames, Peterborough, both of N.H., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Continuation-in-part of Ser. No. 847,819, Mar. 9, 1992. This application Jul. 6, 1992, Ser. No. 910,826

Int. Cl.⁵ A47G *23/02*

U.S. Cl. 248—146 **11 Claims**



1. A support stand for a printer or other apparatus to be supported, which support stand comprises first and second support legs adapted to be placed in a spaced-apart relationship to provide a support stand, each leg formed of integrally molded plastic material having:

a) generally hollow, upwardly extended, tapered front and back sections, each section having a top and a bottom;

b) a base element extending between the front and back sections at the bottom thereof and characterized by an elongated, internal, open space between the front and back sections, the open space of sufficient dimensions to receive therein an elongated support stand element of another identical support stand leg;

c) an elongated support-stand element having a generally flat top surface and extending between the top of the front and back sections, to provide an upper support surface for each leg;

d) each leg characterized by having an open internal space which mimics substantially the external structure, with the first and second support legs nested and stacked within each other, for convenience in shipping and displaying, with the lower leg extending within the internal open space of the base of the upper leg, and the front and back sections in a close, nested, stacked relationship to effect a reduction in total height in the stacked pair of legs; and

e) a removable retaining means about the pair of the support stand elements of the nested and stacked pair of first and second legs to retain together the first and second nested and stacked legs for display or shipping.

5,314,153

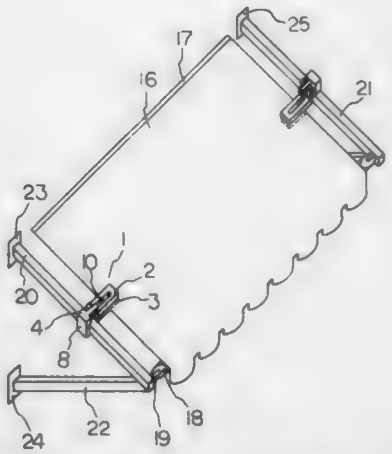
AWNING WIND PROTECTOR

Gary D. White, 117 B Lee Jackson Blvd., Haines City, Fla. 33844

Filed Jun. 15, 1992, Ser. No. 897,932

Int. Cl.⁵ A47B *96/06*

U.S. Cl. 248—229 **2 Claims**



1. An awning wind protector apparatus for preventing an outwardly extending center of an awning from flapping in the wind and to protect it from other elements, comprising:

a substantially L-shaped top clamping jaw having a width and a thickness, a vertical portion having a height, and an extended horizontal portion of approximately four times the length of said vertical portion of said top clamping jaw,

a substantially L-shaped bottom clamping jaw, having a width and a thickness substantially the same as that of said top clamping jaw, a vertical portion of a height of approximately one thickness more than said height of said top clamping jaw vertical portion, and an extended horizontal portion of approximately five time the height of said vertical portion of said bottom clamping jaw,

a flat top portion having a first and second ends and having a width and thickness to match said width and thickness of said top clamping jaw and said bottom clamping jaw, said flat top portion being adjustably and hingedly affixed at said first end to a free end of said vertical portion of said top clamping jaw and also hingedly affixed at said second end to a free end of said vertical portion of said bottom clamping jaw, said first end having an elongated slot which permits said adjustability between said first end and said fee end of said vertical portion of said top clamping jaw,

said extended horizontal portion of said top clamping jaw and said extended horizontal portion of said bottom clamping jaw being engaged

said apparatus forming a substantially square opening at one end for clamping a substantially square piece of material, and said apparatus also defining means for clamping a piece of awning material between said top clamping jaw an said bottom clamping jaw, said clamping means being between said extended horizontal portion of said top clamping jaw and said extended horizontal portion of said bottom clamping jaw.

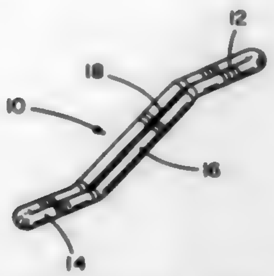
5,314,154
THROUGH HOLE STRAP MOUNT

Bernard J. O'Grady, Oak Lawn, Ill., assignor to Panduit Corp., Tinley Park, Ill.

Filed Oct. 14, 1992, Ser. No. 960,973

Int. Cl.^{5} F16L *3/00*

U.S. Cl. 248—231.9 **8 Claims**



1. A strap mount for securing a bundle to an apertured mounting surface comprising:

a mount member formed from a single piece of metal into a generally elongated loop having a pair of spaced apart substantially parallel extended end sections and an oblique central loop section therebetween including a single generally elliptical passageway.

5,314,155
DEVICE FOR SUSPENDING A CABLE SLEEVE ON A SUPPORT CABLE

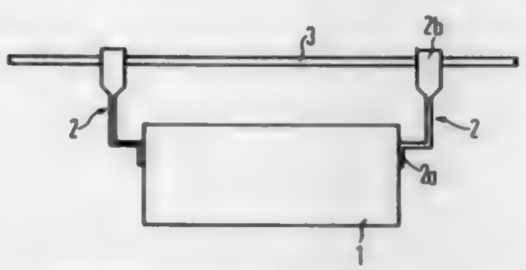
Martin Behrendt, Hagen; Martin Greisinger, Iserlohn, and Hans Winterhoff, Schwerte, all of Fed. Rep. of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Mar. 9, 1992, Ser. No. 848,235

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1991, 4111484

Int. Cl.^{5} A47F *5/00*

U.S. Cl. 248—301 **14 Claims**



1. In a device for suspending a cable sleeve on a support cable, said device comprising a securing part for engaging a support cable and a mounting lug for fastening to the cable sleeve, the improvements comprising the securing part being fashioned as a hook on one end of a band-shaped member, said hook having an enlarged contact area for engaging the support cable and having means for preventing accidental disengagement of the hook from the support cable, said means including a threaded fastener being threaded in a bore in the member and being positioned to be inserted in an opening of the hook to constrict the opening to prevent removal of a cable from said hook, and the mounting lug being provided on the second end of the member and comprising a fastening flange laterally offset to provide lateral attachment to a seal member on an end face of the cable sleeve.

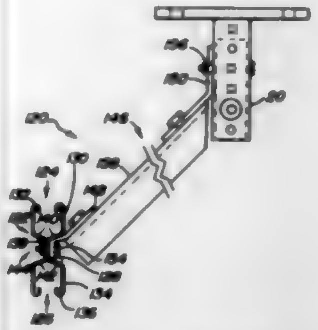
5,314,156
CHANNEL SUPPORT SYSTEM

James A. Moses, Dexter, Mich., assignor to Unistrut International Corp., Ann Arbor, Mich.

Filed Mar. 25, 1992, Ser. No. 857,009

Int. Cl.^{5} E04B *1/38;* **F16B** *5/06*

U.S. Cl. 248—317 **15 Claims**



1. A channel support system comprising:

a support beam extending along a longitudinal axis and having two outwardly facing side channels, each of said side channels being defined by two flanks separated by opposed faces of a common web, each of said flanks extending laterally outwardly from opposite ends of said web, an aperture passing through said web;

a brace secured to said support beam with said brace having a first face contacting said web and;

a first mechanical fastener extending through said aperture and said brace to secure said brace to said support beam.

5,314,157
ELONGATABLE SUPPORT

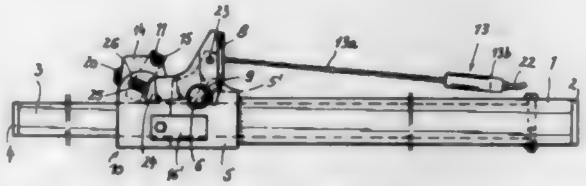
Kurt Linnepe, and Marcus Linnepe, both of Burgstr. 6, W-5820 Gevelsberg, Fed. Rep. of Germany

Filed Apr. 21, 1992, Ser. No. 872,714

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1991, 4132035

Int. Cl.^{5} A47F *5/00*

U.S. Cl. 248—354.1 **13 Claims**



1. An elongatable support, comprising:

an outer tube having a mouth;

a bar telescopingly slidable into and out of said tube at said mouth; and

an actuating head on said outer tube at said mouth, said actuating head being formed with:

a housing,

a guide element pivotally mounted on said housing and having a pair of mutually parallel guide slots on opposite sides thereof and inclined to a surface of said bar,

a drive roller having opposite ends guided in said slots and adapted to be wedged selfblockingly against said surface of said bar under a load applied to said support, said roller being provided with external means for rotating same and being formed with teeth on a surface of said drive roller engageable with said surface of said bar,

spring means acting upon said drive roller for urging said drive roller into engagement with said surface of said bar, said housing having a portion extending beyond said mouth and comprising:

a sleeve formed with a pair of lateral flanges and surrounding said bar proximal to said mouth, said flanges being bridged to form a capped enclosure provided with a slotlike opening and with a surface turned toward said tube, and

an axle pin spanning said flanges,

a clamping pawl swingably or shiftably mounted on said axle pin by one end extending through said slotlike opening and self-lockingly clamped against said bar by another end opposite said one end under load upon swinging of said pawl in one sense,

at least one spring biasing said pawl in said one sense and being supported under prestress by said surface of said enclosure, and

a release mechanism on said housing including a manually actuatable handle engageable operatively coupled with said one end of said pawl for displacing said pawl in an opposite sense to disengage said pawl from said bar.

5,314,158
POWERED SEAT SLIDE DEVICE

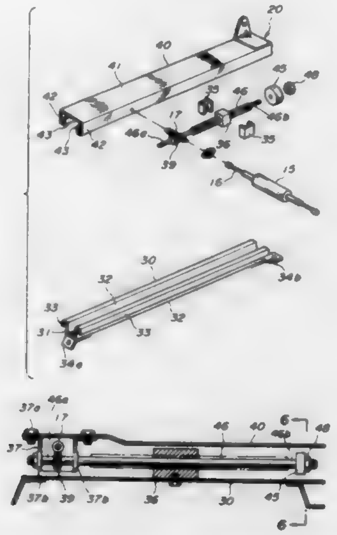
Takayuki Mouri, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Aug. 28, 1992, Ser. No. 936,643

Claims priority, application Japan, Aug. 30, 1991, 3-76754

Int. Cl.^{5} F16M *13/00*

U.S. Cl. 248—429 **3 Claims**



1. A powered seat slide device including at least one pair of guide rails slidably fitted to each other, for slidably supporting a seat such that the position of the seat relative to a floor is adjustable frontwardly and rearwardly, comprising:

a driving mechanism having a driven connection with a drive motor, for causing a relative sliding movement of one of said guide rails to the other;

said driving mechanism including a screw-threaded shaft rotatably mounted on one of said guide rails in an aperture defined between the slidably fitted pair of guide rails and a nut member engaged with said screw-threaded shaft and rigidly mounted on the other guide rail for rotation relative to said screw-threaded shaft;

one end of said screw-threaded shaft being rotatably supported by one of said guide rails, the other end of said screw-threaded shaft being a free end so as to permit a proper flexibility of said screw-threaded shaft; and

an elastomeric mass attached to said free end of said screw-threaded shaft, for preventing a direct contact between said free end and an inner wall of at least one of said guide rails and for attenuating noise generated due to the interference between said free end and at least one of said guide rails;

wherein said elastomeric mass comprises a substantially cylindrical elastomeric member coaxially arranged with said screw-threaded shaft.

5,314,159
HANGING SYSTEM FOR FRAMES OF PAINTINGS OR THE LIKE

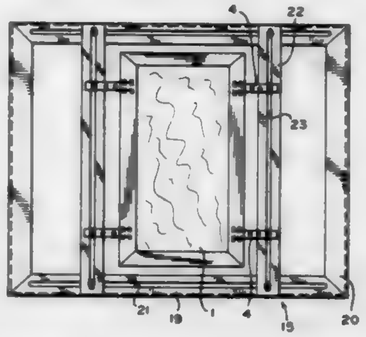
Mathias Szarata, Bornheim-Brenig, Fed. Rep. of Germany, assignor to Hasenkamp Internationale Transporte GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Oct. 19, 1992, Ser. No. 955,368

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1991, 9113038[U]

Int. Cl.^{5} A47G *1/24*

U.S. Cl. 248—476 **27 Claims**



1. Hanging system for framed paintings and other basically plate-like objects, comprising at least one hanging rail attached securely to a frame and a detachable mounting rail; wherein said hanging rail has at least one fastening point by which the mounting rail is detachably fastenable to the hanging rail in a rigid manner by a nondestructively removable fastening device.

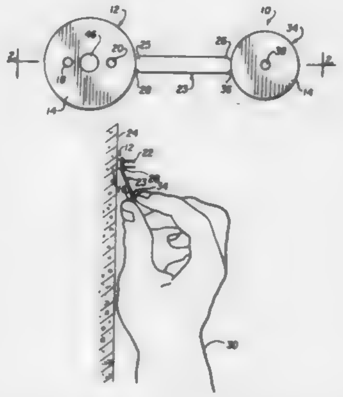
5,314,160
WALL HANGER ASSEMBLY

William H. Larsen, Caguas, P.R., assignor to Larsen Products, Inc., Caguas, P.R.

Filed Feb. 1, 1993, Ser. No. 11,787

Int. Cl.^{5} F16M *13/00*

U.S. Cl. 248—547 **17 Claims**



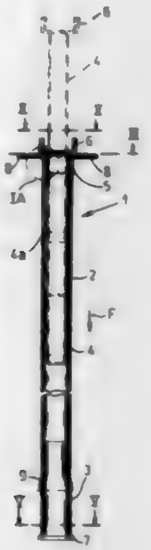
1. A hanger assembly for use in hanging articles on a wall comprising a first hanger body having spaced apart front and rear faces, a bore in said body extending from an open outer end at said front face into said body, said bore having a cross sectional dimension complementary to a fastening element inserted there into through the open end thereof, a handle

having first and second opposed ends, one of said ends being joined by an integral frangible connection to said body, said handle having a length to permit grasping by the hand of a user to hold said body with its rear face against a wall to enable a fastening element inserted into said bore to be driven into a wall clear of the grasping hand of the user, said frangible connection being constructed to permit ready separation of said handle from said body following completion of the driving of said fastener element into a wall.

5,314,161
MINE PROP

Lothar Domanski, Oberhausen, and Rudi Podjadtke, Herne, both of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed May 29, 1992, Ser. No. 891,574
Int. Cl.⁵ E04G *25/00*
U.S. Cl. 248—548 **7 Claims**

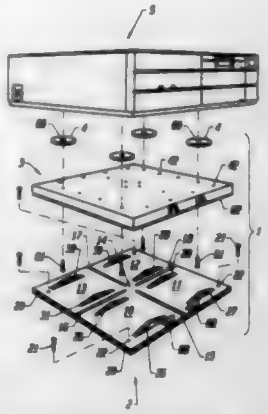


1. A mine prop, comprising:
a lower support tube;
an upper support tube forming a telescoped junction with said lower support tube of circular cross section with one of said tubes being received within another of said tubes to a length sufficient to prevent buckling of said prop at said junction under loading of said prop;
a spindle nut on an upper end of said upper support tube, said spindle nut being rotatable relative to said upper support tube and being braced axially thereagainst;
a threaded spindle threadedly received in said nut, guided axially in said upper support tube with a length sufficient to prevent buckling of said spindle, and axially shiftable by rotation of said nut to brace said prop between a roof and floor of a subterranean structure; and
means at said junction for controlled peripheral deformation of at least one of these tubes allowing axial telescoping of said tubes together upon loading of the prop above a predetermined magnitude, said means at said junction including a bottle-neck-shaped reduction in diameter of an upper end of said lower tube extending in a buckling-stabilized manner into a lower end of said upper tube, the upper tube, at said loading of the prop above said predetermined magnitude, having its lower edge slide over said bottle-neck-shaped reduction and deformed outwardly thereby to determine a force required to telescope said tubes together, said lower tube having a constant outer diameter below said bottle-neck-shaped reduction over an entire length over which said tubes can be telescoped together.

5,314,162
SECURITY APPARATUS

Donald W. Kelley, Fremont, Calif., assignor to Qualtec Data Products, Inc., Fremont, Calif.

Filed Dec. 2, 1992, Ser. No. 984,872
Int. Cl.⁵ F16M *13/00*
U.S. Cl. 248—553 **11 Claims**

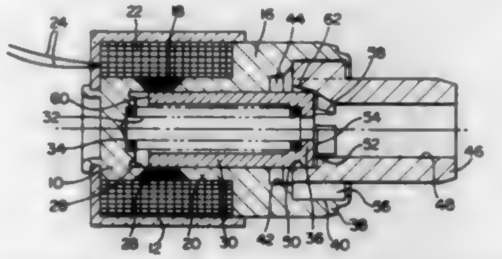


1. A security apparatus comprising:
a plurality of interconnected metallic base plate members, each of said base plate members being movable relative to each other and having a plurality of loop members, each of said loop members being made by providing a pair of parallel cuts in the base plate member and bending up the metal therebetween;
a cover member having a tapered loop engaging member for engaging each of the loop members on the base plate members and forcing the cover member toward the base plate members as the cover member is moved horizontally relative to the base plate member;
means for attaching the base plate members to an underlying surface; and
means for locking the cover member to the base plate members when the cover member has been moved to a predetermined horizontal position relative to the base plate members.

5,314,163
ELECTROMAGNETIC VALVE

Juan S. Bacardit, Barcelona, Spain, assignor to Bendix Espana, Barcelona, Spain

Continuation of Ser. No. 543,625, Jun. 26, 1990, abandoned. This application Sep. 4, 1991, Ser. No. 754,796
Claims priority, application Spain, Aug. 7, 1989, 89 02801
Int. Cl.⁵ F16K *31/02, 39/02*
U.S. Cl. 251—129.07 **10 Claims**

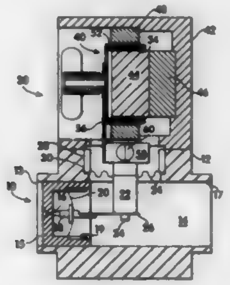


1. An electromagnetic valve for controlling a restricted fluid passage for flow of fluid or for controlling the difference in pressure between the inlet and an outlet of the valve, said valve comprising a body, a solenoid coil mounted on said body, said body defining a bore and a radially extending shoulder on said bore, generally tubular valve member slidably mounted in said bore and having a radially projecting end surface for engagement with said shoulder, said valve member being progressively displaceable within said bore in response to actuation of the solenoid coil between a first position when said end surface is engaged with the shoulder and a second position, said end surface being engaged with said shoulder when the valve member is in one of said first and second positions, said valve member being maintainable in one or more predetermined positions between said first and second positions by applying and holding an electrical current of a predetermined intensity corresponding to each other predetermined positions between the first and second positions to said solenoid coil, the valve member having a circumferentially extending throttling surface cooperating with a circumferentially extending throttling surface on said bore, one of said throttling surface having a length extending parallel to the axis of said bore, the distance between said throttling surfaces defining the restricted passage, said one throttling surface having a contour which varies non-linearly in the radial direction along he length of the throttling surface on the bore, said throttling surface on said valve member cooperating with the throttling surface on the bore so that the area of the restricted passage defined between said throttling surfaces varies non-linearly as said valve member is moved away from said first position to any of said positions between the first and second position so that the area of said restricted passage is a predetermined function of the intensity of the current applied to the solenoid coil, the difference in the pressures between the inlet and the outlet being a linear function of the intensity of the current applied to the solenoid coil.

5,314,164
PIVOTAL DIAPHRAGM, FLOW CONTROL VALVE

Daniel E. Smith, New Hampton, N.H., assignor to MKS Instruments, Inc., Andover, Mass.

Filed Jul. 17, 1992, Ser. No. 916,064
Int. Cl.⁵ F16K *31/10*
U.S. Cl. 251—129.17 **31 Claims**

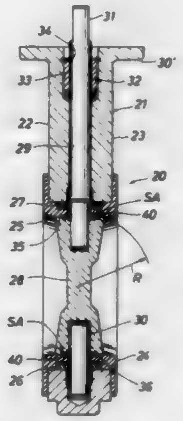


1. Valve assembly for regulating the flow of fluid, said assembly comprising:
(a) housing means defining a valve chamber having means for defining at least one orifice through which fluid flows;
(b) diaphragm means for defining at least a surface internal to said valve chamber and a surface external to said valve chamber; and,
(c) fluid flow regulating means for controlling the flow of fluid through the orifice at a rate proportional to the strength of an external signal, said flow regulating means comprising:
  (i) pivot means comprising a first control member projecting outwardly with respect to said valve chamber from the external surface of said diaphragm means, a second control member projecting inwardly with respect to said valve chamber from the internal surface of said diaphragm means along a longitudinal control member axis substantially perpendicular to the plane of said diaphragm means, said first and second control members defining a pivot axis lying in the plane of said diaphragm means;
  (ii) plug means movable along a plug axis substantially perpendicular to said control member axis between a sealing position wherein said plug means sealingly engages said orifice so as to provide positive shut off and multiple non-sealing positions wherein said plug means at least partly disengages said orifice so as to provide fluid flow through said chamber;
  (iii) means for connecting said second control member to said plug means; and,
  (iv) pivot support means for supporting said pivot means relative to said valve chamber so as to obtain restricted, substantially frictionless pivoting of said pivot means in order to move said plug means along said plug axis, said pivot support means comprising an elongated support member fastened to said first control member such that the longitudinal axis of said support member is substantially perpendicular to said control member axis and to said plug axis, and means for flexibly linking said elongated support member to said housing means.

5,314,165
ROTARY VALVE

Frank J. Raymond, Jr., Houston, and John R. Dernovsek, Cypress, both of Tex., assignors to Bray International, Inc., Houston, Tex.

Filed Jul. 14, 1993, Ser. No. 91,765
Int. Cl.⁵ F16K *1/22*
U.S. Cl. 251—305 **18 Claims**



1. A rotary valve, comprising
a valve body having a flowway therethrough,
a closure member having stem portions on its opposite ends closely received within openings in the valve body to permit the closure member to be rotated between positions opening and closing the flowway, and
an assembly sealing between the closure member and valve body in surrounding relation to each of the stem portions, including
  an outer, essentially U-shaped ring of corrosion-resistant material having flexible legs extending radially inwardly from its closed end for disposal adjacent opposite faces of the body and closure member, and
  an inner ring disposed between the legs of the outer ring to yieldably urge their outer faces against said opposite faces.

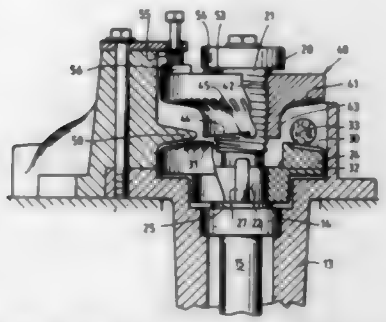
5,314,166
SELF-TAILING WINCH WITH FREE-FALL CAPACITY

Robert J. Muir, Kingston, Australia, assignor to Muir Engineering Pty. Limited, Kingston, Australia

Continuation of Ser. No. 772,237, Oct. 7, 1991, abandoned. This application Jun. 1, 1993, Ser. No. 69,448
Int. Cl.⁵ B66D *1/30*
U.S. Cl. 254—371 **7 Claims**

1. A self-tailing winch which can permit free-fall, comprising:

a shaft adapted to, and capable of being, driven;
a first cone connected about and fixed to said shaft to be driven therewith;
a second cone co-axial with said first cone and movable axially relative thereto along a threaded portion of said shaft, said first cone and said second cone each have a truncated conical surface, the apexes of which are inwardly directed;
means for causing said second cone to assume either of two stable axial positions relative to said first cone so that when said second cone is in a first position of said two stable axial positions, a rope or chain passing between said first cone and said second cone will be gripped firmly when rotation of said shaft in one direction occurs, rotation of said shaft in an opposite direction resulting in said second cone being held against rotation so that said first cone and said second cone move axially apart to a second position thereby permitting said rope or chain to free-fall; and,
a pawl mounted adjacent said second cone, wherein said pawl enters a detent in said second cone for preventing rotation of said second cone in one direction.



5,314,167

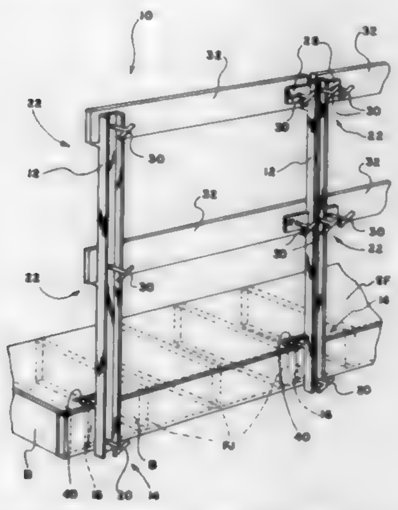
TEMPORARY RAIL STRUCTURE FOR A FLOOR

Jesse H. Holloman, Selma, N.C., assignor to James N. Mitchell, Smithfield, N.C., a part interest

Filed Jan. 8, 1993, Ser. No. 2,239

Int. Cl.⁵ E04H *17/22*

U.S. Cl. 256—69 **7 Claims**



1. A portable and temporary railing structure for surrounding a floor of a residential structure where the floor includes underlying floor joists, a band surrounding the floor joists, and a sub-floor disposed over the floor joists and wherein the sub-floor includes a series of spaced apart openings formed through the sub-floor adjacent the inside of the band, and wherein the temporary railing structure includes a series of temporary posts secured to the band and spaced around the outside edge of the floor area and wherein the temporary posts receive and support a series of side railings that extend between the respective posts; and wherein each temporary support posts includes an elongated member having an inverted U-shaped band attachment for attaching the temporary posts to the band and wherein the U-shaped band attachment includes a first outside leg that extends along the outside of the band, a sub-floor penetrator that extends downwardly through the opening within the sub-floor and rests adjacent the inside of the band, and a bolt-type fastener threaded in the first outside leg and movable therein to engage the band so as to secure the entire U-shaped band attachment to the band; and wherein there is provided rail holding means secured on the elongated member for receiving and holding side rails.

5. A method of erecting and disassembling a temporary rail structure around the floor area of a building under construction comprising the steps of:
a) cutting a series of holes in a sub-floor structure adjacent the inside of a surrounding band that surrounds the floor and floor joists supporting the floor;
b) inserting one leg of a U-shaped yoke through a respective hole in the sub-floor and clamping the U-shaped yoke to a top portion of the surrounding band such that the one leg of the U-shaped yoke is held adjacent the inside of the band while extending through the hole in the sub-floor;
c) extending a post upward from the U-shaped yoke to form a temporary post and continuing to add such posts around the floor by the same method;
d) connecting horizontal side rails between respective posts to form a temporary railing structure around the floor of the building under construction; and
e) dismounting the entire temporary rail structure by removing the rails and then unclamping the U-shaped yokes from the top of the band and pulling the U-shaped yoke upwardly such that the one leg of the yoke is pulled from the opening within the sub-floor.

5,314,168

APPARATUS AND METHOD FOR CONTROLLING OPERATION OF QUENCHING CAR/BUCKET FOR COKE OVEN

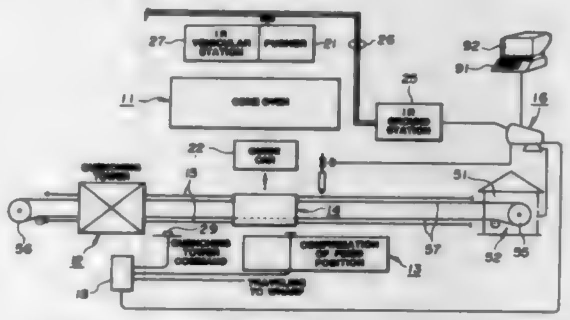
Yoshihiro Omae; Haruo Watanabe; Susumu Sonoki; Yoichi Kanemasa; Kazuo Sagara; Takashi Yoshimune, and Tetsuo Yamasaki, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 734,761, Jul. 23, 1991, Pat. No. 5,253,846. This application Jul. 15, 1993, Ser. No. 91,373

Claims priority, application Japan, Nov. 7, 1990, 2-299740; Jul. 24, 1992, 2-193884; Jul. 24, 1992, 2-193885; Jul. 24, 1992, 2-193886; Aug. 28, 1992, 2-224492; Nov. 7, 1992, 2-299739

Int. Cl.⁵ C21B *13/06*

U.S. Cl. 266—92 **17 Claims**



1. An apparatus for controlling the operation of a quenching car for a coke oven in which the quenching car is actuated in association with a pusher to travel on a track and charged with calcined coke pushed out from a designated coking chamber of the coke oven by the pusher and the quenching car is moved

into a quenching tower for quenching the coke and then moved to designated one of coke wharves for discharging the coke to the coke wharf, comprising:
a quenching car operating means for connecting a wire rope to said quenching car and drawing said wire rope due to driving of a winch structure to reciprocate said quenching car on said track;
a traveling position detecting means for detecting a required operational position of said quenching car on said track depending upon the amount of driving of said winch structure; and
an operational position detecting means for confirming approach of said quenching car to a position at which coke is delivered from said designated coking chamber, a quenching position in said quenching tower and a position at which coke is discharged from said quenching car to said designated coke wharf;
whereby a desired operation is carried out according to a preset operation program when detection of the required operational position of said quenching car by said traveling position detecting means and confirmation of the operational position of said quenching car by said operational position detecting means coincide with each other.

5,314,169

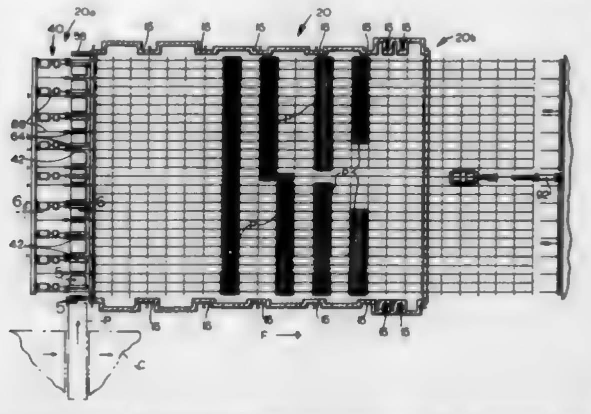
METHOD AND APPARATUS FOR HEAT TREATING ELONGATE METALLIC PRODUCTS

Vijay M. Kamlani, Holland; Otakar A. Kuby, Toledo; Walter J. Operacz, Sylvania, all of Ohio, and Frank J. Vereecke, Palmyra, Mich., assignors to A. C. Leadbetter & Son, Inc., Toledo, Ohio

Filed Aug. 26, 1992, Ser. No. 935,827

Int. Cl.⁵ C21D *9/00*

U.S. Cl. 266—105 **20 Claims**



1. Apparatus for heat treating elongate metallic articles, said apparatus comprising:
a chamber, said chamber having an inlet end with an opening therein and an outlet end spaced from said inlet end, said chamber being substantially enclosed and defining a substantially horizontal flow path for articles, the flow path extending from said inlet end to said outlet end, said chamber being divided into a series of zones extending along the flow path;
recirculating means associated with each of the zones for recirculating atmosphere within said each of the zones without substantial mixing of the atmosphere within said each of the zones with atmosphere from within adjacent zones;
temperature control means associated with each of the zones for maintaining a substantially uniform, predetermined temperature within said each of the zones;
means for forming a series of packs of the elongate metallic articles, the articles within each pack being spaced close to one another;
means for sequentially introducing packs into the chamber through the opening in the inlet end, each pack being positioned within the chamber with the articles extending generally horizontally and generally transversely of the flow path, the spacing between adjacent packs being greater than the spacing between adjacent articles in a pack; and
means for advancing the packs within the chamber in unison in a step by step manner, without contact between adjacent packs, to sequentially remove packs from the chamber through the opening at the outlet end.

5,314,170

STEEL HEATING FURNACE

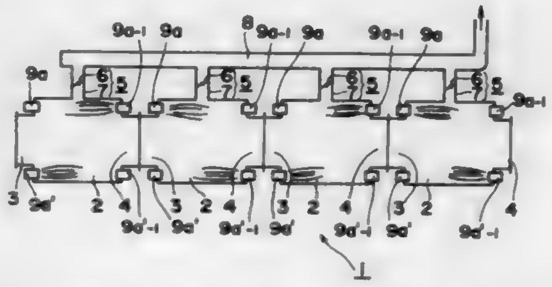
Takeshi Tada; Toshikazu Akiyama, both of Tokyo; Ryoichi Tanaka, and Masao Kawamoto, both of Yokohama, all of Japan, assignors to Nippon Furnace Kogyo Kaisha, Ltd., Kanagawa and NKK Corporation, Tokyo, both of Japan

Filed Oct. 27, 1992, Ser. No. 967,101

Claims priority, application Japan, Oct. 31, 1991, 3-311563

Int. Cl.⁵ F27B *9/36*

U.S. Cl. 266—156 **20 Claims**



1. A continuous steel heating furnace through which workpieces move and are to be heated continuously, comprising:
a plurality of temperature zones defined in a direction in which the workpieces move in the furnace; and
at least one pair of regenerative burner systems provided at each of said plurality of temperature zones, each said at least one pair of regenerative burner systems including:
a regenerative bed;
burner means;
combustion air supply means for supplying a combustion air via said regenerative bed to said burner means;
combustion gas exhaust means for exhausting a combustion gas via said regenerative bed from said burner means; and
switch-over means for effecting a relative switch-over of a flow of said combustion air and a flow of said combustion gas with respect to said regenerative bed;
wherein a combustion amount in each of said plurality of temperature zones is controlled by means of said at least one pair of regenerative burner systems so as to adjustably set temperatures respectively in said temperature zones to selected degrees, independently of one another, whereby a desired temperature pattern is defined in said furnace to permit heating of the workpieces in each of said plurality of temperature zones to an optimal temperature.

5,314,171

APPARATUS FOR THE EXTRACTION OF METALS FROM METAL-CONTAINING RAW MATERIALS

Hans A. Friedrichs, Solingen, and Leonid W. Ronkow, Herzogenrath, both of Fed. Rep. of Germany, assignors to Osaka Fuji Corporation, Hyogoken, Japan

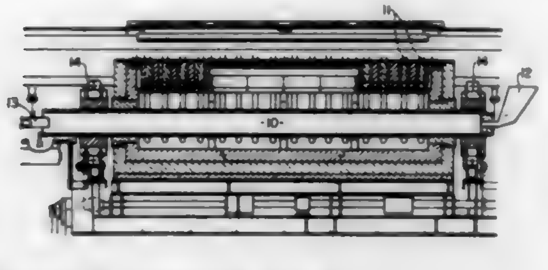
Division of Ser. No. 807,016, Dec. 10, 1991, Pat. No. 5,261,943. This application Mar. 9, 1993, Ser. No. 28,328

Int. Cl.⁵ F27B *7/28*

U.S. Cl. 266—173 **15 Claims**

1. An apparatus for extracting metals from raw materials comprising:
(a) a temperature shock-resistant ceramic pipe, said pipe

being capable of withstanding a temperature change of between about 1100° C. and room temperature within about 5 seconds without failure;

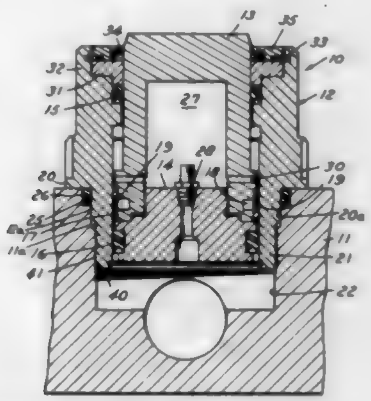


(b) means for rotating said pipe; and
(c) an external heat source for heating said pipe.

5,314,172

HIGH PRESSURE DIE CYLINDER AND MANIFOLD SYSTEM

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128
Filed May 8, 1992, Ser. No. 880,952
Int. Cl.^{5} F16F *9/02*
U.S. Cl. 267—119 **9 Claims**

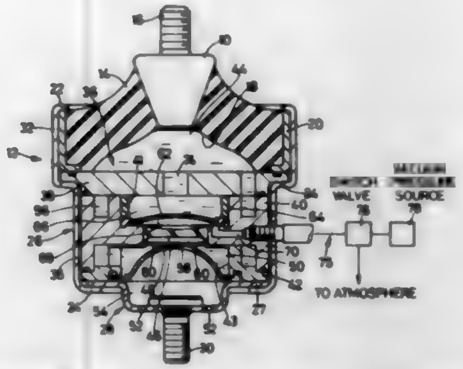


1. A die cylinder comprising
a cylinder containing gas under pressure,
a piston movable relative to said cylinder and urged outwardly by gaseous pressure outwardly relative to said cylinder,
sealing means between said piston and said cylinder,
a combined bearing member and lubricating metering ring on one of said cylinder and said piston and engaging the other of said cylinder and piston,
a closed lubricant chamber associated with said combined bearing member and lubricating ring,
said combined bearing member and lubricating ring having circumferentially spaced radial openings through said bearing member and lubricating ring for delivering lubricant from said chamber to the exterior of said combined bearing member and lubricating ring as the piston is reciprocated in said cylinder.

5,314,173

FLUID-FILLED ELASTIC MOUNT HAVING VACUUM-RECEIVING CHAMBER PARTIALLY DEFINED BY ELASTIC MEMBER FOR ISOLATING HIGH-FREQUENCY VIBRATIONS

Akiyoshi Ide, Inuyama, and Atsushi Muramatsu, Komaki, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan
Filed Feb. 28, 1992, Ser. No. 842,991
Claims priority, application Japan, Mar. 4, 1991, 3-062662
Int. Cl.^{5} F16F *13/00, 9/08*
U.S. Cl. 267—140.14 **9 Claims**

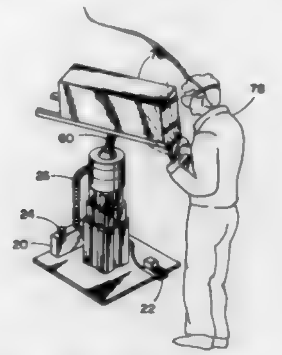


1. A fluid-filled elastic mount for flexibly connecting two members, comprising:
a first support member and a second support member which are respectively fixed to the two members to be flexibly connected, and which are spaced apart form each other in a load-receiving direction in which vibrations are applied to the elastic mount;
an elastic body interposed between said first and second support members for elastically connecting the first and second support members;
said elastic body at least partially defining a pressure-receiving chamber which is filled with a non-compressible fluid, a pressure of said fluid in said pressure-receiving chamber changing due to elastic deformation of said elastic body upon application of the vibrations in said load-receiving direction;
a first flexible diaphragm partially defining a first equilibrium chamber filled with said non-compressible fluid, said first flexible diaphragm being elastically deformable so as to permit a volumetric change of said first equilibrium chamber to absorb a pressure change of said fluid in said first equilibrium chamber;
means for defining a first orifice passage which communicates with said pressure-receiving chamber and said first equilibrium chamber so as to permit flow of said fluid therebetween;
a second flexible diaphragm partially defining a second equilibrium chamber filled with said non-compressible fluid, said second flexible diaphragm being elastically deformable so as to permit a volumetric change of said second equilibrium chamber to absorb a pressure change of said fluid in said second equilibrium chamber;
a fixed partition plate separating said pressure-receiving chamber and said second equilibrium chamber;
means for defining a second orifice passage through said fixed partition plate so as to permit flow of said fluid between said pressure-receiving chamber and said second equilibrium chamber, said second orifice passage having a ratio of a cross sectional area thereof to a length thereof, which ratio is higher than that of said first orifice passage;
a movable elastic restriction member which is opposed to said second flexible diaphragm to at least partially define an air-tight vacuum-receiving chamber, such that said second equilibrium chamber is separated from said vacuum-receiving chamber only by said second flexible diaphragm, said vacuum-receiving chamber permitting elastic deformation of said second flexible diaphragm; and
pressure control means for selectively applying a vacuum pressure to said vacuum-receiving chamber to draw said second flexible diaphragm onto said elastic restriction member, so as to restrict free deformation of said second flexible diaphragm and permit oscillation of the second flexible diaphragm with said elastic restriction member.

5,314,174

ERGONOMIC WORKPIECE POSITIONER

Erland L. Hagman, One Austin Dr., New Fairfield, Conn. 06812
Filed Mar. 8, 1993, Ser. No. 28,693
Int. Cl.^{5} B23Q *1/04*
U.S. Cl. 269—75 **14 Claims**



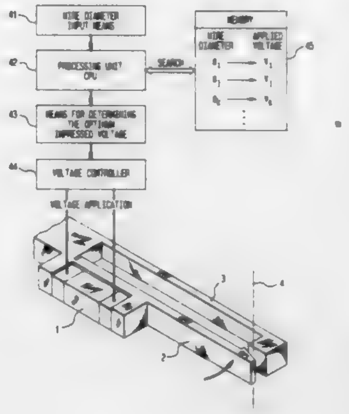
1. A work holder device comprising:
a base member;
piston means located above the base member;
a plurality of equally spaced coil springs located between the base member and piston means;
said springs being in compression to urge the piston means upwardly;
locking means positioned on the piston means and having a spherical upper surface;
a ball located on the said spherical upper surface of the locking means;
housing means partially surrounding the ball to retain it in position on the locking means;
arm means secured to the ball to receive a work piece;
said plurality of springs providing sufficient friction between the ball and said spherical surface to lock said ball against rotation within the housing means;
a fluid chamber in operative relationship with said piston means; and
means to apply fluid pressure to said fluid chamber to move the said piston means against the tension springs to unlock the ball to permit rotation thereof and repositioning of the said arm means.

5,314,175

WIRE CLAMPING DEVICE AND WIRE CLAMPING METHOD

Yasuo Izumi, Ikoma; Nobuya Matsumura, Kyoto; Akihiro Yamamoto, and Yutaka Makino, both of Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Continuation of Ser. No. 494,217, Feb. 27, 1990, abandoned.
This application Apr. 13, 1992, Ser. No. 869,193
Int. Cl.^{5} B25B *1/06*
U.S. Cl. 269—224 **4 Claims**

1. A wire clamping device for clamping bonding wire during wire bonding of electronic components, said wire clamping device comprising:
a fixed arm with a flat end, wherein said flat end of said fixed arm is a clamping surface;
a bendable movable arm with a flat end, wherein said flat end of said movable arm is a further clamping surface, the movable arm positionable prior to wire bonding so that
a) the flat end of said fixed arm faces the flat end of said movable arm,
b) a suitable gap is created so at least one of said fixed arm and said bendable movable arm is not in contact with said bonding wire,
said moveable arm functioning as a plate spring and bendable so that said end of said movable arm approaches said end of said fixed arm and the clamping surfaces of said fixed arm and said movable arm are parallel and sufficiently close to each other when said movable arm is bent to clamp wire therebetween during wire bonding; and
a piezoelectric element that is attached to said movable arm which bends said movable arm by mechanical deformation of said piezoelectric element in order to clamp wire between said end of said movable arm and said end of said fixed arm,
wherein the flat end of the movable arm is an initial state is inclined with respect to the flat end of the fixed arm at angles of $\theta_1 - \theta_2$ indicated by the following equation,



$$\rho_1 - \rho_2 = \int_0^{l_1} \frac{M_1}{E \cdot Iz_1}\,dx - \int_{l_1}^{l_0} \frac{M_2}{E \cdot Iz_2}\,dx \tag{8}$$

where Young's modulus is denoted as E, a geometrical moment of interia of the movable as Iz_1, a geometrical moment of interia of the fixed arm as Iz_2, a bending moment generated by a force applied by the piezoelectric element of the movable arm as M_1, a bending moment generated by a force applied by the piezoelectric element of the fixed arm, a distance from a point of support of the movable arm to a point where the wire is clamped as l_0, and a distance from a point of support of the movable arm to a point which receives a bending force of the piezoelectric element l_1.

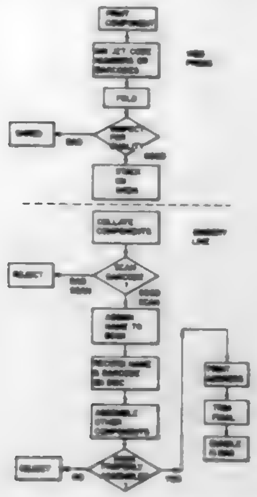
5,314,176

METHOD OF PREPARING TRACKABLE RESPONSE DEVICES WITH INSPECTION BEFORE PRINTING ADDRESS THEREON

Stephen E. Schmitt, Winnetka, Ill., assignor to Berlin Industries, Inc., Carol Stream, Ill.
Filed Sep. 8, 1992, Ser. No. 941,663
Int. Cl.^{5} B41F *13/54;* **G06F** *15/20;* **G06G** *7/48*
U.S. Cl. 270—1.1 **3 Claims**

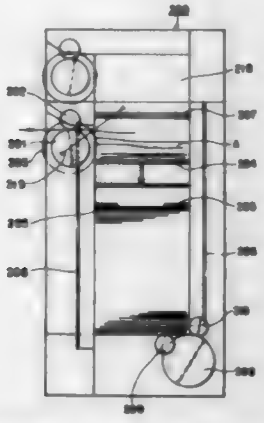
1. A method of preparing trackable response devices comprising the steps of:
passing a web of paper through a printing line,
printing the web with a plurality of response devices,
printing tracking codes on at least some of the response devices, some of the response devices having the same tracking code and comprising a set of response devices, each set having a different tracking code,

folding and trimming the web to form a plurality of separate groups of response devices so that the response devices of each set are included in a separate group having multiple pages of response devices,
removing the separate groups from the printing line,
inspecting each of the groups for compliance with predetermined quality standards for printing and accepting the groups which comply with the standards and rejecting the groups which do not comply with the standards,
passing the groups of accepted response devices through a mailing line and printing each of the separate groups with a different address, and
storing the address of each of the separate groups and the tracking code which is associated with the response devices of the group.



5,314,177
SHEET STACKING APPARATUS

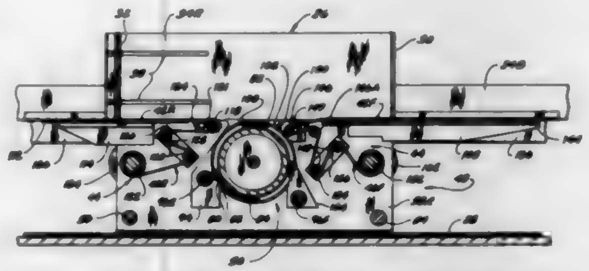
Hideyuki Anma, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 30, 1992, Ser. No. 921,753
Claims priority, application Japan, Jul. 31, 1991, 3-192212
Int. Cl.^{5} B65H *1/06*
U.S. Cl. 271—3.1 **1 Claim**



1. A sheet stacking apparatus comprising:
stacking means, having a sheet loading port and a sheet discharge port, for stacking a plurality sheets between the sheet loading port and the sheet discharge port;
pickup means for picking up one sheet from the plurality of sheets and discharging it through the sheet discharge port;
convey means for conveying the discharged sheet to the sheet loading port;
counting means for counting a number of sheets conveyed by the convey means;
separation means, disposed inside the stacking means, for separating the plurality of sheets stacked by the stacking means from a plurality of newly loaded sheets which are loaded through the sheet loading port, and for stacking the newly loaded sheets;
detection means for detecting a position of the newly loaded sheets stacked by the separating means; and
means for moving the separation means in a stacking direction in accordance with the detection results of the detection means, thereby allowing the sheets stacked on the separation means to be unchanged in position;
sheet detection means, located proximate to the sheet discharge port, for detecting whether one of the plurality of sheets stacked by the stacking means remains on the stacking means during a sheet stacking operation, and for outputting a signal for stopping the pickup means and the counting means when the sheet detecting means detects that none of the plurality of sheets stacked by the stacking means remains on the stacking means.

5,314,178
AUTOMATIC FEEDER FOR WORKPIECES OF LIMP MATERIAL

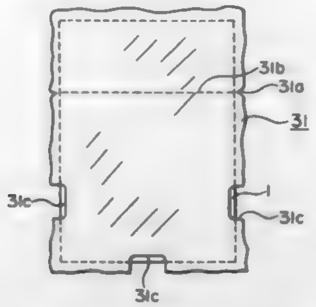
William R. Cole, Jr., and Joel D. Clanton, both of Shelbyville, Tenn., assignors to Ark, Inc., Shelbyville, Tenn.
Filed Nov. 16, 1992, Ser. No. 976,894
Int. Cl.^{5} B65H *3/22*
U.S. Cl. 271—18.3 **22 Claims**



1. An automatic feeder for feeding workpieces of limp material one at a time and one after another from a stack of workpieces, the feeder comprising:
means for supporting the stack;
a gripper located generally underneath the stack and said support means, the gripper including means for gripping the bottom workpiece, said support means having an opening therein for exposing the bottom workpiece in the stack to said gripping means;
means for actuating relative motion between said support means and the stack and the gripper and the stack such that the opening in said support means and the gripper pass conjointly under the stack in a rearward direction generally from one end of the stack to the other thereby to progressively present areas of the bottom workpiece over the opening with said gripping means of the gripper progressively and successively gripping at least a portion of the areas of the bottom workpiece as they are exposed to said gripping means over the opening to peel the areas of the bottom workpiece generally downwardly away from the stack and releasing the areas peeled away thereby to separate the bottom workpiece from the stack.

5,314,179
PRINTING PAPER PROTECTING DEVICE

Keisuke Oda, and Fumio Kouzai, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 28, 1992, Ser. No. 921,000
Claims priority, application Japan, Jul. 29, 1991, 3-188463
Int. Cl.^{5} B65H *1/00*
U.S. Cl. 271—145 **20 Claims**

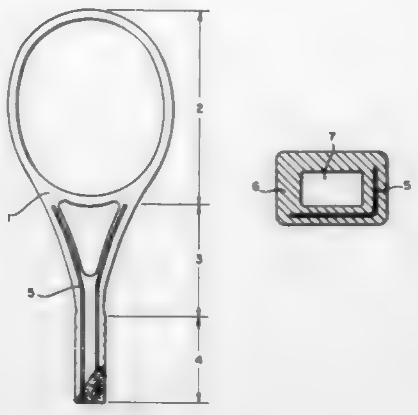


1. A printing paper protecting device comprising:
a paper cassette for holding a stack of printing paper; and
a printing paper support removably disposed in the cassette and including:
a flat protecting plate having a length direction and a width direction; the first and second ends begin and first and second ends transverse to the length direction disposed within the cassette, and a support surface for receiving a stack of paper,
a barrier extending along the width direction of the plate and extending substantially perpendicular to the support surface, and
a grasping surface adjoining the first end of the plate for enabling the paper support to be grasped by a hand without contacting a stack of paper disposed on the paper support.

5,314,180
SPORTS INSTRUMENT AND IMPACT-ABSORBING ELEMENT TO BE ATTACHED TO SPORTS EQUIPMENT

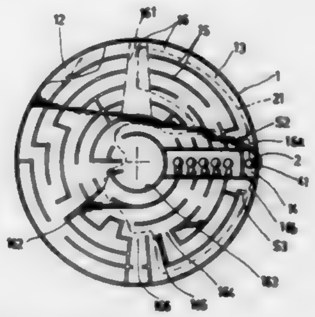
Masahiro Yamagishi, Kusatsu; Masao Hijiri, Okazaki; Yasuo Komatsu, Otsu; Hiroshi Edagawa, Shiga, and Naoki Imaeda, Otsu, all of Japan, assignors to Toray Industries, Inc., Toyko, Japan
Continuation of Ser. No. 684,923, Jun. 18, 1991, abandoned.
This application Dec. 16, 1992, Ser. No. 993,455
Claims priority, application Japan, Aug. 28, 1989, 1-220632; Jan. 25, 1990, 2-15859; Feb. 6, 1990, 2-26431
Int. Cl.^{5} A63B *49/02*
U.S. Cl. 273—73 F **13 Claims**

1. A sports racket having a vibration-reducing material embedded therein,
wherein the vibration-reducing material has a vibration loss coefficient of not less than 0.01 at room temperature,
wherein said vibration-reducing material is a thermally cured material of the following components as major constituents;
(a) an epoxy resin which possesses flowability at a temperature between room temperature and 100° C.,
(b) a polyamide resin which possesses flowability at a temperature between room temperature and 100° C., and
(c) an inorganic filler selected from the group consisting of graphite, ferrite and mica;
and wherein, the sports racket is selected from the group consisting of:
a tennis racket,
a racket ball racket, and
a squash ball racket.



5,314,181
TIMING AND TALKING MARBLES GAME TOY

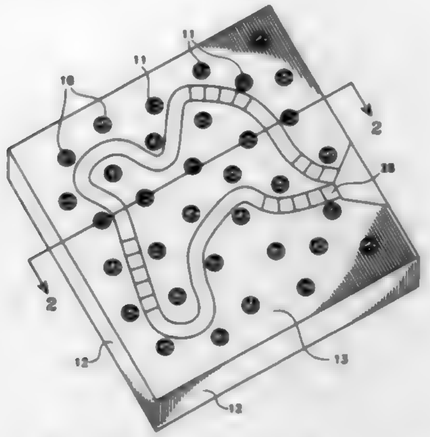
Wen-Tsung Lin, P.O. Box 74-9, Taipei, Taiwan
Filed May 7, 1993, Ser. No. 57,864
Int. Cl.^{5} A63F *7/00*
U.S. Cl. 273—109 **9 Claims**

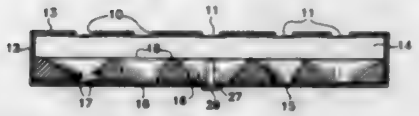


1. A game toy comprising:
a board casing having a base, a transparent cover sealably mounted on the base, and a marbles board mounted on the base under the transparent cover;
an illuminating and talking circuit including a central processing unit, a timing circuit and a talking integrated circuit, and mounted in the casing having a plurality of lamps juxtapositionally mounted in the casing and electrically connected to said central processing unit, and operatively switched on to left up all the lamps when the ball starts at the starting point to switch on a starting switch to start an operation of the central processing unit of the illuminating and talking circuit, the central processing unit operatively subsequently switching off each of the lamps with respect to a time lapse based on said timing circuit of the central processing unit and operatively triggering said talking integrated circuit of said illuminating and talking circuit to give a voice warning in response to each switching off of the lamp, and the central processing unit operatively counting the number of the lamps not switched off when the ball reaches the finishing point to drive the talking integrated circuit for producing a voice indicating a status of the lamps being lit or switched off within a predetermined time period; and a power source electrically connected to the illuminating and talking circuit for powering the same.

5,314,182
FISHING BOARD GAME AND METHOD

Daniel D. Derr, P.O. Box 235, Houston, Ak. 99694
Filed Apr. 2, 1993, Ser. No. 42,778
Int. Cl.⁵ A63F *3/00*
U.S. Cl. 273—140 **11 Claims**





1. A board game comprising:
- a) an opaque top board, said top board having at least one hole formed therein;
- b) a bottom board;
- c) opaque side wall means to connect said top board and bottom board such that a hollow cavity is formed therebetween and further such that the opaque side wall means act to seal said cavity;
- d) a plurality of game pieces, said game pieces being sized to fit through said hole in said top board and further having at least one hole placed therein;
- e) hooking device having long thin handles and at least one hooked end formed therein to engage said hole in said game pieces;
- f) an opaque cover means fixed placed over said hole in said top board such that said cover means prevents visual access to said bottom board, said cover means also having a elastic members that opens to permit penetration of said hooking device through said hole in said top board when the hooking device is pushed through said cover means, and closes when said hooking devise is removed;
- g) a holding means, being fixedly attached to said bottom board to hold said game pieces in a fixed location corresponding to the hole positions in said top board; and
- h) a gathering means to move said game pieces to said holding means.

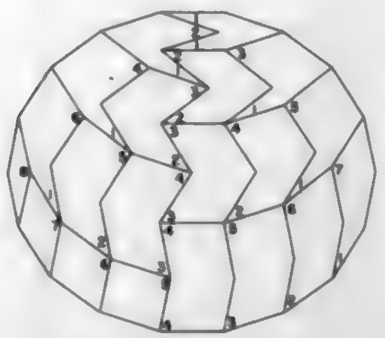
5,314,183
SET OF TILES FOR COVERING A SURFACE

Alan H. Schoen, 316 W. Oak St., Carbondale, Ill. 62901
Filed Mar. 17, 1993, Ser. No. 32,311
Int. Cl.⁵ A63F *9/10, 1/00*
U.S. Cl. 273—157 R **15 Claims**

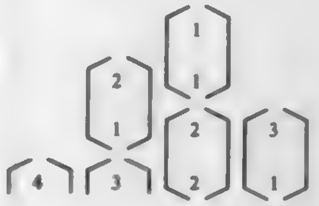
1. A set of tiles for covering a plane surface bounded by a regular polygon of 2n sides, for forming a repeatable cell, and for other purposes, said regular polygon being dissectible into a set of $(n-1)n/2$ rhombuses, comprising one specimen of each distinct rhombus in said set and one specimen of each distinct shape formed by combining two of the remaining rhombuses in said set in such a manner that no two edges at any vertex are collinear,

each said specimen formed by thus combining two rhombuses having an outer notch in its periphery and being identifiable by two integers i and j which are the indices of the convex interior face angles flanking said notch, wherein i is not less than j,

said tiles covering said plane surface in the following configuration of vertical columns of specimens, wherein all said



notches in the longest vertical column face in the same direction and all said notches in the other vertical columns face said longest vertical column, and the integers within each bracket identify the particular specimen as well as its orientation:



etc.,

said configuration setting forth a series of rows of integers as shown in which each succeeding row reverses the order of the integers in the next preceding row and adds the next higher integer after the highest integer of said preceding row until the last row, in which the highest integer is $n-1$ and in which completion of the row is achieved by brackets having a single integer rather than a pair of integers so as to designate the specimens each of which is a rhombus,

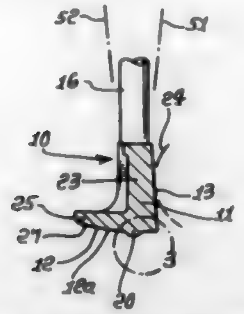
the index of any angle of A degrees being defined as equal to An/180,

or in the mirror image of said configuration.

5,314,184
GOLF PUTTER WITH BOTTOM RAIL

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.
Filed Jan. 28, 1993, Ser. No. 8,628
Int. Cl.⁵ A63B *53/02, 53/04*
U.S. Cl. 273—164.1 **16 Claims**

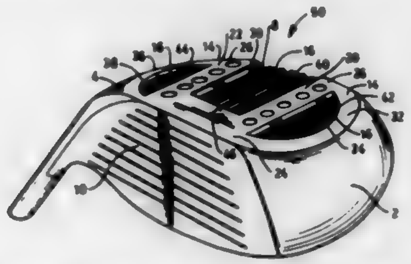
1. A golf putter for use with a putter shaft supporting a head, the head comprising, in combination:
- a) a putter body having a heel, toe, sole defining a bottom wall, and a ball striking front face, the body elongated between the heel and toe, and
- b) a control rail projecting downwardly from said bottom wall, the rail being elongated in a direction between the heel and toe to engage the turf as the putter head is placed downwardly on a golf green, and in a manner tending to stabilize the head against twist during said head downward placement,
- c) said rail spaced rearwardly from said front face along the major length of the rail,
- d) the rail having a narrow bottom surface along the rail length, said surface being flat in a front to rear direction widthwise of the rail,



- e) the body forming a shaft bore extending downwardly in alignment with said rail narrow, flat bottom surface.

5,314,185
WOOD-TPE GOLF CLUB HEAD

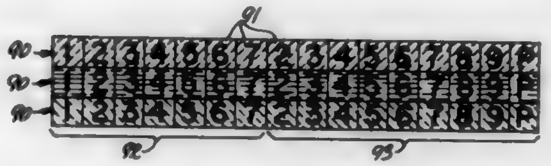
Geoffrey W. Gorman, Greer, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.
Filed Jun. 9, 1992, Ser. No. 896,150
Int. Cl.⁵ A63B *53/04*
U.S. Cl. 273—167 A **7 Claims**



1. A wood-type golf club head comprising a toe portion, a heel portion, a top portion, a sole portion, a front face bounded by said toe, heel, top and sole portions, and a rear wall bounded by said toe, heel, top and sole portions, a peripheral wall depending from the periphery of said sole portion to define a sole cavity in the sole portion, and two struts extending from a portion of said peripheral wall adjacent said rear wall, said struts being substantially parallel to each other and defining therebetween and in cooperation with said portion of said peripheral wall adjacent said front face a central portion of said sole cavity, said peripheral wall being interrupted adjacent said rear wall, a bottom surface of said central portion of said sole cavity intersecting said rear wall and in cooperation with said two struts defining said interruption in said peripheral wall, thereby defining an opening rearwardly of said club head.

5,314,186
GOLF STANCE TRAINING DEVICE

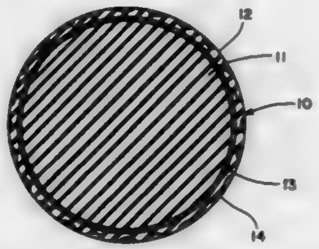
Brad K. Lee, 5591 Mansion Ct., La Verne, Calif. 91750
PCT No. PCT/US90/05975, § 371 Date Apr. 19, 1993, § 102(e) Date Apr. 19, 1993
PCT Filed Oct. 18, 1990, Ser. No. 50,004
Int. Cl.⁵ A63B *69/36*
U.S. Cl. 273—187 R **17 Claims**



1. Golf teaching apparatus comprising a foot alignment member having a foot alignment edge, a ball index member having a ball tip end and an opposite golfer end, and connector means for coupling the members for selectable movement of the alignment member relative to the index member between a first storage relation in which the members are aligned with each other and a second usage relation in which the members are disposed substantially at right angles to each other with the alignment edge disposed toward the golfer end of the index member, and for selective relative movement of the foot alignment member along the index member when the members are in their second relation, and a sight target operatively associated with the alignment member essentially over its alignment edge at a location substantially along the index member when the members are disposed in their second usage relation.

5,314,187
GOLF BALL WITH IMPROVED COVER

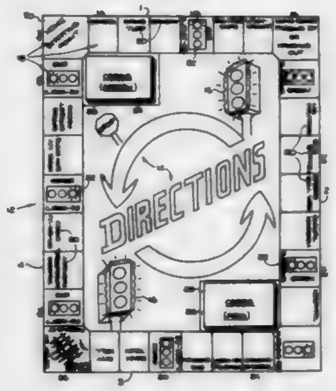
James R. Proudfit, Humboldt, Tenn., assignor to Wilson Sporting Goods Co., Chicago, Ill.
Continuation-in-part of Ser. No. 733,789, Jul. 26, 1991, abandoned. This application Jun. 29, 1992, Ser. No. 905,895
Int. Cl.⁵ A63B *37/12*
U.S. Cl. 273—235 R **25 Claims**

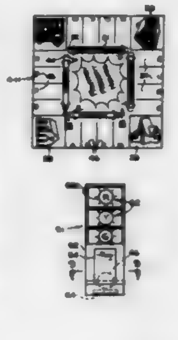


1. A golf ball comprising a core and a cover, the cover comprising an inner layer molded over the core and an outer layer molded over the inner layer, the inner layer comprising ionomer resin and the outer layer containing natural or synthetic balata as a principal ingredient.

5,314,188
COMPETITION GAME

Henry Mason, and Rhonda Mason, both of 3625 S. Lake Park #904, Chicago, Ill. 60653
Continuation-in-part of Ser. No. 856,567, Mar. 24, 1992, abandoned. This application Apr. 26, 1993, Ser. No. 52,764
Int. Cl.⁵ A63F *3/00*
U.S. Cl. 273—251 **8 Claims**





1. A competition game adapted for playing by a plurality of players, comprising,

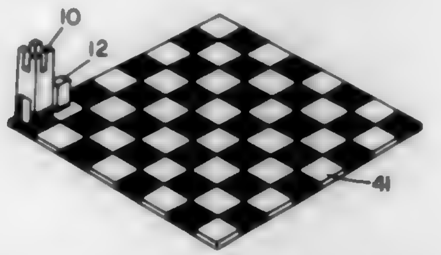
a rectangular game board having squares around its periphery,

the squares including

a) a home square forming a beginning and ending location,
b) other squares bearing instructions,
a plurality of name slips, one for each player, each name slip having identification means identifying each player, said home square comprising a plurality of pairs of slots wherein one pair of slots is located on each side of the home square, the sides of the home square corresponding to the sides of the game board, and each pair of slots is adapted to receive a name slip such that when all the name slips are received in the slots, the position of the name slips relate to the corresponding sides of the game board, thereby identifying the players at those sides respectively,
a plurality of sets of playing pieces, one set for each player, the playing pieces adapted to be placed on the home square, and successively moved onto different ones of the other squares, each set of playing pieces having a first identification means for identifying each set of playing pieces and a second identification means for individually identifying each playing piece in a set, and
indicating means capable of indicating one of green, yellow, red colors randomly in response to manipulation thereof by a player,
the game includes instructions of actions to be taken by the players according to colors respectively.

5,314,189
MODERN CHESS SET USING ARCHITECTURAL LANGUAGE TO SHAPE PLAYABLE PIECES

David W. Kerivan, 12 W. Read St., Baltimore, Md. 21201
Filed May 12, 1992, Ser. No. 881,654
Int. Cl.⁵ A63F *3/02*
U.S. Cl. 273—260 **11 Claims**

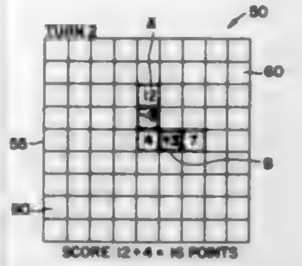


1. A chess set, comprising, a dimensional chess board, a plurality of playable chess pieces and pawns positioned for play on said dimensional chess board, with each said playable chess piece and pawn having a structure comprising channel-like lines extending around all sides of each chess piece and pawn which indicate the point value of each said playable chess piece and pawn, a geometrical band inscribed on the front of each said playable chess piece and pawn for identifying groups of playable pieces which have matching bands, said playable chess pieces and pawns having tops which are geometrically shaped to symbolically indicate the direction that each said playable chess piece and pawn can move when it is engaged in play.

5,314,190
MATHEMATICAL GAME

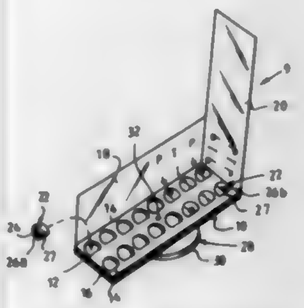
Malcolm J. Lyons, 120 Bishopsgate Street, Carlisle, Western Australia 6101, Australia
Filed Aug. 14, 1992, Ser. No. 930,085
Claims priority, application Australia, Aug. 16, 1991, PK7784
Int. Cl.⁵ A63F *3/00*
U.S. Cl. 273—272 **10 Claims**

1. A mathematical game comprising a plurality of game pieces, each game piece adapted to be laterally or longitudinally located on a playing surface, wherein a first set of game pieces bears an identifying symbol and a second set of game pieces bears a mathematical operation symbol and an identifying symbol, whereby three game pieces comprising two games pieces selected from the first set and one game piece selected from the second set are arrangeable on the playing surface to form a mathematical equation such that the second set game piece is locatable between the first set game pieces wherein the second set game piece depicts the mathematical relationship between identifying symbols of the first set game pieces.



5,314,191
WORD FORMING BOARD GAME WITH MIRRORS

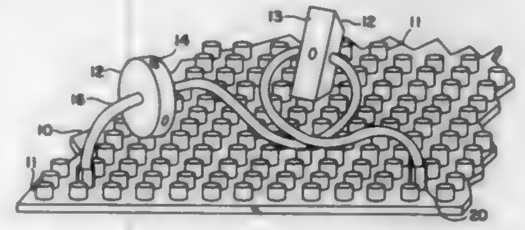
Marcel B. Mayas, 774 De Mott Ave., Baldwin, N.Y. 11510
Filed Jun. 10, 1993, Ser. No. 74,461
Int. Cl.⁵ A63F *3/00*
U.S. Cl. 273—272 **14 Claims**



1. A reflective word game which comprises:
a) a rectangular game plate having a surface with an upper row of a plurality of recessed grids and a lower row of a plurality of recessed grids;
b) a rectangular top mirror positioned horizontally and extending upwardly above said surface at an angle adjacent to and along a long side of said rectangular game plate; and
c) a rectangular side mirror positioned vertically and extending upwardly above said surface at an angle adjacent to and along a short side of said rectangular game plate lateral to said both rows of said plurality of recessed grids.

5,314,192
SOFT AND FLEXIBLE TOY AND GAME SYSTEM

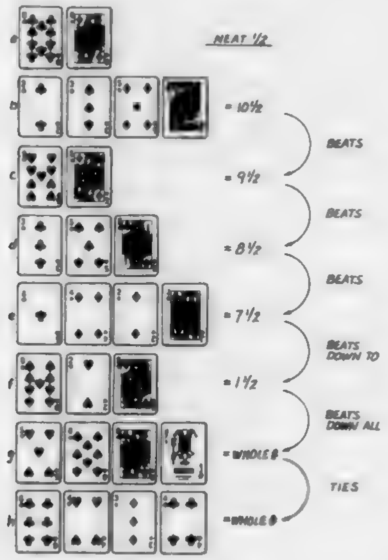
Ronald A. Broudy, 1519 S. Holt Ave., Los Angeles, Calif. 90035, and Joan Pine, 454 S. Palm Dr., Beverly Hills, Calif. 90212
Filed Jul. 23, 1993, Ser. No. 96,723
Int. Cl.⁵ A63F *3/00*
U.S. Cl. 273—282.3 **18 Claims**



1. A toy and game system comprising in combination:
a. a game board having a plurality of knobs protruding from its surface;
b. a plurality of shapes; said shapes being soft and flexible; each of said shapes having at least one through hole;
c. a plurality of tubular wire-like chords adapted to be inserted through said through holes; each of said tubular wire-like chords having two ends; said tubular wire-like chords being designed to retain any shape into which they are bent; said wire-like chords being soft and flexible; and
d. a plurality of short tube sections adapted to connect to either of said ends and said knobs; said short tube sections being soft and flexible;
whereby an almost infinite variety of fanciful objects can be created and a variety of games can be played.

5,314,193
METHOD OF PLAYING A WAGERING CASINO TYPE

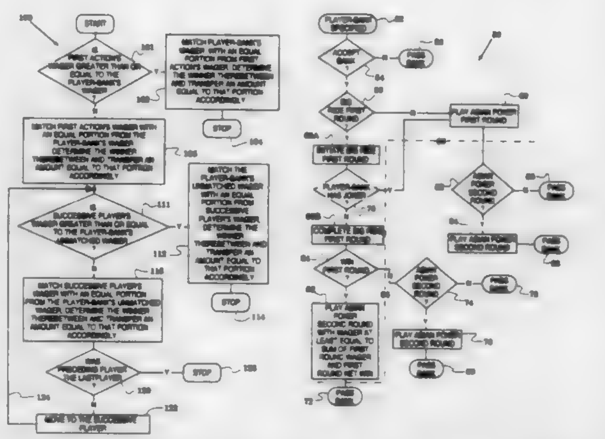
Emilio Ferrer, 4820 E. 60th Pl., Maywood, Calif. 90270
Filed Feb. 22, 1993, Ser. No. 20,633
Int. Cl.⁵ A63F *1/00*
U.S. Cl. 273—292 **27 Claims**



1. A method for playing a card game among two or more players comprising the steps of:
providing fifty-six playing cards including a standard poker deck of fifty-two cards plus four joker cards;
providing a card dealer for dealing said playing cards;
dealing an initial card hand consisting of two cards to each of the players;
offering each player the option to draw at least one additional card from said dealer; and
exposing the card hands of all players to determine the winning card hand according to the following rules:
the point value of each natural number card is its face value and all figure cards and jokers have a value of ½ point;
any hand adding up to an integer plus ½ point wins over any hand adding up to an integer only value;
as between hands adding up to an integer plus ½ point, the hand with the higher integer value wins;
all hands adding up to an integer value tie with each other.

5,314,194
METHOD OF PLAYING A WAGERING GAME

Fred Wolf, 10418 Lubao Ave., Chatsworth, Calif. 91311
Continuation-in-part of Ser. No. 988,724, Dec. 10, 1992, Pat. No. 5,226,661, and a continuation-in-part of Ser. No. 21,469, Feb. 23, 1993, Pat. No. 5,244,809. This application Apr. 15, 1993, Ser. No. 45,873
The portion of the term of this patent subsequent to Oct. 5, 2010, has been disclaimed.
Int. Cl.⁵ A63F *1/00*
U.S. Cl. 273—292 **19 Claims**



1. A method of playing a wagering game by a plurality of game players arranged in successive order, the method comprising the steps of:
specifying a first one of said players;
specifying a second one of said players;
defining a first wagering process having the steps of;
- a) providing, from each of said game players, a wager;
- b) initiating an unmatched portion equal to the first player's wager;
- c) matching a portion of the first player's wager against the second player's wager wherein said portion equals the lesser of said unmatched portion and said second player's wager or equals either of them if they are identical;
- d) determining a game winner or a tie between said first and second players;
- e) transferring an amount equal to said portion from said second player to said first player if said first player is said winner and from said first player to said second player if said second player is said winner and transferring nothing if said tie is determined;
- f) modifying, if a winner was determined, said unmatched portion by subtracting therefrom said portion; and
- g) repeating the combination of said matching, determining, transferring and modifying steps with a different one of said players, excluding said first player, replacing, in successive order, said second player in each repetition, until the first occurs of (1) said transferring step has been completed between said first player and all other players and (2) said unmatched portion equals zero;

defining a second wagering process having the steps of;
- a) providing, from each of said game players, a wager;
- b) initiating a balance equal to the first player's wager;
- c) establishing a bet equal to the lesser of said balance and the second player's wager or equal to either of them if they are identical;
- d) determining a game winner or a tie between said first and second players;
- e) transferring an amount equal to said bet from said second player to said first player if said first player is said winner and from said first player to said second player

if said second player is said winner and transferring nothing if said tie is determined;

f) modifying said balance by adding said bet to it if said first player is said winner and subtracting said bet from it if said second player is said winner; and

g) repeating the combination of said establishing, determining, transferring and modifying steps with a different one of said players, excluding said first player, replacing, in successive order, said second player in each repetition, until the first occurs of (1) said transferring step has been completed between said first player and all other players and (2) said balance equals zero;

wherein said game winner between said first player and another of said players in said first and second wagering processes is determined by the steps of:

a) providing each of said first player and said another player a plurality of playing cards or equivalents thereof;

b) requiring said first player and said another player to set their cards into first and second hands;

c) determining the poker rank of the first and second hands of said first player and said another player; and

d) deeming the game winner to be the player whose first and second hands each outrank respectively the first and second hands of the other player and deeming a tie if neither player's hands meet this condition;

offering first and second wagering options to said first player for selection therebetween wherein said first wagering option includes the step of executing said first wagering process on a first game round; and wherein said second wagering option includes the step of executing said second wagering process on a first game round; and

implementing the selected one of said first and second wagering options.

5,314,195
DART GAME

Ulrich Schulze, Wiesbaden, Fed. Rep. of Germany, assignor to NSM Aktiengesellschaft, Bingen, Fed. Rep. of Germany

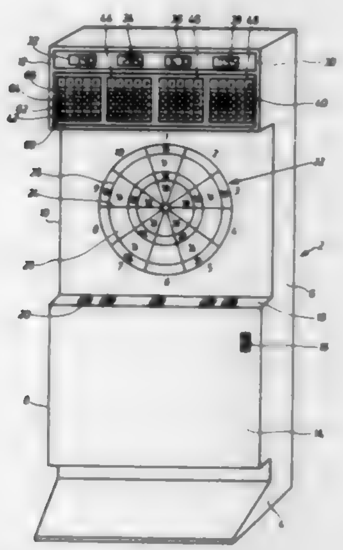
PCT No. PCT/DE91/00053, § 371 Date Jul. 27, 1992, § 102(e) Date Jul. 27, 1992, PCT Pub. No. WO91/11674, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 9, 1991, Ser. No. 915,821

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002126

Int. Cl.⁵ F41J *3/00*

U.S. Cl. 273—371 **9 Claims**



1. A dart game for use by dart game players, comprising:

a dart board which includes a plurality of radial ribs, a plurality of concentric ribs, a plurality of target fields, each of the target fields including a plurality of segments which are disposed between the ribs to receive darts, and a plurality of switches, each switch corresponding to a respective segment and being activated when the respective segment is hit by a dart;

a hit display which includes a plurality of groups of display lamps, the groups of display lamps corresponding to the target fields so that each target field has at least one group corresponding to it, each of the display lamps in a group corresponding to a respective segment of the corresponding target field; and

means, responsive to the switches and including a memory device, for selectively illuminating display lamps when the corresponding segments of the dart board are hit by darts, the display lamps being selectively illuminated in such a manner that a first one of the display lamps corresponding to a given target field is illuminated when a first one of the segments of the given target field is hit by a dart thrown by a player and thereafter further display lamps corresponding to the given target field are illuminated only when further segments of the given target field are hit by darts thrown by the same player.

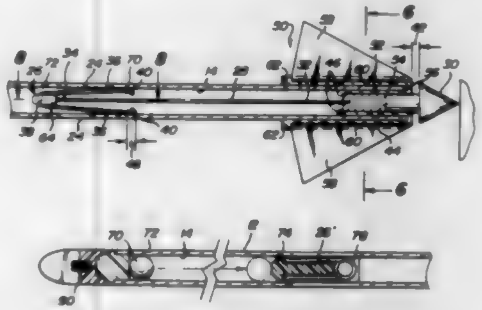
5,314,196
ARROW CONSTRUCTION FOR USE IN BOW HUNTING

Robert J. Ruelle, 952 Bloomfield Village "F", Auburn Hills, Mich. 48326

Filed Aug. 28, 1992, Ser. No. 937,998

Int. Cl.⁵ F42B *6/04, 6/06, 6/08*

U.S. Cl. 273—416 **11 Claims**



1. An arrow construction for use with a bow in hunting wild game, comprising:

a shaft having a hollow interior;

an arrowhead attached to a leading end of said shaft;

a stop member disposed in said shaft for limiting the travel of said shaft and said arrowhead into the body of said wild game in response to said arrowhead impacting said wild game, said stop member expanding radially from said shaft in response to said arrowhead impacting said wild game; and

means responsive to said arrowhead impacting said wild game for activating said stop member from a closed position within said hollow interior of said shaft to an open position outside said shaft, said stop member opening in a direction facing said arrowhead, said means for activating said stop member includes:

a stem longitudinally disposed within said hollow interior of said shaft, said stem having a first end attached to said stop member; and

a tip of said arrow spaced a predetermined distance away from said leading end of said shaft, said tip being attached to a second end of said stem opposite said first end; and

wherein said tip of said arrow is displaceable said predetermined distance upon impacting said wild game, said displacement of said tip displacing said stem and said stop member, said displacement of said stop member permitting said stop member to activate from said closed to said open position.

10. An arrow construction for use with a bow in hunting wild game, comprising:

a shaft having a hollow interior;

an arrowhead attached to a leading end of said shaft;

means disposed in said shaft for limiting the travel of said shaft and said arrowhead into the body of said wild game in response to said arrowhead impacting said wild game; and

means for overcoming frictional losses to said arrow due to the disengagement of a bowstring of the bow from said neck.

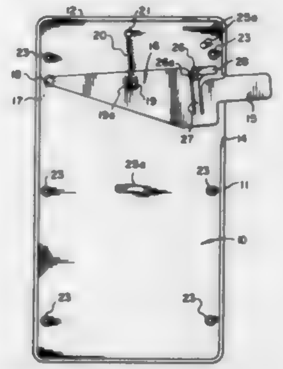
5,314,197
GAME APPARATUS

Brian L. Hersch, Los Angeles, Calif., assignor to Hersch & Company, Los Angeles, Calif.

Filed Feb. 3, 1993, Ser. No. 27,722

Int. Cl.⁵ A63F *9/18*

U.S. Cl. 273—430 **9 Claims**



1. Game apparatus comprising:

game card means for carrying game indicia having a plurality of intelligible game indicia spaced therealong, said game indicia being interspersed with nonintelligible indicia whereby said game indicia can be read only when viewed through a window in the apparatus;

a housing comprising side walls and a front cover, one of said side walls having an opening for receiving said game card means, said front cover having a window for viewing said game indicia on said game card means;

ratchet means on said game card means; and

pawl means in said housing cooperating with said ratchet means for indexing said game card means to bring successive ones of said game indicia into play.

5,314,198
COLLET CHUCK APPARATUS

Roger J. Kanaan, Easley, S.C., assignor to Jacobs Chuck Technology, Wilmington, Del.

Continuation of Ser. No. 770,355, Oct. 3, 1991, Pat. No. 5,193,825. This application Dec. 14, 1992, Ser. No. 992,260

The portion of the term of this patent subsequent to Mar. 16, 2010, has been disclaimed.

Int. Cl.⁵ B23B *31/20, 31/36*

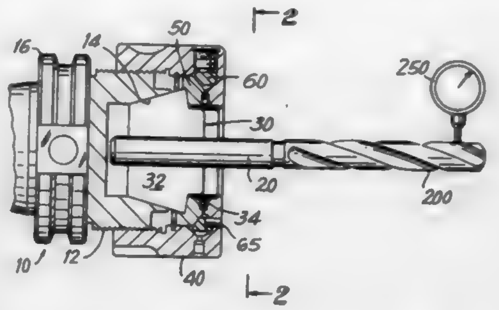
U.S. Cl. 279—133 **22 Claims**

1. A collet chuck for use with a machine collet of the type having a plurlaity of rigid gripper members disposed in an annular array and circumferentially spaced from one another by resilient means, said chuck comprising:

a body member having a frustoconical surface defined therein substantially concentric with said body member, said frustoconical surface for receiving a machine collet;

means moveable relative to said body member for forcing a collet disposed within said body member against said frustoconical surface along a line substantially parallel to an axis concentric with said frustoconical surface, so that the gripper members of a collet disposed within said body are forced against said frustoconical surface thereby changing the circumferential spacing between the gripper members; and

means transversely moveable relative to said axis for displacing at least one gripper member of a collet disposed within



said body member along said frustoconical surface in a direction generally parallel to said centerline axis in order to shift the center of the collet in a direction transverse to said centerline axis.

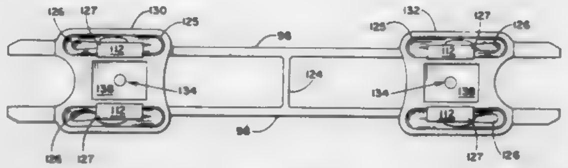
5,314,199
CONVERTIBLE IN-LINE ROLLER SKATES

Scott B. Olson, Minneapolis, and Louis F. Polk, Excelsior, both of Minn., assignors to O.S. Designs, Inc., Waconia, Minn.

Continuation-in-part of Ser. No. 868,457, Apr. 14, 1992, Pat. No. 5,193,827. This application Mar. 12, 1993, Ser. No. 30,974

Int. Cl.⁵ A63C *1/02*

U.S. Cl. 280—7.13 **33 Claims**



1. In a skate assembly comprising a shoe having a sole plate, toe and heel attachment means secured to said sole plate, and means for selectively securing a wearer's surface blade support subassembly to said toe and heel attachment means, said skate assembly being further characterized in that:

said blade support assembly includes a frame having a first and second end, said first and second end having a first and second coupling means, respectively, each said first and second coupling means being identical so that they can be coupled to either the toe or heel attachment means such that said blade support subassembly is securingly adaptable to said shoe in two positions.

5,314,200
MULTI-PURPOSE TRAILER APPARATUS

Vern L. Phillips, 4609 W. 129th Street, Savage, MN 55738

Filed Mar. 1, 1993, Ser. No. 24,284

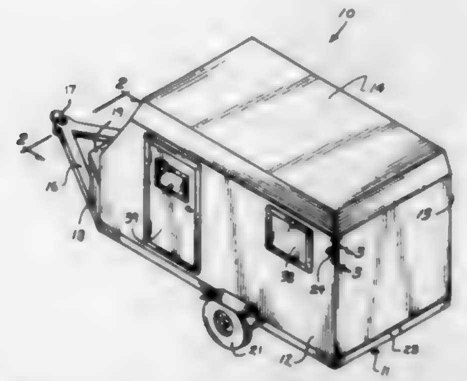
Int. Cl.⁵ B62D *33/04*

U.S. Cl. 280—400 **1 Claim**

1. A multi-purpose trailer apparatus, comprising,

a rectilinear frame assembly, having a trailer housing fixedly mounted to the frame assembly, wherein the trailer housing includes a first side wall spaced from, parallel to, and coextensive with a second side wall, with the first side wall and the second side wall fixedly mounted to the frame assembly, and a front wall fixedly mounted to the first side wall and the second side wall extending between the first side wall and the second side wall, and

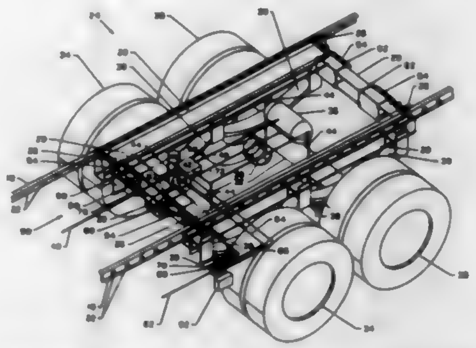
a roof dome positioned upon the first side wall, the second side wall, and the front wall, and
the frame assembly including a triangulated forward frame portion extending from the rectilinear frame assembly and the front wall terminating in a trailer hitch socket at an apex of the triangulated forward frame portion, and
a rear wall door oriented coextensively between the first side wall and the second side wall, and a rear wall door hinge mounted to the rear wall door and to the rectilinear frame assembly permitting pivoting of the rear wall door relative to the frame assembly, and
an axle fixedly mounted to the frame assembly below the trailer housing, with the axle including an axle first end extending beyond the first side wall, and an axle second end extending beyond the second side wall, with the axle orthogonally oriented relative to the first side wall and the second side wall, and a wheel member mounted to the axle first end and a further wheel member mounted to the second end in a rotatable relationship, and
at least one latch rod, wherein the at least one latch rod includes a latch rod handle, and a latch rod housing fixedly mounted to the first side wall in adjacency to the rear wall door, and the latch rod including an abutment plate fixedly mounted to the latch rod within the latch rod housing in adjacency to the first side wall, and a spring captured between the latch rod abutment plate and the housing to bias the latch rod within the trailer housing, and a securement loop fixedly mounted to the rear wall door in adjacency to the first side wall to slidably receive the latch rod therethrough, and
the roof dome includes a unitary flexible roof dome side wall, wherein the roof dome includes a lower periphery of continuous configuration and the roof dome side wall is mounted to the lower periphery, and the roof dome further mounted to the first side wall, the second side wall, and the front wall, with the roof dome having a telescoping leg fixedly mounted to the roof dome within the trailer housing, and a support rod, the trailer housing having a trailer floor plate and the support rod fixedly mounted to the trailer floor plate receiving the telescoping leg slidably therewithin, and lock means arranged for securement of the telescoping leg in a predetermined extended orientation relative to the support rod within the trailer housing.



5,314,201
LOCKING SYSTEM FOR A SEMITRAILER SLIDING UNDERCARRIAGE

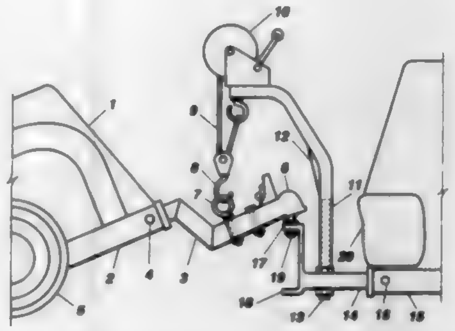
Larry L. Wessels, Lakewood, Colo., assignor to Rocky Mountain Technology Engineering Corp., Lakewood, Colo.
Filed Dec. 24, 1992, Ser. No. 996,580
Int. Cl.⁵ B62D *53/06*
U.S. Cl. 280—407.1 **18 Claims**

1. A locking system for mounting on a sliding undercarriage of a semitrailer, the semitrailer pulled by a tractor, the locking system used for securing and releasing the sliding undercarriage from a pair of parallel rails mounted on an underside of the semitrailer, the parallel rails having spaced apart locking pin holes along the length thereof, the sliding undercarriage having spring operated air brakes operated from a pressurized air source on the semitrailer or tractor, the semitrailer having an electrical power source thereto, the locking system comprising:
a pair of locking pins;
locking pin insertion and retraction means attached to each of said locking pins for inserting and retracting said locking pins in selected locking pin holes in the parallel rails, said insertion and retraction means attached to the sliding undercarriage;
means for allowing retracting of each of said locking pins from the locking pin holes only when the semitrailer brakes on the sliding undercarriage are set, said means for allowing retracting of each of said locking pins connected to said insertion and retraction means; and
individual pin indicator means connected to said locking pin insertion and retraction means for indicating when each of said pins are properly extended into a locked position in the locking pin holes in the rails.



5,314,202
GOLF CAR TOWING HITCH SYSTEM

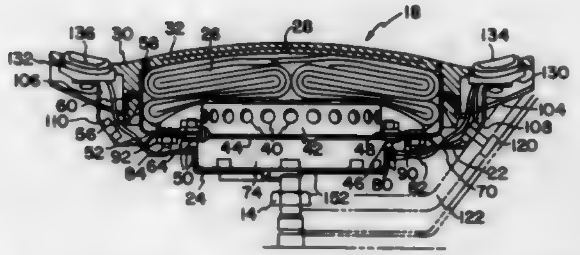
Guy Wilkins, Jr., 1719 Binford St., Ogden, Utah 84401
Continuation-in-part of Ser. No. 756,897, Sep. 9, 1981, abandoned. This application Nov. 2, 1992, Ser. No. 970,149
Int. Cl.⁵ B60P *3/12*
U.S. Cl. 280—511 **18 Claims**



1. A towing hitch system for towing a golf car comprising:
(a) supporting means for supporting a ball, said supporting means being attachable to the rear of a tow vehicle,
(b) a ball supported by said supporting means,
(c) connecting means for connecting the golf car to said ball, said connecting means being attachable to the rear of a golf car, and
(d) lifting means for lifting the rear of a golf car to bring said connecting means into alignment with said ball.

5,314,203
DRIVER-SIDE MODULE ATTACH BRACKET

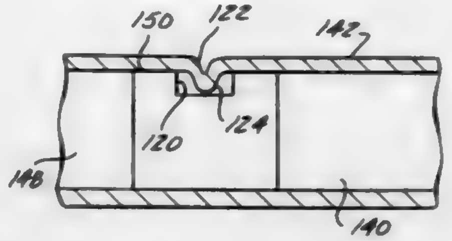
Gary V. Adams, Brigham City, and Bradley W. Smith, Ogden, both of Utah, assignors to Morton International, Inc., Chicago, Ill.
Filed Jan. 15, 1992, Ser. No. 820,826
Int. Cl.⁵ B60R *21/16*
U.S. Cl. 280—728 A **2 Claims**



1. Attach bracket means for fixedly mounting to a selected individual one of different vehicle steering wheels a selected individual one of different styled driver restraint module assemblies wherein all of said module assemblies incorporate common major components including a reaction plate, an inflator, and a folded air bag, said module assemblies being characterized in the provision thereon of a plurality of common module attach points that are located on the reaction plate,
said different steering wheels having different spoke arrangements and attach points thereon for the attachment thereto of said attach bracket means with styling affecting the locations on each of said different steering wheels of said attach points,
said attach bracket means being characterized in the provision thereon of a first plurality of common attach points that are common to the module attach points provided on each of said different styled module assemblies for the attachment thereto of said selected individual one of the different style module assemblies,
said attach bracket means being further characterized in the selective provision thereon of a second plurality of attach points the locations of which are unique to the locations of said attach points provided on said selected individual one of the steering wheels on which said selected individual one of the different styled module assemblies is to be mounted,
wherein said individual one of said different styled driver restraint module assemblies further includes a cover placed over said folded air bag, said cover having a side wall with an inner groove formed therein,
wherein said reaction plate includes an upstanding wall having an inner wall surface which is positioned in close fitting engagement with said folded air bag with a distal edge of said upstanding wall being formed into a rolled-over lip that engages and is locked in mating engagement with said groove in said cover when said reaction plate and said folded air bag are pressed in place within said cover,
and, wherein said bracket means are provided with tangs which in conjunction with said rolled-over lip keep said groove from slipping and hold said cover on said wall of said reaction plate during deployment of said air bag.

5,314,204
COLLAPSIBLE STEERING SHAFT APPARATUS

Dan DuRocher, Leanord, and Ellsworth Miller, Rochester Hills, both of Mich., assignors to ITT Corporation, New York, N.Y.
Continuation of Ser. No. 757,878, Sep. 11, 1991, abandoned. This application Nov. 16, 1992, Ser. No. 977,750
Int. Cl.⁵ B62D *1/19*
U.S. Cl. 280—777 **7 Claims**



1. A vehicle steering apparatus comprising:
a hollow, tubular, steering column housing;
bracket means mounted on the steering column housing for mounting the steering column housing to stationary vehicle structure;
a steering column shaft formed of first and second telescopingly engaged steering shaft members, each member having a longitudinal axis, the first and second members rotatably mounted in the steering column housing and having ends extending outward from the opposed ends of the steering column housing, the second steering shaft member having a side wall surrounding a hollow interior;
a steering wheel fixedly mounted on one outward extending end of one of the steering shaft members;
a notch preformed in one end of the first steering shaft member normal to the longitudinal axis and extending over a limited angular extent of the first steering shaft member; and
a slot formed in and extending through the side wall of one end of the second steering shaft member normal to the longitudinal axis and over a limited angular extent of the second steering shaft member the one end of the second steering shaft member telescopingly overlying the one end of the first steering shaft member, the portion of the second steering shaft member surrounding the slot being deformed into the notch in the first steering shaft member to non-separably and axially interconnect the first and second steering shaft members together during normal operating conditions, but allowing separation of the portion of the second steering shaft member surrounding the slot and deformed into the notch from the notch and the telescoping collapse of the first and second steering shaft members with respect to each other under axial forces acting on the steering column shaft.

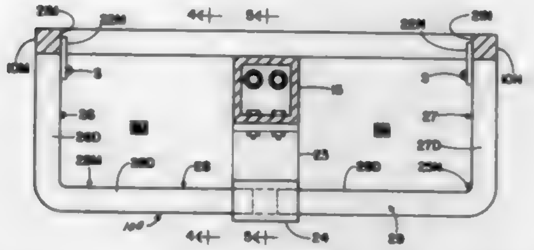
5,314,205
SKELETAL CHASSIS FOR MOTOR-HOME ROADWAY VEHICLES

Herbert C. Glesmann, 6145 S. 102nd St., Omaha, Nebr. 68127
Continuation-in-part of Ser. No. 529,490, May 29, 1990, abandoned. This application Jul. 15, 1992, Ser. No. 914,476
Int. Cl.⁵ B62D *21/04, 21/18*
U.S. Cl. 280—783 **6 Claims**

1. Skeletal chassis for motor-home roadway vehicles and vehicularly directionally longitudinally comprising along a horizontal and directionally longitudinal central-axis thereof, three zones, namely:
(A) a front-end operational-zone for the vehicle driver;
(B) a central occupants'-zone comprising:
(Bi) three directionally longitudinally extending members therealong including a tubular forward-member along said central-axis and that provides the primary and pre-eminent weight-bearing capability for said chassis, and further in-

cluding a leftward sideward-member and a rightward sideward-member together flanking said central-axis and defining a transverse width for said chassis occupants's-zone; and

(Bii) a directionally transversely extending framework delineating a plurality of directionally longitudinally consecutive pairs of transversely aligned storage compartments flanking said central-axis and each compartment being provided with an up-right entrance-opening located immediately below respective sideward-members, said grid-like framework at each pair of compartments including: a plurality of directionally transversely extending horizontal rib members located at and attached to substantially regularly-spaced longitudinal increments of said tubular forward-member, each such transverse rib being substantially perpendicular to said forward-member and having a left-end located adjacent said leftward sideward-member and also having a right-end located adjacent to said rightward sideward-member; horizontal base means located below and extending in both transverse directions from said tubular forward-member; upright left-leg means located adjacent to, extending downwardly from the leftward sideward-member, and being connected to a leftward portion of said horizontal base means; and upright right-leg means located adjacent to, extending downwardly from the rightward sideward-member, and being connected to a rightward portion of said horizontal base means; and



(C) a rearward powertrain-zone located adjacently rearwardly of said central occupants'-zone.

5,314,206
SLIDING SEAT SAFETY DEVICE IN A VEHICLE

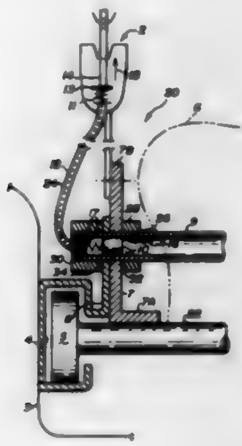
Elmar Vollmer, Wettstetten, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed Mar. 1, 1993, Ser. No. 25,171

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1990, 4032386

Int. Cl.⁵ B60R *21/02, 22/02;* **B60N** *2/42, 2/08*

U.S. Cl. 280—801.1 **8 Claims**



1. An improved passive safety system in a motor vehicle which includes an inflatable air bag, a knee restraint, at least one seat having a seat support for slide adjustable fore/aft movement of the seat and seat support along floor mounted seat rails in a longitudinal direction of the vehicle, a seat adjustment latch for selectively retaining the seat and seat support to the seat rails at a plurality of seat adjustment positions, and a seat belt, said improved passive safety system comprising in operative combination:

a) means for detecting the fastened and unfastened condition of the seat belt;

b) means responsive to said seat belt condition detecting means for selective reinforcement of the seat adjustment latch so that:

i) when the seat belt is fastened, the seat adjustment latch is set at a first reinforced position to resist breakaway movement of the seat and seat support along the seat rails; and

ii) when the seat belt is unfastened, the seat adjustment latch is set at a second unreinforced position to permit breakaway movement of the seat and seat support along the seat rails to carry a seated passenger forward for effective engagement with the knee restraint and air bag in the event of a sudden deceleration impact to the vehicle above a predetermined level of severity.

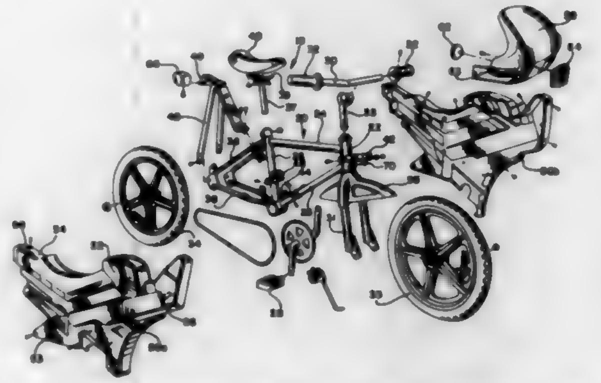
5,314,207
BICYCLE WITH SIMULATED MOTORCYCLE PARTS

David K. Camfield; Daniel G. Hahn; Duane Niemeyer, and Daniel F. Brashear, all of Olney, Ill., assignors to Roadmaster Corporation, Olney, Ill.

Filed Jun. 10, 1992, Ser. No. 896,155

Int. Cl.⁵ B62J *17/00*

U.S. Cl. 280—828 **21 Claims**



1. A combination of a bicycle and a shroud attachable to the bicycle to simulate a motorcycle, the bicycle comprising a frame having a seat tube and a seat mounted on a seat post within said seat tube, the seat having a contoured lower outer surface, the shroud comprising:

a) a center portion simulating a gas tank, the center portion having a concave, contoured upper surface shaped to follow the contour of the bicycle seat lower outer surface;

b) a rear fender portion for extending over a rear wheel of the bicycle; and

c) a front portion for attaching the shroud to the frame of the bicycle.

5,314,208
COMPREHENSIVE, PAR-RELATIVE GOLF SCOREBOARD

Ronald R. Strickland, 4508 Cove Rd., Wilmington, N.C. 28405

Filed Oct. 8, 1992, Ser. No. 958,568

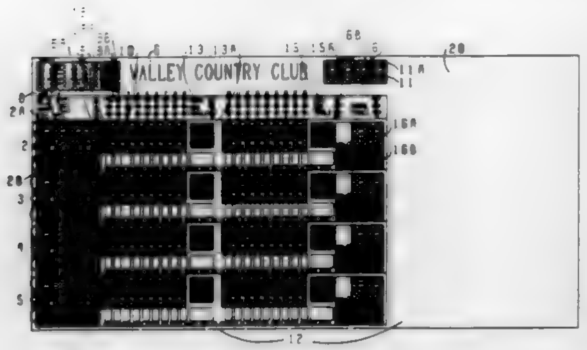
Int. Cl.⁵ B42D *15/00*

U.S. Cl. 283—116 **9 Claims**

1. A golf-scoring card comprising:

(a) a planar member; and

(b) at least one scoring panel on said-planar member including an array of perforated holes for recording golf scores over a plurality of golf holes, said array including a series of perforated holes for each golf hole with each perforated hole in a series representing a different score so that a golf score is recorded by punching out a corresponding perforated hole in a respective series in said array; and



(c) one or more scribe-in areas covered with an etchable medium capable of being inscribed by a scribing instrument.

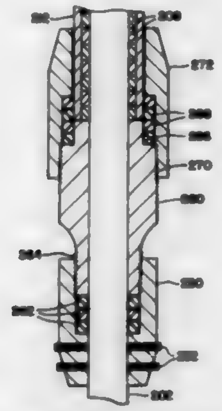
5,314,209
BLAST JOINT FOR SNUBBING UNIT

Karl F. Kuhne, Spring, Tex., assignor to Vermont American Corporation, Louisville, Ky.

Continuation of Ser. No. 342,242, Apr. 24, 1989, Pat. No. 5,059,043. This application Apr. 23, 1991, Ser. No. 690,006

Int. Cl.⁵ F16L *11/12*

U.S. Cl. 285—45 **15 Claims**



1. A blast joint for sealing a casing, comprising:

at least one tubing member;

a plurality of wear-resistant rings concentrically located around said tubing member, said rings abutting each other;

an upper outer casing surrounding at least some of the rings;

a lower outer casing surrounding at least some of the rings; and,

a substantially cylindrical adapter for providing a seal between said upper and lower outer casings comprising:

a) a collar member concentric with and removably attachable to said lower outer casing, said collar member having threads at its upper end and an inner shoulder;

b) means for attaching said collar member to said lower outer casing;

c) a compression member concentric with said upper outer casings, said compression member having and inner shoulder and threads at its lower end;

d) a central member concentric with said upper and lower outer casings, said central member having outer threads for threadably engaging said collar member and said compression member; and

means for sealing interposed between said inner shoulder of said collar member and the end of said central member, and interposed between the end of said central member and the inner shoulder of said compression member;

whereby urging of said collar and said compression member into threaded engagement with said central member compresses said means for sealing interposed thereinbetween, forming an airtight and pressure tight seal between said lower casing and said upper casing.

5,314,210
DEVICE FOR CONNECTING A FLEXIBLE PIPE TO A RIGID TUBULAR JOINING PIECE

Lionel Calmettes, Romorantin-Lanthenay, and Pascal Detable, Villedieu, both of France, assignors to Etablissements Caillau, Issy-Les-Moulineaux, France

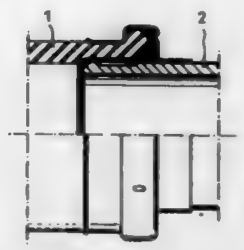
PCT No. PCT/FR91/00065, § 371 Date Jul. 15, 1992, § 102(e) Date Jul. 15, 1992, PCT Pub. No. WO91/11649, PCT Pub. Date Aug. 8, 1991

PCT Filed Feb. 1, 1991, Ser. No. 910,294

Claims priority, application France, Feb. 2, 1990, 90 01259

Int. Cl.⁵ F16L *35/00*

U.S. Cl. 285—93 **8 Claims**



1. A connection device between a flexible pipe having an outwardly extending radial bead at the free end thereof and a rigid tubular joining piece fitted inside the flexible pipe, the improvement comprising:

a rigid inner tubular element, said inner tubular element formed with first and second cylindrical portions of different diameters;

a rigid outer tubular element in spaced coaxial relation with said inner tubular element, said outer tubular element formed with first and second cylindrical portions of different diameters and spaced from and cooperating with respective first and second cylindrical portions of said inner tubular element, said inner and outer tubular elements embracing the radial bead of the flexible pipe in the radial space defined by the outer surface of the second cylindrical portion of said inner tubular element and the inner surface of the second cylindrical portion of said outer tubular element; and

said inner and outer tubular elements embracing the flexible pipe in the radial space defined by the outer surface of the first cylindrical element of said inner tubular element and the inner surface of the first cylindrical element of said outer tubular element;

an annular radial wall secured to said outer tubular element and depending radially inwardly therefrom and terminating at an annular plane substantially aligned with the first cylindrical portion of said inner tubular element; and

an O-ring adapted to contact the outer surface of the rigid tubular joining piece and disposed in a housing defined by the inner surface of the second cylindrical portion of said inner tubular element and said annular radial wall.

5,314,211

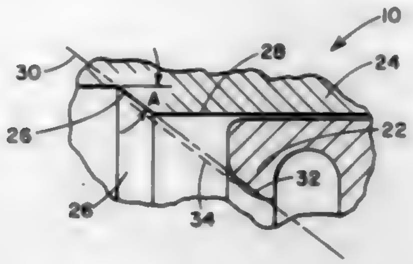
COUPLING MEMBER WITH A TORQUE RESISTIVE-STOP

Kevin J. Landhuis, Rockford, Ill., assignor to The Gates Rubber Company, Denver, Colo.

Continuation-in-part of Ser. No. 844,273, Mar. 2, 1992, abandoned. This application Oct. 1, 1992, Ser. No. 955,395

Int. Cl.⁵ F16L *19/04*

U.S. Cl. 285—110 **14 Claims**



1. In a coupling member of the type having a generally tubular body portion with a flexible lip as a means for sealing, and a swivel nut attached substantially concentrically to the body portion juxtaposed the flexible lip, the improvement comprising:

the swivel nut having a concave frustoconical surface located at a larger diameter than the flexible lip and the flexible lip generally positioned in alignment with a conic line tangent to the frustoconical surface such that the conic line intersects the flexible lip opposite a sealing surface portion of the flexible lip.

5,314,212

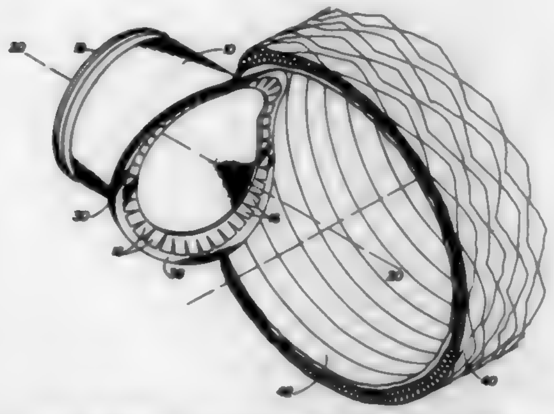
DUCT CONNECTOR FOR LEAKFREE ATTACHMENT TO THE CURVED SIDEWALL OF HIGHLY FLEXIBLE TRUNKLINE DUCT

Gregory C. Sanders, Ocala, Fla., assignor to GCS Innovations, Inc., Lake Mary, Fla.

Continuation-in-part of Ser. No. 754,061, Sep. 3, 1991, abandoned. This application Oct. 16, 1992, Ser. No. 962,241

Int. Cl.⁵ F16L *41/08*

U.S. Cl. 285—197 **23 Claims**



1. A duct fitting of generally cylindrical configuration for attachment to a flexible duct of relatively large size, such duct having a curved sidewall of highly flexible material, in which sidewall a hole of particular size has been created, said duct fitting being constructed of deformable sheet material and having first and second open ends, said first end having a curvature conforming to the configuration of the curved sidewall of the flexible duct with which it is to be used, and a diameter closely conforming to the hole created in the sidewall of the flexible duct, said first end of said duct fitting having a plurality of bendable teeth arranged in a non-planar array around its circumference, said teeth of said first end being insertable into the hole created in the curved sidewall of the flexible duct, and then bent over into conforming engagement with the curved interior surface of the flexible duct, means inside the flexible duct for protecting the interior of the duct from the bent-over teeth, and means for limiting the insertion of said first end of said duct fitting into the hole in the flexible duct.

5,314,213

PIPE COUPLING

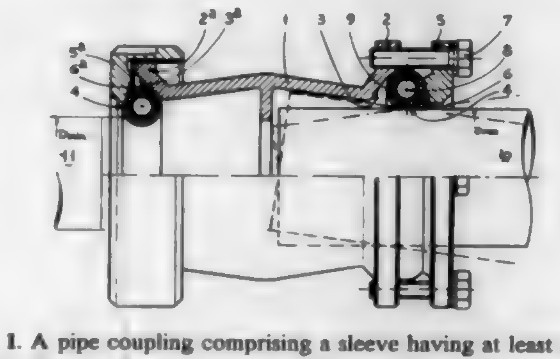
Aloisius H. M. Heister, Enschede, and Andreas J. L. Nijsen, Weerselo, both of Netherlands, assignors to Georg Fischer N.V., Epe, Netherlands

Continuation of Ser. No. 582,258, Sep. 13, 1990, abandoned. This application Feb. 1, 1993, Ser. No. 13,142

Claims priority, application Netherlands, Sep. 14, 1990, 9002006

Int. Cl.⁵ F16L *37/26*

U.S. Cl. 285—231 **3 Claims**



1. A pipe coupling comprising a sleeve having at least one end adapted for the insertion of a pipe, said sleeve having a longitudinally said at least one end having a concave supporting surface and a pressure ring having a pressing surface and being adjustably movable in opposition to said supporting surface, a sealing ring of substantially circular outer cross-section located about the pipe and between said supporting surface and said pressure ring pressing surface, said sealing ring comprising an annular core formed of a helically wound spring, said spring being enclosed in a sheath of elastomeric material, the circumference of the windings of said spring being expandable and contractible within said sheath and substantially undeformable in cross-section under compression, said supporting surface being conically shaped and having a progressively decreasing diameter in the direction of compression thereby defining an increasing taper relative to said longitudinal axis increasing from said at least one end toward said longitudinal axis and means for forcing said pressure ring pressing surface against said sealing ring to compress said annular core and said sheath about the pipe and to conform said outer sheath to the outer surface of the pipe and said pressing and supporting surfaces.

5,314,214

FLEXIBLE JOINT

John L. Highlen, Rives Junction, and Alan K. Clark, Jackson, both of Mich., assignors to Aeroquip Corporation, Maumee, Ohio

Continuation of Ser. No. 862,329, Apr. 2, 1992, abandoned. This application Mar. 29, 1993, Ser. No. 39,805

Int. Cl.⁵ F16L *27/00*

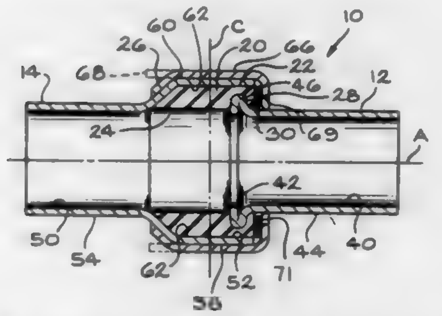
U.S. Cl. 285—233 **18 Claims**

1. A flexible joint for the sealing of tubular sections comprising, in combination:

a flexible pad, said pad having inner and outer surfaces that extend along an axis in a generally circular configuration, said pad further having first and second sides divided by a centerline into substantially equal parts, said pad having a contoured portion having a geometric configuration extending around said inner surface between said centerline of said pad and said second side of said pad;

a first tubular section formed of a wall extending along an axis to an open end, said wall having a cylindrical outer surface, said outer surface having an outwardly extending raised portion having a geometric configuration similar to the geometric configuration of said contoured portion on said inner surface of said pad, said raised portion engaging said contoured portion on said inner surface of said pad to maintain said first tubular section in proper alignment with said flexible pad;

a second tubular section formed of a wall extending along an axis to an open end, said wall having a cylindrical outer surface, said outer surface having an integral enlarged housing defined by said wall of said second tubular section, said housing having exterior and interior surfaces, said interior surface of said housing directly engaging said outer surface of said pad for retaining said pad in a sealing relationship with said first tubular section;



a second housing extending over and engaging said exterior surface of said housing, said second housing including a lip that engages said exterior surface of said housing, a gap maintained between said housing and said second housing and said outer surface of said first tubular section, whereby said gap allows said flexible joint and said first and second tubular sections to move in response to force; and

a containment element positioned around said first tubular section between said flexible pad and said second housing, whereby said containment element retards said flexible pad from entering said gap.

5,314,215

FLANGE RING

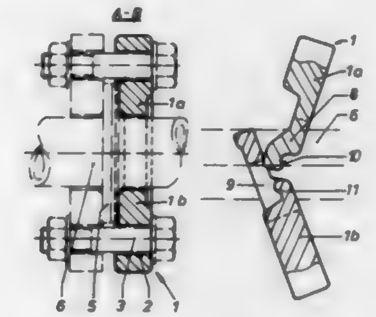
Karl Weinhold, Im Jagdfeld 43, D-4040 Neuss 1, Fed. Rep. of Germany

Filed Jul. 13, 1992, Ser. No. 912,485

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1991, 4123806

Int. Cl.⁵ F16L *35/00, 23/032*

U.S. Cl. 285—283 **6 Claims**



1. A flange ring which is divided along a plane extending in an axial direction into two identical flange halves each of which has two abutment places, each flange half having a bolt at one of said abutment places and a pocket at the other of said abutment places, so that the bolt of each flange half positively engages in the pocket of the other flange half, the bolt and the pocket of each flange half having means configured so that said two flange halves can only be joined or disengaged by tilting said flange halves out of a plane formed by said two flange halves when they are engaged.

5,314,216

THIN RESIN TUBE CONNECTING COUPLING WITH FLANGED INSERT

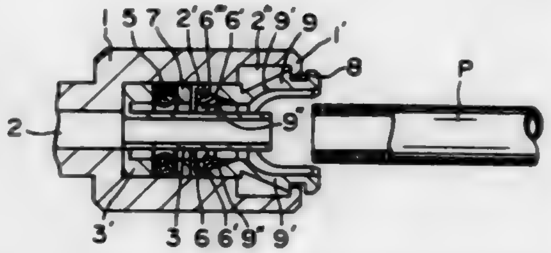
Katsushi Umezawa, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Filed Jan. 21, 1993, Ser. No. 7,326

Claims priority, application Japan, Jan. 22, 1992, 4-006600[U]

Int. Cl.⁵ F16L *37/12*

U.S. Cl. 285—319 **5 Claims**



1. A coupling for connecting to a thin resin tube, said resin tube being generally cylindrical and having a connecting end, an inner circumferential surface defining an inside diameter, and an outer circumferential surface defining an outside diameter, said coupling comprising:

a body having opposed front and rear ends, a large diameter chamber extending axially forwardly into said rear end of said body, a radially inwardly extending retaining wall at said rear end of said body defining a reduced diameter entry to said large diameter chamber, a small diameter chamber extending axially forwardly from said large diameter chamber and a communication hole extending axially forwardly from said small diameter chamber to the front end of said body, said communication hole defining a diameter smaller than the small diameter chamber, such that a step is defined intermediate said small diameter chamber and said communication hole of said body;

an insert having a cylindrical portion with opposed front and rear ends and an outside diameter substantially equal to the inside diameter of said resin tube, a flange extending radially outwardly from said front end of said cylindrical portion and dimensioned for seating in said small diameter chamber and against said step;

an annular elastic seal disposed in said small diameter chamber rearwardly of the flange of said insert and dimensioned for sealing engagement between the outer circumferential surface of said tube and portions of said body defining said small diameter chamber;

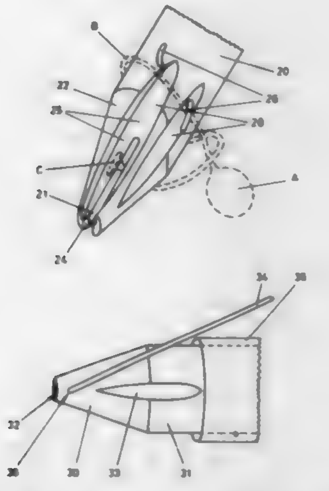
an annular sleeve disposed in said small diameter chamber adjacent and rearwardly of said annular elastic seal and dimensioned for engagement around said tube;

an annular grip having opposed front and rear ends and an axial slit extending therethrough, said grip being disposed in said small diameter chamber substantially adjacent and rearwardly of said annular sleeve, said grip having a tapered outer circumferential surface defining a major diameter adjacent said front end of said grip and a minor diameter adjacent said rear end thereof, an annular pawl wall protruding inwardly on said annular grip for biting engagement with the resin tube; and

a holding member having opposed front and rear ends, said front end defining an annular inwardly facing taper in sliding engagement with the tapered outer circumferential surface of the grip, the rear end of said holding member defining a plurality of deflectable tongue-shaped elastic arms releasably engaged with the inwardly extending retaining wall at the rear end of the body, whereby insertion of the connecting end of said resin tube over the cylindrical portion of the insert causes sealing engagement of the seal with the outer circumferential surface of the resin tube, and whereby rearwardly directed withdrawal forces exerted on said resin tube causes tight wedged engagement of said annular pawl wall of said grip with said resin tube to prevent withdrawal of said resin tube from said coupling.

5,314,217
BALLOON TYING DEVICE

Andrew G. Place, 42 Green Moor Link, Winchmore Hill, London, England N21 2NP
Filed Feb. 25, 1992, Ser. No. 840,846
Claims priority, application United Kingdom, Feb. 25, 1991, 9103910; Jul. 2, 1991, 9114297; Dec. 30, 1991, 9127489
Int. Cl.⁵ D03J *3/00*
U.S. Cl. 289—17 **14 Claims**

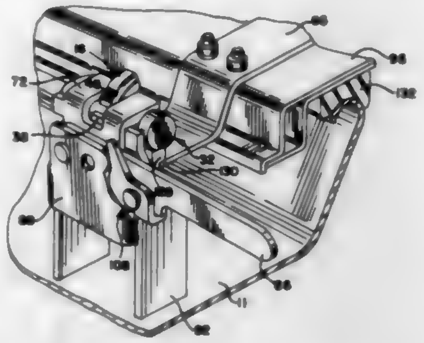


1. A balloon tying device comprising an elongate member dimensioned to be held in the hand of a user, the elongate member having a bifurcated end portion which (a) is defined by two arms, and a slot extending between the arms in which slot the neck of a balloon can be received, (b) has outer surfaces about which the neck of the balloon can be wound, and (c) includes a recess formed in the member to receive the lips of the balloon when the neck is received in the slot, the device further comprising a lever which is connected pivotably to the elongate member towards said end portion thereof, so as to be capable of being pivoted away from the member and flared outwardly from the end portion to facilitate displacement of the neck of the balloon which is wound around the end portion.

5,314,218
HATCH COVER LOCK AND HINGE

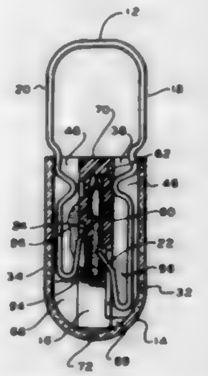
Rudolph E. Nadherny, Naperville, Ill., assignor to Ireco, Inc., Chicago, Ill.
Filed Jan. 22, 1993, Ser. No. 8,714
Int. Cl.⁵ E05C *3/30;* **B63B** *19/14*
U.S. Cl. 292—256.5 **25 Claims**

1. A hatch cover lock for securing a removable roof member of a railway hopper car, one or more of the removable roof members, a hinge thereof or a batten bar therefor carrying a hinge pin, said hatch cover lock comprising:
means for housing the hatch cover lock and securing it to the railway hopper car;
a saddle associated with said means for housing, said saddle being adapted to receive the hinge pin;
first means for automatically providing access of said hinge pin into said saddle and for automatically securing said hinge pin within said saddle; and
second means for securing said hinge pin within said saddle and for providing securement of said hinge pin within said saddle in addition to the automatic securing effected by said first means.



5,314,219
PADLOCK-TYPE SECURITY SEAL HAVING A LOCKING INSERT FIXED IN A HOLLOW BODY AND METHOD OF MAKING SAME

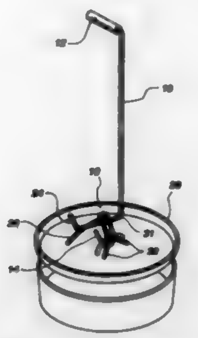
George Georgopoulos, Pine Brook; Ritchie J. Fullerton, Hillside, and Louis J. Mattos, Carteret, all of N.J., assignors to E. J. Brooks Company, Newark, N.J.
Filed Feb. 26, 1993, Ser. No. 23,576
Int. Cl.⁵ B65D *33/34*
U.S. Cl. 292—320 **30 Claims**



1. A security seal comprising:
a transparent seal body having adjacent first and second chambers therein;
a liquid contained in said first chamber;
a shackle having at least one leg including means for locking said leg in said second chamber and for rupturing said first chamber to permit said liquid to seep from said first chamber when a force is exerted to unlock said leg; and
a member secured to said body in said second chamber, said body and said member forming said first chamber, said member being arranged such that the first and second chambers are visible through said body, said member having a channel therethrough in communication with opposing sides of said member, said body having opposing sides, said channel being visible through each said body opposing sides.

5,314,220
LIFTING TOOL FOR DUTCH OVEN COVERS

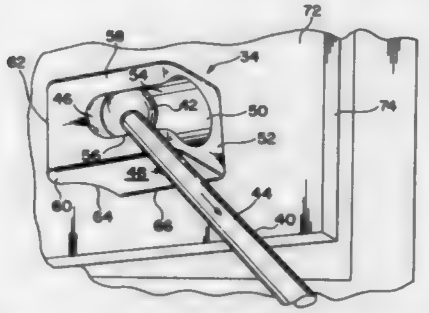
Roger B. Clement, 175 E. Center St., Spanish Fork, Utah 84660
Filed Oct. 6, 1993, Ser. No. 132,253
Int. Cl.⁵ A47J *45/10*
U.S. Cl. 294—10 **9 Claims**



1. A lifting device for lifting and manipulating covers with handles which comprises:
a first rod with a proximal end and a distal end;
said first rod having a handle on the proximal end;
said first rod having a cover engaging first stabilizing means formed on said distal end;
a pivot means formed on said first rod adjacent said distal end;
a second rod means having a proximal end and a distal end;
said second rod means proximal end being pivotally attached to said first rod by said first rod pivot means;
said second rod means having a cover engaging means on said second rod means distal end;
the first rod having at its distal end a hook means for engaging the cover handle;
said second rod means is formed by parallel sides joined at said second rod means proximal end by a shaft;
said second rod means shaft being rotatable in said first rod pivot means;
said second rod means parallel sides are bent outwardly and away from each other at said second rod means distal end.

5,314,221
APPARATUS FOR AIDING PERSONS, PARTICULARLY HANDICAPPED PERSONS, IN MOVING UNREACHABLE OBJECTS

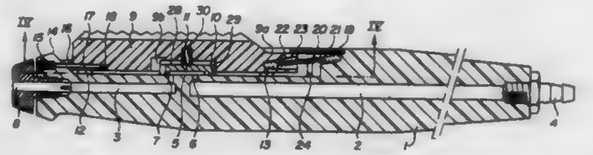
Nicholas A. Hammer, DuBois, Pa., assignor to Help Yourself Designs, Incorporated, DuBois, Pa.
Filed Mar. 3, 1993, Ser. No. 25,791
Int. Cl.⁵ A47B *95/02;* **B25J** *1/04*
U.S. Cl. 294—19.1 **15 Claims**



1. Apparatus for aiding persons and particularly handicapped persons, in moving objects which are out of reach, comprising:
a socket type body member secured to an object which is to be moved, said body member comprising a generally rectangular block type body member including a region of reduced thickness at one end and including a circular cylindrical bore formed in the other end of said body member, said bore having a front opening formed and terminating in a socket for receiving actuating means, said body member further having a slot formed in a surface adjacent said front opening into the bore, said slot extending lengthwise from said front opening to said socket; and
a wand type member comprising said actuating means and including an elongated handle and a ball type element at one end for engaging the socket of said body member;
said circular cylindrical bore further having a diameter at least equal to the diameter of said ball type element, said wand type member being freely movable through said bore between said front opening and said socket with the handle of said wand type member passing through said slot;
whereby a person manually grips the handle of the wand type member, engages the socket via said ball type element, and applies a force thereto for moving said object and thereafter disengages the ball type element from the socket following a desired movement of said object.

5,314,222
VACUUM MANIPULATOR

Jean E. Oehninger, Yverdon-les-Bains, Switzerland, assignor to Cooper Industries, Inc., Houston, Tex.
Continuation of Ser. No. 490,860, Mar. 9, 1990, abandoned, and a continuation-in-part of Ser. No. 733,063, Jul. 17, 1991, Pat. No. 5,127,694, which is a continuation of Ser. No. 491,411, Mar. 3, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 731,810
Claims priority, application Switzerland, Jun. 14, 1988, 02289/88
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.⁵ B25J *15/06;* **F16K** *3/314, 35/04*
U.S. Cl. 294—64.1 **8 Claims**



1. A vacuum manipulator, comprising an elongated body with two duct segments of longitudinal ducts one of which opens at one end of said elongated body for connection to a suction source and the other one of which is adapted to be fitted with a suction nozzle, the internal ends of said duct segments communicating laterally via respective communication holes with the bottom of a longitudinal guide channel, a spool valve, said bottom of said guide channel defining a seat for said spool valve, said spool valve mounted for sliding longitudinally in said guide channel, said bottom of said guide channel being flat with the face of said spool valve adjacent to said bottom having three contact zones with said bottom for spacing said face relative to said bottom, one of said contact zones being a central contact zone, the other two of said contact zones being located at opposite ends of said spool valve, said spool value including a valve body and a piston supported in said valve body at said central contact zone and operatively connected for longitudinal movement with said spool valve, said piston having an endless wall defining an enclosed space and being mounted for transverse movement relative to said valve body and for sliding engagement with said bottom of said guide channel for selective communication with said communication holes, pressure means actuable with said piston to urge said piston transversely from said valve body with said endless wall of said piston in generally sealing engagement against said bottom of said guide channel.

5,314,223

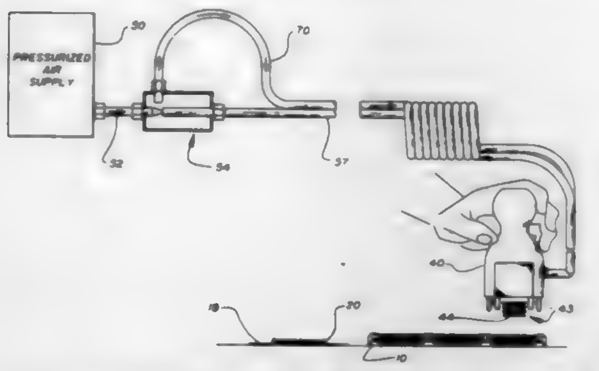
VACUUM PLACEMENT SYSTEM AND METHOD, AND TOOL FOR USE THEREIN

Donald K. Harper, Jr., Harrisburg, and Michael F. Laub, Etters, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 26, 1993, Ser. No. 23,287

Int. Cl.⁵ H05K *13/04*

U.S. Cl. 294—64.1 **10 Claims**



1. A system for picking up a small electrical component, in a proper orientation, for inspection and transporting the component between a container and placement in a socket, comprising:

- a hand-held tool operated by the hand of the holder to pick up, transport and discharge the component;
- visually-observable indicia on said tool for indicating a predetermined proper orientation of the tool with respect to the component and the socket;
- physical keying members on said tool that include
  - a first set of pins that cooperate with the container to properly position the tool relative the container for picking up or discharging the component and
  - a second set of pins that cooperate with the socket to properly position the tool relative the socket for picking up or discharging the component.

5,314,224

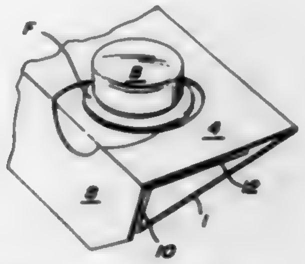
TOP GRIPPING BOTTLE ENGAGING DEVICE

Aaron Bates, Smyrna, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 961,258, Oct. 15, 1992, abandoned. This application Jul. 12, 1993, Ser. No. 91,394

Int. Cl.⁵ B65D *85/62, 71/00*

U.S. Cl. 294—87.2 **8 Claims**



1. A top gripping bottle engaging device for gripping a plurality of bottles at bottle necks thereof, said device comprising:

- a main panel having opposed side edges and a plurality of bottle neck receiving apertures formed therein;
- an auxiliary panel foldably joined to one of said side edges of said main panel and having a plurality of bottle neck receiving apertures formed therein;
- a connector panel foldably joined along one of opposed side edges thereof to the other side edge of said main panel;
- a stabilizing panel foldably joined along one of opposed side edges thereof to the other side edge of said connector panel and having a plurality of bottle neck receiving cutaway areas formed along the other side edge of said stabilizing panel, each of said cutaway areas extending from said other side edge of said stabilizing panel inwardly of said stabilizing panel wherein said cutaway areas are open along said other side edge of said stabilizing panel, said stabilizing and auxiliary panels being disposed in mutually superposed relation such that said main, auxiliary, connector and stabilizing panels form a tubular structure of a generally triangular cross section including a composite top wall formed from said stabilizing and auxiliary panels and such that said cutaway areas cooperate with said apertures of said auxiliary panel to cause said composite top wall to engage said bottle necks; and
- means for maintaining said device in a tubular assembled condition.

5,314,225

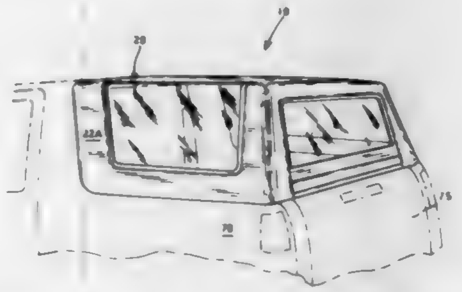
SPORT TRUCK TOP

W. Dale Gordon, Scott County, Tenn., assignor to Fleet Air Worldwide, Inc., Knoxville, Tenn.

Filed Dec. 14, 1992, Ser. No. 990,125

Int. Cl.⁵ B60P *7/02*

U.S. Cl. 296—10 **9 Claims**



1. A top for a convertible vehicle, wherein said convertible vehicle has a body, a soft convertible top, a tail-gate and a conventional weather-seal mounted on the body for forming a weather-tight junction between the body and the soft convertible top, said top comprising:

- a shell member having first and second sides, said first and second sides having first and second lower edges, first and second front edges and first and second rear panels; and
- at least one channel carried by said lower edges of said shell member wherein said channel is dimensioned to receive the conventional weather-seal in a tight frictional fit thereby forming a weather-tight junction between said top and the body of the convertible vehicle.

5,314,226

VEHICLE SUNSHIELD

Juan P. Tovar, 405 Broadway, Bayonne, N.J. 07002

Filed Jan. 25, 1993, Ser. No. 8,146

Int. Cl.⁵ B60J *3/02*

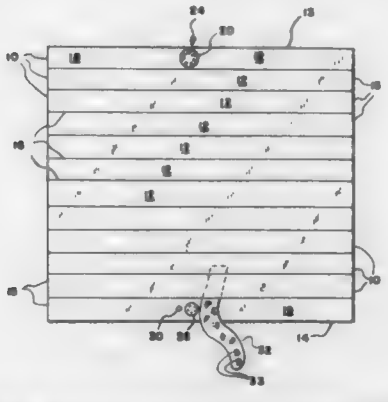
U.S. Cl. 296—97.7 **4 Claims**

1. A sunshade adapted for use in a vehicle having windows having upper and lower extremities and fixed structure disposed above and below said upper and lower extremities, respectively, said sunshade comprised of:

- a) a plurality of panels of elongated, substantially rectangular configuration fabricated from a single sheet having hinge lines serving to join adjacent panels, each panel having inner and outer surfaces, side edges, and upper and lower boundaries defined by said hinge lines, thereby disposing said panels in a vertical array bounded by an uppermost and a lowermost panel, said uppermost panel having at least one mounting aperture communicating between said inner and outer surfaces, said lowermost panel having means for releasible attachment to said fixed structure below a vehicle window, said panels adapted to stack with vertical travel in an accordion-folded storage state disposing said inner and outer surfaces in alternating overlying juxtaposition,
- b) at least one suction cup associated with said uppermost panel and having a suction surface of circular perimeter outwardly directed from the outer surface of said panel, a stem adapted to penetrate said mounting aperture, and release means for causing said suction surface to release from engagement with said window, said release means penetrating said panel and terminating in a distal extremity spaced apart from the inner surface of said panel,
- c) at least one suction cup associated with said lowermost panel and having a suction surface of circular perimeter outwardly directed from the inner surface of said panel, and release means for causing the release of said suction surface, said release means penetrating said panel and terminating in a distal extremity spaced apart from the outer surface of said panel, and
- d) strapping means fixedly associated with said lowermost panel and adapted to be wrapped around said stacked panels, said strapping means having fastening means adapted to secure said panels,

whereby,

- a) the sunshade may be deployed from said storage state by releasing said fastening means, lifting said uppermost panel, and pressing said suction surface against said window, and
- b) the shade may be returned to its storage state by releasing said suction surface from said window, folding said panels downwardly in accordion fashion to form a compact stack, and wrapping said strapping means around said stack.



5,314,227

BEZEL LOCKING VISOR MOUNT

Walter M. Weiland, Holland, and Jerry M. De Jong, West Olive, both of Mich., assignors to Prince Corporation, Holland, Mich.

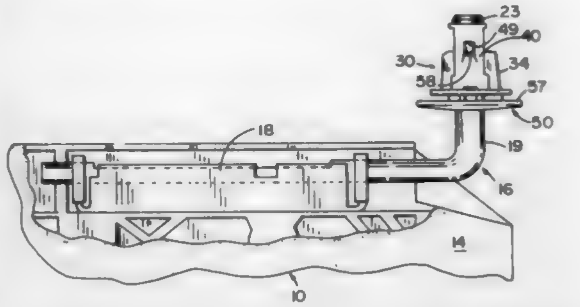
Filed Mar. 26, 1993, Ser. No. 38,625

Int. Cl.⁵ B60J *3/02*

U.S. Cl. 296—97.9 **20 Claims**

1. A visor mount for attaching a vehicle visor to the roof structure of a vehicle comprising:

- a visor pivot rod having a first end for extending within the body of a visor and a second end;
- an attachment member including a body having an aperture for receiving said second end of said pivot rod, said attachment member further including at least one resilient leg extending outwardly and downwardly in spaced relationship from said body and including means for engaging an edge and upper surface of a mounting aperture in the vehicle roof support structure; and
- a bezel extending over said pivot rod and including tab means which cooperates with said leg of said attachment member to lock said bezel to said attachment member when said bezel is installed with said tab means extending between said body and said leg for urging said leg into locking engagement with the roof structure.



5,314,228

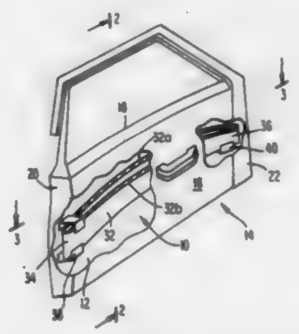
VEHICLE SIDE IMPACT INTRUSION BARRIER

Irving E. Figge, Sr., Manassas, Va., assignor to Atlantic Research Corporation, Vienna, Va.

Filed Mar. 16, 1993, Ser. No. 31,974

Int. Cl.⁵ B60J *5/00*

U.S. Cl. 296—146.6 **20 Claims**

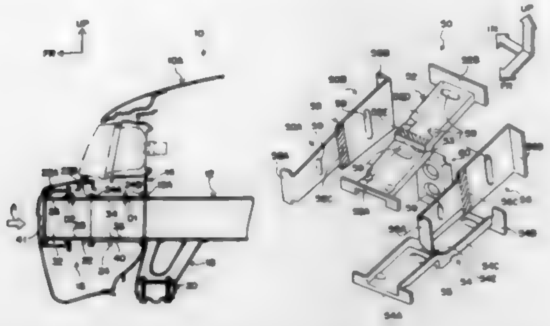


1. Impact intrusion barrier device for a vehicle door of the type which includes spaced inner, outer and side door panels defining a door cavity therebetween and which is movably mounted between forward and rear door pillar members each having a substantially flat outwardly facing surface thereon and an abutment surface thereon which extends outwardly from the outwardly facing surface, said barrier device comprising a beam member positioned in the door cavity and adapted to extend laterally between the pillar members, wherein said beam member is curved outwardly along a longitudinal axis thereof and has a pair of beam end portions which are positioned outwardly of and adjacent to the outwardly facing surfaces, and adjacent to but spaced from the abutment surfaces on the pillar members, respectively, and means for slidably supporting said end portions in the door cavity, whereby said end portions are operable to move longitudinally away from one another on the outwardly facing surfaces when an inward force is applied to said beam member until said end portions contact the abutment surfaces, respectively, thereby absorbing energy therefrom and initially directing the force laterally away from the interior of the vehicle and into the pillar members.

5,314,229
FRONT BODY STRUCTURE

Tomoki Matuzawa, Susono; Seiji Yokota, Nagoya; Katsuhiko Emori, Okazaki, and Junichi Harada, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota City, Japan

Filed Nov. 16, 1992, Ser. No. 977,013
Claims priority, application Japan, Nov. 19, 1991, 3-303575
Int. Cl.⁵ B60R *27/00*
U.S. Cl. 296—189 **17 Claims**

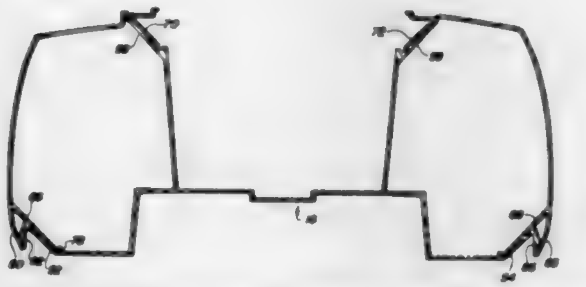


1. A front body structure for use in a vehicle comprising:
a front-side member disposed on a vehicle body;
a crush box disposed in front of said front-side member, said crush box including first and second sections, said first section adapted to exhibit a plastic characteristic upon compressive deformation, said second member adapted to exhibit a plastic characteristic greater than that of said first section upon compressive deformation thereof, whereby said crush box exhibits a total plastic characteristic in a first and a second stage when under a compressive load; and
an acceleration sensor mounted on said vehicle body and operatively associated with said crush box so that deformation of said crush box due to the compressive load of said second stage activates said sensor at a predetermined acceleration value.

5,314,230
MONOCOQUE BODY ASSEMBLY

Wayne R. Hutchison, Mayville; Richard D. Teal, Horicon, both of Wis.; Steven C. Wasson, Midland, Mich.; Mansour Mirdamadi, Midland, Mich.; Earl T. Moore, Midland, Mich.; Luis Lorenzo, Midland, Mich.; Michael J. Coffey, Midland, Mich., and Daniel R. Nickles, Monroe, N.Y., assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 715,204, Jun. 14, 1991, abandoned. This application Jan. 25, 1993, Ser. No. 8,252
Int. Cl.⁵ B62D *23/00;* **A01D** *67/00*
U.S. Cl. 296—203 **37 Claims**

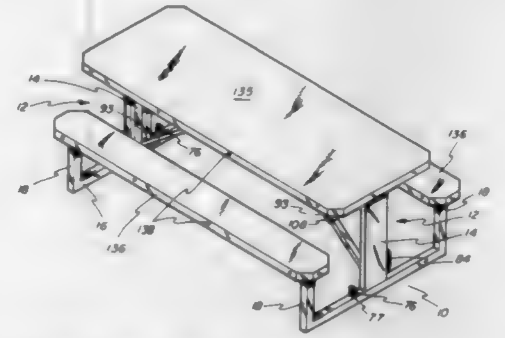


1. Means for positioning and joining a plastic upper body member with a plastic lower frame member to form a monocoque vehicle assembly, said members including mid and edge portions, the means including first and second leg portions carried in the mid portion of one member and receivable in a channel means carried in the other member, a guide structure and following structure respectively carried by the body and frame members at the edge portions thereof, operative to position the edge portions relative to one another as the leg portions are received in the channel means, and adhesive reservoir means provided on one of the guide and following structures wherein adhesive may be received to enable the other structure to be bonded to it as the edge portions are positioned and provide a joint between the members that is adapted to transfer and distribute loads encountered by the members throughout the assembly.

5,314,231
FOLDING PICNIC TABLE

Gary Otterbacher, c/o Otterbacher Manufacturing, Inc. P.O. Box 396 U.S. Hwy. 30 N., Crestline, Ohio 44827

Filed Sep. 25, 1992, Ser. No. 951,467
Int. Cl.⁵ A47B *3/06*
U.S. Cl. 297—159 **18 Claims**



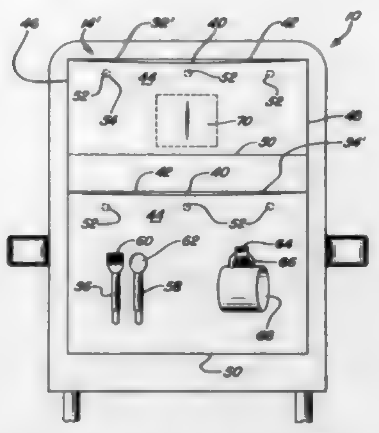
1. A folding picnic table comprising
a pair of spaced end frames each having a center pedestal and a pair of upright bars, said pair of upright bars connected to said respective center pedestal by a base cross bar,
a table top frame comprising a fixed cross panel and a plurality of fixed cross bars, each of said center pedestals connected to said table top frame,
two pairs of cooperating folding braces, each of said pairs of braces comprising a first brace portion and a second brace portion, each of said first brace portions connected to a respective one of said end frames, said second brace portion connected to said table top frame, said first brace portion and said second brace portion also connected to each other, said first brace portion and said second brace portion connected by a first fastener and also by a second fastener, said second fastener being adapted to be removed from connecting said first and second brace portions such that the removal enables the respective end frames to be pivoted relative to said table top frame so as to effect folding of said table, said first brace portion and said second brace portion being in partially coextensive relationship, and
a pair of bench frames, each bench frame comprising at least two slotted bars having a slot formed therethrough, said upright bars connected to said slotted bars.

5,314,232
HIGH CHAIR POUCH

David Hopkins, 19411 Old Homestead, Harper Woods, Mich. 48225

Filed Apr. 22, 1993, Ser. No. 52,593
Int. Cl.⁵ A47C *7/62*
U.S. Cl. 297—191 **5 Claims**

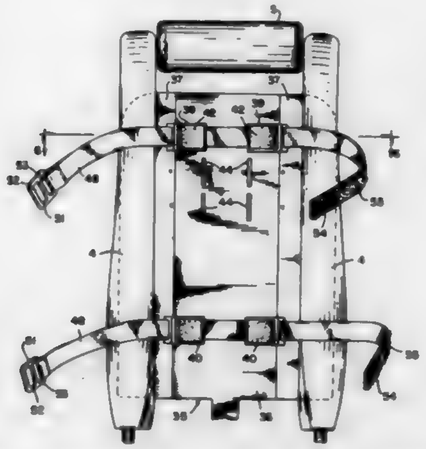
1. A high chair pouch for use in combination with a high chair, said pouch comprising:
a generally rectangular body which is removably mounted to the back of a high chair;
a first hollow cylindrical member mounted upon said body and having open ends which allow said first cylindrical member to removably receive a first utensil and to vertically mount a received first utensil on said body;
a second hollow cylindrical member mounted upon said body and having open ends which allow said second cylindrical member to removably receive a second utensil and to vertically mount a received second utensil on said body; and
first and second flap means for providing a first storage cavity into which various articles may be placed.



5,314,233
SEAT CONSTRUCTION HAVING A MECHANISM FOR STORING A TANK

John M. Bostrom, 6609 Riverside Rd., Waterford, Wis. 53185, and Kurt H. Bostrom, W296 N2241 Glen Glove Rd., Pewaukee, Wis. 53072

Continuation-in-part of Ser. No. 724,598, Jul. 2, 1991, Pat. No. 5,213,392. This application May 19, 1992, Ser. No. 885,506
Int. Cl.⁵ A47C *7/62*
U.S. Cl. 297—217 **9 Claims**

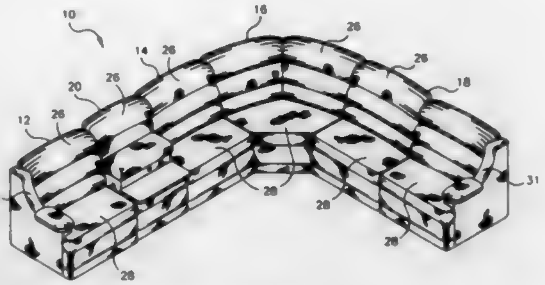


1. A seat construction having a provision to store a tank, comprising a back structure including a rear surface and a side surface extending forwardly from each side edge of the rear surface, tank support means including bracket means removably connected to said back structure, a pair of generally flat supporting surfaces disposed on said bracket means and located in forwardly diverging planes, said support surfaces being disposed to support a tank, and clamping means connected to said bracket means for clamping the tank to said supporting surfaces.

5,314,234
SECTIONAL SOFA ASSEMBLY WITH DUAL RECLINING SEATS

Michael E. England, Tazewell, Tenn., assignor to England Corsair Upholstery Mfg. Co., Inc., New Tazewell, Tenn.

Filed Oct. 13, 1992, Ser. No. 959,383
Int. Cl.⁵ A47C *17/02*
U.S. Cl. 297—248 **15 Claims**

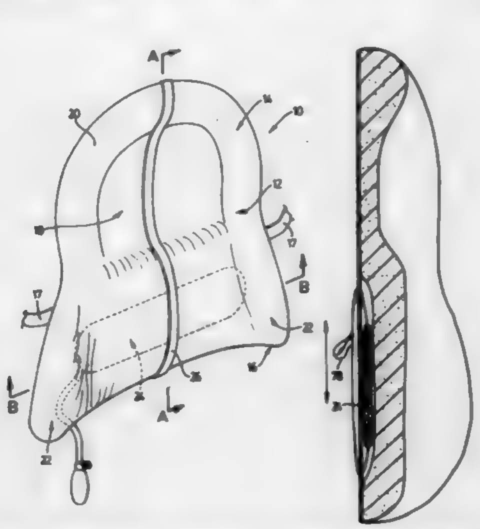


1. A furniture assembly comprising:
(a) a first reclining seat module having a frame member and being without an armrest on at least one side;
(b) a second reclining seat module having a frame member and being without an armrest on at least one side;
(c) an armrest module including a frame member and an armrest surface; and
(d) connector means for detachably connecting the first and second reclining seat modules between an adjacent position where the sides of the first and second reclining seat modules without the armrests are adjacently positioned and a separated position where the armrest module is detachably connected between the first and second reclining seat modules.

5,314,235
PORTABLE BACK SUPPORT

David G. Johnson, P.O. Box 2265, Orillia Ontario, Canada L3V 6S1

Filed Nov. 5, 1991, Ser. No. 788,163
Int. Cl.⁵ A47C *3/00*
U.S. Cl. 297—284.5 **11 Claims**



4. A portable back support comprising a base plate having a top, a bottom, a front surface and a rear surface, a cushion layer extending over said front surface of the base plate, said cushion layer being connected to said base plate and having an upper portion and a lower portion, an inflatable bladder mounted between said base plate and said lower portion and capable of providing further support for the lumbar spine of a user, said bladder being firmly supported by said front surface of the base plate, and means for displacing said bladder verti-

cally relative to the base plate so as to enable the bladder to accommodate variations in the location of the lumbar spine.

5,314,236
LUMBAR SUPPORT APPARATUS FOR VEHICULAR SEAT

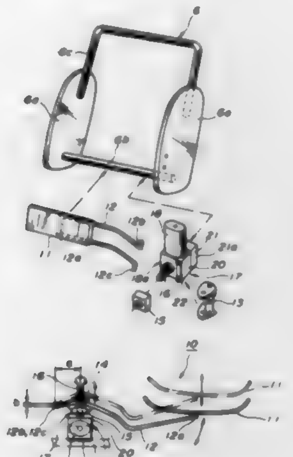
Mamoru Suzaki, Kanagawa; Shinya Inabe, and Junko Seki, both of Tokyo, all of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Aug. 18, 1992, Ser. No. 931,382

Claims priority, application Japan, Aug. 22, 1991, 3-074226[U]

Int. Cl.⁵ A47C *3/00*

U.S. Cl. 297—284.8 **7 Claims**



6. A lumbar support apparatus installed in a seat back of a vehicular seat, said lumbar support apparatus comprising:
a supporting panel having a front side and a back side;
a seat back frame disposed within said seat back and having a pair of side panels and a lower pipe frame;
a bracket fixed to one of said side panels;
a spring member connected at one end to said back side of said supporting and pivotably supported at another end by said bracket;
a nut member which bears against a portion of said spring member near the pivotably supported end; and
a control mechanism connected to said bracket and disposed between said spring member and said lower pipe frame, said control mechanism including a screw shaft which is rotated in accordance with a predetermined command, the screw shaft being screwed to said nut member so as to move said spring member in forward and aft directions by rotation of the screw shaft.

5,314,237
RECLINING CHAIR

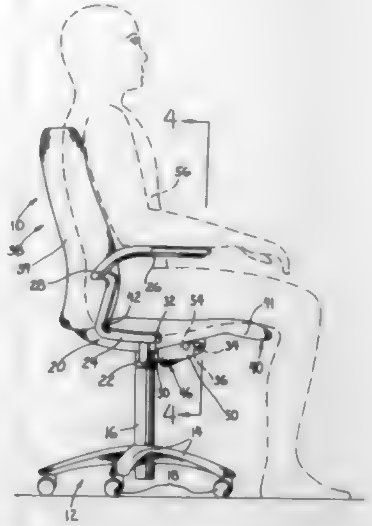
Marcus C. Koepke, and Earl H. Koepke, both of Sturgis, Mich., assignors to Kimball International Marketing, Inc., Jasper, Ind.

Filed Feb. 12, 1992, Ser. No. 834,585

Int. Cl.⁵ A47C *1/024*

U.S. Cl. 297—318 **9 Claims**

9. A chair comprising a base, arm supports connected to opposite sides of said base and extending above said base, a seat support shiftably supported atop said base, a back support, means for pivotally connecting said seat support and back support for relative movement therebetween, said base including a roller arm, said seat support including an inclined ramp shiftably supported atop said roller arm, means for pivotally connecting said back support to said arm supports adjacent said upper ends wherein said seat support and back support are shiftable relative to said base between an upright position and a reclined position by a user's shifting of weight.



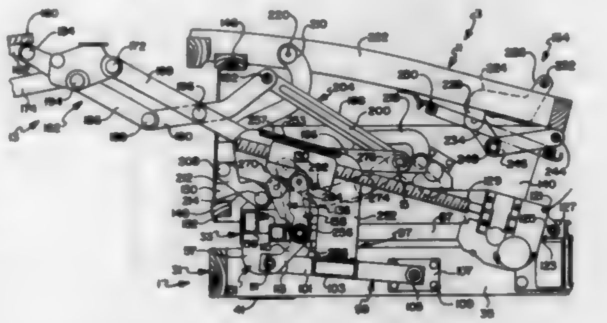
5,314,238
CAM GUIDE DRIVE MECHANISM FOR POWER-ASSISTED CHAIRS

Karl J. Komorowski, Petersburg; Jonathan R. Saul, LaSalle, and Larry P. LaPointe, Temperance, all of Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Continuation-in-part of Ser. No. 774,536, Oct. 8, 1991, abandoned, which is a continuation of Ser. No. 613,355, Nov. 14, 1990, Pat. No. 5,061,010, which is a continuation-in-part of Ser. No. 425,384, Oct. 18, 1989, Pat. No. 4,993,777, which is a continuation of Ser. No. 196,750, May 20, 1988, abandoned. This application Sep. 28, 1992, Ser. No. 951,902

Int. Cl.⁵ A47C *1/02*

U.S. Cl. 297—325 **21 Claims**



1. A power-assist chair comprising:
a base assembly;
a chair frame supported on said base assembly;
a rotatable drive shaft extending transversely between opposite side portions of said chair frame;
a leg rest assembly supported from said chair frame and operatively coupled to said drive shaft for movement from a retracted position to an extended position in response to rotation of said drive shaft in a first direction;
follower means supported for pivotal movement on said base assembly;
coupling means for coupling said drive shaft to said follower means such that pivotal movement of said follower means causes concurrent rotation of said drive shaft, said coupling means including adjustment means for enabling the angular coupled relationship between said follower means and said drive shaft to be selectively adjusted; and
a drive mechanism for selectively actuating said leg rest assembly, said drive mechanism including a cam member operable for selectively engaging said follower means to cause pivotable movement thereof and concurrent rotation of said drive shaft in said first direction, and power operated means for selectively moving said cam member between positions of engagement and disengagement with said follower means.

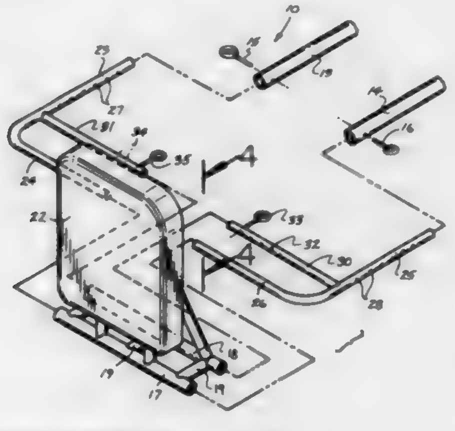
5,314,239
ATV BACKREST

Daniel R. Edwards, 4716 Old Lemay Ferry Rd., Imperial, Mo. 63052, and Gary G. Johnson, Rte. 1, Box 214 X, Elvins, Mo. 63601

Filed May 17, 1993, Ser. No. 61,565

Int. Cl.⁵ A47C *15/00*

U.S. Cl. 297—352 **5 Claims**



1. An ATV backrest, comprising,
a first mounting tube spaced from, parallel to, and coextensive with a second mounting tube, and
a first L-shaped rod spaced from and in a mirror image relationship relative to a second L-shaped rod, wherein the first L-shaped rod includes a first L-shaped rod first leg orthogonally oriented relative to a first L-shaped rod second leg, with the second L-shaped rod having a second L-shaped rod first leg orthogonally oriented relative to a second L-shaped rod second leg, and
cushion support means arranged for reception of the first L-shaped rod and the second L-shaped rod, wherein the cushion support means includes a cushion member mounted thereon, and the first L-shaped rod first leg is arranged for reception within the first mounting tube, the second L-shaped rod first leg is arranged for reception within the second mounting tube, with a first lock pin directed through the first mounting tube and the first L-shaped rod first leg, and a second lock pin directed through the second mounting tube and the second L-shaped rod first leg.

5,314,240
SHELL STRUCTURE FOR USE WITH A CHAIR HAVING SYNCHRONOUSLY MOVING SEAT AND SEAT BACK

Yuji Ishi; Toru Nagao, both of Osaka, and Harumatsu Sato, Tokyo, all of Japan, assignors to Itoki Co., Ltd., Tokyo, Japan

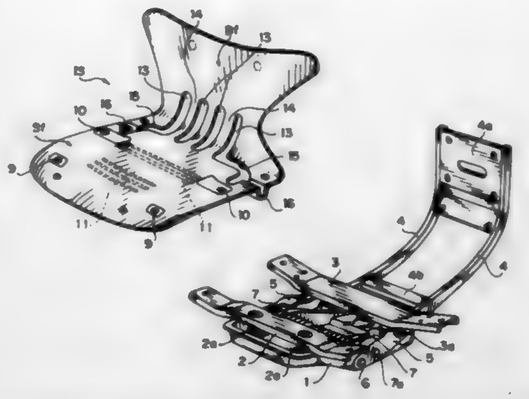
Filed Dec. 27, 1991, Ser. No. 813,788

Claims priority, application Japan, May 21, 1991, 3-144074; Oct. 11, 1991, 3-290393

Int. Cl.⁵ A47C *7/02*

U.S. Cl. 297—452.15 **8 Claims**

1. A shell structure for use with a chair having a synchronously moving seat and seat back, the shell structure for the seat comprising:
a bottom portion and a back portion of the same material, with a curved connecting therebetween;
said curved connecting portion having at least two slots extending between said bottom portion and said back portion, wherein a portion of said curved connecting portion sandwiched between said slots has a greater curvature than other portions of said curved connecting portion;
sideways notches extending outwardly from the outermost ones of said slots adjacent said bottom portion; and
U-shaped bent portions extending out of the plane of said curved connecting portion and outwardly from said notches.



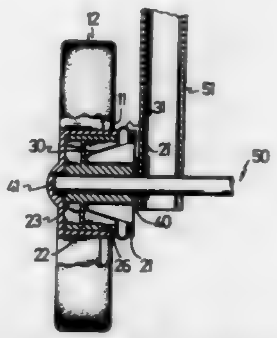
5,314,241
HANDCART WHEEL-MOUNTING APPARATUS

Chin-Chang Cheng, No. 20, Lane 327, Sec. 2, Chung Shan Rd., Chung Ho City, Taipei Hsien, Taiwan

Filed Aug. 20, 1993, Ser. No. 109,685

Int. Cl.⁵ B60B *37/00*

U.S. Cl. 301—111 **3 Claims**



1. A handcart wheel-mounting apparatus comprising:
a hub member comprising an axial bore formed therethrough, a tubular bearing co-axially formed therethrough about said axial bore, a plurality of recesses formed therein about said axial bore, and a plurality of holes radially formed therethrough so that each of said holes communicates with a corresponding one of said recesses;
a number of elastic elements received in said recesses;
a number of latches each formed on a corresponding one of said elastic elements, said latches biased through said holes by means of said elastic elements;
a wheel shaft inserted through a passage formed transversely through a wheel support, a washer, and said axial bore, a tip of said wheel shaft being firmly fitted in a cap so that said hub member can be firmly mounted on said wheel shaft; and
a wheel co-axially formed with a tubular portion through which a number of sockets is transversely formed, said hub member being mounted in said tubular portion, hav-

ing said holes aligned with said sockets so that said latches can be inserted through said holes into said sockets, thus, said wheel being mounted on said hub member.

5,314,242

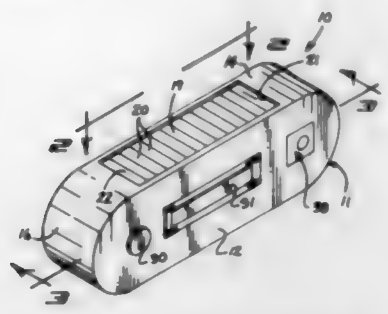
CASSETTE CAROUSEL APPARATUS

Jonny W. Ludlow, 44916 18th St. W., Lancaster, Calif. 93534

Filed Feb. 16, 1993, Ser. No. 17,602

Int. Cl.^{5} **A47F** *1/06*

U.S. Cl. 312—9.45 **1 Claim**



1. A cassette carousel apparatus, comprising,

a housing, with the housing having a first end wall spaced from, parallel to, and coextensive with a second end wall, and a top wall spaced from and parallel to a bottom wall, and a plurality of arcuate side walls, the top wall having a top wall opening and a guide track positioned within the housing extending coextensively with the top wall opening, and at least one of the side walls, with a door slide structure mounted within the guide track and extending coextensively with the top wall opening in a first position, and displaced from the top wall opening in a second position received within the guide track along said at least one side wall, and

the door slide structure having a plurality of adjacent parallel pivoted door slats, and the top wall opening having an opening first end spaced from an opening second end and

conveyor means within the housing securing an endless array of cassette holders, and

the top wall opening first end includes an illumination bulb mounted thereto, and a battery member and a switch member mounted within the housing in electrical communication with the illumination bulb to effect selective illumination of the illumination bulb to project illumination within the housing for illumination of the conveyor means, and

the conveyor means includes a first roller and a second roller rotatably mounted in a parallel relationship between the first end wall and the second end wall, wherein the first roller and the second roller are arranged in a spaced relationship, having a continuous endless conveyor belt mounted about the first roller and the second roller, with the first roller having a first roller axle, and the first roller axle orthogonally and rotatably mounted through the first end wall and an axle handle mounted to the first roller axle for effecting selective rotation of the first roller axle and the second roller, and rotation of the endless conveyor belt, and

the first roller and the second roller each include a matrix of projections mounted to an exterior surface of each of the first roller and the second roller for enhanced engagement with the conveyor belt, and

the continuous array of cassette holders includes a plurality of individual holders, with each individual holder having a holder base, each holder base fixedly mounted to the conveyor belt, and the holder base having a plurality of spring-biased side walls, wherein the spring-biased side walls are arranged for receiving a cassette therebetween, and

the holder base includes a holder base sponge member directed through the holder base and the conveyor belt, and a fluid reservoir, the conveyor belt having spaced parallel flights, and the fluid reservoir mounted between the flights, and the fluid reservoir having a reservoir first end wall mounted to the housing first end wall, and the reservoir having a reservoir second end wall mounted to the housing second end wall, with a fill cap directed through the first end wall of the reservoir into fluid communication with the reservoir to effect selective filling of the reservoir, and the reservoir having a reservoir side wall, the reservoir side wall having a side wall sponge, and the side wall sponge arranged in contiguous communication with the conveyor belt for cleaning fluid from the reservoir through the holder base sponge member and the side wall sponge to direct the cleaning fluid within each of said cassette holders.

5,314,243

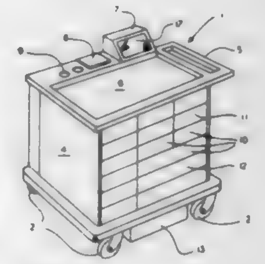
PORTABLE NURSING CENTER

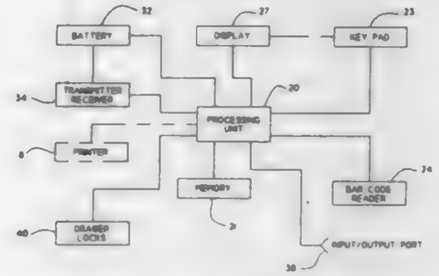
Sean C. McDonald; Robert H. McDonald, both of Pittsburgh; Richard R. Lunak, Fair Oaks, and Aldo Zini, Pittsburgh, all of Pa., assignors to Automated Healthcare, Inc., Pittsburgh, Pa.

Filed Dec. 4, 1992, Ser. No. 986,042

Int. Cl.^{5} **E05B** *65/00*

U.S. Cl. 312—215 **15 Claims**





1. A portable nursing center comprising:

a) a housing having a base and a plurality of wheels attached to the base;

b) a plurality of patient drawers carried by the housing, each of said drawers being movable between a given position and a closed position each drawer sized and configured for holding pharmaceutical items which have been prescribed for a specific patient;

c) patient identification means affixed to each patient drawer;

d) at least one on demand drawer carried by the housing, movable between an open position and a closed position and being sized and configured to hold pharmaceutical and other nursing items used on an as needed basis;

e) a control unit for selectively locking said patient drawers and at least one on demand medication drawer to prevent access thereto, said control unit including data entry means for entry of predetermined access data and other data, lock means for selectively locking and unlocking said patient drawers and on demand medication drawers and a processing unit with an associated memory for unlocking selected drawers in response to entry of access data while maintaining other drawers in a locked condition and recording at least a portion of the access data; and

f) a transmitter connected to the central unit for transmitting selected access data and other data from the medication dispensing center to a remote receiver, the nursing center being sized and constructed so that when filled with pharmaceuticals and other nursing items, the nursing center can be moved through a nursing area by a single nurse.

5,314,244

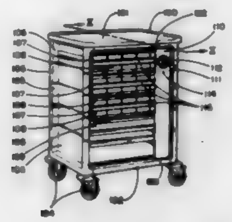
PHARMACEUTICAL CABINET LOCKING ARRANGEMENT

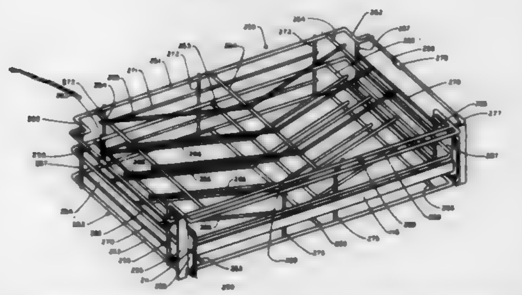
Mark D. Swets, Grand Rapids; George A. Williams, Hudsonville, and Steven F. Goodman, Wyoming, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Division of Ser. No. 950,976, Sep. 23, 1992, Pat. No. 5,205,628, which is a continuation of Ser. No. 766,623, Sep. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 521,640, May 10, 1990, Pat. No. 5,069,511. This application Nov. 12, 1992, Ser. No. 974,940

Int. Cl.^{5} **A47B** *8/00*

U.S. Cl. 312—330.1 **15 Claims**





1. A wire cage cassette for supporting a plurality of pharmaceutical dispensing bins in a pharmaceutical cabinet, comprising:

at least one rectangularly-shaped shelving structure having a perimeter and comprising a framing bar extending along said perimeter of said shelving structure in a predetermined plane and a plurality of spanning bars, including a central spanning bar and side spanning bars disposed on opposite sides of said central spanning bar, extending in said predetermined plane and attached to said framing bar at opposite sides of said rectangularly-shaped shelving structure and a plurality of angled shelving bars attached to said spanning bars in an overlapping relationship and each having substantially straight sections extending angularly with respect to sides of said shelving structure between said side spanning bars and said central spanning bar;

a pair of side support bars extending substantially parallel to opposite sides of said shelving structure and external to said framing bar for supporting said cassette in said pharmaceutical cabinet; and

a plurality of upstanding support bars connected to said framing bar and extending in a substantially vertical direction from said framing bar, at least two of said upstanding support bars connected to each of said side support bars.

5,314,245

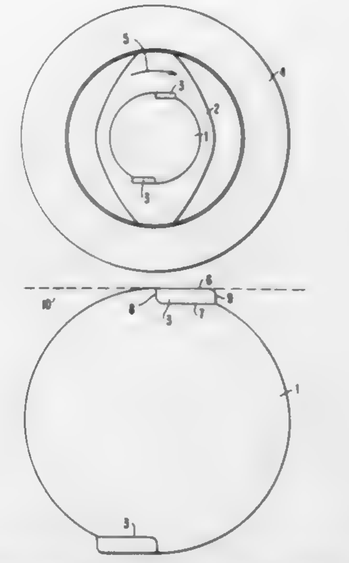
ARRANGEMENT FOR MIXING AND KNEADING OF MATERIALS WITH A SCREW SHAFT AND AT LEAST ONE SCREW ELEMENT CONNECTED WITH ONE ANOTHER BY WEDGES

Josef A. Blach, Hof 120, 5310 Mondsee, Austria

Filed Feb. 5, 1993, Ser. No. 14,372

Int. Cl.^{5} **B01F** *7/08*

U.S. Cl. 366—79 **12 Claims**



1. An arrangement for mixing and/or kneading a viscous, plastic, powder or grain materials, comprising a housing provided with a housing opening; a screw shaft driveably arranged in said housing opening and having a torque transmitting shaft and at least one screw element arranged on said shaft, said shaft and said screw element in assembled condition forming two diametrically opposite open grooves, each defined by two long walls and two short walls arranged so that said long walls intersect said short walls at a right angle to form corners which are rounded; two wedges connecting said at least one screw element with said shaft and each wedge having a substantially rectangular cross-section with two long sides and two short sides, each of said wedges being arranged so that one long side of said cross-section which faces toward said screw element substantially coincides with a tangent to a circumference of said shaft and is arranged substantially in said screw element, another long side of said cross-section which faces toward said shaft is arranged substantially in said shaft, one short side of said cross-section which extends in a direction opposite to the rotary direction of said shaft is located substantially in said shaft, another short side of said cross-section which extends in the rotary direction of said shaft is arranged substantially in said screw element, said long and short sides of said cross-section abutting said shaft and said screw element, said wedges having rounded corners said long sides of said cross-section intersecting said short sides of said cross-section at a right angle to form said rounded corners of said wedges, said wedges being located diametrically opposite to one another and received in said diametrically opposite open grooves.

5,314,246

INCREASED BARREL-STRESS EXTRUDER

Stephen J. Derezinski, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

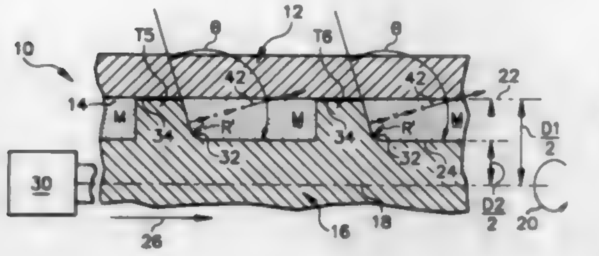
Filed Jul. 28, 1993, Ser. No. 98,186

Int. Cl.^{5} **B29B** *1/06;* **B01F** *7/08*

U.S. Cl. 366—79 **6 Claims**

1. An apparatus for extruding material in a given direction of material flow, the apparatus comprising:

(a) a hollow barrel having an inner wall;
(b) an extrusion screw mounted rotatably about an axis within said hollow barrel, said extrusion screw including pushing material threads, each said thread having a crest, a radial height 'H' and relative to the direction of material flow; a material pushing flank surface on the downstream side of each thread; said material pushing flank surface forming a material moving angle Θ of greater than 90° with the axis of rotation of said screw such that said material pushing flank surface has a maximum axial spacing 'L' along said inner cylindrical wall from the upstream surface of an adjacent downstream thread, and such that a line, normal to said material pushing flank surface at a point 'H'/2 , will intersect said inner wall downstream of said pushing flank surface at a point 'L'/2 ; and
(c) means for rotating said extrusion screw within said hollow barrel.



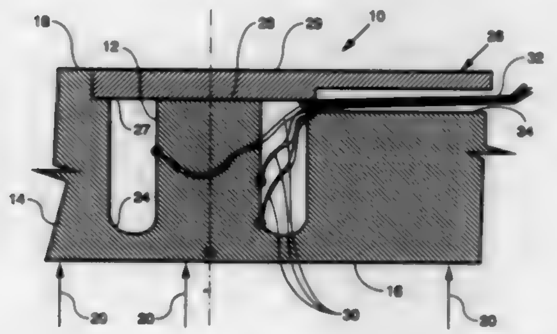
5,314,247
DUAL ACTIVE SURFACE, MINIATURE, PLUG-TYPE HEAT FLUX GAUGE

Curt H. Liebert, Middleburg Heights, and John Koch, Jr., Medina, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Apr. 16, 1993, Ser. No. 47,120

Int. Cl.⁵ G01K *17/00*

U.S. Cl. 374—29 **12 Claims**



1. A dual active surface plug-type heat flux gauge comprising
- a metal member having a first surface and a second surface oppositely disposed from said first surface, said member further including an annulus extending away from said second surface towards said first surface,
- a thermoplug extending from said first surface toward said second surface through said annulus with a surface of said thermoplug being spaced from a surface of said annulus thereby forming an annular chamber, said thermoplug being integrally formed from a portion of said member in said annulus so that said thermoplug is of the same material as said member with no seam connecting the same, said thermoplug having an end face spaced inwardly from said second surface,
- a plurality of thermocouple wires extending into said annular chamber, each of said thermocouple wires being in heat conducting contact with said thermoplug at a predetermined point, the spacing between each predetermined point and said first and second surfaces being different for each thermocouple wire, and
- a metal cover plate covering said annular chamber for insulating said wires and contact points, said plate being contiguous with said end face and permanently secured thereto for transferring heat substantially one-dimensionally from one of said surfaces through said thermoplug and cover plate to the other of said surfaces.

5,314,248
LASER DEVICE FOR SIMULTANEOUS INDUSTRIAL PROCESSING AND MONITORING OF TEMPERATURE

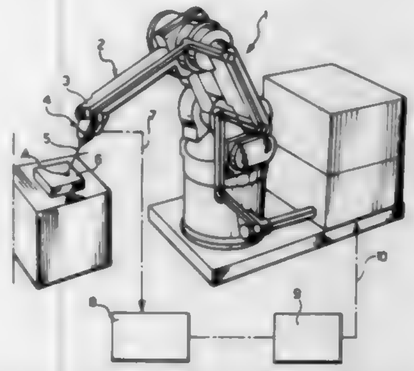
Giorgio Manassero, Orbassano, and Alberto Maccagno, Beinasco, both of Italy, assignors to Comau S.p.A., Grugliasco and Consiglio Nazionale Delle Ricerche, Rome, both of Italy

Filed Mar. 24, 1993, Ser. No. 36,475

Claims priority, application Italy, Mar. 24, 1992, TO92A000251

Int. Cl.⁵ G01J *1/00, 5/00*

U.S. Cl. 374—124 **7 Claims**



1. A laser device for simultaneous monitoring of temperature and processing of a workpiece, the device comprising a focusing head, processing means fitted on the focusing head for focusing a laser beam onto the workpiece in order to carry out an industrial process, pyroelectric sensor means for detecting the thermal energy emitted by the workpiece in the region being processed and transmitting a signal corresponding to and indicative of the temperature of the workpiece in the region being processed, and electronic for processing the signal transmitted by the sensor means, wherein:
- the pyroelectric sensor means is fitted on the focusing head of the laser device and includes a row of pyroelectric sensors which detect the thermal energy emitted by the workpiece in correspondence to a plurality of points which are located along an ideal line extending across a focal area of the workpiece onto which the laser beam is focused.

5,314,249
SURFACE CONDITION MEASUREMENT APPARATUS

Tomohiro Marui, Tokyo, and Kazuo Arai, Chiba, both of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

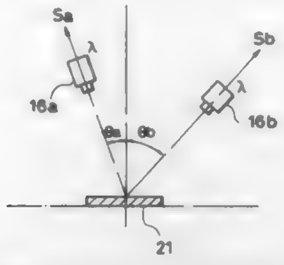
Filed Nov. 13, 1992, Ser. No. 976,414

Claims priority, application Japan, Nov. 19, 1991, 3-330092; Nov. 19, 1991, 3-330093; Dec. 10, 1991, 3-350095; Feb. 6, 1992, 4-21068

Int. Cl.⁵ G01J *5/02*

U.S. Cl. 374—128 **15 Claims**

1. A surface condition measurement apparatus comprising:
- detection means for detecting light with a specified wavelength, the light radiated from a material, the detection means outputting a plurality of detection signals;
- calculation means for calculating a first parameter from said plurality of detection signals, the first parameter corresponding to an emissivity ratio; and
- converting means for converting the first parameter to a second parameter based on a predetermined relationship between the first parameter and the second parameter, the second parameter indicative of a surface condition of said material.



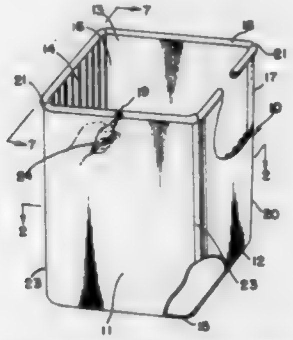
5,314,250
INFLATABLE CONTAINER

Ung L. Lee, 193 Tumblebrook Dr., South Windsor, Conn. 06074

Filed May 18, 1993, Ser. No. 62,834

Int. Cl.⁵ B65D *33/00*

U.S. Cl. 383—3 **12 Claims**



1. An inflatable container of a number-sided hedron comprising:
- a plurality of vertical air conduits disposed in at least one wall of the container, said container having an upper open end;
- a horizontal air conduit disposed around a perimeter of the upper open end of said container and in communication with said plurality of vertical conduits at opposing edges of each wall of the container, said horizontal air conduit having at least three passages of a smaller diameter than said horizontal air conduit and disposed therein at corners of the container for bending the horizontal air conduit in accordance with the number of said at least three smaller diameter passages so as to form the number sided-hedron during inflation; and
- a one-way valve attached to said horizontal air conduit for communicating with said plurality of vertical air conduits through said horizontal air conduit, said one-way valve being provided with a detachable air pump, whereby upon inflating, the inflatable container is fully inflated by airpumping through the one-way valve from a folded position thereof so that the inflatable container self-stands effectively.

5,314,251
DEPOSIT ENVELOPE

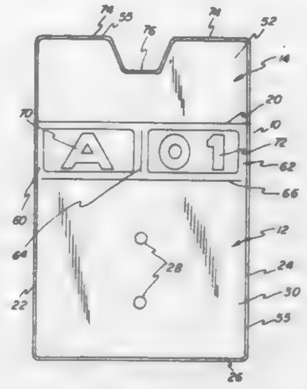
William A. Taylor, 1685 Bucksglen Dr., Columbus, Ohio 43119

Filed Jul. 13, 1992, Ser. No. 912,725

Int. Cl.⁵ B65D *33/04*

U.S. Cl. 383—106 **21 Claims**

1. An improved deposit envelope comprising a front panel, said front panel comprising a first designation area and a second designation area, a top edge, a bottom edge spaced apart from said top edge a first distance, two side edges, an interior surface, and at least one aperture, said first and second designation areas being directly adjacent each other, and
- a rear panel, said rear panel comprising a top edge, a bottom edge spaced apart from said top edge a second distance, two side edges, an interior surface, and at least one aperture, said second distance being greater than said first distance, said rear panel having a notch-like indentation formed along said rear panel top edge, and said front panel secured along its sides to said rear panel such that all of said rear panel interior surface is always facing said front panel interior surface.



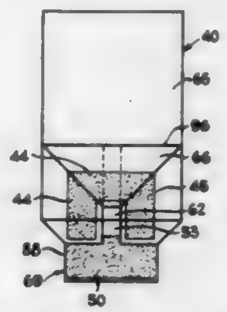
5,314,252
SEALABLE SQUARE BOTTOM CONTAINER APPARATUS

Thomas W. Happ, Boswell, Ind., assignor to AB Specialty Packaging, Inc., Hialeah, Fla.

Filed Oct. 9, 1992, Ser. No. 959,290

Int. Cl.⁵ B65D *30/18*

U.S. Cl. 383—126 **23 Claims**



1. A sealable square bottom container apparatus for use in storing, shipping and using various contents contained therewithin, said container apparatus preventing the inadvertent migration and release of oils, steam, fluids and fine powdered materials, among other types of contents, from within said container apparatus to the outside environment during said storage, shipping and use, said container apparatus comprising:
- bag means for containing said articles, said bag means including a front panel, a back panel, side panels and a bottom panel;
- each of said front, back and side panels having an interior surface and an exterior surface, top and bottom edges and first and second side edges;
- said side panels comprising at least first and second side panels interposed between and operably connecting said front and back panels, respectively, so as to form a contiguous tube about a longitudinal axis, said contiguous tube including a top end bounded by said top edges of said

front, back and side panels, a bottom end and an interior region bounded by said interior surfaces of said front, back and side panels;

each of said front, back and side panels further including front, back and side panel closure flap means for forming said bottom panel and having corresponding interior and exterior surfaces and side edges, said front, back and side panel closure flap means emanating downwardly from the respective bottom edges of each of said front, back and side panels respectively, to collectively form said bottom panel upon articulation and sealing of said respective panel closure flap means,

each of said front, back and side panel closure flap means emanating from said respective ones of said front, back and side panels at front, back and side flap folds respectively interposed therebetween,

said side panel closure flap means respectively forming a substantially rectangular first side bottom panel and a substantially rectangular second side bottom panel, opposite said first side bottom panel, as part of said bottom panel, upon articulation of said side panel closure flap means,

said first side bottom panel emanating from said first side panel at a first of said side flap folds and said second bottom side panel emanating from said second side panel at a second of said side flap folds, each of said first and second side bottom panels, upon said articulation and folding at said respective side flap folds, being positioned independent of each other in a non-overlapping orientation;

said front and back panel closure flap means respectively forming a front bottom panel and a back bottom panel opposite said front bottom panel upon articulation of said front and back panel closure flap means,

said front bottom panel emanating from said front panel at said front flap fold and said back bottom panel emanating from said back panel at said back flap fold, with said front and back bottom panels, upon said articulation and folding at said respective front and back flap folds, being positioned in overlapping orientation

sealable adhesive material operably positioned on the interior and exterior surfaces of at least one of said front, back and side panel closure flap means, prior to articulation, for operable, overlapped sealing of said front and back bottom panels over one another and over said first and second side bottom panels, upon articulation of said closure flap means to seal same;

said sealable adhesive material being positioned on at least two of said front, back and side panel closure flap means to create, upon said sealing, a substantially closed, positively locked, continuous periphery of sealed attachment among said front, back and side panel closure flap means,

said sealable adhesive material on said front, back and side panel closure flap means, and, in turn, said front, back and side bottom panels, respectively formed thereby, imparting to said continuous periphery of sealed attachment, a substantially rectangular shape within said formed bottom panel, having a region devoid of said adhesive material therewithin said periphery, to thereby maximize the region of sealed attachment against which the weight of said contents may be distributed within said interior region;

said substantially closed, positively locked, continuously sealed periphery along said bottom panel forming a sift-proof bottom panel closure that is substantially restrictive to the migration of oils, steam, fluids and finely powdered materials.

5,314,253
ROLLING ELEMENT GUIDE FOR DRAWER GUIDES

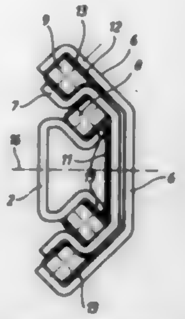
Alfred Grass, Jr., Hochst/Vlbg., Austria, assignor to Grass AG, Hochst/Vlbg., Austria

Filed Feb. 9, 1993, Ser. No. 15,625

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1992, 4204067

Int. Cl.^{5} A47B *88/00;* **F16C** *29/04*

U.S. Cl. 384—19 **8 Claims**



1. Rolling element guide for drawer guides comprising a furniture unit body rail mounted on the furniture unit body side wall and a drawer rail mounted on the drawer, rolling surfaces for the rolling elements transmitting the drawer load being arranged on the two rails, said rolling elements being held in a roller cage that is arranged between the rails, characterized in that, on opposing end faces, the rolling elements have pins, which pivot in the roller cage, and in that the pins of the rolling elements in the same plane are staggered 90 degrees with respect to each other.

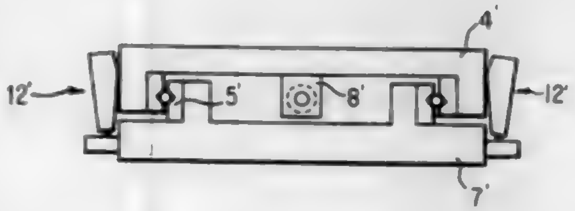
5,314,254
STIFFNESS ENHANCER FOR MOVABLE STAGE ASSEMBLY

Frank D. Yashar; Charles R. Meyer, and John A. Gurley, all of Santa Barbara, Calif., assignors to Digital Instruments, Santa Barbara, Calif.

Filed Nov. 3, 1992, Ser. No. 970,875

Int. Cl.^{5} F16C *29/02, 29/12*

U.S. Cl. 384—49 **31 Claims**



1. A movable stage device comprising:

a base;

a stage supported on said base;

means for moving said stage relative to said base in a first direction;

a stiffener member and means for applying a force for urging said stiffener member against at least one of said stage and said base, and wherein said means for applying a force applies two forces in respective two directions, wherein each of said two directions are orthogonal to said first direction.

5,314,255
BEARING HAVING RESILIENT BELLOWS AND BUMPERS

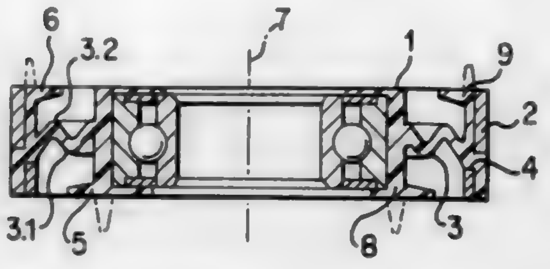
Hans-Werner Schwerdt, Laudenbach, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Dec. 2, 1992, Ser. No. 984,145

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1991, 4139923

Int. Cl.^{5} F16C *27/06*

U.S. Cl. 384—536 **15 Claims**



1. A bearing comprising:

two hollow cylindrical prop rings coaxially surrounding a central axis;

a bellows element formed from a thermoplastic elastomer material elastically coupling said prop rings in the radial direction, the bellows element having a radially extending profile that includes at least one fold protruding in the axial direction and having an axial length that does not overlap the axial length of said prop rings;

at least one bumper provided axially outside the axial length of the fold, said at least one bumper having a profile that radially extends, during normal operational use, from at least one of said prop rings in the direction of the other prop ring, said bumper and said fold partially overlapping.

5,314,256
PRINTING DEVICE

Akihiko Niwa, Toki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 22, 1992, Ser. No. 949,772

Claims priority, application Japan, Sep. 25, 1991, 3-274852

Int. Cl.^{5} B41J *5/30*

U.S. Cl. 400—61 **22 Claims**

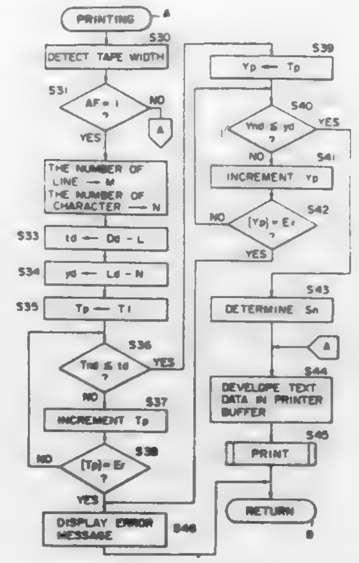
1. A printing device for printing characters/symbols on a tape member having a predetermined width, comprising:

means for inputting a length of said tape member within which said characters/symbols are printed;

first detecting means for detecting the number of said characters/symbols to be printed in a line within said length of said tape member;

second detecting means for detecting the number of lines to be printed within said predetermined width;

means for determining the size of the characters/symbols based upon:



the number of said characters/symbols detected by said first detecting means; and

the number of lines detected by said second detecting means.

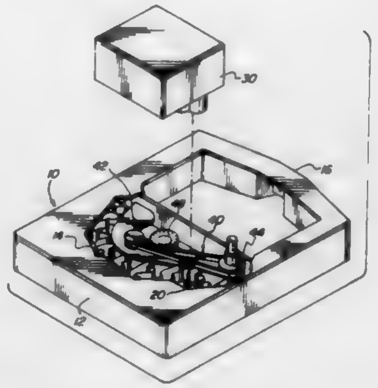
5,314,257
PRINTER CARTRIDGE ASSEMBLY

Wei T. Cheng, 1540 New Haven Rd., Naugatuck, Conn. 06770

Filed May 18, 1993, Ser. No. 63,520

Int. Cl.^{5} B41J *31/16*

U.S. Cl. 400—199 **25 Claims**



1. An inking apparatus for applying a film of ink received from an applicator operably connected to a source of ink, to a ribbon material, comprising:

a retainer carriage;

a drive pulley rotatably fitted to one end of said retainer carriage;

a trailing pulley rotatably mounted to said retainer carriage and separated from said drive pulley;

an inking pulley rotatably mounted on said retainer carriage between said drive pulley and said trailing pulley and positioned to permit an outer perimeter of said inking pulley to contact the applicator and receive a film of ink from the applicator;

said drive pulley and said trailing pulley being provided with at least one belt receiving channel;

at least one endless belt having inner and outer surfaces, said belt being mounted on and extending around said drive and trailing pulley wheels in said belt receiving channels, said belt retaining said drive and trailing pulleys to said retainer carriage to create a self-retaining assembly that can be handled without loss of said pulleys, said outer surface of said belt frictionally contacting an outer perimeter of said inking pulley to drive said inking pulley and to receive a film of ink from said inking pulley and transfer said film of ink to the ribbon material at a position remote from the position of the inking pulley.

5,314,258

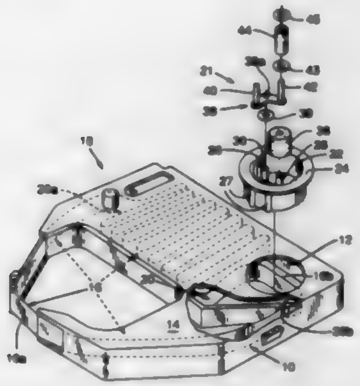
SELF-CONTAINED RE-INKING INSERT AND RIBBON CARTRIDGE DEVICE

William R. Brown, 36905 SW. Goddard Rd., Cornelius, Oreg. 97113, and Don E. Casey, 406 Thurber Dr. West, Ste. 9, Columbus, Ohio 43215

Filed Aug. 31, 1992, Ser. No. 938,857

Int. Cl.^{5} B41J *31/14*

U.S. Cl. 400—202.4 **16 Claims**



1. In combination a re-inking insert and a pre-existing printer-ribbon cartridge, the cartridge including an endless ribbon configuration and a pocket portion within the cartridge through which said ribbon traverses in operation, said insert comprising:

a wall defining a cavity of said insert, said wall including a side wall portion and a floor portion whereby said cavity may be placed within said pocket and slit formations in both side wall portion and said floor portion allowing a portion of said ribbon to pass into and through said cavity through said floor portion during insertion of said insert into said pocket portion and through said side wall portion during operation of the ribbon cartridge;

an ink source within said cavity; and

an ink transfer mechanism within said cavity coupling said ink source and said portion of said ribbon passing through said cavity whereby said ribbon may receive a replenishing ink supply during use of said ribbon cartridge.

5,314,259

RECORDING APPARATUS HAVING AN IMPROVED MECHANISM FOR MOVING THE RECORDING SECTION THEREOF

Hiroharu Nakajima, Tokyo, and Toshiaki Ozawa, Urayasu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 667,372, Mar. 12, 1991, abandoned, which is a continuation of Ser. No. 420,748, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 163,127, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 907,170, Sep. 15, 1986, abandoned, which is a continuation of Ser. No. 648,957, Sep. 10, 1984, abandoned. This application Mar. 31, 1992, Ser. No. 860,122

Claims priority, application Japan, Sep. 20, 1983, 58-172285

Int. Cl.^{5} B41J *35/20*

U.S. Cl. 400—216.2 **8 Claims**

1. An electronic typewriter adapted to operate in a character/character mode comprising:

key input means for inputting character data to be printed;

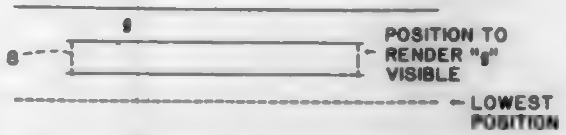
a platen;

a carriage having a printing section including an ink ribbon, movable in a first direction along said platen;

means for moving said ink ribbon in a second direction perpendicular to the first direction in which said carriage is movable so as to move said ink ribbon between up and down positions;

control means for controlling said moving means to move said ink ribbon between the up and down positions;

counting means for counting a period of time between at least two adjacent key input operations made by an operator; and



latch means for holding the time counted by said counting means,

wherein said control means controls said moving means such that said ink ribbon is moved by said moving means to its up position in response to input of data to be printed from said inputting means and said ink ribbon is moved to its down position in accordance with the duration of time held by said latch means, and wherein after the elapse of an extended waiting time greater than the time counted by said counting means, said control means controls said latch means to store a standard time duration different than the duration of time held by said latch means.

5,314,260

FINGER PEN

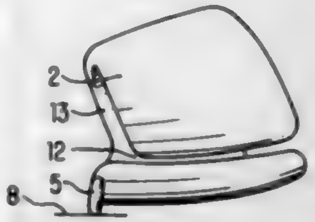
Jan Andersson, Alsikegatan 2, S-753 23 Uppsala, Sweden

Continuation-in-part of Ser. No. 761,347, Sep. 11, 1991, abandoned. This application Jan. 29, 1993, Ser. No. 11,100

Claims priority, application Sweden, Mar. 22, 1989, 89 01012-8

Int. Cl.^{5} B43K *7/00, 8/00*

U.S. Cl. 401—7 **2 Claims**



1. A finger pen comprising a sleeve removably attachable to a finger and a pen tip protruding from the sleeve at an angle and in communication with a container for supplying paste, ink or the like to the pen tip, the sleeve being resilient and adapted to be positioned upon a user's finger so that in use in a protonated orientation the pen tip will extend from said sleeve such as to project from the vicinity of a sensible center of feeling of the finger and at an angle from the sleeve corresponding to an angle of a rod-shaped pen held in a normal semi-supine manner, and the pen tip will extend from the sleeve at such a length that the pen tip will be visible to the user during use, and the sleeve being discontinuous, a split separating a lower pen tip supporting portion of said sleeve from a finger grasping portion of said sleeve.

5,314,261

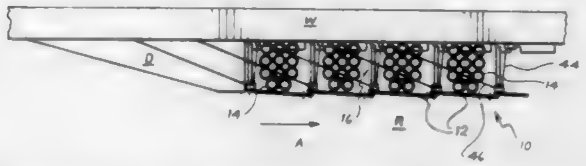
VEHICLE CRASH CUSHION

Barry D. Stephens, Roseville, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Feb. 11, 1993, Ser. No. 16,685

Int. Cl.^{5} E01F *15/00*

U.S. Cl. 404—6 **16 Claims**



1. A vehicle crash cushion for decelerating a vehicle that has left a roadway and is moving toward a wall, said crash cushion comprising:

a plurality of panels positioned to overlap one another partially along an anticipated impact direction;

a mechanical linkage coupled to the panels to suspend the panels above grade adjacent a wall such that the panels are oriented generally parallel to the wall and the panels are movable toward the wall, said linkage comprising a plurality of support struts, each pivoted at a first end adjacent the wall and at a second end adjacent a respective panel; and

a plurality of energy absorbing elements positioned adjacent the panels between the panels and the wall and suspended above grade at least in part by the linkage such that movement of the panels toward the wall deforms the energy absorbing elements, thereby retarding movement of the panels toward the wall.

5,314,262

HOISTING GEAR ON THE TROLLEY OF A CONTAINER CRANE

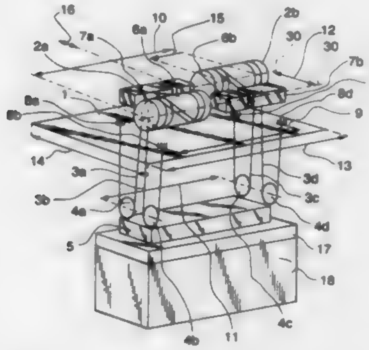
Eduard Meisinger, Wendelstein, and Herbert Steiner, Schwabach, both of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette Aktienegesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Dec. 17, 1992, Ser. No. 991,739

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1991, 4142779

Int. Cl.^{5} B63B *27/00;* **B66C** *11/02*

U.S. Cl. 414—137.1 **2 Claims**



1. A container crane trolley hoisting arrangement, comprising:

a trolley frame;

a first motor driven cable drum supported on said trolley frame;

a second motor driven cable drum supported on said trolley frame;

a roller support connected to a spreader for engaging a container to be unloaded or loaded;

a first set of cable rollers connected to said roller support;

a second set of cable rollers connected to said roller support;

a first set of hoisting cables connected to said first cable drum in a double-thread design wherein said first set of cables is fed off of said first cable drum from an outer first cable drum location toward an inner cable drum location;

a second set of hoisting cables connected to said second cable drum in a double-thread design wherein said second set of cables is fed off of said second drum from an outer second cable drum location toward an inner cable drum location;

a first set of fixed cable points connected to said trolley frame and a second set of cable fixed points connected to said trolley from, said first set of hoisting cables extending to said first cable rollers and to said first set of cable fixed points and said second set of hoisting cables extending to said second set of cable rollers and to said second set of cable fixed points, said first cable drum being positioned parallel to said second cable drum and offset from said second cable drum by a distance equal to a diameter of said first cable drum and said second cable drum, said first set of cables at said outer position of said first cable drum being spaced a distance from said second set of cables at an outer position of said second cable drum at a distance approximately corresponding to a distance between said first set of cable rollers and said second set of cable rollers, when said first cable drum and said second cable drum are substantially fully wound, said first set of cable fixed points and said second set of cable fixed points being spaced a distance approximately equal to said distance between said first set of cable rollers and said second set of cable rollers, said first set of hoisting cables and said second set of hoisting cables running off said first drum and said second drum respectively in an inward direction during lowering of said spreader.

5,314,263

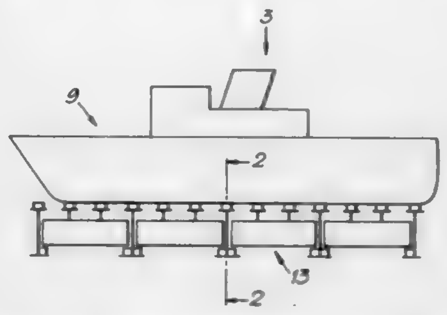
METHOD OF DISTRIBUTING LOADS GENERATED BETWEEN A SHIP AND A SUPPORTING DRY DOCK

Geoffrey A. Stokoe; George M. Green, and Iver D. Cayocca, all of Miami, Fla., assignors to NEI Syncrolift Incorporated, Miami, Fla.

Filed Jun. 18, 1991, Ser. No. 717,011

Int. Cl.^{5} B63C *1/00*

U.S. Cl. 405—1 **4 Claims**



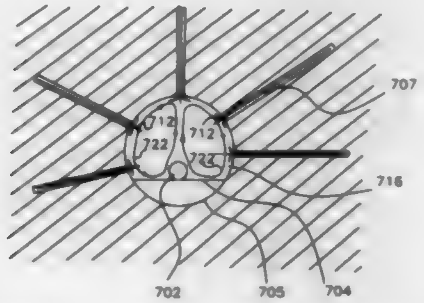
1. A method of adjusting the distribution of loads, the magnitude of which are not accurately known and which are generated between a ship and a supporting dry dock, comprising the steps of:

a) placing the ship on a dry dock comprising a number of articulatedly joined platforms, with each said platform being suspended from a number of pairs of opposing hoist winches, and with said hoist winches comprising apparatus including means for signalling the load experienced by each one of said hoist winches, means for displaying the loads experienced by said hoist winches in accordance with said signals and means for controlling said hoist winches in accordance with said signals;

b) activating one or more of said hoist winches relative to the remainder of said hoist winches to lift or lower some part of the platforms, and thereby generate an adjustment of the support provided thereby on a part of the ship's hull sufficient to cause the ship's load to be redistributed relative to at least some of said platforms to minimize an imbalance caused by the distribution of the unknown loads.

5,314,264
METHOD AND APPARATUS FOR UNDERGROUND NUCLEAR WASTE REPOSITORY

George Danko; Pierre Mousset-Jones, and Richard A. Wirtz, all of Reno, Nev., assignors to University of Nevada, Reno, Nev.
Continuation-in-part of Ser. No. 504,612, Apr. 4, 1990, Pat. No. 5,078,958. This application Jul. 12, 1991, Ser. No. 728,672
The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.
Int. Cl.^{5} B09B *1/00;* **E21D** *21/00*
U.S. Cl. 405—128 **10 Claims**



1. A long-term repository system for the storage of heat generating spent nuclear fuel, comprising:

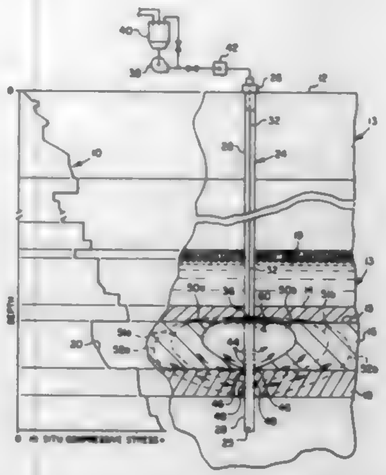
(a) a mechanically stable geological formation constituting a natural barrier system for said spent fuel;
(b) a drift tunnel defined in said geological formation, said drift tunnel having a height and a width, and a length much greater than said height and said width:
(c) a plurality of containers of spent, heat generating nuclear fuel, said containers being positioned in said drift tunnel, said drift tunnel and container characteristics being such that each container heats a section of said drift tunnel wall;
(d) at least three elongated heat transfer boreholes having a length and having an average cross-sectional width much smaller than said length and extending from said heated drift tunnel wall section into a heat dissipation region in said geological formation, said at least three heat transfer boreholes and said heat dissipation region extending around said drift tunnel in a vertical sense; and
(e) a plurality of elongated heat transfer devices extending into and through each said elongated heat transfer borehole to said heat dissipation region to transfer heat from said heated drift tunnel wall section to said heat dissipation region.

5,314,265
WASTE DISPOSAL IN HYDRAULICALLY FRACTURED EARTH FORMATIONS

Thomas K. Perkins, Dallas, and Richard G. Keck, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Filed Mar. 17, 1993, Ser. No. 32,951
Int. Cl.^{5} B09B *3/00*
U.S. Cl. 405—128 **16 Claims**

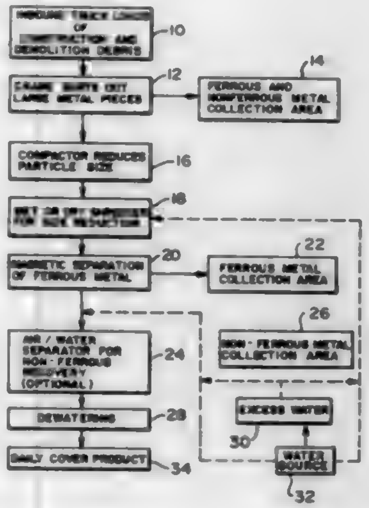
1. A method of disposing of solids waste material in an earth formation, comprising the steps of:

injecting a slurry, including particles of said solids waste, into a disposal zone of said earth formation which has an in situ compressive stress lower than an adjacent overburden zone and at a pressure sufficient to hydraulically fracture said earth formation in said disposal zone and to deposit a filter cake of said particles in said fracture adjacent to said overburden zone and continuing the injection of said slurry to progressively increase the fracture extending downwardly from said disposal zone while continuing to deposit a filter cake of said particles in said progressively increasing fracture and without substantially penetrating said overburden zone with said fracture.



5,314,266
METHOD OF RECYCLING CONSTRUCTION AND DEMOLITION DEBRIS

R. Paul Smith, McLean, Va., and Michael I. Price, Upper Marlboro, Md., assignors to Recovermat Technologies, Inc., Wilmington, Del.
Continuation-in-part of Ser. No. 871,103, Apr. 20, 1992, Pat. No. 5,181,803. This application May 15, 1992, Ser. No. 883,354
The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.
Int. Cl.^{5} B02C *15/00*
U.S. Cl. 405—129 **7 Claims**

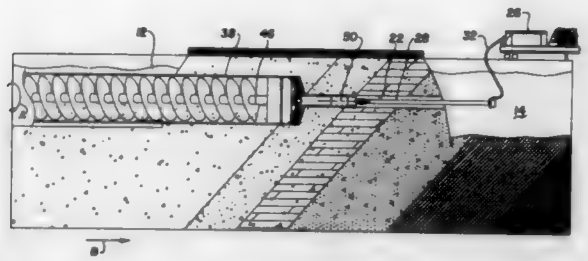

OF
DEMOLITION DEBRIS
10
LARGE METAL PIECES
12
FERROUS AND NONFERROUS METAL COLLECTION AREA
14
COMPACTOR REDUCES PARTICLE SIZE
16
18
MAGNETIC SEPARATION OF FERROUS METAL
20
FERROUS METAL COLLECTION AREA
22
AIR / WATER SEPARATOR FOR NON - FERROUS RECOVERY (OPTIONAL)
24
NON - FERROUS METAL COLLECTION AREA
26
EXCESS WATER
30
DEWATERING
28
DAILY COVER PRODUCT
34
WATER SOURCE
32

1. A method of recycling construction and demolition debris comprising the steps of:

providing a supply of construction and demolition debris;
processing said debris through a shredder;
during the processing of the debris through the shredder adding water to the debris so as to reduce said debris to a moist shredded product; and
applying said moist shredded product to a landfill as daily cover.

5,314,267
HORIZONTAL PIPELINE BORING APPARATUS AND METHOD

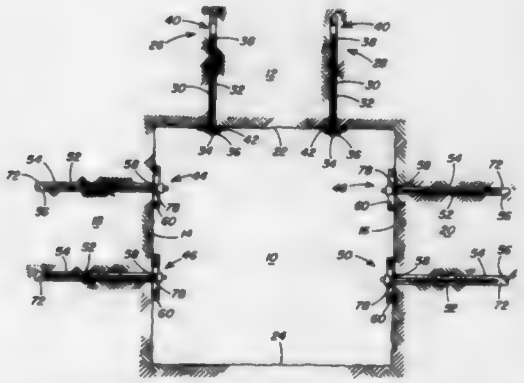
Mark Osadchuk, 10040 Happy Valley Rd., Scottsdale, Ariz. 85255
Filed Aug. 27, 1992, Ser. No. 936,599
Int. Cl.^{5} F16L *1/00;* **E02D** *29/00*
U.S. Cl. 405—184 **3 Claims**



1. A pipeline boring head of the type which when rotated and axially advanced can be used for forming a horizontally extending pipeline passageway to install pipeline under a transverse barrier such as a roadway, waterway, pipeline or the like comprising: a cylindrical body, a plurality of cutters mounted on one end of said body positioned to form a cylindrical passageway when the body is rotated, a conduit connected to said body to extend from said body along the path of a pilot bore for supplying drilling fluid to said cutters, a cylindrical guide rigidly connected to said body and positioned on the side of said cutters opposite said body, said guide being of a size to engage the walls of the pilot bore and to dam the pilot bore, thereby preventing a drilling fluid supplied to an area adjacent said cutters from flowing back through the pilot bore, and said guide being axially spaced away from the body to steer the body along the path of said pilot bore, and means on the other side of said body for rotating and advancing said body.

5,314,268
NON-METALLIC REINFORCING ROD AND METHOD OF USE IN SUPPORTING A ROCK FORMATION

Frank Calandra, Jr., Pittsburgh; John C. Stankus, Canonsburg, and John G. Oldsen, Butler, all of Pa., assignors to Jennmar Corporation, Pittsburgh, Pa.
Filed Jan. 13, 1993, Ser. No. 4,076
Int. Cl.^{5} E21D *20/02, 21/00*
U.S. Cl. 405—259.5 **14 Claims**

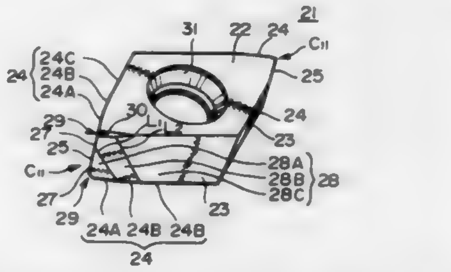


1. Apparatus for reinforcing an underground passageway comprising,

an elongated rod fabricated of polymeric material having a preselected length for insertion into a hole bored a preselected depth into a rock formation surrounding the underground passage,
said rod having an anchoring end portion for insertion in the bore hole and a tensioning end portion extending out of the bore hole,
said rod having a substantially uniform cross sectional area along the length thereof between said anchoring end portion and said tensioning end portion,
retaining means extending from said tensioning end portion for transmitting torque to said rod, said retaining means including an integral polymeric structure of a torque receiving end portion separated from said tensioning end portion by a washer element, said integrally formed torque receiving end portion, washer element, and tensioning end portion extending axially on said rod,
a bearing block having an opening therethrough to receive said rod with said retaining means abutting said bearing block around said opening to maintain said bearing block on said rod, and
means positioned in the bore hole surrounding said anchoring end portion for retaining said rod in said bore hole to compress said bearing block against the rock formation to reinforce the rock formation surrounding the bore hole.

5,314,269
CUTTING INSERT AND CUTTER

Tatsuo Arai; Takayoshi Saito, and Hiroaki Hayashizaki, all of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Sep. 3, 1992, Ser. No. 940,289
Claims priority, application Japan, Sep. 5, 1991, 3-226232
Int. Cl.^{5} B26D *1/12*
U.S. Cl. 407—42 **8 Claims**



1. A cutting insert comprising a polygonal plate-shaped insert body including two opposite faces directed in a direction of insert thickness and a plurality of peripheral faces disposed between said opposite faces, said opposite faces having marginal edges with at least one of said marginal edges defining a main cutting edge, said peripheral faces intersecting one another to form marginal edges with at least one of said marginal edges defining an auxiliary cutting edge which intersects said main cutting edge, a peripheral face which intersects the marginal edges defining said main and auxiliary cutting edges including a rake region extending along said main and auxiliary cutting edges, said insert body having a nose portion into which said main cutting edge and said auxiliary cutting edge merge;

said rake region comprising a plurality of sections, each said section being disposed in a plane different from another section, said sections intersecting one another to define marginal edges at intersections thereof and terminating at one end at said main cutting edge, said rake region being convexly shaped in such a manner that an included angle defined by a respective section and one of said opposite faces which extends from said main cutting edge decreases with distance from said nose portion, at least one of said marginal edges of said sections having the other end extending to a marginal edge defined between said peripheral faces.

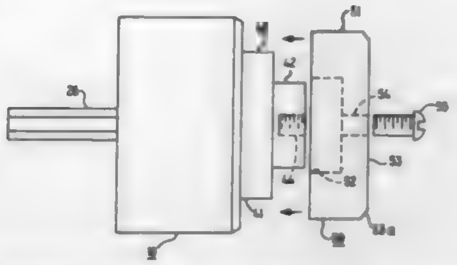
5,314,270
PLUNGE CUTTING DEVICE AND METHOD FOR PIPES

Wayne N. Lavancy, 5116 Peyton Place Ct., St. Louis, Mo. 63128, and Darrell G. Stack, 3111C Broken Oak Dr., St. Louis, Mo. 63129

Continuation-in-part of Ser. No. 854,586, Mar. 20, 1992. This application Apr. 29, 1993, Ser. No. 52,521

Int. Cl.^{5} B23B *5/16*

U.S. Cl. 408—1 R **16 Claims**



1. A plunge cutting device comprising:
- a cylindrical body having an end wall, a cylindrical wall having a first end with an end face and a second end, the cylindrical wall being jointed to the end wall at the second end and having an inner cylindrical surface and an outer cylindrical surface, at least one slot being formed in the end face and extending axially from the first end of the cylindrical wall;
- at least one cutter disposed in each slot; and
- a pilot for guiding the cylindrical body relative to a tubular member, the pilot comprising a main pilot coaxially secured to the cylindrical body and having a cylindrical outer surface surrounded by and spaced from the inner cylindrical surface of the cylindrical body, and a one-piece auxiliary pilot detachably mounted on the main pilot had having a cylindrical outer surface coaxial with the inner cylindrical surface of the cylindrical body.

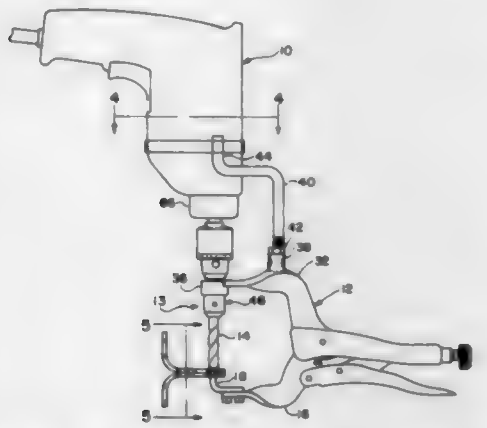
5,314,271
PORTABLE DRILL GUIDE

Nicholas W. Christiano, 58 Bodwell St., Hartford, Conn. 06114

Filed Dec. 3, 1992, Ser. No. 985,019

Int. Cl.^{5} B23B *45/14*

U.S. Cl. 408—87 **13 Claims**



1. Portable apparatus for drilling workpieces comprising:
- an electric drill, said drill having a body and being manually energizable, said drill also having a chuck for delivering torque to a rotatable tool to cause the tool to rotate about an axis; and
- drill guide means for supporting said drill, said guide means including:
  - grip means having a pair of relatively movable jaws, each of said jaws having a handle associated therewith, said handles being manually operable with a single hand to cause said jaws to move toward one another;
- a back-up fixture removably attached to a first of said jaws for movement therewith; and
- means for releasably connecting the other of said jaws to the body of said drill, said connecting means causing said axis of rotation to be generally in alignment with said back-up fixture when said jaws are in a closed condition with the back-up fixture positioned against a first side of a workpiece and a rotatable tool driving by said chuck is juxtapositioned to the second side of the workpiece which is disposed oppositely to the workpiece first side, said connecting means including arm means, a portion of said arm means being in contact with the body of said drill, said connecting means further including means for coupling said arm means to said other of said jaws, said coupling means comprising means for establishing a rotatable connection between said arm means and said other jaw whereby the angular orientation between the drill body contacting portion of said arm means and said other jaw may be varied.

5,314,272
DRILL

Masao Kubota, 22-7, Narimasu 2-chome, Itabashi-ku Tokyo 175, Japan

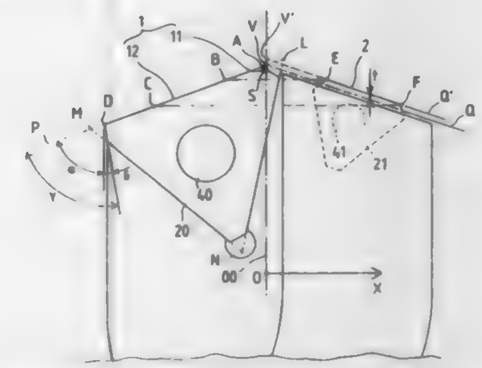
PCT No. PCT/JP91/01680, § 371 Date Jul. 28, 1992, § 102(e) Date Jul. 28, 1992, PCT Pub. No. WO92/09393, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 30, 1991, Ser. No. 915,724

Claims priority, application Japan, Nov. 30, 1990, 2-330366

Int. Cl.^{5} B23B *51/02*

U.S. Cl. 408—224 **8 Claims**



1. A drill having a drill body, a tool center line and a feed per drill revolution, said drill comprising:
- a first cutting edge forming a first angle with the tool center line;
- a second cutting edge located in a same plane as said first cutting edge and on an opposite side of the tool center line, said second cutting edge forming a second angle with said tool center line equal to said first angle;
- a middle point of said first cutting edge and a middle point of said second cutting edge connected by an imaginary straight line extending substantially perpendicular to the tool center line;
- a length of said first cutting edge being substantially twice a length of said second cutting edge; and
- said second cutting edge having a lip height in a direction of the tool center line, above a level of said first cutting edge, said lip height being greater than ½ of the feed per drill revolution.

5,314,273
CUTTING TOOL

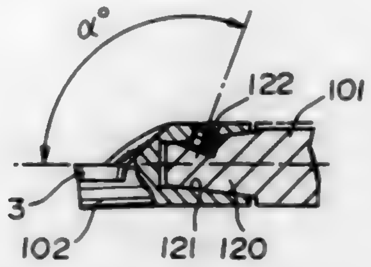
Masaaki Nakayama; Masayuki Okawa, and Junichi Saito, all of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Mar. 13, 1992, Ser. No. 851,204

Claims priority, application Japan, Mar. 13, 1991, 3-048462; Mar. 20, 1991, 3-016925[U]

Int. Cl.^{5} B23B *51/00*

U.S. Cl. 408—233 **5 Claims**



1. A cutting tool comprising:
- a head segment rotatable around an axis thereof, said head segment including a forward end portion having at least one cutting-insert receiving seat and a rear end portion;
- a shank segment rotatable around an axis thereof having a forward end portion adapted to be coaxially joined with said forward end of the head segment and a rearward end portion adapted to be fixedly secured to a machine spindle;
- an engaging tapered hole coaxially formed on one of said segments;
- an engaging tapered portion in the form of a general conical frustum coaxially formed on the other one of said segments and engagingly fitted into said hole;
- at least one internal thread communicating between said hole and the external surroundings through a peripheral surface of said head segment;
- at least one clamp screw respectively threaded through said at least one internal thread, a bottom end of said clamp screw being in contact with a surface of said engaging tapered portion;
- said engaging tapered portion further including a chamfered flat portion on an outer peripheral surface thereof for receiving said bottom end of the clamp screw;
- said clamp screw being inclined in an axial direction of the head segment at an angle α of more than 90°, while a surface of said chamfered flat portion is perpendicular to an axis of said clamp screw and is inclined to the axial direction of the head segment at an angle of α minus 90°.

5,314,274
METHOD AND APPARATUS FOR DUPLICATING KEYS USING TIP-REFERENCED ALIGNMENT BETWEEN KEY BLANK AND MASTER KEY

George L. Heredia, Paradise Valley, Ariz.; Robert E. Almblad, Mundelein, and Mike A. Mueller, Lindenhurst, both of Ill., assignors to Axxess Entry Technologies, Tempe, Ariz.

Continuation-in-part of Ser. No. 425,731, Oct. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 260,815, Oct. 21, 1988, abandoned. This application Sep. 30, 1991, Ser. No. 769,921

Int. Cl.^{5} B23C *3/35*

U.S. Cl. 409—81 **39 Claims**

1. A method for simultaneously duplicating both the bit notch pattern and shoulder position of a master key onto a key blank, the key blank including a shank with an uncut length, a shoulder, a blade with an uncontoured surface and an original blade length, a tip and a first longitudinal axis, the master key including a shank with a surface and a length, a shoulder, a blade with a contoured surface forming a bit notch pattern and a blade length, a tip and a second longitudinal axis aligned relative to the master key as the first longitudinal axis is aligned relative to the key blank, the original key blank blade length being shorter than the master key blade length, comprising the steps of:

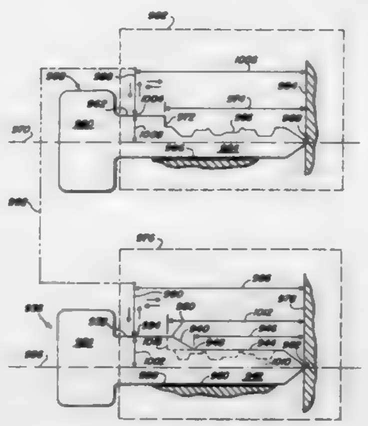
a. longitudinally aligning the key blank relative to a key cutter at a longitudinal index position spaced apart from the key tip by a first distance along the first longitudinal axis of the key blank;

b. laterally aligning the key blank relative to the key cutter to engage the key cutter with the shank or blade at the first distance to define a lateral reference distance relative to the first longitudinal axis;

c. longitudinally aligning the master key relative to a key follower at the longitudinal index position spaced apart from the key tip by the first distance along the second longitudinal axis of the master key;

d. laterally aligning the master key relative to the key follower to engage the key follower with the shank or blade surface at the first location at a distance offset from the second longitudinal axis by the lateral reference distance; and

e. longitudinally and laterally displacing the key follower relative to the master key to trace the contour of the master key shank, shoulder and bit notch pattern while simultaneously displacing the key cutter relative to the key blank in an identical manner to reproduce the traced contour of the master key shank, shoulder and bit notch pattern on the key blank and to longitudinally reposition the key blank shoulder to coincide with the relative longitudinal location of the master key shoulder by cutting away a portion of the shank to reduce the length of the shank to thereby increase the blade length to a length greater than the original key blank blade length and equal to the master key blade length.



13. A key cutting machine for simultaneously duplicating both the bit notch pattern and shoulder position of a master key onto a key blank, the key blank including a shank with an uncut length, a shoulder, a blade with an uncontoured surface and an original blade length, a tip and a first longitudinal axis, the master key including a shank with a surface and a length, a shoulder, a blade with a contoured surface forming a bit notch pattern and a blade length, a tip and a second longitudinal axis aligned relative to the master key as the first longitudinal axis is aligned relative to the key blank, the original key blank blade length being shorter than the master key blade length, comprising:

a. a key blank alignment fixture for longitudinally aligning the key blank relative to a key cutter at a longitudinal index position spaced apart from the key tip by a first distance along the first longitudinal axis of the key blank and for laterally aligning the key blank relative to the key cutter to engage the key cutter with the shank or blade at the first distance to define a lateral reference distance relative to the first longitudinal axis;

b. a master key alignment fixture for longitudinally aligning the master key relative to a key follower at the longitudinal index position spaced apart from the key tip by the first distance along the second longitudinal axis of the master key and for laterally aligning the master key relative to the key follower to engage the key follower with the shank or blade at the first location at a distance offset from the second longitudinal axis by the lateral reference distance; and

c. a displacement mechanism for longitudinally and laterally displacing the key follower relative to the master key to trace the contour of the master key shank, shoulder and bit notch pattern while simultaneously displacing the key cutter relative to the key blank in an identical manner to reproduce the traced contour of the master key shank, shoulder and bit notch pattern on the key blank and to longitudinally reposition the key blank shoulder to coincide with the relative longitudinal location of the master key shoulder by cutting away a portion of the shank to reduce the length of the shank to thereby increase the blade length to a length greater than the original key blank blade length and equal to the master key blade length.

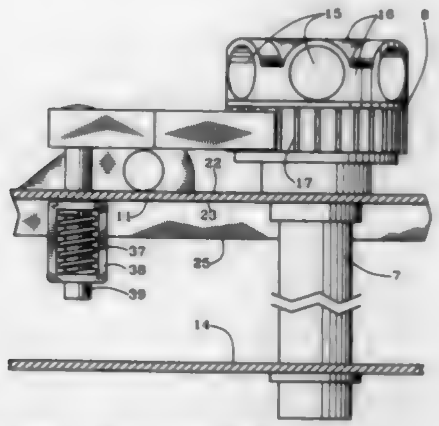
5,314,275
SAFETY TIE-DOWN ROLLER

D. Michael Cottrell, and Don J. Cottrell, both of Gainesville, Ga., assignors to Cottrell, Inc., Gainesville, Ga.

Filed Apr. 27, 1992, Ser. No. 874,395

Int. Cl.⁵ B60P *3/079*

U.S. Cl. 410—26 **15 Claims**



1. A safety tie-down roller having:

a wheel ramp channel of a generally U-shaped configuration, the wheel ramp channel further having a top surface and a proximal underwall and a distal underwall, each underwall having a proximal side and a distal side;

a tie-down rod in rotational contact with the proximal underwall and the distal underwall of the wheel ramp channel;

a pivot axle in rotational contact with the proximal underwall of the wheel ramp channel, the pivot axle having a proximal end and a distal end;

a tie-down ratchet gear attached to the tie-down rod at the proximal side of the proximal underwall, the tie-down ratchet gear being spaced a select distance from the proximal side of the proximal underwall;

a tie-down ratchet pawl attached for pivotal movement to the proximal end of the pivot axle, the proximal end of the pivot axle being located outwardly from the proximal side of the proximal underwall at a position which allows contact of the tie-down ratchet gear by the tie-down ratchet pawl;

ratchet teeth on the tie-down ratchet gear having ratchet abutment relationship to the tie-down ratchet pawl from a top of the tie-down ratchet gear; p1 a pawl spring positioned at the distal side of the proximal underwall and having resilience in a rotational direction of travel of the tie-down ratchet pawl towards the top of the tie-down ratchet gear;

the pawl spring comprising a coil spring positioned co-axially with the distal end of the pivot axle at a select distance from an outside periphery of the pivot axle at the distal side of the proximal underwall;

a means for transmitting resilient pressure from the pawl spring at the distal side of the proximal underwall to the tie-down ratchet pawl at the proximal end of the pivot axle;

the means for transmitting resilient pressure from the pawl spring to the tie-down ratchet pawl is attachment of one end of the coil spring to the pivot axle of the tie-down ratchet pawl and attachment of an opposite end of the coil spring to an appendage from the wheel ramp channel in rotational resilient relationship between the said appendage and the coil spring;

the ratchet pawl having a select width dimension and being normally positioned on the pivot axle of the tie-down ratchet pawl a select distance outwardly from the proximal side of the proximal underwall, said select distance being of an amount to position the tie-down ratchet pawl to overlie and engage the ratchet teeth of the tie-down ratchet gear; and

the select distance between the proximal side of the proximal underwall and the ratchet pawl being at least equal to the select width dimension of the ratchet pawl, means to disengage the ratchet pawl from the ratchet teeth of the tie-down ratchet gear and to place the ratchet pawl in said select distance between the proximal side of the proximal underwall and the tie-down ratchet gear to thereby permit free rotation of the tie-down ratchet gear.

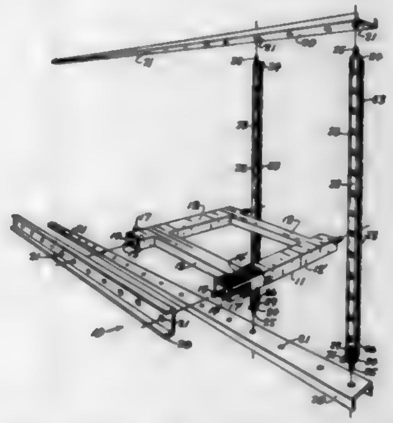
5,314,276
LADING SEPARATING AND BRACING MEANS

Joseph P. Barone, 1502 Erbs Mill Rd., Blue Bell, Pa. 19422

Continuation of Ser. No. 924,596, Jul. 24, 1992, abandoned, which is a continuation of Ser. No. 610,810, Nov. 8, 1990, abandoned. This application Jul. 23, 1993, Ser. No. 96,711

Int. Cl.⁵ B60P *7/00*

U.S. Cl. 410—139 **2 Claims**



1. In a freight carrying body having a floor disposed in a horizontal plane, two opposing vertical sidewalls, a front wall, and a ceiling parallel to the floor;

at least one pair of longitudinally extending tracks, one track of said pair mounted on the ceiling, the other track mounted on the floor, said tracks being positioned equidistant from the sidewalls and having a series of aligned spaced apart apertures along their longitudinal axes;

at least one pair of spaced apart vertical tracks mounted on one of said sidewalls and an opposing pair of spaced apart vertical tracks mounted on the other one of said sidewalls, each of said vertical tracks having a plurality of spaced apart apertures along the longitudinal length thereof in alignment with apertures in an opposing vertical track;

a pair of spaced apart, vertical posts extending between said pair of longitudinally extending tracks, said posts having spaced apart apertures along their longitudinal axes and a locking means located o each end of each post respectively engaged with aligned apertures in said track on the ceiling and said track on the floor to secure said posts to said longitudinally extending tracks, at least one locking means on each of said posts being retractable to remove said posts form their vertical positions, the position of one of said posts being located between a first pair of opposing vertical tracks, the position of the other post being located between a second pair of opposing vertical tracks, each post having apertures in alignment with apertures in an associated pair of opposing vertical tracks;

the improvement comprising a unitary support frame having a pair of substantially parallel spaced apart elongated members, spaced apart support arms extending between said members and being fixedly connected thereto, a detachable connecting means on each end of each of said members to secure said support frame to said posts and said vertical tracks on either one of said sidewalls when said unitary support frame is in a horizontal orientation, said connecting means on one end of said frame engaged with selected aperture sin a pair of said vertical tracks on either one of the sidewalls and said connecting means on the opposite end of said frame engaged with aligned apertures in said pair of vertical posts to provide an upper decking means to support articles of freight in an area extending from one of the sidewalls to the center of said body;

or alternatively, said support frame in a first vertical orientation when positioned between said posts and having said connecting means on one end of said frame engaged with selected apertures in one of said vertical posts and having said connecting means on the opposite end of said frame engaged with aligned apertures in the other one of said vertical posts to provide a bracing means to retain articles of freight against the sidewalls of said body, said support frame being used in a second vertical orientation by having the connecting means on one end of said frame engaged with selected apertures in a selected vertical track on either one of the sidewalls and having the connecting means on the opposite end of said frame engaged with aligned apertures in one of said vertical posts which has apertures in alignment with apertures in said selected vertical track so as to provide a bracing means to retain articles of freight against the front wall of said freight carrying body.

5,314,277
EXPANSIBLE PLUG HAVING AN EXPANDER BODY

Artur Fischer, Waldachtal 3/Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Mar. 2, 1993, Ser. No. 25,621

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1992, 4208016

Int. Cl.⁵ F16B *13/06*

U.S. Cl. 411—55 **8 Claims**

1. Expansible plug comprising

a plug shank;

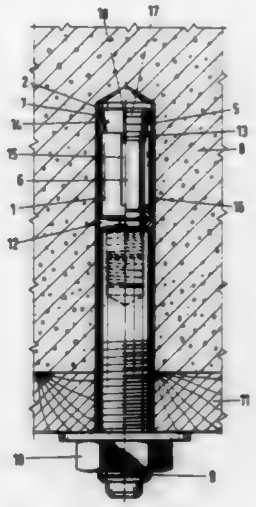
an expander body having an outer surface, arranged at one end of the plug shank and widening toward a free end of the expander plug;

an expansible sleeve having a conical inner face and positioned on the plug shank so as to be engagable with the expander body;

fixing means arranged at another end of the plug shank remote from said end of said plug shank provided with said expander body;

a sliding ring having a conical outer face and an inner surface, said sliding ring being positioned between the expander body and the expansible sleeve so that the conical inner face of the expansible sleeve fits closely against the conical outer face of the sliding ring, and

interlocking means provided on the inner surface of the sliding ring and the outer surface of the expander body for interlocking said sliding ring and said expander body when the sliding ring is engaged with the expander body so that the sliding ring does not slip off the expander body when the expansible sleeve is slid over the expander body and the sliding ring.



5,314,278
EXPANSIBLE ANCHOR

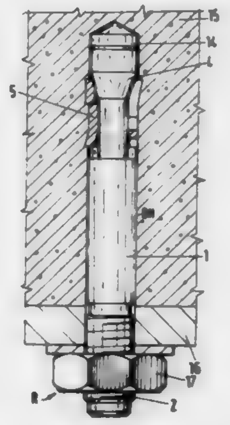
Wilfried Weber, Schopfloch-Unteriflingen, Fed. Rep. of Germany, assignor to fischerwerke, Artur Fischer GmbH & Co. KG, Tumlingen 3/Waldachtal, Fed. Rep. of Germany

Filed Jun. 4, 1993, Ser. No. 72,591

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1992, 4219984

Int. Cl.⁵ F16B *13/06*

U.S. Cl. 411—61 **12 Claims**

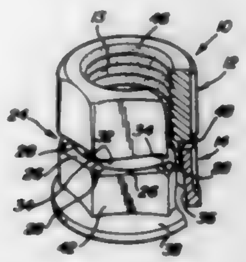


1. An expansible anchor for anchoring of an article to a component, said expansible anchor including a shank having a rear end, a front end and a portion of reduced cross-section in the vicinity of said front end, means for fixing the article at said rear end, an adjoining expander cone at said front end of said shank, and an expansible sleeve having a front end edge, a rear end edge, an outer diameter and a sleeve length, said expansible sleeve being positioned over said portion of reduced cross-section, having locking elements projecting beyond said outer diameter and being provided with a plurality of throughgoing

longitudinal slits, each of said longitudinal slits extending over at least half the sleeve length from said front end edge, having a slit width and continuing into an enlarged opening provided in the sleeve, said enlarged opening having a width greater than said slit width, said expansible sleeve also being provided with a plurality of notch-like indentations aligned with said slits and terminating at a distance from said enlarged openings to define a web so as to facilitate expansion of said expansible sleeve by said expander cone, each of said webs having a length approximately equal to a wall thickness of said expansible sleeve, said length being in a longitudinal direction of said expansible sleeve.

5,314,279
LOCKING FASTENER

Paul E. Ewing, 32005 Alameda, Farmington Hills, Mich. 48336
Continuation of Ser. No. 656,569, Feb. 15, 1991, Pat. No. 5,190,423. This application Jan. 28, 1993, Ser. No. 10,418
Int. Cl.⁵ F16B *39/00*
U.S. Cl. 411—134 **10 Claims**



1. In a locking threaded fastener of the type comprising a threaded shank with threads advancing axially of the shank in a tightening direction from an outer end to an inner end, and a nut assemblage including a first nut member having outer and inner faces and having a through-hole for a clearance fit with the threaded shank and including a second nut member having outer and inner faces and having a threaded hole for threaded engagement with the threaded shank, the second nut member being disposed nearer the outer end of the threaded shank than the first nut member whereby a workpiece surface may be disposed between the first nut member and the inner end of the threaded shank, said nut members having facing surfaces with a wedge cam formed on the facing surfaces for coupling the first and second nut members together for rotation together when the second nut member is rotated in the tightening direction and for wedging the first and second nut member axially apart in response to rotation of the second nut member relative to the shank and the first nut member in the loosening direction, the wedge cam having a wedge angle which is greater than the angle of the threads whereby such rotation causes the threads to jam and inhibit loosening of the second nut member, the improvement in said nut assemblage wherein:

said first nut member has a flat inner surface for engaging a workpiece surface with frictional resistance between said inner surface and said workpiece surface,

and said wedge cam has engaging surfaces with frictional resistance therebetween which is less than the frictional resistance between said flat inner surface and the workpiece surface.

5,314,280
SETTABLE HEIGHT ADJUSTING FASTENER

Matthew Gagliardi, Oswego, Ill., and Noah B. Mass, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jul. 6, 1993, Ser. No. 85,801
Int. Cl.⁵ F16B *37/04, 43/00;* B23P *11/02*
U.S. Cl. 411—182 **15 Claims**

1. A fastener for securing two workpieces together in a desired spatial relation, at an axial distance, within a predetermined spacing range comprising:

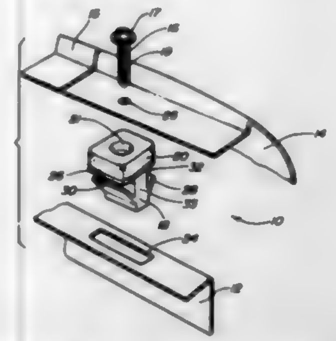
a first member;

a second member;

one said member being received within the other;

said first and second members including respective clamping surfaces and

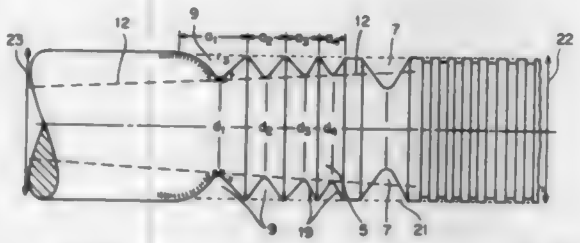
means for positioning one member within the other member to establish the distance between the respective clamping surfaces of said first and second members within a predetermined distance range; and



a heat curable member positioned adjacent said first and second members having a predetermined thickness establishing a maximum spacing within said predetermined range, whereby the first member is drawn toward the second member and the curable member is reduced in thickness until the desired spatial relation is obtained, said curable member thereafter being susceptible of being cured to thereby set the established distance between the respective clamping surfaces of said first and second members and thereby set the workpieces in the desired spatial relation.

5,314,281
TOLERANCE RIVET FOR HIGHLY STRESSED RIVETED JOINTS

Gerhard Turlach, Osterode a.H., and Walter J. Mages, Alsfeld, both of Fed. Rep. of Germany, assignors to Kamax-Werke Rudolf Kellermann GmbH & Co. KG, Osterode, Fed. Rep. of Germany
Continuation of Ser. No. 624,609, Dec. 10, 1990, abandoned. This application May 13, 1993, Ser. No. 61,821
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1990, 4034862
Int. Cl.⁵ F16B *19/00*
U.S. Cl. 411—361 **9 Claims**



1. A tolerance rivet for highly stressed riveted joints, comprising:

a rivet head and a free end located opposite to said head;

a shank with a length dependent on two members to be jointed by said rivet; and

a retaining element cooperating with a retaining collar and having at least four circular grooves,

said retaining element having a constant outer diameter slightly smaller than an outer diameter of said shank;

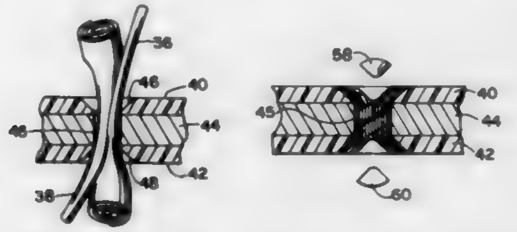
said grooves on said retaining element having root diameters on an enveloping jacket linking said root diameters of said grooves and widening frusto conically in a direction from said head toward said opposite free end;

said grooves on said retaining element having a groove profile with (a) an angle of opening decreasing continuously in said direction, (b) a groove width decreasing continuously in said direction, (c) an inclination of a supporting flank of the grooves increasing continuously in said direction and (d) an asymmetry increasing continuously in said direction;

said retaining element having a first groove adjacent said shank with a rounded shape in a strain-hardened area of the root diameter of said first groove, said strain-hardened area facilitating deformation of said retaining collar by providing a smooth surface with reduced surface friction for greater flowability of said retaining collar in filling said first groove; said rounded shape on said first groove preventing fracture of the rivet due to stress concentration caused by forces applied to said rivet at said respective riveted joint.

5,314,282
COMPOSITE FASTENER

Guy C. Murphy, Fairfield; Barrett J. Fuhrmann, Cincinnati, and Jackie D. Jones, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Continuation of Ser. No. 125,899, Nov. 27, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 342,684
Int. Cl.⁵ F16B *19/04*
U.S. Cl. 411—426 **31 Claims**



1. A fiber reinforced composite fastener member comprising:

an integral head portion and shank portion which together define a shape tapered from the head portion to the shank portion and oriented generally about a longitudinal axis;

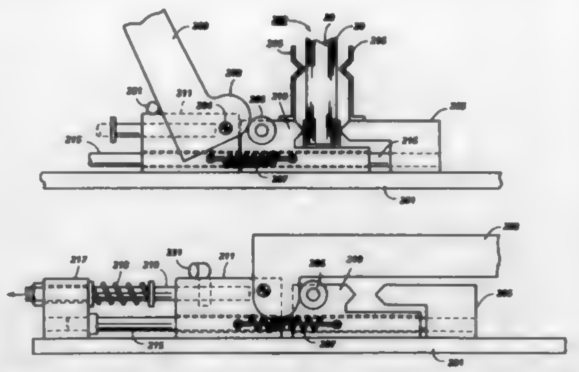
the fastener member being defined by a plurality of superimposed composite sheets having reinforcing fibers, the sheets being spirally wound about the axis.

5,314,283
APPARATUS FOR APPLYING HARD AND SOFT COVERS TO BOUND OR UNBOUND DOCUMENTS

John D. Zoltner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 486,485, Feb. 28, 1990, abandoned, which is a division of Ser. No. 369,482, Jun. 20, 1989, Pat. No. 5,061,139. This application Dec. 16, 1992, Ser. No. 995,903
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.⁵ B42B *5/06;* B42C *11/00, 11/02, 11/04*
U.S. Cl. 412—34 **11 Claims**

1. In combination: a plurality of pages; a case having front and back covers and a spine portion; a deformable U-shaped channel means for being crimped against said plurality of pages, said U-shaped channel means having a smooth inner surface throughout and attached to said spine portion; an apparatus for binding said plurality of pages to said case comprising guide means for guiding said case into said apparatus and means for crimping said case once it has been guided into said apparatus in order to thereby deform said U-shaped channel means and secure said pages to said case.

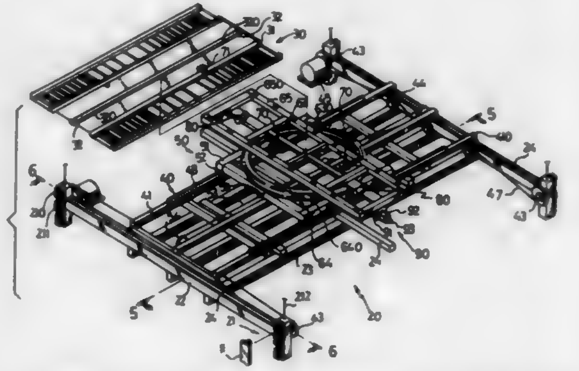
5. In combination: a case having front and back covers and a spine portion; a plurality of pages to be placed into said case; a smooth inner surfaced, U-shaped channel means for being crimped against said plurality of pages adhered to said spine portion of said case for receiving said plurality of pages; a binding apparatus comprising means for guiding the case into



said binding apparatus and beveled shaped jaws for crimping the extending sides of said U-shaped channel means to thereby secure said plurality of pages to said case.

5,314,284
PARKING TOWER WITH A CARRIER HANDLING DEVICE ON A ELEVATOR

Chi-Chung Tsai, 17-3, Alley 27, Lane 70, Sec. 2, Touchung Rd., Tantzu Hsiang, Taichung County, Taiwan
Filed Apr. 23, 1993, Ser. No. 52,954
Int. Cl.⁵ E04H *6/22*
U.S. Cl. 414—234 **6 Claims**



1. A parking tower comprising a plurality layers each having at least one parking unit provided therein, a first driving means and a plurality of first rolling means disposed in said parking unit, an elevator movable up and down to each of said layers and including a longitudinal direction and a lateral direction perpendicular with each other, a first movement means slidably supported on said elevator and movable along said lateral direction of said elevator, a second movement means slidably supported on said first movement means and movable along said longitudinal direction of said elevator, a rotating means rotatably supported on said second movement means, a frame disposed on said rotating means and rotated by said rotating means, a second driving means and a plurality of second rolling means disposed in said frame, and a carrier slidably supported on said first and second rolling means and engaged with either of said driving means, said carrier being moved along said lateral direction of said elevator by said first movement means and being moved along said longitudinal direction of said elevator by said second movement means, and said carrier being rotated by said rotating means, whereby, said carrier is caused to move between said parking units and said elevator by said first and said second driving means.

5,314,285

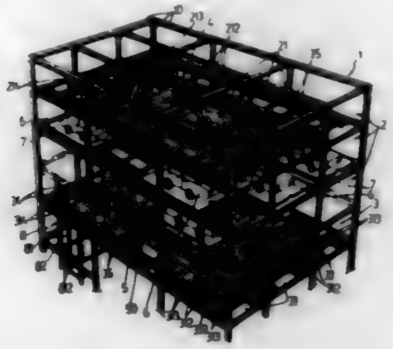
AUTOMATIC CONTROLLED MULTI-LEVEL STORAGE SYSTEM

Nelson Lai, Taipei, Taiwan, assignor to Necer International Co., Ltd., Taipei, Taiwan

Filed Jan. 13, 1993, Ser. No. 4,125

Int. Cl.^{5} F04H *6/12*

U.S. Cl. 414—236 **7 Claims**



1. An automatic controlled multi-level storage system comprising a storage structure formed of structural steel elements and having an access level and at least one storage level and an elevator space, said access level and each of said at least one storage level having each a plurality of contiguous substantially rectangular spaces, wherein:

said access level is for moving cargo elements to be stored into a specific individual space on either storage level and retrieving them from the storage structure, having a center space formed into part of said elevator space, two opposite conveying spaces transversely aligned at two opposite sides adjacent to said elevator space, which comprises each a plurality of four-way wheel assemblies arranged in longitudinal direction and controlled to move individual storage platforms and cargo elements thereon into or out of the storage system, three conveying spaces respectively and longitudinally aligned with the aforesaid two opposite conveying spaces and said elevator space at one side, said three conveying spaces each comprise a plurality of four-way wheel assemblies arranged in longitudinal and transverse directions, and three platform storage spaces at an opposite side relative to said elevator space and the conveying space, said three platform storage spaces each comprise a plurality of two-way wheel assemblies arranged in longitudinal direction and controlled to move individual storage platforms into platform storage devices therein:

said at least one storage level is for storing cargo elements, said at least one storage level having a center space formed into part of said elevator space, two opposite cargo storage spaces transversely aligned at two opposite sides adjacent to said elevator space, which comprise each a plurality of four-way wheel assemblies arranged in longitudinal direction controlled to move individual storage platforms in longitudinal direction from one cargo storage space to another, three contiguous cargo storage spaces respectively and longitudinally aligned with the aforesaid two cargo storage spaces and said elevator space at one side, said three contiguous cargo storage spaces each comprise a plurality of two-way wheel assemblies controlled to move individual storage platforms in longitudinal direction;

said elevator space is disposed through said access level and said at least one storage level vertically and having elevator means for raising and lowering individual storage platforms and cargo thereon to a desired level, said elevator means comprising two register spaces vertically spaced corresponding to the spacing of the levels of said storage structure, each register space comprising a plurality of four-way wheel assemblies arranged in longitudinal direction, and two opposite mechanical arms at two opposite ends thereof respectively supported on a respective hydraulic lift, said mechanical arms being respectively lowered by said respective hydraulic lift for permitting individual storage platforms and cargo thereon, if any, to be moved longitudinally from either register space to an adjacent space on either level of the storage structure;

said access level and said at least one storage level each comprises pairs of parallel rails longitudinally and transversely interconnected with one another in directions corresponding to said four-way and two-way wheel assemblies for guiding horizontal rollers on individual storage platforms.

5,314,286

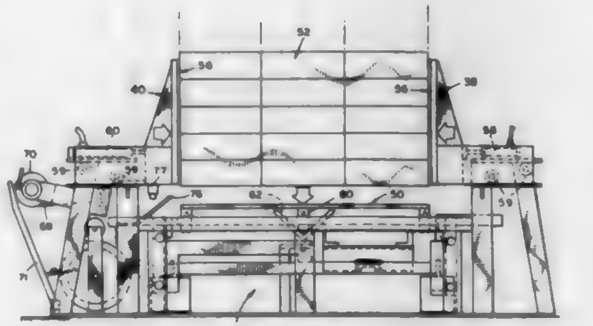
APPARATUS FOR BAGGING PRODUCT UNITS

Kevin J. Bolejack; Frederick Forgnone, and Christopher McCoy, all of Salinas, Calif., assignors to Transfresh Corporation, Salinas, Calif.

Continuation of Ser. No. 666,693, Mar. 8, 1991, abandoned, which is a division of Ser. No. 473,919, Jan. 31, 1990, Pat. No. 5,014,495. This application Jan. 8, 1993, Ser. No. 2,081

Int. Cl.^{5} B65G *65/00*

U.S. Cl. 414—416 **16 Claims**



5. An apparatus for temporarily supporting a load comprising two opposed, substantially planar vertical sidewalls comprising a plurality of ridges which are shaped so as to not substantially penetrate the load, at least one of the sidewalls being movable independently of the other to control the distance between said sidewalls, said ridges having longitudinal axes which are vertically oriented on said sidewalls, each of said sidewalls having a gripping surface wherein the outer surfaces of the ridges on said sidewalls are positioned to engage said load substantially only at predetermined, desired locations on said load that are sufficiently strong to resist damage form said sidewalls, when said sidewalls are moved into contact with said load.

5,314,287

PROCESS AND DEVICE FOR ATTACHING AN AIRCRAFT NOSE LANDING GEAR TO AN AIRCRAFT TRACTOR

Benno Wichert, Welzheim, Fed. Rep. of Germany, assignor to Schopf Maschinenbau GmbH, Ostfildern, Fed. Rep. of Germany

PCT No. PCT/EP90/00775, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO90/14266, PCT Pub. Date Nov. 29, 1990

PCT Filed May 14, 1990, Ser. No. 777,414

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917255

Int. Cl.^{5} B64F *1/22*

U.S. Cl. 414—427 **46 Claims**

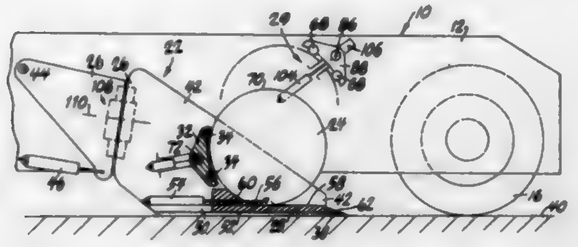
15. A tractor for towing an aircraft having a landing gear with at least one nose wheel, comprising:

a chassis including at least one recess for receiving the landing gear;

a shovel member coupled to the chassis and movable within the recess for being lowered to receive the nose wheel and raised to lift the nose wheel and tow the aircraft;

first means for immovably coupling the tractor to the landing gear wherein the first means includes a device coupled to the shovel member for rotatably supporting the nose wheel; and

second means for sliding the shovel member relative to the chassis and underneath the nose wheel to support the nose wheel on the shovel member and in turn raise the shovel member and the nose wheel to tow the aircraft.



5,314,288

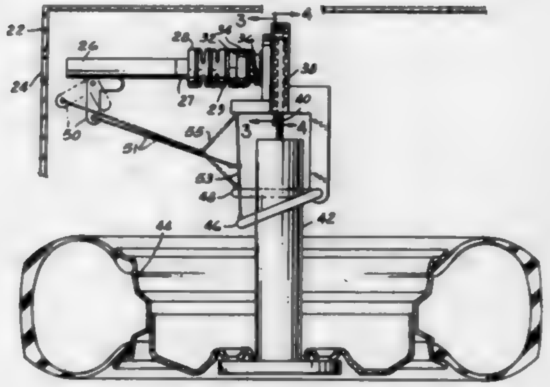
WHEEL-LIFT MECHANISM

Horst Schmidt, Windsor, Canada, assignor to Build-A-Mold Limited, Windsor, Canada

Filed Jun. 10, 1991, Ser. No. 713,427

Int. Cl.^{5} B62D *43/04*

U.S. Cl. 414—463 **6 Claims**



1. A wheel-lift mechanism comprising:

a first shaft connected to a first end of a coupling, said coupling having a second end connected to a second shaft, said coupling being operable to transmit rotation from said first shaft to said second shaft even when said first and second shafts occupy non-parallel orientations relative to each other, said second shaft being connected to a reel for raising and lowering a flexible lift member, said flexible lift member being operably connected to a wheel hub to raise and lower said wheel hub; and

a tee is received in said wheel hub, one end of said flexible lift member extends through said tee, a locking member is positioned over said tee, said locking member preventing said tee from moving downwardly to lower said wheel hub when said locking member is in the locked position, said locking member being movable to a release position in which the locking member allows said tee to move vertically.

5,314,289

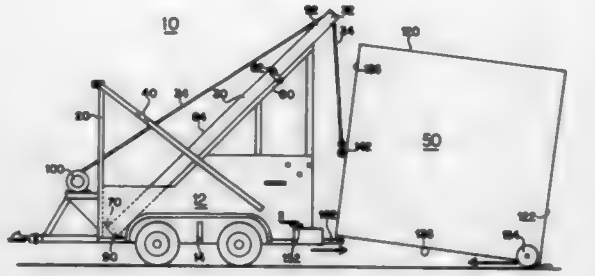
VEHICLE CRANE UNIT

Robert M. O'Leary, 1419 N. 13th St., Boise, Id. 83702

Filed Dec. 14, 1992, Ser. No. 990,279

Int. Cl.^{5} B60P *1/48*

U.S. Cl. 414—494 **13 Claims**



13. A vehicle crane unit comprising:

a vehicle comprising a horizontal base, having a front edge and an opposing back edge, and a vertical frame attached to and upstanding from the horizontal base,

a cable and a winch for lifting and pulling an object,

a boom for directing the lifting and pulling force supplied by the cable and winch, the boom comprising:

an arm having a pivot end and an opposing cantilevered end, a pulley wheel, and a transverse bar extending perpendicularly for the cantilevered end of the said arm of the boom for holding the pulley wheel a horizontal distance from the cantilevered end of the arm, the said pulley wheel configured for detachably receiving a cable adapted at one end to attach to the object to be lifted and pulled and at the other end to be taken in and let out by the winch,

the pivot end of the arm being pivotally attached to the vehicle near the horizontal base for allowing the boom to swing in a vertical plane toward and away from the front and back edges of the horizontal base,

a container,

for being lifted, tipped, and pulled on to and off of the vehicle by changing the position of the boom and by taking in and letting out the cable,

the container defined by an enclosure wall having an interior surface, and exterior surface, and an opening for insertion and removal of objects into and out of the container,

the container adapted for placement between the vehicle horizontal base and the transverse bar of the boom, the container having a bottom for resting on and cooperating with the horizontal base, a top side for facing up toward the transverse bar and the top side having an uppermost extremity, a front end for facing toward the front edge of the horizontal base, a back end for facing toward and resting near the back edge of the horizontal base, a first side for facing but not intersecting the vertical plane in which swings the arm of the boom, an opposing second side, and a bottom back corner where the bottom and back end join, and the container having fastening means attached to the front end for connecting the container to the cable,

a block means attached to the vertical frame for contacting and stopping the boom in a lowered position, with the boom swung toward the back edge of the horizontal base, to block the boom from swinging to an angle that places the transverse bar in contact with the top side of the container and to block the boom from swinging to an angle that places the transverse bar below a height equivalent to the height of the uppermost extremity of the top side for preventing the boom from obstructing the movement of the container as it is pulled onto and off of the vehicle, and

a lock attached to the block means and extending to detachably connect to the boom when the boom is in the lowered position, for restraining the boom from swinging up from the lowered position,

and wherein:

when the boom is in the said lowered position, the boom extends through the vertical plane in which lies the back edge of the horizontal base and the transverse bar and pulley wheel lie in a vertical plane that is parallel, close to, and beyond the vertical plane of the back edge, for allowing the cable to pull the front end of the container to lie in a vertical plane with the transverse bar and pulley wheel without binding on the back edge.

5,314,290

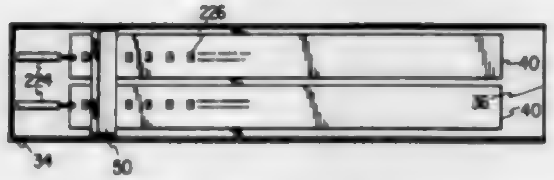
CARGO CARRYING VEHICLE HAVING A MOVABLE BULKHEAD LOCATED THEREIN

David E. Lutz, P.O. Box 810, and David W. Lutz, P.O. Box 4444, both of Carlisle, Pa. 17013

Filed Oct. 4, 1991, Ser. No. 771,185

Int. Cl.^{5} B60P *1/00*

U.S. Cl. 414—509 **7 Claims**



1. A cargo carrying vehicle comprising:

(a) a body having an interior, an internal floor, a left internal sidewall, a right internal sidewall, a front end, and a rear end;

(b) two or more movable support surfaces mounted on said internal floor for movement relative thereto, each one of said two or more movable support surfaces having a front end and a rear end;

(c) first means for moving each one of said two or more movable support surfaces back and forth between a first position and second position spaced longitudinally from said first position toward said rear end of said body, said first means comprising:

  i) a first fluidic jack that is mounted at or near said front end of said body and that is connected to the front end of one of said movable support surfaces, and

  ii) a second fluidic jack that is mounted at or near said front end of said body and that is connected to the front end of the other of said movable support surfaces;

(d) a movable bulkhead mounted in said interior above said two or more movable support surfaces for movement relative to said internal floor; and

(e) second means for moving said movable bulkhead back and forth between a first position and a second position spaced longitudinally from said first position toward said rear end of said body.

5,314,291

LOAD BALANCER

Hirotaka Ohashi, and Toru Yasunobe, both of Tokyo, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

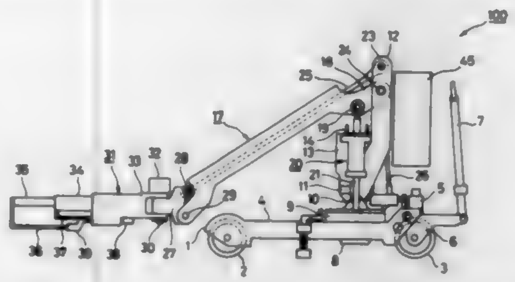
Filed Sep. 10, 1992, Ser. No. 942,885

Claims priority, application Japan, Sep. 24, 1991, 3-243425; Nov. 20, 1991, 3-304752

Int. Cl.^{5} B66F *9/06*

U.S. Cl. 414—719 **3 Claims**

1. A load balancer comprising an undercarriage (1), a turntable (9) capable of turning around a vertical shaft owing to a swing bearing (8) provided on a chassis frame (4) of said undercarriage (1), a horizontal pin (10) provided on said turntable (9), a weight sensing cylinder (11) connected pivotally to an intermediate portion of said horizontal pin (10) and extending substantially upward, a balance cylinder (13) provided with a piston (41) fitted in said weight sensing cylinder (11), a balance frame (14) fixed to the upper end of said balance cylinder (13) with a piston rod (16) of a balance piston (15) of said balance cylinder (13) passed therethrough, air brake cylinders (22) fixed to said balance frame (14) and positioned at the same distance on opposite sides of said balance cylinder (13), a pin (19) connected at an intermediate portion thereof to said piston rod (16) via a shaft, connected at the portions thereof which are on both sides of and equally spaced from said piston rod-connected portion to a lower arm (18) of a rhomboidal link (17) via shafts and connected both end portions thereof via bearings to brake rods (21) passed through said air brake cylinders (22), swing arms (12) supported upright on said turntable (9) and connected to one end portion of each of an upper and said lower arms (25, 18) of said rhomboidal link (17), a support frame (27) connected at the portions thereof which are spaced at a distance equal to that between pivot pins (23, 24), via which said swing arms (12) and said upper and lower arms (25, 18) are connected together, to the other end portions of said upper and lower arms (25, 18), and an article support member (31) fitted around a vertical pin (30) fixed to said support frame (27).



5,314,292

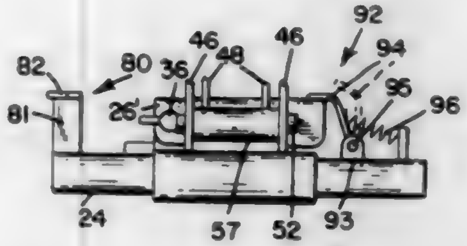
MATERIAL CLAMPING APPARATUS

Vaino J. Holopainen, P.O. Box 806, Center Harbor, N.H. 03226

Filed Sep. 29, 1992, Ser. No. 953,486

Int. Cl.^{5} B66C *23/54*

U.S. Cl. 414—724 **2 Claims**



1. Material clamping apparatus for use on a pivoted tractor bucket which has an upper edge and a lower edge, said apparatus comprising:

(a) a mounting bracket which is fixed to the upper edge of the bucket,

(b) a connecting bracket which is mounted on said mounting bracket for pivoting movement about a horizontal axis which is transverse to said upper edge between a horizontal active position to a vertical inactive position,

(c) an elongated clamp arm which is mounted on said connecting bracket for pivoting movement within a vertical plane between an upper non-clamping position to a lower clamping position relative to the lower edge of said bucket when said connecting bracket is in its active position, said elongated arm extending above and parallel to said upper edge when said connecting bracket is in its inactive position and said clamping arm is in said upper non-clamping position relative to said connecting bracket,

(d) hydraulic actuating means for selectively moving said clamping arm to either said upper non-clamping position or said lower clamping position,

(e) first retaining means for selectively maintaining said connecting bracket in said active position, said first retaining means having a first portion which is fixed to said mounting bracket and a second portion which is movable relative to said first portion for selectively engaging said connecting bracket and for selectively locking said connecting bracket relative to said first portion, the second portion of first retaining means comprising a locking bracket which is pivotally connected to said mounting bracket for pivoting movement between a locking position and an unlocking position, said locking bracket having a retaining finger which is fixed to said locking bracket and which engages said connecting bracket when said locking bracket is in its locking position for preventing said connecting bracket from pivoting about its horizontal pivoting axis, and

(f) second retaining means for selectively maintaining said connecting bracket in said inactive position, said second retaining means being fixed to said mounting bracket and spaced from said first retaining means.

5,314,293

DIRECT DRIVE ROBOTIC SYSTEM

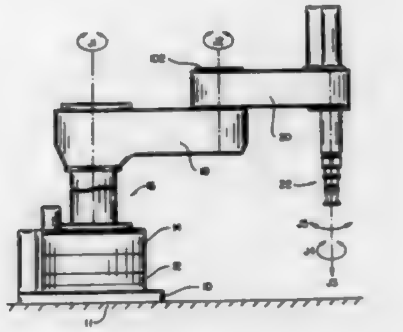
Brian R. Carlisle, Palo Alto; Carl R. Witham, Dublin; Donald R. Allan, Menlo Park, and John W. Meadows, Los Altos Hills, all of Calif., assignors to Adept Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 930,214, Nov. 12, 1986, abandoned, which is a continuation of Ser. No. 694,585, Jan. 24, 1985, Pat. No. 4,702,668. This application Sep. 8, 1992, Ser. No. 941,859

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.^{5} B25J *17/00*

U.S. Cl. 414—744.5 **41 Claims**



1. An articulated direct drive robotic manipulator providing rotation about first and second parallel axes comprising first and second motors rotating about a common axis which is in common with the first axis of rotation of the manipulator, the first motor including a rotor directly coupled to a driver member rotating about said first of rotation, the manipulator including a first arm mounted to said driver member for movement in a plane perpendicular to the first axis about a joint centered at said first axis, the end of said first arm distal from the first axis including a joint rotatable about said second axis, said second motor including a rotor rotating about the first axis and coupled to said second axis joint to rotate said joint.

5,314,294

SEMICONDUCTOR SUBSTRATE TRANSPORT ARM FOR SEMICONDUCTOR SUBSTRATE PROCESSING APPARATUS

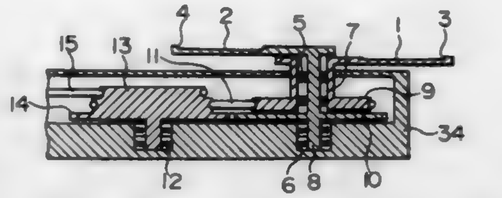
Takao Taniguchi, and Hiroshi Sato, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1992, Ser. No. 881,061

Claims priority, application Japan, Jul. 31, 1991, 3-191511

Int. Cl.^{5} B25J *18/04*

U.S. Cl. 414—744.6 **4 Claims**



1. A transport arm for carrying semiconductor substrates into and out of a semiconductor substrate processing chamber comprising:

an extendable arm including serially interconnected proximal, intermediate, and distal links, each of said links having a leading end and a trailing end, said proximal link being connected at its trailing end to a rotatable drive shaft for extending and retracting said extendable arm in response to rotation of said drive shaft, said intermediate link being rotatably connected at its trailing end to the leading end of said proximal link and being rotatably connected at its leading end to the trailing end of said distal link, said distal link being rotatably connected at its trailing end to the leading end of said intermediate link;

a first arm and a first rotatable shaft, said first arm being mounted on said first rotatable shaft and thereby rotatably connected to the leading end of said distal link and having a first substrate holder, said first arm being rotatable between a first position where said first substrate holder is located on a first side of the leading end of said distal link and a second position where said first substrate holder is located on a second side, opposite the first side, of the leading end of said distal link;

a second arm and a second rotatable shaft coaxial with said first rotatable shaft, said second arm being mounted on said second rotatable shaft and thereby rotatably connected to the leading end of said distal link, said second arm having a second substrate holder, said second arm being rotatable between the first position where said second substrate holder is located on the second side of the leading end of said distal link and the second position where said second substrate holder is located on the first side of the leading end of said distal link; and

arm driving means for simultaneously turning said first and second rotatable shafts in opposite directions, thereby turning said first and second arms in opposite directions between the first and second positions.

5,314,295

ROLL STOP AND OPERATING METHOD OF THE SAME

Jorma Lukkari, Järvenpää, and Matti Kärnä, Hyvinkää both of Finland, assignors to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed Feb. 8, 1993, Ser. No. 14,782

Claims priority, application Finland, Feb. 7, 1992, 920517

Int. Cl.^{5} B66F *11/00*

U.S. Cl. 414—746.4 **9 Claims**

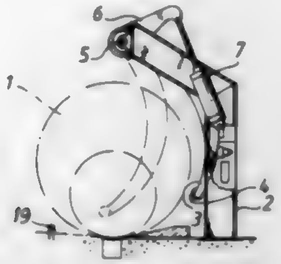
1. A pneumatically operated roll stop of controllable speed for stopping a roll, said roll stop comprising:

a frame having a pivotal joint;

a stop arm having a first end and a distal end, said first end being operatively connected to said pivotal joint, said distal end provided for making contact with said roll to be stopped;

a pneumatic cylinder comprising a cylinder unit having first and second end defining a cavity therein and a piston axially aligned in said cylinder separating first and second working chambers and a piston rod operatively connected to said piston axially extending outward from said cavity at said first end of said cylinder unit, wherein one of said rod and said second end is operatively engaged with said frame and the other of said rod and said second end is operatively engaged to said stop arm;

a control valve;



first passage means for pneumatically connecting said first working chamber to said control valve;

second passage means for pneumatically connecting said second working chamber to said control valve;

a pulsed valve pneumatically connected to said first passage means; and

control means for opening and closing said control valve and for modulating the opening and closing of said pulsed valve for pneumatically controlling said first and second working chambers for regulating the movement of said stop arm to stop the roll.

5,314,296

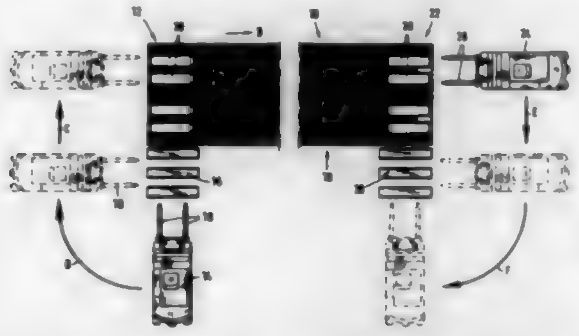
METHOD FOR FEEDING A TWO-WAY PALLET ONTO A ROLLER PATH

Hans vom Stein, Wermelskirchen, Fed. Rep. of Germany, assignor to Interroll Holding AG, Switzerland

Division of Ser. No. 675,323, Mar. 26, 1991, Pat. No. 5,257,895. This application Dec. 2, 1992, Ser. No. 984,353

Int. Cl.⁵ B65G *63/00*

U.S. Cl. 414—786 8 Claims



1. A method of using at least one forklift device for feeding a two-way pallet relative to an elongate roller path, said forklift device having a pair of spaced apart forks for selectively lifting the pallet, said pallet having a top, a plurality of parallel spaced apart continuous scantlings connected to the top and a bottom connected to the scantlings, such that a plurality of fork-receiving spaces are defined between the top, the bottom and the respective scantlings, said elongate roller path having an initial region for feeding the pallet to the elongate roller path, the initial region of the roller path having a pair of recesses extending parallel to the elongate roller path, said recesses being dimensioned and disposed for receiving the forks of one said forklift device therein, said method comprising the steps of:

providing at least one interim parking station disposed in proximity to the initial region of the elongate roller path, the interim parking station having a parking surface with a pair of spaced apart elongate recesses disposed and dimensioned for receiving the forks of the forklift device;

inserting the forks of one said forklift device into the fork-receiving spaces of said pallet;

lifting said pallet with said forklift device;

placing the bottom of the pallet on the parking surface of the interim parking station such that the fork-receiving spaces of the pallet are transverse to the elongate recesses of the interim parking station;

inserting the forks of one said forklift device into the elongate recesses of the interim parking station and beneath the bottom of the pallet;

lifting the forks of said forklift device sufficiently for engaging the bottom of the pallet and lifting the pallet from the interim parking station;

moving said forklift device and the pallet thereon to the initial region of the elongate roller path;

moving the forks of said forklift device into the recesses of said initial region of the elongate roller path such that said bottom of said pallet is engaged on the elongate roller path; and

separating said forklift device from said pallet for permitting said pallet to traverse said elongate roller path.

5,314,297

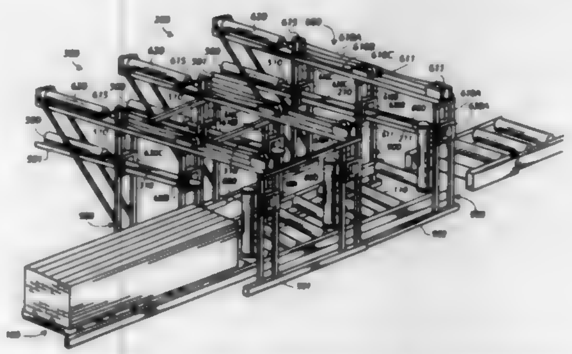
METHOD AND APPARATUS FOR STACK SEPARATOR AND RESTACKER

Oma L. Herndon, Box 117, Hatcheechubbee, Ala. 36858; Ruis Russell, Rte. 3, Box 1, Greenville, Ala. 36037, and John D. Hite, Jr., 609 Dale Ave., Bradfordwoods, Pa. 15015

Filed Dec. 2, 1991, Ser. No. 801,394

Int. Cl.⁵ B65H *3/50*

U.S. Cl. 414—796.5 12 Claims



1. An apparatus for lateral separation, lift and reformation of stacks of board lumber or stacks containing multi-member layers of other rigid elongated objects, said apparatus comprising:

an adjustable frame comprising:
  a splitter assembly frame, and
  a support assembly frame which is slidably mounted to said splitter assembly frame;

a partially motorized conveyor means for advancing a stack of lumber or other rigid elongated objects toward and into said adjustable frame;

an alignment means for aligning, holding and stabilizing said stack of lumber or other elongated objects prior to and during the separation and lifting of one or more layers of said stack;

a tapered splitter means operably mounted to said splitter assembly frame for facilitation of the initial lateral separation and vertical lifting of one end of one or more layers of said stack;

a support means, operably mounted to said support assembly frame and spaceably and adjustably positioned away from said splitter assembly frame, for assisting in the lifting and lateral support of one or more layers of said stack after said splitter means has separated and partially lifted one end of said separated layer or layers of said stack;

a pressurized fluid control means for coordination and control of said conveyor means, said alignment means, said splitter means, and said support means; and,

an engine means for providing pressurized fluid through said control means to said conveyor means, said alignment means, said splitter means, and said support means.

5,314,298

AUTOMATIC LEAD FRAME FEEDING DEVICE FOR A TO-220 SEMICONDUCTOR MANUFACTURING APPARATUS

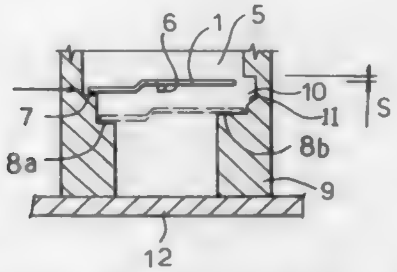
Youl Kim, Daeku, Rep. of Korea, assignor to Gold Star Electron Co., Ltd., Chungcheongbuk, Rep. of Korea

Filed May 22, 1992, Ser. No. 886,830

Claims priority, application Rep. of Korea, May 23, 1991, 8377

Int. Cl.⁵ B65G *59/06*

U.S. Cl. 414—797.9 6 Claims



1. An automatic lead frame feeding device for a TO-220 semiconductor manufacturing apparatus in which the lead frame includes four sides, two of said sides being parallel and the remaining two of said sides forming a perimeter with the two parallel sides, the feeding device comprising:

a loading section including a pair of guide members vertically disposed in horizontally spaced opposite relation to each other to stack up lead frames therebetween, each guide member having a lower end;

a transferring section disposed at one side of said loading section for transverse movement to drop one by one the stacked lead frames in said loading section in sequence beginning with the lowermost lead frame;

a feeding section positioned to feed the dropped lead frame in said loading section to a subsequent process;

wherein said loading section further comprises
  a lug provided at each of the lower end of the guide members, each lug support supporting a respective one of said parallel sides of the lead frame;
  a support rail extending parallel to a first one of said remaining sides of the lead frame between and transverse to said guide members to support said first remaining side;
  two spaced transfer rails extending parallel to said support rail at a level lower than said support rail to receive the lead frame being dropped by said transferring section; and
  a retreating groove provided adjacent a second one of said remaining sides on the opposite side of said second remaining side from said first remaining side, said retreating groove being spaced horizontally from said support rail and positioned between said support rail and said transfer rail in a vertical direction; and

wherein a lowermost one of a stack of lead frames is initially supported by the lugs on each of its parallel sides and by the support rail on the first of its remaining sides and subsequently translated in a horizontal direction toward the retreating groove by the feeding section such that the lead frame falls from the lugs and the support rail, the second remaining side of the lead frame is temporarily received by the retreating groove, and the lead frame subsequently falls onto the transfer rails.

5,314,299

SPEED GOVERNOR FOR A PNEUMATIC POWER TOOL

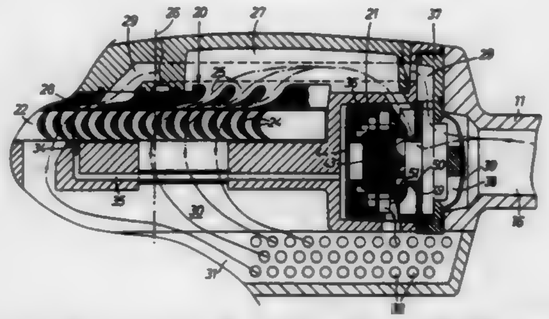
Rolf A. Jacobsson, Saltsjö-Boo, Sweden, assignor to Atlas Copco Tools AB, Nacka, Sweden

Filed Jun. 8, 1993, Ser. No. 73,768

Claims priority, application Sweden, Jun. 16, 1992, 9201844-9

Int. Cl.⁵ F01D *7/02*

U.S. Cl. 415—30 5 Claims



1. In a speed governor for a pneumatic power tool including a housing (**10**) with a pressure air inlet passage (**16**), a rotating output spindle, an air turbine (**20**) including a turbine wheel (**22**) drivingly coupled to said output spindle and one or more air nozzles (**25**) in said housing (**10**) for directing motive pressure air onto said turbine wheel (**22**), said speed governor comprising a valve element (**43**) arranged to control the pressure air flow through said inlet passage (**16**) and a valve element (**43**) activating piston means (**44**) exposed to a speed responsive control pressure,

the improvement comprising:

a separate idle running nozzle (**28**),

an idle flow supply passage (**29**) extending from said air inlet passage (**16**) to said idle running nozzle (**28**),

a control pressure passage (**35**), and

a pressure sensing opening (**34**) located substantially opposite said idle running nozzle (**28**) downstream of said turbine wheel (**22**),

said control pressure passage (**35**) connecting said pressure sensing opening (**34**) with said piston means (**44**) so as to make said piston means (**44**) activate said valve element (**43**) in response to said turbine speed responsive control pressure prevailing in said pressure sensing opening (**34**).

5,314,300

NOISE CONTROL DEVICE FOR CENTRIFUGAL BLOWER

William S. Gatley, Jr., and Bobby D. Garrison, both of Cassville, Mo., assignors to Fasco Industries, Inc., Cassville, Mo.

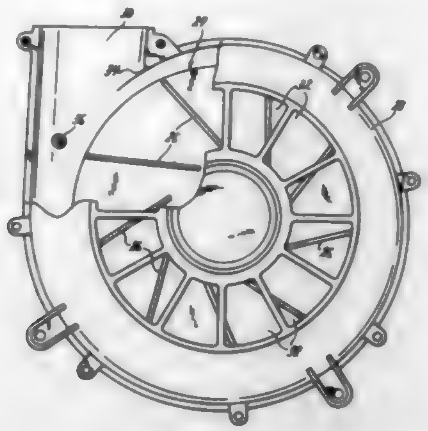
Filed Jan. 13, 1992, Ser. No. 820,096

Int. Cl.⁵ F04D *29/66*

U.S. Cl. 415—119 1 Claim

1. A centrifugal blower having means for blowing air from an inlet to an outlet, said blowing means including a rotatably mounted impeller having a plurality of blades, said inlet being disposed axially of said impeller and said outlet being disposed tangentially of said impeller, said blower including a first stationary structure aligned with said impeller such that as said impeller is rotated said blades sweep past said first stationary structure to create a first noise, said first stationary structure being disposed in said outlet and formed in part by a wall of said outlet, a second stationary structure fixed in said outlet and aligned with said impeller, said second stationary structure

comprising a rod fixed at both ends to outlet wall portions, said rod between said ends being adjacent an outlet wall portion opposite from said first stationary structure and having means for creating a second noise combining with said first noise to substantially reduce the intensity of said first noise, said rod being closer to said outlet wall portion opposite from said first stationary structure than to said first stationary structure.



5,314,301
VARIABLE CAMBER STATOR VANE

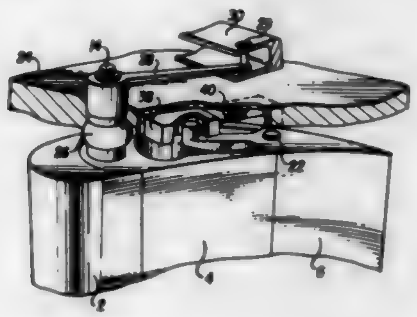
Mark J. Knight, Bridgnorth, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 12, 1993, Ser. No. 17,185

Claims priority, application United Kingdom, Feb. 13, 1992, 9203168

Int. Cl.⁵ F01D *9/02*

U.S. Cl. 415—160 **12 Claims**



1. A variable camber stator vane for a gas turbine engine comprising:

a plurality of vane sections including a leading edge section, at least one mid-chord section and a trailing edge section,

said sections being sequentially mounted such that the plurality of vane sections are articulated together for pivotal movement,

one of the plurality of vane sections being a first driven vane section and having a shaft extending radially through an engine casing to receive an actuating input,

a coupling mechanism coupling the first driven vane section with at lease one of the remaining vane sections for coordinated movement in a predetermined relationship,

an input lever mounted on the shaft for actuating the coupling mechanism to alter the relative disposition of the vane sections whereby to change the camber of the vane, wherein

the leading edge vane section is fixed relative to the engine casing, and the first driven vane section comprises the mid-chord section pivotally mounted to a trailing edge of the leading edge section,

the trailing edge vane section is pivotally mounted to a trailing edge of the mid-chord section,

the coupling mechanism determines the angular disposition of the trailing edge vane section relative to the mid-chord section in accordance with the angular displacement of the mid-chord section relative to the leading edge vane section,

the coupling mechanism progressively increases the displacement of the trailing edge vane section relative to the mid-chord section as the mid-chord section displacement increases relative to the leading edged vane section, and

the coupling mechanism comprises a guide slot in the engine casing, a guide block engaged with the guide slot, and a spigot carried by the trailing edge vane section, which engages the guide block.

5,314,302
CENTRIFUGAL PUMP FOR SUPPLYING HOT LIQUID FROM A CONTAINER

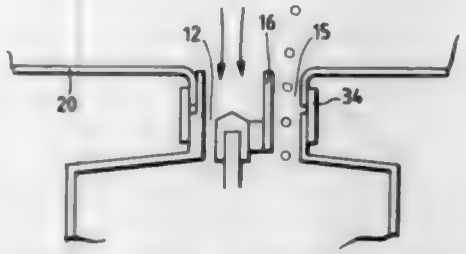
Goro Kakizawa, Tokyo, and Tadashi Fukami, Kanagawa, both of Japan, assignors to Ohken Seiko Co., Ltd., Inagi, Japan

Filed Feb. 18, 1993, Ser. No. 19,260

Claims priority, application Japan, Feb. 18, 1992, 4-061035; Apr. 27, 1992, 4-131447

Int. Cl.⁵ F04D *29/70*

U.S. Cl. 415—169.1 **8 Claims**



1. A centrifugal pump for supplying a hot liquid from a container comprising:

a pump chamber,

an impeller rotatably located in said pump chamber,

a cylindrical outer wall,

a guide port defined at least in part by said outer wall and connecting said pump chamber and said container,

an arched dividing wall concentric with an axis of rotation of the impeller and defining, at least in part, a suction port connecting said pump chamber and said container, and

a discharge port formed in said pump chamber,

both said suction port and said guide port terminating at an open end thereof in said container, said open ends being adjacent one another and said suction port and said guide port being substantially coextensive,

whereby hot liquid is drawn from said container through said suction port and is discharged through said discharge port by rotation of said impeller, and bubbles generated in said pump chamber pass from said pump chamber through said guide port into said container.

5,314,303
DEVICE FOR CHECKING THE CLEARANCES OF A GAS TURBINE COMPRESSOR CASING

Jean-Louis Charbonnel, Le Mee sur Seine; Jacky Naudet, Bondoufle, and Gérard J. Stangalini, Fontainebleau, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA" , Paris, France

Filed Jan. 4, 1993, Ser. No. 298

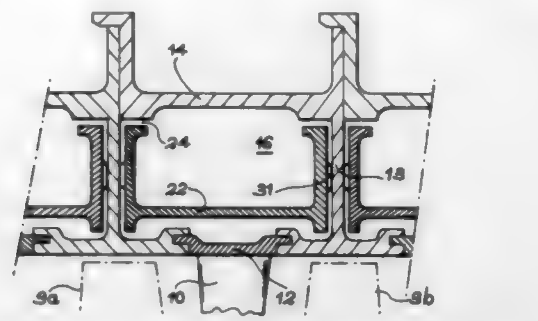
Claims priority, application France, Jan. 8, 1992, 92 00103

Int. Cl.⁵ F01D *5/20*

U.S. Cl. 415—173.1 **9 Claims**

1. Gas turbine compressor casing having a structure forming a casing, which comprises:

a locking member having a thermal inertia higher than that of said structure and mounted in said structure so as to limit contraction of the casing during a temperature drop wherein said structure forming the casing has an inner envelope and an outer envelope forming at least one closed cavity.



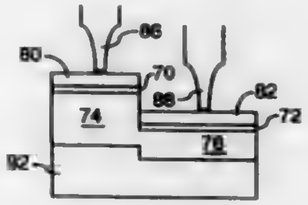
5,314,304
ABRADEABLE LABYRINTH STATOR SEAL

David J. Wiebe, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 15, 1991, Ser. No. 745,630

Int. Cl.⁵ F01D *11/08*

U.S. Cl. 415—173.4 **14 Claims**



1. In a gas turbine, having a labyrinth seal between a rotor and stator therein, in which the stator is surmounted by a honeycomb structure and the rotor has at least one knife edge which is mounted to rotate in close proximity with said honeycomb structure, the improvement comprising, a layer of flowably applied abradeable coating for the rotor knife edge to rub in, for reduced wear to said knife edge said coating being mounted on a support layer, which layer, in turn, is mounted atop said honeycomb structure.

5,314,305
COMPRESSED AIR VIBRATOR WITH TURBINE DRIVE

Willy Fink, Schaffhausen, Switzerland, assignor to Findeva AG, Oerlingen, Switzerland

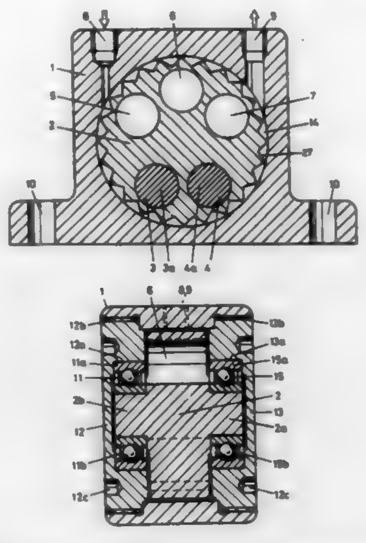
Filed Mar. 12, 1993, Ser. No. 30,613

Claims priority, application Switzerland, Mar. 17, 1992, 840/92

Int. Cl.⁵ B06B *1/16, 1/18*

U.S. Cl. 415—202 **11 Claims**

1. A compressed air, turbine drive, vibrator comprised of an outer housing having an internal cylindrical chamber terminating at two open ends, each open end being closed by a cover removably secured to said outer housing, said housing further including an inlet opening for admitting compressed air to internal chamber and an outlet opening for allowing the exit of air from the internal chamber, an unbalanced cylindrical rotor provided with a support shaft extending axially outwardly from opposite sides of the rotor, each support shaft being rotatably mounted within a ball bearing assembly, each said cover including an interior bore for receiving therein an outer race of one of said ball bearing assemblies in a manner that permits relative rotation between said outer race and said cover during rotation of the rotor.



5,314,306
FRAME FOR PUMP-MOTOR ASSEMBLIES

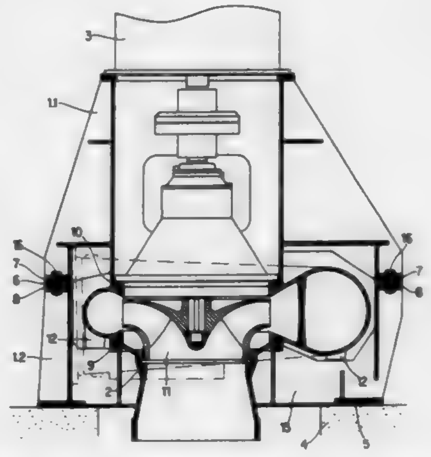
Günter Beiss, Bremen, and Horst Schäfer, Rhade, both of Fed. Rep. of Germany, assignors to KSB Aktiengesellschaft, Frankenthal/Pfalz, Fed. Rep. of Germany

Filed Mar. 30, 1993, Ser. No. 40,169

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1992, 4211033

Int. Cl.⁵ F01D *25/28*

U.S. Cl. 415—213.1 **11 Claims**



1. A pump-motor assembly comprising a centrifugal pump including a casing; a motor connected with said pump and a frame surrounding at least a portion of said casing and including a first section mounting said motor and a second section mounted on a support, said sections having neighboring outer portions at approximately the height of said casing and said second section carrying said casing, said first section being borne by said casing and said sections being at least slightly resilient and being affixed to each other.

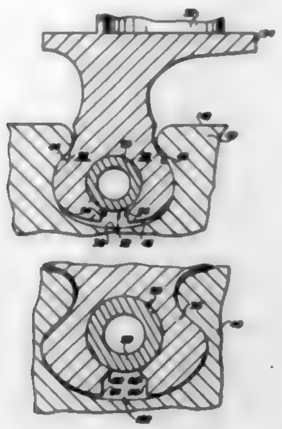
5,314,307
GAS TURBINE TEST AIRFOIL

James L. Farmer, Tempe, Ariz., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Dec. 18, 1992, Ser. No. 993,151

Int. Cl.^{5} F01D *5/30*

U.S. Cl. 416—2 **11 Claims**



1. A gas turbine engine airfoil designed for failure, comprising:

an aerodynamic blade adapted to be placed in momentum exchange relationship with a fluid stream;

a platform from which said blade extends radially outwardly;

a dovetail shaped root extending radially inwardly from said platform and adapted to be received in a generally complementally shaped groove at the outer periphery of a rotary wheel, said dovetail root having radially outwardly facing, axially extending, load carrying faces, and a radially innermost, axially extending bottom face, said dovetail further having an internal bore extending through its axial length and a radial slot between said bore and said bottom face; and

a tubular insert within said internal bore, said insert being of a material having strength characteristics such that said insert fails under preselected conditions to cause release of the airfoil from the rotary wheel.

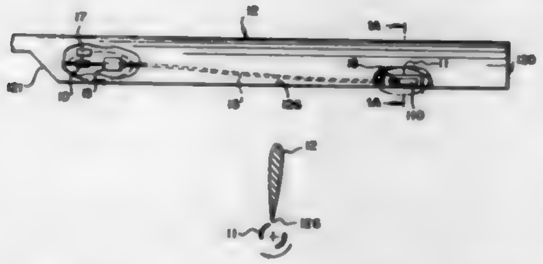
5,314,308
SYSTEM FOR CONTROLLING HIGHER HARMONIC VIBRATIONS IN HELICOPTER ROTOR BLADES

Wilmer H. Reed, III, Hampton, Va., assignor to Dynamic Engineering, Inc., Newport News, Va.

Filed Dec. 11, 1992, Ser. No. 989,583

Int. Cl.^{5} B64C *27/46*

U.S. Cl. 416—91 **16 Claims**



1. A device for reducing vibrations caused by higher harmonic frequencies generated in a helicopter rotor blade during flight, comprising:

a rotatable cylinder means, mounted on the blade, for imparting counteracting higher harmonic frequencies to the blade so as to control the vibrations, said rotatable cylinder means having slotted means for allowing air to pass therethrough;

wherein said rotatable cylinder means having the slotted means provides a harmonically varying force with controllable magnitude and phase.

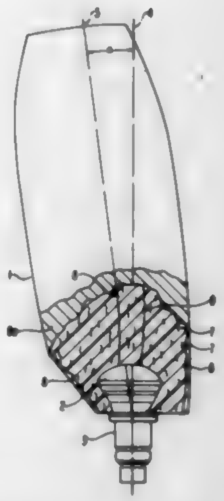
5,314,309
TURBINE BLADE WITH METALLIC ATTACHMENT AND METHOD OF MAKING THE SAME

Anthony Blakeley, 4116 Florida Dr., Rockford, Ill. 61108; Gregory E. Horihan, 3358 Tannenbaum La., Rockford, Ill. 61109; Timothy S. Konicek, 138 Flintridge, Apt. 5, Rockford, Ill. 61107; Patrick J. O'Callaghan, 4825 Sovereigh Blvd., Rockford, Ill. 61108; Martin W. Carrington, 5061 Linden Rd., Apt. 5101, Rockford, Ill. 61109, and Jeffrey A. Brown, 2224 Colorado Ave., Rockford, Ill. 61108

Continuation of Ser. No. 528,479, May 25, 1990, abandoned. This application Dec. 10, 1991, Ser. No. 804,391

Int. Cl.^{5} F01D *5/14;* **B32B** *17/04*

U.S. Cl. 416—226 **36 Claims**



1. A turbine blade comprising an elongated, molded blade of composite material consisting essentially of short fibers positioned in an epoxy resin, and a rotor retention member having an insert at a first end of said member and a hub securing end at a second opposite end of said member, said insert being integrally molded into said composite material of said molded blade at one end of said blade with said hub securing end of said member protruding from said one end of the blade for connecting the turbine blade to a hub of a turbine rotor, wherein short fibers of said composite material are aligned in parallel to each other in a longitudinal direction of said elongated blade as a result of flow of the composite material in said direction occurring during a molding of the molded blade, so as to rigidify the elongated turbine blade.

14. A turbine blade according to claim 1, wherein the insert is angled relative to the longitudinal axis of the hub securing end of the rotor retention member such that the insert extends along a central line of the molded blade of composite material.

5,314,310
SPIDER MOUNTED CENTRIFUGAL MIXING IMPELLER

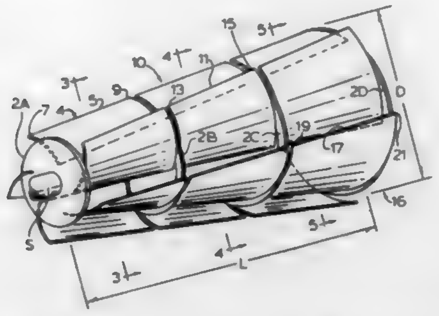
Carl R. Bachellier, 10 Watsons Lane, Dundas, Ontario, Canada L9H 1T3

Continuation-in-part of Ser. No. 46,713, May 7, 1986, abandoned. This application Sep. 1, 1988, Ser. No. 239,350

The portion of the term of this patent subsequent to Aug. 17, 2007, has been disclaimed.

Int. Cl.^{5} B01F *7/24*

U.S. Cl. 416—201 A **3 Claims**



1. A mixing impeller comprising a plurality of blades circumferentially mounted around a frame with adjacent blades being open from one another, each of said blades having a forward intake end and a rearward discharge end and being tapered such that said forward intake end is enlarged relative to said rearward discharge end and said blades being turned along the length thereof from said forward intake end to said rearward discharge end to cause an outward flow of fluid along said blades, said frame also being rearwardly tapered such that fluid taken in at the forward intake end of said blades is discharged outwardly away from said frame at said rearward discharge end of said blades.

5,314,311
THRUST GENERATOR

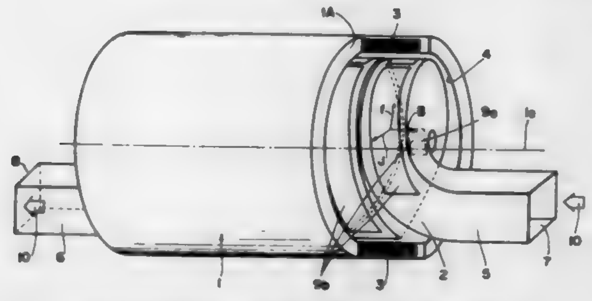
Eiichi Tada, Izumi, Japan, assignor to Kontsu Gas Kogyo Co., Ltd.; Masaaki Muroya, both of Ohsaka and Masao Hiroi, Shiga, all of Japan, part interest to each

PCT No. PCT/JP89/01153, § 371 Date Sep. 10, 1991, § 102(e) Date Sep. 10, 1991, PCT Pub. No. WO91/07806, PCT Pub. Date May 30, 1991

PCT Filed Nov. 10, 1989, Ser. No. 752,552

Int. Cl.^{5} H02K *44/08*

U.S. Cl. 417—50 **3 Claims**



1. An electromagnetic thrust generator, comprising:

a housing having a circular cylindrical interior surface defining an interior space extending through said housing, said space having a longitudinal center axis;

a superconducting electrical coil arrangement disposed within said housing for generating a magnetic field within said space,

a helical duct arranged coaxially within said space, said duct formed by:

a circular cylindrical outer wall arranged opposite said interior surface of said housing,

a circular cylindrical inner wall spaced radially inwardly of said outer wall, and

intermediate walls interconnecting said outer and inner walls to form therewith a helical passage of substantially rectangular cross section and having a fluid inlet and a fluid outlet spaced longitudinally apart,

a first electrode member mounted in said duct on an interior face of said inner wall; and

a second electrode member mounted in said duct on an interior face of said outer wall and being of opposite polarity than said first electrode for creating an electrical field across said duct.

5,314,312
FLUID-ROTATING APPARATUS

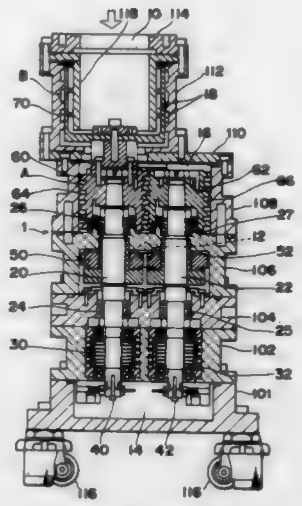
Yoshihiro Ikemoto, Katano, and Teruo Maruyama, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 29, 1993, Ser. No. 11,314

Claims priority, application Japan, Jan. 31, 1992, 4-016042; Jan. 31, 1992, 4-016043; Mar. 31, 1992, 4-076451

Int. Cl.^{5} F04B *49/06*

U.S. Cl. 417—16 **6 Claims**



1. A fluid-rotating apparatus comprising, a plurality of rotors accommodated in a housing; first and second rotary shafts installed on the rotors, respectively; a plurality of motors, each for driving one of the rotary shafts independently; a rotation-detecting means for detecting one of a rotational angle of each motor and a number of rotations thereof; a suction opening and a discharge opening forming in the housing; and a positive displacement pump structure section formed by the housing and the rotors;

characterized in that the first rotary shaft functions as a driving side rotary shaft; the second rotary shaft functions as a driven side rotary shaft; and a rotation controlling means is provided for controlling rotation of the second rotary shaft based on information detected by the rotation-detecting means provided on the first rotary shaft, to thereby synchronously rotate the first rotary shaft and the second rotary shaft;

wherein a PLL control circuit is provided for rotating the driven side rotary shaft synchronously with the driving side rotary shaft under PLL control operation; and

wherein a gain-switching means is provided for setting a high gain in the PLL control circuit when the driving side rotary shaft is accelerating or decelerating, and setting a low gain therein when the driving side rotary shaft is rotating in a steady state.

5,314,313

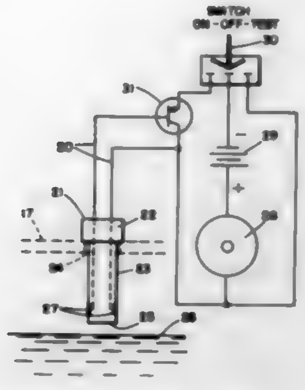
WATER-SENSING ALARM FOR WATER-CONTROL SYSTEMS

Lawrence Janesky, 1 Clayton St., Milford, Conn. 06460

Filed Jun. 23, 1993, Ser. No. 81,525

Int. Cl.⁵ G08B *21/00*

U.S. Cl. 417—63 **3 Claims**



1. In a water control system for admitting exterior ground water into a subterranean room, channeling it into a sump pump reservoir having a cover and containing a water level-actuated sump pump, and automatically pumping the water therefrom whenever the water level rises to the pump-activation level, the improvement which comprises an alarm which is activated whenever the water level in the sump pump reservoir rises above the pump-actuation level, said alarm comprising an open electrical circuit including a power source, an audible warning means and an elongate, removable probe member comprising an elongate housing having an upper stop member and a lower contact end containing exposed spaced contacts which, when immersed in water, close said circuit to activate said audible warning means, said probe member housing extending through an opening in said reservoir cover and being supported by engagement between said probe stop member and the upper surface of said cover, the contact end of said probe member being contained within the sump pump reservoir, supported at a predetermined alarm activation level, above said sump pump actuation-level, to provide an audible warning whenever the water level rises to said alarm-activation level.

5,314,314

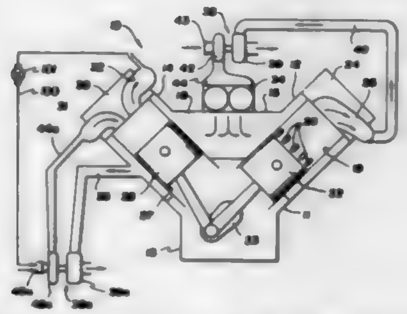
TWO-CYCLE ENGINE COMPRESSOR

Stanley J. Hinkle, Milford, Mich., assignor to Detroit Diesel Corporation, Detroit, Mich.

Filed Jun. 21, 1993, Ser. No. 80,381

Int. Cl.⁵ F04B *17/00*

U.S. Cl. 417—364 **2 Claims**



1. A positive displacement multiple cylinder turbocharged engine compressor comprising:

a frame defining an air chamber;

a scavenging and charging air pump operative to provide pressurized charging and scavenging air to said air chamber;

a turbocharger connected to the air pump to supply, when operative, more highly pressurized air to the air chamber;

at least one power cylinder assembly including a power cylinder and a power piston reciprocable therein between top and bottom dead center positions on a two-stroke power cycle, said power cylinder having exhaust means at one end adjacent to the power piston top dead center position and air admission ports communicating said air chamber with the power cylinder interior, said ports being located for control by movement of the power piston to be open for admission of pressurized charging and scavenging air to the power cylinder only when the power piston is near its bottom dead center position, said exhaust means being connected with the turbocharger for driving the same when adequate exhaust energy is present;

at least one compressor cylinder assembly including a compressor cylinder and a compressor piston connected to be reciprocally driven by the power cylinder assembly between top and bottom dead center positions on a two-stroke compressor cycle, said compressor cylinder having admission and exhaust openings only at one adjacent to the top dead center position of the compressor piston;

a second turbocharger, said second turbocharger being connected to the admission opening of said compressor cylinder to supply air to the compressor cylinder at a pressure greater than that prevailing in the air chamber, said second turbocharger being driven by pressurized air in the air chamber;

whereby common air pump and turbocharger means supplying the air chamber provide pressurized air for scavenging and charging the power cylinder and for driving said second turbocharger and thereby providing highly pressurized precompressed charger to the compressor cylinder to increase compressor volumetric efficiency.

5,314,315

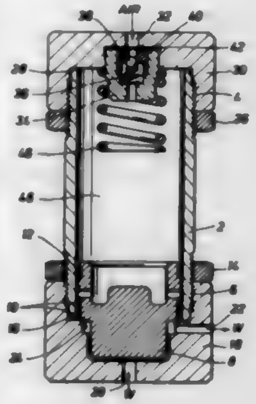
HYDRAULIC PUMP OUTPUT PRESSURE COMPENSATION SYSTEM

Stoil M. Tcholakov, 1913 W. Lamar, Houston, Tex. 77019

Filed May 21, 1992, Ser. No. 888,354

Int. Cl.⁵ E04B *11/00*

U.S. Cl. 417—540 **5 Claims**



1. For use with a high pressure piston driven hydraulic pump having a known working pressure, a hydraulic pressure output compensation system comprised of:

a sealed compensator body, the compensator body further having a high pressure water inlet and check valve means, a high pressure water outlet and a high pressure air inlet;

means for connecting said compensator body to the pump output;

means for connecting said high pressure air inlet to a compressed air source;

a single free-floating piston in said compensator body, said free-floating being sealingly disposed between said high pressure air inlet and said high pressure water inlet and outlet;

means for biasing said free-floating piston toward said high pressure water inlet and said water outlet for overcoming said water pressure within said compensator body when the hydraulic pump working pressure decreases, thereby maintaining hydraulic pressure output from said compensator body.

5,314,316

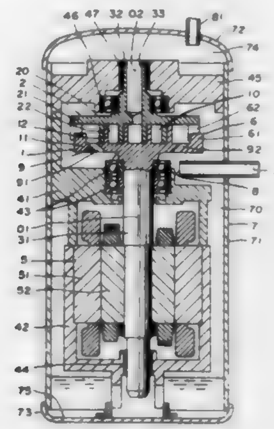
SCROLL APPARATUS WITH REDUCED INLET PRESSURE DROP

Yoshitaka Shibamoto; Hiroyuki Taniwa; Hiromichi Ueno; Shigeki Hagiwara, all of Osaka, Japan; Ronald J. Forni, Lexington, and John E. McCullough, Carlisle, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass. and Daikin Industries, Ltd., Osaka, Japan

Filed Oct. 22, 1992, Ser. No. 965,150

Int. Cl.⁵ F01C *1/02*

U.S. Cl. 418—55.1 **8 Claims**



1. A scroll type fluid machine, comprising:

(a) a first rotary shaft;

(b) a second rotary shaft having a second rotation axis eccentric to a first rotation axis of said first rotary shaft;

(c) a first scroll which is provided with a first base and a first spiral member erected on a front surface of said first base and which is rotatable around said first rotation axis;

(d) a second scroll which is provided with a second base and a second spiral member erected on a front scroll surface of said second base and which is rotatable around said second rotation axis;

(e) means for moving one said scroll with respect to the other scroll;

(f) a body housing having an internal space for housing therein said first scroll and said second scroll;

(g) a suction port open into said internal space in said body casing for allowing fluid into said space, said space being in fluid communication with a compression volume formed between said first spiral member and said second spiral member; and

(h) said first scroll being provided with a suction bore perforating through said first base from a rear surface thereof to the front surface, open at an outer peripheral portion of said front surface, allowing fluid communication between said internal space of said body casing and a suction side of said compression volume.

5,314,317

METHOD OF WORKING SCROLL MEMBER OF SCROLL COMPRESSOR

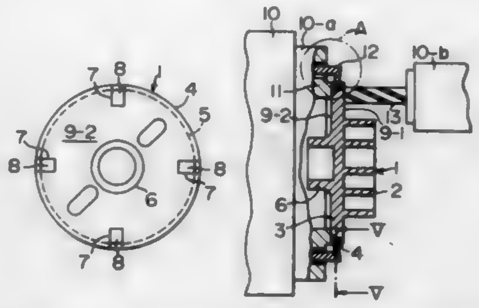
Nobuo Abe; Tatsuo Horie, both of Tochigi; Toshio Yamanaka, Yokohama, and Atsui Simada, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1993, Ser. No. 77,105

Claims priority, application Japan, Jun. 19, 1992, 4-160526

Int. Cl.⁵ F01C *1/02*

U.S. Cl. 418—55.2 **7 Claims**



1. A method of working a semi-finished scroll member for a scroll compressor, said semi-finished scroll member comprising a substantially circular end plate having an axis, a first axial end face and a second axial end face with a spiral wrap extending therefrom, said method comprising the steps of:

working an outer peripheral surface of said end plate to provide jaw finger engaging surfaces spaced from said first and second axial end faces of said end plate axially thereof;

forming radially directed cuts in the outer periphery of said end plate such that each cut extends between and is open in one of the jaw finger engaging surfaces and in said first end face of said end plate;

thereafter, positioning said semi-finished scroll member relative to a machine tool having a main shaft, jaw fingers and a back-up member such that said first axial end face of said end plate is placed adjacent said back-up member of said machine tool;

then, moving said jaw fingers of said machine tool into engagement with said jaw finger engaging surfaces of said semi-finished scroll member, respectively; and

moving said jaw fingers axially of said main shaft of said machine tool toward said back-up member until said first axial end face of said end plate is urged against said back-up Plate, whereby said semi-finished scroll member is firmly fixed to said machine tool and ready for machining of said second axial end face of said end Plate and of said spiral wrap thereon.

5,314,318

HORIZONTAL MULTI-CYLINDER ROTARY COMPRESSOR

Hiroaki Hata; Kazuhisa Ichimoto; Kazunori Morita, and Junichi Fukayama, all of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1993, Ser. No. 16,884

Claims priority, application Japan, Feb. 18, 1992, 4-029871

Int. Cl.⁵ F01C *1/02*

U.S. Cl. 418—60 **14 Claims**

1. A horizontal multi-cylinder rotary compressor, comprising:

a compressor mechanism unit for compressing refrigerant and being within a sealed container;

an electric motor unit for driving the compressor mechanism unit and being within the sealed container;

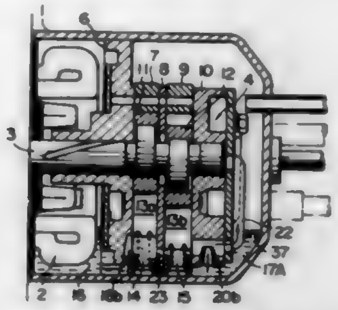
a lubricating oil reservoir at a bottom portion of the sealed container for each of said compressor mechanism unit and said electric motor unit, said reservoirs being separate from each other;

said compressor mechanism unit having a plurality of cylinders and a rotating shaft of the compressor mechanism unit supported generally horizontally by a bearing portion including a main bearing and sub-bearing;

a first vane chamber formed in a sealed manner with respect to the reservoirs behind a first vane that reciprocates by following a roller which is eccentrically rotated within a first cylinder as said rotating shaft rotates;

a second vane chamber formed in a sealed manner with respect to the reservoirs behind a second vane which similarly reciprocates within a second cylinder;

a first communication passage provided in said first vane chamber and communicating lubricating oil directly with the lubricating oil reservoir of the electric motor unit at the bottom portion of the said sealed container;



said second vane chamber being provided with an oil supply passage for supplying the lubricating oil to said bearing portion of the compressor mechanism unit, a hole for communication lubricating oil directly with the first vane chamber, and a second communication passage communication lubricating oil with the lubricating oil reservoir of the compressor mechanism unit at the bottom portion of the sealed container; and

said first vane chamber being sealed except for said hole and said first communication passage.

5,314,319

HYDRAULIC PUMP FOR A VEHICLE ENGINE

Per-Inge Nilsson, Vagnhärad, and Per-Anders Bülow, Södertälje, both of Sweden, assignors to Saab Automobile Aktiebolag, Sweden

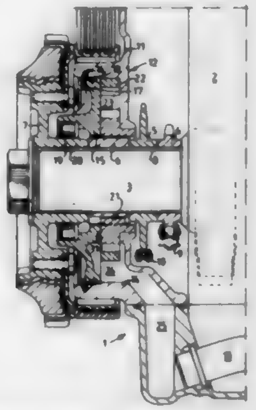
PCT No. PCT/SE92/00131, § 371 Date Oct. 30, 1992, § 102(e) Date Oct. 30, 1992, PCT Pub. No. WO92/15773, PCT Pub. Date Sep. 17, 1992

PCT Filed Mar. 3, 1992, Ser. No. 946,294

Claims priority, application Sweden, Mar. 5, 1991, 9100635

Int. Cl.^{5} F01C *1/10*

U.S. Cl. 418—170 **20 Claims**



1. A hydraulic pump for a vehicle engine, comprising:

an engine crankshaft which defines a first rotation center;

a pinion for being driven by the crankshaft to rotate around the first rotation center;

a ring gear around the pinion and having a second rotation center which is displaced radially from the first rotation center, the ring gear having an interior including one side engaging the pinion for rotating the ring gear and having another side which is spaced away from the pinion; and

a housing enclosing the pinion and the ring gear, the housing comprising:

an end cover fastened to the vehicle engine, wherein the end cover is a transmission cover, and containing at least one transmission driven by the engine crankshaft;

a collar extending away from the end cover;

an end cap inside and supported by and centered by the collar and spaced away from the end cover; and

urging means extending between the collar and the end cap for urging the end cap toward the end cover for closing the cavity within the housing, the end cap closing the housing, whereby the ring gear and the pinion are enclosed in the housing.

5,314,320

SCREW VACUUM PUMP WITH A REDUCED STARTING LOAD

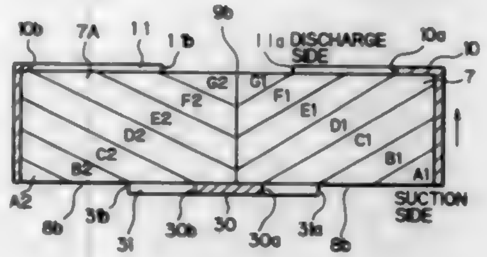
Noburu Shimizu, and Kiyoshi Yanagisawa, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jul. 1, 1992, Ser. No. 907,033

Claims priority, application Japan, Jul. 10, 1991, 3-195943

Int. Cl.^{5} F01C *1/16, 1/24*

U.S. Cl. 418—201.1 **5 Claims**



1. A screw vacuum pump, which comprises:

a male and female rotor rotating in mesh with each other around two parallel axes, respectively,

a casing for accommodating said rotors, said casing having a suction port and a discharge port, said casing and said rotors having a groove space formed therebetween

wherein a rotor rotation angle at which said suction port closes said groove space formed by said casing and said rotors is set at an angle at which the volume of said groove space has not yet reached a maximum, and wherein said discharge port is formed so that V_1/V_2 is about 1, where V_1 is a groove volume defined by said casing and said rotors immediately after a gas has been trapped, and V_2 is a groove volume immediately before the gas is discharged.

5,314,321

SCREW-TYPE ROTARY FLUID MACHINE INCLUDING ROTORS HAVING TREATED SURFACES

Akihiko Yamamoto; Toshihiro Yamada, both of Ibaraki; Tatsuo Natori, Kashiwa; Kotaro Naya, Shimizu; Motohiro Satoo; Mitsuru Fujiwara, both of Ibaraki; Katsumi Matsubara, Ushiku; Kazuaki Shinoki, Shimizu, and Hirotaka Kameya, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

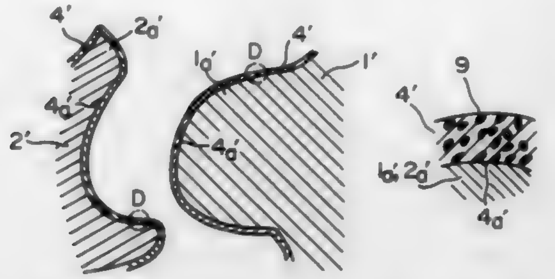
Division of Ser. No. 680,071, Apr. 3, 1991, Pat. No. 5,223,052.

This application Oct. 28, 1992, Ser. No. 967,841

Claims priority, application Japan, Apr. 6, 1990, 2-090093

Int. Cl.^{5} F01C *1/16, 21/08*

U.S. Cl. 418—178 **4 Claims**



1. A dry screw-type rotary fluid machine comprising at least one male rotor and at least one female rotor which rotate within a casing, said male and female rotors being surface-treated to have treated surface structures and being arranged to rotate in contact with each other, wherein said treated surface structure is formed by applying, to the surface of each rotor, a non-electrolytic Ni plating material, and heat-treating the rotor surface carrying said non-electrolytic Ni plating layer, thereby producing fine crystal grain structure in the non-electrolytic Ni plating layer while allowing diffusion of constituents of both the main body of the rotor and the plating layer at the boundary layer between the rotor surface and said non-electrolytic Ni plating layer.

5,314,322

APPARATUS FOR SUPPLYING A UNIFORM STRIP OF BREAD DOUGH

Michio Morikawa, and Koichi Hirabayashi, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

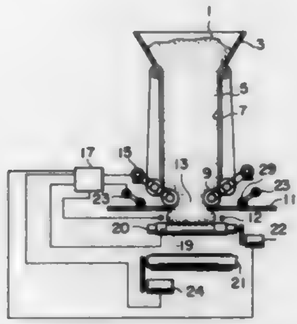
Division of Ser. No. 976,154, Nov. 13, 1992, Pat. No. 5,266,341.

This application Jun. 25, 1993, Ser. No. 82,622

Claims priority, application Japan, Dec. 5, 1991, 3-348864

Int. Cl.^{5} A21C *9/08*

U.S. Cl. 425—142 **2 Claims**



1. An apparatus for supplying a uniform strip of bread dough comprising:

a) a dough hopper having an outlet at its bottom,

b) a dough-cutting device located at the outlet of said hopper for dividing a dough mass into dough pieces,

c) an outlet conveyor located under said dough-cutting device for conveying said dough pieces, said outlet conveyor having a weighing table for weighing each said dough piece, and

d) a supply conveyor located under said outlet conveyor, on which said dough pieces are stretched to make a uniform strip of bread dough, characterized by:

e) a dough-detecting device located adjacent to said outlet conveyor for detecting a predetermined degree of the spread of said dough mass in the direction perpendicular to the conveying direction of said supply conveyor to thereby generate a cutting signal for said dough-cutting device.

5,314,323

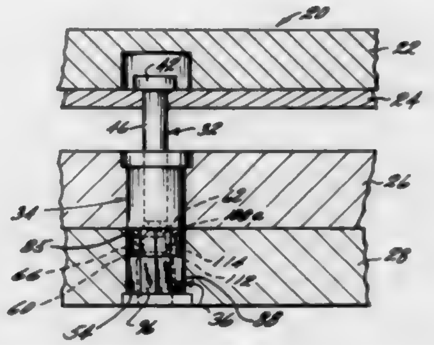
STRIPPER PLATE LOCKING DEVICE

Gene Bolles, South Windsor, Conn., assignor to Precision Plastic Tool Co., Inc., South Windsor, Conn.

Filed Sep. 9, 1992, Ser. No. 944,892

Int. Cl.^{5} B29C *33/20, 45/64*

U.S. Cl. 425—186 **25 Claims**



13. A stripper plate locking device for use with a molding machine having a fixed platen and a moving platen, the device comprising:

a first mold plate having an opening therein;

a second mold plate attached to said first plate, said second plate having an opening therethrough, said second plate closing off said opening in said first plate except at said opening in said second plate, at least one of said first and second plates being secured to one of the platens of the molding machine;

a third mold plate having an opening;

a fourth mold plate having an opening therethrough, said third mold plate disposed between said fourth and second mold plates, said fourth mold plate secured to the other one of the platens of the molding machine;

a pin having a shaft with a boss disposed at one end thereof and releasing means disposed at the other end thereof, said boss being slidably retained in said opening in said first mold plate by said second mold plate, said shaft extending through said opening in said second mold plate;

wherein said release means comprises,

(1) a shaft portion having a diameter sufficient for cooperating with said expanding means to expand said fingers to an amount sufficient for releasing said first and second coupling means, and

(2) first and second camming surfaces having said shaft portion therebetween, said first camming surface disposed at one end of said shaft, said first camming surface to facilitate release of said first and second coupling means during the opening of the molding machine, said second camming surface to facilitate release of said first and second coupling means during the closing of the molding machine;

a body having first coupling means disposed at one end thereof, said body having an opening extending therethrough, said shaft of said pin extending through said opening in said body, said body having means for retaining said body in said opening of said third mold plate;

a collet having a plurality of expandable fingers defining an opening, said collet having expanding means disposed at the interior of said opening defined by said fingers, said fingers being expanded by said releasing means cooperating with said expanding means of said collet, said fingers having second coupling means for engaging said first coupling means of said body, wherein said first and second coupling means are released by expanding said fingers, said collet having means for retaining said collet in said opening of said fourth plate;

wherein said expanding means comprises,

(1) an inwardly extending surface disposed on each of said fingers at the interior of said opening defined by said fingers, said inwardly extending surfaces defining a diameter sufficient for cooperating with said shaft portion to expand said fingers to the amount sufficient for releasing said first and second coupling means, and

(2) third and fourth camming surfaces disposed on each of said fingers, said third and fourth camming surfaces having said inwardly extending surfaces therebetween, said third camming surfaces cooperating with said first camming surface to facilitate the release of said first and second coupling means during the opening of the molding machine, said fourth camming surfaces cooperating with said second camming surface to facilitate the release of said first and second coupling means during the closing of the molding machine;

wherein said first coupling means comprises,

(1) a cylindrical portion having said opening of said body therethrough, said cylindrical portion having a diameter sufficient for being received by said second coupling means when said fingers are expanded and for being retained by said second coupling means when said fingers are in a nonexpanded position, and

(2) fifth and sixth camming surfaces having said cylindrical portion therebetween, said fifth camming surface disposed at one end of said body, said fifth camming surface to assist in releasing said cylindrical portion from said second coupling means during the opening of the molding machine, said sixth camming surface to assist in releasing said cylindrical portion from said second coupling means during the closing of the molding machine; and

wherein said second coupling means comprises,

(1) an inwardly extending surface disposed on each of said fingers at the interior of said opening defined by said fingers, said inwardly extending surfaces defining a diameter sufficient for allowing said cylindrical portion to pass through said inwardly extending surfaces when said fingers are expanded and for retaining said cylindrical portion when said fingers are in the nonexpanded position, and

(2) seventh and eighth camming surfaces disposed on each of said fingers, said seventh and eighth camming surfaces having said inwardly extending surfaces therebetween, said seventh camming surfaces cooperating with said fifth camming surface to assist in allowing said cylindrical portion to pass through said inwardly extending surfaces during the opening of the molding machine, said eighth camming surfaces cooperating with said sixth camming surface to assist in allowing said cylindrical portion to pass through said inwardly extending surfaces during the closing of the molding machine.

5,314,324

APPARATUS FOR FORMING A PARTIBLE PORT IN A PRODUCTION PIECE

Michael L. Wendt, 1382 E. Hull Rd., Hope, Mich. 48628

Continuation-in-part of Ser. No. 621,226, Nov. 30, 1990, Pat. No. 5,151,233. This application Sep. 29, 1992, Ser. No. 954,887

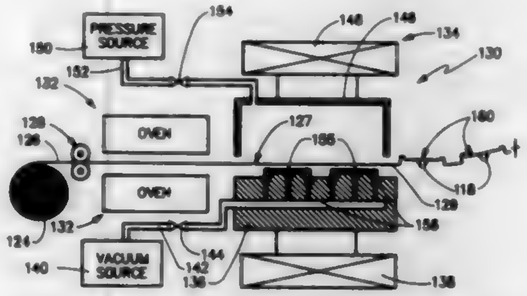
Int. Cl.^{5} B29C *51/10, 51/32*

U.S. Cl. 425—299 **12 Claims**

1. Apparatus operative to thermoform a breakaway port section in a molded piece wherein said molded piece has a first thickness, said breakaway port section maintaining the integrity of the piece against passage of fluids yet which is partible under mechanical pressure thereby to form a port for the passage of an implement therethrough and which forms a relative seal at an interface between said implement and said port section to reduce leakage of fluids at the interface when said breakaway port section is parted by said implement, comprising:

oven means for heating said piece to a preselected elevated temperature so that said piece is in a plastic state;

a mold assembly associated with said oven means, said mold assembly having a mold element providing a mold shape for the piece to be formed, said mold element including a mold surface with a female cavity formed therein, said female cavity having a cavity surface and a plurality of grooves formed in the cavity surface; and



a pressure box assembly including pressuring means for creating pressure, said pressure box assembly and said mold assembly being relatively movable with respect to one another between a mold open position and a mold closed position creating a mold chamber, said pressurizing means selectively pressuring the mold chamber to cause said piece to take the shape of the mold element and to form the resilient breakaway port section in the configuration of said female cavity.

5,314,325

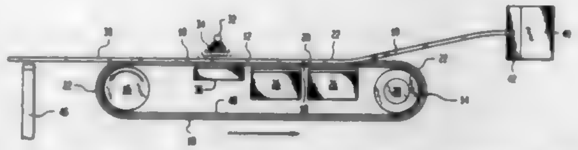
APPARATUS FOR CONTINUOUS VACUUM FORMING OF A HOT PLASTICIZED MATERIAL ON A MOVING FLAT FORMING SURFACE

Kenneth Bosler, 82 Mulberry Dr., Holland, Pa. 18966

Filed Mar. 3, 1993, Ser. No. 25,519

Int. Cl.^{5} B29C *59/00*

U.S. Cl. 425—384 **19 Claims**



1. An apparatus for continuous vacuum forming of hot plasticized material onto a moving flat forming surface comprising:

a) a housing means;

b) a first roller member movably mounted on said housing means to be rotatable with respect thereto;

c) a second roller member movably mounted on said housing means to be rotatable with respect thereto, said second roller member being spatially disposed from said first roller means to be horizontally spaced therefrom;

d) a vacuum support belt means extending about said first roller member and said second roller member to be moveable therewith, said vacuum support belt means being of a woven flexible material to facilitate air flow therethrough and flexible resiliency thereof, said vacuum support belt means including impregnated sections defined thereon being impregnated with a gas impermeable material to prevent air flow therethrough, said impregnated sections extending along said vacuum support belt means to define a plurality of vacuum sections therebetween to facilitate air flow therethrough;

e) a flexibility resilient belt means extending about said vacuum support belt means to be movable therewith;

f) a flat forming station defined on said housing means adjacent said flexibly resilient belt means and adjacent said vacuum support belt means at a location between said first roller member and said second roller member, said flat forming station being stationary with respect to said flexibly resilient belt means and said vacuum support belt means;

g) a pattern form means positioned upon said flexibly resilient belt means and also being flexibly resilient and movable therewith, said pattern form means being seamless and continuously movable through said flat forming station adjacent said vacuum support belt means to receive the hot plasticized material thereon for vacuum forming thereagainst, said pattern form means defining a plurality of vacuum aperture means therein to facilitate vacuum forming of hot plasticized material thereagainst, said vacuum apertures in said pattern form means being in fluid flow communication with respect to said vacuum sections defined in said vacuum support belt means to facilitate air flow therethrough; and

h) a vacuum means positioned immediately adjacent said flat forming station adjacent said vacuum support belt means moving therealong, said vacuum means being stationary with respect to said vacuum support belt means and said flexibly resilient belt means moving therealong, said vacuum means being maintained in fluid flow communication with respect to said vacuum sections of said vacuum support belt means and said vacuum aperture means defined in said pattern form means during movement therealong to facilitate drawing of the hot plasticized material into abutment with respect to said flexibly resilient belt means within said flat forming station to facilitate vacuum forming thereof against said pattern form means thereon.

5,314,326

MOLD HAVING A RESIN WELL FORMING A WELD AT THE UNION OF TWO SEPARATE RESIN STREAMS

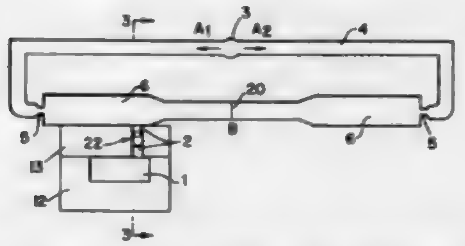
Yoshihiro Furugohri, Shimizu, and Yukihisa Kumagai, Shizuoka, both of Japan, assignors to Polyplastics Co. Ltd., Osaka, Japan

Division of Ser. No. 865,882, Apr. 9, 1992, Pat. No. 5,225,136. This application Sep. 9, 1992, Ser. No. 942,406

Claims priority, application Japan, Apr. 9, 1991, 3-76337

Int. Cl.^{5} B29C *45/18*

U.S. Cl. 425—573 **16 Claims**



1. A mold for injection-molding a thermoplastic resin comprising: a mold cavity, a means to divide an injected molten resin into at least two streams whereby said separate streams of injected molten resin form a weld at the union of said separate streams in said cavity, said divide means comprising one of separate runners to direct said molten resin to said mold cavity, a core in said mold cavity and a mold cavity of uneven thickness, at least one resin well communicating with one of said mold cavity and said separate runners at a point spaced from said weld and located intermediate the point where the injected molten resin is divided into separate streams and the point where said weld is formed.

5,314,327

MOLD CLAMP FOR AN INJECTION MOLDING MACHINE

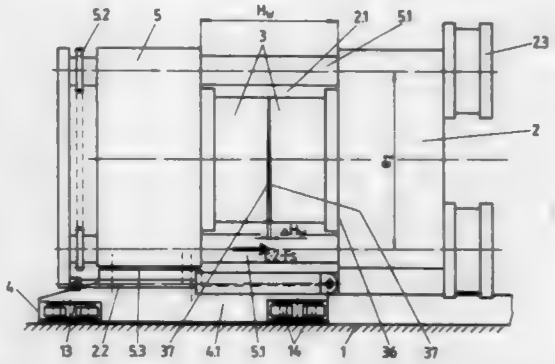
Walter Stein, Schwerin, Fed. Rep. of Germany, assignor to Hemscheidt Maschinentechnik Schwerin GmbH, Fed. Rep. of Germany

Filed Dec. 14, 1992, Ser. No. 990,387

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1991, 4141259

Int. Cl.^{5} B29C *45/64*

U.S. Cl. 425—589 **6 Claims**



1. A mold clamp for an injection molding machine, comprising:

a machine frame;

a sliding carriage having two sliding blocks and a connecting member;

a stationary mold clamping plate;

a movable mold clamping plate arranged on said sliding carriage, the stationary and movable mold clamping plates being supported on the machine frame, each of the plates being formed so as to receive half of a mold;

straight columns provided so as to connect the plates to each other, the columns being adjustable in accordance with a mold height;

means for adjusting the columns to the mold height;

quick-action cylinder means for displacing the movable mold clamping plate between an open position in which the mold halves are separated and a closed position in which the mold halves are brought together;

closing cylinder means for providing closing and retaining forces as well as an opening force on the plates;

side guide rollers arranged on lateral sides of the sliding carriage, which side guide rollers are adjustable with eccentric bolts and are supported on the machine frame, an air clearance being provided between the movable mold clamping plate and the sliding carriage; and

means for connecting the movable mold clamping plate and the sliding carriage together, said connecting means including at least three flexible compression rods, and, to permit relative displacement, a vertical trunnion displaceable transverse to a longitudinal axis of the machine, and fastening screws arranged in edge areas of the machine longitudinal axis for securing the sliding carriage and movable mold clamping plate together.

5,314,328

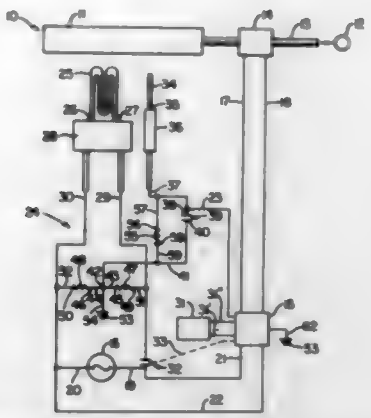
FUEL IGNITION SYSTEM AND METHOD OF MAKING THE SAME

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 19, 1993, Ser. No. 5,590

Int. Cl.^{5} F23N *5/00*

U.S. Cl. 431—66 **10 Claims**



1. In a fuel ignition system for a burner means comprising an igniter having opposite ends, a source of alternating current having two power source leads for being respectively electrically interconnected to said opposite ends of said igniter for heating said igniter to ignition temperature thereof whereby said igniter emits electrons therefrom in relation to the temperature thereof, feeding means for feeding fuel from a source thereof to said burner means, and detecting means for detecting the condition of said igniter and being operatively associated with said feeding means to feed fuel to said burner means only when said detecting means detects that said igniter is at ignition temperature, said detecting means comprising a member for receiving at least some of said emitted electrons, determining means operatively associated with said member for determining from the received electrons an emission rate of said electrons from said igniter, and operating means operatively associated with said determining means for operating said feeding means to feed said fuel only when the determined emission rate is at a certain level, the improvement comprising a lead means having opposite ends one of which is electrically interconnected to said member and the other of which is electrically interconnected to ground, and a pair of resistors respectively electrically interconnecting said two power source leads to said lead means at a point thereof intermediate said ends thereof whereby said member is adapted to develop an electrical voltage that has a present magnitude that is related to the amount of emitted electrons that are being received by said member at that time.

5,314,329

PULSE COMBUSTOR IGNITOR SYSTEM

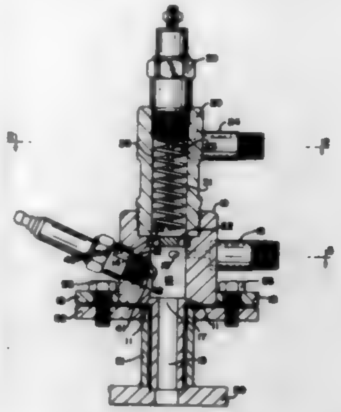
Hanford N. Lockwood, Jr., San Mateo, Calif., assignor to Bepex Corporation, Minneapolis, Minn.

Filed Jul. 10, 1992, Ser. No. 912,147

Int. Cl.^{5} F23C *11/00*

U.S. Cl. 431—259 **8 Claims**

1. A pulse combustor ignitor for pulse combustor start-up comprising a combustion chamber, a spark ignition source communicating with said chamber, first chamber inlet means and a source of fuel connected to said first inlet means, second chamber inlet means and a source of air connected to said second inlet means, said spark ignition source operating to periodically ignite a mixture of fuel and air entering said combustion chamber, means defining an exit passage communicating with the combustion chamber, and means for connecting the ignitor to a pulse combustor housing whereby the ignited mixture can be directed through said exit passage into the pulse combustor for the short period required for start-up, means for preheating the air delivered to said chamber from said second inlet means, and wherein said exit passage comprises a tubular member defining an inlet end and an outlet end, said tubular member extending between said combustion chamber and said pulse combustor whereby the ignited mixture is directed into said inlet end and then from said outlet end into the pulse combustor, said tubular member extending at an angle relative to the centerline of the combustion chamber, means rotatably mounting said tubular member for thereby adjusting the relative locations of said inlet and outlet ends and to thereby adjust the location of said outlet end relative to the interior of said pulse combustor, and means for securing said tubular member in a fixed position after said adjustment.



5,314,330

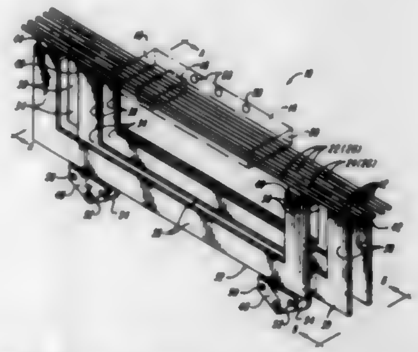
WALKING HEARTH FURNACE

Gary A. Orbeck, Windham, N.H., assignor to BTU International, No. Billerica, Mass.

Filed Oct. 1, 1992, Ser. No. 955,295

Int. Cl.^{5} F27B *9/14*

U.S. Cl. 432—128 **17 Claims**



1. A walking hearth furnace comprising:

a furnace muffle defining a chamber for containing heat generated by a heat source, said furnace muffle including an entrance aperture and an exit aperture;

a first and a second support surface that transverse but do not contact interior surfaces of said furnace muffle for supporting a work product to be heated therein extending through said chamber, each said support surface having a first end portion protruding from said entrance aperture and a second end portion protruding from said exit aperture;

a first movable support structure engaging only said first and said second end portion of said first support surface;

a second movable support structure engaging only said first and said second end portion of said second support surface; and

a movement mechanism engaging said first and said second movable support structure to reciprocally move said first movable support structure with respect to said second movable support structure.

5,314,331

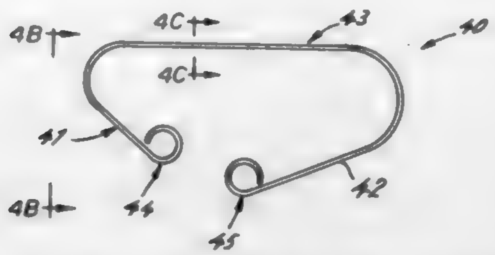
ORTHODONTIC SPACING SPRING

David J. Brosius, Crete, and Joseph M. Sim, Edwardsville, both of Ill., assignors to Mid-American Dental Specialties, Inc., Hickory Hills, Ill.

Filed Apr. 23, 1992, Ser. No. 872,592

Int. Cl.^{5} A61C *3/00*

U.S. Cl. 433—21 **5 Claims**



1. A wire spring device for use in separating adjacent teeth, said spring device comprising a single piece of wire having a first leg portion for insertion into the lingual embrasure, a second leg portion for insertion into the buccal embrasure and a bridge portion connecting said first and second leg portions,

said first and second leg portions being offset from one another and from a central reference plane such that a torsional load is created within said bridge portion when said first and second legs are drawn towards said central reference plane and inserted between the adjacent teeth, thereby applying a separating force to said teeth as said first leg portion acts against the proximal wall of one of the adjacent teeth and said second leg portion acts against the proximal wall of the other of the adjacent teeth,

said wire having a substantially rectangular cross section defining a horizontal surface dimension and a vertical side dimension with the horizontal dimension being greater than the vertical dimension, said device being configured such that when it is inserted between the teeth, the vertical dimension of said wire lies adjacent the proximal walls of the teeth and the horizontal dimension lies in a plane spanning the interproximal gap between the teeth and wherein the vertical dimension determines the thickness of said wire above the occlusal surface of the teeth.

5,314,332

DENTAL ARTICULATOR

Hans W. Lang, Leutkirch, and Alfred Straka, Isny, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

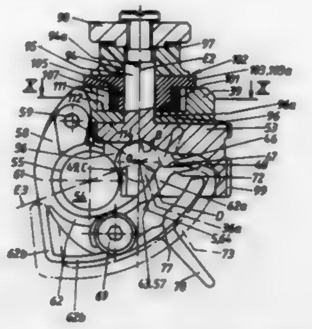
Filed Apr. 1, 1993, Ser. No. 41,820

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1992, 4211021

Int. Cl.^{5} A61C *11/00*

U.S. Cl. 433—66 **18 Claims**

1. A dental articulator including two articulator arms which extend forwardly in the working positions thereof, one said arm being mounted in two swivel and sliding joints for pivotal motion about a swivel axis extending at right angles to a vertical longitudinal center plane of said articulator, said joints being arranged on opposite sides of the vertical longitudinal center plane as mirror-images, each said joint being formed by an articular recess in an articular housing; an a spherical head engaging through an opening in the articular recess; said articular recess having a sagittal guide surface, a Bennett guide surface and a lateral guide surface; each said swivel and sliding joint having a locking device with a locking element operatively associated therewith for locking an associated swivel and sliding joint in an O-position defining a final biting position, said locking element being adjustable between a locking position and a releasing position facilitating sliding movement in the associated swivel and sliding joint; a resilient part being associated with the locking element, said resilient part consisting of a resiliently elastic material extending beyond the locking element and resiliently contacting the joint part in the releasing position of the locking element and being subjected to a pretensile force urging the joint into the O-position.



5,314,333

DEVICE FOR GENERATING OSCILLATIONS FOR DENTAL APPLICATIONS

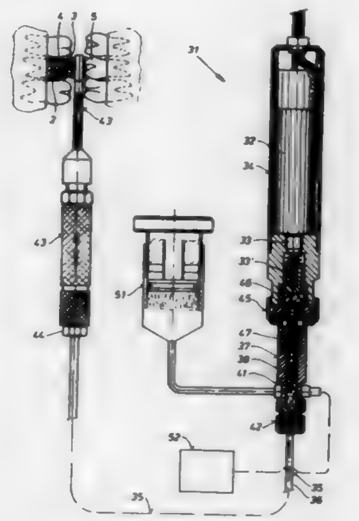
Joachim Irmer, Happenweiler Strasse 19, D-7997 Immenstaad, and Detlef Kersting, Immenstaad, both of Fed. Rep. of Germany, assignors to Joachim Irmer, Immenstaad, Fed. Rep. of Germany

Filed Oct. 9, 1992, Ser. No. 959,255

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1991, 4134428

Int. Cl.^{5} A61C *1/02, 1/07*

U.S. Cl. 433—120 **25 Claims**



1. A device for generating oscillations for dental applications, comprising:

an actuator for generating oscillations, said actuator connectable to an energy source and comprising a lifting member;

a hydraulic linkage with a first and a second end, said first end connected to said lifting member; and

a working device, connected to said second end of said hydraulic linkage, wherein the oscillations of said actuator are transmitted by said lifting member via said hydraulic linkage to said working device and from said working device to a workpiece.

5,314,334
DENTAL PROCELAIN BOND LAYER FOR TITANIUM AND TITANIUM ALLOY COPINGS

Carlino Panzera, Belle Mead, N.J., and Arun Prasad, Cheshire, Conn., assignors to American Thermocraft Corporation Subsidiary of Jeneric/Pentron Incorporated, Somerset, N.J.

Continuation-in-part of Ser. No. 629,617, Dec. 18, 1990, abandoned. This application Jun. 6, 1991, Ser. No. 711,066

The portion of the term of this patent subsequent to Jun. 6, 2008, has been disclaimed.

Int. Cl.⁵ A61C *13/08*

U.S. Cl. 433—206 **9 Claims**

1. A dental restoration comprising a titanium or titanium alloy coping, a bond layer applied to said coping, and a body porcelain composition applied to said bond layer, wherein said bond layer comprises from about 10 to about 75 percent by weight titanium dioxide, from about 5 to about 20 percent by weight boron oxide and from about 5 to about 20 percent by weight silicon dioxide, and wherein said body porcelain composition comprising 50–70 percent by weight silicon dioxide and 7–33 percent by weight boron oxide.

5,314,335
DENTAL CROWN

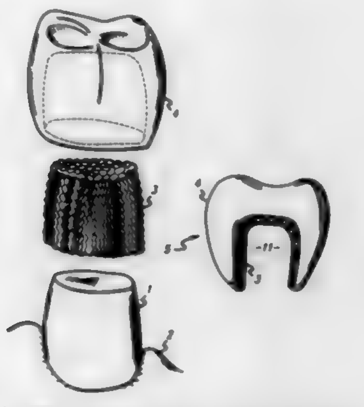
John Fung, 627 George Street, Sydney, NSW 2000, Australia

Filed Feb. 11, 1993, Ser. No. 969,186

Claims priority, application Australia, Aug. 16, 1990, PK1780

Int. Cl.⁵ A61C *5/10, 5/08*

U.S. Cl. 433—223 **9 Claims**



1. A method of manufacturing a dental prothesis comprising the steps of:

shaping a textured corrosion resistant flexible insert to a general cup shape so as to fit over an outer surface of a prepared tooth remnant;

forming a dental outer body shell of heat hardenable material which is partially fired, with an internal cavity and an external surface being of a tooth shape;

coating the insert with a porcelain paint and positioning the insert into the cavity; and

bonding the shell to the insert by further firing to complete the firing process of the body shell and bond the body shell to the insert.

5,314,336
TOY AND METHOD PROVIDING AUDIO OUTPUT REPRESENTATIVE OF MESSAGE OPTICALLY SENSED BY THE TOY

Mark Diamond, 3495 Mountain, Apt. 701, Montreal, Quebec, Canada H3G 2A5 , and Najeeb A. Khalid, 4998 de Maisonneuve ouest, Apt. 1020, Montreal, Quebec, Canada H3Z 1N2

Filed Feb. 7, 1992, Ser. No. 832,868

Int. Cl.⁵ G09B *5/00*

U.S. Cl. 434—169 **8 Claims**

1. A toy for teaching recognition skills by providing an audio output on detection of a coded optical signal on one of a plurality of remotely located objects, said toy comprising:

a plurality of objects which are remotely located and distance apart from said toy, wherein each one of said remotely located object including a different coded optical message and an optical symbol which is associated with said coded optical message, said coded optical message being optically transmitted from said one object to said toy;

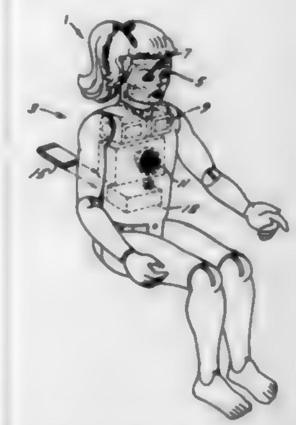
light emitting means in said toy for emitting light so that when said toy is directed at one of said remotely located object, emitted light is reflected from said one of said remotely located object;

optical detecting means in said toy for optically detecting said emitted light reflected from a coded optical message of said one of said remotely located object, wherein said optical detecting means including

a rotating mirror optical scanner for optically scanning said emitted light reflected from said coded optical message and for providing optical data representative of said emitted light reflected from said coded optical message;

data processing means in said toy for analyzing said optical data and for providing an electronic message representative of said optical data;

audio playback means in said toy comprising means for storing a plurality of different audio messages, and means for playing back a selected one of said audio messages; and



means in said toy for selecting a particular one of said audio messages, said means for selecting being activated by said electronic message, whereby said selected audio message is a function of the particular coded optical message detected so as to establish a relationship between an optical symbol and a related one of said audio messages.

6. A method for teaching recognition skills by using a toy and a selected one of a plurality of objects, each one of said plurality of objects having different optical symbols and coded optical message associated with said optical symbols thereon, said toy providing an audio output on detection of a particular coded optical message on a particular object, said audio output related to the nature of said particular optical symbol on said particular object; said toy including:

light emitting means in said toy for emitting light so that when said toy is directed at one of said plurality of object, emitted light is reflected from said one of said plurality of object;

optical detecting means in said toy for optically detecting said emitted light reflected from said coded optical message of said one of said plurality of object, wherein said optical detecting means including

a rotating mirror optical scanner for optically scanning said emitted light reflected from said coded optical message and for providing optical data representative of said emitted light reflected from said coded optical message;

data processing means in said toy for analyzing said optical data and for providing an electronic message representative of said optical data;

audio playback means in said toy comprising means for storing a plurality of different audio messages, and means for playing back a selected one of said audio messages; and

means in said toy for selecting a particular one of said audio messages, said means for selecting being activated by said electronic message, whereby said selected audio message is a function of the particular coded optical message detected; said method including the steps of:

remotely locating a selected one of said objects distance apart from said toy; and

positioning said toy to optically receive the particular coded optical message on said selected objects;

whereby said coded optical message is optically detected by said optical detecting means by optically scanning said coded optical message to provide optical data representative of said coded optical message, and by analyzing said optical data in said data processing means to provide said electronic message representative of said coded optical message;

said toy subsequently selecting a particular audio message by actuating said means for selecting with said electronic message whereby said selected audio message is a function of the particular coded optical message detected so as to establish a relationship between an optical symbol and a related one of said audio messages.

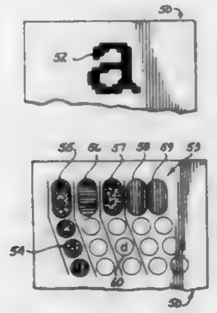
5,314,337
COLOR-CODED DATA INPUT SYSTEM METHOD AND APPARATUS

Peter O. Dixon, P.O. Box 5653, Carefree, Ariz. 85377

Filed Sep. 25, 1992, Ser. No. 951,139

Int. Cl.⁵ G09B *19/00*

U.S. Cl. 434—227 **23 Claims**



1. A color-coded data input operating system for instructing users comprising:

a sector-color-coded data input device having a plurality of keys wherein each of said keys is associated with at least one key symbol and each of said key symbols is covered with a removable colored applique whose color correlates with a predetermined color code which divides the plurality of keys into sectors;

a look-away reproduction of the sector-color-coded data input device wherein the key symbols are visible; and

a set of color coded flashcards comprising a card for each key symbol which corresponds to the predetermined sector-color-code of the plurality of keys of the input device wherein each set of cards comprises a facsimile of a portion of the sector-color-coded data input device which contains the key symbol associated with the card.

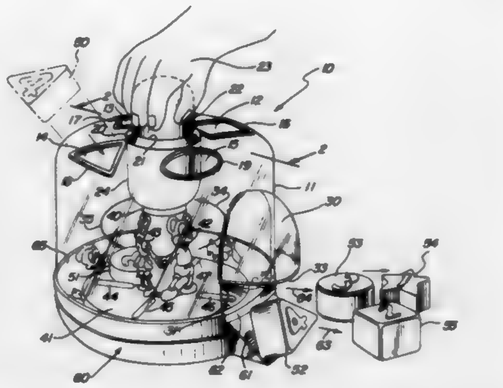
5,314,338
SHAPE-MATCHING SPIN-ACTION TOY

Martin J. Caveza, Redondo Beach, and Derek Gable, Palos Verdes, both of Calif., assignors to Mattel, Inc., El Segundo, Calif.

Filed Aug. 17, 1992, Ser. No. 930,580

Int. Cl.⁵ G09B *19/00;* **A63H** *1/06*

U.S. Cl. 434—259 **9 Claims**



1. A shape-matching toy comprising:

a housing defining an interior cavity, a plurality of geometrically shaped apertures, and an exit opening;

a plurality of geometric objects having shapes generally corresponding to said geometrically shaped apertures;

a base supporting said housing;

a generally horizontal rotatable floor rotatably supported upon said base within said interior cavity and rotatable with respect to said housing; and

drive means coupled to said rotatable floor for imparting a rotational force thereto and causing said geometric objects within said interior cavity to be agitated and randomly expelled from said interior cavity through said exit opening.

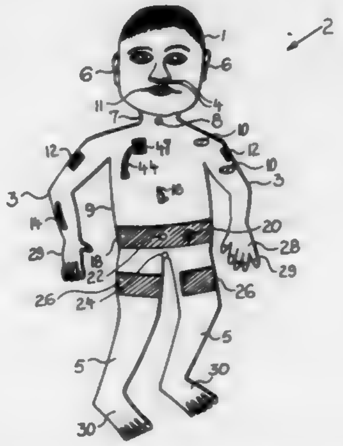
5,314,339
EDUCATIONAL MEDICAL MANNEQUIN

Marivel Aponte, 1104 McKinnon Ave., Oviedo, Fla. 32765

Filed Mar. 29, 1993, Ser. No. 38,654

Int. Cl.⁵ G09B *23/28*

U.S. Cl. 434—267 **24 Claims**



1. An educational medical mannequin comprising:

a head comprising ears, nostrils and a mouth, said head being attached to a torso by means of a neck;

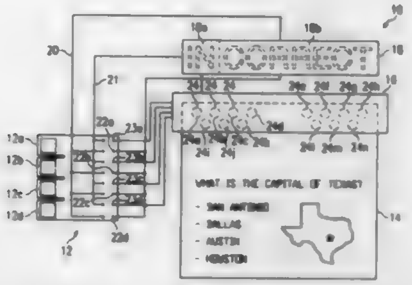
arms terminating in hands attached to said torso;

legs terminating in feet attached to said torso;

a wound disposed on said educational medical mannequin; and
a decubitus site.

5,314,340
ELECTRONIC TEACHING APPARATUS HAVING TWO-PART PARTIALLY AND WHOLLY ACTUATED FOR INDICATION OF CORRECT AND INCORRECT ANSWERS

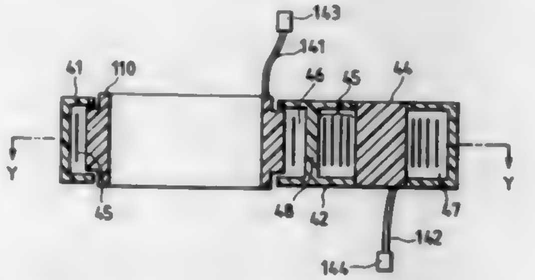
Ronald A. Gaddis, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 30, 1990, Ser. No. 605,909
Int. Cl.^{5} G09B *7/00*
U.S. Cl. 434—327 **20 Claims**



10. A portable electronic teaching apparatus comprising:
a medium for posing one of a question and a problem to a user for which a user response in the form of an answer is desired;
a keypad including a plurality of keys for receiving a response to said one of a question and a problem from the user as determined by the selective actuation by the user of at least one key of said plurality of keys;
means providing an electrical signal in response to the selective actuation of one of said keys by the user, the selective actuation of said one key by the user being indicative of a proposed answer to said one of a question and a problem;
a display operably associated with said keypad and responsive to the electrical signal resulting from the selective actuation of a particular key by the user for indicating the correctness of the response by the user, as determined by the selective actuation of the particular key by the user, to said one of a question and a problem as posed by said medium;
said display including first and second display portions,
said first display portion being actuated and said second display portion being unactuated in response to the selective actuation of a particular key by the user corresponding to the correct response to said one of a question and a problem as posed by said medium for visually indicating on said first display portion only that the user response is correct, and
both of said first and second display portions being actuated in response to the selective actuation of a particular key by the user corresponding to an incorrect response to said one of a question and a problem as posed by said medium for visually indicating on the combined first and second display portions that the user response is incorrect;
each of said plurality of keys having a first key output conductor connected in common to said first display portion and a second key output conductor connected in common to said second display portion;
a set of first and second voltage nodes operably associated with each key of said plurality of keys, said first and second nodes being respectively connected to said first and second display portions;
a machine readable code provided on said medium and defined by the selective enablement of one set of first and second nodes corresponding to one of said plurality of keys;
said first and second voltage nodes being engaged by a key as selectively actuated by the user as a response in the form of an answer to said one of a question and a problem such that the selective actuation of any key provides voltage via said first voltage node to drive said first display portion; and
a plurality of contact points respectively corresponding to said plurality of keys connected between said medium and said second display portion, all of said plurality of contact points corresponding to said plurality of keys being enabled except for a single contact point corresponding to the correct answer;
the selective actuation of one key of said plurality of keys by the user as a user response which corresponds to a non-enabled contact point producing a correct answer as a visual indication on said display by driving said first display portion while said second display portion remains inactive; and
the selective actuation of any other key except for said one key of said plurality of keys by the user as a user response producing an incorrect answer as a visual indication on said display by driving said first and second display portions.

5,314,341
ELECTRICAL CONNECTOR DEVICE

Hidenobu Kazita, Okazaki, and Toshinobu Nishi, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jan. 21, 1993, Ser. No. 6,534
Claims priority, application Japan, Jan. 21, 1992, 4-008612
Int. Cl.^{5} H01R *39/02*
U.S. Cl. 439—15 **16 Claims**

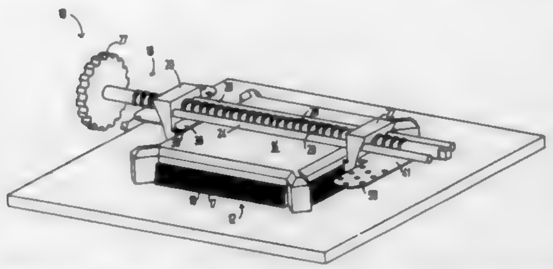


1. An electrical connector device comprising:
a cable winding member;
a first case supporting said cable winding member so as to allow relative rotation between said first case and said cable winding member;
a second case having a cable winding core; and
a flexible cable having one end fixed to said cable winding member and the other end fixed to said cable winding core, said flexible cable being wound around the cable winding core to form a loose winding of a plurality of turns therearound,
wherein said cable winding member is provided around a rotary shaft of a vehicular steering wheel.

5,314,342
UNIVERSAL PROBE ADAPTER

Timothy A. Figge, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sep. 9, 1992, Ser. No. 944,153
Int. Cl.^{5} H01R *9/09, 43/04*
U.S. Cl. 439—66 **13 Claims**

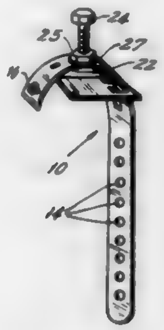
1. A probe adapter for making electrical connection between an electronic probe and leads of a fine pitch surface mount electronic device, said probe adapter comprising:
a flexible circuit having a plurality of conductive traces formed thereon, wherein portions of said conductive traces are exposed to provide a plurality of contacts at one end of said flexible circuit and said conductive traces are patterned to provide means for electrically connecting at another end of said flexible circuit, said flexible circuit having at least one fold between said plurality of contacts and said means for electrically connecting;
an electrical connecting member comprising a plurality of conductors and an elastomer block, wherein said plurality of conductors are embedded in said elastomer block and said plurality of conductors are aligned substantially perpendicular to the plurality of contacts on the flexible circuit and the leads on the electronic device;



means for compressing said connecting member between said plurality of contacts and said leads so that more than one of said plurality of conductors electrically connect one of said leads to one of said plurality of contacts wherein said means for compressing comprises a pair of jaws, each jaw supporting a plurality of said contacts and said electrical connecting member, and means for urging said jaws toward each other and wherein said means for compressing also comprises means for adjusting said probe adapter to fit a number of possible physical sizes of said electronic device.

5,314,343
GROUNDING STRAP

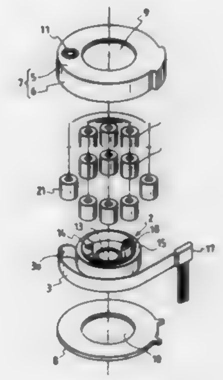
Sol Englander, Jamaica, N.Y., assignor to Rosco, Inc., Jamaica, N.Y.
Filed Jun. 30, 1993, Ser. No. 85,027
Int. Cl.^{5} H01R *4/38, 4/66*
U.S. Cl. 439—100 **14 Claims**



1. A grounding strap comprising:
a strap of flexible, electrically conductive material, the strap having a plurality of holes therethrough spaced equidistantly along a portion of the strap;
a threaded nut fastened to the strap at an aperture in the strap at a location near one end thereof, the nut being held to the strap by a portion of the strap;
a projection near said one end for engaging a hole in the strap when the strap is wrapped around a grounded member such that the portion of the strap with the hole engaging the projection is on top of the portion of the strap having the projection;
the holes in said strap being spaced so that when a first hole in the strap is above the projection, a second hole in the strap is approximately above the threaded nut;
a member separate from an fastened to the strap and positioned near the nut and being arranged such that a surface of the member is disposed below the nut; and
the nut receiving a tightening screw, whereby when the strap is wrapped about the grounded member, the screw is insertable through the second hole and screwable into the nut so as to bear down on the surface of the member, forcing the nut upwardly away from the member and tightening the strap around the grounded member.

5,314,344
CLOCK SPRING CONNECTOR

Yuichi Ida, Miyagi; Hironori Kato, Sendai; Kunihiko Sasaki, Miyagi, and Hiroyuki Bannai, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1992, Ser. No. 987,915
Claims priority, application Japan, Dec. 13, 1991, 3-351289
Int. Cl.^{5} H01R *35/04*
U.S. Cl. 439—164 **13 Claims**



1. A clock spring connector comprising:
a fixed member;
a movable member rotatably mounted to said fixed member;
a flexible cable having one end connected to the fixed member and a second end connected to the movable member, said flexible cable contained in a space between an inner cylindrical portion provided on either of said fixed member and the movable member and an outer cylindrical portion provided on the other; and
a moving member disposed in said space and having an opening;
wherein said flexible cable is reversed within said opening of said moving member and is wound on said outer cylindrical portion and said inner cylindrical portion in opposite directions, an indicator portion is provided on said moving member, and means for visually observing the indicator portion are formed on one of the fixed member and the movable member so that said indicator portion can be visually observed from the outside when said movable member is in a neutral position of rotation.

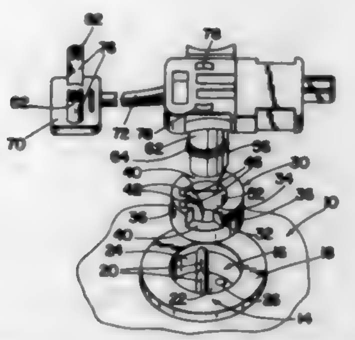
5,314,345
ELECTRICAL CONNECTION SYSTEM WITH INTERLOCK

James E. Cahaly, Milford, N.H., and Brian R. Pitstick, Mesa, Ariz., assignors to TRW Inc., Cleveland, Ohio
Filed Oct. 9, 1992, Ser. No. 960,474
Int. Cl.^{5} H01R *29/00*
U.S. Cl. 439—188 **19 Claims**

1. An electrical connection including:
a) a first component carrying a pair of first connector elements;

b) a shorting element associated with the first component and including a disk-shaped insulative body carrying a pair of shorting contact elements each biased into electrical contact with respective ones of said pair of first connector elements for producing an electrical short therebetween;

c) a second component having a body releasably matable with the first component and carrying a pair of second connector elements engagable with said pair of first connector elements, a portion of the body being contoured to enter into said disk-shaped body to a position between both contact elements of said pair of said shorting contact elements and the pair of first connector elements to disconnect the electrical short upon mating of the second component with the first component;



d) latch means carried by one of the first and second components for providing a mechanical latch with the other component; and,

e) a locking element insertable into a lock position in one of the first and second components for preventing release of the latch means and preventing separation of the first and second components while in the lock position.

5,314,346

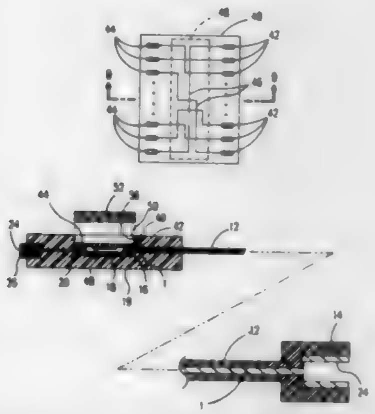
FLEXIBLE CIRCUIT APPLIQUE PATCH CUSTOMIZATION FOR GENERIC PROGRAMMABLE CABLE ASSEMBLIES

Gene R. Owens, Oronoco; Robert J. Reis, Winona, both of Minn.; Richard G. Shomo, Rhinebeck, N.Y., and Scott D. Wickus, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1992, Ser. No. 993,472

Int. Cl.^{5} H01R *29/00*

U.S. Cl. 439—189 **11 Claims**



1. A customized programmable cable assembly comprising:

a first connector comprising a first plurality of mating contacts for contacting and mating with contacts on a connected device;

said first connector further comprising a printed circuit, said printed circuit further comprising a first plurality of conductors extending from and in electrical contact with said mating contacts, a first plurality of termination pads electrically connected to said conductors, and a plurality of second termination pads;

an electrical cable comprising a second plurality of conductors, each of said second plurality of conductors disposed in electrical contact with one of said plurality of second termination pads;

said first termination pads disposed spaced from said second termination pads;

an applique comprising a flexible multi-layer circuit having exposed termination pads disposed in an array corresponding to placement of said first termination pad and said second termination pads, at least one of said applique termination pads electrically interconnected with another of said applique termination pads;

said applique juxtaposed to said first termination pads and said second termination pads with corresponding ones of said applique termination pads and said contacting termination pads joined to form an electrical connection there between,

whereby a cable having a designated conductor assignment at one end may be customized to present different conductor assignment at another end thereof.

5,314,347

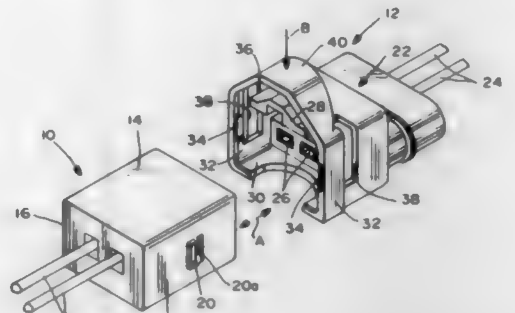
LATCHABLE ELECTRICAL CONNECTOR SYSTEM

Stephen A. Colleran, Lisle; Russell L. Mackowiak, Wheaton, both of Ill.; Lorenzo Manassero, Turin, Italy; Uwe Schwartz, Ettlingen, Germany; Bill B. Wilson, Montgomery, Ill.

Filed Aug. 13, 1992, Ser. No. 929,610

Int. Cl.^{5} H01R *13/627*

U.S. Cl. 439—350 **5 Claims**



1. In a latchable electrical connector system which includes first and second electrical connectors matable in a given mating direction, the first connector including a pair of latch devices cantileverly attached to said first connector and interengageable with complementary latch means on the second connector when the connectors are mated to resist unmating of the connectors, the latch devices being flexible in a direction transverse to said mating direction for movement into and out of latching interengagement with the latch means of the second connector, wherein the improvement comprises transversely flexible unlatching means coupled between the latch devices and bowed outwardly from the mating direction whereby inward flexing of the unlatching means towards the mating direction at a single point of the unlatching means, as by the application of pressure by a user, is effective to cause outward unlatching movement of the latch devices.

5,314,348

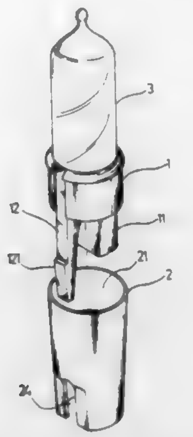
INNER LOCK TYPE FASTENING CONSTRUCTION OF A LIGHT BULB HOLDER

Hsin-Wei Wu, No. 5, Lane 193, Kon Yua Rd., Hsin-chu, Taiwan

Filed Mar. 2, 1993, Ser. No. 24,959

Int. Cl.^{5} H01R *13/627*

U.S. Cl. 439—356 **1 Claim**



1. A light bulb holder for positionally locating and stabilizing a light bulb comprising:

(a) a cap member extending in a vertical direction having a first end portion for insertion of said light bulb therein, and a second end portion, said second end portion of said cap member defining a stub member having a vertically extending tongue member forming a protrusion at one end thereof, said tongue member being secured to a sidewall of said stub member and extending beyond an extension length of said stub member;

(b) a base member extending in said vertical direction having a base opening defining a base opening diameter in open communication with a base axial hole defining a base axial diameter less than said base opening diameter for providing an internal shoulder member of said base member, said base axial opening having a vertically extending slot formed within an internal sidewall thereof and a vertically extending opening through a lower section of said sidewall in alignment with said slot for passage therethrough of said protrusion, said cap member having a first end portion diameter greater than said base opening diameter whereby when said cap first end portion is positioned contiguous an upper surface of said base member, said cap second end portion is positioned contiguous said shoulder and said protrusion extends through said vertically extending opening thereby providing a fixed securement for said cap member and said light bulb.

5,314,349

CONNECTOR FOR COAXIAL CABLE

Franz Czeschka, Rechberghausen, and Roland Mödinger, Weinstadt, both of Fed. Rep. of Germany, assignors to ERNI Elektroapparate GmbH, Adelberg, Fed. Rep. of Germany

Filed Apr. 8, 1993, Ser. No. 44,125

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1992, 4212710

Int. Cl.^{5} H01R *4/24*

U.S. Cl. 439—394 **17 Claims**

1. A connector for a coaxial cable, comprising:

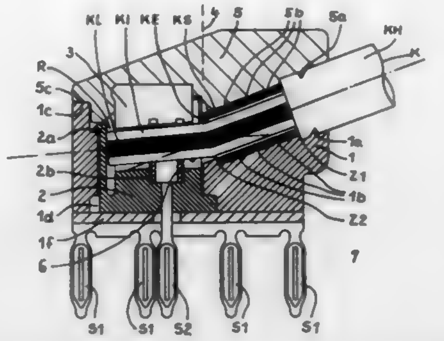
an electrically conductive base;

an electrically conductive cover securable to said base and defining therewith a cavity and at least one cable clamping and contacting feed which opens into said cavity;

at least one insulation stripping contact located in said base and having a connection element;

an electrically insulated thrust member arranged opposite said insulation stripping contact and cooperating therewith;

an insulation member for insulating said insulating stripping contact from shielded conductor means;



force-transmitting means for connecting said base and said cover together; and

a plurality of connecting elements for abuttingly connecting said connector to a printed circuit plate.

5,314,350

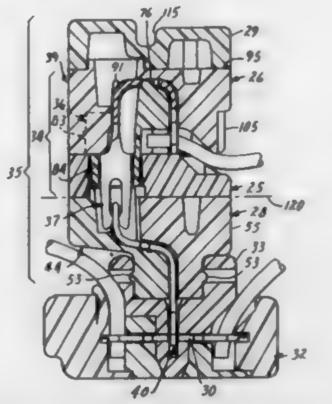
PLUGGABLE MODULAR SPLICING CONNECTOR AND BRIDGING ADAPTER

Gary B. Matthews, Austin, and Jerome A. Pratt, Leander, both of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 684,323, Apr. 12, 1991, Pat. No. 5,147,218. This application Apr. 2, 1992, Ser. No. 861,959

Int. Cl.^{5} H01R *4/24*

U.S. Cl. 439—404 **9 Claims**



1. A multiple wire-splice module comprising

an elongate base, formed of an insulating polymeric material, having opposite longitudinal sides and opposite surfaces, having slotted openings extending through said base between said surfaces along one longitudinal side, and having wire-retaining members positioned along one surface adjacent the opposite side, said wire-retaining members forming channels for receiving the wires,

an elongate body of insulative material having opposite surfaces, and

a plurality of conductive contacts,

said body supporting said contacts, each said contact having a bifurcated wire-receiving end portion, a second connecting member at the other end and a third connection portion intermediate the ends of the contact,

said bifurcated wire-receiving end portion extending from one surface of said body for making an electrical junction with a said wire in a channel of said base and said second connecting member extending from said one surface of said body and extending through said slotted openings in said base when said base and body are assembled with a wire junction being formed therebetween, and said third connection portion being accessible from the other surface of said body,

whereby the second connecting members extend beyond the second surface of the base, adapting said second connecting members for connection to the third connection portion of contacts on a second module to splice wires in the two modules or to connect the module to another external member and wherein said module comprises means for making connection with the contacts of a 710 connector through the bridging slots thereof, said means including:

a bridging strip having opposite longitudinal surfaces and a plurality of bridging contacts each with a forked connecting member positioned in a plane parallel to the length of said bridging strip and extending from one surface thereof, and a connecting tab positioned in a plane parallel to the length of said strip and accessible from the opposite surface of said strip, said connecting tabs being adapted for connection to said second connecting members of said module when said base and body are assembled with a wire junction being formed therebetween.

5,314,351

PRESSURE CONNECTION TERMINAL

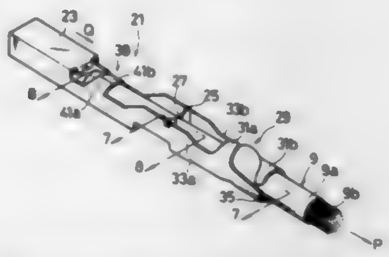
Masaya Yamamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Feb. 23, 1993, Ser. No. 21,134

Claims priority, application Japan, Feb. 25, 1992, 4-008312[U]

Int. Cl.^{5} H01R *4/24*

U.S. Cl. 439—407 11 Claims



1. A pressure connection terminal for connecting and coupling a member to an insulated wire, said terminal comprising:

a base;

two side walls extending from the base;

an electrically connecting portion disposed at a first end portion of the terminal;

a pressure connection blade disposed between the electrically connecting portion and a second end portion of the terminal, said pressure connection blade for receiving and stripping off a corresponding insulating portion of the insulated wire;

a first holder disposed near the second end portion for holding the insulated wire; and

a second holder disposed between the first end portion and the pressure connection blade for holding the electric wire;

wherein each of the first and second holders is formed by crimping together a pair of opposing portions extending from the respective side walls of the terminal and wherein the pair of opposing portions for constructing the first holder are spaced apart from each other along the longitudinal direction of the terminal at a predetermined interval, further comprising a first projection provided on the base of the terminal at a location opposing the first holder so as to secure the wire cooperatively with the first holder.

5,314,352

STRAIN RELIEF WIRING HOUSING ASSEMBLY

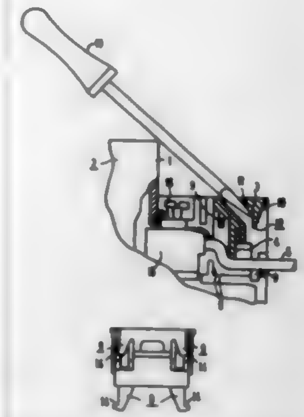
Evi Halbinger, Bad Abbach, and Herbert Neuberg, Regensburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 9, 1992, Ser. No. 895,891

Claims priority, application European Pat. Off., Jun. 11, 1991, 91109526.3

Int. Cl.^{5} H01R *13/58, 13/506*

U.S. Cl. 439—469 20 Claims



1. A wiring housing assembly for housing a wire, and a coupling thereto, and for use in building services control systems, said wiring housing assembly comprising:

a) a cover sealing a wiring housing, said wiring housing having a wire entry hole and two side walls;

b) a strain relief device disposed at said wire entry hole, said strain relief device including an opposing clamp area;

c) a molded component having a plurality of gripping arms, said molded component being disposed between the side walls of said wiring housing and forming at least one clamping lip for providing strain relief for a wire inserted into said wire entry hole by locking the wire against the opposing clamping area;

d) a plurality of opposing gripping joint bars being disposed on said side walls of said wiring housing, wherein each of said plurality of gripping arms of said molded component bracing each of said plurality of opposing gripping joint bars of said wiring housing in one clamping plane and gripping each of said plurality of opposing gripping joint bars of said wiring housing from behind; and

e) a guide element being disposed on said molded component; and

f) a corresponding guide element being disposed on said side walls, whereby said guide element and said corresponding guide element interact to secure said molded component to prevent said molded component from tipping.

5,314,353

TEST LEAD ADAPTER

Otto H. Schroeder, Houston, Tex., assignor to Houston Industries Incorporated, Houston, Tex.

Filed Feb. 26, 1993, Ser. No. 23,562

Int. Cl.^{5} G01R *25/00*

U.S. Cl. 439—517 17 Claims

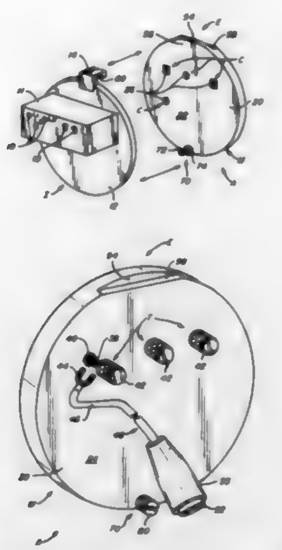
1. An adapter for connecting multiphase electrical power conductors with electrical contacts of a phase rotation indicator having a hanger jaw mounting apparatus therewith, the phase rotation indicator including a test circuit to test the phase rotation of the multi-phase power in the power conductors, comprising:

an insulative plate member;

terminal means mounted on said plate member for connection to each of the multiphase electrical power conductors;

electrical contact means on said plate member connected to said terminal means and adapted for engagement with the electrical contacts of the phase rotation indicator;

means on said plate member comprising a raised lip extending outwardly from said plate member for fitting into the hanger jaw of the mounting apparatus for engaging the mounting apparatus to align said electrical contact means with the electrical connectors of the phase rotation indicator.



5,314,354

FUSE BOX

Fumihiko Nomura, Kanagawa; Yuji Maeda, and Tomotoshi Kamiyama, both of Shizuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

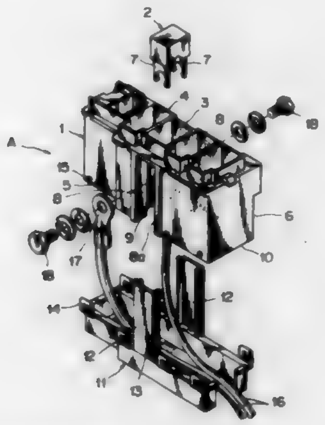
Continuation of Ser. No. 712,275, Jun. 11, 1991, abandoned.

This application Jul. 22, 1992, Ser. No. 917,675

Claims priority, application Japan, Jun. 15, 1990, 2-62695[U]

Int. Cl.^{5} H01R *13/68*

U.S. Cl. 439—621 3 Claims



1. A fuse box comprising:

a housing;

at least one first opening formed in said housing, said first opening receiving a screw-fastened type fuse having two terminals inserted through said first opening;

a second opening formed in said housing, said second opening receiving and directing conductors connected to said terminals to external circuits;

two opposing third openings formed in said housing, said third openings receiving bolts inserted into said housing and threaded into apertures in said housing to mechanically secure said terminals together with said conductors to said housing and to electrically connect said terminals with said conductors, said third openings facing said terminals of the fuse when the fuse is inserted and having guide grooves spaced a predetermined distance from said apertures in said housing; and

a cover for covering said second opening, said cover having two opposing lids formed continuously integral therewith and an opening through which said conductors are directed from said second opening to the external circuits, said two opposing lids are adapted to be slidably guided and accepted by said guide grooves to close said third openings when said cover is assembled to the housing and said bolts are fully threaded into the housing to press said terminals and said conductors between said bolts and said housing, and said bolts prevent closure of the two opposing lids when at least one of said bolts is not fully threaded into said housing.

5,314,355

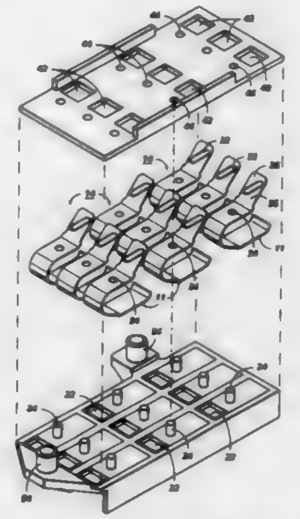
COPLAINER SLIDING ELECTRICAL CONNECTOR

Mark R. Halvonik, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1992, Ser. No. 891,085

Int. Cl.^{5} H01R *25/00*

U.S. Cl. 439—638 19 Claims

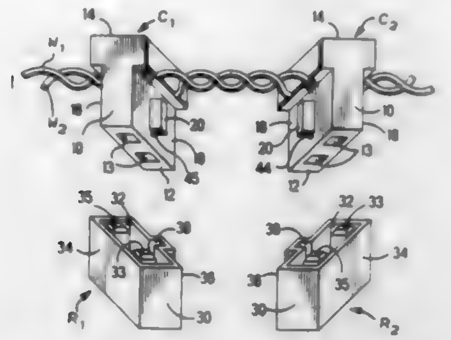


1. An electrical connector assembly having a front and a back view comprising an electrically insulating connector housing having a front side and a back side and at least one aperture therein extending from said front side to said back side, an electrically conductive unitary spring clip connector extending from the front side of said housing through said aperture to the back side of said housing, said spring clip connector having a connecting terminal on one end and a resiliently deflectable spring contact on the other end and an insulating retention plate to retain said spring clip connector in said housing, said retention plate being fastened to and on the back side of said connector housing and having at least one aperture therein with the connecting terminal on one end of said spring clip connector extending therethrough said assembly including a mating and locating feature comprising at least one mounting pin adjacent said at least one aperture in said housing, a mounting hole in said spring clip connector and at least one retention hole in said retention plate, said spring clip being mounted on said mounting pin through said mounting hole and said retention plate being mounted on the top of said spring clip on said mounting pin.

5,314,356
CONNECTOR AND METHOD FOR VARIABLE POLARIZATION

Shigeru Isohata, Machida, and Hisayoshi Wakamatsu, Kawasaki, both of Japan, assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 807,932, Dec. 16, 1991, abandoned.
This application Nov. 6, 1992, Ser. No. 973,224
Claims priority, application Japan, Jan. 18, 1991, 3-016821
Int. Cl.^{5} H01R *13/645*
U.S. Cl. 439—681 14 Claims

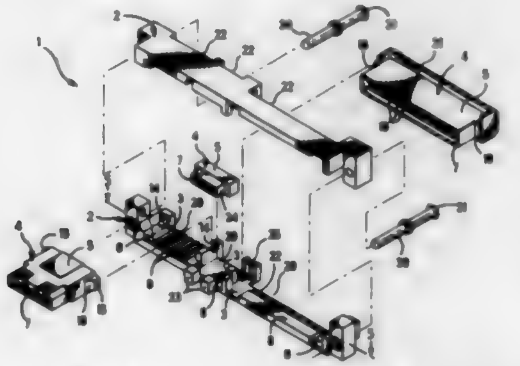


1. An electrical connector including first and second mating connector halves for connecting a pair of twisted wires thereby, each half having a dielectric housing having a given mating axis including terminals contained therein and adapted to be interconnected to the pair of wires in a T-tap interconnection transversely oriented to said given mating axis, said first half housing including key means for reciprocating a given external profile from first and second positions and said second half including a single key way adapted to receive said key means and thereby require and second positions and said second half including a single key way adapted to receive said key means and thereby require one or the other of two rotational orientations of said first half relative to said second half for intermating said halves together to orient said wires, characterized in that said key means external profile movably reciprocates from said first position protruding from an outside surface of the first housing to a second position protruding from an opposite outside surface of the first housing relative to said first half housing and includes detent means to latch said key means in at least one of the two protruding positions to provide said particular orientation of halves and wires.

5,314,357
COMBINED ELECTRICAL CONNECTOR

Charles H. Weidler, Lancaster, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 10, 1993, Ser. No. 29,085
Int. Cl.^{5} H01R *13/514*
U.S. Cl. 439—701 9 Claims

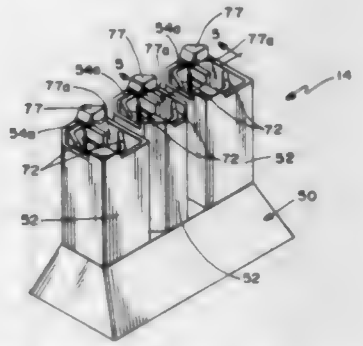


1. An electrical connector comprising: first and second clasping bodies that interlock with each other and define therebetween multiple housing cavities, multiple cable connectors in the cavities, each connector having a housing with an external profile, the cavities conforming to and encircling the external profiles of the housings, front mating faces of the connectors being staggered front to rear, relatively wide portions of at least two of the connectors being spaced apart front to rear, and the relatively wide portions overlapping one another laterally, side to side, to achieve a compact width.

5,314,358
TERMINAL POSITION ASSURANCE SYSTEM FOR ELECTRICAL CONNECTORS

Robert A. Klemmer, Wheaton; Ronald S. Krzeczowski, Lemont; Kirk B. Peloza, Naperville, and Russell E. Wende, Oak Lawn, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Apr. 2, 1993, Ser. No. 42,312
Int. Cl.^{5} H01R *13/415*
U.S. Cl. 439—741 9 Claims



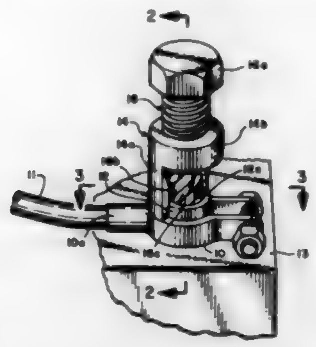
1. A terminal position assurance system in an electrical connector which includes a dielectric housing having a wall with a terminal-receiving passage therethrough, the wall defining first and second surfaces, a terminal adapted to be received in the passage with a mating portion on one side of the wall and a terminating portion on the other side of the wall, stop means on the terminal for engaging a stop surface of the housing to prevent the terminal from passing completely through the passage in an insertion direction toward the first surface and to define a fully inserted position of the terminal, and a bendable tab on the terminal and adapted to be bent against the second surface of the wall when the terminal is inserted into the passage, wherein the improvement comprises said mating terminal portion having a forward end, said stop means located at said forward end and said bendable tab located at said forward end being structured to be bent about an axis perpendicular to the second surface of the wall and be positioned over the second surface when the terminal is fully positioned in the passage.

5,314,359
BATTERY CABLE TERMINAL

Evan Probst, 1744 W. 2400 South, Charleston, Utah 84082

Filed Jun. 7, 1993, Ser. No. 73,339
Int. Cl.^{5} H01R *4/26*
U.S. Cl. 439—766 7 Claims

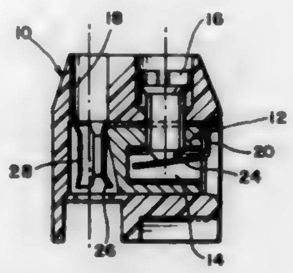
1. A battery cable terminal for establishing electrical connection with a terminal post of an electrical storage battery, comprising an electrically conductive terminal ring having means for electrical connection with a battery cable; an electrically conductive bracket electrically conductively associated with said terminal ring and providing a transverse platform member with an internally threaded aperture overlying the open interior portion of said tèrminal ring; and an electrically conductive screw member threadedly received by said aperture of the platform member of the bracket and having an end face adapted to bear against the exposed face of a terminal post of an electrical storage battery when said terminal ring is installed thereon and as said screw member is screwed toward said terminal ring, said end face of the screw member being provided with means for cutting into said exposed face of the terminal post when said screw is turned as it bears against said face, and said screw having means whereby it may be turned.



5,314,360
TERMINAL BLOCK

Dieter Jaag, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to RIA Electronic Albert Metz, Blumberg, Fed. Rep. of Germany

Filed Oct. 9, 1992, Ser. No. 959,041
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1991, 9112548
Int. Cl.^{5} H01R *4/40*
U.S. Cl. 439—811 9 Claims

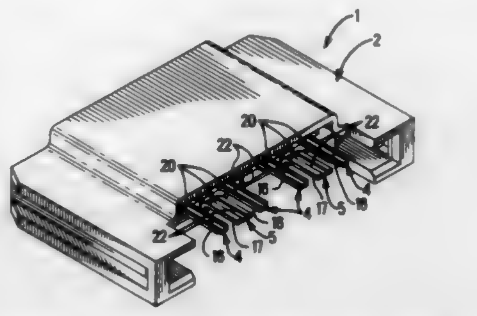


1. A terminal block comprising:
at least one clamp body having a front end and a rear face,
a conductor receiving passage extending within said clamp body between said front end and said rear face, a bore within said clamp body, said bore receiving a binding post;
a terminal housing with at least one mounting unit, said unit having a front opening and a bushing aperture, an interior part extending within said terminal housing from said front opening to said bushing aperture;
a conductor protection element including at least a free leg, a plurality of contact blades, and said conductor protection element and said plurality of the contact blades being formed as one coherent unit;
whereby said clamp body is insertable into said interior part of the housing through said front opening, in an assembled condition of said terminal block at least said free leg of said conductor protection element being situated within said conductor receiving passage and said plurality of contact blades is situated within said bushing aperture adjacent to said rear face of said clamp body.

5,314,361
ELECTRICAL CONTACT WITH RECESSED WIRE CONNECTING PORTION

Reuben E. Ney, Mount Joy; Kenneth E. Markle, York, and William E. Zelko, Dauphin, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 694,627, May 2, 1991, abandoned. This application Apr. 15, 1992, Ser. No. 870,725
Int. Cl.^{5} H01R *4/02*
U.S. Cl. 439—874 6 Claims

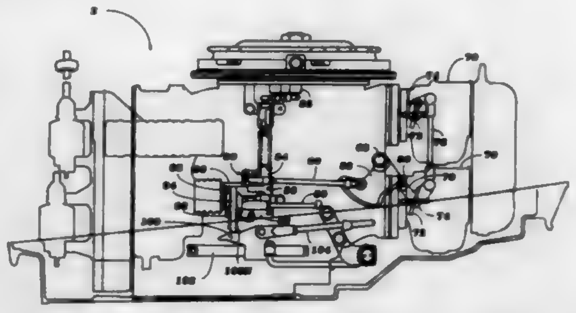


1. An electrical connector adapted for connection to wires having multiple wire strands comprising: an insulative housing block, electrical contacts spaced apart along the housing block, wire connecting portions of the contacts constructed for being overlaid by corresponding electrical wires each having multiple wire strands and for being welded to the corresponding wires by welding electrodes of a welding apparatus, top surfaces of the wire connecting portions having elongated recesses recessed toward bottom surfaces of the wire connecting portions for cradling the multiple wire strands of corresponding wires, and the bottom surfaces of the wire connecting portions being constructed with shapes different from the shapes of the top surfaces for conforming abutment with surfaces of corresponding welding electrodes.

5,314,362
THROTTLE OPENING LIMITING SYSTEM FOR A MARINE PROPULSION UNIT

Osamu Nagahora, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 706,805, May 29, 1991, abandoned.
This application May 21, 1993, Ser. No. 66,340
Claims priority, application Japan, May 31, 1990, 2-139947
Int. Cl.^{5} B60K *41/00*
U.S. Cl. 440—86 19 Claims



1. A throttle opening limiting system for an engine of a marine propulsion unit, comprising: a manually operated transmission control system for shifting between forward, neutral and reverse operative states; and further, a throttle, a manually operated throttle control device and an intermediate linkage arrangement operatively connecting said manually operated throttle control device to said throttle, said intermediate linkage arrangement further comprising a throttle opening limiting mechanism operable for setting a distinct and different maxi-

mum obtainable throttle opening position for each of a forward a neutral and a reverse operative state of said marine propulsion unit; wherein said throttle opening limiting mechanism includes a blocking element and a first lever; and further including a cowling member surrounding said engine; wherein said blocking element and said first lever are located within said cowling member; wherein said blocking element is a stopper member which is arranged for linear movement along a generally vertical direction; and wherein said first lever is disposed along a generally horizontal plane and is arranged for movement in a generally horizontal fashion within its plane of disposition.

5,314,363

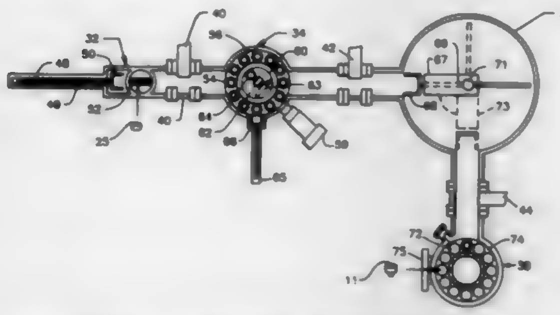
AUTOMATED SYSTEM AND METHOD FOR ASSEMBLING IMAGE INTENSIFIER TUBES

Timothy G. Murray, Hardy, Va., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 8, 1993, Ser. No. 73,746

Int. Cl.⁵ H01J *9/12*

U.S. Cl. 445—14 **26 Claims**



17. A method of assembling photocathodes into vacuum tube housings, comprising the steps of:
- loading at least one photocathode into a first chamber;
- loading at least one vacuum tube housing into a second chamber;
- evacuating said first chamber and said second chamber;
- processing said at least one photocathode within said first chamber and said at least one vacuum tube housing within said second chamber;
- interconnecting said first chamber to said second chamber by selectively opening at least one valve disposed between said first chamber and said second chamber;
- transferring said at least one photocathode from said first chamber to said second chamber; and
- assembling said at least one photocathode to said at least one vacuum tube housing in said second chamber forming at least one vacuum tube assembly.

5,314,364

SCANDATE CATHODE AND METHODS OF MAKING IT

Frans M. M. Snijkers, and Jacobus E. Crombeen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

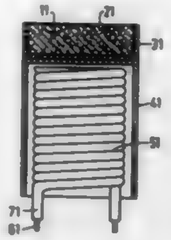
Division of Ser. No. 606,020, Oct. 30, 1990. This application Aug. 17, 1992, Ser. No. 931,238

Claims priority, application Netherlands, Nov. 13, 1989, 8902793

Int. Cl.⁵ H01J *9/04*

U.S. Cl. 445—51 **12 Claims**

1. A method of manufacturing a scandate cathode having a cathode body which has a top layer which comprises at least one oxidic phase which comprises, as composite elements, at least barium and a scandium compound which can exhibit scandium segregation, a monolayer of a scandium-containing material being segregated from the oxidic phase and deposited on the top layer during heating of the cathode to elevated temperatures, wherein a matrix is pressed from a powder comprising scandium or scandium hydride and a powder of a high-melting point metal and/or metal alloy, whereafter optionally the scandium or scandium hydride powder is partly oxidized, and the matrix is subsequently sintered and impregnated with a barium compound.



5,314,365

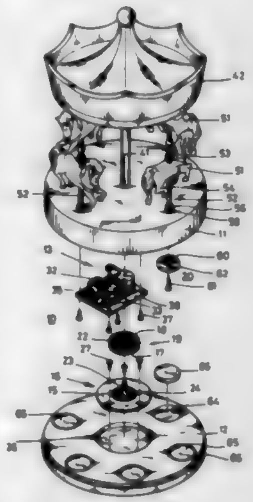
TURNTABLE STRUCTURE FOR A MOVING WOODEN HORSE TOY

Da-Hsuan Chen, P.O. Box 96-405, Taipei 10098, Taiwan

Filed Apr. 22, 1993, Ser. No. 51,151

Int. Cl.⁵ A63H *33/26, 3/28*

U.S. Cl. 446—133 **3 Claims**



1. An improved turntable structure for a moving wooden horse toy comprising a turntable, a base disk and a rotation structure; said rotation structure including:
- a music box assembly which including a base plate mounted with a mechanical type music box; a transmission shaft of said music box passing through a round hole of said base plate, and an outer surface of said round hole mounted with a ring-shaped flange; said music box assembly fixed in a music box chamber under said turntable; said transmission shaft of said music box being position in a center of said turntable and being screwed together with a supporting shaft of a bearing base;
- said bearing base having said supporting shaft screwed together with said transmission shaft of said music box in a center on a supporting disk; an outer surface of said supporting shaft being mounted concentric with said ring-shaped flange; said bearing base fastened with several screws in a round niche of said base disk, and said supporting shaft being put in a center of said base disk, and screwed together with said transmission shaft;
- a roller bearing assembly mounted between said music box assembly and said bearing base; said roller bearing assembly including a plurality of roller bodies, of which both a top roller contact surface and a bottom roller contact surface being covered with a lower and an upper metal washers respectively; said upper metal washer positioned in place by means of a ring-shaped flange of said music box assembly, while said lower metal washer positioned in place by means of another ring-shaped flange of said bearing base.

5,314,366

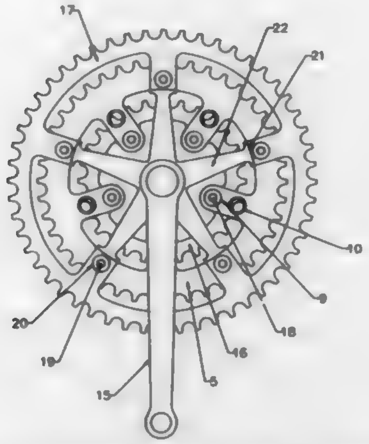
ADAPTER CHAINRING

Kirby A. Palm, Rte. 1, Box 3498, Havana, Fla. 32333

Filed Mar. 25, 1993, Ser. No. 36,737

Int. Cl.⁵ F16H *55/30*

U.S. Cl. 474—152 **8 Claims**



1. An adapter chainring for converting a bicycle conventional two-chainring crankset, including outer and inner chainrings, to a three-chainring crankset including a third, inner chainring having an outer diameter smaller than the outer diameter of the conventional inner chainring, by replacing the conventional inner chainring with the adapter chainring and adding a third, inner chainring to the conventional crankset, said adapter chainring comprising:
- a ring-like plate having inner and outer faces and an outer periphery, a plurality of teeth on said outer periphery, a plurality of spaced outer holes in said plate for receiving bolts for attaching said adapter chainring to the conventional inner chainring, and a plurality of spaced inner holes in said plate for receiving bolts for attaching said adapter chainring to the third, inner chainring.

5,314,367

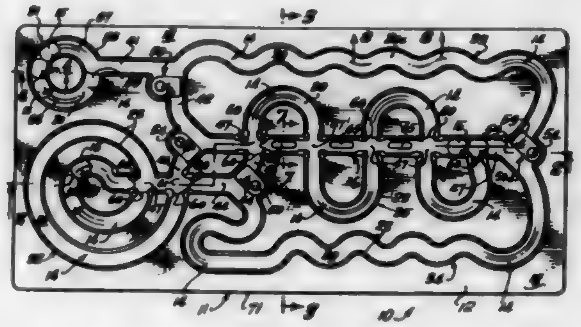
MARBLE TOY

Nicholas E. Schaefer, 29801-B Fir Dr., Evergreen, Colo. 80439

Filed Apr. 2, 1992, Ser. No. 862,296

Int. Cl.⁵ A63H *29/08;* **A63B** *67/14;* **A63D** *3/02*

U.S. Cl. 446—168 **25 Claims**



1. A toy for rolling one or more members therein the toy in combination with a plurality of generally spherical rollable members captured in the toy yet being accessible for manipulation, the toy comprising
- a block of material having a surface in which a series of slots is formed,
- channel means having spaced walls and a floor formed within said block below the slots with which the channel means communicates,
- the slots having a dimension less than that between said spaced walls thereby capturing said one or more rollable members in the channel means,
- the channel means forming a path featuring a plurality of geometrical patterns,
- one or more of said patterns intersecting at least another of said patterns, and
- means for determining the direction for said one or more rollable members mounted in said channel means at the intersecting of said one or more of said patterns with at least another of said patterns.

5,314,368

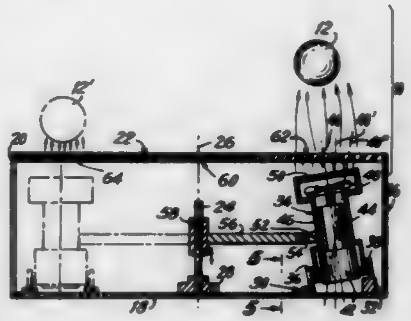
FLYING BALL APPARATUS

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Feb. 3, 1993, Ser. No. 13,032

Int. Cl.⁵ A63H *23/10;* **G09F** *19/02*

U.S. Cl. 446—179 **10 Claims**



1. An action apparatus comprising:
- (a) a housing having an upright housing axis, a base and an annular track mounted on the base, said track having at least one rail of variable undulating height as considered in a circumferential direction around the track;
- (b) an element;
- (c) means in the housing for directing a flow of air to the element with sufficient force to support the element in mid-air above the housing; and
- (d) means for moving the air-supported element in a non-circular path relative to the housing axis.

5,314,369

TWIRLING TOY

Paul H. Gamble, 8330 SW. Pine St., Portland, Oreg. 97223-8779

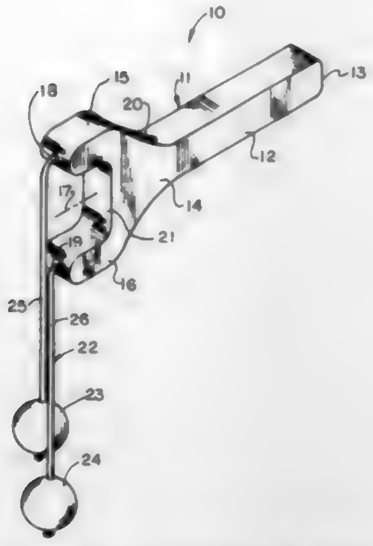
Filed Aug. 24, 1992, Ser. No. 933,769

Int. Cl.⁵ A63H *1/06, 3/52;* **A63B** *67/10*

U.S. Cl. 446—247 **3 Claims**

1. A twirling toy, comprising,
- a handle member, the handle member having an elongate, rigid shaft, the shaft having a shaft axis and the shaft longitudinally aligned about the shaft axis, with the shaft having a first free end and a bifurcated second end, the bifurcated second end including a first leg and a second leg, with the first leg and second leg arranged in a parallel relationship relative to one another, and an equal distance relative to the shaft axis, and

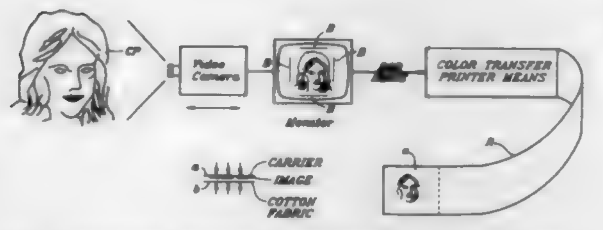
a flexible cord mounted to the bifurcated second end, and the flexible cord having a cord first end and a cord second



end, the cord first end mounting a first sphere, the cord second end mounting a second sphere.

5,314,370
PROCESS FOR PRODUCING A DOLL

Mary L. Flint, 217 Artillery Rd., Middlebury, Conn. 06762
Filed Mar. 25, 1993, Ser. No. 36,961
Int. Cl.⁵ A63H *3/36*
U.S. Cl. 446—391 6 Claims

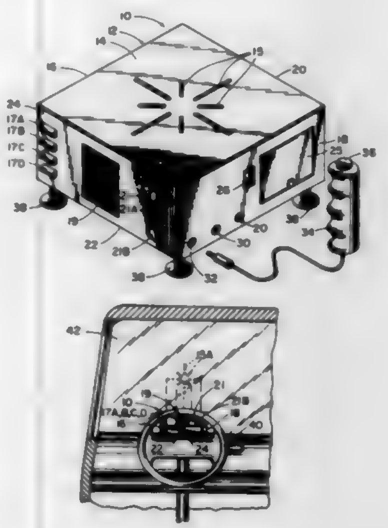


1. A process for producing a doll having a face resembling a certain person including the steps of:

- a. providing a doll having a head and a three-dimensional facial area,
- b. posing a certain person or color photograph of the certain person in front of a color video camera,
- c. using a video monitor having a screen provided with lateral and up-and-down boundary markers, adjusting the position of the person or photograph and the camera so that the face of the certain person is where the sides and top and bottom of the face on the monitor screen generally line up with the respective boundary markers on the monitor screen to produce from the camera an output signal representing a still picture of the face of desired size,
- d. transferring the signal from the video camera to color transfer printer means to produce on a suitable of the face,
- e. juxtaposing the wax layer with the representation of the face against a layer of fabric of natural fiber,
- f. applying to the juxtaposed layers heat and pressure to transfer the wax layer including the representation of the face onto the layer of fabric,
- g. trimming the layer of fabric about the perimeter of the face, and
- h. securing with cement the layer of fabric with the wax representation of the face outward onto the facial area of the doll.

5,314,371
TOY WEAPON SIMULATOR FOR STRESS REDUCTION

Kirk D. Mason, 2304 Cumberland Cir., #215, Clearwater, Fla. 34623
Filed Aug. 2, 1993, Ser. No. 100,315
Int. Cl.⁵ A63H *5/00, 33/26*
U.S. Cl. 446—397 11 Claims

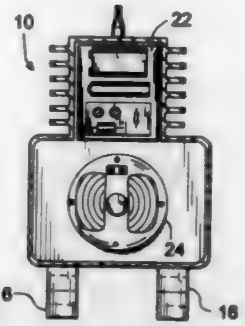


1. A toy for mounting upon the dashboard of a vehicle to reduce the stress of the driver of the vehicle when rude or offensive operator of other vehicles are encountered, comprising:

a housing of predetermined geometrical configuration;
a power switch actuator for connecting a power source to said housing;
at least one tone generator disposed within said housing;
a speaker means in electrical communication with said at least one tone generator;
a least one tone generator actuator switch for actuating said at least one tone generator;
a firing switch in electrical communication with said at least one tone generator actuator switch so that a predetermined sound is generated by said at least one tone generator only when the power switch actuator has been throw, said at least one tone generator switch actuator has been thrown, and said firing switch has been thrown;
said housing having a top wall;
a plurality of elongate slots formed in said top wall;
a plurality of light-emitting means disposed within said housing, there being one light-emitting means associated with each of said elongate slots in closely spaced relation therebelow so that light emitted by said light-emitting means is cast through said elongate slots;
each of said light-emitting means being in electrical communication with said power switch actuator so that activation of said power switch activates each of said light-emitting means; and
said housing adapted to be mounted atop said dashboard so that light emitted through said elongate slots is projected onto the windshield of the vehicle to thereby simulate the presence of a target sight;
whereby a driver of a vehicle may engage the driver of another vehicle in imaginary combat by causing said device to emit preselected sounds.

5,314,372
SIMULATED ENGINE WITH SOUND GENERATOR

Fred J. Kramer, P.O. Box 865, Corning, Calif. 96021
Filed Apr. 12, 1993, Ser. No. 44,694
Int. Cl.⁵ A63H *5/00, 17/28;* B60K *1/00;* B62D *61/02*
U.S. Cl. 446—404 4 Claims

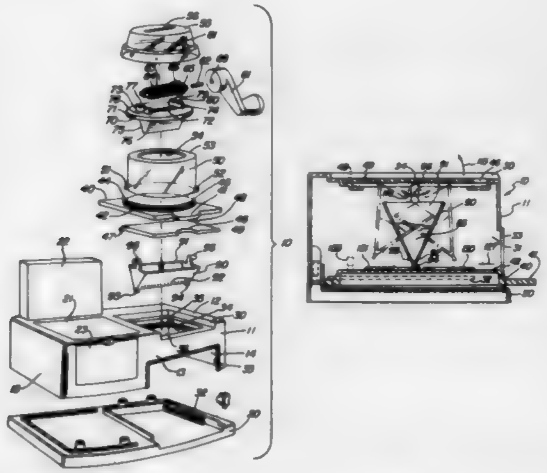


1. A toy sound generator to simulate engine sounds for mounting on a bicycle comprising,

- a) a hollow engine shell with mounting means, said mounting means attachable to frame elements of a bicycle,
- b) batteries in circuit with an audio oscillator and a sound transducer, said batteries, oscillator and transducer located in said shell,
- c) circuit modulation means comprising a bike generator driving a light means which drives a photocell, output from said photocell directed to said audio oscillator,
- d) attachment means to connect said generator to said light means,
- e) said audio oscillator comprising a resistor-capacitor network providing sound signals to said sound transducer, said oscillator modulated by said bike generator as that bicycle said sound generator is mounted upon is caused to move by a user.

5,314,373
TOY FOOD PROCESSOR AND SIMULATED OVEN

Martin J. Caveza, Redondo Beach; Caleb S. Chung, Van Nuys, both of Calif., and Gregory M. Cannone, Toms River, N.J., assignors to Mattel, Inc., El Segundo, Calif.
Filed Feb. 1, 1993, Ser. No. 12,088
Int. Cl.⁵ A63H *33/30*
U.S. Cl. 446—481 17 Claims

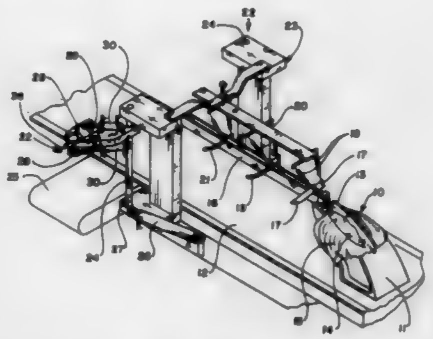


1. A toy oven for use in combination with a crushable food article and a colored powdered food article, said toy oven comprising:

a housing defining a simulated baking chamber;
crushing means for crushing said food article to form a crushed particulate food material suitable for forming into one or more shaped food objects; and
simulated baking means supported proximate said simulated baking chamber and having means for receiving said colored powdered food article and for imparting a baked appearance to said food objects within said simulated baking chamber by depositing a quantity of said colored powdered material thereupon.

5,314,374
APPARATUS FOR REMOVING TENDERS FROM A POULTRY CARCASS

Jay Koch, 177 Ocean Shore Dr., Key Largo, Fla. 33037, and Andrew C. Estes, 211 Widgeon Rd., Russellville, Ark. 72801
Filed Jun. 14, 1993, Ser. No. 76,105
Int. Cl.⁵ A22C *21/00*
U.S. Cl. 452—136 3 Claims



1. In combination with an apparatus for butchering poultry carcasses including conveyor means for advancing the poultry carcasses along a path and means associated with the conveyors for positioning the poultry carcasses upright and longitudinally aligned with the path, an apparatus for removing tenders from the sides of the the poultry carcass, comprising:

a pair of knives positioned alongside said path for severing tendons and ligaments which secure the tenders to the poultry carcass;
plow means positioned alongside said path comprising at least one pair of plows for further severing tendons and ligaments which secure the tenders to the poultry carcass and positioning the tenders for removal without completely separating the tenders from the carcass;
gripping means for gripping the tenders and separating the tenders from the carcass; and
an auxiliary conveyor for receiving the tenders after separation from the keelbone.

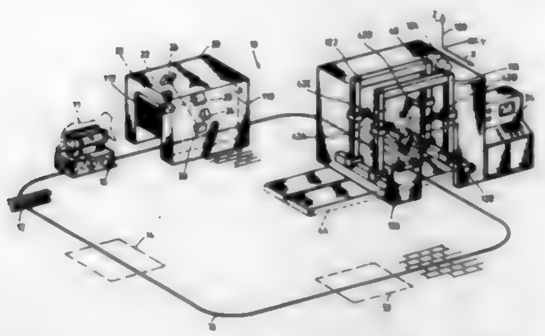
5,314,375
METHOD AND APPARATUS FOR AUTOMATICALLY SEGMENTING ANIMAL CARCASSES

William H. O'Brien, Amarillo, Tex., and James M. Malloy, Albay, Calif., assignors to Texas Beef Group, Amarillo, Tex.
Continuation-in-part of Ser. No. 888,256, May 22, 1992, Pat. No. 5,205,779, which is a continuation of Ser. No. 754,527, Sep. 4, 1991, abandoned. This application Jan. 21, 1993, Ser. No. 6,831
Int. Cl.⁵ A22C *25/04*
U.S. Cl. 452—157 18 Claims

1. An apparatus for segmenting an animal carcass, said apparatus comprising:

an imaging station having a vision system, said vision system being arranged to scan at least a portion of said carcass, said vision system producing a signal corresponding to only an interior image of said scanned portion of said carcass;
a computer coupled to said vision system, said computer receiving said signal and processing said signal to determine a cutting path for segmenting said carcass; and

a cutting station being coupled to said computer, said cutting station having at least one cutting implement being controllably moveable along said cutting path to segment said [redacted]



5,314,376

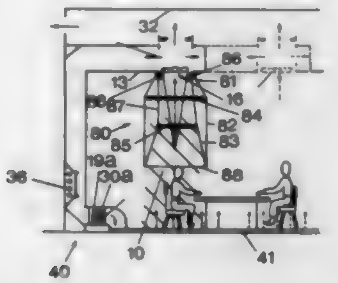
AIR CONDITIONER

Kullapat Kuramarohit, P.O. Box 23, Maggasan P.O., Bankgkok 10402, Thailand

Filed Oct. 1, 1990, Ser. No. 590,794

Int. Cl.⁵ F24F *7/10*

U.S. Cl. 454—186 7 Claims



1. Air conditioning delivery apparatus comprising:

a) a region enclosing a volume of air within a space at least partially defined by an upper surface and a lower surface;

b) an air flow system associated with said region forming one or more air flow loops including;

- i) means for redirecting floor air to said region vertically disposed within said space, said means for redirecting floor air located substantially directly beneath said region at said lower surface and further comprising a plurality of downward-facing elongated channel members laid side by side on a supporting surface such that the channels and supporting surface form a plurality of passageways, each of said channel members including a plurality of aperture means on at least one side of the channel member for redirecting air through said region;
- ii) at least one air collection means for collecting air from said region;
- iii) ducting means for transferring air between said means for redirecting and said air collection means;
- iv) means for moving air being located within said one or more air flow loops of said air flow system;
- v) means for air temperature adjustment situated within at least one of said air flow loops;
- vi) means for fresh air ingress communicating with the air flow system;

wherein said air collection means comprises an overhead hood extending downward form the upper surface, including:

A) a top portion, wherein said top portion forms an envelope joining an aperture in the upper surface, and

B) a flexible lower portion, said lower portion being of a flexible material joined at an upper edge thereof t the top portion with an outer ring and further including: an outer portion, and a mobile inner portion joined at a lower edge thereof to an inner ring, said inner portion being formed from the lower portion by folding the lower portion inside itself; and

C) plural lines attached to the inner ring and passing through at least tow pulley means located above the lower portion for raising the lower edge to a desired height.

5,314,377

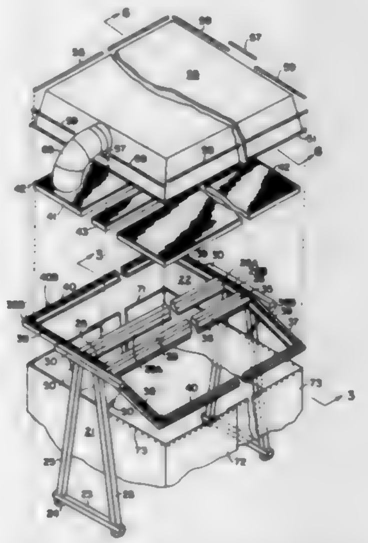
CLEAN AIR ISOLATION ENCLOSURE

Michael H. Pelosi, III, Birchrunville, Pa., assignor to Airo Clean Inc., Exton, Pa.

Filed Oct. 5, 1992, Ser. No. 956,680

Int. Cl.⁵ F24F *7/007*

U.S. Cl. 454—187 6 Claims



1. Portable clean air enclosure providing a contaminant free environment within a room and adapted to be connected to a source of clean air comprising:

a pair of spaced apart upstanding frame members;

a generally rectangular center section connecting the frame members at their upper ends;

horizontal wing support members mounted on the upper end of each of the frame members and extending outwardly beyond either side of the center section;

a pair of wing members hingedly connected to opposing side edge portions of said center section actuatable from a downwardly depending retracted position to an upper position aligned with the support members;

releasable latching means operatively associated with the support members for securing the wing members in the upper limit position; and

curtain means attached to said wing members and said center section and depending downwardly therefrom forming therewith an isolation enclosure.

5,314,378

REAR DIFFERENTIAL GEAR LOCK CONTROLLER WITH AUTOMATIC UNLOCK CONTROL MEANS

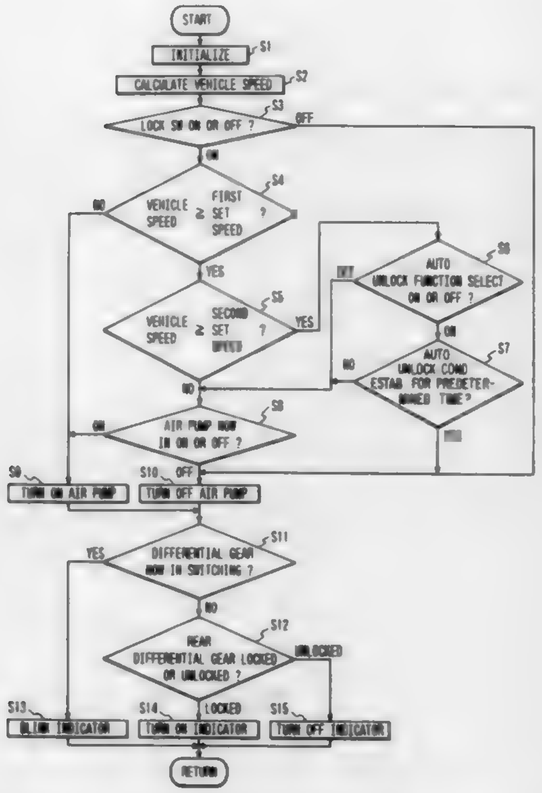
Shigeki Ohtagaki, and Hirosi Watanabe, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1992, Ser. No. 936,004

Claims priority, application Japan, Aug. 27, 1991, 3-215001

Int. Cl.⁵ B60K *23/04;* F16H *37/08*

U.S. Cl. 475—150 3 Claims


START
INITIALIZE
S1
CALCULATE VEHICLE SPEED
S2
LOCK SW ON OR OFF ?
S3
OFF
ON
VEHICLE SPEED ≥ FIRST SET SPEED ?
S4
NO
YES
VEHICLE SPEED ≥ SECOND SET SPEED ?
S5
YES
NO
AUTO UNLOCK FUNCTION SELECT ON OR OFF ?
S6
OFF
ON
AUTO UNLOCK COND ESTAB FOR PREDETERMINED TIME ?
S7
NO
YES
AIR PUMP NOW IN ON OR OFF ?
S8
ON
OFF
S9
TURN ON AIR PUMP
S10
TURN OFF AIR PUMP
DIFFERENTIAL GEAR NOW IN SWITCHING ?
S11
YES
NO
REAR DIFFERENTIAL GEAR LOCKED OR UNLOCKED ?
S12
UNLOCKED
LOCKED
S13
BLINK INDICATOR
S14
TURN ON INDICATOR
S15
TURN OFF INDICATOR
RETURN

1. A rear differential gear lock controller comprising:

driving means for driving a mechanism for locking a rear differential gear of a vehicle;

first instruction means for issuing an instruction for locking and unlocking said rear differential gear;

second instruction means for issuing an instruction for automatically unlocking said rear differential gear;

a speed sensor for detecting a speed of said vehicle;

detecting means for detecting a locked state of said rear differential gear;

automatic unlock condition judging means for judging that an automatic unlock condition, based on said second instruction means, has been established and including means for judging that said locked state of said rear differential gear has been detected for a predetermined time at a vehicle speed greater than or equal to a second set vehicle speed, said second set vehicle speed being greater than a first set vehicle speed; and

a control means for allowing said rear differential gear to be locked by an operation of said instruction means whenever the vehicle speed is less than said first set vehicle speed, for prohibiting said rear differential gear from locking at a speed greater than or equal to said first set vehicle speed, and for automatically unlocking said locked state without said operation of said instruction means when said automatic unlock condition has been established.

5,314,379

MAILER FORM AND A COMPOUND FOR PROTECTING AN IMAGE TRANSFER MEDIUM

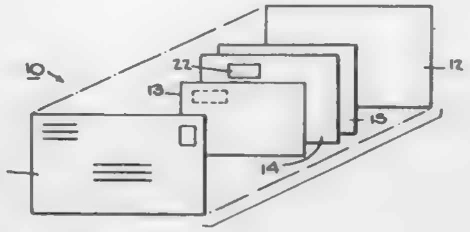
Frank Neubauer, Mount Kisco, N.Y.; Gordon Pickett, Reynoldsburg, and Barbara A. Metz, Baltimore, both of Ohio, assignors to Transkrit Corporation, Brewster, N.Y.

Filed Dec. 18, 1992, Ser. No. 992,581

The portion of the term of this patent subsequent to Apr. 20, 2010, has been disclaimed.

Int. Cl.⁵ B41L *1/20*

U.S. Cl. 462—6 11 Claims



1. A mailer form comprising

a front ply having a front face for impacting of an imaging means thereon and a rear face;

a back ply secured to said front ply to define a pocket therewith;

at least one insert ply disposed in said pocket between said front ply and said back ply;

an image transfer medium on said rear face of said front ply for transferring an image imposed on said front ply under an impact force of an imaging means onto said insert ply; and

a polyethylene wax overcoat over at least a part of said transfer medium to reduce transfer of an image imposed on said front ply under a transversely applied force onto said insert ply while transferring an image imposed on said front ply under an impact force onto said insert ply.

5,314,380

STRUCTURE OF UNIVERSAL JOINT

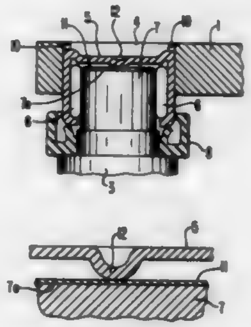
Yoshimi Yamamoto, Shizuoka, Japan, assignor to Fuji Kiko Company, Ltd., Japan

Continuation of Ser. No. 598,939, Oct. 17, 1990, abandoned. This application Feb. 5, 1993, Ser. No. 14,009

Claims priority, application Japan, Oct. 23, 1989, 1-123743[U]

Int. Cl.⁵ F16C *1/24;* F16D *3/40*

U.S. Cl. 464—11 7 Claims



1. A universal joint structure, comprising:

(a) a pair of yoke portions facing each other;

(b) a trunnion linking the pair of yoke portions to each other so as to enable mutual tilting of both yoke portions, the trunnion having a spider;

(c) a wholly flat end surface of the spider having a solid lubricant coating affixed thereto; and

(d) a bearing cup having a projection with an arc-shaped engagement portion at a center portion thereof, the bearing cup being inserted operatively between said flat end surface of the spider and an inner wall of a respective one of the yoke portions, and the arc-shaped engagement portion of said projection being contacted against the solid lubricant coating of the flat end surface of the spider in a point-to-point contact.

5,314,381
DETENT ARRANGEMENT FOR THE COUPLING PIN OF AN OVERLOAD ELEMENT, PARTICULARLY IN AN OVERLOAD CLUTCH

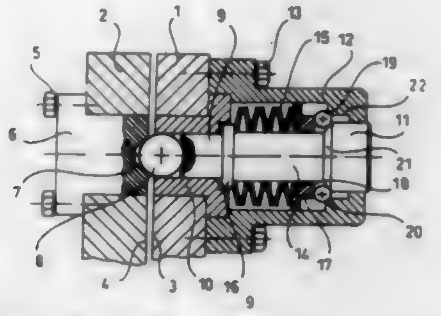
Ruprecht Maurer, Bad Homburg vor der Höhe, Fed. Rep. of Germany, assignor to Ringspann GmbH, Bad Homburg, Fed. Rep. of Germany

Filed Aug. 19, 1992, Ser. No. 932,383

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1991, 4132193; Oct. 23, 1991, 4134919

Int. Cl.⁵ F16D *7/02*

U.S. Cl. 464—30 **17 Claims**



1. An overload clutch comprising:
(a) a first clutch half;
(b) a second clutch half facing said first clutch half;
(c) a housing disposed adjacent said first clutch half;
(d) a coupling pin including a longitudinal axis, a front pin end disposed within said first clutch half and a rear pin end disposed within said housing;
(e) a detent arrangement having a locked position and an unlocked position, the locked position of said detent arrangement being defined by said front pin end being in form locking engagement with said second clutch half, and the unlocked position of said detent arrangement being defined by said form locking engagement having been released due to an overloading of said clutch, said detent arrangement being configured such that, during an overloading of said clutch, said coupling pin moves along said longitudinal axis and away form said second clutch half for releasing said form locking engagement, said detent arrangement further including a spring arrangement surrounding said rear pin end within said housing, said spring arrangement having a front spring end facing toward said front pin end, and a rear spring face facing toward said rear pin end; wherein said detent arrangement further includes:
(i) a slide ring disposed within said housing and having a front slide ring face and a rear slide ring face, said front slide ring face being urged against said rear spring face, said slide ring thereby supporting said spring arrangement within said housing at said rear spring face;
(ii) a radial shoulder disposed on said coupling pin at said front pin end, said radial shoulder being urged against said front spring face for supporting said spring arrangement within said housing at said front spring face;
(iii) a radially outwardly extending coupling pin cone envelope face disposed on said coupling pin at said rear pin end, said coupling pin cone envelope face being oriented toward said second clutch half;
(iv) a contact face disposed on said housing and oriented toward said second clutch half; and
(v) a plurality of locking elements circumferentially distributed about said coupling pin such that, in a locking position of said detent arrangement, said locking elements are captured between said slide ring, said coupling pin cone envelope face, and said contact face, and such that, during an overloading of said clutch, said locking elements are displaced initially toward said longitudinal axis and thereafter generally parallel to said longitudinal axis within a housing bore surrounding said coupling pin and disposed further away from said second clutch half than said contact face.

5,314,382
TORQUE-TRANSMITTING COUPLING MEMBER

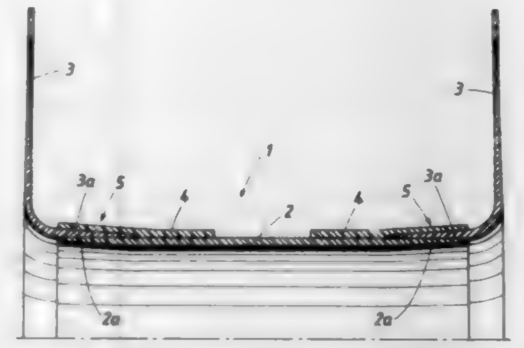
Peter Pfeifer, Salzburg, Austria, assignor to Geislinger & Co. Schwingungstechnik Gesellschaft m.b.H., Salzburg, Austria

Filed Aug. 28, 1992, Ser. No. 937,963

Claims priority, application Austria, Sep. 24, 1991, A 1920/91

Int. Cl.⁵ F16C *3/00*

U.S. Cl. 464—181 **4 Claims**



1. A torque-transmitting coupling member comprising
(a) a tube having opposite ends,
(b) a flange having an axial extending portion adjoining one of the tube ends,
the tube and the flange consisting of two separate prefabricated parts of fiber-reinforced plastic and being arranged such that the axial extending portion overlaps the one tube end, and
(c) a sleeve overlapping the axial extending potion and connecting the flange to the one tube end,
the separate tube and the separate flange being adhesively joined to each other by said sleeve.

5,314,383
ROCKING SHIP FUNFAIR RIDE

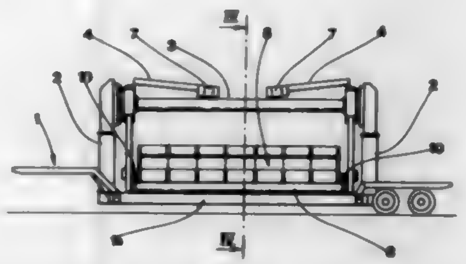
Licinio Fabbri, Bergantino, Italy, assignor to Far Fabbri S.r.L., Bergantino, Italy

Filed Jan. 15, 1993, Ser. No. 5,124

Claims priority, application Italy, Jan. 29, 1992, M092 A 000010

Int. Cl.⁵ A63G *1/08, 31/16*

U.S. Cl. 472—45 **3 Claims**



1. An improved "rocking ship" funfair ride of the type mountable on a plane of a carriage and comprising:

a pair of parallel, telescopic, upright members, each having an upper end, a lower end, an inner side, an outer side, and an adjustable height;
a pair of parallel levers, each having two arms of equal length projecting in opposite directions from a fulcrum, each of said arms having an outer end distant from said fulcrum and an inner end adjacent said fulcrum;
a shaft rigidly connected to, and extending between said lever fulcrums, said shaft having a central axis and being perpendicular to said levers and holding said levers in spaced, parallel relationship to each other, and said shaft being rotatably mounted to the upper ends of said upright members;
motor means for rotating said levers and said shaft about said central axis of said shaft;
a ship arranged parallel to said shift, and having a plurality of seats, two lateral ends, and a predetermined height, with said lateral ends being rotatably connected at two points defining a ship rotation axis to the respective outer ends of two of said lever arms on a same side of said lever fulcrums; and
brake means for controlling rotation of said ship; wherein
the two lever arms opposite to the lever arms connected to the ship are hinged at the respective inner ends and foldable inwardly from said upright members and parallel to said shaft; and
a maximum height of said ship is less than the length of an arm of said levers, a minimum height of said upright members is greater than the length of an arm of said levers, and a maximum height of said upright members is greater than a sum of the length of an arm of said levers and said maximum height of said ship.

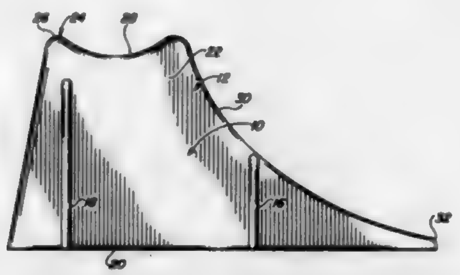
5,314,384
COLLAPSABLE RAMP FOR PROJECTING BOWLING BALLS

Mark Ross-Sullivan, 580 Mercedes Ave., Pasadena, Calif. 91107

Filed Nov. 19, 1992, Ser. No. 978,585

Int. Cl.⁵ A63D *5/00*

U.S. Cl. 473—55 **8 Claims**



1. An improved, portable, child's bowling aid device, said device comprising, in combination:
a) first and second vertical side plates, each of said side plates having 1) a flat horizontal bottom extending along its length 2) an undulating top, including:
i) means for releasably retaining a bowling ball on said device, including a rear dish-shaped bowling ball-retaining top portion, and
ii) a front portion which slopes from said rear top portion to the forward end of said bottom,
b) a rear transverse vertical crossplate connected to said first and second vertical side plates adjacent the rear end of said side plates and holding said side plates in spaced parallel relation, said rear cross plate having each end thereof extending a distance from each respective vertical side plate to provide stability to said device,
c) a front transverse vertical crossplate shorter than said rear transverse vertical crossplate and connected to said first and second vertical side plates adjacent the front end of said side plates and holding said side plates in spaced parallel relation,
said device being adapted to received and cradle a bowling ball on said top rear portion after positioning said device at a predetermined position on a bowling lane and permitting said bowling ball to be moved forward from its resting position and to be easily rolled down said slope for bowling said ball onto a bowling lane from said predetermined position.

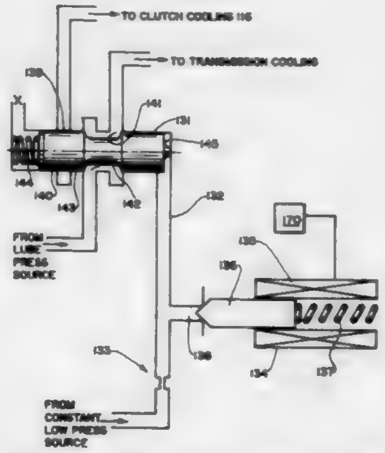
5,314,385
SYSTEM FOR COOLING A STARTING CLUTCH OF A CONTINUOUSLY VARIABLE TRANSMISSION

William J. Haley, Chippewa Falls, Wis.; Alan L. Miller, and Karl F. Schneider, both of Ithaca, N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Nov. 13, 1992, Ser. No. 975,736

Int. Cl.⁵ F16H *61/00*

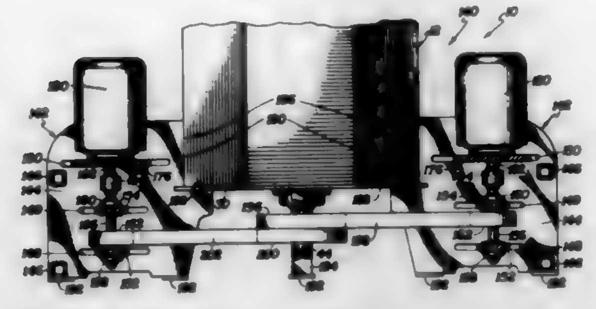
U.S. Cl. 474—28 **20 Claims**



1. A clutch cooling system for cooling a clutch used in combination with a continuously variable transmission having an input variable-diameter pulley and an output variable-diameter pulley, said pulleys each having a fixed sheave and a movable sheave, a belt connecting said pulleys, and a means for controlling axial movement of said input movable sheave and said output movable sheave to alter the effective diameter of said input pulley to provide a continuously variable drive ratio, and to alter the effective diameter of said output pulley to maintain belt tension, said cooling system comprising:
a pressure controlled spool valve having a first position and a second position, said first position allowing flow of cooling fluid to a clutch cooling circuit, and said second position allowing flow of cooling fluid to a transmission cooling circuit, said spool valve position being determined by the amount of pressure applied to a remote end of said spool valve;
a conduit linking said remote end of said pressure controlled spool valve to a pressure source;
a port extending from said conduit;
a solenoid valve adjacent to said port such that it controls flow through said port;
a restrictive orifice within said conduit located between said pressure source and said port; and
a solenoid valve capable of adjustment of said spool valve between said first and second positions by energization of said solenoid valve, energization of said solenoid valve being effective to provide a regulation of the pressure applied at said remote end of said spool valve.

5,314,386
DRIVE DEVICE FOR A ROTATABLE SHAFT

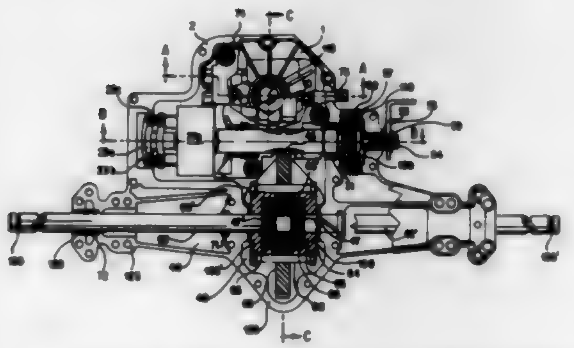
Russel L. Eide, and Eric P. Eide, both of Mondovi, Wis., assignors to Light Work Inc., New Underwood, S. Dak.
Filed Jun. 18, 1992, Ser. No. 900,115
Int. Cl.⁵ F16H *7/00*
U.S. Cl. 474—84 **20 Claims**



11. Device for driving a rotatable shaft of an apparatus comprising, in combination: first and second carriers, with each of the carriers including a jack shaft rotatably mounted by first and second bearings about an axis parallel to the rotatable shaft of the apparatus and including means on the jack shaft between the first and second bearings for rotatably relating the jack shaft to the rotatable shaft of the apparatus, with the jack shaft of the first carrier being diametrically opposite the rotatable shaft of the apparatus and the jack shaft of the second carrier; means for rotating the jack shaft of the first carrier; and means for rotating the jack shaft of the second carrier.

5,314,387
HYDROSTATIC TRANSMISSION

Ray M. Hauser, Decatur, Ill., and Alan W. Johnson, Ames, Iowa, assignors to Hydro-Gear Limited Partnership, Sullivan, Ill.
Continuation-in-part of Ser. No. 727,463, Jul. 9, 1991. This application Jul. 22, 1992, Ser. No. 917,858
Int. Cl.⁵ F16H *47/04*
U.S. Cl. 475—74 **4 Claims**

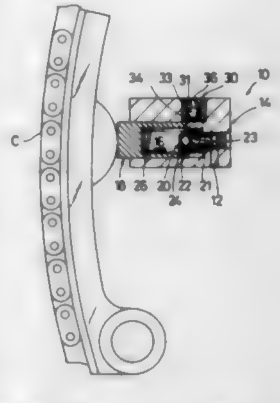


1. A hydrostatic transmission for use in a vehicle to convert rotational power from the vehicle engine to output axle means of said vehicle, comprising

- (a) at least one hydraulic displacement pump located in the housing for said hydrostatic transmission and having a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons, and receiving a rotatable input shaft;
- (b) at least one hydraulic displacement motor located in said housing and having a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons;
- (c) means for driving a rotatable output drive mechanism;
- (d) mounting means for rotatably mounting said hydraulic displacement pump and said hydraulic displacement motor;
- (e) porting means integrally formed with said mounting means for hydraulically connecting said hydraulic displacement pump to said hydraulic displacement motor;
- (f) hydraulic transfer means comprising said piston chambers of said hydraulic displacement pump, said piston chambers of said hydraulic displacement motor and said porting means wherein the displacement of said piston chambers of said hydraulic displacement motor is larger than the displacement of said piston chambers of said hydraulic displacement pump; and
- (g) means for reducing the speed of said input shaft, wherein at least a portion of the speed reduction of said input shaft is accomplished through said hydraulic transfer means and a portion of said reduction is taken through at least one set of mechanical gears.

5,314,388
OIL-OPERATED TENSIONER WITH AIR BLEEDING MECHANISM

Tadasu Suzuki, Chicopee, Mass., and Kiyotaka Sakamoto, Hanno, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan
Filed Jun. 10, 1993, Ser. No. 74,783
Claims priority, application Japan, Jun. 10, 1992, 4-046124[U]
Int. Cl.⁵ F16H *7/08*
U.S. Cl. 474—110 **4 Claims**



1. An oil-operated tensioner comprising:
means providing a hollow housing having an interior and an exterior;
means providing a plunger slidable in the interior of the hollow housing and, together with the housing-providing means, forming an oil chamber;
an oil passage formed in said housing extending from the exterior thereof to the oil chamber;
means comprising a first ball check valve, located between the oil passage and the oil chamber, for allowing flow of oil through the oil passage into the oil chamber but checking flow of oil through the oil passage out of the oil chamber;
means comprising a second ball check valve for checking oil flow outwardly from the oil chamber, the second ball check valve being mounted in a position above the oil chamber, whereby oscillation of the tensioner, permitted by the presence of air along with oil in the oil chamber, and resulting oscillatory opening and closing of the second ball check valve, permit the release of air through the second ball check valve to the exterior of said oil chamber without substantial escape of oil from the oil chamber.

5,314,389
EXERCISE MONITOR

Simon Dotan, 47 Vradim Street, Natanya, Israel
Filed Mar. 12, 1992, Ser. No. 851,684
Claims priority, application Israel, Mar. 12, 1991, 097526
Int. Cl.⁵ A61B *5/00*
U.S. Cl. 482—3 **9 Claims**

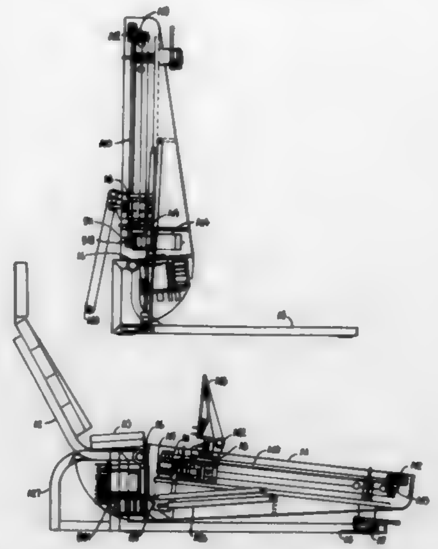
2. An exercise system for providing a vocal indication of a pulse rate at any desired point of time to an exercising person, comprising in combination an ECG device including electrodes for attachment to the person, earphones, one of the electrodes forming part of one of the earphones, a control means for controlling input to the earphones, a filter and amplification means connected between the ECG device and the control means, the control means comprising a speech synthesizer and being connected to an active combiner, where the combiner is adapted for connection to an audio player means for playing audio information via the earphones, the control means being operable to control the combiner, said combiner being connected via an audio amplifier to the earphones.

5,314,390
LINEAR TRACKING PROGRAMMABLE EXERCISER

Stephen Westing, Davis, and Glen R. Mangseth, El Dorado Hills, both of Calif., assignors to Loredan Biomedical, Inc., West Sacramento, Calif.
Continuation-in-part of Ser. No. 110,347, Aug. 20, 1993, which is a continuation-in-part of Ser. No. 473,281, Jan. 31, 1992, abandoned. This application Jun. 12, 1992, Ser. No. 898,969
Int. Cl.⁵ A63B *21/005*
U.S. Cl. 482—6 **33 Claims**

16. An exercise apparatus comprising:
a base for placing the exercise apparatus on a surface;
a horizontally extending guide coupled to the base, the guide having a horizontally extending axis;
a first reciprocating member coupled to the guide for motion in the direction of the axis;
a second reciprocating member coupled to the guide for motion in the direction of the axis;
control means for selectively controlling the motion of the reciprocating members with respect to each other between a reciprocal motion and a tandem motion; and
position selecting means for selectively positioning said guide between first and second position relative to the base.

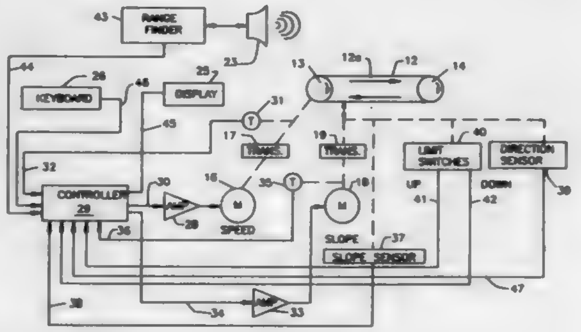
30. An exercise apparatus comprising:
a horizontally extending guide having a horizontally extending axis;
a first reciprocating member coupled to the guide for linear motion in the direction of the axis;
a second reciprocating member coupled to the guide for linear motion in the direction of the axis;



control means including motion constraining means for constraining the linear motion of at least one of the reciprocating members to be at a constant rate of change of velocity.

5,314,391
ADAPTIVE TREADMILL

Robert L. Potash, Dedham; Carl J. Jentges, Brighton, both of Mass.; Stephen K. Burns, Durham, N.H., and Richard J. Potash, Dedham, Mass., assignors to Computer Sports Medicine, Inc., Waltham, Mass.
Filed Jun. 11, 1992, Ser. No. 897,250
Int. Cl.⁵ A63B *24/00*
U.S. Cl. 482—7 **29 Claims**



1. An adaptive treadmill comprising:
a movable tread capable of supporting a person;
motor means for moving the tread at a speed which may be varied;
control means responsive to a control signal and coupled to said motor means for varying the speed of the tread;
detecting means for determining the position of a person on said tread relative to a reference position and generating said control signal to change the speed of the tread when the position of said person bears a predetermined relationship to said reference position; and
means for determining the rate of change of said person's position relative to said reference position and modifying said control signal in response thereto.

19. An adaptive treadmill comprising:

a movable tread capable of supporting a person;

motor means for moving the tread in accordance with at least one exercise parameter;

control means responsive to a control signal and coupled to said motor means for varying said at least one exercise parameter of the tread; and

detecting means for determining the position of a person on said tread relative to a reference position and generating said control signal to change said at least one exercise parameter when the position of said person bears a predetermined relationship to said reference position,

said control means stopping the movement of the tread when said detecting means determines that no one is on the tread.

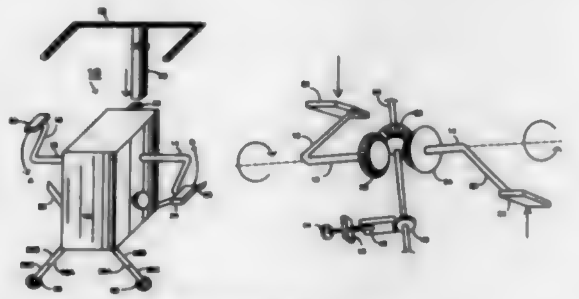
5,314,392
PORTABLE PEDAL EXERCISER

Tranel Hawkins, 831 Spencer Ave., San Jose, Calif. 95125, and Robert S. Smith, 1263 Emory St., San Jose, Calif. 95126

Filed Jun. 11, 1993, Ser. No. 75,742

Int. Cl.⁵ A63B *22/04, 22/06*

U.S. Cl. 482—57 **11 Claims**



1. An exerciser which comprises:

a housing base adapted for positioning on a floor;

a pair of crankshafts rotatably mounted in said housing base positioned on a common center line;

a pair of bevel gears, one gear of said pair mounted on one of said crankshafts, respectively;

a third bevel gear with an idler shaft rotatably mounted in said housing base and engaging both said gears of said pair of bevel gears such that when one crankshaft turns in one direction, the other crankshaft turns in an opposite direction;

a pedal crank having a pedal on one end and another end secured substantially perpendicularly to one of said crank shafts respectively;

means for applying an adjustable resistance to turning said crankshafts.

5,314,393
WATER JUMP ROPE

Arnold Rubio, 17437 Palora St., Encino, Calif. 91316, and Michael J. Poulin, 6686 Tenth Line West, Mississauga, Ontario, Canada L5N 5L4

Filed Sep. 3, 1992, Ser. No. 940,066

Int. Cl.⁵ A63B *5/20*

U.S. Cl. 482—82 **1 Claim**

1. An apparatus for use as a jump rope comprising

a first hollow flexible tube segment;

a second hollow flexible tube segment, said second hollow flexible tube segment having a series of openings through the walls of said second hollow flexible tube segment;

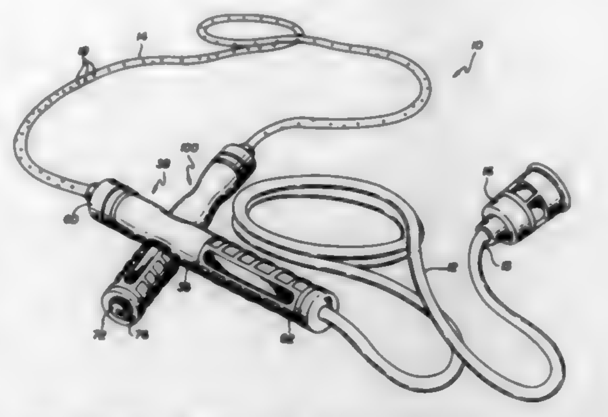
said first hollow flexible tube segment having means for connecting its first end to a source of water and its second end to the first end of said second hollow flexible tube segment;

said second hollow flexible tube segment having its second end sealed; and

two handles;

the first handle surrounding the juncture between the first hollow flexible tube segment and the second hollow flexible tube segment, and the second handle surrounding said second end of said second hollow flexible tube segment

and wherein said first and second hollow flexible tube segments rotate freely within said handles, as the handles are grasped and the second hollow flexible tube segment is rotated, thereby allowing the spraying of fluid over a user as the device is rotated about a user.



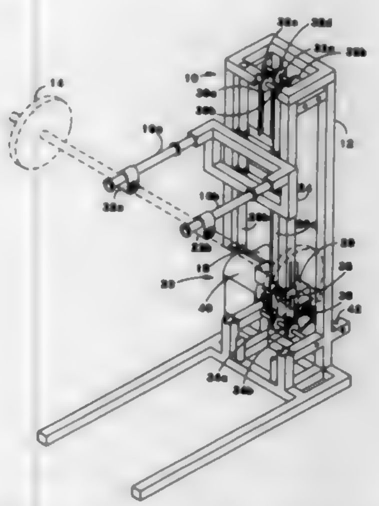
5,314,394
SPOTTING APPARATUS FOR ASSISTING A WEIGHTLIFTER

John J. Ronan, 15 Tremont St., Newburyport, Mass. 01950

Continuation-in-part of Ser. No. 816,630, Dec. 31, 1991, abandoned. This application Aug. 20, 1992, Ser. No. 933,029

Int. Cl.⁵ A63B *21/078*

U.S. Cl. 482—104 **11 Claims**



1. A weightlifting apparatus for providing spotting assistance to a weightlifter, said apparatus comprising:

a support structure including a first support arm attached to said support structure and a first bar spotting unit attached to said support arm, wherein said bar spotting unit is adapted to receive a weightlifting bar such that the bar may be moved from a lower position within said bar spotting unit to an upper position within said bar spotting unit;

position sensor means associated with said bar spotting unit for providing a lower position output signal indicative of the presence of said bar at said lower position;

weight sensor means for producing a weight output signal indicative of the gravitational force exerted by the weightlifting bar on said spotting unit;

assisting means for providing lifting assistance to the weightlifter; and

control means for controlling said assisting means responsive to said lower position output signal.

5,314,395
AQUATIC REHABILITATION PLATFORM

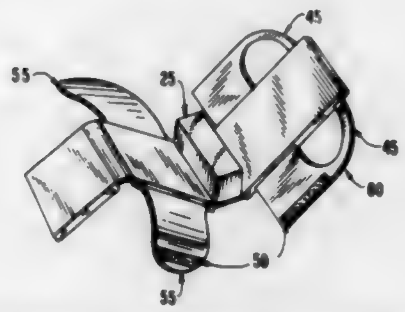
Peter A. Ciolino, 561 Cherry Tree La., Kinnelon, N.J. 07405

Continuation-in-part of Ser. No. 530,620, May 30, 1990, Pat. No. 5,149,314, which is a continuation-in-part of Ser. No. 359,215, May 31, 1989, abandoned. This application Jun. 5, 1992, Ser. No. 894,181

The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.

Int. Cl.⁵ A63B *21/008*

U.S. Cl. 482—111 **7 Claims**



1. In combination in an apparatus to provide support and buoyancy to a user during a rehabilitation exercise routine performed in an aquatic environment comprising: a first flotation section configured and dimensioned to correspond to the shape of the user's back as extending from the upper shoulders to the waist of the user and having sufficient buoyancy to support the user's back at about the level of water in the aquatic environment, a second flotation section configured and dimensioned to correspond to the shape of the user's seat as made up of the buttocks to the upper thigh region of said user and having sufficient buoyancy to support said seat at about the level of water in said aquatic environment, and a first hinge means connecting said first flotation section with said second flotation section wherein said hinge means has restricted angle flexing and said first flotation section includes symmetrically positioned pontoons attached to said first flotation section for increased stability.

5,314,396
PERFORMANCE ALIGNMENT REACTION TOOL OF EXERCISE USING THE PERFORMANCE ALIGNMENT REACTION TOOL

Robert G. Parr, 3901 Rushton Crescent, Mississauga, Ontario, Canada L5L 4H5

Filed Mar. 6, 1992, Ser. No. 848,409

Int. Cl.⁵ A63B *21/02*

U.S. Cl. 482—126 **22 Claims**

1. A performance alignment reaction tool comprising:

a control bar;

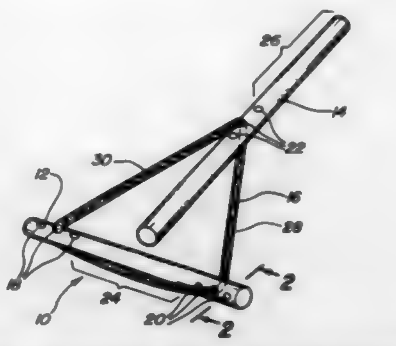
an alignment bar substantially normal to said control bar, said control bar and said alignment bar are cylindrical bars having an axis of symmetry; and

means for elastically connecting at least one intermediate location on said alignment bar to spatially separated locations on said control bar, said means for elastically connecting comprises:

said control bar having at least one pair of through holes provided therethrough normal to said axis of symmetry of said control bar,

said alignment bar having at least one hole provided therethrough normal to said axis of symmetry of said alignment bar; and

a length of elastic material connecting each hole of said pair of through holes provided through said control bar to said at least one hole provided through said alignment bar, said control bar and said length of elastic material forming an isosceles triangle in which said hole provided through said alignment bar is the apex of said isosceles triangle.



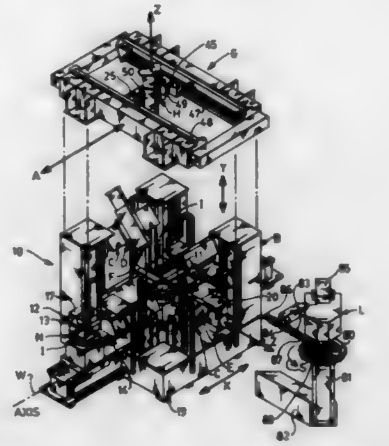
5,314,397
POSITIONING APPARATUS FOR MULTIPLE-SPINDLE MACHINING

Daniel M. Mills, Riverview; Richard Ogletree, Southfield, both of Mich., and Thomas J. Lindem, Rockford, Ill., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1992, Ser. No. 923,436

Int. Cl.⁵ B23Q *3/157*

U.S. Cl. 483—30 **18 Claims**



1. Positioning apparatus for multiple-spindle machining within a predetermined machine space, comprising:

(a) at least three upstanding columns rigidly interconnected to a common platform and aligned substantially parallel to each other and substantially perpendicular to said platform within an accuracy of ±0.0005 inches;

(b) rail means extending between each of said columns along the periphery defined by the footprint of said columns for providing movable support and having bearing means providing for movability of each rail means along a Y-axis;

(c) other movement means slidable on each of said rail means along at least another axis of movement;

(d) linear motor means for selectively moving said rail means between locations along said y axis and for selectively moving said other movement means along said another axis at peak accelerations or decelerations of about 1–2 G's; and

(e) spindle means supported on each said other movement means and having a spindle rotationally driven about an adjustable S-axis.

5,314,398

FLOWER POT OR FLOWER POT COVER WITH BASE HAVING OVERLAPPING FOLD SOME OF WHICH ARE CONNECTED AND SOME OF WHICH ARE UNCONNECTED

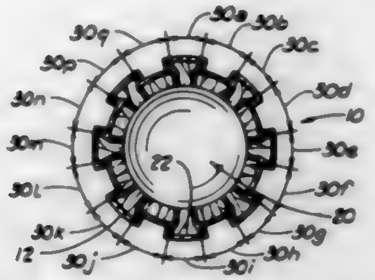
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 701,390, May 16, 1991, which is a continuation-in-part of Ser. No. 397,114, Aug. 22, 1989, Pat. No. 5,029,412, which is a continuation-in-part of Ser. No. 366,588, Jun. 15, 1989, Pat. No. 5,111,613, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Aug. 31, 1992, Ser. No. 937,570

The portion of the term of this patent subsequent to Jul. 20, 2010, has been disclaimed.

Int. Cl.⁵ A01G *9/02*

U.S. Cl. 493—121 **4 Claims**



1. A method for making a flower pot or flower pot cover comprising:

forming a base having an upper end and a lower end with an object opening extending through the upper end of the base by forming a plurality of overlapping folds in said base extending at various angles and having different and various lengths;

dividing some base into a plurality of segments with each segment defining an area extending between the upper and lower end of the base and with each segment defining a circumferential distance about the base;

designating some of said segments as connected segments and some of said segments as unconnected segments; and connecting the folds in the connected segments only.

5,314,399

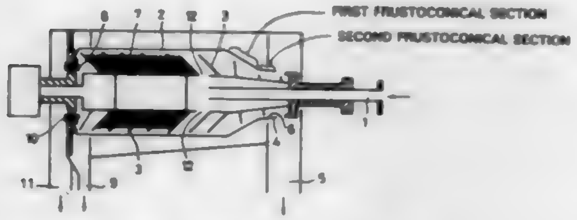
SEDIMENTATION CENTRIFUGE WITH HELICAL FINS MOUNTED ON THE SCREW CONVEYOR

Souroku Suzuki, Mobara, Japan, assignor to Kotobuki Techrex Ltd., Kawasaki, Japan

Continuation of Ser. No. 748,207, Aug. 20, 1991, abandoned. This application Feb. 3, 1993, Ser. No. 13,249

Int. Cl.⁵ B04B *1/20*

U.S. Cl. 494—54 **3 Claims**



3. A sedimentation centrifuge, comprising:

an elongated, hollow, rotatable, solid-wall bowl adapted to receive a mixture of a liquid and solids, said bowl being rotatable about a longitudinally extending axis, said bowl having a cylindrical section having first and second axial ends, said bowl having first and second, coaxial, truncated conical, canted sections connected in series with each other, said first canted section extending away from said first end of said cylindrical section, said second canted section being adjacent to and extending away from said first canted section, said first and second canted sections each having a tapered wall, said tapered walls each extending at an acute angle to the axis of rotation of said bowl, said tapered wall of said first canted section being tapered at a larger angle than said tapered wall of said second canted section, said bowl having a first outlet for solids at an axially outer end of said second canted section, said bowl having a second outlet for liquid at said second end of said cylindrical section; a rotatable, helical screw conveyor rotatably mounted inside said bowl and extending substantially the full length thereof, said screw conveyor having a screw flight which is inclined with respect to the axis of rotation of said bowl and conforms to said cylindrical section and said canted sections; a plurality of helical fins mounted on said screw conveyor and extending parallel to and being positioned between the turns of said screw flight, said fins being straight in a direction from a radially innermost edge to a radially outermost edge thereof; a coaxial supply pipe inside said conveyor and hole means extending from said pipe for feeding the mixture into said cylindrical section of said bowl at a location close to said first end of said cylindrical section, a first zone extending from said location to the axially outer end of said second canted section being free of fins, a second zone extending from said location to said second axial end of said cylindrical section containing said fins.

5,314,400

DEVICE FOR MAGNOTHERAPY

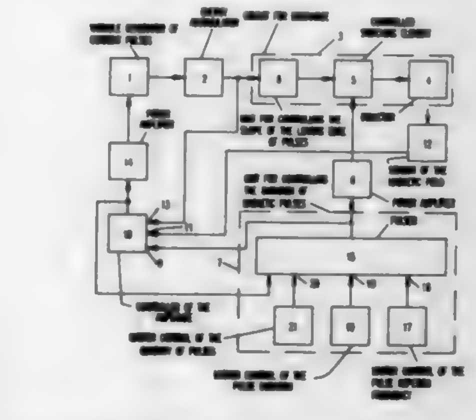
Anatoly F. Tsyb, prospekt Lenina, 4/3, kv. 26., Kaluzhskaya oblast, Obninsk; Pavel V. Sergeev, Truzhennikov pereulok, I9, kv. I9., Moscow; Vladimir I. Sharlai, prospekt Marxa, 8, kv. III., Kaluzhskaya oblast, Obninsk; Vladimir S. Dikun, ulitsa Golodeda, 39, korpus 3, kv. 27.; Nikolai S. Sobchuk, ulitsa Miroshnichenko, 49, kv. I6., both of Minsk; Tatyana N. Raiskaya, prospekt Marxa, 34, kv. 2II., Kaluzhskaya oblast, Obninsk; Anatoly D. Kotlyar, poselok Sosny, 8, kv. 33., Minsk; Vladimir M. Bolshov, ulitsa Marshala Timoshenko, 4, kv. 44., Moscow; Valery M. Tsarenkov, ulitsa Zaslavskogo, II, korpus 2, kv. 58.; Ljudmila V. Suloeva, ulitsa Olshevskogo, 23, kv. 57., both of Minsk, and Oleg G. Bogatov, ulitsa Novaya, 5, kv. 138., Moskovskaya oblast, Zheleznodorozhny, all of U.S.S.R.

Continuation of Ser. No. 935,477, Aug. 25, 1992, abandoned, which is a continuation of Ser. No. 449,877, Dec. 27, 1989, abandoned. This application Mar. 15, 1993, Ser. No. 31,933

Claims priority, application U.S.S.R., Apr. 25, 1988, 4406261[1]

Int. Cl.⁵ A61N *2/00*

U.S. Cl. 600—9 **7 Claims**



1. A magnetotherapy device comprising:

a series connection of:

variable generator means for providing current pulses,

an energy accumulator, and

discharge circuit means for discharging energy accumulated by the energy accumulator, said discharge circuit means including:

a controlled switching element,

inductor means for producing a therapeutic pulsed magnetic field containing pulses and having an input connected with said controlled switching element, and

means for controlling slopes of leading edges of the pulses of the magnetic field produced by the inductor means,

means for controlling the duration of the pulses of the magnetic field produced by the inductor means, the means for controlling the duration of the pulses having an output connected to a control input of the controlled switching element, and

controller means for controlling amplitudes of the pulses of the magnetic field, and having an output connected to a control input of the variable generator means.

5,314,401

CONFORMABLE PEMF TRANSDUCER

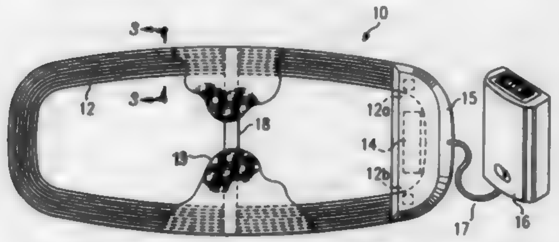
John C. Tepper, Carrollton, Tex., assignor to AMEI Technologies Inc., Wilmington, Del.

Filed Mar. 29, 1991, Ser. No. 677,665

The portion of the term of this patent subsequent to Mar. 23, 2010, has been disclaimed.

Int. Cl.⁵ A61N *1/00*

U.S. Cl. 600—14 **23 Claims**



1. A conformable PEMF transducer for providing PEMF therapeutic stimulation to a selected target area of a patient's body, comprising:

a transducer including at least a primary winding with a selected number of turns, and a structural winding of semi-rigid stiffening wire with a selected number of turns to form a primary/structural winding bundle;

said primary/structural winding bundle being held together to form an integral transducer coil, with the structural winding providing a predetermined degree of structural rigidity such that the transducer is formable to a selected anatomical contour and is flexibly conformable to accommodate patient movement; and

activation electronics coupled to said primary winding for selectively activating electromagnetic fields, thereby implementing a prescribed PEMF therapy.

5,314,402

AIRCRAFT AIRCREW LIFE SUPPORT SYSTEMS

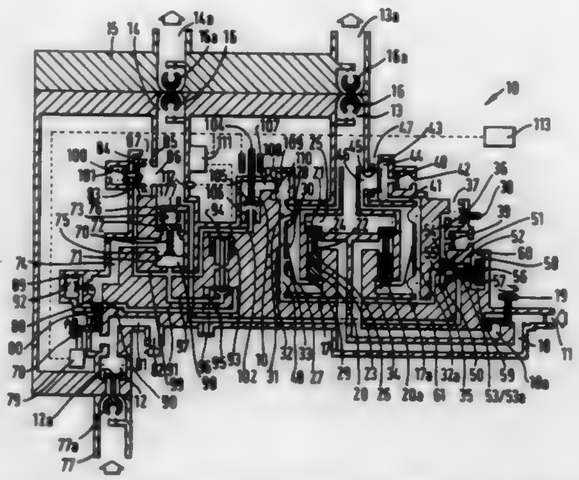
James C. Foote; Michael W. Harral, and Peter J. Rowland, all of Yeovil, England, assignors to Normalair-Garrett (Holdings) Limited, England

Filed Jun. 11, 1991, Ser. No. 713,103

Claims priority, application United Kingdom, Jun. 19, 1990, 9013630

Int. Cl.⁵ B64D *10/00*

U.S. Cl. 600—20 **8 Claims**



1. A method of controlling inflation pressure of an aircrew G-suit in protecting an aircrew member against G-load and against exposure to altitude above a predetermined level, comprising the steps of:

storing in an aircraft on-board systems computer a schedule of G-suit inflation pressure against increasing acceleration along a vertical axis of the aircraft and a schedule of G-suit inflation pressure against decreasing cabin ambient pressure; inputting to the computer signals representative of acceleration sensed along the vertical axis of the aircraft and signals representative of cabin ambient pressure;

looking up in the schedules and presenting requirements for G-suit inflation pressure;

determining by control logic programmed in the computer a higher one of values for G-suit inflation pressure in the vent of simultaneous acceleration and cabin ambient pressure signal inputs requiring inflation of the G-suit;

generating in the computer a G-suit inflation pressure demand signal;

transmitting the G-suit inflation pressure demand signal to an electronic control unit dedicated to control of G-suit inflation pressure;

sensing pressure existing in the G-suit or a pressure substantially corresponding thereto;

feeding back to the electronic control unit a signal representative of existing G-suit pressure;

comparing the existing G-suit pressure signal with the G-suit inflation pressure demand signal;

generating a compensated error signal;

combining the compensated error signal with the G-suit inflation pressure demand signal to provide a servo-demand signal;

transmitting the servo-demand signal to servo-control valve means for regulation of a servo-pressure which acts to close G-suit vent valve means adapted when open for communicating the interior of the G-suit with ambient and to open G-suit inflation gas supply valve means adapted for controlling delivery of inflation gas to the interior of the G-suit whereby the G-suit is inflated to a required pressure.

5,314,403

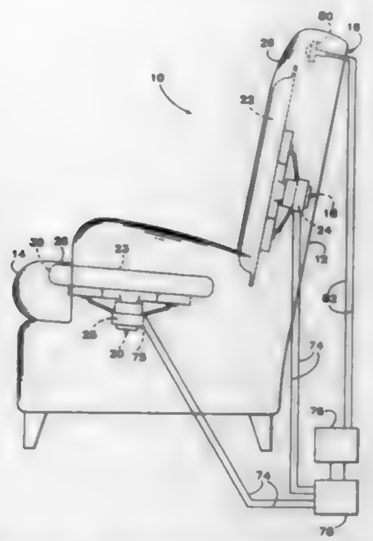
APPARATUS FOR THE ENHANCEMENT OF THE ENJOYMENT OF THE EXTREMELY LOW FREQUENCY COMPONENT OF MUSIC

Richard T. Shaw, 13003 SE. Hwy. 212, Clackamas, Oreg. 97015

Continuation-in-part of Ser. No. 824,069, Apr. 24, 1992, abandoned. This application Dec. 22, 1992, Ser. No. 995,185

Int. Cl.^{5} A61H *1/00*

U.S. Cl. 601—148 **10 Claims**



1. An apparatus for applying vibrations to a portion of a human body, comprising:

(a) at least one flexible bladder substantially full of a liquid;

(b) transducer means intimately coupled with said bladder for converting an electrical signal into a mechanical vibration and for moving a portion of said bladder in response to said electrical signal, said transducer means including an elastic diaphragm of generally planar elastic sheet material, having a front side and a rear side, said front side defining a depression filled with a solid material and said front side being in contact with said bladder, said transducer means further including means for supporting said diaphragm, and a driver having a face fixedly attached to said rear side of said diaphragm; and

(c) support means for holding said bladder and said transducer means in position to support a portion of a human body.

5,314,404

TETHERED MEDICAL RESTRAINT DEVICE

Robert L. Boughner, Lansing, and Robert P. Hubbard, East Lansing, both of Mich., assignors to Biomechanical Design, Inc., Okemos, Mich.

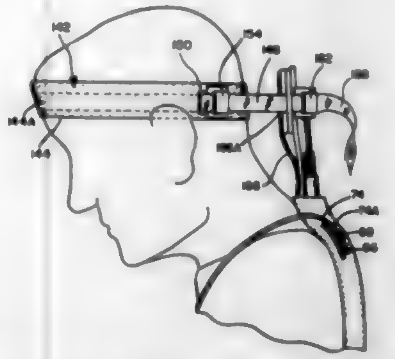
Division of Ser. No. 975,687, Nov. 13, 1992, Pat. No. 5,242,377, which is a continuation-in-part of Ser. No. 784,571, Oct. 29, 1991, Pat. No. 5,248,293. This application Sep. 1, 1993, Ser. No. 115,431

Int. Cl.^{5} A63B *5/00*

U.S. Cl. 602—17 **8 Claims**

1. A head harness means for a head support device to be worn by a person to maintain a desired head position relative to a support means which is mounted on the torso of a person to which the head harness means is secured, which comprises:

a headband having a pocket therein, a harness slidably mounted in said pocket and a tether means connected to the harness adjacent the center of gravity of the person's head and adapted to be connected to a support means, so that the tether means supports the head in a desired position and so that the person's head can be moved side to side on his neck.



5,314,405

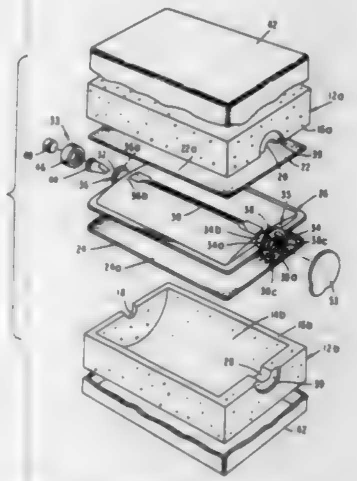
LIQUID DELIVERY APPARATUS

Marshall S. Kriesel, Saint Paul, and Thomas N. Thompson, Richfield, both of Minn., assignors to Science Incorporated, Bloomington, Minn.

Filed Apr. 17, 1992, Ser. No. 870,403

Int. Cl.^{5} A61M *5/00*

U.S. Cl. 604—8 **20 Claims**



1. A liquid delivery apparatus comprising:

(a) a housing having internal walls defining a cavity;

(b) a support disposed within said housing having a central portion, an edge portion circumscribing said central portion and including a liquid passageway in communication with said cavity of said housing, said liquid passageway having an inlet and an outlet;

(c) a distendable membrane having a central portion circumscribed by an edge, said central portion spanning said central portion of said support with said edge being disposed in engagement with said edge portion of said support, said distendable membrane being distendable from a first position wherein said central portion is in close proximity with said support to a second position wherein said central portion is in close proximity of said internal walls defining said cavity, said distendable membrane in said second position having internal stresses tending to return it to said position,

(d) means for sealably encapsulating said housing, said distendable membrane and said support, said means comprising an oxygen impermeable barrier surrounding said housing; said barrier comprising a structure made up of materials which cooperate to completely surround and encapsulate said housing in a manner to provide a substantially oxygen impermeable anti-microbial, leak-free aseptic container for containing the liquid to be delivered; and

(e) means for permitting the flow of gases between atmosphere and said cavity of said housing as said distendable membrane moves from said second position to said first position.

5,314,406

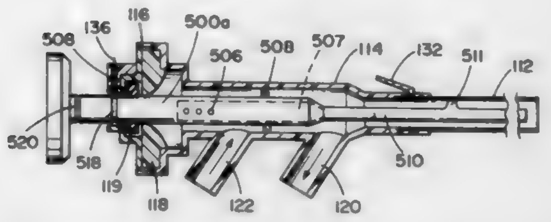
ENDOSCOPIC ELECTROSURGICAL SUCTION-IRRIGATION INSTRUMENT

Juan J. Arias, Hialeah; Thomas O. Bales; Jurgen A. Kortenbach, both of Miami; Dana W. Ryan, Davie; Charles R. Slater, Fort Lauderdale; Kevin W. Smith, Miami, and Matthew S. Solar, Cooper City, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Filed Oct. 9, 1992, Ser. No. 959,280

Int. Cl.^{5} A61M *1/30, 1/00*

U.S. Cl. 604—21 **18 Claims**



1. An endoscopic suction/irrigation instrument capable of use with a probe means, comprising:

a) a fluid chamber having a proximal end and an open distal end with a separate suction port and a separate irrigation port located therebetween and in fluid communication with said fluid chamber;

b) a hollow cannula communicating with said distal end of said fluid chamber, said hollow cannula and said fluid chamber forming a fluid flow path;

c) a first automatic valve means covering said proximal end of said fluid chamber, said first automatic valve means for permitting the probe means to be inserted through said automatic valve means and into and through said fluid chamber and for preventing leakage of fluid out said proximal end of said fluid chamber when the probe means is in place in said fluid chamber in a first mode, and said first automatic valve means for automatically closing said proximal end of said fluid chamber when the probe means is withdrawn from said fluid chamber in a second mode and for preventing leakage of fluid out said proximal end of said fluid chamber in said second mode;

d) a suction valve means for selectively coupling a suction tube to said fluid chamber via said suction port; and

e) an irrigation valve means for selectively coupling an irrigation tube to said fluid chamber via said irrigation port.

5,314,407

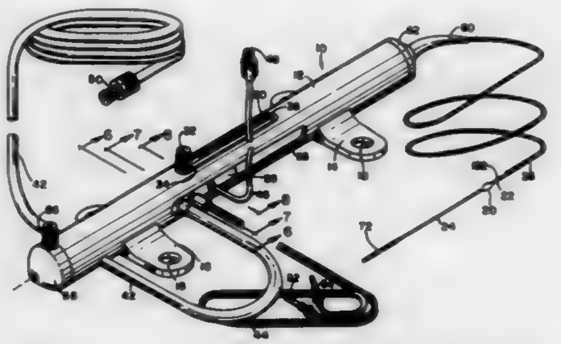
CLINICALLY PRACTICAL ROTATIONAL ANGIOPLASTY SYSTEM

David C. Auth, Redmond; Michael J. Intlekofer, Bellevue; Michael W. Slota, Bothell; John S. Hinchcliffe, Seattle, and Thomas J. Clement, Redmond, all of Wash., assignors to Heart Technology, Inc., Bellevue, Wash.

Continuation of Ser. No. 806,828, Dec. 6, 1991, abandoned, which is a continuation of Ser. No. 646,519, Jan. 25, 1991, abandoned, which is a continuation of Ser. No. 462,899, Dec. 29, 1989, abandoned, which is a continuation of Ser. No. 135,495, Dec. 21, 1987 abandoned, which is a continuation of Ser. No. 930,842, Nov. 14, 1986, abandoned. This application Jul. 21, 1992, Ser. No. 917,923

Int. Cl.^{5} A61B *17/22*

U.S. Cl. 604—22 **32 Claims**



2. A gas driven, rotary ablative apparatus for medical applications comprising:

(a) a body having an advancer assembly which can be moved between a proximal position and a distal position;

(b) a gas driven prime mover within said advancer assembly and movable therewith, said gas driven prime mover having a shaft which is attached to a first end of a flexible, hollow, high speed drive;

(c) a rotating ablative burr attached to the second end of said flexible, hollow, high-speed drive and movable between proximal and distal positions with said advancer assembly;

(d) a flexible sheath which extends from one end of said body substantially along the length of said drive, whereby the inner walls of a patient's vessel into which said drive is inserted will be isolated from said rotating drive by said sheath; and

(e) a water pump within said advancer assembly and movable therewith having a shaft connected to said prime mover shaft, the output of said water pump being connected to a lumen formed between said drive and said sheath.

5,314,408

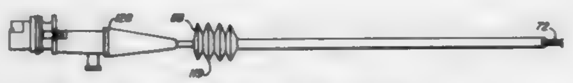
EXPANDABLE MEMBER FOR A CATHETER SYSTEM

Stephen M. Salmon, Sunnyvale; John R. McKenzie, San Francisco; Peter Thornton, Cupertino, and Richard Ginn, San Jose, all of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Filed Nov. 13, 1992, Ser. No. 976,228

Int. Cl.^{5} A61M *5/00;* **A61B** *17/32*

U.S. Cl. 604—22 **7 Claims**



1. A vascular catheter system comprising:

a catheter body having a lumen therethrough, a proximal end, and a distal end;

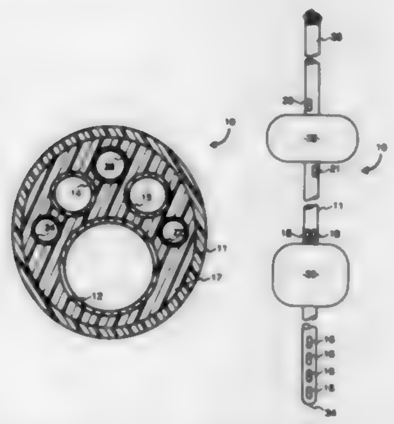
a drive shaft having a proximal end and a distal end and

being reciprocatably disposed within the lumen of the catheter body;
a work element secured to the distal end of the drive shaft;
an axially expandable member connected to the proximal end of the catheter body; and
a proximal housing connected to the proximal end of the drive shaft and to the axially expandable member, whereby the work element may be advanced or retracted within the lumen of the catheter body by selectively moving the proximal housing with respect to the catheter body.

5,314,409
CATHETER FOR ESOPHAGEAL PERFUSION

Jerzy Sarosiek; Richard W. McCallum, and Ravinder K. Mittal, all of Charlottesville, Va., assignors to UVA Patents Foundation, Charlottesville, Va.

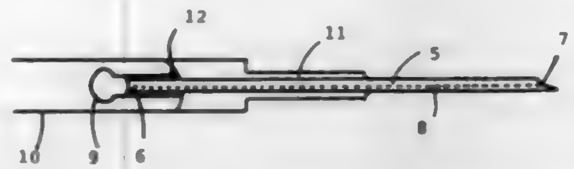
Filed Mar. 11, 1993, Ser. No. 29,440
Int. Cl.⁵ A61M *25/00*
U.S. Cl. 604—101 **11 Claims**



1. An esophageal perfusion catheter, the catheter comprising:
an outer housing,
a plurality of flexible, tubular channel members within said outer housing, at least two spaced balloon members encompassing said catheter,
a first of said tubular channel members being in fluid communication with a first of said at least two balloons, said first balloon being closer to the distal end of said catheter than the second balloon,
a second of said tubular channel members being in fluid communication with a second of said at least two balloons,
a third of said tubular channel members being an esophageal perfusion aspirating channel and being in communication with at least one port, said at least one port being at the distal end of said catheter,
a fourth of said tubular channel members being a gastric aspirating channel, said gastric aspirating channel being in fluid communication with a plurality of ports positioned at the distal end of the catheter,
a fifth of said tubular channel members being an aspirating channel, said fifth channel member being in communication with a port above said second balloon, and
a sixth channel member, said sixth channel member being an air vent and being in fluid communication with a port positioned below and proximate the second balloon.

5,314,410
ENTRY INDICATOR DEVICE FOR ARTERIAL OR INTRAVENOUS NEEDLE

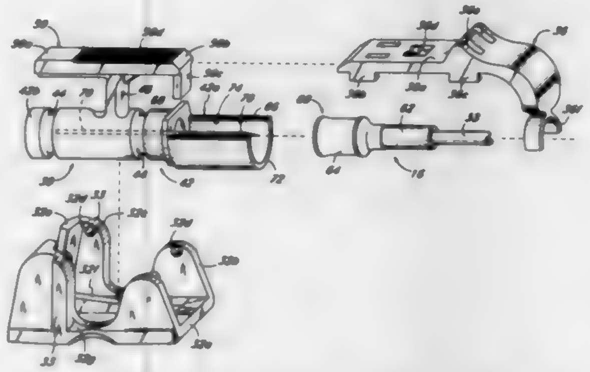
Ronald L. Marks, 1124 Townsley, Bakersfield, Calif. 93304
Continuation-in-part of Ser. No. 832,956, Feb. 10, 1992, abandoned. This application Dec. 16, 1992, Ser. No. 991,705
Int. Cl.⁵ A61M *5/178*
U.S. Cl. 604—168 **8 Claims**



1. A blood vessel entry indication device comprising a hypodermic needle assembly including a transparent body and a cannula, said cannula having a proximal and a distal end adapted for entry into a body and a flexible airtight membrane directly and sealingly engaging said proximal end wherein said membrane flexes in response to pressure changes in a blood vessel.

5,314,411
CATHETERIZATION SYSTEM WITH UNIVERSAL RETENTION DEVICE AND METHOD OF USE

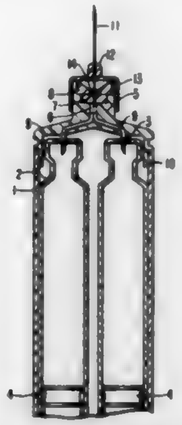
Steven F. Bierman, 143 Eighth St., Del Mar, Calif. 92014, and David C. Howson, Denver, Colo., assignors to Steven F. Bierman, M.D., Del Mar, Calif.
Continuation-in-part of Ser. No. 518,964, May 4, 1990, Pat. No. 5,192,273, which is a continuation-in-part of Ser. No. 384,326, Jul. 24, 1989, abandoned. This application May 3, 1991, Ser. No. 695,549
Int. Cl.⁵ A61M *5/32*
U.S. Cl. 604—174 **28 Claims**



1. An apparatus for removably connecting together a fluid supply tube and an intravenous catheter, said apparatus comprising:
an adaptor having a tubular body with a passage extending through said body, the body having a forward end comprising a needle to engage a septum connector disposed on the catheter end, and a rear end adapted to be connected to the tubing; and
a clip slidably mounted on said adaptor for movement in a direction generally parallel to an axis through said passage, said clip including a latch adapted to cooperate with said catheter end to hold the catheter end on said forward end, said clip and said adaptor having an interengaging element to hold said latch in a manually selected position on said adaptor.

5,314,412
MANIFOLD FOR A TWO BARREL SYRINGE

Jorn Rex, Roskilde, Denmark, assignor to Novo Nordisk A S, Bagsvaerd, Denmark
Filed May 16, 1991, Ser. No. 701,236
Claims priority, application Denmark, Apr. 17, 1991, 689/91
Int. Cl.⁵ A61M *5/00*
U.S. Cl. 604—191 **3 Claims**

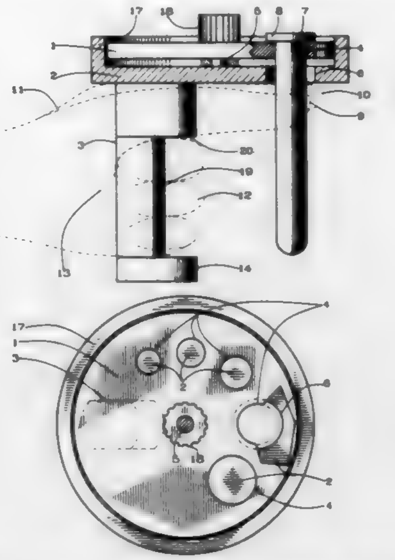


1. Manifold for a two-barrel pen syringe for administering two different kinds of medicine, said syringe having two parallel cartridges each containing a different kind of medicine and each sealed at their outlet end with a rubber membrane, said manifold comprising:
a molded plastic body;
a mixing chamber being formed as a cavity within said plastic body;
a first, second and third needle each having two ends, a first sharp end and a second end opening into said mixing chamber;
said mixing chamber being open at one end thereof for one end of said first and second needles, the other end of the mixing chamber being closed by a membrane through which one end of said third needle must pass to open into said cavity;
said first and second needles being embedded in said molded plastic body and having said first sharp ends project from one side of said molded plastic body with a spacing bringing them in a position to pierce rubber membranes of cartridges in a syringe when the manifold is mounted thereon; and
said third needle having its first sharp end project outside of said molded plastic body from a side opposite the sharp ends of said first and second needles.

5,314,413
SAFETY VIAL-HANDLER TOOL AND METHOD

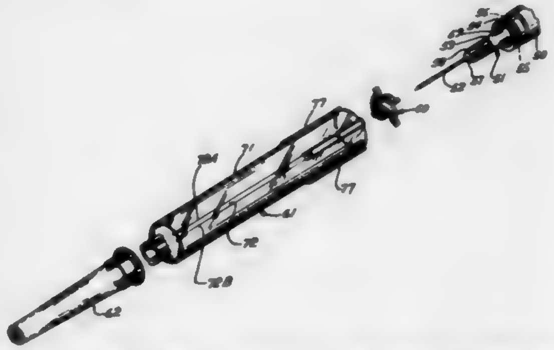
Deborah McCowan, 2712 Courtland Blvd., Deltona, Fla. 32738, and Diana McCoy, 524 Gaspar Ave., Deltona, Fla. 32725
Filed Sep. 16, 1993, Ser. No. 121,542
Int. Cl.⁵ A61M *5/32*
U.S. Cl. 604—192 **21 Claims**

1. A safety vial-handler tool comprising:
a vial plate superimposed rotatably on a shield plate;
a plurality of vial orifices in the vial plate positioned at a common radius from a rotational axis of the vial plate;
each vial orifice having a different diameter sized to contain a vial with a desired diameter;
a shield orifice in the shield plate positioned at a radial distance from the rotational axis of the vial plate that is equal to the common radius of the plurality of vial orifices from the rotational axis of the vial plate on the shield plate;
the shield orifice being sized to receive a vial having the largest diameter that is fittable into a vial orifice having the largest desired diameter; and
a handle extended perpendicularly from a bottom surface of the shield plate, such that the handle is parallel to a vial suspended from a vial orifice and passing through the shield orifice.



5,314,414
HYPODERMIC NEEDLE GUARD AND METHOD TO PREVENT NEEDLE STICK INJURIES

Lawrence W. Hake, and Michael R. Flodman, both of Grand Island, Nebr., assignors to Needlepoint Guard, Inc., Grand Island, Nebr.
Continuation-in-part of Ser. No. 704,359, May 23, 1991, Pat. No. 5,256,153, which is a continuation-in-part of Ser. No. 317,733, Mar. 2, 1989, Pat. No. 5,019,051. This application Apr. 23, 1993, Ser. No. 52,259
Int. Cl.⁵ A61M *5/32*
U.S. Cl. 604—198 **29 Claims**



1. A needle guard for a hypodermic syringe assembly, the assembly being of the type including a hypodermic needle and a syringe barrel having a needle hub portion adjacent the hypodermic needle, the needle guard comprising a separate assembly which is attachable to the syringe assembly and which in combination therewith maintains either a non-protective or an irreversible protective configuration for the needle, said needle guard comprising in combination:
a separate, attachable fitting having a generally annular core and a plurality of radially extending elastic arms ending in a tang extending from the annular core, the interior portion of the core having deformable engagement means adapted to cooperatively mount the fitting in a fixed position on the needle hub portion of the syringe, the deformable engagement means including means to penetrate the surface of the needle hub portion of the syringe;

a hollow protective sleeve on the fitting, said sleeve having an interior surface adapted to slidably coact with the fitting, an exterior surface, a distal end and a proximal end;

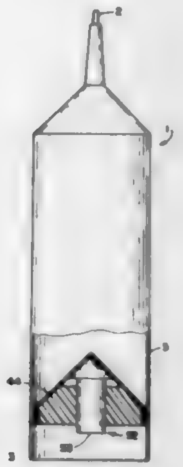
guide means for slidably connecting the interior surface of said sleeve and the radially extending arms of said fitting, said sleeve thereby being movable on the fitting axially in the direction of the length of the needle between a non-protective retracted position exposing the needle and a protective, extended position covering the needle; and

means for irreversibly locking said sleeve only in the protective, extended position relative to said fitting, whereby axial and rotational movement of the sleeve relative to the fitting is prevented, and the sleeve in the protective, extended position protrudes beyond the tip of the needle such that the sleeve defines a guard which irreversibly prevents further access to the needle once the sleeve has been moved to the extended position.

5,314,415
ASPIRATING PLUNGER FOR POWER INJECTOR CARTRIDGES

Richard T. Liebert, Ballston Spa, N.Y., and Neil H. Brown, Royersford, Pa., assignors to Sterling Winthrop Inc., Malvern, Pa.

Filed Jul. 21, 1993, Ser. No. 94,284
Int. Cl.^{5} A61M *5/315*
U.S. Cl. 604—218 **6 Claims**



1. In a self-aspirating hypodermic cartridge which contains an injectable fluid therein including a generally cylindrical barrel having a wall, and a plunger reciprocable in said barrel to aspirate the cartridge and to expel said injectable fluid therefrom wherein the improvement comprising: the plunger having

a female ring component, with a vertically oriented cylindrical hole, having a cylindrical flat bottom portion, a cylindrical flat top portion spaced from said cylindrical flat bottom portion, and a side portion connecting said cylindrical bottom and top portions and integral therewith, said side portion having a degree of incline with respect to a horizontal plane of from about 1° to about 89°;

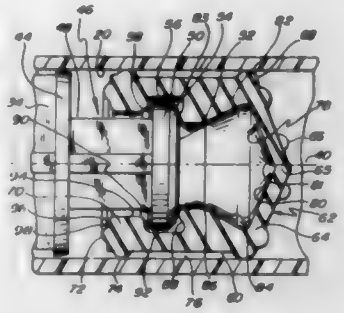
a mushroom-shaped component having a cylindrical plunger shaft slideably positioned into said female ring component, and a cone-shaped head at one end of the shaft and integral therewith having a degree of incline with respect to a horizontal plane of from about 1° to about 89°; and

an elastomeric diaphragm-shell having a cylindrical bottom portion and a generally cone-shaped side portion integral therewith covering said male and female components, said cylindrical bottom portion forming a slideable seal between the female ring component and the wall of the cylindrical barrel when the plunger is placed in the barrel and said cone-shaped side portion forming a diaphragm whereby upon alternate exertion of pressure upon said plunger shaft and release thereof the deformation of the diaphragm reduces head space in the cylindrical barrel thereby expelling head space gas and upon release of pressure the diaphragm returns to its original shape resulting in aspiration.

5,314,416
LOW FRICTION SYRING ASSEMBLY

Anthony K. Lewis, St. Charles, and Eugene E. Weilbacher, Ellisville, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 22, 1992, Ser. No. 902,184
Int. Cl.^{5} A61M *5/315*
U.S. Cl. 604—219 **22 Claims**



1. A plunger rod assembly for use with a cylindrical barrel member having a longitudinal axis and an interior surface and provided with an open proximal end to receive the plunger rod assembly therethrough and a distal end adapted to receive or deliver fluid therethrough, said plunger rod assembly comprising:

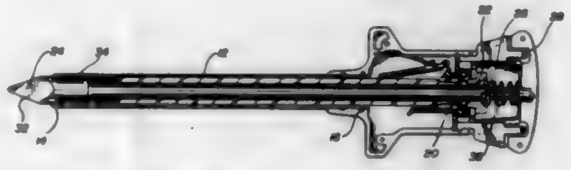
a plunger rod including a rigid elongate shaft portion and a front flange on the distal end thereof; and

a flexible plunger tip operatively mounted on said front flange, said plunger tip including front and side walls and interior and exterior surfaces and a lip member which extends radially inwardly from said interior surface of said side wall, said lip member being oriented in such a manner on said side wall so that movement of said plunger rod causes said front flange to operatively contact said lip member to radially expand at least a portion of said plunger tip.

5,314,417
SAFETY TROCAR

Randy R. Stephens, Fairfield; Gregory D. Bishop, Hamilton; James Voegele; Diane Welling, both of Cincinnati; Richard Smith, Loveland, all of Ohio; John M. Collins, Ipswich, and George Selecman, Salem, both of Mass., assignors to Ethicon, Inc., Somerville, N.J.

Filed Dec. 22, 1992, Ser. No. 994,817
Int. Cl.^{5} A61M *5/18*
U.S. Cl. 604—264 **8 Claims**



1. A trocar comprising:

an obturator connected to an obturator handle, and said obturator having a sharpened tip;

a cannula connected to a cannula handle, said obturator insertable into said cannula, and said cannula having an inner wall defining an inner diameter;

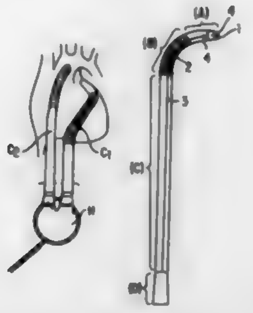
a safety shield, spring loaded within said obturator handle and capable of covering said obturator tip;

wherein said safety shield contains an opening through which said obturator tip may pass, and said obturator tip when extending through said opening abuts the inner wall of said cannula, and wherein said obturator tip has a pair of planar surfaces forming a knife edge, and said knife edge extending across substantially the entire length of said cannula inner wall diameter.

5,314,418
CANNULA

Hisateru Takano; Yoshiyuki Taenaka; Takeshi Nakatani; Eisaku Sasaki, all of Suita; Susumu Kashiwabara, and Takashi Kimura, both of Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Continuation of Ser. No. 762,343, Sep. 19, 1991, abandoned. This application Sep. 9, 1993, Ser. No. 118,281
Claims priority, application Japan, Sep. 21, 1990, 2-253938
Int. Cl.^{5} A61M *25/00*
U.S. Cl. 604—282 **4 Claims**



1. A cannula which comprises a tip portion (A), a curvature portion (B) connected with said tip portion and a body tubular portion (C) connected with said curvature portion, said cannula having a lumen longitudinally extending through the tip portion, the curvature portion and the body tubular portion;

the length and the outer diameter of said cannula being, at least, 300 mm and, at most, 12 mm, respectively;

the length of said tip portion (A) and said curvature portion (B) being 10 to 50 mm and 20 to 100 mm, respectively;

said curvature portion (B) being made of a material which is more flexible than that of said body tubular portion (C);

a resilient spiral thin wire provided within the thickness of the wall part defining the lumen of said curvature portion (B) and extending over, at least, 20 mm in length of said curvature portion (B);

wherein said cannula is adapted to be inserted into the femoral vein with the tip portion (A) passing through the cava, the right atrium and the interatrial septum to reach the left atrium, for draining from the left atrium without thoracotomy; and

wherein the material of the curvature portion (B) has a Shore hardness of 45A to 65D and the body tubular portion (C) has a Shore hardness of 90A to 75D.

5,314,419
METHOD FOR DISPENSING OPHTHALMIC DRUGS TO THE EYE

George E. Pelling, 9441 Mokihana Dr., Huntington Beach, Calif. 92646

Filed Oct. 30, 1992, Ser. No. 968,992
Int. Cl.^{5} A61M *35/00*
U.S. Cl. 604—294 **2 Claims**

1. A method for administering a drug to the upper fornix area of a patient's eye so as to allow for direct medication of the posterior and superior of the eye; the method comprising the steps of:

selecting a hand held dispensing device including a body with a forward end, a top surface, said body containing a chamber, a channel connecting the chamber with an orifice located in the forward end of the body, and a bleb located on the top surface over the chamber;

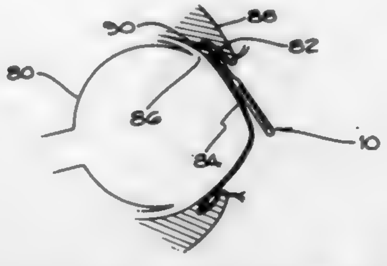
selecting a drug to be administered;

filling the chamber with the drug;

inserting the forward end of the device under the upper eyelid so that the orifice of the device is directed toward the cul-de-sac and advancing it to a point where the bleb is under the upper eyelid;

allowing the upper eyelid to rest upon the top surface of the device and bleb;

then withdrawing the device from under the upper eyelid so that the pressure of the upper eyelid presses downward on the bleb so that the drug will be dispensed through the channel, out of the orifice, and into the upper fornix.



5,314,420
SUPERABSORBENT POLYMER HAVING IMPROVED ABSORPTION RATE AND ABSORPTION UNDER PRESSURE

Scott J. Smith, Aurora, and Eric J. Lind, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 17, 1993, Ser. No. 123,561
Int. Cl.^{5} A61F *13/15, 13/20*
U.S. Cl. 604—358 **15 Claims**

1. A method of making a superabsorbent polymer having improved absorption under pressure and improved absorption rate when absorbing aqueous body fluids, wherein the method comprises the steps of:

(a) providing a solution containing carboxylic acid monomers or water soluble salts thereof, and a crosslinking agent;
(b) adding a carbonate blowing agent and a polymerization initiator, individually or in combination, to the solution to form a carbonated monomer solution;
(c) polymerizing the carbonated monomer solution at temperatures ranging from about 0° C. to about 130° C. to form a microcellular hydrogel;
(d) chopping or grinding the microcellular hydrogel into gel pieces having a particle diameter ranging from about 0.1 mm to about 5.0 cm;
(e) drying the gel pieces at temperatures ranging from about 85° C. to about 210° C.;
(f) grinding the pieces to form a polymer having a particle size of from about 0.05 mm to about 5.0 mm;
(g) mixing 100 parts by weight of the polymer with about 0.001 to about 30 parts by weight of a surface crosslinking agent; and
(h) reacting the polymer with the surface crosslinking agent to crosslink molecular chains existing on a surface of the polymer, forming the superabsorbent polymer.

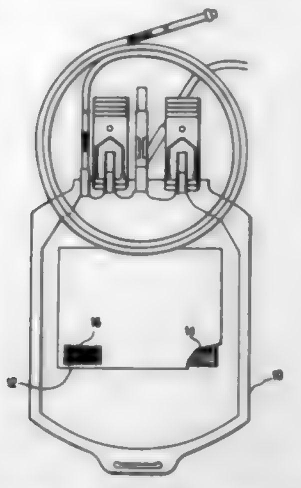
5,314,421
BLOOD PACK LABELS AND THE LIKE

Mark Leuenberger, Gurnee, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Mar. 5, 1992, Ser. No. 847,165
Int. Cl.^{5} A61B *19/00;* **B42D** *15/00*
U.S. Cl. 604—403 **4 Claims**

1. A blood pack including a label wherein the label including

a substrate having a top surface capable of receiving ink and a bottom surface providing means for securing the label to a blood pack, the substrate being constructed from a microporous plastic film including a matrix of interconnected pores for allowing gas to flow into and out of the blood pack through the



label, at least pores located on an outer surface of the label being so constructed and arranged to receive ink allowing the label to be written on, the blood pack being defined by plastic sheets that are sealed along edges thereof to define an interior for receiving and storing blood.

5,314,422

EQUIPMENT FOR THE CORRECTION OF PRESBYOPIA BY REMODELLING THE CORNEAL SURFACE BY MEANS OF PHOTO-ABLATION

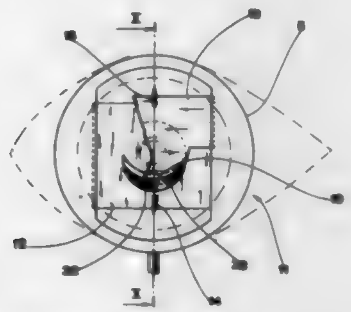
Guido M. Nizzola, Modena, Italy, assignor to Nibatec S.A., Chiasso, Switzerland

Filed Nov. 12, 1991, Ser. No. 790,436

Claims priority, application Italy, Nov. 14, 1990, 40147 A/90

Int. Cl.^{5} A61N *5/06*

U.S. Cl. 606—5 **5 Claims**



1. Equipment for the correction of presbyopia by shaping of a corneal surface at a pupil of an eye using an output of laser energy, said pupil having a periphery having a curvature, said laser output being capable of removing a thin layer of tissue from said corneal surface when pulsed, said equipment comprising:

a mask interposed between said laser output and said corneal surface, said mask having an aperture for allowing said laser output to pass therethrough, said aperture having a curved edge, said curved edge having a curvature substantially similar to said curvature of said pupil;

a frame for supporting said mask above said corneal surface;

said mask having two mask elements slidably mounted within said mask, each of said mask elements having a curved edge, said two mask elements positioned within said mask such that said aperture is blocked by said mask elements except at an aperture portion defined by said two curved edges when in a facing arrangement, a first of said curved edges being convex, a second of said curved edges being concave, said mask elements being slidable to vary the dimensions of said aperture portion.

5,314,423

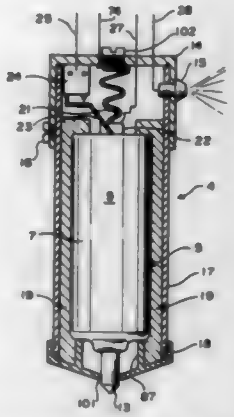
COLD ELECTRODE PAIN ALLEVIATING TISSUE TREATMENT ASSEMBLY

John S. Seney, 57 Marlin Dr., Sugarloaf Shores, Fla. 33044

Filed Nov. 3, 1992, Ser. No. 970,850

Int. Cl.^{5} A61B *17/36*

U.S. Cl. 606—20 **44 Claims**



1. A non-invasive tissue treatment device providing cooling and electrical stimulation comprising:

a removable cold electrode comprising:

an external metallic housing;

an internal electrical conduit;

a thermal storage fluid encapsulated between said external housing and said conduit, and

a gasket interconnecting said external housing and said conduit;

an insulative housing for holding said removable cold electrode;

a control console operatively coupled to said insulative housing and said cold electrode for providing an alterable electrical source to said electrode and control thereof;

a biofeedback device comprising at least one sensor for providing biological data to said control console, and

wherein said removable cold electrode is brought into contact with said tissue and said alterable electrical source is transferred thereto.

5,314,424

SURGICAL INSTRUMENT LOCKING MECHANISM

David A. Nicholas, Trumbull, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Apr. 6, 1992, Ser. No. 863,951

Int. Cl.^{5} A61B *17/39*

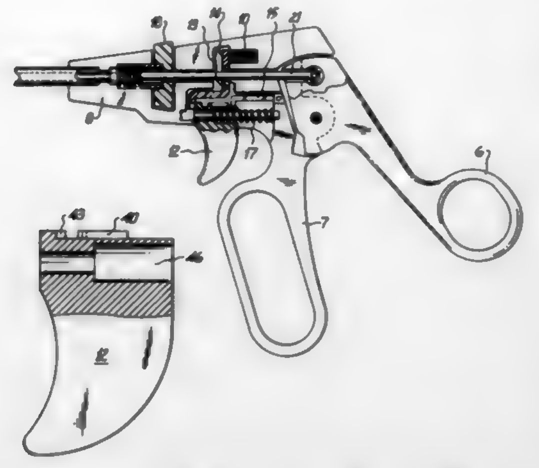
U.S. Cl. 606—41 **16 Claims**

1. An endoscopic or laparoscopic surgical instrument comprising:

a handle assembly including a barrel portion, a stationary handle, and a pivoting handle;

a body assembly having a pair of coaxial members attached at one end to said handle assembly, including an inner rod member slidable within an outer tube member in response to movement of said pivoting handle of said handle assembly, said body assembly terminating at an end remote from said handle assembly at which end is provided a reciprocatingly movable tool mechanism; and

locking means positioned within said barrel portion of said handle assembly for locking said tool mechanism, said locking means being movable in a first direction a first distance to lock said tool mechanism, and being movable a second distance in said first direction to release said tool mechanism, said locking means being actuable independent of the movement of said pivoting handle.



5,314,425

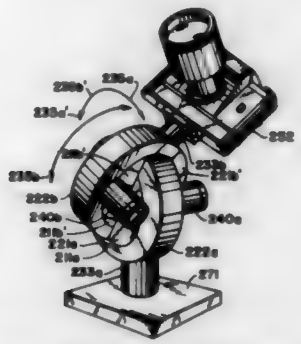
INTERLOCKING-BODY CONNECTIVE JOINT

Vladimir Shpigel, Brooklyn, N.Y., assignor to Amrus Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 492,622, Mar. 13, 1990, Pat. No. 5,101,681. This application Mar. 19, 1992, Ser. No. 853,675

Int. Cl.^{5} A61B *17/56;* G05G *11/00;* F16D *3/00;* B25J *17/00*

U.S. Cl. 606—53 29 Claims



1. In a connective joint for interconnecting two articles for controlled relative motion, which joint comprises a pair of interlocking bodies; means for attaching each of the bodies to one of such articles, respectively; and structure constraining the bodies for systematic relative movement, said constraining structure including four quarter elements arranged in adjacent quadrant relationship; the improvement comprising means for inhibiting relative movement of said pair of interlocking bodies, wherein said movement inhibiting means includes means for applying a force between two diametrically opposing ones of said quarter elements.

5,314,426

EXTERNAL BONE FIXATION DEVICE

Anthony P. Pohl, 8 Caralue Road, Marino, Australia 5049, and Bruce H. Ide, 7 Orchard Court, Newton, Australia 5074

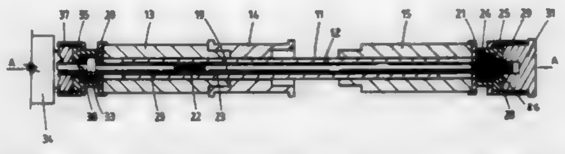
Filed Apr. 14, 1993, Ser. No. 48,405

Claims priority, application Australia, Apr. 16, 1992, PL1971

Int. Cl.^{5} A61B *17/60*

U.S. Cl. 606—58 **9 Claims**

1. An improved unilateral external bone fixation device having a central longitudinal axis, comprising a central non-rotatable rigid shaft or rod having a central bore extending therethrough and being longitudinally displaceable along the axis of the device, first, second and third clamp carrier housings co-axially supported along the length of the shaft or rod, the second housing being the intermediate one of said housings and being fixed to the shaft so as to be movable therewith, each said housing being adapted to support an orthopedic pin clamp assembly for removably securing one or more fixator retainer pins therein, a lead screw housed within the bore of the shaft or rod and having a thread mating with a thread in the shaft bore,



said lead screw being rotatable from one end thereof, and adjustment means for adjusting the axial distance between confronting ends of said intermediate housing and at least one of the other housings, said adjustment means arranged and constructed so that rotation of the lead screw imparts longitudinal displacement to said shaft and also to said intermediate housing fast therewith relative to said at least one of the other housings.

5,314,427

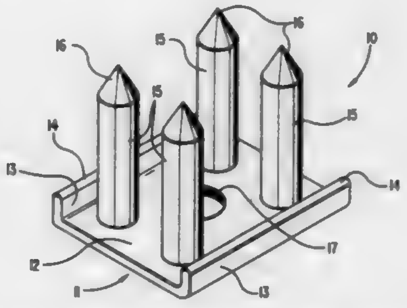
CHANNEL LIGAMENT CLAMP

E. Marlowe Goble, 850 E. 1200 North, and W. Karl Somers, 651 N. 150 West, both of Logan, Utah 84321

Filed Oct. 13, 1992, Ser. No. 959,546

Int. Cl.^{5} A61B *17/56;* F16B *15/00*

U.S. Cl. 606—72 **4 Claims**



1. A ligament clamp comprising, a thin flat rectangular section of a material that is suitable for human implantation, with the opposite parallel side portions of said section of material bent at approximately right angles to form identical short parallel upstanding side walls, with said parallel side walls and the material therebetween, or web, constituting a channel section, said parallel side walls of said channel section each having a smooth flat bone engaging edge and are each of a height to contain, without crushing a section of a ligament fitted therebetween; a plurality of equal length, spaced apart pointed pins, that extend beyond said parallel side walls, each said pin secured at its base to said web in a pattern to extend parallel at right angles outwardly from said web, and parallel to said side walls; and said web has a threaded hole formed therethrough said pins form an array that surrounds said threaded hole, wherein said pins extend outwardly and from within said walls of said web.

5,314,428

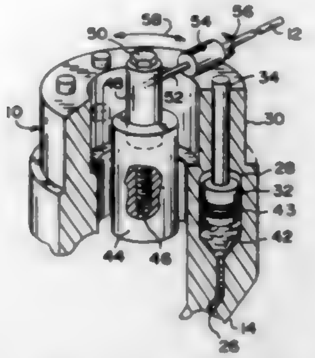
HYDRAULICALLY FLEXING CATHETER

Louis C. Marotta, P.O. Box 372, Westport, N.Y. 12993

Filed Dec. 28, 1992, Ser. No. 997,314

Int. Cl.⁵ A61M *37/00*

U.S. Cl. 604—95 **7 Claims**



1. A catheter adapted to be directed through a tortuous or branching bodily passageway comprising:

a) a narrow,.circular catheter tube having a radially expandable region at its forward end and a larger diameter socket contiguous with said tube at its rearward end, said catheter tube and said socket having a plurality of longitudinally extending narrow channels embedded therein evenly spaced about the circumference of said tube and immediately adjacent the outer surface thereof, each said channel being filled with fluid with said expandable region being adapted to expand slightly and stiffen in the area surrounding each channel having the fluid therein under pressure; and

b) manually operated means connected with said socket for selectively pressurizing the fluid in selected ones of said channels and comprising:

i) a piston assembly of circular cross-section and with a central axis, containing therein a plurality of cylinders evenly spaced about a circumference of said piston assembly each containing a piston, the number of cylinders being equal to the number of channels, each said piston comprising a circular head member having two flat sides, a shaft member extending from one side of said head member, and spring means within said cylinder and bearing against the other side of said head member for maintaining said piston in said cylinder so that a portion of said shaft member extends through said cylinder and a short distance above said circular assembly when said piston is not actuated, said piston assembly having a circular socket adapter at one end thereof configured to mate with said socket whereby each said piston is connected with on of said channels; and

ii) actuator means connected with said circular piston assembly for selectively moving one or more of said pistons to pressurize the fluid within the channel to which said actuated pistons are connected said actuator means comprising:

a rotatable shaft member parallel with said piston shaft member and adapted to rotate about the central axis of said circular assembly;

an arm attached to and extending radially from said rotatable shaft member in a plane substantially parallel with a topmost extension of said piston shaft members, said arm being adapted to be moved manually about said rotatable shaft; and

mechanical means attached to said arm and movable therewith form contacting and depressing at least one of said extending piston shaft member upon movement of said arm.

5,314,429

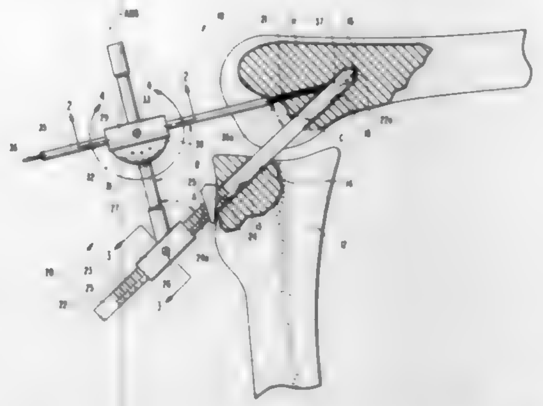
METHOD FOR FORMING A TUNNEL INTERSECTING A STRAIGHT CRUCIATE LIGAMENT TUNNEL

E. Marlowe Goble, 850 E. 1200 North, Logan, Utah 84321

Division of Ser. No. 580,172, Sep. 7, 1990. This application Nov. 29, 1991, Ser. No. 800,115

Int. Cl.⁵ A61B *17/60, 19/00;* **A61F** *2/38*

U.S. Cl. 606—96 **5 Claims**



1. In a knee surgical procedure a method for guiding drilling from outside a patient's knee, that includes a distal femur intracondyle notch and endosteum to form a tunnel from a point along the distal femur intracondyle notch to intersect a point along a straight cruciate ligament tunnel utilizing a sight barrel instrument having a guide rod, a straight mast extending therefrom and one or more sight barrel sleeves connected to said straight mast for guiding travel of a drill to pass through said point along the distal femur intracondyle notch and to intersect a location in the femur endosteum along said straight cruciate ligament tunnel comprising, sliding the sight barrel instrument guide rod through an open tibial end of the straight cruciate ligament tunnel so as to position the sight barrel instrument straight mast alongside and in a vertical plane of the patient's knee that intersects their tibia and femur longitudinal axis; and with a sight barrel sleeve portion of the sight barrel instrument positioned at a select angle relative to the straight mast where a longitudinal opening through said sight barrel sleeve exactly aligns with the point along the distal femur intracondyle notch, fitting a drill through said sight barrel sleeve longitudinal opening and turning said drill into the patient's knee to the select point along said distal femur intracondyle notch and continuing to turn said drill into said femur endosteum to form a straight intersecting tunnel that intersects the straight ligament tunnel at an acute angle.

5,314,430

ATRIAL DEFIBRILLATOR EMPLOYING TRANSVENOUS AND SUBCUTANEOUS ELECTRODES AND METHOD OF USE

Gust, H. Bardy, Seattle, Wash., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 24, 1993, Ser. No. 83,136

Int. Cl.⁵ A61N *1/39*

U.S. Cl. 607—5 **17 Claims**

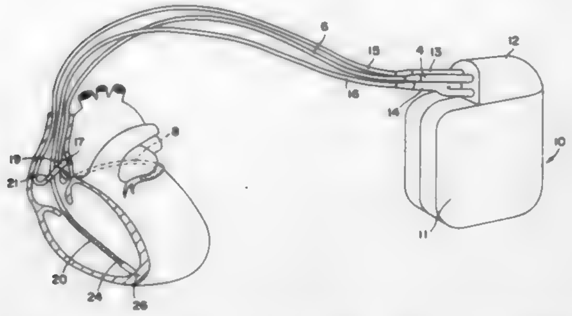
2. An apparatus for defibrillating the atrium of a patient's heart, comprising:

a first defibrillation electrode means for location in the coronary sinus of said patient's heart;

a second defibrillation electrode means for subcutaneous location in the left pectoral region of said patient's thorax;

an implantable defibrillation pulse generator coupled to said first and second defibrillation electrodes; and

means for sensing the occurrence of atrial fibrillation and for triggering the delivery of a defibrillation pulse between said first and second defibrillation electrodes in response to sensing the occurrence of atrial fibrillation.



5,314,431

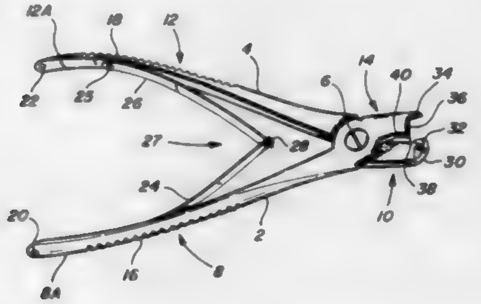
SURGICAL INSTRUMENT USED IN CONJUNCTION WITH FIXATION OF FRACTURES OR SURGICAL OSTEOTOMIES

Thomas A. Graziano, 101 Mountainview Dr., Clifton, N.J. 07013

Filed Jun. 19, 1992, Ser. No. 901,574

Int. Cl.⁵ A61B *17/56*

U.S. Cl. 606—101 **3 Claims**



1. A surgical instrument used in conjunction with fixation of fractures or surgical osteotomies, comprising:

first and second handle members;

means for pivotally mounting the first and second handle members, each to the other;

the first handle member having a grasping end and an operating end;

the second handle member having a grasping end and an operating end;

means for biasing the first and second handle members so that the grasping and operating ends thereof are normally spaced apart;

the operating end of one of the first and second handle members arranged for receiving a wire which is capable of being inserted into a fixed bone member so as to extend therefrom said wire extending from said one operating end of one of the first and second handle member;

said operating end of one of the first and second handle members including an upwardly extending step having a front end and a back end, and extending in length from said front end to said back end toward the grasping end of the one handle member;

the step including a slot extending angularly across said step from said front end to said back end;

the wire extending from the one operating end having an end which is received in the slot;

the operating end of the other of the first and second handle members including a lip which extends away from the grasping end of the other handle member, a first edge which extends substantially normal to and away from the lip toward the operating end of the one handle member, said edge terminating in a corner, and a second edge having first and second linear portions which extend away from the corner, said first linear portion extending angularly toward the grasping end of the one handle member and said second linear portion extending angularly toward the grasping end of the other handle member;

the lip, the first and second edges, and the corner being in cooperative arrangement with the step, with the corner engaging the wire extending from the one operating end when the grasping ends of the first and second handle members are squeezed, whereupon the operating ends of the first and second handle members are displaced toward each other, to bend said wire;

the grasping end of each of the first and second handle members including an angle cannulation; and

said wire being receivable in one of said angled cannulations for being bent.

5,314,432

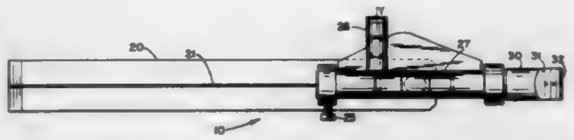
LUMBAR SPINAL DISC TROCAR PLACEMENT DEVICE

Kamaljit S. Paul, 3220 Old Orchard La., Oshkosh, Wis. 54901

Filed Aug. 5, 1993, Ser. No. 102,201

Int. Cl.⁵ A61B *17/00*

U.S. Cl. 606—130 **8 Claims**



1. A stereotactic device adapted for fluoroscope-monitored alignment and placement of a medical probe for percutaneous lumbar discectomy in a human body comprising:

(a) an elongated base plate with a radiopaque reference line along a plate longitudinal axis;

(b) a trocar support means pivotally secured adjacent to one end of said base plate, a longitudinal x-axis of said support means being in plane alignment with the longitudinal radiopaque reference line along said base plate;

(c) leveling gauges integral to the trocar support means for leveling of the longitudinal x-axis and a y-axis of said trocar support means, said leveling gauges being pivotable with said trocar support means relative to aid elongated base plate; and

(d) endpiece means for trocar orientation and slidable guidance integral to and adjacent to a posterior end of said trocar support means.

5,314,433

SUTURE THROW HOLDER AND RUNDOWN SYSTEM

Lehmann K. Li, Wellesley, Mass., assignor to Mitek Surgical Products, Inc., Norwood, Mass.

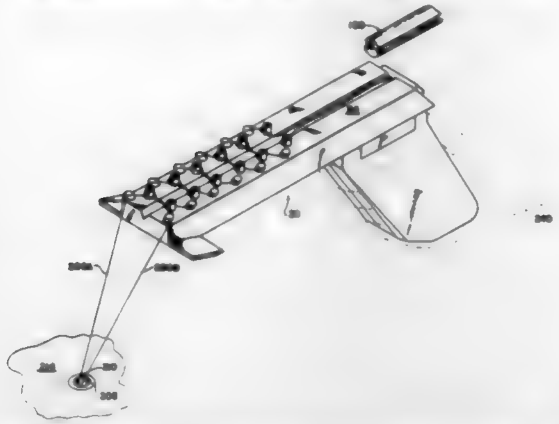
Division of Ser. No. 514,179, Apr. 25, 1990, Pat. No. 5,087,263. This application Dec. 10, 1991, Ser. No. 805,385

Int. Cl.⁵ A61B *17/00*

U.S. Cl. 606—139 **26 Claims**

1. A suture throw holder and rundown system for running at least one suture throw down loose ends of suture extending from a surgical site, the system comprising:

support means for releasably supporting adjacent a surgical site at least one throw formed using two ends of suture extending from said surgical site, wherein said support means comprises a frame and a plurality of pegs attached to said frame in at least one group so that each of said at least one suture throw formed using said two ends of suture may be releasably supported by a corresponding respective one of said at least one group of pegs; and

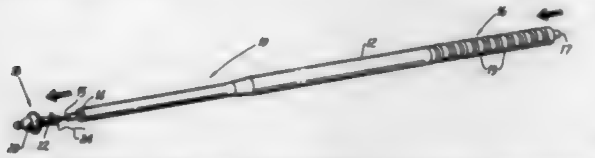


rundown means for transferring said at least one throw from said support means and running said at least one throw down said two ends of suture to said surgical site.

5,314,434

Patent Not Issued For This Number

5,314,435
ANVIL DELIVERY SYSTEM
David Green, Westport; Henry Bolanos, East Norwalk, both of Conn., and Patrick F. Leahy, Dublin, Israel, assignors to United States Surgical Corporation, Norwalk, Conn.
Filed May 19, 1992, Ser. No. 886,040
Int. Cl.^{5} A61B *17/00*
U.S. Cl. 606—153 **17 Claims**



1. A surgical apparatus for delivery an anvil component within a tubular organ section, which comprises:

an elongated delivery member dimensioned to be positioned within a hollow tubular organ, said elongated delivery member including a longitudinal bore extending therethrough and having proximal and distal end portions;

an anvil component releasably mounted at said distal end portion of said elongated delivery member, said anvil component including an anvil shaft, said anvil shaft positioned within said longitudinal bore of said elongated delivery member and being dimensioned to form a frictional fit between an outer peripheral surface of said anvil shaft and an inner peripheral wall of said elongated delivery member to releasably mount said anvil component to said distal end portion of said elongated delivery member; and

releasing means for releasing said anvil component from said distal end portion of said elongated delivery member.

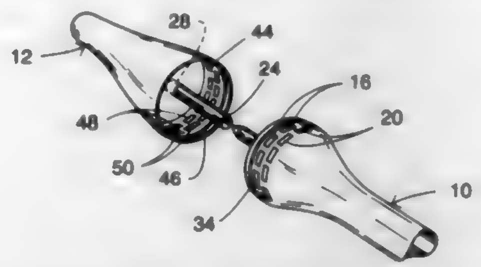
5,314,436
METHOD AND APPARATUS FOR PERFORMING END-TO-END ANASTOMOSES
Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023
Filed Oct. 30, 1992, Ser. No. 969,744
Int. Cl.^{5} A61B *17/00*
U.S. Cl. 606—153 **5 Claims**

1. A device for use in performing an end-to-end anastomosis, comprising:

a stapling member insertable into a first end segment of a tubular organ;

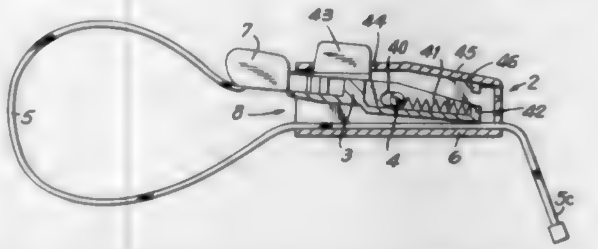
a plurality of staples arranged in a circular array in said stapling member;

an anvil member insertable into a second end segment of said tubular organ, said stapling member being movably connected to and at least partially insertable into said anvil member to enable a clamping of said first and said second end segment to one another in juxtaposition to said circular array and between said stapling member and said anvil member; and



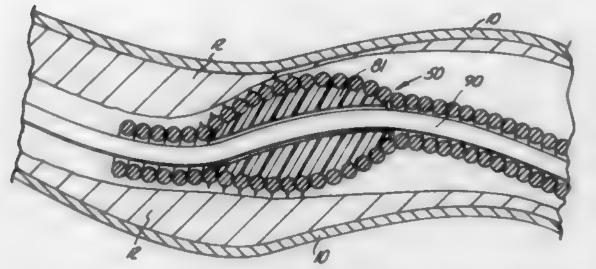
staple ejection means in said stapling member for ejecting said staples in a substantially radial outward direction towards said anvil member and through said first and said second end segment, thereby stapling said first and said second end segment to one another along an annular locus.

5,314,437
CONSTRICTING DEVICE FOR BODY PARTS
Peter Holtsch, Taunusstein, Fed. Rep. of Germany, assignor to Holtsch Metallwarenherstellung Inh. Maria Holtsch, Taunusstein, Fed. Rep. of Germany
Filed Apr. 9, 1993, Ser. No. 45,616
Int. Cl.^{5} A44B *11/06;* **A61B** *17/12*
U.S. Cl. 606—157 **8 Claims**



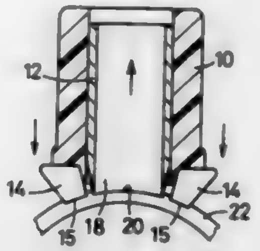
1. A constricting device for body parts, comprising a housing; a clamping rocker rotatably supported in said housing, said clamping member being rotatable between a clamping position in which one end of said clamping rocker clamps a band extending through said housing against a housing wall and an opposite releasing position in which it releases said band, said clamping rocker, when said band which is in a constricting position under tension, being rotated in one direction to said clamping position under the action of the tension while a manual actuating pressure applied to said clamping rocker rotates said clamping rocker in an opposite direction to said releasing position; a releasable arresting closure provided between another end of said clamping rocker and an end of the band; and a mechanical transmission member cooperating with said clamping rocker and with said arresting closure so that during applying the manual actuating pressure to said clamping rocker said mechanical transmission member first, rotates said clamping rocker to said releasing position and then after a release of said band opens said arresting closure.

5,314,438
ABRASIVE DRIVE SHAFT DEVICE FOR ROTATIONAL ATHERECTOMY
Leonid Shturman, Minneapolis, Minn., assignor to Shturman Cardiology Systems, Inc., Minnetonka, Minn.
Continuation-in-part of Ser. No. 992,415, Dec. 17, 1992. This application Feb. 2, 1993, Ser. No. 12,444
Int. Cl.^{5} A61B *17/32*
U.S. Cl. 606—159 **114 Claims**



1. An abrasive drive shaft atherectomy device comprising a flexible, elongated drive shaft having a central lumen for receipt of a guide wire therein around which the drive shaft may be rotated, the drive shaft being comprised of at least one helically wound wire and having proximal, intermediate and distal segments, wire turns of the proximal segment of the drive shaft having a generally constant diameter, turns of the intermediate segment of the drive shaft having a diameter that progressively increases distally through a proximal portion of such intermediate segment and having a diameter that progressively decreases distally through a distal portion of such intermediate segment, thereby defining an enlarged diameter segment of the drive shaft, at least part of the enlarged diameter intermediate segment including an external coating of an abrasive material to define an abrasive segment of the drive shaft, the intermediate segment of the drive shaft including a gap between adjacent wire turns to define a sonolucent window in the intermediate segment.

5,314,439
HOST CORNEA MARKING DEVICE
Juntaro Sugita, Nagoya, Japan, assignor to Menicon Co., Ltd., Japan
Filed Oct. 29, 1992, Ser. No. 968,592
Claims priority, application Japan, Nov. 5, 1991, 3-099371[U]
Int. Cl.^{5} A61F *9/00*
U.S. Cl. 606—166 **6 Claims**



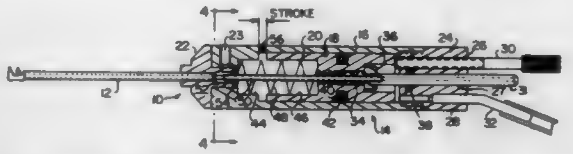
1. A host cornea marking device for providing marks on a recipient cornea bed of a corneal transplant patient, said cornea bed having a cutout section, said host cornea marking device comprising:

an outer tube having a plurality of marking blades at one of opposite axial ends thereof which is adapted to face the recipient cornea bed, said marking blades being spaced apart from each other in a circumferential direction of said outer tube;

an inner tube which is received in said outer tube, such that said inner tube is axially slidable relative to the outer tube during a marking operation between a first position in which the inner tube protrudes a predetermined distance from said one of opposite axial ends of the outer tube and axially past the marking blades, and a second position in which the inner tube is entirely positioned within the outer tube; and

positioning means for positioning the marking device with respect to the cutout section in the recipient cornea bed for receiving a donor cornea, said positioning means comprising a contact portion of one of opposite axial ends of the inner tube, said contact portion being adapted to fit within the cutout section and adapted to be in contact with the cornea bed so as to position the marking device.

5,314,440
MICROSURGICAL SCISSOR APPARATUS
Henry Shapiro, 328 Downham Ct., Walnut Creek, Calif. 94598
Filed Nov. 2, 1992, Ser. No. 953,075
Int. Cl.^{5} A61B *17/32*
U.S. Cl. 606—174 **15 Claims**



5. A surgical instrument for performing microsurgical procedures and including a motion producing portion and an elongated rigid tubular housing, said tubular housing having one end attached to said motion producing portion and a free end for insertion into a surgical site for performing said microsurgical procedures, said tubular housing having a longitudinal axis and a circular cross section and having an inner tubular wall supporting therein a fixed and a movable elongated shaft member, each of said shaft members having a longitudinal axis substantially parallel to said longitudinal axis of said tubular housing, said motion producing portion including means for producing relative axial motion between said fixed and movable elongated shaft members within said tubular housing, said fixed and movable elongated shaft members terminating in cooperating surfaces including sharpened blades having cutting edges exterior of said free end of said tubular housing, said cutting edges being functional to perform said microsurgical procedures, the improvements comprising:

a) said fixed and movable elongated shaft members having outer surfaces terminating in corners, said corners abutting said inner tubular wall of said tubular housing, said shaft members being held in a spacial relationship relative to each other and said inner tubular wall by said corners, whereby said shaft members occupy only a portion of the space in said tubular housing, said movable elongated shaft member being maintained in a sliding relationship within said fixed shaft member and said inner tubular wall;

b) said fixed elongated shaft member being attached to said inner tubular wall of said tubular housing adjacent to the attachment of said tubular housing and said motion producing portion;

c) said movable elongated shaft member being operably connected to a portion of said motion producing portion whereby said movable elongated shaft member is reciprocated axially relative to said fixed elongated shaft member;

d) said sharpened blade and said cutting edge of said fixed elongated shaft member directed along a plane transverse to the longitudinal axis of said tubular housing, said sharpened blade and said cutting edge of said movable elongated shaft member directed toward said cutting edge of said fixed elongated shaft member, whereby said axial movement of said movable elongated shaft member causes said cutting edges of said elongated shaft members to effect an axial scissor action exteriorly of said tubular housing;

e) and said cooperating surfaces of said fixed and movable elongated shaft members exterior of said free end of said tubular housing having a relative tension bias toward each other so as to cause said cooperating surfaces to maintain said cutting edges in firm scissor contact with each other as said movable elongated shaft member is moved axially.

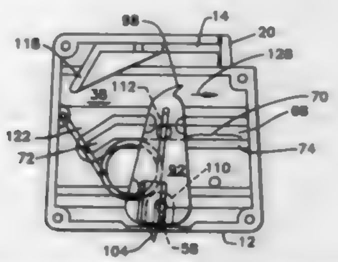
5,314,441
DISPOSABLE SLICING LANCET ASSEMBLY

Robert Cusack, Edison, and Robert Samo, Lakewood, both of N.J., assignors to International Technidyne Corporation, Edison, N.J.

Filed Oct. 16, 1992, Ser. No. 962,284

Int. Cl.^{5} A61B *17/32*

U.S. Cl. 606—182 **18 Claims**



1. A lancet device for implementing an incision comprising;

a hollow housing means having at least two opposing internal surfaces;

a pivot arm supporting a blade located within said housing means;

biasing means for biasing said pivot arm from a first position to a second position within said housing means;

a guide means within said housing means for guiding the path of said pivot arm from said first position to said second position, said guide means causing said blade to emerge from said housing means, create said incision with a slicing motion and return into said housing means wherein said blade follows a generally tear drop shaped path between said first position and said second position; and

a contact means for creating contact between said pivot arm said two opposing internal surfaces as said pivot arm moves from said first position to said second position, said contact means limiting the movement of said blade support arm and said blade to a single plane.

5,314,442
BLOOD COLLECTING APPARATUS

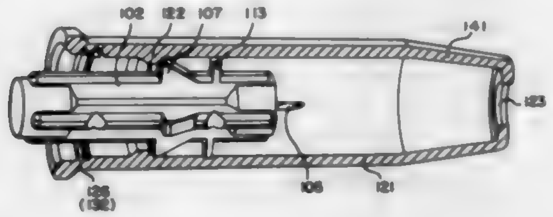
Susumu Morita, Nishinomiya, Japan, assignor to APLS Co., Ltd., Okayama, Japan

Filed Dec. 28, 1992, Ser. No. 997,337

Claims priority, application Japan, Oct. 26, 1992, 4-287287

Int. Cl.^{5} A61B *17/32*

U.S. Cl. 606—182 **8 Claims**



1. A blood collecting apparatus for use with a lancet ejector of the type having an ejecting means which includes a spring means and a holding portion for coupling to a lancet assembly, the spring means being in a compressed state before ejection, the spring means being related and extended to propel the holding portion and the lancet assembly, and the spring means retracting to retract the holding portion and the lancet assembly after ejection, the blood collecting apparatus comprising, in combination:

a lancet assembly comprising a needle and an integrally molded lancet body, the needle having a point, the lancet body defining an axis and having an adapter portion and a needle end, the needle extending from the needle end, and the adatper portion being releasably attachable to the holding portion of the lancet ejector, the lancet body comprising

first locking means, the first locking means being molded with the lancet body and extending radially therefrom in a plane substantially perpendicular to the axis of the lancet body to provide a guiding member, and

locking arm means, the locking arm means being elastically yieldable such that the locking arm means deforms when the spring means is released and extended to allow the lancet assembly to be propelled forward and the locking arm means recovers its original shape when the spring means retracts to retract the lancet assembly after ejection,

an end cap having a distal end, an open proximal end, and an axially extending internal cavity having an inner wall and cooperating with the open proximal end, the open proximal end being releasably attachable to said lancet ejector, the distal end having an axially extending opening, the end cap being adapted to cover and protect the lancet body and needle such that the lancet assembly is disposed within the internal cavity when the lancet assembly and the end cap are attached to the lancet ejector, the needle point advancing outward through the opening when the lancet is propelled through the end cap, the end cap comprising

a first lockable means adapted to cooperate with the first locking means on the lancet body to prevent the lancet body from slipping out the open proximal end of the end cap when the end cap is detached from the lancet ejector, the first locking means being integrally molded in the end cap and extending substantially radially inward from the inner wall of the end cap, and

a second lockable means adapted to engage the arm means of the lancet body to prevent the needle point from accidentally protruding out of the opening in the open proximal end of the end cap.

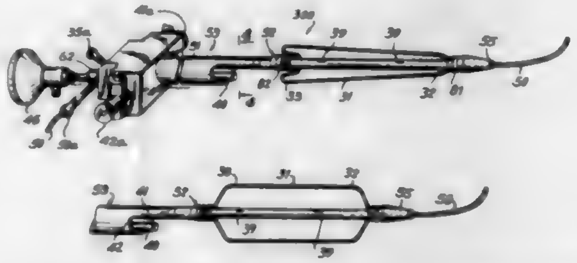
5,314,443
PROSTATE BALLOON DILATATION CATHETER

James J. Rudnick, Plainfield, N.J., assignor to Meadox Medicals, Inc., Oakland, N.J.

Continuation of Ser. No. 542,869, Jun. 25, 1990, abandoned. This application Jan. 21, 1993, Ser. No. 7,048

Int. Cl.^{5} A61M *29/02*

U.S. Cl. 606—192 **20 Claims**



1. A prostate balloon dilatation catheter for treating benign prostate hyperplasia, comprising:

an elongated flexible shaft having a longitudinal axis, which is flexible along its entire length, having a proximal end and a distal end and at least two lumens therethrough, the first lumen denominated an inflation lumen and the second lumen denominated a viewing lumen;

the inflation lumen within the shaft extending from the proximal end of the catheter shaft to the distal region of the shaft;

a balloon portion mounted at the distal region of the shaft in communication with the inflation lumen for expanding the balloon to dilate the prostate;

the viewing lumen within the flexible shaft extending from the proximal end to a position proximal to the balloon portion for receiving viewing means for permitting an operator to view the proximal portion of the balloon and anatomical landmarks to accurately dilate the prostate without injury to the external sphincter when the balloon is expanded.

5,314,444
ENDOVASCULAR STENT AND DELIVERY SYSTEM

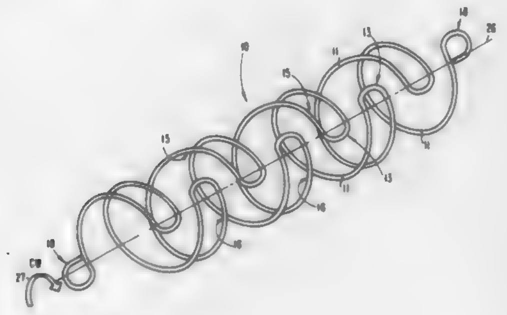
Cesare Gianturco, Champaign, Ill., assignor to Cook Incorporated, Bloomington, Ind.

Continuation of Ser. No. 666,211, Mar. 7, 1991, abandoned, which is a continuation of Ser. No. 244,669, Sep. 14, 1988, Pat. No. 5,041,126, which is a continuation of Ser. No. 25,736, Mar. 13, 1987, Pat. No. 4,800,882. This application Apr. 2, 1993, Ser. No. 41,946

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.^{5} A61M *29/02*

U.S. Cl. 606—195 **8 Claims**



1. A stent comprising:

a malleable wire formed into a serpentine pattern including a plurality of wire segments joined in a series by a plurality of bends;

said serpentine pattern being wrapped about a longitudinal axis to define a hollow cylinder;

said hollow cylinder having a first diameter and at least a portion of said hollow cylinder being inelastically deformable from said first diameter to a second expanded diameter; and

means, disposed within said hollow cylinder, for inelastically expanding said portion from said first diameter to said second expanded diameter.

5,314,445
SURGICAL INSTRUMENT

Elke Heidmueller née Degwitz, and Harald Heidmueller, both of Heidenrichstr. 10, D-5000 Koeln 80, Fed. Rep. of Germany

PCT No. PCT/EP92/00313, § 371 Date Sep. 30, 1992, § 102(e) Date Sep. 30, 1992, PCT Pub. No. WO92/14412, PCT Pub. Date Sep. 3, 1992

PCT Filed Feb. 13, 1992, Ser. No. 930,591

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1991, 4104755

Int. Cl.^{5} A61B *17/28*

U.S. Cl. 606—208 **7 Claims**

1. A surgical instrument for performing cutting or gripping movements, comprising

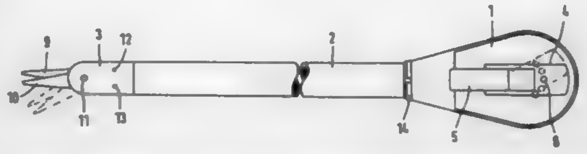
a tube body (2) having an axis and an end portion (1) at its rear end, said end portion (1) having a handle (4) including an actuating lever (5),

a forceps disposed at the front end of said tube body (2) and comprising a pair of forceps legs (9, 10) that are pivotable relative to each other, and

a transmission device extending from said end portion (1) through said tube body (2) to said forceps for pivoting said forceps legs (9, 10), said device further being coupled to said actuating lever for spreading said forceps legs (9, 10) apart or for pressing them together in dependence of the movements of said actuating lever (5),

characterised in

that said handle is provided with supporting means to allow for the rotation of said handle about an axis which is generally normal to said tube body axis, such that rotation of said handle about said normal axis pivots said forceps legs commonly and in the same direction.



5,314,446
STERILIZED HETEROGENEOUS BRAIDS

Alastair W. Hunter, Bridgewater; Arthur Taylor, Jr., Plainfield, both of N.J., and Mark Steckel, Maineville, Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 19, 1992, Ser. No. 838,511

Int. Cl.^{5} D04C *1/00*

U.S. Cl. 606—231 **12 Claims**

1. A surgical suture consisting essentially of a heterogeneous braid composed of a first and second set of continuous and discrete yarns in a sterilized, braided construction wherein at least one yarn from the first set is in direct intertwining contact with a yarn from the second set; and

a) each yarn from the first set is composed of a plurality of filaments of a first fiber-forming material selected from the group consisting of PTFE, FEP, PFA, PVDF, PETFE, PP and PE; and

b) each yarn from the second set is composed of a plurality of filaments of a second fiber-forming material selected from the group consisting of PET, nylon and aramid; and

c) optionally a core.

5,314,447
MALE CONDOM DEVICE AND METHOD OF USING SAME

David M. Papurt, 37 Kinnaird St., Cambridge, Mass. 02139

Continuation of Ser. No. 603,244, Oct. 22, 1990, Pat. No. 5,070,890. This application Dec. 5, 1991, Ser. No. 803,104

The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.

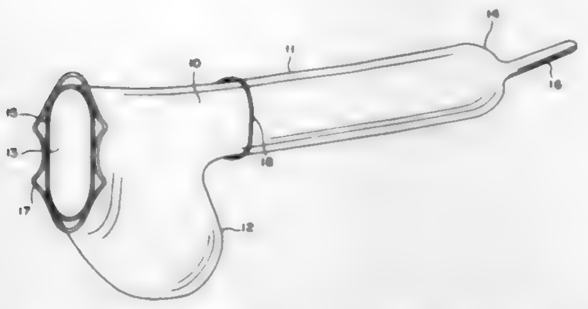
Int. Cl.^{5} A61F *6/02, 6/04*

U.S. Cl. 128—842 **12 Claims**

1. A prophylactic and contraceptive condom device, comprising:

a single and continuous sheath of thin walled tubular construction having a closed first end and an open second end, said sheath shaped such that, when the device is in place over the male genitalia, the sheath covers the penis, including the base of the penis shaft, and the scrotum, and is retained adjacent the open second end by the posterior of the scrotum, said sheath including a penis covering segment and a scrotum covering segment; and

a portion of the penis covering segment being wound in combination with a portion of the scrotum covering segment into a toroidally shaped winding of more than 360 degrees, such that said penis covering segment portion and said scrotum covering segment portion are interleaved as alternate layers within said toroidally shaped winding.

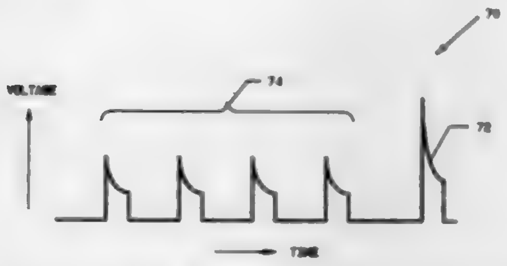


5,314,448

PROCESS FOR DEFIBRILLATION PRETREATMENT OF A HEART

Mark W. Kroll, Minnetonka, and Theodore P. Adams, Edina, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Filed Oct. 28, 1991, Ser. No. 783,763
Int. Cl.^{5} A61N *1/39*
U.S. Cl. 607—5 **27 Claims**



1. A process for the electrical pretreatment of a fibrillating heart comprising:
   a. at least one low-energy pretreatment pulse applied to the heart before application of a defibrillation pulse to the heart;
   b. at least one of said pretreatment pulses having a duration that is long compared to that of said defibrillation pulse and a voltage that is low compared to that of said defibrillation pulse; and
   c. said pretreatment pulses being spaced away from said defibrillation pulse by a time interval.

5,314,449

RATE-ADAPTIVE CARDIAC PACEMAKER

Anders Lindgren, Taeby, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 17, 1993, Ser. No. 18,525
Claims priority, application European Pat. Off., Feb. 26, 1992, 92103277.7
Int. Cl.^{5} A61N *1/365*
U.S. Cl. 607—24 **5 Claims**

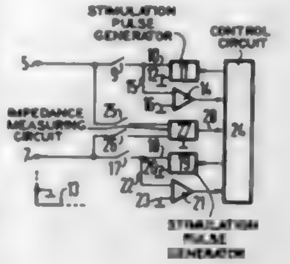
1. A rate-adaptive implantable cardiac pacemaker comprising:

implantable dual chamber pacing means including first stimulation pulse generating means for generating atrial stimulation pulses and second stimulation pulse generating means for generating ventricular stimulation pulses;

a first electrode, electrically connected to said first stimulation pulse generating means, and arranged on a first electrode catheter adapted for inserting said first electrode in an atrial position of a heart to be stimulated;

a second electrode, electrically connected to said second stimulation pulse generating means, and arranged on said first or on a second electrode catheter adapted for inserting said second electrode in a ventricular position of said heart to be stimulated;

implantable impedance measuring means, electrically connected to said first and second electrodes, for acquiring a measurement of the electrical impedance between said first and second electrodes as an indicator of the level of physical activity of a patient in whom said pacemaker is implanted; and


STIMULATION PULSE GENERATOR
CONTROL CIRCUIT
5
9'
10
11
12
15
16
14
IMPEDANCE MEASURING CIRCUIT
25
27
28
24
26'
2
17'
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STIMULATION PULSE GENERATOR

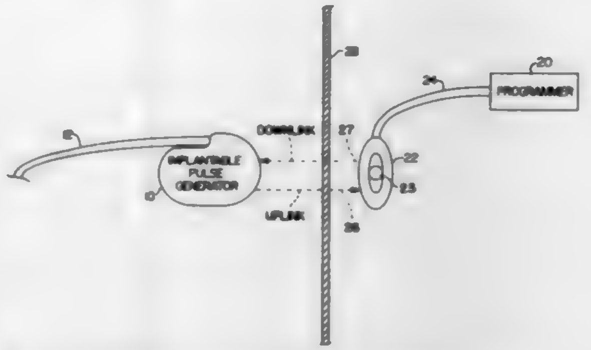
control means electrically connected to said impedance measuring means and to said first and second stimulation pulse generating means for causing said first and second stimulation pulse generating means to respectively generate stimulation pulses at a rate matched to said physical activity level of said patient.

5,314,450

DUAL CHANNEL TELEMETRY FOR IMPLANTED MEDICAL DEVICE

David L. Thompson, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 765,475, Sep. 25, 1991, which is a continuation of Ser. No. 468,407, Jan. 22, 1990, abandoned. This application Jun. 10, 1992, Ser. No. 896,641
Int. Cl.^{5} A61N *1/00;* G08B *23/00;* H04J *9/00;* H04L *5/04*
U.S. Cl. 607—32 **2 Claims**



2. An implantable medical device comprising:

(a) a pulse generator, wherein said pulse generator comprises first means for modulating a radio frequency carrier with digital information and second means for modulating said carrier with analog data, and wherein said first modulating means comprises a pulse position modulator and wherein said second modulating means comprises a phase shift modulator; and

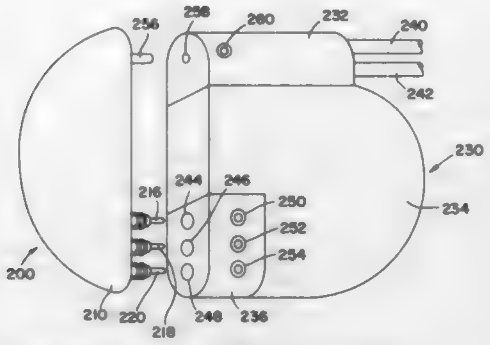
(b) coupling means coupled to said pulse generator for electrically coupling said pulse generator to a patient's heart.

5,314,451

REPLACEABLE BATTERY FOR IMPLANTABLE MEDICAL DEVICE

Peter M. J. Mulier, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 15, 1993, Ser. No. 6,099
Int. Cl.^{5} A61N *1/02*
U.S. Cl. 607—33 **5 Claims**



1. An implantable medical device, comprising:

a first hermetically sealed enclosure containing a capacitor and electrical circuitry including control means for generating a control signal and provided with a first connector means for coupling to said capacitor and a second connector means for coupling to said control means, said enclosure further comprising output connector means for coupling to body stimulation electrodes, and means for connecting said capacitor to said output connector means for discharging said capacitor to stimulate body tissue; and

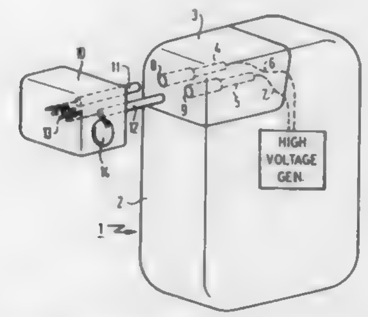
a second hermetically sealed enclosure, containing a battery and a switch having a control input, and provided with third connector means for removably coupling to said first connector means, and fourth connector means for removably coupling to said second connector means, said fourth connector means coupled to said control input of said switch, said switch comprising means for coupling said battery to said third connector means responsive to a control signal applied at said control input.

5,314,452

PROTECTIVE ARRANGEMENT FOR AN IMPLANTABLE DEFIBRILLATOR

Jakub Hirschberg, Taeby, and Hans Strandberg, Sundbyberg, both of Sweden, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 18, 1992, Ser. No. 946,599
Claims priority, application European Pat. Off., Sep. 23, 1991, 91116160
Int. Cl.^{5} A61N *1/08*
U.S. Cl. 607—36 **4 Claims**



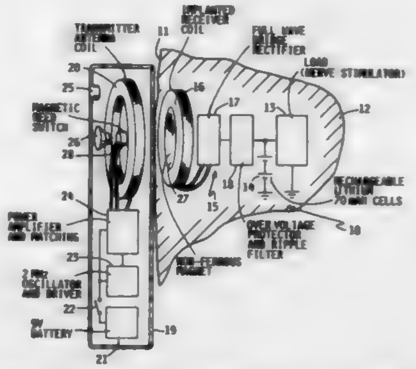
1. A protective arrangement for an implantable defibrillator containing high-voltage components, said defibrillator having a housing with exposed sockets for the connection of electrode leads to said high-voltage components, said protective arrangement consisting of a non-conductive plug part detachably connectable to said defibrillator housing, said plug part having two terminal pins insertable into said sockets with said plug part completely covering said sockets, and an electrical resistor directly connected between said terminal pins, said terminals and forming means for producing a constant electrically conductive path between said sockets and protecting against discharge of said high-voltage components.

5,314,453

POSITION SENSITIVE POWER TRANSFER ANTENNA

Dean C. Jeutter, Grafton, Wis., assignor to Spinal Cord Society, Fergus Falls, Minn.

Filed Dec. 6, 1991, Ser. No. 803,022
Int. Cl.^{5} A61N *1/08*
U.S. Cl. 607—61 **18 Claims**



1. A high frequency transmitting and receiving device wherein a high frequency signal is generated by an external transmitter with a transmitter antenna coil, and the signal is transmitted between the transmitter antenna coil and a receiver coil wherein the receiver coil is implantable behind a tissue barrier, the device comprising:

a disseminating means adjacent the receiver coil for exuding a sensible media capable of passing through such a tissue barrier and distinguishable from the high frequency signal being transmitted;

and a sensing means adjacent the transmitter antenna coils for detecting said sensible media and for determining the proximity of the disseminating portion and therefore the relative proximity of the coils, the sensing means comprised of a switch means connected to the transmitter for alternately enabling and disabling the transmitter in correspondence to the relative proximity of the coils.

5,314,454

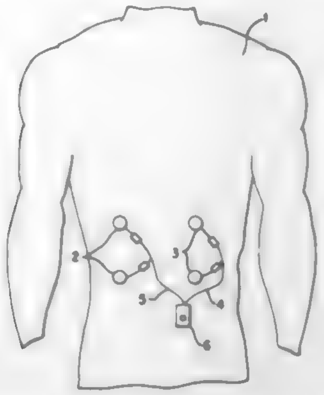
METHOD AND APPARATUS OF ARTIFICALLY STIMULATING COUGH REFLEX

Robert J. Jaeger, 548 N. Garfield, Hinsdale, Ill. 60521, and Elliot J. Roth, 216 Carter Ct., Northbrook, Ill. 60062

Filed Apr. 2, 1992, Ser. No. 862,344
Int. Cl.^{5} A61N *1/18*
U.S. Cl. 607—62 **19 Claims**

1. An artificial cough reflex apparatus comprising:

at least one pair of electrodes, stimulator means for electronically receiving an input signal and computing an output signal corresponding to a stimulus time period, input means for generating said input signal as a representation of a volitional decision of a user to initiate a cough, signal means for alerting said user of an upcoming said cough, said stimulator means emitting said output signal after an adjustable time delay during which said user coordinates a volitional activity, transformer means for transforming said output signal into a pulse electrical voltage across each said pair of electrodes that activates lower motor neurons and contracts a plurality of expiratory muscles,



and said signal means for signalling said user to engage said volitional activity and complete said cough.

5,314,455

THERMAL COMPRESS SYSTEM

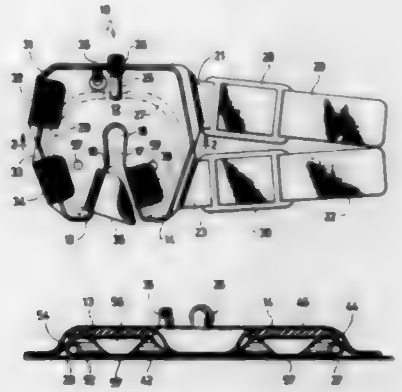
Glenn W. Johnson, Jr., Summit; Henry J. McVicker, Chatham, both of N.J., and K. Donald Shelbourne, Indianapolis, Ind., assignors to Aircast, Inc., Summit, N.J.

Filed Jan. 23, 1991, Ser. No. 644,835

The portion of the term of this patent subsequent to Jul. 27, 2010, has been disclaimed.

Int. Cl.^{5} A61F *7/00*

U.S. Cl. 607—104 **29 Claims**



14. A device for treating an injured knee of a human limb comprising:

a therapeutic cold and compression applying means including a cuff-like device having a liquid-tight chamber with inner and outer walls and formed with a transverse portion and first and second spaced hollow dependent arms having distal ends, the transverse portion being intended for contact with the general area of only the suprapatella pouch and the first and second hollow arms extending generally along and in contact with the respective sides of the knee;

means for attaching the cold and compression applying means to the knee;

means for applying a pressurized fluid to the cuff-like device; and

means coupled to the compression applying means for limiting the compression applied to the general area alongside and below the knee and no compression behind the knee thereby limiting venous constriction below the knee while simultaneously enabling a different level of compression to be applied to the general area of the suprapatella pouch and independent of the means for attaching the cold and compression applying means to the knee.

5,314,456

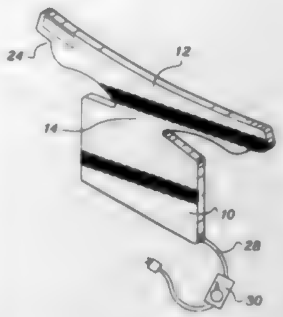
THERAPEUTIC PAD FOR RELIEF OF HEADACHE-RELATED HEAD, TEMPLE, NECK AND BACK PAIN

Gary M. Cohen, 9694 Sun Pointe Dr., Boynton Beach, Fla. 33437

Filed Mar. 19, 1993, Ser. No. 34,831

Int. Cl.^{5} A61F *7/00*

U.S. Cl. 607—109 **8 Claims**



1. A therapeutic pad for the relief of headache-related pain of the head, eyes, temples, base of the skull, neck and upper back, the pad comprising:

(a) a lower portion substantially defining, in surface geometry, a region having a major axis and a minor axis, and an axis of symmetry co-linear to said minor axis;

(b) an upper portion substantially defining, in surface geometry, an elongate wing-like shape having a major axis of about double the length of said major axis of said lower portion, and having a minor axis comprising an axis of symmetry of said upper portion, said axis of symmetry co-linear to said axis of symmetry of said lower portion said upper portion, said upper portion having a first and second lateral end, said upper portion also including means for selectably securing to each other said first and second lateral ends thereof;

(c) a connecting portion defining an isthmus between said lower and upper portions, the geometry of said connecting portion having an axis of symmetry, colinear with said axes of symmetry of said upper and lower portions, said connecting portion also having a major axis, transverse to its axis of symmetry, having a length of about one-half of the length of said major axis of said lower portion; and

(d) means, embedded within each of said portions for selectably providing simultaneous and substantially uniform therapeutic stimuli to all surfaces of said portions.

5,314,457

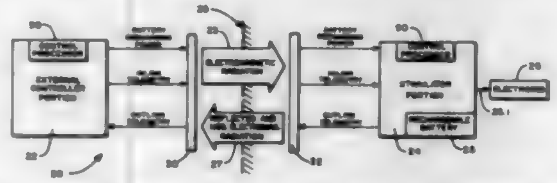
REGENERATIVE ELECTRICAL

Dean C. Jeutter, 246 Oak St., Grafton, Wis. 53024, and Mark S. Geisler, 7819 S. 83rd St., Franklin, Wis. 53132

Filed Apr. 8, 1993, Ser. No. 44,634

Int. Cl.^{5} A61N *1/36*

U.S. Cl. 607—116 **22 Claims**



1. A nerve regeneration device of the type comprising an external controller portion and an implantable stimulator portion, the stimulator portion to provide electrical stimulus to nerve tissue;

the external controller comprising:

a first antenna coil;

a radio frequency transmitter connected to the antenna coil, the transmitter generating electromagnetic radiation at a selected transmission frequency; whereby the antenna coil radiates the electromagnetic radiation as a signal;

a first receiver means connected to the first antenna coil to detect electromagnetic radiation reflected back to the first antenna coil, the receiver having means for generating a signal corresponding to the reflected electromagnetic radiation;

a control processor connected to the receiver means, the control processor having means for receiving and responding to said signal;

the stimulator portion comprising:

a second antenna coil that couples with the first antenna coil and absorbs a portion of the electromagnetic radiation;

a sensing means for detecting a specified condition of the stimulator portion, the sensing means providing a condition indicating signal which varies as a function of the condition;

a reflecting means for reflecting a portion of the electromagnetic radiation as a signal back to the first antenna coil;

a switching means for activating and deactivating said reflecting means;

a second control processor connected to the switching means and to the sensing means; the control processor having means for operating the switching means in accordance with the condition indicating signal, whereby the reflected electromagnetic radiation forms an encoded signal corresponding to the specified condition.

5,314,458

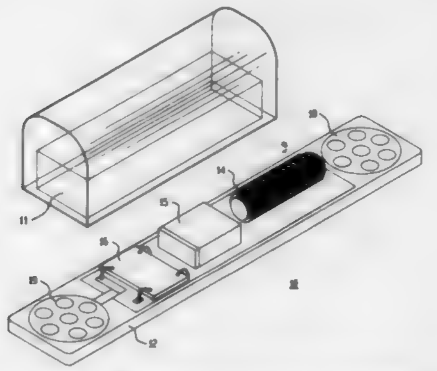
SINGLE CHANNEL MICROSTIMULATOR

Khalil Najafi, and Kensall D. Wise, both of Ann Arbor, Mich., assignors to University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 532,271, Jun. 1, 1990, abandoned. This application May 24, 1993, Ser. No. 66,925

Int. Cl.^{5} A61N *1/18*

U.S. Cl. 607—116 **12 Claims**



1. An electrical stimulator system for delivering a controlled electrical stimulation into the body of a living being, the system comprising:

a non-implantable portion, said non-implantable portion being provided with:

code generator means for producing a coded information; and

transmitter means for transmitting an electromagnetic energy signal, said electromagnetic energy signal containing said coded information;

an implantable portion comprising a silicon substrate upon which are provided:

a receiver coil for receiving said electromagnetic energy signal;

code detector means coupled to said receiver coil for detecting coded information contained in said electromagnetic energy signal;

energy storage means coupled to said receiver coil for storing electrical energy obtained from said electromagnetic energy signal;

a housing cover having an edge portion which is bonded to a surface of said silicon substrate to form an hermetically sealed housing with said silicon substrate, said receiver coil, said code detector means, and said energy storage means being arranged in said hermetically sealed housing;

stimulator electrode means formed directly on said surface of said silicon substrate coupled to said energy storage means for coupling electrically with the living being, said stimulator electrode means being formed of a plurality of electrode subportions, said stimulator electrode means being arranged exterior of said hermetically sealed housing; and

electrical coupling means for coupling said stimulator electrode means electrically to the interior of said hermetically sealed housing, said electrical coupling means comprising thin metallic conductor means interposed intermediate of said silicon substrate and said edge portion of said housing cover bonded thereto.

5,314,459

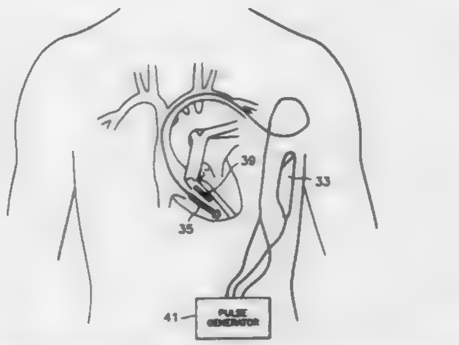
DEFIBRILLATION ELECTRODE SYSTEM HAVING SMOOTH CURRENT DISTRIBUTION WITH FLOATING ELECTRODE

David K. Swanson, Roseville; Roger W. Dahl, Andover, and Douglas J. Lang, Arden Hills, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Division of Ser. No. 468,739, Jan. 23, 1990, Pat. No. 5,111,812. This application Nov. 19, 1991, Ser. No. 794,003

Int. Cl.^{5} A61N *1/05*

U.S. Cl. 607—122 **10 Claims**



10. An implantable defibrillation/cardioversion system comprising pulse generator means, a defibrillation/cardioversion electrode for implantation in the region of the heart and connected to said pulse generator means for serving as an active electrode for discharging electrical energy to the heart, and a floating electrode for mounting in the heart and not being connected to said pulse generator, wherein said floating electrode is a endocardial catheter electrode for mounting in the right ventricle of the heart.

5,314,460

ADAPTOR DEVICE FOR ELECTRODE CATHETERS

Enzo Borghi, Via Romagnoli, 15, 40054 Budrio, Italy

Filed Feb. 25, 1992, Ser. No. 840,887

Claims priority, application Italy, Mar. 29, 1991, B091A000102

Int. Cl.^{5} A61N *1/362*

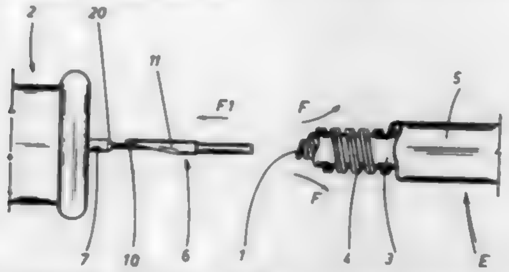
U.S. Cl. 607—122 **13 Claims**

1. An apparatus comprising a conductive catheter comprising:

an internal, first electrically conductive spiral wound wire ensheathed by an electrically insulating flexible tube, of which a first end is adapted to be connected by way of an electrode to a first pole of a pacemaker and a remaining end terminates in an element adapted to be secured positively to a ventricular wall of a cardiac muscle;

a second electrically conductive spiral wound wire, coaxially ensheathing the flexible tube and ensheathed in turn by a first protective outer sleeve, of which a first end is adapted to be connected to a second pole of the pacemaker and a remaining end is adapted to be connected to an atrial electrode;

a single bipolar electrode with a socket end portion and poles comprising two terminal contact elements for enabling connection to a pacemaker implanted in conjunction with an existing catheter from which a previous electrode has been removed and of which said first and second wires are bared a suitable distance from the first protective outer sleeve;



an electrically conductive hollow expander element coaxially and stably accommodated within the socket end portion of the electrode and associated with the second pole of which at least a free end is of tapered profile and insertable stably between the flexible tube and the second spiral wound wire;

a rigid core associated at one end with a first pole of the electrode and at the remaining end with an electrically conductive anchor element that is positioned internally of and coaxial with the expander element, and an anchor element capable of sliding movement coaxially with and in relation to the socket end portion and insertable into and stably retainable by the first spiral wound wire;

adjustment means associated at least with the free end of the electrode for selectively producing sliding movement of the anchor element to cause the electrode and the catheter to be drawn together for seating the catheter in the socket end portion.

5,314,461
ACTIVELY ANCHORED ELECTRODE FOR ELECTRODE CATHETERS

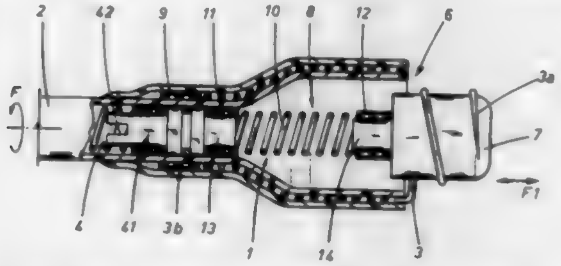
Enzo Borghi, Budrio, Italy, assignor to X-Trode S.R.L., Bologna, Italy

Filed Sep. 30, 1992, Ser. No. 954,579

Claims priority, application Italy, Oct. 2, 1991, BO91A000351

Int. Cl.^{5} A61N *1/00*

U.S. Cl. 607—127 **6 Claims**



1. An actively anchored electrode catheter comprising:

a protective insulating tubular sheath having an enlarged end portion;

at least one spiral wound stimulation signal conductor accommodated internally of the sheath;

a spiraled anchor point ending in a tip, positioned at and projecting from a distal end of the tubular sheath by a rotation control means, connected stably to the protective tubular sheath in a position coinciding with the enlarged end portion of the sheath and isolated electrically from the spiral wound conductor, for rotating the spiraled anchor point causing the spiraled anchor point to penetrate a cardiac muscle thereby anchoring the electrode catheter;

a stimulation head disposed coaxially with the sheath and connected to the spiral wound conductor, at least partly encircled by the spiraled anchor point, of which an exposed surface is disposed in alignment at least with the tip of the point in a non-operative configuration of the catheter;

conductive elastic means interposed between the stimulation head and the spiral wound conductor for allowing a measured retraction of the head into the sheath as the spiraled anchor point is made to penetrate the cardiac muscle, in such a way that the contact induced between the head and the surface of the cardiac muscle can be maintained constant independently of the penetrating movement of the point.

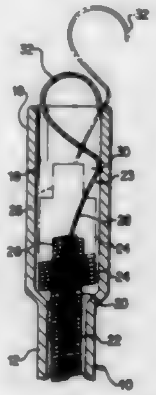
5,314,462
POSITIVE FIXATION DEVICE

Ronald W. Heil, Jr., Roseville; Wickham, Jr. Robert W., Harris, and Bruce H. Kenknight, Robbinsdale, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed May 27, 1992, Ser. No. 888,492

Int. Cl.^{5} A61N *1/00*

U.S. Cl. 607—128 **8 Claims**



1. An implantable defibrillation electrode comprising:

an electro-catheter including a conductive distal end portion and a non-conductive proximal end portion, at least a major portion of the length of said distal end portion having a preconfigured shape and being resiliently deformable into a generally straight condition, said distal end portion including distal and proximal ends, at least one of said distal and proximal ends being hollow,

hook means, shiftably supported in said at least one of said distal and proximal ends, for engaging body tissue and including a reversed turned free end portion and a mounted base end portion, said hook means further including a bend therein intermediate said free end portion and said base end portion contained within said hollow end when said hook means is in a retracted position and projectable outwardly of said hollow end when said hook means is in an extended position for lateral displacement of said hook means relative to said hollow end during final displacement of said hook means to said extended position,

means for moving said hook means longitudinally of said electro-catheter from said retracted position, in which said hook means is at least substantially entirely contained within said hollow end, and said extended position, in which said hook means is substantially fully outwardly projected from said hollow end, and

said means is substantially fully outwardly projected from said hollow end, and

means for yieldingly biasing said hook means from said extended position toward said retracted position, and axial thrust developing means being slidingly telescoped through said proximal end portion and operatively associated with said hook means in order to exert an axial thrust thereon from a terminal end of said proximal end portion.

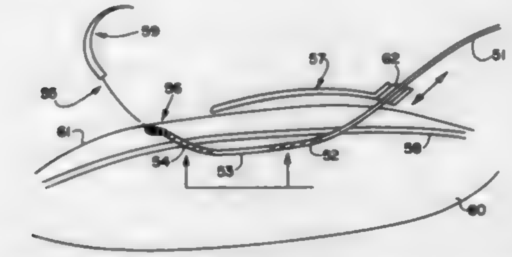
5,314,463
BIPOLAR NERVE ELECTRODE

Antoine N. J. M. Camps, Eys, Netherlands; Pierre A. Grandjean, Bassenge, Belgium; Gary M. Johnson, Ramsey; Philip H. J. Lee, Woodbury, both of Minn.; Nicolaas M. H. Lokhoff, Kerkrade, and Willem J. Van Driel, Heerlen, both of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 795,942, Nov. 18, 1991, Pat. No. 5,241,957. This application Apr. 14, 1993, Ser. No. 47,211

Int. Cl.^{5} A61N *1/04*

U.S. Cl. 607—129 **3 Claims**



1. A bipolar nerve electrode for permanent implantation into a muscle (60) and adjacent a nerve (58) for simulation of the nerve, said nerve electrode comprising:

a first (52) electrode means;

a cable means (52) coupled to said first electrode, and including a conductor (54) having an exposed distal end which exposed end comprises a second electrode means (54), said first (52) and second (54) electrode means providing opposite polarity electrical energy to the nerve (58);

an insulating means (53) coupled between said conductor (54) and said first electrode (52); and

an insulating flap means (57) coupled to said cable means (51) comprising means for coupling said flap means to a surface (61) of the said muscle (60) for shielding adjacent muscle structure from the electrical stimulation provided by said first (52), and second (54) electrodes thereby concentrating the stimulation current field to the nerve,

wherein said flap means (57) comprises suture means for suturing said flap means to said surface (61) of said muscle (60), and said flap means also comprises an aperture means (62) coupled to said cable (51) for facilitating sliding of the flap along the cable (51).

5,314,464
METHOD AND APPLICATOR TOOL FOR IMPLANTING CARDIAC DEFIBRILLATION ELECTRODES

Bruce H. KenKnight, Minneapolis; Jeffrey A. Hall, Bloomington, and William J. Eastman, Maple Grove, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Sep. 30, 1992, Ser. No. 954,514

Int. Cl.^{5} A61N *1/05*

U.S. Cl. 607—132 **12 Claims**

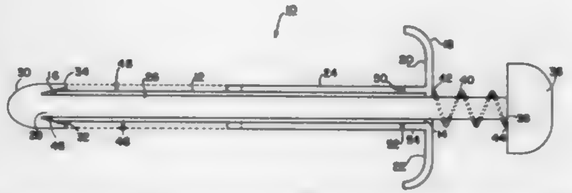
1. A tool for inserting cardiac defibrillation electrodes into a patient, said tool comprising:

an elongate electrode support tube having a rounded distal end and a proximal end, said electrode support tube exhibiting a diameter;

a finger grip connected to said electrode support tube toward said proximal end thereof;

an actuating rod slidably disposed coextensively within said electrode support tube, said actuating rod having a distal end extending beyond the rounded distal end of said electrode support tube and a proximal end extending beyond said proximal end of said electrode support tube;

a blunt conically shaped distal tip connected to said distal end of said actuating rod, said distal tip having a portion with a diameter larger than the diameter of said electrode support tube, said distal tip further having an inner surface for engaging said rounded distal end of said electrode support tube;



a palm member connected to said proximal end of said actuating rod; and

resilient means for exerting a force on said actuating rod tending to withdraw said actuating rod out through said proximal end of said electrode support tube, such withdrawal being prevented by engagement of said inner surface of said distal tip with said rounded distal end of said electrode support tube.

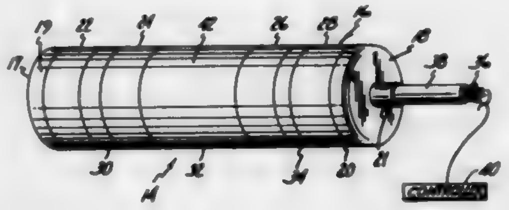
5,314,465
INCONTINENCE ELECTRODE APPARATUS AND METHOD

Donald D. Maurer, Anoka, and Alexander Kipnis, Minneapolis, both of Minn., assignors to Empi, Inc., St. Paul, Minn.

Continuation of Ser. No. 675,568, Mar. 26, 1991, Pat. No. 5,199,443. This application Jan. 14, 1993, Ser. No. 980,902

Int. Cl.^{5} A61N *1/05*

U.S. Cl. 607—138 **7 Claims**



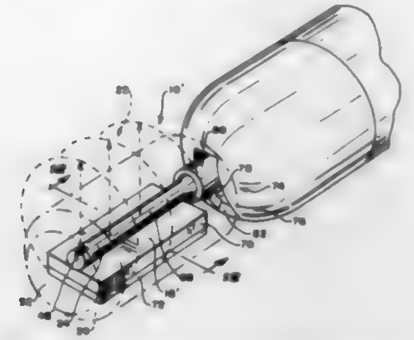
1. A urinary incontinence electrode for stimulation of vaginal musculature, the electrode comprising a resilient hollow cylindrical body having an outer surface, an inner surface and opposing sealed ends, the inner surface and opposing sealed ends defining an enclosed, generally cylindrical cavity, the body further having a first conductive region and a second conductive region disposed on the outer surface, the first and second conductive regions being separated by a non-conductive region and being configured for electrical connection to an electric power source, wherein upon being electrically connected to the electric power source, inserted into a vagina, and activated by the electric power source, the cylindrical body flexes inwardly in response to a contraction of the vaginal musculature.

5,314,466

ARTICULATED UNIDIRECTIONAL MICROWAVE ANTENNA SYSTEMS FOR CARDIAC ABLATION

Roger A. Stern, Cupertino; Stuart D. Edwards, Los Altos; Jerome Jackson, Sunnyvale, all of Calif., and Arye Rosen, Cherry Hill, N.J., assignors to EP Technologies, Inc., Sunnyvale, Calif.

Filed Apr. 13, 1992, Ser. No. 868,113
Int. Cl.^{5} A61N *5/02*
U.S. Cl. 607—156 **9 Claims**



1. A unidirectional microwave ablation antenna comprising

a main conductor,

a ground plane conductor having a width substantially greater than its thickness and being positioned with is widest dimension facing said main conductor, and

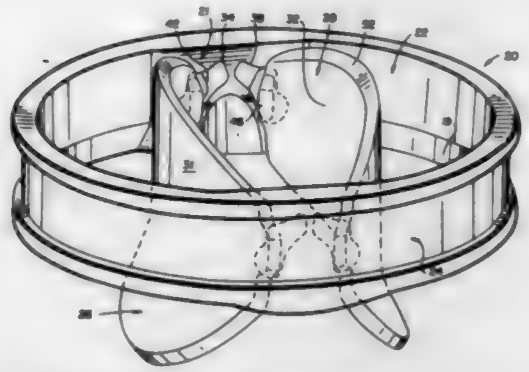
a dielectric material sandwiched between the main conductor and the ground plane conductor to restrict the propagation of the electromagnetic field by the main conductor in a single direction radially away from the dielectric material.

5,314,467

COMPOSITE CURVATURE BILEAFLET PROSTHETIC HEART VALVE WITH SERPENTINE CURVE HINGE RECESSES

Mark C. S. Shu, Brooklyn Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 711,244, Jun. 6, 1991, abandoned. This application Aug. 19, 1992, Ser. No. 932,110
Int. Cl.^{5} A61F *2/24;* **F16K** *15/00, 17/00, 21/04*
U.S. Cl. 623—2 **13 Claims**



1. A heart valve prosthesis comprising:

a generally annular valve base having an interior surface which defines a central passageway for blood flow in a downstream direction and a pair of leaflets mounted therein; and

hinge means for supporting said pair of leaflets for substantially pivoting movements on eccentric axes between a closed position generally blocking blood flow through said central passageway and an open position allowing blood flow therethrough in said downstream direction;

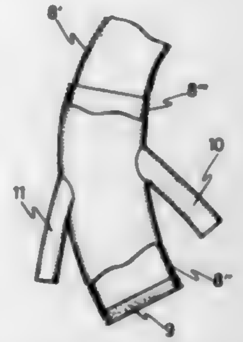
wherein each of said pair of valve leaflets has a first arcuate major edge which is configured to interface with the interior surface of said annular base in a blood flow sealing relationship therewith and a second, minor edge which is configured to interact with the said second minor edge of the other leaflet in a fluid flow sealing relationship therewith when in a closed position, each of said leaflets further having opposite and generally parallel inflow and outflow surfaces, wherein said inflow and outflow surfaces are curved to define generally cylindrical surfaces in regions of said leaflets adjacent said minor edges and said inflow and outflow surfaces are curved in along a second radius of curvature in the regions of said leaflets adjacent said major edges, said second radius of curvature being generally transverse to the curvature of said cylindrical surfaces and located downstream of said valve base when said leaflets are in their open position.

5,314,468

AORTIC VALVED TUBES FOR HUMAN IMPLANTS

Wilson Ramos Martinez, Doctor Fleming, 24, Madrid, Spain

Division of Ser. No. 765,000, Sep. 24, 1991, Pat. No. 5,178,634, which is a continuation of Ser. No. 461,056, Jan. 4, 1990, abandoned. This application Dec. 14, 1992, Ser. No. 990,127
Claims priority, application Spain, Mar. 31, 1989, 8901122
Int. Cl.^{5} A61F *2/24, 2/04*
U.S. Cl. 623—2 **9 Claims**



1. An artificial aortic valved tube implant manufactured of biocompatible material for a human for replacing an aortic valve and an ascending section of an human aorta, comprising:

a tube of synthetic biocompatible material and of a generally circular cross section, said tube having a proximal end and a distal end, said tube by a tube wall defining a single continuous flow passage between said ends;

a cardiac valvular prosthesis located within said tube at said proximal end, said flow passage having a substantially constant flow area from said prosthesis to said distal end;

a first tubular branch of said synthetic biocompatible material and a second tubular branch of said synthetic biocompatible material, each said branch intersecting and extending transversely at different locations from said tube wall and being integral therewith, interiors of said branches communicating with said continuous flow passage of said tube through respective holes in said wall, said branches being located on said wall to facilitate subsequent connection of said branches respectively to left and right coronary arteries of said human.

5,314,469

ARTIFICIAL HEART

Hua Gao, Shorewood, Wis., assignor to Milwaukee Heart Research Foundation, Milwaukee, Wis.

Filed Mar. 11, 1992, Ser. No. 849,190
Int. Cl.^{5} A61M *1/10;* **A61N** *1/362*
U.S. Cl. 623—3 **22 Claims**

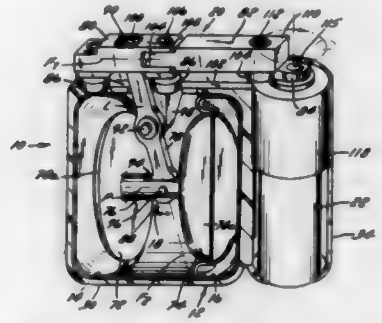
1. A biocompatible, implantable artificial heart, comprising:

a housing having first and second inlet ports and first and second outlet ports;

first and second flaccid bladders disposed in the housing, the first bladder communicating with the first inlet and outlet ports and the second bladder communicating with the second inlet and outlet ports;

pairs of one-way, inlet and outlet valves disposed in each inlet and outlet port, respectively, the inlet valves in the inlet ports permitting blood to flow into but not out of the bladders, and the outlet valves in the outlet ports permitting blood to flow out of but not into the bladders;

a pusher plate assembly positioned between and contacting the bladders for alternately compressing one bladder while decompressing the other bladder by back-and-forth motion of the pusher plate assembly;



a motor having a rotary drive shaft, which motor is mounted in the housing at a position offset from the pusher plate assembly, such that the motor is located at a position other than between the bladders; and

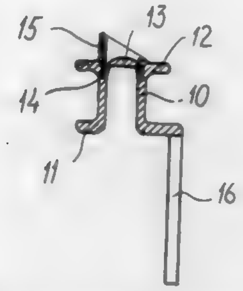
a mechanical linkage connecting the motor to the pusher plate assembly, the mechanical linkage transmitting drive force from the motor to the pusher plate assembly to reciprocate the pusher plate assembly so that the first and second bladders alternately fill with and eject blood through the respective inlet ports and outlet ports when the artificial heart is implanted in a host.

5,314,470

VOICE PROSTHESIS

Jan-Ove Persson, Höör, Sweden, assignor to Atos Medical AB, Horby, Sweden

PCT No. PCT/SE90/00878, § 371 Date Jun. 26, 1992, § 102(e) Date Jun. 26, 1992, PCT Pub. No. WO91/09576, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 27, 1990, Ser. No. 866,176
Claims priority, application Sweden, Dec. 27, 1989, 8904365
Int. Cl.^{5} A61F *2/20, 2/02, 2/04*
U.S. Cl. 623—9 **5 Claims**



1. A voice prosthesis adapted to be inserted in a fistula between an esophagus and a trachea of a user, said prosthesis comprising:

a cylindrical middle piece defining a passageway therethrough which has a groove therein and having first and second end portions;

a first external flange extending from said first end portion of said middle piece;

a second external flange extending from said second end portion of said middle piece;

said middle piece and said first and second flanges being made of flexible material;

a ring made of a material which is stiff in relation to the flexible material of said middle piece and said first and second flanges and inserted into said groove in said passageway of said middle piece for stiffening said middle piece; and

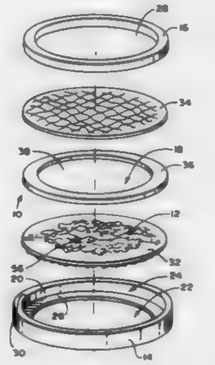
valve means including a seat formed in said passageway of said middle piece and a flap extending across said passageway and carried by said middle piece for resting on said seat to close said passageway and being adapted to be moved off said seat to open said passageway.

5,314,471

TISSUE INPLANT SYSTEMS AND METHODS FOR SUSTAINING VIABLE HIGH CELL DENSITIES WITHIN A HOST

James H. Brauker, Harvard; Ronald S. Hill, Grayslake; Laura A. Martinson, Lake Villa; Daniel R. Boggs, Libertyville, and Robert C. Johnson, Bartlett, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 735,401, Jul. 24, 1991, abandoned. This application Apr. 1, 1992, Ser. No. 861,921
Int. Cl.^{5} A61F *2/02;* **A61K** *9/22;* **A61J** *1/00*
U.S. Cl. 623—11 **11 Claims**



1. An assembly for embedding in host tissue, where it is exposed to physiological stresses and vascularization by host tissue comprising

wall means defining a chamber for holding cells while embedded in host tissue, the wall means including means for forming a porous boundary between host tissue and the cells in the chamber, the porous boundary being characterized by

a tensile strength and a pore size sufficient to isolate the implanted cells from an immune response of host tissue in which the chamber is embedded; and

a metabolic transit value including a permeability value of greater than about 1.5×10^{-4} cm/sec. for ^{125}I-labeled insulin as determined by pseudo-steady state diffusion in a diaphragm cell,

whereby the wall means sustains a flux of nutrients from host tissue in which the chamber is embedded to the cells in the chamber and waste products from the cells in the chamber to host tissue in which the chamber is embedded in the absence of close vascular structures to thereby sustain viability of the cells in the chamber until vascular structures of host tissue form close to the porous boundary.

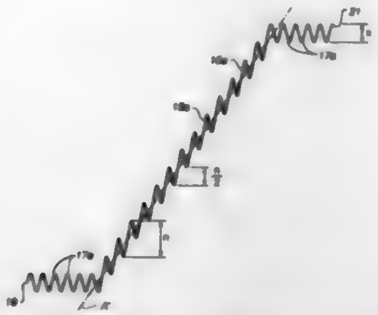
5,314,472
VASCULAR STENT

Arthur B. Fontaine, Fresno, Calif., assignor to Cook Incorporated, Bloomington, Ind.

Filed Oct. 1, 1991, Ser. No. 769,216

Int. Cl.^{5} A61F *2/04, 2/06;* **A61M** *29/02*

U.S. Cl. 623—12 **20 Claims**



5. A vascular stent having a longitudinal axis comprising:

wire bent into a waveform pattern and having a portion spirally wrapped into a hollow cylindrical shape; and

successively connected said waveform pattern including a plurality of substantially straight wire segments serially connected by bent wire segments said successively connected said straight wire segments alternate between long and short lengths.

5,314,473
PROSTHESIS FOR PREVENTING GASTRIC REFLUX INTO THE ESOPHAGUS

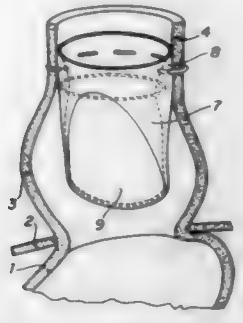
Norman J. Godin, 14, Quai du Seujet, 1201 Geneva, Switzerland

Continuation-in-part of Ser. No. 656,136, Mar. 11, 1991, abandoned. This application Jan. 5, 1993, Ser. No. 937

Claims priority, application Switzerland, Jul. 20, 1989, 2703/89; PCT Int'l Appl., Jul. 16, 1990, PCT/CH90/00171

Int. Cl.^{5} A61F *2/04, 2/02;* **A61H** *2/24*

U.S. Cl. 623—12 **11 Claims**



1. A prosthesis for preventing gastric reflux into an esophagus comprising:

a valve means for controlling a flow direction through the esophagus, said valve means having first and second ends, a longitudinal axis, a generally tubular, resilient side wall, and a flow passage defined therethrough, said valve means being formed from a resilient, bicompatible material and being implantable;

said first end of said valve means having a circular cross-section substantially corresponding to a cross-section of the esophagus to allow fixation of said first end to a wall of a hiatal hernia of the esophagus;

the resilient side wall of said valve means being progressively, resiliently collapsed adjacent said second end thereby defining a segment of said valve means having resiliently collapsed side walls to at least substantially constrict said flow passage at said second end of said valve means;

so that when said valve means is secured to the wall of the hiatal hernia with said second end disposed downstream of the first end, 1) any force generated on an alimentary bolus by a peristaltic wave of the esophagus tends to space apart the resiliently collapsed side walls whereby the second end of said valve means can offer a passage cross-section that is substantially equal to that of the first end of the valve means, 2) a regurgitate gastric reflux force which is substantially greater than a force of a peristaltic wave urges said resiliently collapsed side walls to invert to a position of repose to define, solely for a duration of said gastric reflux force, a flow path for vomit, and 3) any gastric reflux force which is not substantially greater than a force of a peristaltic wave urges said resiliently collapsed side walls to substantially close side walls to substantially close said second end, thereby to substantially prevent gastric reflux into the esophagus.

5,314,474
BONE REPLACEMENT PART MADE OF GLASS IONOMER CEMENT

Jan Helms; Götz Geyer, both of Würzburg; Erich Wanek, Seefeld; Werner Zöllner, Oberpfaffenhofen, and Oswald Gasser, Seefeld, all of Fed. Rep. of Germany, assignors to THERA Patent GmbH & Co. KG, Gesellschaft für industrielle Schutzrechte, Seefeld, Fed. Rep. of Germany

Continuation of Ser. No. 489,826, Mar. 9, 1990, abandoned. This application Apr. 2, 1992, Ser. No. 862,204

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1989, 3907663

Int. Cl.^{5} A61F *2/28*

U.S. Cl. 623—16 **17 Claims**

1. An implant for replacing defective bone parts, the implant having a predetermined shape, wherein the implant is shaped intraoperatively and finished by curing extracorporally, or is both shaped and cured extracorporally, the implant being a nonfoamed, non-porous, glass ionomer cement comprising:

(a) an aluminum fluorosilicate glass which forms by acid decomposition, metal ions causing cross-linking of (b),

(b) a polymer containing acid groups selected from the group consisting of sulphonic, phosphonic, and carboxylic acid, and

(c) water.

5,314,475
METHOD FOR PRODUCING OSTEO-INTEGRATING SURFACES ON SKELETAL IMPLANTS AND SKELETAL IMPLANTS WITH OSTEO-INTEGRATING SURFACES

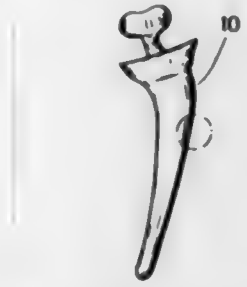
Detlev Repenning, Krabbenhöhe 12,, 2057 Reinbek, Fed. Rep. of Germany

Continuation of Ser. No. 656,301, Feb. 15, 1991, abandoned. This application Apr. 16, 1993, Ser. No. 48,579

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009337

Int. Cl.^{5} A61F *2/28, 2/30, 2/54;* **A01N** *1/02*

U.S. Cl. 623—16 **10 Claims**



1. A method for producing osteo-integrating surfaces on skeletal implants, said skeletal implants being made from metal or metal alloys, said method comprising the steps of:

coating said skeletal implant with a layer of an oxide by a high vacuum plasma coating process, wherein in said high vacuum plasma coating process a plasma consisting of said oxide is generated and said plasma consisting of said oxide is deposited on said skeletal implant to form said layer of said oxide; and

subsequently applying a calcium hydroxyl apatite layer onto said layer of said oxide.

5,314,476
DEMINERALIZED BONE PARTICLES AND FLOWABLE OSTEOGENIC COMPOSITION CONTAINING SAME

Annamarie B. Prewett, Little Silver, N.J., and Roger C. Stikeleather, Doylestown, Pa., assignors to Osteotech, Inc., Shrewsbury, N.J.

Continuation of Ser. No. 830,934, Feb. 4, 1992, abandoned. This application Sep. 10, 1993, Ser. No. 119,882

Int. Cl.^{5} A61F *2/28, 2/44, 2/02, 13/00*

U.S. Cl. 623—16 **20 Claims**

1. A flowable osteogenic composition comprising a quantity of entangled demineralized bone particles of which at least about 60 weight percent of said particles is made up of demineralized bone particles substantially in the shape of threads or filaments having a median length to median thickness ratio of at least about 10:1 and up to about 500:1, a median length of from about 2 mm to about 400 mm and a median thickness of from about 0.05 mm to about 2 mm and a sufficient amount of biocompatible fluid carrier to provide a flowable mass,

whereby said osteogenic composition maintains its cohesiveness and resists erosion subsequent to being applied to an osseus defect site.

5,314,477
PROSTHESIS FOR INTERVERTEBRAL DISCS AND INSTRUMENTS FOR IMPLANTING IT

Thierry Marnay, Nimes, France, assignor to J.B.S. Limited Company, France

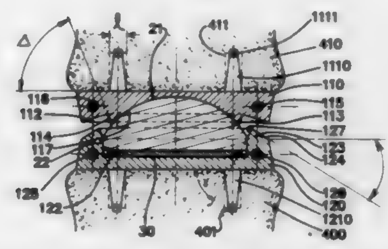
PCT No. PCT/FR91/00173, § 371 Date Aug. 4, 1992, § 102(e) Date Aug. 4, 1992, PCT Pub. No. WO91/13598, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 4, 1991, Ser. No. 773,577

Claims priority, application France, Mar. 7, 1990, 90 02997

Int. Cl.^{5} A61F *2/44*

U.S. Cl. 623—17 **13 Claims**



1. An intervertebral disc prosthesis for placement in a lateral direction between vertebrae, each vertebra having a pair of mortises cut into the vertebra in the lateral direction, said prosthesis comprising:

a cap having a convex bearing surface and an opposite mounting surface;

a first plate having a vertebra-contacting surface and an opposite cap-retaining surface including a cavity receiving said cap mounting surface in a fixed orientation with respect to said first plate; and

a second plate having a vertebra-contacting surface and an opposite concave bearing surface, said bearing surfaces cooperating to provide a pivoting joint between said plates, said vertebra-contacting surfaces each having a pair of anchoring flaps extending from said vertebra-contacting surface toward respective vertebra, said flaps being sized to engage said mortises when said prosthesis is inserted between said vertebrae in said lateral direction.

5,314,478
ARTIFICIAL BONE CONNECTION PROSTHESIS

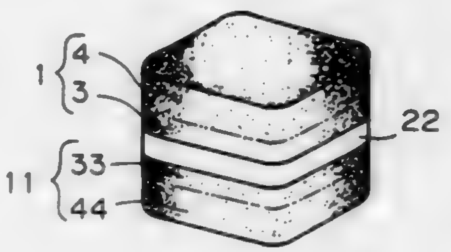
Masanori Oka, Nara; Shokyu Gen; Yoshito Ikada, both of Uji, and Hideaki Okimatsu, Kyoto, all of Japan, assignors to Kyocera Corporation and Kabushiki Kaisha Biomaterial Universe, both of Kyoto, Japan

Filed Apr. 26, 1991, Ser. No. 692,202

Claims priority, application Japan, Mar. 29, 1991, 3-92699

Int. Cl.^{5} A61F *2/02, 2/28, 2/30, 2/44*

U.S. Cl. 623—18 **13 Claims**



1. A prosthesis used for replacing damaged articular bone portions having bone tissue grown thereon and damaged articular cartilage of a living body, the prosthesis comprising: polyvinyl alcohol hydrogel and a porous body, wherein the hydrogel is carried into said porous body via infiltration and fixation thereby forming a resulting porous body such that said porous body is shaped in the form of said bone portions or articular cartilage it replaces, and wherein the resulting porous body is positioned at and brought into contact with the articular bone portions so that the bone tissue is allowed to grow into and ossify within said resulting porous body to connect said hydrogel to the bone portions of the living body.

5,314,479
MODULAR PROSTHESIS

Charles A. Rockwood, Jr., San Antonio, Tex.; John A. Engelhardt, and Jeffrey M. Ondrla, both of Warsaw, Ind., assignors to DePuy Inc., Warsaw, Ind.

Continuation-in-part of Ser. No. 529,197, May 25, 1990, Pat. No. 5,080,685, which is a continuation of Ser. No. 450,058, Dec. 13, 1989, Pat. No. 5,181,928, which is a continuation of Ser. No. 896,957, Aug. 15, 1986, abandoned. This application Nov. 18, 1991, Ser. No. 793,860

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

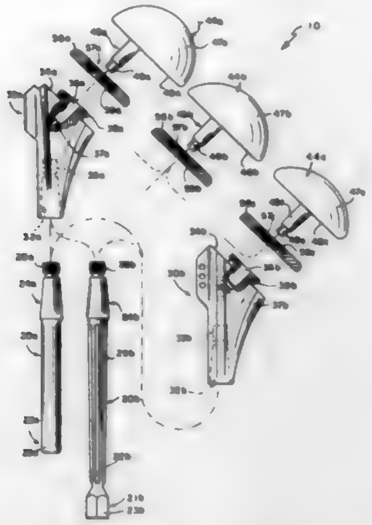
Int. Cl.^{5} A61F *2/40*

U.S. Cl. 623—19 **45 Claims**

1. A kit for the assembly of a modular shoulder prosthesis for the replacement of a head, neck, and adjacent portions of a humerus, the kit comprising

at least two stems, with each stem sized for insertion into the humerus,

at least two bodies, with each body sized to replace a portion of the humerus, and with each body configured to receive in fixed attachment one of the at least two stems, at least two head members, with each head member sized to replace the head of the humerus, and



means for fixedly attaching one of the at least two head members to one of the at least two bodies.

5,314,480

PATELLAR COMPONENTS

Martin A. Elloy, North Yorkshire, and Robert Johnson, Hoylake, both of Great Britain, assignors to DePuy International Ltd., Leeds, United Kingdom

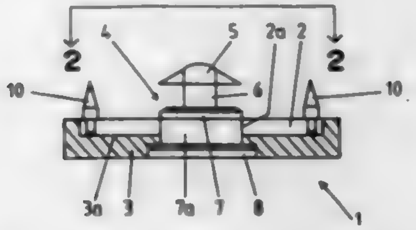
PCT No. PCT/GB90/00860, § 371 Date Jan. 31, 1992, § 102(e) Date Jan. 31, 1992, PCT Pub. No. WO91/15168, PCT Pub. Date Oct. 17, 1991

PCT Filed Jun. 4, 1990, Ser. No. 828,861

Claims priority, application United Kingdom, Jun. 2, 1989, 8912684

Int. Cl.⁵ A61F *2/38*

U.S. Cl. 623—20 **11 Claims**



1. A patellar component for use in conjunction with a prosthetic knee joint having a femoral component and a tibial component, said patellar component comprising a first member having a flat bearing surface for bearing directly against the femoral component and a second surface which is opposite to said flat bearing surface, a second member having means for fixing said second member to a natural patella, and means for holding said first and second members together at said second surface, so that said flat bearing surface of said first member bears directly against said femoral component.

5,314,481

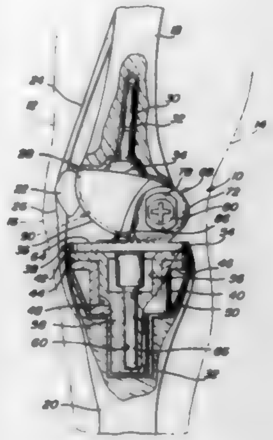
HINGED KNEE PROSTHESIS WITH EXTENDED PATELLAR TRACK

Peter T. Bianco, Memphis, Tenn., assignor to Wright Medical Technology, Inc., Arlington, Tenn.

Filed Nov. 12, 1992, Ser. No. 974,549

Int. Cl.⁵ A61F *2/38*

U.S. Cl. 623—20 **6 Claims**



1. A total knee joint prosthesis comprising: femoral attachment means for fixed attachment to the condyle region of a femur in a human knee; tibial attachment means for fixed attachment to the superior articular region of a tibia in the knee; hinge means interconnecting the femoral attachment means and the tibial attachment means for pivoting the tibial attachment means relative to the femoral attachment means throughout a predetermined arc about a pivotal axis; and patellar tracking means for forming a patella guide surface disposed anterior the pivotal axis and extending continuously and uninterrupted inferior the pivotal axis throughout the predetermined arc thereby preventing the superior edge of a patella in a fully flexed knee from becoming painfully lodged in the hinge means or the interface between the femoral attachment means and the tibial attachment means; the hinge means comprising a central knuckle extending from the femoral attachment means and a pair of flanking knuckles disposed on opposite sides of the central knuckle and extending from the tibial attachment means, and the patella guide surface extends anteriorly and superiorly in aligned fashion from the central knuckle.

5,314,482

FEMORAL COMPONENT, TOOL AND METHOD

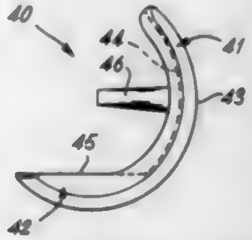
John W. Goodfellow, Woodeaten, and John J. O'Connor, Headington, both of England, assignors to British Technology Group Ltd, London, England

Continuation of Ser. No. 306,075, Feb. 6, 1989, abandoned. This application Nov. 8, 1991, Ser. No. 789,772

Claims priority, application United Kingdom, Feb. 5, 1988, 8802671

Int. Cl.⁵ A61F *2/38*

U.S. Cl. 623—20 **10 Claims**



1. A method of preparing a femoral condyle for securement thereto of a prosthetic component having a bone engaging concave surface configured for fixation to the bone of said condyle, said surface having at least a major area shaped as a concave segment curved in each of three-dimensions thereby substantially defining a surface of revolution about an axis therethrough, which method comprises exposing said condyle, locating the condyle in a position of flexion with its posterior portion immediately adjacent the tibia, forming in the inferior portion of the condyle a bore which is axially parallel to the longitudinal axis of the femur and located radially at a first predetermined spacing from the tibia in said position of flexion, forming a condyle to a shape substantially complementary to said surface of revolution, and locating said complementary shape coaxially with said bore and at a second predetermined spacing from the tibia in a position of full extension for said condyle.

5,314,483

MENISCUS PLATFORM FOR AN ARTIFICIAL KNEE JOINT

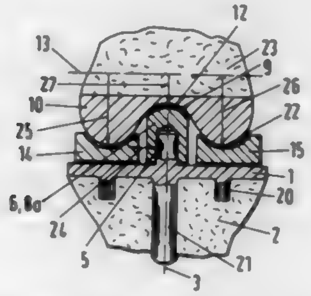
Ueli Wehrli, Wabern, and Walter Moser, Herrenschwanden, both of Switzerland, assignors to Protek AG, Muensingen-Bern, Switzerland

Filed Dec. 1, 1992, Ser. No. 983,941

Claims priority, application Switzerland, Jan. 14, 1992, 00091/92

Int. Cl.⁵ A61P *2/38*

U.S. Cl. 623—20 **6 Claims**



1. A non-constrainde artificial knee joint comprising:

a platform having a planar surface and an attachment member, the attachment member being adapted to be attached to a tibia having a tibia axis so that the planar surface is perpendicular to the tibia axis when the platform is attached to the tibia;

first and second femur condyles adapted to be connected to a femur;

a central slide member including means for rotatably coupling the central slide member to the platform for rotation about the tibia axis, the central slide member also having a median line extending in a sagittal direction when the central slide member is in a non-rotated central position; and first and second outer slide members positioned on and free to slide relative to the planar surface in at least a direction of the median line, the central slide member being positioned between the first and second outer slide members, and the first and second outer slide members being positioned against the first and second femur condyles, respectively.

5,314,484

BI-AXIAL ELBOW JOINT REPLACEMENT

Donald R. Huene, 201 N. Valeria St., Fresno, Calif. 93701

Continuation of Ser. No. 740,918, Aug. 6, 1991, abandoned. This application Jan. 19, 1993, Ser. No. 6,126

Int. Cl.⁵ A61F *2/38*

U.S. Cl. 623—20 **20 Claims**

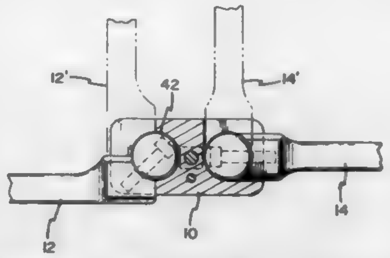
1. An implantable artificial elbow, comprising:

a) a hinge block having first and second spaced ends and a longitudinal axis extending therebetween;

b) first and second pins, each pin secured to one of said ends and said pins defining parallel axes extending generally transverse to said longitudinal axis and therewith defining a plane;

c) an ulna spike member pivotal relative to said block and including a first portion operably secured to said first pin and a second portion extending therefrom parallel to and spaced from said plane when in a first orientation;

d) a humerus spike member pivotal relative to said block and including a first portion operably secured to said second pin and a second portion extending therefrom on said plane when in a first orientation;



e) each of said ends includes a first face engageable with the associated member for providing said first stop so that said members may be pivoted between a first orientation in which said members engage the associated first end face and extend respectively parallel to and along said plane and a second orientation in which each said member extends at an angle relative to said longitudinal axis; and

f) each said member second portion adapted for being secured within a respective one of an ulna and a humerus.

5,314,485

TOTAL PROSTHESIS OF THE WRIST

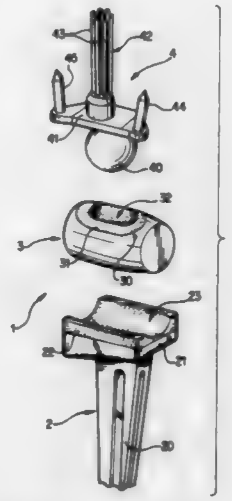
Thierry Judet, Ville d'Avray, France, assignor to Etablissements Tornier, Saint-Ismier, France

Filed Sep. 11, 1992, Ser. No. 943,565

Claims priority, application France, Sep. 12, 1991, 91 11465

Int. Cl.⁵ A61F *2/42, 2/30*

U.S. Cl. 623—21 **3 Claims**



1. A total wrist prosthesis configured to replace the lunate and scaphoid bones and which is anchored between the radius bone and metacarpal bones of an individuals hand, the prosthesis having a radio-carpal articular level and a medio-carpal articular level, with said radio-carpal articular level having a first radio-ulnar center of rotation located in a frontal plane and said medio-carpal articular level having a second radio-ulnar

center of rotation located also in said frontal plane, said second radio-ulnar center of rotation being distinct from said first radio-ulnar center of rotation, said prosthesis comprising:

a radial element having an anchoring shank and a shoulder connected to said anchoring shank, said anchoring shank being configured to be inserted into a the radius bone with said shoulder resting against a distal face thereof;

a plate of bio-compatible plastic material connected to said radial element, said plate having a concave bearing surface, said concave bearing surface having a radio-ulnar deviation radius of curvature in the frontal plane and a flexion-extension radius of curvature in a sagittal plane smaller than said radio-ulnar deviation radius of curvature;

an intermediate element free to rotate in radio-ulnar deviation and in flexion-extension with respect to said concave bearing surface of the said plate according to the radio-carpal articular level of movement of the wrist, said intermediate element having a shape so as to cooperate with said concave bearing surface of said plate and including a recess, said recess being offset dorsally and in an ulnar direction;

a metacarpal element having anchor means configured to anchor into the metacarpal bones, said metacarpal element being free to rotate in a radio-ulnar deviation movement with respect to said intermediate element according to the medio-carpal articular level of movement of the wrist.

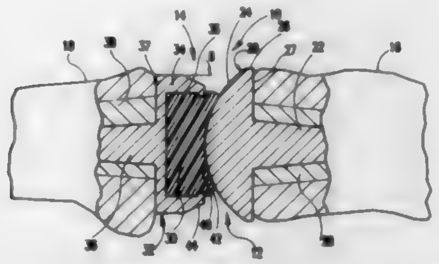
5,314,486
NON-CONSTRAINED TOTAL JOINT SYSTEM

Kerry Zang, Paradise Valley, Ariz., and Randall J. Huebner, Aloha, Oreg., assignors to MicroAire Surgical Instruments, Inc., Valencia, Calif.

Continuation of Ser. No. 720,709, Jun. 25, 1991, abandoned. This application Jan. 19, 1993, Ser. No. 7,370

Int. Cl.^{5} A61F *2/42, 2/30*

U.S. Cl. 623—21 **14 Claims**



1. A non-constrained total joint system for effecting an articulation between first and second adjacent resected bony shafts, the system comprising:

A. a first component formed of non-plastic biocompatible material and including:

(a) a first stem configured to be received in the end of said first bony shaft;

(b) a convex bearing surface, said convex bearing surface extending up to 180°; and

(c) means, including a non-bearing intermediate portion interposed between said first stem and said convex bearing surface, for fixedly attaching said convex bearing surface transversely to said first bony shaft, said non-bearing intermediate portion comprising a cylindrical portion adjacent to said first stem and a frustro-conical portion adjacent to said convex bearing surface, said frusto-conical portion providing for sufficient clearance for articulation of the joint system and protecting said convex bearing surface against possible boney overgrowth;

B. a second component, including:

(a) a second stem adapted to be received in the end of said second bony shaft;

(b) a receptacle portion attached to said second stem; and

(c) an intermediate insert formed of a biocompatible plastic, fixedly disposed in said receptacle portion, said insert including a concave bearing surface conforming to said convex bearing surface and of an area significantly less than the area of said convex bearing surface.

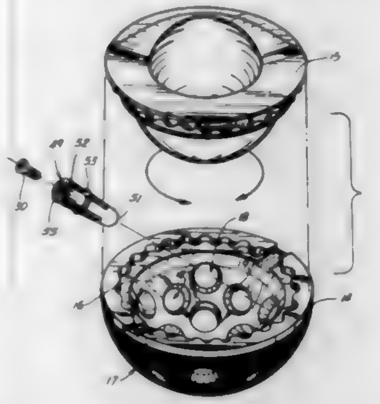
5,314,487
ACETABULAR PROSTHESIS WITH ANCHORING PEGS

Jeff Schryver, Cordova; Jeff Shea, Memphis, and Dawn M. Ryan, Memphis, all of Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 656,247, Feb. 14, 1991, Pat. No. 5,226,917. This application Feb. 10, 1992, Ser. No. 830,243

Int. Cl.^{5} A61F *2/34*

U.S. Cl. 623—22 **12 Claims**



1. An acetabular cup prosthesis, comprising:

a) an acetabular cup body having an inner concave surface and an outer convex surface;

b) a plurality of openings that extend between the inner and outer surfaces, the openings forming bores surrounded by a bore wall portion of the acetabular cup body at least two of the bores have axes that are not parallel to each other;

c) the openings being positioned to define drill guides so that the surgeon can drill into the underlying tissue and form surgical openings therein via the openings;

d) at least one peg closure member, each being insertable into and registering respectively with one of the openings, each peg member having a first proximal end portion having means thereon for forming a substantially rigid connection with the acetabular cup body at one of the openings and with the bore wall; and

e) wherein the closure members are disposed between the concave and convex surfaces of the cup body during use, and wherein each peg closure member has a length substantially greater than the diameter of the peg closure member for extending into and engaging the underlying bone tissue.

5,314,488
ACETABULAR SOCKET FOR AN ARTIFICIAL HIP JOINT

Kazuo Hayashi, Fukuoka, and Noriyuki Ishida, Kyoto, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 633,250, Dec. 21, 1990, abandoned. This application Sep. 1, 1992, Ser. No. 939,552

Claims priority, application Japan, Dec. 27, 1989, 1-341590

Int. Cl.^{5} A61F *2/34*

U.S. Cl. 623—22 **2 Claims**

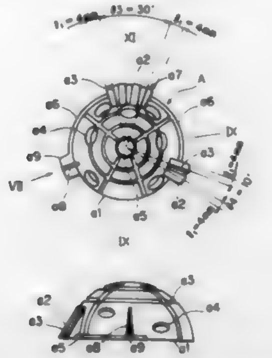
1. An artificial acetabulum socket for an artificial hip joint comprising:

a generally hemispherical shell having an opening edge;

a plurality of outer flanges along the circumference of said opening edge;

at least one generally planar beam member provided in proximity to said opening edge and extending between said flanges;

a plate-like rib member for increasing resistance against rotational movement of said acetabulum socket; and



a radial web extending radially in proximity to said opening edge, wherein said plate-like rib member is provided on said radial web and extends along the external surface of said hemispherical shell.

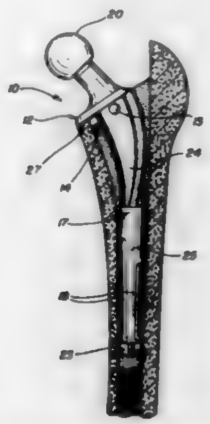
5,314,489
HIP PROSTHESIS

William H. Hoffman, Canton; Richard D. Scott, Dedham, both of Mass., and James A. Rand, Rochester, Minn., assignors to Johnson & Johnson Orthopaedics, Inc., Raynham, Mass.

Continuation of Ser. No. 769,030, Sep. 30, 1991. This application Nov. 6, 1992, Ser. No. 973,198

Int. Cl.^{5} A61F *2/32, 2/36, 2/30*

U.S. Cl. 623—22 **8 Claims**



1. A femoral component of a hip prosthesis comprising a neck adapted to receive a ball head, a collar having a proximal surface on the side of the neck and a distal surface on the side of a stem, said stem being capable of insertion into the medullary canal of the femur of a patient, said collar having a cross sectional area larger than the cross sectional area of part of the stem adjacent the collar, said stem having anterior, posterior, medial and lateral surfaces, and said collar having anterior, posterior and medial edges that extend beyond the anterior, posterior and medial surfaces of the stem, a cement spacer located on each of the anterior, posterior and medial surfaces of the stem, each of said spacers having a generally circular cross section and having a proximal edge and a center line through the center of said spacer, each of said spacers extending outwardly from the stem surface on which it is located, said spacers being affixed to the stem immediately adjacent the distal surface of the collar whereby the spacers may position the stem when the stem is placed in the medullary canal of the femur of a patient.

5,314,490
OUTER CUP FOR AN ARTIFICIAL HIPJOINT SOCKET

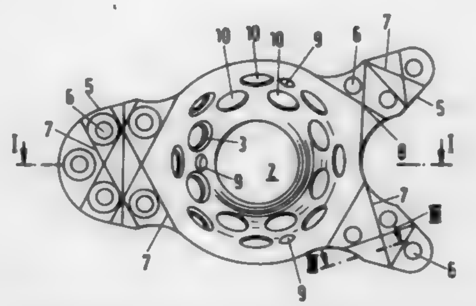
Heinz Wagner, Schwarzenbruck, Fed. Rep. of Germany, and Roland Willi, Neftenbach, Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur and Protek AG, Bern, both of Switzerland

Filed Feb. 5, 1993, Ser. No. 13,900

Claims priority, application European Pat. Off., Apr. 3, 1992, 92810254.0

Int. Cl.^{5} A61F *2/34*

U.S. Cl. 623—22 **4 Claims**



1. An artificial hip joint socket for fastening to a pelvic bone comprising:

a metallic outer cup for an artificial hipjoint socket forming a concavity for receiving a hip, said concavity terminating at an equatorial edge;

supporting flaps for fastening to said pelvic bone provided at said equatorial edge of said metallic outer cup;

said supporting flaps defining holes drilled for bone screws to pass through and as openings for checking the clearance from the bone; and,

said supporting flaps provided with preset lines of grooves for enabling preferential bending of said flaps along said at least one of said preset lines of grooves to conform said supporting flaps and metallic outer cup to said pelvis.

5,314,491
PROSTHETIC SOCKET IMPLANT

Nisra Thongpreda, and Fred Kline, both of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Continuation of Ser. No. 799,697, Nov. 25, 1991, abandoned, which is a continuation of Ser. No. 474,437, Feb. 2, 1990, abandoned. This application Mar. 22, 1993, Ser. No. 37,490

Int. Cl.^{5} A61F *2/34*

U.S. Cl. 623—22 **12 Claims**

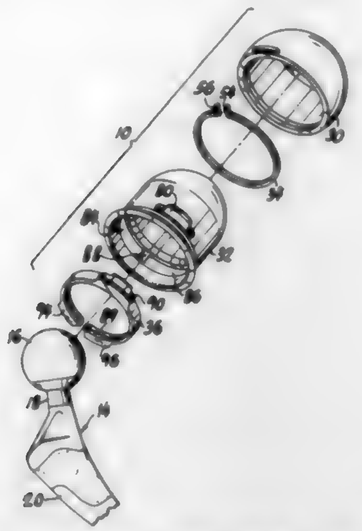
1. An implantable prosthetic socket for use with an associated component having a head, said socket comprising:

an outer cup-shaped shell having an inner surface, an open end and a first peripheral groove formed on its inner surface proximate its open end and an access aperture extending through said shell and said first groove to allow access to said groove from the exterior of said shell;

a cup-shaped bearing insert having a body wall, inner and outer surfaces and an open end, said bearing insert adapted for substantially mateable engagement within said outer shell and having a socket chamber for receiving said head, the wall of said insert having a second peripheral groove on its outer surface proximate the open end of said insert and a plurality of peripherally spaced apertures axially spaced from said second groove;

a split, insert-retaining ring having two ends adjacent a split in the ring, said insert retaining ring adapted to fit within said first and second grooves, said insert-retaining ring provided with grasping means adjacent the two ends, said grasping means being accessible through said access aperture from the exterior of said outer shell; and

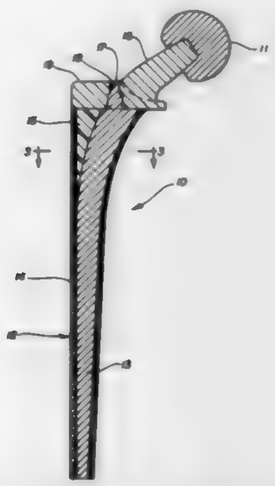
a split, head-retaining bearing ring having a split therein and being retained within said spaced apertures, said bearing ring being sufficiently expandable, when said bearing insert is not within said outer shell, to enable said head to be inserted past said bearing ring into the socket chamber of said bearing insert, said bearing ring having predetermined portions thereof conforming to and contiguous with the inner surface of said outer shell such that expansion of said bearing ring is opposed by said outer shell.



5,314,492
COMPOSITE PROSTHESIS

John V. Hamilton, Foxborough; Salvatore Caldarise, Hanson, and Debra J. Treacy, Middleborough, all of Mass., assignors to Johnson & Johnson Orthopaedics, Inc., Raynham, Mass.

Filed May 11, 1992, Ser. No. 881,105
Int. Cl.⁵ A61F *2/32*
U.S. Cl. 623—23 14 Claims



1. A load bearing orthopaedic prosthesis comprising a stem having a distal end adapted to be inserted into a cavity formed in a bone and a proximal end opposed to the distal end;

said stem comprising an inner metal core extending substantially the length of the stem from the proximal end to the distal end of the prosthesis;

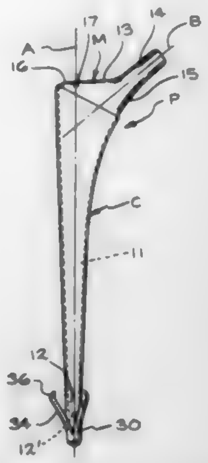
a composite shell comprising braided high strength fibers bonded with a thermoplastic resin surrounding said metal core along substantially the entire length thereof;

said metal core contributing between 5 and 25% of the total flexural stiffness of the stem at any position along the length of the stem.

5,314,493
FEMORAL HIP JOINT PROSTHESIS

W. E. Michael Mikhail, 4203 Shamley Green, Toledo, Ohio 43623

Filed Sep. 10, 1992, Ser. No. 942,993
Int. Cl.⁵ A61F *2/30*
U.S. Cl. 623—23 12 Claims



1. A femoral hip joint prosthesis for insertion into a prepared intramedullary canal comprising:

(a) a structural member formed of metal and having an elongated stem extending from a proximal end to a distal end, said stem tapering from larger to progressively smaller cross-sectional sizes from said proximal end to said distal end, said stem having surfaces with a polished finish; and

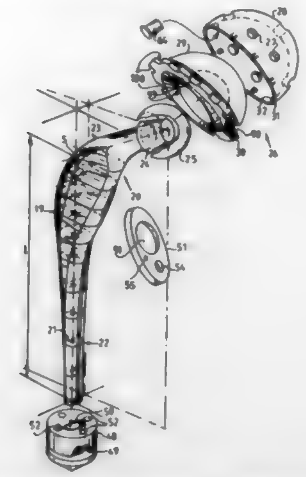
(b) a preapplied cement mantle on said surfaces, in direct engagement with said surfaces forming a non-bonded interfacial relationship therewith which permits subsidence of said stem within said preapplied cement mantle, said cement mantle extending beyond the end of said distal end and including an integral centralizer, said centralizer including outwardly extending means engageable with said prepared intramedullary canal and having a closed end defining a pocket, said centralizer closed end being spaced distally from said stem distal end.

5,314,494
ENDO-PROSTHESIS, A FEMORAL HEAD PROSTHESIS AND AN ACETABULUM PROSTHESIS

Hendrik W. J. Huiskes, Wijchen; Franciscus A. M. Ypma, Oudkerk, and Pierre J. T. M. Jaspers, Utrecht, all of Netherlands, assignors to Orthopaedic Technology B.V., Bilthoven, Netherlands

Continuation of Ser. No. 642,656, Jan. 17, 1991, abandoned, which is a division of Ser. No. 267,095, Nov. 3, 1988, Pat. No. 5,041,141. This application Mar. 31, 1993, Ser. No. 40,571
Claims priority, application Netherlands, Nov. 3, 1987, 87 02626
Int. Cl.⁵ A61F *2/32*
U.S. Cl. 623—23 11 Claims

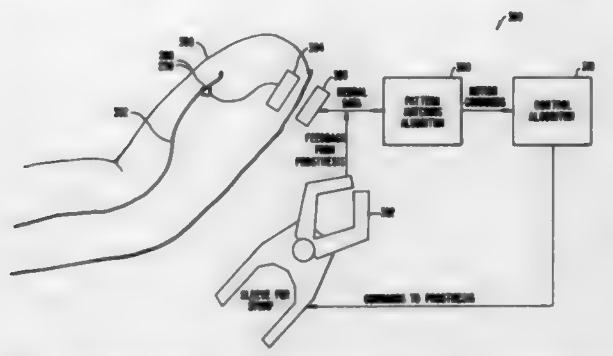
1. A femoral head prosthesis for insertion into a long bone having a canal therein disposed along an intramedullary axis of the long bone which has been resected along a resection plane to expose the interior canal thereof, and wherein said prosthesis is modeled relative to the long bone, said prosthesis comprising a neck extending above the resection plane wherein the prosthesis is inserted into the long bone; and an elongated stem having a continuous protrusion formed with a proximal taper and a distal taper said proximal taper extending continuously only along the medial side to an area below the resection plane terminating in a apex region of said protrusion and the digital taper extending continuously from the apex region of said protrusion distally and continuously only along the medial side, such that, after having been inserted into the canal, the resulting stresses between said stem and contact surfaces between the stem and the long bone defining the canal are minimized and evenly distributed in accordance with said model.



5,314,495
MICROELECTRONIC INTERFACE

Gregory T. A. Kovacs, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 671,640, Mar. 19, 1991, Pat. No. 5,178,161, which is a continuation of Ser. No. 240,172, Sep. 2, 1988, abandoned. This application Nov. 4, 1992, Ser. No. 971,395
Int. Cl.⁵ A61F *2/70*
U.S. Cl. 623—25 6 Claims



1. A prosthetic device for replacing a portion of a person's body, said portion used for performing mechanical movements, said device comprising:

a structure adapted for performing substantially at least one predetermined mechanical movement of the portion;

a neural interface in the body connected to a nerve for controlling movements of the portion, said interface detecting neural messages in the nerve;

means within the body for transmitting the neural messages detected by the interface;

means for storing at least one pattern of neural messages corresponding to the predetermined movement of the structure;

means for receiving the transmitted neural messages;

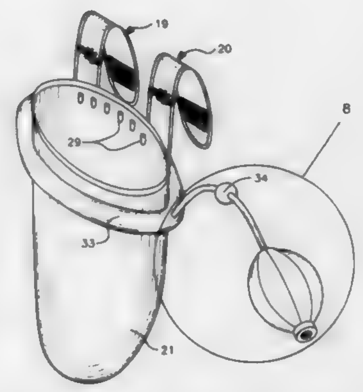
means for comparing said one pattern with the neural messages received, said comparing means providing an enabling signal when the received neural messages match said one pattern; and

means for controlling the movements of the structure, said controlling means responsive to the enabling signal for causing the structure to perform substantially the predetermined movement.

5,314,496
STUMP SOCK ARRANGEMENT

Bertram H. Harris, and Lois E. Harris, both of 224 Valley La., Crossville, Tenn. 38555

Filed Dec. 31, 1992, Ser. No. 999,265
Int. Cl.⁵ A61F *2/60, 2/68*
U.S. Cl. 623—31 2 Claims



1. A stump sock arrangement for use with an artificial limb, wherein the artificial limb includes a limb cavity, and wherein the stump sock arrangement comprises,

a support strap, the support strap including a thigh strap, the thigh strap having an anchor strap fixedly and orthogonally mounted to the thigh strap, with the anchor strap arranged for securement to the artificial limb in adjacency to the limb cavity, and

a flexible sock body, the flexible sock body having an exterior surface and an interior surface, and

the interior surface including a body cavity, and

the sock body having an entrance periphery for access to the body cavity, and

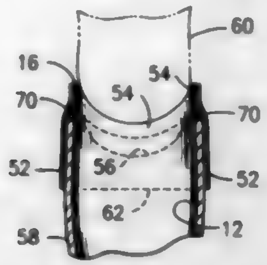
a first strap and a second strap, each having a predetermined length, and each fixedly mounted to the entrance periphery in adjacency relative to one another in a coextensive relationship, wherein the first strap and the second strap are arranged for securement to the thigh strap, and the first and second straps are secured to the sock body at the entrance periphery, and

the first strap and the second strap each include a strap outer surface directed in alignment with the sock exterior surface and the first strap and the second strap each having an inner surface in alignment and extending into the sock interior surface, wherein the interior surface of the first strap and the second strap each include a first hook and loop fastener patch spaced from a second hook and loop fastener patch, wherein each first hook and loop fastener patch is arranged for securement to a second hook and loop fastener patch for securement about the thigh strap, and

an array of porous flexible tube members mounted within the sock cavity onto the sock interior surface in adjacency to the periphery, wherein each of the tube members includes a frangible capsule, wherein each frangible capsule includes a fluid contained therewithin for seepage onto an individual's leg portion directed into the flexible sock body.

5,314,497
APPARATUS AND METHOD FOR SEALING A LINER TO A PROSTHESIS

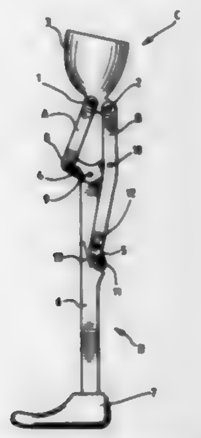
John N. Fay, and Cheryl A. Fay, both of 1120 Boca Ciega Isle, St. Petersburg Beach, Fla. 33706
Continuation-in-part of Ser. No. 814,969, Dec. 23, 1991, abandoned. This application Jun. 19, 1992, Ser. No. 901,319
Int. Cl.^{5} A61F *2/80*
U.S. Cl. 623—34 **12 Claims**



1. An article of manufacture having utility in securing a rigid prosthesis socket to a residual limb, comprising:
a liner made of elastomeric material adapted to be worn on the residual limb, said liner lining the socket when the residual limb is placed into said socket;
a tubular cuff made of elastomeric material;
said cuff disposed in overlying relation to said liner and having a predetermined diameter substantially equal to the predetermined diameter of said liner so that it tightly overlies said liner when in repose;
said liner and said cuff being disposed in tightly abutting relation to one another along their respective uppermost edges;
said socket having an uppermost end disposed in sandwiched relation to said cuff and liner; and
an annular air pocket being disposed in circumscribing relation to said uppermost end of said socket;
said annular air pocket forming a vacuum that circumscribes said uppermost end of said socket, said vacuum maintaining said socket between said cuff and said liner.

5,314,498
ARTIFICIAL TOGGLE JOINT

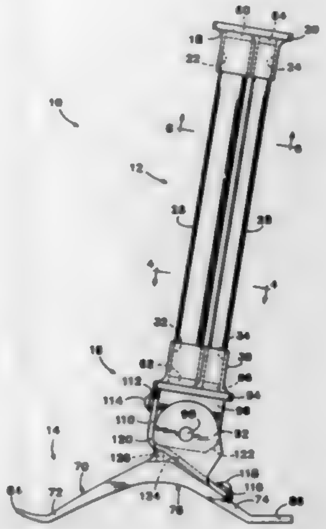
Finn Gramnäs, Brantalid 18, 511 56 Kinna, Sweden
PCT No. PCT/SE91/00240, § 371 Date Oct. 1, 1992, § 102(e) Date Oct. 1, 1992, PCT Pub. No. WO91/15170, PCT Pub. Date Oct. 17, 1991
PCT Filed Mar. 28, 1991, Ser. No. 941,041
Claims priority, application Sweden, Apr. 2, 1990, 9001183
Int. Cl.^{5} A61F *2/64*
U.S. Cl. 623—39 **8 Claims**



1. An artificial knee-joint comprising a thigh part and an elongated lower-leg part with an upper end a lower end, which parts are connected to a front linkage arm with a first end and a second end and a back linkage arm with a first end and a second end, wherein the first end of said front linkage arm is pivotally connected to said thigh part and the second end of said front linkage arm is pivotally connected to said lower-leg part, wherein the first end of said back linkage arm is pivotally connected to said thigh part and the second end of said back linkage arm is pivotally connected to said lower-leg part, characterized in that said pivotal attachment points of said second end of said front linkage arm and said second end of said back linkage arm to the lower-leg part are arranged, respectively, in a first moveable attachment element pivotally connected to the upper end of the lower-leg part and a second moveable attachment element pivotally connected to a point between the upper end and the lower end of the lower-leg part which when the knee-joint is substantially straight coact in a manner such that the knee-joint will automatically either take a substantially locked or a moveable position, depending on the direction of the load on the knee-joint, wherein the first attachment element has two or more pivot points and the second attachment element has two pivot points.

5,314,499
ARTIFICIAL LIMB INCLUDING A SHIN, ANKLE AND FOOT

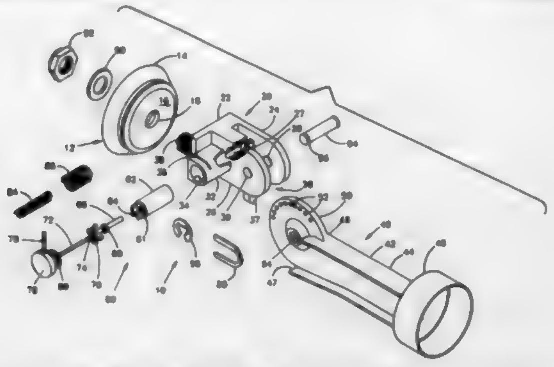
Milo S. Collier, Jr., 1152 Douglas St., Longview, Wash. 98632
Filed Apr. 4, 1991, Ser. No. 680,310
Int. Cl.^{5} A61F *2/64, 2/74, 2/66, 2/68*
U.S. Cl. 623—47 **15 Claims**



1. A prosthesis comprising:
an elongate member having a toe section and a heel section;
a pair of elongate rods which are substantially parallel and spaced from one another;
a mount coupled to the elongate member for supporting the rods, where the mount is capable of rotation around an axis substantially perpendicular to a line connecting the toe and heel sections of the elongate member where the mount includes a pair of sockets which receive the rods, the rods extending upwardly from the mount to function similarly to a human's tibia and fibula; and
a rotation controlling element connected to both the mount and the elongate member to restrict rotation of the mount toward the heel section of the elongate member.

5,314,500
PROSTHETIC ELBOW JOINT

Bruce C. Weddendorf, Decatur, Ala., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.
Filed Jul. 8, 1992, Ser. No. 912,953
Int. Cl.^{5} A61F *2/66, 2/54, 2/58*
U.S. Cl. 623—57 **14 Claims**



1. A manually positionable elbow joint for attachment to and between an upper extremity, above-elbow, prosthetic and a forearm prosthetic, said elbow joint comprising:
a turntable for attachment to said upper extremity, above-elbow prosthetic;
a frame secured to said turntable, said frame having a base;
a forearm including an elongated beam having first and second ends, means on said second end of said beam for pivotal attachment to said frame including a generally round locking wheel having a central bore therein, at least one bore in said frame and means for passing through said bores for securing said forearm to said frame including a pin having first and second ends, an enlarged shoulder at said first end and a circular groove having opposed walls at said second end, and a C-clip for frictional engagement with said walls of said circular groove, and means on said first end of said beam for attachment to said forearm prosthetic;
a housing secured to said frame; and
forearm locking means carried in said housing and including a member for reciprocal movement therein into and out of engagement with said means on said second end of said forearm for selectively locking said forearm in a plurality of positions between maximum extended and flexed conditions.

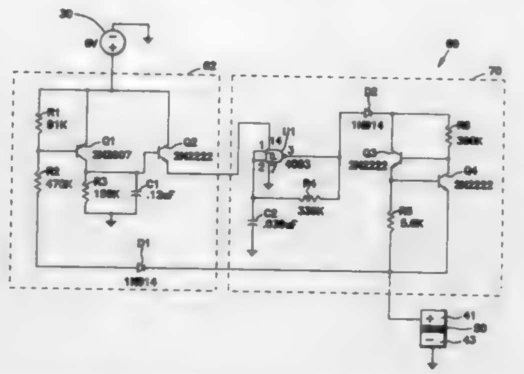
5,314,501

Patent Not Issued For This Number

5,314,502
IONTOPHORETIC DELIVERY DEVICE

Larry A. McNichols; John D. Badzinski, both of Coon Rapids, and Gary K. Hayden, New Brighton, all of Minn., assignors to Alza Corporation, Palo Alto, Calif.
Continuation-in-part of Ser. No. 671,305, Mar. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 502,298, Mar. 30, 1990, abandoned. This application Oct. 2, 1992, Ser. No. 956,547
Int. Cl.^{5} A61N *1/30*
U.S. Cl. 604—20 **23 Claims**

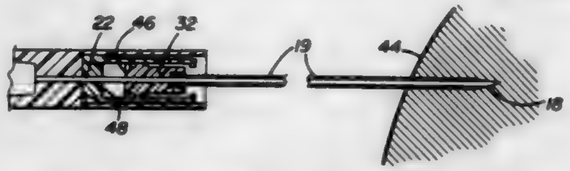
1. An electrically powered iontophoretic delivery device for delivering an agent by iontophoresis including:
a pair of electrode assemblies, at least one of the assemblies containing the agent to be delivered;
a source of electrical power adapted to be electrically connected to the pair of electrode assemblies; and
circuit means connecting the pair of electrode assemblies and the source of electrical power, the circuit means comprising:
an activation circuit and a current generating circuit, the activation circuit being electrically connected to said power source and being responsive to the completion of a circuit between said electrode assemblies for automatically activating the current generating circuit, the activation circuit having substantially no power consumption when said circuit between said electrode assemblies is open,



the current generating circuit being electrically connected to the activation circuit for generating current for delivering the agent, the current generating circuit being selectively activatable by the activation circuit, the current generating circuit having substantially no power consumption when not activated.

5,314,503
AUTOMATIC SHEATH PROTECTION OF HYPODERMIC NEEDLE

Arthur M. Bobrove, Palo Alto; Robert K. Fernandez, Santa Clara; Thomas C. Robinson, Berkeley, and Thomas P. Sahines, Milpitas, all of Calif., assignors to Rasor Associates, Inc., Sunnyvale, Calif.
Filed Mar. 23, 1993, Ser. No. 35,937
Int. Cl.^{5} A61M *29/00*
U.S. Cl. 604—164 **29 Claims**



1. A protective assembly for a medical needle having a pointed end for piercing tissue of a patient to inject or withdraw fluid from the patient, the assembly automatically providing shielding of the needle pointed end upon extraction of the needle from a patient, comprising:
a sheath circumscribing the needle with a distal end portion of the sheath being adjacent to the pointed end of the needle for entering the patient's tissue with the needle in response to a distal force applied into the patient's tissue; and
wherein the sheath and the needle are of a retention assembly such that the sliding frictional force between a generally continuous non-radially expanding external surface of the sheath and the tissue exceeds the sliding frictional force between an internal surface of the sheath and an external surface of the needle in a sufficient amount so that, due to such exceeding being in said sufficient amount, the sheath is retained by the patient's tissue as a proximal force is applied outwardly to remove the needle from the patient's tissue until after extraction of the pointed end of the needle from the tissue;
whereby upon extraction of both the needle pointed end and the sheath from the tissue, the pointed end is automatically disposed within the sheath.

CHEMICAL

5,314,504
PROCESS FOR THE APPLICATION OF DYE FIXING AGENTS TO POLYAMIDE FIBER UTILIZING CONTROLLED FIXING AGENT ADDITION

Winfried T. Holfeld, and Dale E. Mancuso, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 745,044, Aug. 14, 1991, Pat. No. 5,203,709, which is a continuation-in-part of Ser. No. 614,535, Nov. 15, 1990, abandoned. This application May 28, 1993, Ser. No. 69,046

Int. Cl.^{5} D06M *15/00;* **C09B** *67/00*

U.S. Cl. 8—115.56 **9 Claims**

1. A process for increasing the washfastness of a fibrous article containing polyamide fibers dyed with anionic dye by treatment with an anionic dye fixing agent, said process comprising:

immersing said article in a liquid bath of a solvent medium for said fixing agent, said solvent medium being selected from the group consisting of aqueous solvent mediums and substantially nonaqueous solvent mediums;

heating said bath and said article in said bath to a temperature at least equal to the dyeing transition temperature of said fiber of polyamide polymer;

adding said fixing agent to said bath as a liquid concentrate, at least about 33% of the total fixing agent to be applied during said process being added while said bath and said article are at a temperature at least equal to said dyeing transition temperature; and

stirring said bath as the fixing agent is added to said bath to mix said concentrate into said bath to form a dilute solution of said fixing agent and to provide a flow of said dilute fixing agent solution relative to said article to cause said fixing agent to be transported to said article, said stirring further providing, on the average, essentially uniform transport of said fixing agent to said article;

said fixing agent being added to the bath at an addition rate of about 0.0005 to about 0.5% fixing agent/minute based on the weight of said article.

5,314,505
AMINOAN THRAQUINONE DYES HAVING A QUATERNARY CENTER WITH A LONG ALIPHATIC CHAIN

Alexander Chan, Mineola, N.Y., and Ynh-Guo Pan, Stamford, Conn., assignors to Clairol, Inc., New York, N.Y.

Division of Ser. No. 786,860, Nov. 1, 1991, Pat. No. 5,169,403. This application Sep. 1, 1992, Ser. No. 939,202

Int. Cl.^{5} A61K *7/13*

U.S. Cl. 8—426 **8 Claims**

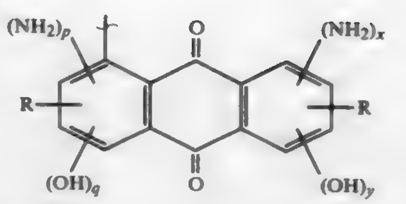
1. A dye composition comprising:

(a) a tinctorially effective amount of at least one aminoanthraquinone dye compound of the formula (I):

$$Q\text{-}NR_6(CH_2)_n\text{-}N^+R_1R_2R_3X^-$$

or cosmetically acceptable salts thereof, wherein

Q is an anthraquinone of the formula (V):



(V)

n is 2 to 12;

p, q, x, ad y are, independent of each other, 0, 1, or 2;

R is hydrogen, C_{1-6} alkyl, C_{1-6} hydroxyalkyl, C_{1-6} polyhydroxyalkyl, halogen, C_{1-6} alkoxy, halogenated C_{1-3} alkyl, polyhalogenated C_{1-3} alkyl, CN, $CONH_2$, SO_3H, or COOH;

R_1 is C_{1-6} alkyl, C_{1-6} hydroxyalkyl, or C_{1-6} polyhydroxyalkyl;

R_2 is C_{1-6} alkyl, C_{1-6} hydroxyalkyl, or C_{1-6} polyhydroxyalkyl;

R_3 is a C_{8-22} aliphatic chain;

R_6 is hydrogen, C_{1-6} alkyl, C_{1-6} hydroxyalkyl, or C_{1-6} polyhydroxyalkyl; and

X^- is a monovalent or divalent anion;

(b) a cosmetically acceptable carrier that is compatible with the dye compound of formula (I); and

(c) at least one adjuvant or additive selected from the group consisting of surface active agents, alkalizing agents, chelating agents and perfumes.

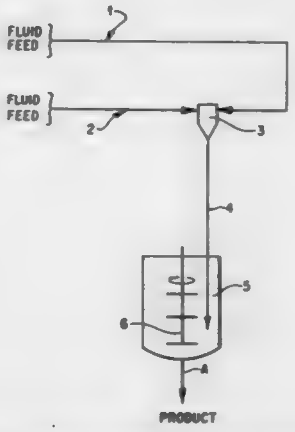
5,314,506
CRYSTALLIZATION METHOD TO IMPROVE CRYSTAL STRUCTURE AND SIZE

Michael Midler, Jr., East Brunswick; Edward L. Paul, Chatham Township, Morris County; Edwin F. Whittington, Linden; Mauricio Futran, Westfield, all of N.J.; Paul D. Liu, Concord, Mass.; Jaanpyng Hsu, Colonia, and Shih-Hsie Pan, Princeton Junction, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 706,682, Jun. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 538,611, Jun. 15, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 793,764

Int. Cl.^{5} B01D *9/02*

U.S. Cl. 23—295 R **28 Claims**



1. A process for crystallization of an organic pharmaceutical compound comprising contacting one or more jet streams of a feed solution of the organic pharmaceutical compound with one or more jet stream of an anti-solvent, said jet streams impinging to create high turbulence at their point of impact, and each jet stream having sufficient linear velocity to achieve high intensity micromixing of the feed solution and the anti-solvent prior to nucleation, followed by nucleation and the

direct production of small crystals, at least 95% of said crystals having a diameter equal to or less than 25 microns.

5,314,507

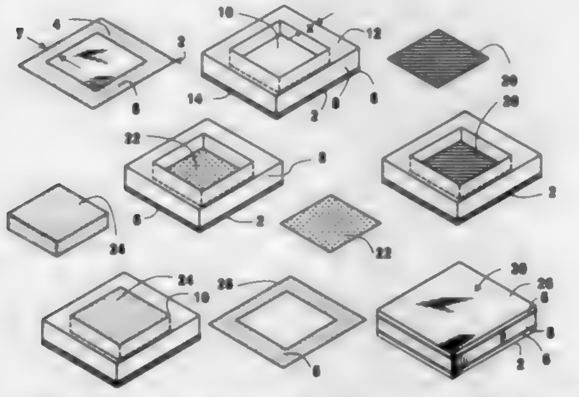
ADHESIVE SEALED SOLID ELECTROLYTE CELL HOUSED WITHIN A CERAMIC FRAME AND THE METHOD FOR PRODUCING IT

Mary P. Rossoll, Willoughby, Ohio, assignor to Gould Electronics Inc., Eastlake, Ohio

Filed Nov. 27, 1992, Ser. No. 982,622

Int. Cl.^{5} H01M *6/00*

U.S. Cl. 29—623.4 **16 Claims**



1. A method for producing a cell assembled within a ceramic housing comprising the steps:

(a) preparing a first conductive terminal sheet and a second conductive terminal sheet:

(b) forming a ceramic frame defining an opening at the center and having a top surface and a bottom surface and treating said top surface and said bottom surface with one of the following steps: (b-1) depositing on said top surface and said bottom surface a metal or metal alloy for bonding to an adhesive and (b-2) treating said top surface and said bottom surface with a corona treatment to improve each surface affinity for an adhesive:

(c) preparing an anode, an electrolyte and a cathode:

(d) assembling said anode, said electrolyte and said cathode into the opening in the frame and superimposing and securing the first and second conductive terminal sheets onto the top and bottom surfaces of the frame, respectively using an adhesive layer placed between the peripheral area of one side of each sheet and the surfaces of the frame and said adhesive seal maintaining its adhesive characteristics at a temperature of 225° C.; and wherein said anode is in electrical contact with one conductive terminal sheet and said cathode is in electrical contact with the other conductive terminal sheet.

5,314,508

SOLID ELECTROLYTE FUEL CELL AND METHOD FOR MANUFACTURE OF SAME

Noboru Taniguchi, Osaka; Junji Niikura, Hirakata; Kazuhito Hatoh, Daito, and Takaharu Gamo, Fujiidera, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 942,373, Sep. 9, 1992, Pat. No. 5,244,753, which is a continuation-in-part of Ser. No. 706,977, May 29, 1991, abandoned. This application Jul. 30, 1993, Ser. No. 74,784

Claims priority, application Japan, May 29, 1990, 2-141051; Aug. 20, 1990, 2-219295

Int. Cl.^{5} H01M *6/00*

U.S. Cl. 29—623.5 **3 Claims**

1. A method of manufacturing a solid electrolyte fuel cell, comprising the steps of:

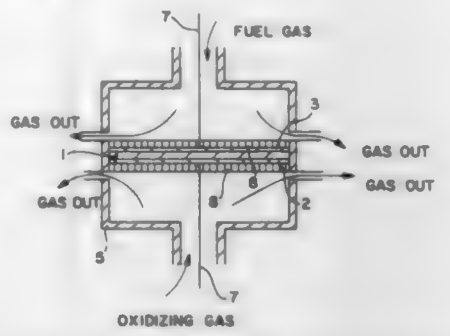
forming a solid electrolyte layer by tape casting;

sintering said layer;

forming an air electrode layer for a positive electrode on one side of said solid electrolyte layer by tape casting;

forming a fuel electrode layer for a negative electrode on the other side of said solid electrolyte layer by tape casting; and

simultaneously sintering said positive and negative electrodes.



5,314,509

VACUUM PROCESSING APPARATUS AND OPERATING METHOD THEREFOR

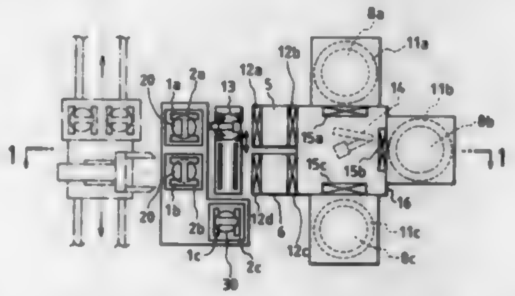
Shigekazu Kato, Kudamatsu; Kouji Nishihata, Tokuyama; Tsunehiko Tsubone, Hikari, and Atsushi Itou, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1991, Ser. No. 751,951

Claims priority, application Japan, Aug. 29, 1990, 02-225321

Int. Cl.^{5} B08B *3/00;* **C23C** *16/00*

U.S. Cl. 34—406 **23 Claims**



1. A method of operating a vacuum processing apparatus having vacuum processing chambers for which dry cleaning is effected therein after substrates to be processed are processed therein in vacuum, said method comprising the step of:

disposing first storage means for storing said substrates to be processed and second storage means for storing dummy substrates in the air atmosphere;

transferring said substrates to be processed between said first storage means and said vacuum processing chambers, and vacuum-processing said substrates to be processed; and

transferring said dummy substrates between said second storage means and said vacuum processing chamber before and after dry cleaning of said vacuum processing chambers.

5,314,510

METHOD FOR PREVENTING THE GROWTH OF AEROBIC FUNGI IN AQUEOUS HYDROCARBONS

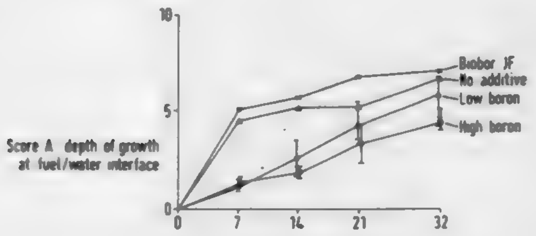
Leif Hammer, Solroed Strand, and Benny Smith, Nyborg, both of Denmark, assignors to BP Chemicals (Additives) Limited, London, United Kingdom

Continuation of Ser. No. 768,456, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 483,993, Feb. 22, 1990, abandoned, which is a continuation of Ser. No. 363,083, Jun. 8, 1989, abandoned. This application Feb. 8, 1993, Ser. No. 15,036

Claims priority, application United Kingdom, Jun. 29, 1988, 8815424

Int. Cl.^{5} C10L *1/22, 1/30*

U.S. Cl. 44—317 **11 Claims**



1. A process for the prevention of aerobic fungal growth in hydrocarbons selected from diesel fuels, heavy marine fuels and fuel oils, said hydrocarbons being in storage and contaminated with water, said process comprising the step of adding to said hydrocarbons an additive comprising boric acid or a salt thereof and a hydrocarbyl-substituted succinimide in which the hydrocarbyl substituent contains from about 40 to 150 carbon atoms, said additive being used in an amount sufficient to provide up to 500 ppm wt in the hydrocarbons.

5,314,511

DIESEL FUEL

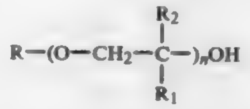
Frank J. Liotta, Jr., Collegeville, and Haven S. Kesling, Jr., Drexel Hill, both of Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Dec. 23, 1992, Ser. No. 995,496

Int. Cl.^{5} C10L *1/18*

U.S. Cl. 44—322 **10 Claims**

1. A fuel composition comprising a major proportion of hydrocarbons boiling in the diesel fuel range and containing less than 500 ppm sulfur, and an amount of an additive combination of an organic peroxidic component and an additive of the formula



$$R-(O-CH_2-\underset{R_1}{\overset{R_2}{\underset{|}{\overset{|}{C}}}}-)_nOH$$

effective to reduce engine emissions and improve fuel economy, R being an alkyl group having 1–10 carbon atoms, R_1 being a C_1-C_2 alkyl group, R_2 being hydrogen or methyl and an integer from 1 to 5, or R being hydrogen and n being 4–30.

5,314,512

ABRASIVE TOOL

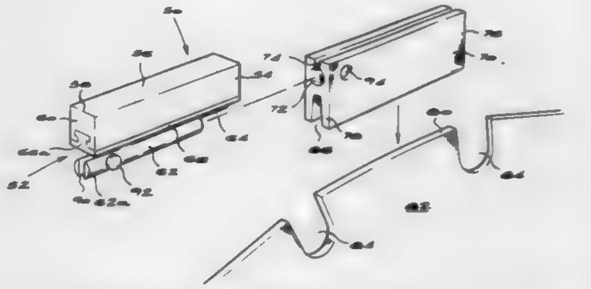
John S. Sexton, Bobcat, West Street, Odiham, Hampshire, United Kingdom

Continuation of Ser. No. 762,422, Sep. 19, 1991, abandoned. This application Aug. 10, 1993, Ser. No. 105,103

Claims priority, application United Kingdom, Sep. 19, 1990, 9020462

Int. Cl.^{5} B24D *3/00*

U.S. Cl. 51—293 **8 Claims**



1. A method for preparing an injection molded saw segment comprises the steps of:

(a) heating a mass of ultra-hard abrasive particles dispersed in a non-porous thermoplastic polymer matrix in the barrel of an injection molding machine at a temperature of from about 280° to 400° C., wherein the abrasive content of the segment is at least 4 volume percent;

(b) injecting said heated product of step (a) into a mold at a pressure of from about 70 MPa to 150 MPa; and

(c) maintaining said injected product of step (b) in said mold at a pressure of about 35 MPa to about 75 MPa for a period of from about 2 to about 10 seconds.

5,314,513

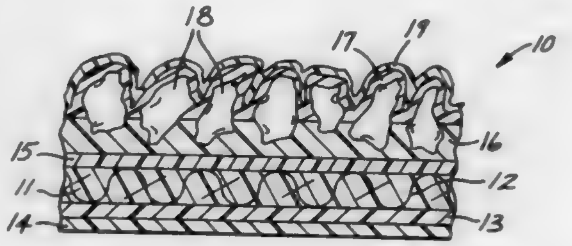
ABRASIVE PRODUCT HAVING A BINDER COMPRISING A MALEIMIDE BINDER

Philip Miller, St. Paul; Eric G. Larson, Lake Elmo, both of Minn., and Don H. Kincaid, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 845,016, Mar. 3, 1992, abandoned. This application Sep. 28, 1992, Ser. No. 953,302

Int. Cl.^{5} B24D *11/00*

U.S. Cl. 51—295 **20 Claims**



1. An abrasive article comprising:

(a) a flexible substrate having a front side and a back side;

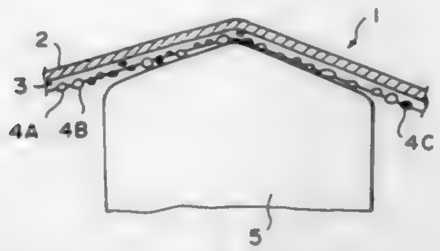
(b) at least one layer of abrasive grains bonded to said front side of said substrate by means of a make coat;

(c) optionally one or more additional coats selected from the group consisting of a size coat, a supersize coat, a saturant coat, a presize coat, and a backsize coat;

wherein at least one of said make, size supersize, saturant, presize, and backsize coats comprises a cured maleimide binder.

5,314,514
ABRASIVE TAPE

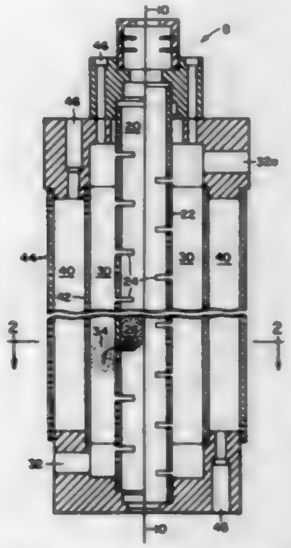
Masami Sato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 8, 1993, Ser. No. 43,933
Claims priority, application Japan, May 13, 1992, 4-120415
Int. Cl.⁵ B24B *1/00*
U.S. Cl. 51—295 **6 Claims**



1. An abrasive tape comprising a flexible substrate and an abrasive layer which is overlaid on the flexible substrate and which contains abrasive grains and a binder,
wherein the abrasive grains comprise:
i) first abrasive grains, which have a mean grain diameter falling within the range of 0.07 μm to 0.40 μm and a Molls hardness falling within the range of 5 to 7,
ii) second abrasive grains, which have a mean grain diameter falling within the range of 0.20 μm to 0.60 μm and a Molls hardness not lower than 8.5, and
iii) fine diamond grains, which have a mean grain diameter falling within the range of 0.5 μm to 3.0 μm,
the proportion of the weight of the fine diamond grains being not lower than 4% with respect to the total weight of the first abrasive grains and the second abrasive grains.

5,314,515
METHOD AND APPARATUS FOR FIBER COOLING

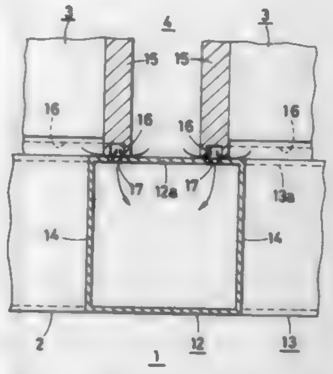
Michael B. Cain, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Jul. 14, 1992, Ser. No. 913,182
Int. Cl.⁵ C03B *37/023*
U.S. Cl. 65—3.11 **8 Claims**



1. A method for cooling a glass optical fiber as drawn from a glass preform to reduce the temperature thereof to a temperature in the range for coating the fiber which comprises the step of transporting the fiber through a cooling zone containing coolant consisting of a solid or liquid dispersion of a chemical element or compound having a vapor pressure of at least 1 atmosphere at 25° C.

5,314,516
SEALING DEVICE FOR FILTERS

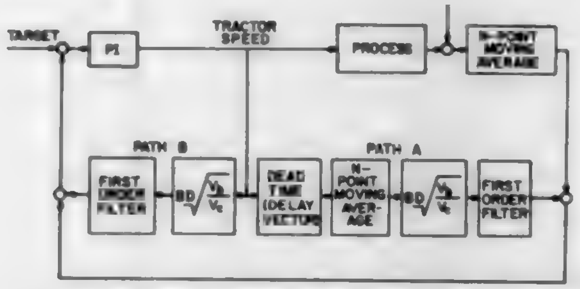
Masakazu Kashima, Tokyo, Japan, assignor to Taikisha, Ltd., Tokyo, Japan
Filed Nov. 3, 1993, Ser. No. 145,096
Int. Cl.⁵ B01D *46/10*
U.S. Cl. 55—484 **2 Claims**



1. A filter sealing device for sealing a clearance between a ceiling frame and a filter frame placed on the ceiling frame, the sealing device including the ceiling frame is in the form of a closed tube, the filter frame having a lower face formed with a groove, the ceiling frame having an upper wall formed with holes for holding the interior of the ceiling frame in communication with the groove of the filter frame, the interior of the ceiling frame being given a negative pressure by suction.

5,314,517
METHOD CONTROLLING THE DRAW RATE IN THE DRAWING OF A GLASS FEEDSTOCK

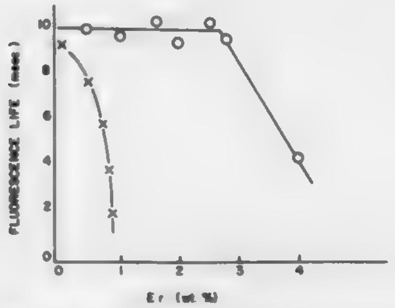
David M. Koening, Lowman; Peter J. Majestic, and Richard O. Maschmeyer, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Dec. 31, 1992, Ser. No. 999,081
Int. Cl.⁵ C03B *23/047*
U.S. Cl. 65—2 **19 Claims**



1. A method for drawing a glass object from a glass feedstock, comprising,
a. providing a glass feedstock,
b. heating said glass feedstock to its softening temperature,
c. drawing said glass feedstock into a glass object at a drawing speed which is adjustable, and
d. adjusting the drawing speed to control a dimension of said glass object,
wherein said step of adjusting the drawing speed comprises comparing an on-line measurement of said dimension to a predetermined target value and compensating for an inherent deadtime which exists between a change in the drawing speed and the detection of the effect of said change in the drawing speed on said dimension.

5,314,518
METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Masumi Ito; Sumio Hoshino, and Shinji Ishikawa, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Jun. 23, 1992, Ser. No. 902,821
Claims priority, application Japan, Jun. 24, 1991, 3-151751; Jun. 24, 1991, 3-151752; Sep. 6, 1991, 3-227182; Oct. 14, 1991, 3-264876
Int. Cl.⁵ C03B *37/023*
U.S. Cl. 65—3.11 **14 Claims**

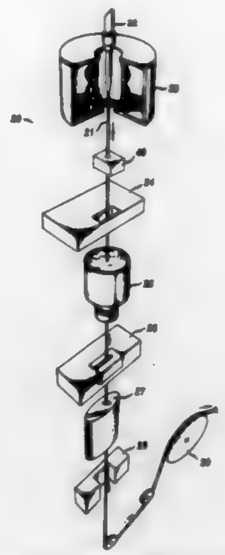


1. A method for producing a glass preform for use in the fabrication of an optical fiber which comprises steps of:
providing a glass tube which forms a core part of the preform,
forming a coating film of a sol-gel solution comprising SiO_2 and a dopant compound on an inner wall of said glass tube,
vitrifying and collapsing said glass tube having the coating of the sol-gel solution to obtain a glass rod as a core part of the preform, and
providing a cladding part around the periphery of said glass rod
wherein a diameter of said core part prepared from said sol-gel solution is 3 to 30% of the entire diameter of said core part.

5,314,519
METHODS AND APPARATUS FOR INCREASING OPTICAL FIBER DRAW SPEED

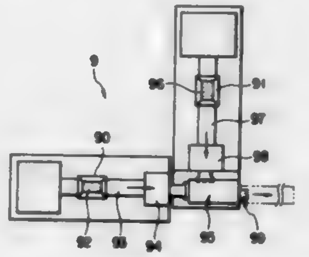
James R. Petisce, Norcross, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Aug. 31, 1992, Ser. No. 938,076
Int. Cl.⁵ C03B *37/023*
U.S. Cl. 65—3.11 **12 Claims**

1. A method of making an optical fiber which has a relatively low absorption loss, said method comprising the steps of:
exposing successive increments of length of a preform to heat energy which is sufficient to allow optical fiber to be drawn from the successive increments of length;
drawing optical fiber from successive increments of length which are subjected to heat energy; and
exposing the drawn fiber to a magnetic field to remove defect sites, wherein the strength of the magnetic field is sufficient to reduce transmission loss by causing a reduction in the number of free radicals present in the drawn fiber.



5,314,520
METHOD FOR MANUFACTURING OPTICAL FIBER PREFOHM

Takeshi Yagi; Tsuguo Satoh; Yoshiaki Koinuma, and Kazuaki Yoshida, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Feb. 9, 1993, Ser. No. 15,644
Claims priority, application Japan, Feb. 12, 1992, 4-25319; Mar. 13, 1992, 4-55572
Int. Cl.⁵ C03C *25/02*
U.S. Cl. 65—3.110 **11 Claims**



1. A method for manufacturing an optical fiber preform comprising:
(a) obtaining a plastic material by kneading a silica powder, a binder, water and an non-ionic surfactant, said surfactant being in an amount of 0.01 to 0.5 parts by weight relative to 100 parts by weight of said silica powder; and
(b) obtaining a porous preform by extrusion molding the plastic material.

5,314,521

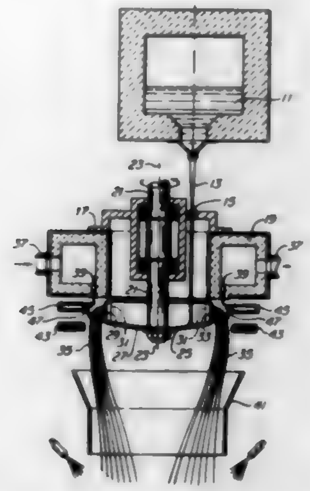
METHOD AND APPARATUS FOR PRODUCTION OF GLASS FIBERS UTILIZING SPINNING CUP STRUCTURE

Albert Lewis, Covina, Calif., and Cenek A. Kottnauer, W. Vancouver, Canada, assignors to Glass Incorporated International, Chino, Calif.

Filed Jun. 29, 1992, Ser. No. 905,456

Int. Cl.^{5} C03B ***37/04***

U.S. Cl. 65—6 **15 Claims**



1. A method of forming glass fibers, comprising:

(a) depositing a molten stream of glass onto a bottom wall of a spinning cup structure having an annular upstanding side wall with a multiplicity of holes therein, said molten glass being centrifugally urged along the cup structure for extension through the holes,

(b) generating an annular body of hot gases above the spinning cup structure,

(c) directing an annular stream of the generated hot gases downwardly along the outer surface of the cup side wall to stretch and attenuate the glass fibers produced by glass flow through the holes,

(d) heating only a lower portion of the cup structure side wall, whereby glass fibers generated at the lowermost holes are at about the same temperature as the glass fibers generated at the uppermost holes,

(e) generating an annular stream of relatively cool gas between the induction heater and the generation plane of the hot gas stream, and

(f) directing an annular curtain of said cool gas downwardly along the outer boundary of the hot gas fiber-attenuating stream to prevent divergence of the hot gas stream from the cup structure side wall.

5,314,522

METHOD OF PROCESSING PHOTOSENSITIVE GLASS WITH A PULSED LASER TO FORM GROOVES

Nobuhiro Kondo, and Hirokazu Ono, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1992, Ser. No. 975,196

Claims priority, application Japan, Nov. 19, 1991, 3-303440; Nov. 19, 1991, 3-303442

Int. Cl.^{5} C03B ***32/02***

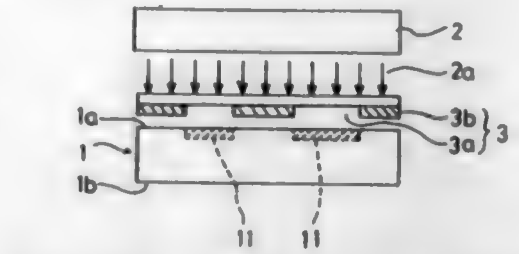
U.S. Cl. 65—31 **15 Claims**

1. A method of forming grooves in a photosensitive glass article comprising the steps of:

exposing a photosensitive glass article to a pulsed laser emitting radiation, including radiation to which said photosensitive glass article is sensitive such that said radiation forms an exposed groove pattern in said photosensitive glass article;

thermally developing said exposed photosensitive glass article to crystallize said exposed groove pattern;

etching said crystallized groove pattern to thereby form grooves in said photosensitive glass article;



said pulsed laser emitting energy pulses with each pulse having an intensity such that a total number of energy pulses determine a total energy dosage; and

controlling the depth of said grooves by controlling the intensity of each of said energy pulses and controlling the total energy dosage.

5,314,523

METHOD FOR REMOVING A MARGINAL ZONE EXTERNAL OF AN OUTLINE CUT IN A GLASS SHEET

Kimmo J. Ikola, Kangasala, and Kimmo E. Stenman, Tampere, both of Finland, assignors to Tamglass Engineering OY, Finland

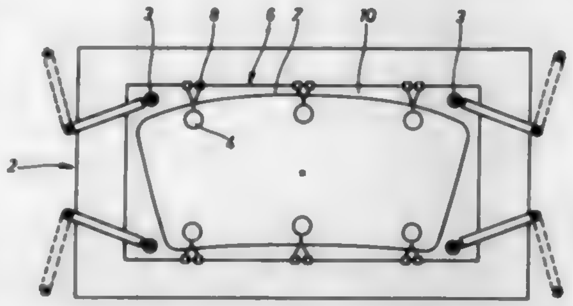
Division of Ser. No. 529,664, May 29, 1990, Pat. No. 5,110,340. This application Apr. 20, 1992, Ser. No. 871,115

Claims priority, application Finland, Jun. 9, 1989, 892858

The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.

Int. Cl.^{5} C03B ***33/02, 33/09***

U.S. Cl. 65—112 **2 Claims**



1. A method of removing a marginal zone of a glass sheet from an inner zone thereof, comprising the steps of:

cutting an outline in a glass sheet to define an inner zone of the glass sheet located inside of the outline, and a marginal zone of the glass sheet located outside of the outline;

positioning the glass sheet on support surface means such that both said inner zone and said marginal zone are supported from below by said support surface means;

arranging a carrier carrying suction pads and mechanical removing means such that said suction pads adhere to the inner zone of the glass sheet, and a bottom surface of said mechanical removing means contacts an outer edge of the marginal zone, said bottom surface being beveled and extending downwardly so that a lowermost end thereof is situated outwardly relative to an innermost end thereof, said removing means and said suction pads being capable of relative movement upwardly and downwardly;

heating the marginal zone by means of a flame burner to at least partially remove the marginal zone from the glass sheet; and raising said carriage to move said suction pads and inner zone upwardly relative to said bottom surface of said removing means whereby said bottom surface restrains upward movement of the outer edge of the marginal zone, causing the marginal zone to break along said outline and be removed from said inner portion.

5,314,524

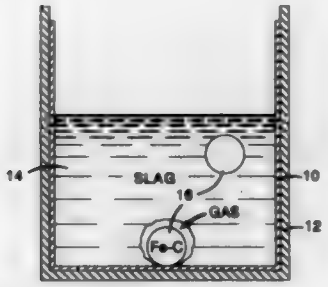
PROCESS OF DISCHARGING CHARGE-BUILD UP IN SLAG STEELMAKING PROCESSES

Uday B. Pal, Malden; Gopala K. M. Gazula, Somerville, both of Mass., and Ali Hasham, Karachi, Pakistan, assignors to MIT (Mass. Institute of Technology), Cambridge, Mass.

Filed Feb. 28, 1992, Ser. No. 843,742

Int. Cl.^{5} C21B ***11/10***

U.S. Cl. 75—10.35 **11 Claims**



1. A process for improving the rate of metal production and FeO utilization in an iron and steelmaking process which uses Fe-C alloy droplets in an FeO containing slag and in which a charge build-up occurs in the slag at the slag-alloy interface comprising discharging the charge buildup in the slag at the slag-alloy interface.

5,314,525

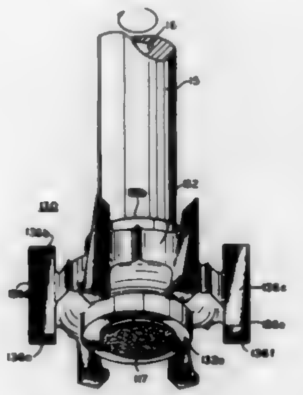
METHOD FOR TREATING A LIQUID WITH A GAS USING AN IMPELLER

Charles E. Eckert, 260 Lynn Ann Dr., New Kensington, Pa. 15068, and Nicholas G. Walker, 692 Mimosa Tree La., West Chester, Pa. 19380

Division of Ser. No. 766,624, Sep. 26, 1991, Pat. No. 5,160,693. This application Sep. 23, 1992, Ser. No. 950,412

Int. Cl.^{5} C22B ***21/06***

U.S. Cl. 75—583 **38 Claims**



1. A method for treating a liquid with a gas comprising the steps of:

a) containing the liquid in a vessel having an impeller mounted on a shaft for rotation about an upright axis, providing a predetermined number of radially projecting vanes on the impeller, and submerging the top and bottom faces of the impeller in the liquid;

b) introducing a gas into the liquid below the surface of the liquid;

c) intermixing the gas and the liquid by creating predominantly radial flow to maximize shear by rotating the impeller below the surface of the liquid; and

d) suppressing downward flow along said upright axis to prevent the formation of a surface vortex in the liquid.

5,314,526

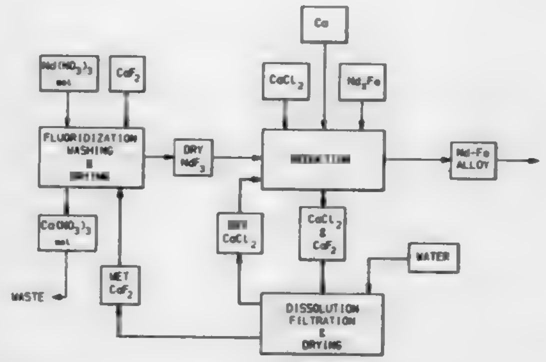
METALLOTHERMIC REDUCTION OF RARE EARTH FLUORIDES

Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1990, Ser. No. 623,150

Int. Cl.^{5} C22B ***5/00***

U.S. Cl. 75—610 **8 Claims**



1. A method of producing rare earth metal from corresponding rare earth fluoride in high yield and low reactor volume, comprising

preparing a melt under non-oxidizing atmosphere comprising a reaction medium salt phase initially consisting essentially of calcium chloride and a higher density metal alloy phase consisting essentially of rare earth metal and iron,

adding rare earth fluoride to the melt,

adding calcium metal to the melt in an amount sufficient to reduce a desired amount of the rare earth fluoride,

stirring the melt and maintaining its temperature in the range of about 825° C. to 900° C. while the calcium reacts with rare earth fluoride to form rare earth metal and calcium fluoride, the weight of the initial charge of salt phase being determined such that its weight plus the weight of byproduct calcium fluoride is no more than about twice the theoretical yield of rare earth metal,

abating the stirring rate to permit separation of the heavier metal phase, now containing the rare earth metal product, and the salt phase, and

removing a desired amount of the product-containing metal phase from the salt phase.

5,314,527

MERCURY CONTAMINATED MUD TREATMENT

Michael A. Rockandel, 5195 Turquoise Dr., Richmond, British Columbia, Canada, and Larry G. Twidwell, c/o Montana Enviromet, Inc., 601 S. Clark, Butte, Mont. 59701

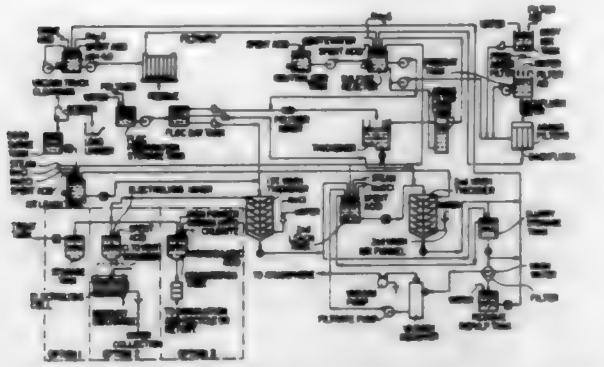
Continuation-in-part of Ser. No. 875,100, Apr. 28, 1992, Pat. No. 5,209,774. This application Apr. 26, 1993, Ser. No. 52,655

Int. Cl.^{5} C22B ***43/00***

U.S. Cl. 75—742 **47 Claims**

1. A hydrometallurgical process for the removal of mercury and mercury compounds from solid materials containing mercury and mercury compounds comprising:

(a) treating the solid materials in a leach with acid, sodium chloride and sodium hypochlorite for a sufficient length of time to produce a leached product having a reduced mercury and mercury compound content and a byproduct having an elevated mercury and mercury compound content; and



(b) washing and de-watering the leached product to yield a residue which is low in mercury content, and a wash fluid which is delivered to a treating tank.

5,314,528
PERMEATION PROCESS AND APPARATUS

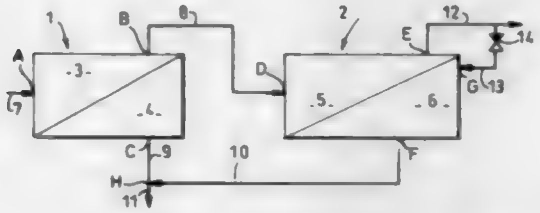
Christian Monereau, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 16, 1992, Ser. No. 976,472

Claims priority, application France, Nov. 18, 1991, 91 14167

Int. Cl.⁵ B01D *53/22*

U.S. Cl. 95—55 13 Claims



1. A process of obtaining production of an impure light gas by permeation from a gas mixture containing said light gas, comprising the steps of:

providing a permeation apparatus comprising a first permeation stage including at least one permeator of a first type having a high pressure side with an inlet and an outlet, and a low pressure side with an outlet only and a second permeation stage including at least one permeator of a second type having a high pressure side with an inlet and an outlet, and a low pressure side with an inlet and an outlet;

introducing the gas mixture under pressure into the inlet of the high pressure side of a permeator of the first permeation stage;

passing residual gas from the outlet of the high pressure side of a permeator of the first permeation stage to the inlet of the high pressure side of a permeator of the second permeation stage;

withdrawing residual gas from the outlet of the high pressure side of a permeator of the second permeation stage;

introducing into the inlet of the low pressure side of at least one permeator of the second permeation stage a gas mixture having a light gas content lower than the light gas content of the production gas; and

withdrawing permeate gas from the outlets of the low pressure sides of the permeators of the first and second permeation stages as said production gas.

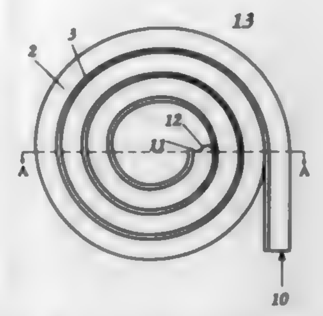
5,314,529
ENTRAINED DROPLET SEPARATOR

Donald E. Tilton, Rte. 1, Box 67A, Colton, Wash. 99113, and Charles L. Tilton, 401 Summit Ave. N., Kent, Wash. 98031

Filed Sep. 13, 1993, Ser. No. 119,619

Int. Cl.⁵ B01D *19/00*

U.S. Cl. 96—204 10 Claims



1. An apparatus for separating liquid from a liquid/gas or liquid/vapor mixture comprising:

a curved main channel with an inlet into which flows the mixture, said curved channel forming a surface against which liquid droplets within the mixture impinge against;

a collection artery for collecting droplets separated from the mixture;

a plurality of bleed ports connected to said collection artery for removing the separated droplets from said channel;

wherein, the liquid portion of the mixture is separated from the remainder of the mixture by said apparatus.

5,314,530
COATING COMPOSITIONS FOR PRODUCING WATERTIGHT, VAPOR-PERMEABLE AND FLAME RETARDANT COATINGS

Konrad A. Wierer, Senokofen, Fed. Rep. of Germany, and Franco Serafini, Lendelange, Italy, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany and DuPont de Nemours Intl., S.A., Geneva, Switzerland

Filed Jul. 23, 1992, Ser. No. 919,177

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1991, 4124560

Int. Cl.⁵ C09K *3/18;* **C09D** *5/18*

U.S. Cl. 106—2 11 Claims

1. A coating composition for producing watertight, vapor-permeable and flame retardant coatings, comprising

A) an aqueous dispersion i) having a solids content of from 30 to 70% by weight of a vinyl chloride copolymer with from 20 to 90% by weight of vinyl chloride, based on the total weight of the copolymer,

from 10 to 80% by weight, based on the total weight of the copolymer, of at least one comonomer from the group consisting of the (meth) acrylic esters of alcohols of from 1 to 10 carbon atoms, the vinyl esters of saturated aliphatic carboxylic acids of from 2 to 10 carbon atoms, and the α-olefins, and

from 0 to 10% by weight, based on the total weight of the copolymer, of at least one ethylenically unsaturated functional comonomer from the group of mono- or dicarboxylic acids and amides thereof, hydroxy-functional monomers and sulfonate-functional monomers, or an aqueous dispersion ii) having a solids content of from 30 to 70% by weight of a vinyl acetate-ethylene copolymer with from 10 to 40% by weight of ethylene, based on the total weight of the copolymer, and

from 0 to 10% by weight, based on the total weight of the copolymer, of at least one ethylenically unsaturated functional comonomer from the group of mono- or dicarboxylic acids and amides thereof, hydroxy-functional monomer and sulfonate-functional monomers,

B) from 5 to 70% by weight based on the solids content of the aqueous dispersion A of a flameproofing agent selected from the group consisting of the antimony oxides, phosphoric esters, zinc borates, metallic oxide hydrates, metal hydroxides and chloroparaffins,

C) from 0 to 20% by weight based on the solids content of the aqueous dispersion A, of a crosslinker,

D) from 0.5 to 20% by weight, based on the solids content of the aqueous dispersion A, of a foam stabilizer,

E) from 0 to 10% by weight, based on the solids content of the aqueous dispersion A, of a thickener.

5,314,531
NON-AQUEOUS BALL POINT PEN INK

Bernhard Huber, Dülmen, and Werner Freitag, Dorsten, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 11, 1993, Ser. No. 16,454

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1992, 4204182

Int. Cl.⁵ C09D *11/18*

U.S. Cl. 106—22 F 17 Claims

1. A non-aqueous ball point pen ink containing a dye, resin and solvent, said ink comprising 0.01 to 10% by weight of an alcohol-soluble cellulose compound and having a viscosity in the range of 2–15 Pa•s at 23° C.

5,314,532
SOLUBLE SALT-FREE CONTAMINANT-FREE PIGMENTED MIRROR COATINGS

Zephuren J. Hughes, Alvarado, and Ole G. Torgussen, Carrollton, both of Tex., assignors to Sureguard, Inc., Grand Prairie, Tex.

Continuation-in-part of Ser. No. 754,898, Sep. 4, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 902,206

Int. Cl.⁵ C09D *5/08, 7/12, 191/00*

U.S. Cl. 106—253 9 Claims

1. A coating composition useful as a durable and long term protective coating for thin metal films which comprises the combination of:

(a) an organic resin polymer selected from the group consisting of alkyd resins, acrylic resins, acrylic modified alkyd resins, polyurethane oils, vinyl halide polymers, vinyl halide copolymers, non-oil based urethane, and phenol-formaldehyde resins contained in aqueous or non-aqueous medium; and

(b) an anti-corrosion amount of a substantially soluble salt-free antioxidant scavenger pigment comprising a cyanamide compound of a metal, said cyanamide compound of said metal containing no more than about 0.5% by weight of said soluble salts and wherein said metal is selected from the group consisting of zinc, nickel, cobalt, lead, mixtures thereof, and blends.

5,314,533
AQUEOUS EMULSIONS CONTAINING ORGANOSILICON COMPOUNDS FOR THE IMPREGNATION OF INORGANIC MATERIALS

Thomas Goebel, Hanau; Rudolf Michel, Freigericht; Harald Alff, Kahl am Main, and Josef Karl, Alzenau-Hoerstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1992, Ser. No. 902,882

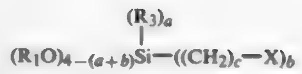
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1991, 4122263

Int. Cl.⁵ C09D *201/10*

U.S. Cl. 106—287.13 5 Claims

1. An aqueous organosilicon emulsion suitable for the impregnation of inorganic materials, comprising:

(a) from 1 to 80% by weight of at least one alkoxysilane corresponding to the formula



$$(R_1O)_{4-(a+b)}\overset{\overset{\displaystyle (R_3)_a}{|}}{Si}-((CH_2)_c-X)_b \qquad (I)$$

in which

R_1=C_1–C_3-alkyl,

R_3=C_1-C_{20}- alkyl, straight chain or branched, or phenyl,

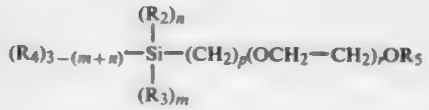
X=H, Cl, Br, I, NH_2, SCN, CN, N_3, NHR, NR_2, $\oplus NR_3$, $-S_x-$, aryl or alkenyl,

a=0 or 1,

b=1 or 2 and

x and c stand for an integer from 1 to 6,

(b) from 1 to 30% by weight of an organosilicon compound corresponding to the formula



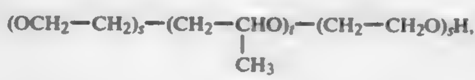
$$(R_4)_{3-(m+n)}-\underset{\underset{\displaystyle (R_3)_m}{|}}{\overset{\overset{\displaystyle (R_2)_n}{|}}{Si}}-(CH_2)_p(OCH_2-CH_2)_rOR_5 \qquad (II)$$

in which

R_2 and R_3, which may be identical or different, denote C_1–C_{20}–alkyl, straight chain or branched, or phenyl,

R_4 stands for C_1–C_3–alkoxy,

$(OCH_2-CH_2)_rOR_5$,



$$(OCH_2-CH_2)_s-(CH_2-\underset{\underset{\displaystyle CH_3}{|}}{CHO})_t-(CH_2-CH_2O)_sH,$$

wherein s=3–50 and t=3–25,

R_5 denotes H, C_1–C_{20}–alkyl, C_2–C_{36} –alkenyl, C_5–C_8–cycloalkyl or C_7–C_{36}–arallkyl

when p=0 and r=0 , OR_5 stands for:

$-(OCH_2-CH_2)_s-(CH_2-CHO)_t(CH_2-CH_2O)_5H$;

m=0, 1 or 2 and n=0, 1 or 2 on condition that when p=0, then (m+n)=1 or 2 and when P≠0, then (m+n) =0,1 or 2;

p=0, 1, 2, or 3 and

r=an integer with a value from 0 to 50, and

(c) water for the balance up to 100% by weight.

5,314,534
PREPARATION AND METHOD FOR COATING GLASS VESSELS

Joachim Giersberg, Marl-Sinsen; Hartmut Gomm, Mühlheim, and Dirk Naumann, Essen-Kupferdreh, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jul. 20, 1992, Ser. No. 917,255

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1991, 4124136

Int. Cl.⁵ C09D *1/00*

U.S. Cl. 106—287.19 6 Claims

1. A preparation suitable for coating hot glass vessels to improve the exterior surface of the vessels, said preparation comprising a solution of the compound $(OH)_2SnCl_2$ in such an amount that the content of Sn in the solution is between about 0.45 to 4.5 moles/L.

5,314,535

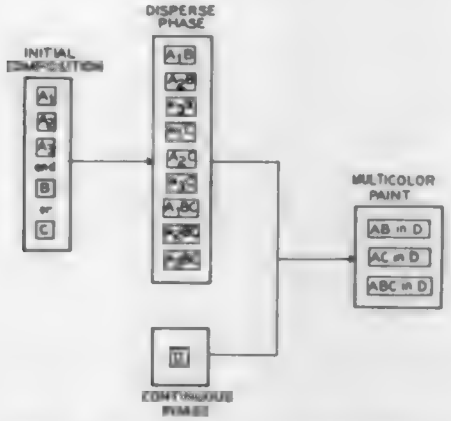
POLYURETHANE-BASED WATER-IN-WATER MULTICOLOR PAINT AND METHOD FOR MAKING

James F. Lynch, Schaumburg, and John Predkelis, Glen Ellyn, both of Ill., assignors to Multicolor Specialties, Inc., Cicero, Ill.

Continuation-in-part of Ser. No. 851,525, Mar. 16, 1992, Pat. No. 5,199,980, which is a continuation-in-part of Ser. No. 694,311, May 1, 1991, Pat. No. 5,114,485, which is a continuation-in-part of Ser. No. 586,762, Sep. 21, 1990, Pat. No. 5,114,484. This application Apr. 6, 1993, Ser. No. 43,520

Int. Cl.^{5} C09D *5/29*

U.S. Cl. 106—311 31 Claims



1. A method for making a water-in-water multicolor paint comprising the steps of:

(A) providing a first composition comprising on a 100 weight percent basis:

(a) about 10 to about 40 weight percent of a water dispersed, film-forming, crosslinkable, polymer system selected from the group consisting of a polyurethane polymer system, a carboxylated polymer system and mixtures thereof, said polyurethane polymer system comprising on a 100 weight percent total crosslinkable solids basis about 75 to and including 100 weight percent of polyurethane polymer and correspondingly from and including 0 to about 25 weight percent of reactive curative, and said carboxylated polymer system comprising on a 100 weight percent total polymer solids basis about 75 to and including 100 weight percent carboxylated polymers and correspondingly from and including 0 up to about 25 weight percent of organic crosslinking agent;

(b) about 0.5 to about 2 weight percent dissolved cellulose material selected from the class consisting of hydroxy (lower alkyl) cellulose and alkali metal carboxylated (lower alkyl) cellulose,

(c) from and including 0 to about 30 weight percent dispersed pigment,

(d) from and including 0 to about 10 weight percent organic cosolvent, and

(e) about 20 to about 80 weight percent water;

(B) providing a second composition comprising on a 100 weight percent basis:

(a) about 0.5 to about 5 weight percent dissolved cationic quaternized cellulose ether, and

(b) about 95 to about 99.5 weight percent water;

(C) providing a third composition comprising on a 100 weight percent basis:

(a) about 0.5 to about 2 weight percent dissolved peptizing agent,

(b) about 5 to about 10 weight percent dispersed water swellable clay, and

(c) about 88 to about 95 weight percent water;

(D) providing a fourth composition comprising on a 100 weight percent basis:

(a) about 5 to about 40 weight percent of said water dispersed, film-forming, crosslinkable, polymer system,

(b) about 1.5 to about 5 weight percent of said dispersed water swellable clay,

(c) about 0.1 to about 0.8 weight percent of said dissolved peptizing agent,

(d) from and including 0 to about 30 weight percent of pigment,

(e) from and including 0 to about 0.25 weight percent of anti-foaming agent,

(f) from and including 0 to about 0.25 weight percent of a wetting agent,

(g) from and including 0 to about 0.25 weight percent of an organofunctional silane,

(h) from and including 0 to about 5 weight percent of colloidal silica,

(i) from and including 0 to about 15 weight percent of an organic cosolvent, and

(j) about 30 to about 70 weight percent water, the relationship between components of said fourth composition being such that said fourth composition has a viscosity in the range of about 1,000 to about 1,500 centipoises;

(E) blending said first composition with a composition selected from the group consisting of:

(a) said second composition in the weight ratio range of about 85:15 through about 80:20 of said first composition to said second composition,

(b) said third composition in the weight ratio range of about 85:15 to about 80:20 of said first composition to said third composition, and

(c) a combination of said second composition and said third composition in the weight ratio range of about 70:15:15 to about 80:10:10 of said first composition to said second composition to said third composition so as to produce a first disperse phase gel composition having a viscosity in the range of about 25,000 to about 85,000 centipoises; and

(F) mixing said first disperse phase gel composition with said fourth composition so that the ratio of the viscosity of said fourth composition to the viscosity of said first disperse phase composition is in the range of about 1:5 to about 1:10, the mixing shear force used in said mixing being sufficient to break up said first disperse phase gel composition into discrete gel bodies dispersed in said fourth composition said mixing shear force being inversely proportional to the average size of said so formed disperse phase bodies, thereby to produce said multicolor paint.

5,314,536

METHOD OF MAKING LUMINOUS CONSTRUCTION MATERIAL

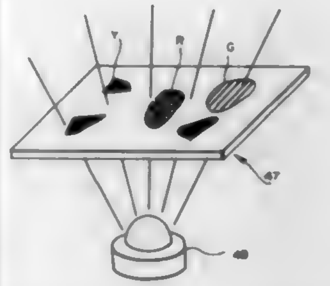
Masaki Kawasaki, 171-3, Oaza Nishiiribe, Sawara-ku, Fukuoka-shi, Fukuoka, 811-11, Japan

Filed Jul. 27, 1992, Ser. No. 920,402

Claims priority, application Japan, Nov. 26, 1990, 2-324949; Apr. 30, 1991, 3-98520

Int. Cl.^{5} C04B *14/04*

U.S. Cl. 106—712 17 Claims



1. A method of making a luminous construction material comprising:

mixing an amount, sufficient to make said luminous construction material of at least one of an inorganic material containing a substance luminous in response to ultraviolet rays and an amount, sufficient to make said luminous construction material, of an artificially refined inorganic component luminous in response to ultraviolet rays into an amount, sufficient to make said luminous construction material, of a concrete to create a mixture; molding said mixture to make a concrete block; curing said concrete block; and cutting said concrete block to produce a plurality of ultraviolet luminous plates.

5,314,537

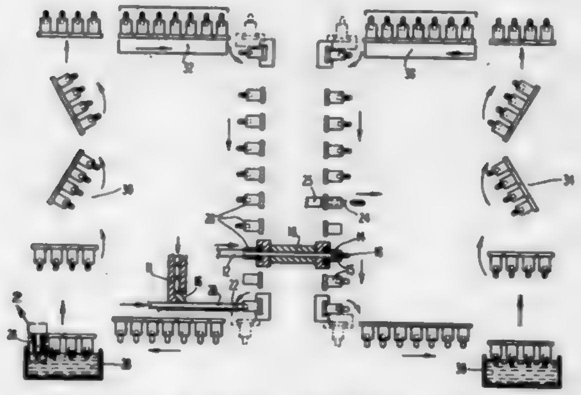
GELATIN COATED CAPLETS AND PROCESS FOR MAKING SAME

Norbert I. Berta, Radnor, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Division of Ser. No. 16,914, Feb. 20, 1987, Pat. No. 4,820,524. This application May 5, 1988, Ser. No. 190,616

Int. Cl.^{5} B05C *03/09*

U.S. Cl. 118—30 23 Claims



1. An apparatus for coating a caplet with a gelatinous material to produce a capsule-like medicament comprising:

(a) inserting means for inserting a first end of said caplet into a first holding means while leaving a second end of said caplet exposed;

(b) said first holding means having at a first side a caplet channel defined therein for permitting the passage of said caplet, said holding means further comprising retaining means which is positioned near said first side to grip said caplet at a first end of said caplet and hold said caplet in position for application of a gelatinous coating to said second end;

(c) first application means for applying a gelatinous coating to said second exposed end of said caplet including a bath of gelatinous material into which said second exposed end is moved while being held by said first holding means;

(d) first drying means positioned after said first application means for permitting said second gelatinous coating to dry to form a coated second end;

(e) gripping means which engages one end of said caplet for displacing said caplet through said caplet channel to expose said first end;

(f) retaining means positioned adjacent one end of said holding means for retaining side caplet in said holding means with said first end exposed;

(g) second application means for applying a gelatinous coating to said first end of said caplet including a bath of gelatinous material into which said first end is dipped while being held by said holding means;

(h) dipping means positioned adjacent the bath of gelatinous material for moving said caplet ends into their respective bath of gelatinous material and removing the caplets from the bath once application is complete; and

(i) second drying means positioned after said first application means for permitting said gelatinous coating on said first end to dry, forming a simulated capsule-like medicament.

5,314,538

APPARATUS FOR MANUFACTURING SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Kazuo Maeda; Noboru Tokumasu, and Yuhko Nishimoto, all of Tokyo, Japan, assignors to Semiconductor Process Laboratory; Canon Sales Co., Inc. and Alcan Tech Co., Inc., all of Japan

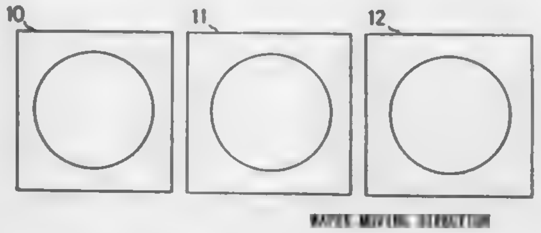
PCT No. PCT/JP92/00468, § 371 Date Dec. 22, 1992, § 102(e) Date Dec. 22, 1992

PCT Filed Apr. 14, 1992, Ser. No. 958,105

Claims priority, application Japan, Apr. 22, 1991, 3-90612

Int. Cl.^{5} C23C *16/00*

U.S. Cl. 118—715 3 Claims



1. An apparatus for manufacturing a semiconductor device comprising:

a film forming section having a gas dispersion unit providing a planar gas release surface for contacting a surface of a substrate with a reaction gas to form a film on the substrate;

a processing section having processing means for processing the formed film;

a wafer holder having a wafer support surface for holding a wafer facing said planar gas release surface or facing said processing means and means for moving said wafer holder between said film forming section and said processing section with the wafer held on said wafer support surface; and

heating means, mounted in said wafer holder, for heating the wafer held on said wafer support surface including the period while said wafer is moving.

5,314,539

APPARATUS FOR PLASMA TREATMENT OF CONTINUOUS MATERIAL

Robert W. Brown, Ivanhoe; Ian H. Coopes, Camberwell; Joseph Fusca, Macleod West; Kenneth J. Gifkins, Victoria, and John A. Irvin, Applecross, all of Australia, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US91/03229, § 371 Date Nov. 2, 1992, § 102(e) Date Nov. 2, 1992, PCT Pub. No. WO91/17561, PCT Pub. Date Nov. 14, 1991

PCT Filed May 9, 1991, Ser. No. 946,490

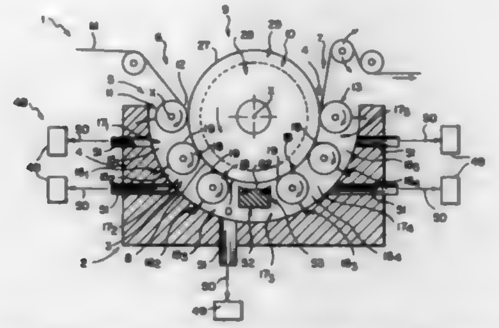
Claims priority, application Australia, May 10, 1990, 90/0066; Oct. 19, 1990, 90/2831

Int. Cl.^{5} C23C *16/50, 16/54*

U.S. Cl. 118—718 27 Claims

1. An apparatus (1) for continuous treatment of a material (M) of continuous length with a low temperature plasma of a plasma gas under vacuum, the apparatus (1) comprising: a plasma treatment chamber (3) having a chamber wall (4) and, in the wall (4), an entrance zone (6) and an exit zone (7) for receiving and discharging the continuous material (M), respectively, and the treatment chamber (3) having at least one transition zone (16) spaced from the entrance and exit zones (6,7) and dividing the treatment chamber (3) into sub-chambers (17); evacuating means (49) operable to establish a vacuum in the

sub-chambers (17); support means (9) for advancing the continuous material ()M) along a path (8) through the sub-chambers (17) and also for maintaining a vacuum seal at the entrance and exit zones (6,7) and each transition zone (16) while the continuous material (M) passes therethrough; and plasma generating means (52) positioned within the treatment chamber (3) adjacent the path (8) for generating a low temperature plasma which contacts the continuous material (M) while it is advanced through the treatment chamber (3); characterized in that the support means (9) includes a backing roller (10) mounted adjacent the entrance and exit zones (6,7) for rotation on an axis (X) thereof, an entrance sealing roller (11) positioned adjacent the entrance zone (6), an exit sealing roller (13) positioned adjacent the exit zone (7) and a transition sealing roller (18) positioned at each transition zone (16), each sealing roller (11, 13, 18) being mounted for rotation on a respective axis thereof; the backing roller (10) forming with each sealing roller (11, 13, 18) a respective nip (12, 14, 19) at the entrance zone (6), exit zone (7) and each transition zone (16) through which the continuous material (M) passes into and out of the treatment chamber (3) and during advancement between adjacent sub-chambers (17), respectively.



5,314,540

APPARATUS FOR FORMING DIAMOND FILM

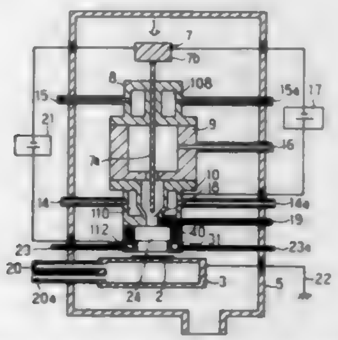
Satoshi Nakamura, Aichi; Minoru Yamamoto, Kariya; Nobuei Ito, Chiryu, and Tadasi Hattori, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 23, 1992, Ser. No. 855,742

Claims priority, application Japan, Mar. 22, 1991, 3-58824; Mar. 22, 1991, 3-58825; Mar. 22, 1991, 3-58826; Mar. 22, 1991, 3-58827

Int. Cl.⁵ C23C *16/00, 16/50*

U.S. Cl. 118—723 DC **18 Claims**



1. An apparatus for forming a diamond film, comprising:

a vacuum vessel the inside of which is maintained at a given degree of vacuum;

a positive electrode and a negative electrode which are disposed opposite to each other inside the vacuum vessel;

an arc discharge power supply which is electrically connected with the positive and negative electrodes to supply a given electric power into the space between the positive and negative electrodes to produce an arc discharge in the space;

a gas supply means which supplies raw material gases including hydrogen and carbon containing gas into the arc discharge to produce a gas plasma and which blows this gas plasma against a substrate located downstream of the gas plasma;

a third electrode disposed between the substrate and the region in which the gas plasma is produced;

a plasma current power supply for passing an electrical current from the third electrode into the gas plasma; and

an inhibiting means which inhibits flow of positive electrical current from the substrate to the third electrode.

5,314,541

REDUCED PRESSURE PROCESSING SYSTEM AND REDUCED PRESSURE PROCESSING METHOD

Masasi Saito, Yamanashi; Teruo Iwata, Nirasaki; Nobuo Ishii, Yamanashi; Towl Ikeda, Kofu, and Hiroaki Saeki, Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed May 28, 1992, Ser. No. 889,378

Claims priority, application Japan, May 28, 1991, 3-152633; May 28, 1991, 3-152634; Jul. 25, 1991, 3-186241

Int. Cl.⁵ C23C *16/00*

U.S. Cl. 118—725 **9 Claims**

1. A reduced pressure processing system comprising:

a load lock chamber having outer and inner walls and at least one opening communicating with at least one of an outer air atmosphere and a process atmosphere in which a substrate is processed;

gate means for closing said opening so as to separate an interior of said chamber from at least one of the outer air atmosphere and the process atmosphere, and for opening said opening so as to make the interior of said chamber communicate with at least one of the outer air atmosphere and the process atmosphere;

convey means for loading/unloading the substrate through said opening into/out of a first space which is surrounded by said inner wall and said gate means;

evacuation means for evacuating said chamber, said evacuation means including a first evacuator for evacuating said first space and a second evacuator for evacuating a second space which is surrounded by said outer and inner walls;

gas supply means for supplying a gas into said first and second spaces;

first heating means for heating said inner wall; and

differential pressure detecting means for detecting a difference in pressure within said first and second spaces and providing a signal of said pressure difference to a control means for controlling at least one of said evacuation means and said gas supply means;

wherein the inner wall is thinner than the outer wall.

5,314,542

NITROSOMONAS PRESERVATION AND REACTIVATION FOR AQUARIA

Edward J. Cassidy, Stuart, and Ronald D. Jones, Sunrise, both of Fla., assignors to Precision Aquarium Testing, Inc., Stuart, Fla.

Filed Aug. 6, 1993, Ser. No. 103,453

Int. Cl.⁵ A01K *61/00;* **C12N** *1/20, 1/38, 9/06*

U.S. Cl. 119—231 **1 Claim**

1. A method for reactivating a metabolic activity of liquid culture of dormant ammonia oxidizing bacteria prior to their addition into an aquarium, comprising the steps of:

a. increasing a concentration of ammonia in said liquid culture to about 200 ppm, and

b. waiting about 72 hours to restore the metabolic activity of said dormant ammonia oxidizing bacteria before adding said culture into said aquarium.

5,314,543

METHOD FOR CLEANING A PROSTHESIS BY HEATING IN A MICROWAVE OVEN

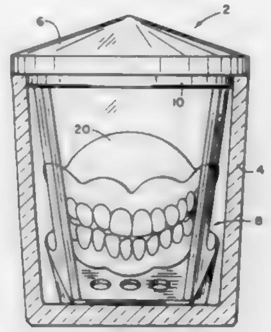
William E. Elkins; William K. Kerr, and Louis M. Ohls, all of Tulsa, Okla., assignors to DeBron International, Tulsa, Okla.

Division of Ser. No. 681,563, Apr. 5, 1991, Pat. No. 5,201,411.

This application Jan. 25, 1993, Ser. No. 8,473

Int. Cl.⁵ B08B *7/00*

U.S. Cl. 134—1 **3 Claims**



1. A method of cleaning a prosthesis, said prosthesis comprising a metallic portion, comprising the steps of:

(a) placing said prosthesis, water, and an effective amount of a denture cleanser for cleansing said prosthesis in a microwave insulating device; and

(b) then heating the contents of said microwave insulating device in a microwave oven.

5,314,544

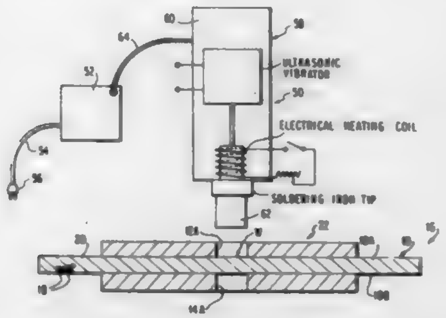
HIGH-SPEED NON-DESTRUCTIVE CLEANING OF METAL FOAM SUBSTRATE OF ELECTROMECHANICAL CELL ELECTRODES

Salah Oweis, Ellicott City, Md., assignor to Saft America, Inc., Valdosta, Ga.

Filed May 18, 1993, Ser. No. 62,213

Int. Cl.⁵ B08B *5/00, 7/02*

U.S. Cl. 134—5 **13 Claims**



1. A cleaning method for cleaning a localized area of an open pore foam type metal substrate of an electrical chemical cell electrode, said substrate being filled with active material, and then compressed, said cleaning method comprising:

placing said substrate within a fixture with at least one surface of the substrate exposed,

scrubbing a localized area of the exposed surface of the substrate with a heated soldering iron head under pressure while subjecting said soldering iron head to ultrasonic vibration, whereby said active material in the vicinity of said one surface at said localized area is nearly instantaneously dislodged from the pores of the substrate, and

blowing compressed air through said substrate at said localized area to remove the dislodged active material from a three-dimensional network of the open pore foam type substrate, without deformation to the open pore foam type metal substrate, thereby facilitating the mass production welding of metal strip connectors or terminals to said clean, localized surface area of the metal foam substrate.

5,314,545

METHOD OF CLEANING AN INTERNAL ACCESS OPENING BY A NOZZLE WITH WEARING CONTACT

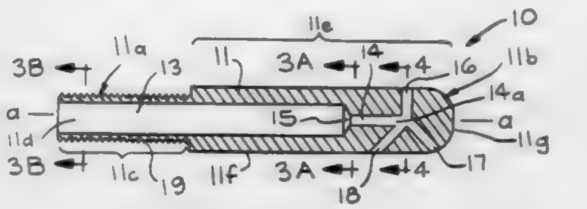
Michael E. Folts, 216 Fransisco Rd., Grass Lake, Mich. 49240, and Mahammed Abdo, 5050 Runnymede, Holt, Mich. 48842

Division of Ser. No. 661,126, Feb. 27, 1991, Pat. No. 5,125,425.

This application May 14, 1992, Ser. No. 882,675

Int. Cl.⁵ B08B *9/04*

U.S. Cl. 134—22.11 **21 Claims**



1. A method for delivering a high velocity working liquid at fluid pressures of about 1,000 to 20,000 pounds per square inch to an internal access opening in a work material for cleaning and for removing thin cross-section materials including burrs from the work material, which comprises:

(a) providing a high pressure liquid source connected to a nozzle means which comprises a unitary nozzle body shaped to fit into the internal access opening in the work material to remove the tin cross-section materials and having spaced apart ends along a longitudinal axis of the nozzle body with an external sidewall between the ends, wherein one of the ends of the nozzle body has an opening and the other end is closed; an internal liquid passageway having a circular cross-section along the longitudinal axis of the nozzle body and extending part of a length of the sidewall from the open end of the nozzle body to an end of the internal liquid passageway adjacent to the closed end of the nozzle body, wherein a diameter of the internal liquid passageway has a constriction between the open and the closed ends that narrows the internal liquid passageway a ratio of at least 2:1 to create the high velocity working liquid from the high pressure working liquid; at least one discharge slot means through the sidewall of the nozzle body for emitting the high velocity working liquid onto the work material, wherein the discharge slot means is provided along a plane intersecting the longitudinal axis of the nozzle body and is in liquid communication with the internal liquid passageway, adjacent to the closed end of the nozzle body and leading to the constriction in the internal liquid passageway and wherein the construction in the internal liquid passageway is in an upstream position with respect to the discharge slot means; and a connection means adjacent to the open end of the nozzle body, wherein the nozzle body can be connected to a high pressure working liquid source by the connection means so that the high pressure working liquid can be moved through the internal liquid passageway and exit from the discharge slot means, onto the work material as the high velocity working liquid;

(b) providing the nozzle means into the internal access opening of the work material wherein the external sidewall comes into wearing contact with the internal access opening without damage to the constriction of the internal liquid passageway and without reducing the effectiveness of the high velocity working liquid; and

(c) pumping a high pressure working liquid through the internal liquid passageway so that the high velocity working liquid exits from the discharge slot means in the internal access opening of the work material to remove the thin cross-section materials.

5,314,546

PROCESS FOR ENHANCED DRAINAGE OF RESIDUAL AQUEOUS RINSE ON THE EXTERNAL SURFACE OF PLASTIC PARTS

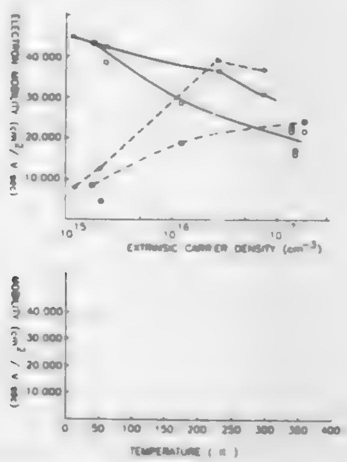
Jeffrey I. Melzer, Lansdale, and Barry P. Gunagan, Hatboro, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed Jan. 4, 1993, Ser. No. 435
Int. Cl.⁵ B08B *7/00*
U.S. Cl. 134—42 **8 Claims**

1. A process for enhancing the drainage of residual aqueous rinse for the external surfaces of plastic parts comprising contacting said plastic parts with an effective amount of an aqueous solution of a ziroaluminate compound, for the purpose of enhancing said the drainage of residual aqueous rinse wherein said compound remains on the surfaces of said parts during subsequent rinse stages.

5,314,547

RARE EARTH SLAB DOPING OF GROUP III-V COMPOUNDS

Joseph P. Heremans, Troy; Dale L. Partin, Romeo, and Christopher M. Thrush, Shelby Township, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 28, 1992, Ser. No. 951,995
Int. Cl.⁵ H01L *29/00*
U.S. Cl. 148—33.1 **14 Claims**



1. A composition for use in a magnetic field sensing device, said composition comprising:

a first semiconductor layer formed from a narrow-gap Group III-V compound and a contiguous doped layer of said Group III-V compound doped with a rare-earth element to a predetermined dopant density that establishes an average extrinsic electron density between said undoped and doped layers of said narrow gap Group III-V compound;

wherein said composition is characterized by a high carrier mobility while having an enhanced extrinisic electron density so as to enable said high carrier mobility to be substantially temperature independent.

5,314,548

FINE GRAINED ANISOTROPIC POWDER FROM MELT-SPUN RIBBONS

Viswanathan Panchanathan, Anderson, Ind.; Gregory P. Meisner, Ann Arbor, Mich., and John J. Croat, Noblesville, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 22, 1992, Ser. No. 903,067
Int. Cl.⁵ H01F *1/02*
U.S. Cl. 148—101 **6 Claims**

1. A method of making fine grained, magnetically anisotropic permanent magnet powder particles consisting essentially of grains of the tetragonal crystal phase $RE_2(Fe_xCo_{1-x})_{14}B_1$ with an intergranular phase surrounding the grains, where RE represents one or more rare earth elements including at least 60 percent neodymium and/or praseodymium, the value of x is in the range of 0.6 to 1, and the composition of the intergranular phase is richer in rare earth element content than the tetragonal crystal phase, the composition of said powder being further characterized in that in molten precursor form, it is susceptible to being rapidly cooled to solidification over a determinable and controllable range of cooling rates within which range a series of fine grained crystalline products is formed that respectively display (a) values of magnetic coercivity that continually increase toward a maximum value and decrease from such value as the cooling rate is increased and (b) values of magnetic remanence that increase over at least a part of such range as the cooling rate is increased, said method comprising

rapidly solidifying a said molten precursor composition at a maximum coercivity value cooling rate or greater to form fine-grained particles in which the average grain size is no greater than about 100 nanometers,

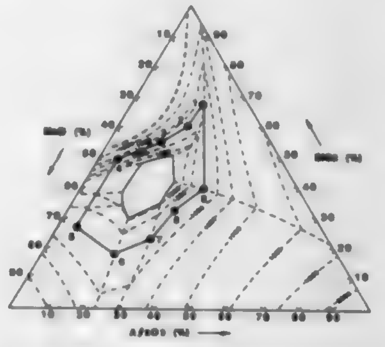
heating said rapidly solidified particles in a hydrogen atmosphere at a pressure no greater than atmospheric pressure at a temperature for forming metal hydrides in the particles, and thereafter

removing hydrogen from the particles and cooling the particles to provide said magnetically anisotropic powder, the time and temperature of hydrogen treatment and removal being such that the average grain size of the 2-14-1 phase is no greater than 500 nanometers.

5,314,549

HIGH STRENGTH AND HIGH TOUGHNESS STAINLESS STEEL SHEET AND METHOD FOR PRODUCING THEREOF

Hitoshi Misao; Katsuhisa Yamauchi; Tadashi Inoue, and Tomoyoshi Okita, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Jul. 29, 1993, Ser. No. 99,171
Claims priority, application Japan, Mar. 8, 1993, 5-072901
Int. Cl.⁵ C22C *38/40;* **C21D** *8/00*
U.S. Cl. 148—325 **14 Claims**



1. A high strength and high toughness stainless steel sheet consisting essentially of:

0.01 to 0.2 wt. % C, 0.1 to 2 wt. % Si, 0.1 to 2 wt. % Mn, 4 to 11 wt. % Ni, 13 to 20 wt. % Cr, 0.01 to 0.2 wt. % N, 0.0005 to 0.0025 wt. % sol.Al, 0.002 to 0.01 wt. % O, 0.009 wt. % or less S, and the balance being Fe and inevitable impurities;

said inevitable impurities existing as nonmetallic inclusions, a composition of said nonmetallic inclusions being in a range enclosed with lines connecting nine points in a phase diagram in a 3-component system of "Al_2O_3-MnO-SiO_2" given below;

Point 1 (Al_2O_3: 21%, MnO: 12%, SiO_2: 67%),
Point 2 (Al_2O_3: 19%, MnO: 21%, SiO_2: 60%),
Point 3 (Al_2O_3: 15%, MnO: 30%, SiO_2: 55%),
Point 4 (Al_2O_3: 5%, MnO: 46%, SiO_2: 49%),
Point 5 (Al_2O_3: 5%, MnO: 68%, SiO_2: 27%),
Point 6 (Al_2O_3: 20%, MnO: 61%, SiO_2: 19%),

Point 7 (Al_2O_3: 27.5%, MnO: 50%, SiO_2: 22.5%),
Point 8 (Al_2O_3: 30%, MnO: 38%, SiO_2: 32%),
Point 9 (Al_2O_3: 33%, MnO: 27%, SiO_2: 40%);

the steel sheet containing 40 to 90% martensite; and

the steel sheet having a 1400 N/mm^2 or more tensile stress when a tensile strain is 1.0%.

5,314,550

RECOVERY OF ALUMINUM AND HYDROCARBON VALUES FROM COMPOSITE ENERGETIC COMPOSITIONS

Boris D. Nahlovsky, Cameron Park, and Michael K. Wong, Sacramento, both of Calif., assignors to Aerojet-General Corporation, Rancho Cordova, Calif.
Filed Mar. 27, 1992, Ser. No. 858,838
Int. Cl.⁵ C06B *23/00*
U.S. Cl. 179—109.6 **14 Claims**

1. A process for the recovery of useful materials from a solid composite propellant composition comprising a polymeric binder, an oxidizer and aluminum particles, said process comprising:

(a) removing oxidizer from said composition to achieve a substantially oxidizer-free composition;

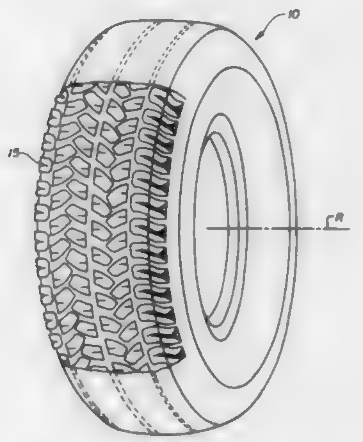
(b) heating said substantially oxidizer-free composition in the substantial absence of oxygen to pyrolyze said polymeric binder to vaporized oils, leaving said aluminum particles as a residue; and

(c) condensing at least a portion of said vaporized oils as a liquid oil, and separately recovering said liquid oil and said aluminum particles.

5,314,551

TIRE PITCH SEQUENCING FOR REDUCED TIRE TREAD NOISE

Thomas A. Williams, North Canton, Ohio, assignor to General Tire, Inc., Akron, Ohio
Filed Nov. 14, 1991, Ser. No. 792,006
Int. Cl.⁵ B60C *11/11*
U.S. Cl. 152—209 R **5 Claims**

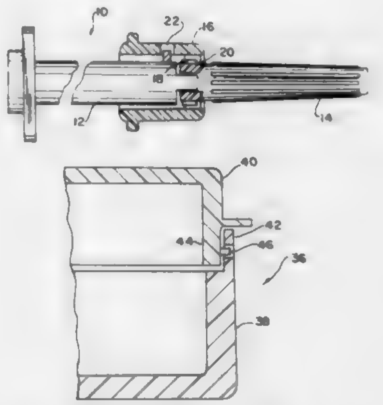


1. A tire having a tread with a plurality of base pitches placed around the circumference of the tire, said plural base pitches having three different pitch lengths which define a preselected pitch sequence extending around the entire circumference of the tire, said base pitches being arranged in said pitch sequence such that the transitions between the base pitches with the smallest of said three different pitch lengths and the base pitches with the largest of said three different pitch lengths are between about 15% and 30% of the total number of transitions between base pitches of different lengths in the pitch sequence, the base pitches with the smallest and the largest pitch lengths each comprise at least 35% of the total number of base pitches around the circumference of the tire, and wherein not more than three base pitches having the same pitch length are adjacent each other around the circumference of the tire.

5,314,552

BREAKAWAY PLUG ULTRASONICALLY BORED FROM FIRST THERMOPLASTIC PART & ULTRASONICALLY BONDED TO SURFACE OF SECOND THERMOPLASTIC PART

Thomas B. Sager, Newtown, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.
Filed Dec. 17, 1992, Ser. No. 992,065
Int. Cl.⁵ B32B *31/00*
U.S. Cl. 156—73.3 **3 Claims**



1. The method of providing an assembly of thermoplastic parts separable responsive to the application of a predetermined force upon a breakaway plug comprising:

assembling a first thermoplastic upper part in an overlapping relation upon a second thermoplastic lower part;

providing a horn rendered resonant as a half wavelength resonator at an ultrasonic frequency and having at its free frontal end a bore, the depth of which is substantially equal to the thickness of the material of said first part at the isolation where said horn is intended to engage said first part;

providing forced engagement between said horn and said first part at said location and causing said horn to penetrate into said first part, causing thermoplastic material to be cut from said first part and enter into said bore for forming a solid plug, whereby leaving a cavity in said first part;

continuing motion of said horn toward the underlying second part until the end surface of said plug confronting said second part is in contact with said second part for welding said plug to the surface of said second part;

maintaining for a brief time interval said horn at the position at which there is contact between said end surface of said plug and said second part; ceasing the horn to be resonant for causing softened and flowed thermoplastic material, produced at the interface between said plug and said second part responsive to the dissipation of vibratory energy, to rigidify;

withdrawing said horn from said second part and said first part whereby to leave said plug free-standing but welded to said second part with the wall of the aperture produced in said first part responsive to cutting said plug surrounding a portion of said plug, and

whereby, responsive to a predetermined breakaway force applied between said wall of said aperture and said plug, said plug breaks away from its attachment to said second part, thereby rendering said first part and said second part separable.

5,314,553

FIBER-REINFORCED RESIN MEMBER AND METHOD OF PRODUCING THE SAME

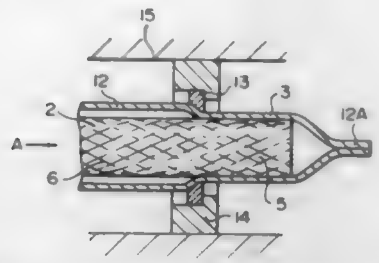
Hisayoshi Hashimoto, Ushiku, and Morio Tamura, Tsuchiura, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/01283, § 371 Date Jan. 7, 1991, § 102(e) Date Jan. 7, 1991, PCT Pub. No. WO91/09724, PCT Pub. Date Jul. 11, 1991

PCT Filed Dec. 21, 1989, Ser. No. 635,502

Int. Cl.^{5} B32B *31/20;* **B65H** *81/00*

U.S. Cl. 156—153 **6 Claims**



1. A method of producing a fiber-reinforced resin member comprising a first step of forming a solid or hollow rod member by winding on a core a fiber material composed of a strand of continuous filaments impregnated with a resin, a second step of thermosetting said resin in said rod member and thereafter mechanically polishing an outer periphery of the rod member to finish a surface of the outer periphery, a third step of forming a soft metal layer on the outer periphery of said rod member by squeezing a soft metal on the finished outer periphery surface of said rod member so as to cause said soft metal to adhere under pressure to said outer periphery surface, and a fourth step of forming a hard metallic deposit on the surface of said soft metal layer to provide a fiber-reinforced resin member.

5,314,554

METHOD FOR PRODUCING A LAMINATED TILE PRODUCT

Charles R. Owens, 125 S. Reynolds St., Suite J-302, Alexandria, Va. 22302

Division of Ser. No. 424,193, Oct. 19, 1989, Pat. No. 5,208,086, and a continuation-in-part of Ser. No. 375,726, Jul. 5, 1989, Pat. No. 5,062,913, each is a continuation-in-part of Ser. No. 177,947, Apr. 5, 1988, Pat. No. 4,931,331. This application Dec. 4, 1992, Ser. No. 985,908

Int. Cl.^{5} E04C *2/00;* **B32B** *31/18*

U.S. Cl. 156—154 **15 Claims**

1. A method for producing a laminated tile comprising:

providing a sheet of natural stone having opposed first and second major surfaces;

providing a first plurality of ceramic substrates, each of said plurality of ceramic substrates having opposed first and second major surfaces;

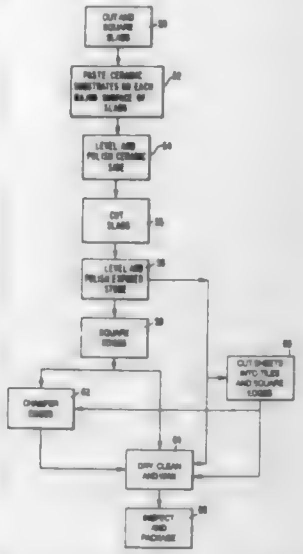
providing a second plurality of ceramic substrates, each of said plurality of ceramic substrates having opposed first and second major surfaces;

providing an adhesive material on at least one of said first major surface of said sheet of natural stone and said first major surface of each of said first plurality of ceramic substrates;

providing an adhesive material on at least one of said second major surface of said sheet of natural stone and said first major surface of each of said second plurality of ceramic substrates;

assembling said first plurality of ceramic substrates and said sheet of natural stone to form a laminated assembly such that said first surface of each of said first plurality of ceramic substrates faces said first major surface of said sheet of natural stone with said adhesive material therebetween;

assembling said second plurality of ceramic substrates and said sheet of natural stone to form a laminated assembly such that said first surface of each of said second plurality of ceramic substrates faces said second major surface of said sheet of natural stone with said adhesive material therebetween;


CUT AND SQUARE SLABS
PASTE CERAMIC SUBSTRATES ON EACH MAJOR SURFACE OF SLABS
LEVEL AND POLISH CERAMIC SIDE
CUT SLABS
LEVEL AND POLISH EXPOSED STONE
SQUARE EDGES
CUT SHEETS INTO TILES AND SQUARE EDGES
CHAMFER EDGES
DRY CLEAN AND WAX
INSPECT AND PACKAGE

cutting said sheet of natural stone having said first and second pluralities of ceramic substrates adhered thereto along a plane substantially parallel to said first and second major surfaces of said sheet of natural stone to form two laminates each having an exposed layer of natural stone and ceramic substrates adhered thereto; and

polishing said exposed layer of natural stone of each of said two laminates.

5,314,555

PRODUCTION OF RUBBER THREAD - WOUND GOLF BALLS

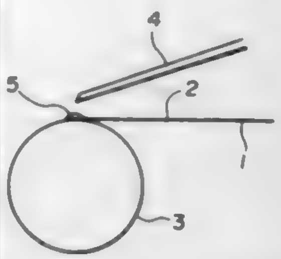
Fumio Fukazawa, Tokyo, Japan, assignor to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1993, Ser. No. 12,441

Claims priority, application Japan, Feb. 3, 1992, 4-47478

Int. Cl.^{5} A63B *45/00, 37/00*

U.S. Cl. 156—170 **11 Claims**



1. A process for producing thread-wound golf balls by winding a rubber thread on a core and covering a layer of wound rubber thread, characterized in that the winding of rubber thread is initiated by a method comprising the steps of:

placing a starting end of rubber thread on a core surface;

dropping a hot-melt adhesive (in a molten state) on the starting end; and

flattening the hot-melt adhesive via application of pressure to reduce the time required to solidify the adhesive, thereby fixing the starting end of rubber thread to the core.

6. A process for producing thread-wound golf balls by winding a rubber thread on a core and covering a layer of wound rubber thread, characterized in that the winding of rubber thread is completed by a method comprising the steps of:

placing a terminating end of rubber thread on a layer of wound rubber thread;

dropping a hot-melt adhesive (in a molten state) on the terminating end; and

flattening the holt-melt adhesive via application of pressure to reduce the time required to solidify the adhesive, thereby fixing the terminating end of rubber thread to the layer of wound rubber thread.

5,314,556

PROCESS FOR MANUFACTURING REINFORCED ROOFING MEMBRANES

D. Mark Woiceshyn, St. Catharines, Canada, assignor to Bay Mills Limited, Ontario, Canada

Continuation of Ser. No. 860,196, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 520,770, May 8, 1990, abandoned. This application Jun. 16, 1993, Ser. No. 77,404

Int. Cl.^{5} B32B *11/02;* **D04H** *3/12*

U.S. Cl. 156—177 **11 Claims**

1. A process of manufacturing a roofing membrane that is free of any organic mat, comprising the steps of:

selecting a lightweight polyester fabric consisting essentially of an open grid of over-under construction in which fill yarns are held between pairs of machine direction yarns lying essentially one above the other, the fabric having no mechanical connection at cross-over points of the fill and machine direction yarns and comprising polyester yarns having about 30 to about 300 denier yarns in the machine direction, about 30 to bout 300 denier yarns in the fill direction and a yarn per inch count of about 3×3 to about 10×10;

applying to the fabric an adhesive binder that is one of dissolved and dispersed in a liquid for application to the fabric so that the open grid fabric is held together by the adhesive alone, the adhesive binder being applied to the fabric in a sufficiently large amount to accumulate between the two yarns of each pair of machine direction yarns and to bind the machine direction yarns together and hold the fill yarns between the pairs of machine direction yarns securely in subsequent processing;

selecting a high strength reinforcing fabric consisting essentially of a non-woven open grid of polyester having no mechanical connections at cross-over points in the grid;

combining the high strength reinforcing fabric with the adhesively secured lightweight polyester fabric; and

passing the combination of the adhesively secured lightweight polyester fabric and the high strength reinforcing fabric with a fiberglass mat adjacent to the high strength reinforcing fabric, and any additional reinforcements free of any organic mat, through bituminous material to form the roofing membrane.

5,314,557

METHOD OF UNITIZING PACKAGES BY MEANS OF A STRETCHABLE ADHESIVE TAPE

Mark E. Schwartz, Mahtomedi, Minn., and Karl W. Kreckel, Benzenbergweg, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 731,341, Jul. 19, 1991, abandoned. This application Jul. 28, 1993, Ser. No. 102,537

Int. Cl.^{5} B29C *65/00*

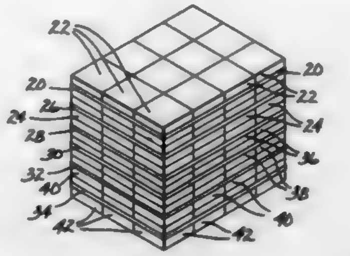
U.S. Cl. 156—229 **11 Claims**

1. A method of unitizing at least two objects that are arranged in one or more tiers, at least one of said tiers comprising at least one object, said method comprising the steps of:

(1) providing a stretchable, detackifiable pressure-sensitive adhesive tape having (1) a backing having a Young's modulus of at least about 2,500 psi but less than about 100,000 psi, a lengthwise elongation at break of at least about 150% and low recovery, (2) said backing bearing a layer of pressure-sensitive adhesive thereon;

(2) adhering a first small portion of said tape to a small portion of one of said objects;

(3) stretching said tape sufficiently to detackify the portion thereof not adhered to said one of said objects;



(4) wrapping said detackified portions of said tape around at least two of said objects; and

(5) adhering a second portion of said tape to a small portion of one of said objects, whereby said objects are capable of resisting mechanical handling and vibration of said arranged objects.

5,314,558

METHOD OF APPLYING A DECORATIVE FOIL TO A TAPE CASSETTE REEL

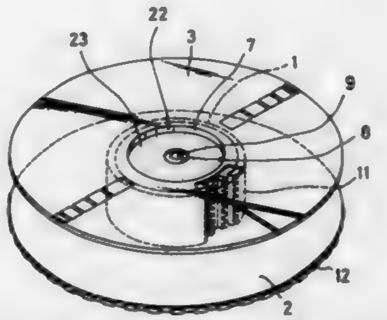
Kiyoshi Urayama, and Kazuo Ozawa, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 641,598, Jan. 15, 1991, abandoned, which is a division of Ser. No. 108,372, Oct. 14, 1987, Pat. No. 4,995,565. This application Jun. 8, 1993, Ser. No. 73,972

Claims priority, application Japan, Jan. 12, 1986, 61-269402

Int. Cl.^{5} B32B *33/00*

U.S. Cl. 156—251 **1 Claim**



1. A method of applying a label to the flange of a tape cassette reel comprising the steps of forming a groove in a concave portion centered about the longitudinal axis of the reel in one of the flat surfaces of the reel, the groove extending about the periphery of the concave portion, and pressing a layer of foil onto the one flat surface by means of a hot rubber stamper having a diameter slightly greater than the diameter of the groove, whereby the edges of the groove sever the portion of the foil extending beyond the groove.

5,314,559

APPARATUS FOR APPLYING GLUE TO CLOSURE STAMPS FOR INSERTION ONTO PACKAGES

Steven R. Rinehart, Chesterfield; James W. Giles, Jr., Petersburg; Charles P. Pendleton, Madison Heights, and Marvin M. Grimsley, Mosely, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

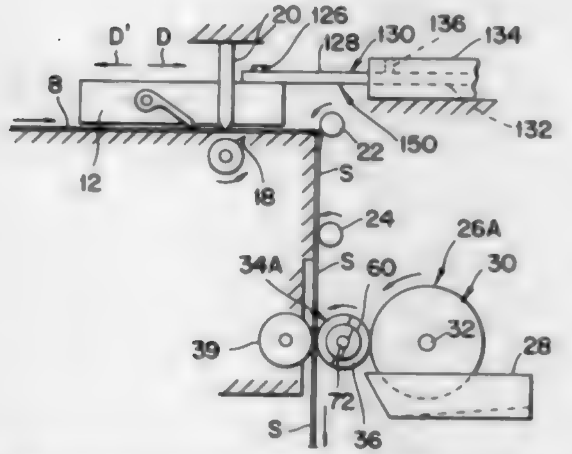
Filed Sep. 28, 1992, Ser. No. 952,257

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—356 **5 Claims**

1. Apparatus for applying glue to closure stamps for insertion onto cigarette packs, comprising:

means for supplying cigarette packs for receiving closure stamps;
feeding means including a reciprocable member for advancing a row of closure stamps sequentially through a glue-applying zone;
drive means for reciprocating said reciprocable member;
a glue pot disposed in the glue-applying zone;
glue-transfer means for transferring glue from the glue pot to the closure stamps comprising:
 a rotatable shaft disposed adjacent the glue pot, and connectible to said drive means to be rotated thereby;
 at least one glue-applying wheel affixed to the shaft for rotation therewith and positioned such that a peripheral edge thereof receives and transfers a line of glue to the closure stamps as the closure stamps pass through the glue-applying zone, a portion of the peripheral edge of said glue-applying wheel being recessed radially inwardly to define an interruption in an outer diameter of the peripheral edge so that only a non-recessed portion of the outer edge transfers glue to the closure stamps, the non-recessed portion having a circumferential length shorter than a distance separating leading and trailing edges of each closure stamp, so that opposite ends of the glue line are spaced from the leading and trailing edges, respectively;



the glue pot being manually movable between a glue-applying position in which the shaft is in driven connection with the drive means, and a retracted position in which the shaft is out of driven connection with the drive means, the shaft being manually rotatable when the glue pot is in the retracted position,
synchronizing means for synchronizing the position of the glue-applying wheel relative to the position of the reciprocable member upon reconnection of the drive means with the glue-applying wheel, to ensure that the ends of the glue line are spaced from the leading and trailing ends of the closure stamps, the synchronizing means comprising:
 a first reference mark rotatable with the shaft,
 a first sensor for sensing the first reference mark when the latter is in a predetermined position and providing a first signal in response thereto,
 a second reference mark reciprocable with the reciprocable member, and
 a second sensor for sensing the second reference mark when the latter is in predetermined position and providing a second signal in response thereto, so that movement of the glue pot into the glue-applying position when both of the first and second signals are provided ensures that the glue-applying wheel and the reciprocable member are properly synchronized.

5,314,560

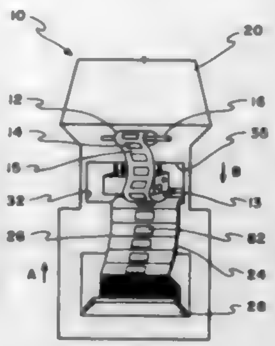
BLINDED LABEL AND METHOD OF MAKING SAME

Warren A. Pritchet, Oak Ridge, N.J., assignor to Almedica Services Corp., Waldwick, N.J.

Continuation of Ser. No. 715,477, Jun. 14, 1991, abandoned. This application Apr. 21, 1993, Ser. No. 51,261

Int. Cl.^{5} B42D *15/00*

U.S. Cl. 156—238 **5 Claims**



1. A process for producing labels suitable for use in blinded testing, comprising:
 (a) printing desired information on a printing surface of a base sheet at incremental locations along its length, said printing surface having a gloss finish;
 (b) advancing said base sheet into a hot stamping machine at a predetermined rate;
 (c) advancing a web containing heat and pressure transferable, scratch-off opaquing hotstamp foil into a hot stamping machine at the same predetermined rate; and
 (d) applying said hotstamp foil to said printing surface of said base sheet by compressing and heating said base sheet an said web with sufficient heat and pressure from said hot stamping machine to transfer said hot stamp foil from its web directly to said printing surface of said base sheet over an increment of information.

5,314,561

METHOD OF PREPARING LAMINATED PACKAGING MATERIAL

Yuji Komiya, Tama, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 757,569, Sep. 11, 1991, abandoned. This application Jun. 10, 1993, Ser. No. 74,726

Claims priority, application Japan, Sep. 14, 1990, 2-244538

Int. Cl.^{5} B29C *47/04*

U.S. Cl. 156—244.11 **14 Claims**

1. A method of preparing a laminated packaging material, comprising the steps of:
 forming a thin-film layer on a substrate, said thin-film layer comprising an inorganic or metal compound and having gas barrier properties;
 laminating a heat buffer layer on said thin-film layer in such a way that the substrate undergoes no expansion and constriction during the lamination step; and
 forming an extruded coating layer on said heat buffer layer.

5,314,562

CONSUMER POLYOLEFIN PRIMER

Patrick F. McDonnell, Dublin; Gerard M. Wren, County Kildare, both of Ireland, and Edward K. Welch, II, Bristol, Conn., assignors to Loctite Corporation, Hartford, Conn.

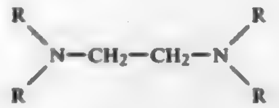
Continuation of Ser. No. 812,771, Dec. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 620,227, Nov. 29, 1990, abandoned. This application Feb. 1, 1993, Ser. No. 13,143

Int. Cl.^{5} C09J *5/04*

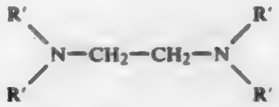
U.S. Cl. 156—314 **20 Claims**

1. A method of bonding a pair of substrates at least one of which is a plastic substrate, the method comprising:

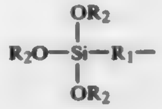
 applying to said plastic substrate a primer solution comprising between 0.01 and 0.75% of an adhesion-promoting ethylenediamine primer substance selected from the group consisting of (a) first ethylenediamine compounds having the formula:



 wherein each R, which may be the same or different, is hydrogen, an alkyl, alkenyl or alkoxy group having 1 to 8 carbon atoms, an aryl group having 6 to 8 carbon atoms, a nitrogen-or sulphur-substituted group having 1 to 8 carbon atoms or a heterocyclic group having up to 8 carbon atoms which may be unsubstituted or substituted with hydroxy, ether oxygen or sulphur, (b) mixtures of said first ethylenediamine compounds, and (c) mixtures of a first said ethylenediamine compound and a second ethylenediamine compound of the formula:



wherein at least one R' group has the formula:



$$R_2O-\overset{\displaystyle OR_2}{\underset{\displaystyle OR_2}{\overset{|}{\underset{|}{Si}}}}-R_1-$$

wherein R_1 is a branched or straight-chained aliphatic group having 3 to 8 carbon atoms, R_2, is a branched or straight-chained aliphatic group having 1 to 8 carbon atoms, and the remaining R' groups are defined as for R, dissolved in a solvent;
 allowing the primer solution to dry;
 applying an alpha-cyanoacrylate adhesive to one of said substrates; and,
 joining the substrates.

5,314,563

TAPE LAYING AND COMPACTION APPARATUS

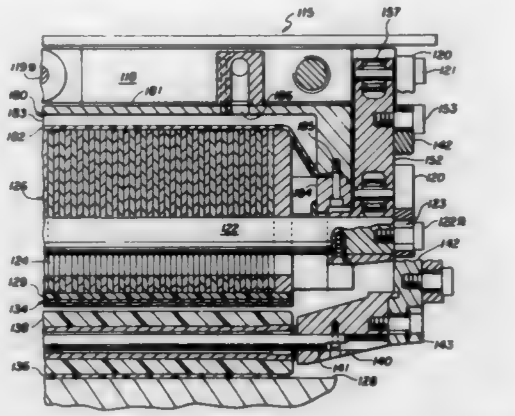
Michael N. Grimshaw, and David A. Peterson, both of Milford, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 68,008, May 27, 1993. This application Sep. 23, 1993, Ser. No. 126,287

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—358 **12 Claims**

1. An improved machine for laying plastic tape on a work surface to produce a plastic article comprising:
 a base structure located in a predetermined tape laying position relative to the work surface; and
 a tape laying head means movably mounted on the base structure for applying the tape to the work surface, said head means comprising:
 a frame; and
 a presser member means movably affixable to said frame, said presser member means comprising:
 a presser member housing affixable to the frame;
 means for affixing the housing to the frame;
 a presser shoe member movably supported in the housing and having a tape presser face extendable from said housing and a biasing portion extending into the housing and said shoe having a vertical centerline;
 a bladder spring means in said housing for yieldably biasing the tape presser face of said shoe member away from the housing including a fluid chamber having a flexible membrane enclosing said chamber and extending into contact with the biasing portion of the shoe member;
 a tape compaction means adjacent said presser shoe member movable to and from compaction engagement with the tape; and
 means for directing and controlling the movement of said head; wherein the improvement comprises:
 means for applying bladder spring biasing force to the tape compaction means for compacting tape onto the work surface;
 means for controlling the bladder spring biasing force applied to the tape compaction means; and



 means for moving the tape compaction means to and from engagement with the tape independently of and coordinated with the vertical movement of the presser shoe member to and from a tape depositing position on the work surface, said engagement of the tape by the tape compaction means first occurring at a point significantly rearward of the centerline of said presser shoe member and hence to a point substantially coincident with the intersection of said centerline with the tape applied to the work surface upon retraction of the presser shoe member from the work surface.

5,314,564

APPARATUS FOR ATTACHING BAR CODES TO RETICLE CASES

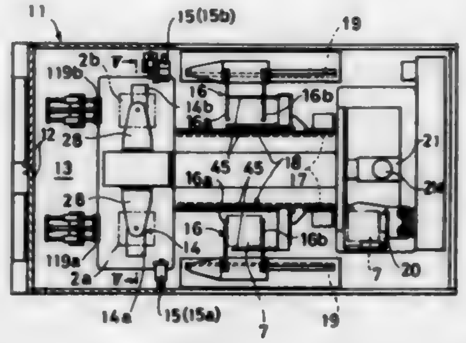
Kenji Kobayashi, Tokyo, Japan, assignor to Lintec Corporation, Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 753,156

Claims priority, application Japan, Sep. 26, 1990, 2-254169

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—384 **10 Claims**



1. An apparatus for attaching a bar code to a reticle case comprising:
 at least one elevating base which is movable up and down with the reticle case placed thereon, the reticle case containing therein a reticle so as to be taken in and taken out through an outlet on a side of said reticle case;

at least one opening means for opening the outlet of the reticle case which is positioned in a predetermined position;

at least one transfer device;

at least one take-in/takeout device, said at least one take-in/takeout device for lifting the reticle while the outlet is open and for transferring the reticle between an inside of the reticle case and said at least one transfer device outside the reticle case;

a reading means;

a carrying base for receiving the reticle held by said at least one transfer device and moving the reticle to and from a position in from of said reading means for reading a mark which is marked on the reticle for identifying the reticle;

means for converting a signal of said mark from said reading means to a bar code image corresponding to said mark;

means for printing said bar code image on a label; and

label attaching means for attaching to the reticle case the label on which the bar code image has been printed.

5,314,565

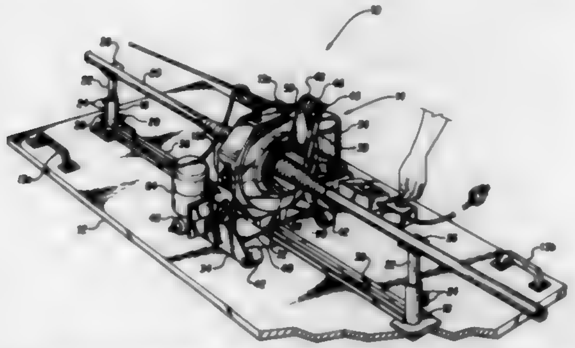
PORTABLE SPLICE TAPING MACHINE

Marshall N. Moore, 1314 Apple Orchard La., Troutville, Va. 24175

Continuation of Ser. No. 827,755, Jan. 29, 1992, abandoned. This application Apr. 9, 1993, Ser. No. 44,106

Int. Cl.⁵ B31C *1/00*

U.S. Cl. 156—392 **11 Claims**



1. An apparatus for uniformly taping with a constant overlap of tape a spliced electric cable member having a longitudinally elongated splice and opposed intermediate ends, comprising:

a stationary base;

support means on said base, for supporting said spliced electric cable member parallel to said base and intermediate the ends of said spliced electric cable member, said support means being removably fixed on said base to facilitate assembly and disassembly of said apparatus about said electric cable member;

tape means, removably supported on said base, for uniformly wrapping said splice of said electric cable member with tape throughout the length thereof, said tape means being rotatable around said spliced electric cable member, and movable on said base relative to said spliced electric cable member only along a straight line longitudinal direction of said spliced electric cable member, said tape means has means automatically holding said tape at a desired degree of tension to ensure said uniform winding of said tape;

rotary means, coupled to said tape means, for rotating said tape means at a predetermined rotating speed around said spliced electric cable member, said rotary means comprising a pair of upper and lower shells which are readily assembled and disassembled at said job site about said electric cable member being spliced;

mobile means, coupled to said tape means, for moving said tape means at a predetermined moving speed on said base only in a continuous straight line along said longitudinal direction of said spliced electric cable member; and

control means, removably supported by said base and coupled to said rotary means and said mobile means, for independently controlling operations of said rotary means and said mobile means so as to adjust said predetermined rotating speed and said predetermined moving speed; whereby

said apparatus is uniformly shiftable in said straight line longitudinal direction relative to said spliced electric cable member while supporting the spliced electric cable member to ensure said uniform winding of said tape; and

said apparatus is easily assembled at a job site.

5,314,566

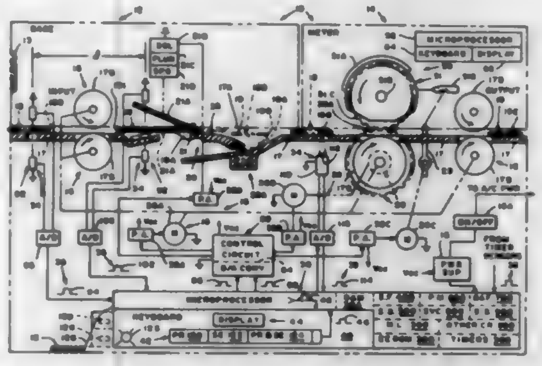
MAILING MACHINE INCLUDING LOW SPEED SHEET FEEDING AND JAM DETECTION STRUCTURE

Dennis M. Gallagher, Danbury; Thomas M. Pfeifer, Bridgeport, and Richard P. Schoonmaker, Wilton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 17, 1992, Ser. No. 991,898

Int. Cl.⁵ B43M *5/00*

U.S. Cl. 156—441.5 **14 Claims**



1. In a machine including means for printing an indicia on a sheet at a predetermined printing speed, wherein the machine includes means for feeding the sheet in a path of travel to the printing means, apparatus for detecting a malfunction of the machine, the apparatus comprising:

a. means for controlling the machine, the controlling means including a microprocessor;

b. means for sensing the sheet in the path of travel, the sensing means including a first sensor connected to the microprocessor for providing a first sensing signal thereto in response to sensing the sheet, the sensing means including a second sensor connected to the microprocessor for providing a second sensing signal thereto in response to sensing the sheet; and

c. the microprocessor programmed for;

(i) causing the sheet feeding means to feed the sheet to the sensing means at a first predetermined sheet feeding speed less than the printing speed;

(ii) causing the printing means to commence a printing cycle after a first predetermined time delay from the microprocessor receiving the first sensing signal,

(iii) preventing the printing means from commencing the printing cycle after a second predetermined time delay from the microprocessor receiving the first sensing signal if the second sensing signal is not previously received thereby, and

(iv) causing the sheet feeding means to feed the sheet at the printing speed if the second sensing signal is received by the microprocessor before the second predetermined time delay is ended.

5,314,567

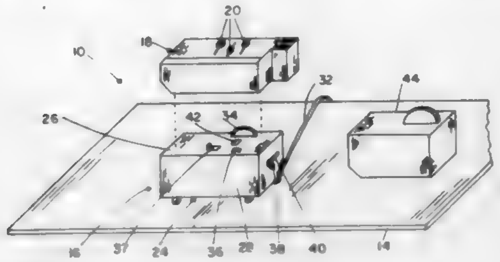
MODULAR APPARATUS FOR PREPARING ARTICLES TO BE MAILED

Marvin H. Noll, 634 Lake Shore Dr., Parsippany, N.J. 07054

Filed May 12, 1993, Ser. No. 60,741

Int. Cl.⁵ B43M *3/00*

U.S. Cl. 156—441.5 **10 Claims**



1. A modular apparatus for preparing sheets of material to be mailed, said apparatus comprising:

a postage meter base having a motor, feed means operatively connected to said motor for sequentially feeding the sheets of material relative to said base and a driver operatively connected to the motor and projecting from said postage meter base;

a postage meter head removably engageable with the postage meter base, said postage meter head including adjustable printing means driven by said driver of said base for sequentially printing indicia on the sheets of material driven by the postage meter base; and

at least one applicator head removably engageable with the postage meter base upon removal of the postage meter head therefrom, said applicator head being engageable with the driver of the postage meter base for selectively applying adhesive backed applications to the sheets of material driven by the postage meter base.

5,314,568

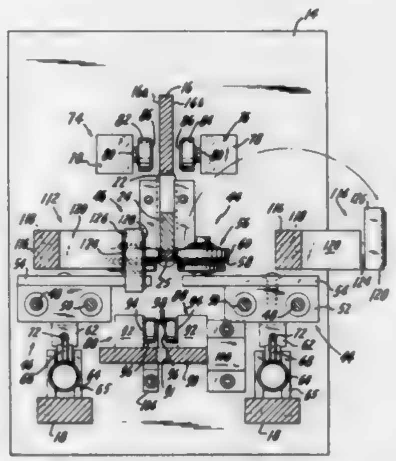
SPLICE ASSEMBLY FOR PAPER WEB TRANSPORT APPARATUS

Ralph L. Ryan, East Hanover, N.J., assignor to Compensating Tension Controls, Inc., West Caldwell, N.J.

Filed Jun. 30, 1993, Ser. No. 85,744

Int. Cl.⁵ B65H *21/00*

U.S. Cl. 156—504 **16 Claims**



1. A splice assembly for a paper web transport apparatus of the type including first and second webs of paper with each said web alternately constituting a running web moving in first direction and a new web to be spliced to the running web upon depletion of the running web from a roll, the splice assembly comprising:

knife guide means for providing a cutting edge for cutting said running web and said new web;

moving means for moving said knife guide means back and forth in a direction of movement of said running web;

first clamping means for selectively clamping said running web and said new web, said first clamping means being positioned on one side of said knife guide means in the direction of movement of said running web;

second clamping means for clamping said running web, said second clamping means being positioned on an opposite side of said knife guide means from the first clamping means in the direction of movement of said running web;

knife means for selectively cutting said running web and said new web against said knife guide means;

tape applicator means for applying a piece of tape to the same side of a splice of the running web and the new web, regardless of which of said first and second webs is the running web and which of said first and second webs is the new web, without indexing rolls of said first and second webs; and

tape backing means for providing a backing pressure for said tape applicator means such that the cut running web and the cut new web are sandwiched between said tape backing means and said tape applicator means and said piece of tape is applied to said splice during the sandwiching operation.

5,314,569

METHOD FOR THE CONTROLLED GROWTH OF CRYSTAL WHISKERS AND APPLICATION THEREOF TO THE MAKING OF TIP MICROCATHODES

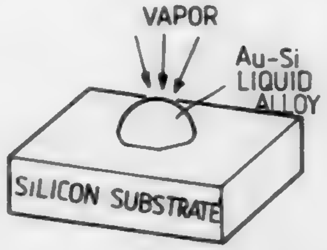
Didier Pribat, Sevres; Pierre Leclerc, Voisins-Le-Bretonneux; Pierre Legagneux, Le Mesnil St Denis, and Christian Collet, Limours, all of France, assignors to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 645,241, Jan. 24, 1991, abandoned. This application Dec. 22, 1992, Ser. No. 995,533

Claims priority, application France, Feb. 23, 1990, 90 02258

Int. Cl.⁵ C03B *25/04*

U.S. Cl. 117—75 **20 Claims**



1. A method for controlled growth of crystal whiskers, comprising the following steps:

a first step of forming on a substrate a first layer of a first material on which neither growth nor nucleation of a material to be grown occurs;

a second step of forming at least one aperture in said first layer;

a third step of selectively depositing, in said at least one aperture, a second material which, in liquid form, is capable of dissolving and absorbing said material to be grown;

a fourth step of heating and growing in vapor phase, in said at least one aperture, said material to be grown in the form of said crystal whisker; and

decreasing a temperature of the whisker during the fourth step of growth in such a way as to achieve a decrease of an upper width of the whisker relative to a lower width of the whisker in order to form a narrow whisker tip.

5,314,570

PROCESS AND APPARATUS FOR THE PRODUCTION OF DIAMOND

Akihiko Ikegaya, and Naoji Fujimori, both of Itami, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

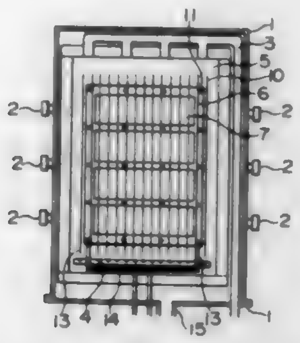
PCT No. PCT/JP91/00955, § 371 Date Mar. 13, 1992, § 102(e) Date Mar. 13, 1992, PCT Pub. No. WO92/01828, PCT Pub. Date Jan. 2, 1992

PCT Filed Jul. 17, 1991, Ser. No. 838,726

Claims priority, application Japan, Jul. 18, 1990, 2-187962; Jul. 17, 1991, 3-176762

Int. Cl.^{5} C30B *25/00*

U.S. Cl. 117—103 **14 Claims**



1. A process for the production of diamond comprising subjecting to decomposition, excitation and activation, by a thermoelectron radiation material heated at a high temperature, a raw material gas comprising at least one carbon source selected from the group consisting of hydrocarbons, hydrocarbons containing oxygens and/or nitrogens in the bonded groups, carbon oxides, halogenated hydrocarbons and solid carbon, hydrogen and optionally any one of inert gases of Group VIII elements, H_2O, O_2 and F_2 and depositing diamond on the surface of a substrate provided near the thermoelectron radiation material, characterized by surrounding the circumference of the thermoelectron radiation material by a cooling plate, providing a substrate to be deposited with diamond between the cooling plate and the thermoelectron radiation material such that a small gap exists between the substrate and the thermoelectron radiation material and controlling the surface temperature of the substrate facing the thermoelectron radiation material by the cooling plate and optionally a buffer material inserted between the cooling plate and the substrate, thereby depositing diamond.

5,314,571

CRYSTALLIZATION FROM HIGH TEMPERATURE SOLUTIONS OF SI IN COPPER

Theodore F. Ciszek, Evergreen, Colo., assignor to Midwest Research Institute, Kansas City, Mo.

Filed May 13, 1992, Ser. No. 881,416

Int. Cl.^{5} C30B *9/04*

U.S. Cl. 117—60 **6 Claims**

1. A liquid phase epitaxy method for forming thin crystalline layers of device quality silicon having less than 5×10^{16} Cu atoms/cc impurity, comprising:

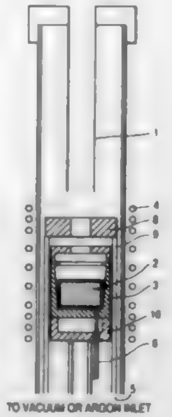
a) preparing saturated liquid solution melt of Si in Cu at about 16% to about 90% wt. Si at a temperature range of about 800° C. to about 1400° C. in an inert gas;

b) applying a liquid $CaCl_2$ layer to cover said solution melt;

c) immersing or partially immersing a substrate in said saturated solution melt;

d) supersaturating the solution by lowering the temperature of said saturated solution melt and holding said substrate immersed or partially immersed in said solution melt for a period of time sufficient to cause growing Si to precipitate out of said solution to form a crystalline layer of Si on said substrate; and

e) withdrawing said substrate from said solution; said liquid $CaCl_2$ placed on said melt prevents spurious nucleation of silicon.



5,314,572

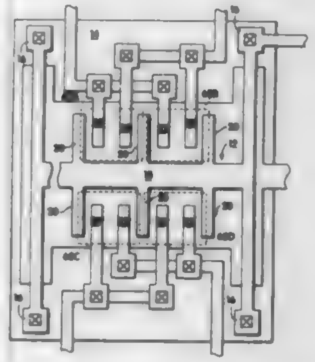
METHOD FOR FABRICATING MICROSTRUCTURES

Theresa A. Core, North Andover, Mass., and Roger T. Howe, Lafayette, Calif., assignors to Analog Devices, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 569,080, Aug. 17, 1990, abandoned. This application Apr. 22, 1992, Ser. No. 872,037

Int. Cl.^{5} H01L *21/306;* **B44C** *1/22;* **B29C** *37/00;* **C03C** *15/00*

U.S. Cl. 156—643 **7 Claims**



1. A method of fabricating a suspended microstructure comprising the steps of:

depositing a layer of sacrificial material on a substrate,

selectively removing portions of said sacrificial material so as to create holes in said sacrificial layer for formation of posts for said microstructure,

depositing a second material over said substrate and said sacrificial layer, said microstructure to be formed of said second material, said second material filling in said holes in said sacrificial layer and forming a second layer over said sacrificial layer,

selectively removing portions of said second layer to form gaps in said second layer and to pattern said second layer into a shape comprising said suspended microstructure, whereby portions of said sacrificial layer are exposed beneath said second layer,

selectively removing sections of said exposed portions of said sacrificial layer as well as sections of said sacrificial layer adjacent to said exposed portions which are beneath said microstructure so as to form gaps in said sacrificial layer,

depositing a photosensitive polymer over said substrate,

sacrificial layer and second layer, said photoresistive material filling in said gaps in said sacrificial layer and said second layer,

selectively removing portions of said photosensitive polymer from said gaps in said sacrificial layer and said second layer such that some of said photosensitive polymer remains beneath said microstructure forming pedestals between said substrate and said second layer,

removing any remaining portions of said sacrificial layer, and

removing any remaining portions of said photosensitive polymer.

5,314,573

DRY ETCHING POLYSILICON USING A BROMINE-CONTAINING GAS

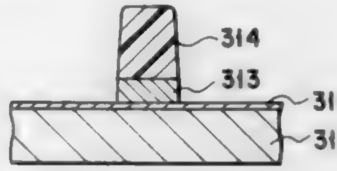
Fumihiko Higuchi, Yokohama, and Yoshio Fukasawa, Kofu, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed May 20, 1992, Ser. No. 885,855

Claims priority, application Japan, May 20, 1991, 3-145660

Int. Cl.^{5} H01L *21/306;* **B44C** *1/22*

U.S. Cl. 156—643 **10 Claims**



1. A dry etching method, comprising the steps of:

disposing a workpiece having an exposed polysilicon layer on the upper surface of a lower electrode disposed to face an upper electrode within an etching apparatus; and

supplying a mixed gas comprising a first gas containing bromine and a second gas containing a halogen element other than bromine in a plasma discharge region over the workpiece, RF power being applied to the upper electrode so as to form a plasma of the mixed gas in said discharge region and to permit the exposed polysilicon layer of the workpiece to be etched with the plasma, said plasma discharge region being irradiated with ultraviolet light when said workpiece is etched.

5,314,574

SURFACE TREATMENT METHOD AND APPARATUS

Nobuaki Takahashi, Hachioji, Japan, assignor to Tokyo Electron Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1993, Ser. No. 81,052

Claims priority, application Japan, Jun. 26, 1992, 4-192876

Int. Cl.^{5} H01L *21/306;* **B44C** *1/22*

U.S. Cl. 156—646 **12 Claims**

1. A method for surface treating of a treatment object comprising the steps of:

transporting a treatment object into a preparatory chamber filled with an inert gas and holding the treatment object on a loading platform atop an intermediate cover in the preparatory chamber;

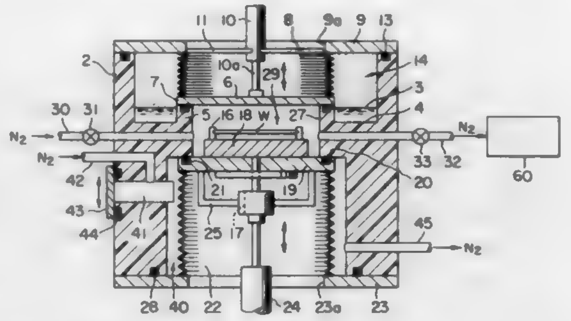
closing the preparatory chamber with respect to the exterior;

moving said intermediate cover toward an intermediate chamber located adjacent to and communicating with said preparatory chamber, so as to position the loading platform atop the intermediate cover and the treatment object held thereon in said intermediate chamber and to hermetically isolate said preparatory chamber and said intermediate chamber by said intermediate cover;

opening an open/close cover, capable of communicating said intermediate chamber with a treatment gas atmosphere chamber adjacent thereto, to cause a treatment gas in said treatment gas atmosphere chamber to flow into the intermediate chamber and to cause the treatment gas to act on the treatment object;

closing said open/close cover to isolate the treatment gas atmosphere chamber and the intermediate chamber;

introducing an inert gas into said intermediate chamber to purge the treatment gas in the intermediate chamber to the exterior;



moving said intermediate cover away from the intermediate chamber to communicate the intermediate chamber and the preparatory chamber and to cause the treatment object on the loading platform to be positioned in the preparatory chamber; and

opening the preparatory chamber to the exterior to transport the treatment object to the exterior.

5,314,575

ETCHING METHOD AND APPARATUS

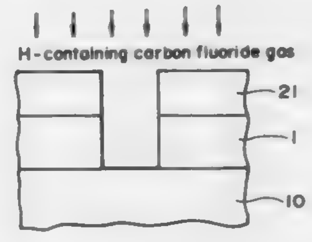
Toshiharu Yanagida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 614,137, Nov. 16, 1990, Pat. No. 5,160,395. This application Aug. 11, 1992, Ser. No. 927,954

Claims priority, application Japan, Nov. 17, 1989, 1-298914

Int. Cl.^{5} H01L *21/00*

U.S. Cl. 156—651 **8 Claims**



1. A reactive ion etching method which comprises the steps of:

forming a mask layer with a pattern on a silicon compound film;

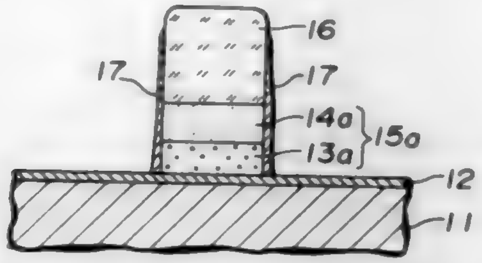
etching part of the silicon compound film along a depth of the film through the mask layer with a first etching gas consisting of a hydrogen-free carbon fluoride gas; and

further etching the remaining portion of the silicon compound film along the depth with a second etching gas consisting of a hydrogen-containing carbon fluoride gas.

5,314,576
DRY ETCHING METHOD USING $(SN)_x$ PROTECTIVE LAYER

Shingo Kadomura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 895,693
Int. Cl.⁵ H01L *21/00*
U.S. Cl. 156—655 **25 Claims**



1. A dry etching method comprising plasma etching a target material layer selected from the group consisting of silicon based materials and aluminum based materials deposited on a substrate by using etching gas containing a nitrogen based compound and a sulfur based compound capable of forming free nitrogen and sulfur, respectively, in a plasma when dissociated by electric discharges to form a side wall protection compound of sulfur nitride.

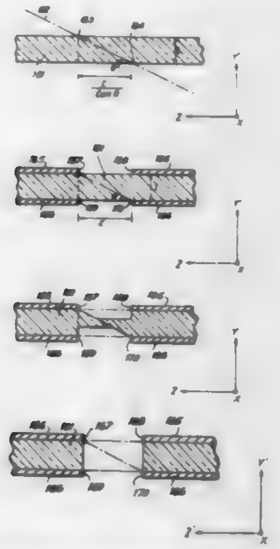
5,314,577
AT-CUT CRYSTAL OSCILLATING REED AND METHOD OF ETCHING THE SAME

Hideaki Nakamura, and Eiji Karaki, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 691,888, Apr. 26, 1990, abandoned. This application Jun. 19, 1992, Ser. No. 901,293

Claims priority, application Japan, Apr. 27, 1990, 2-114686; Sep. 19, 1990, 2-249649; Sep. 19, 1990, 2-249650; Sep. 19, 1990, 2-249651; Sep. 19, 1990, 2-249652; Sep. 21, 1990, 2-252260; Sep. 21, 1990, 2-252261

Int. Cl.⁵ B44C *1/22;* H01L *41/04*
U.S. Cl. 156—659.1 **10 Claims**



1. A method of etching a crystal oscillating segment for use as a crystal oscillating reed, comprising:

cutting a crystal wafer having a front and back surface from a rough crystal;

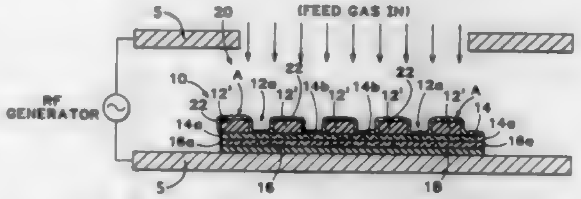
forming etching resisting films on the front and back surfaces of the crystal wafer, said etching resisting films having gaps at the portion of the wafer to be etched for forming the crystal segment; and

etching the wafer to form at least one side edge of a crystal oscillating segment, said at least one side edge being at an angle of about 90° from the front or back surface of the crystal oscillating reed.

5,314,578
PROCESS FOR ETCHING A MULTI-LAYER SUBSTRATE

David A. Cathey, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 25, 1992, Ser. No. 904,463
Int. Cl.⁵ H01L *21/00*
U.S. Cl. 156—662 **13 Claims**



1. A process for plasma etching a multi-layer substrate in an etching device having a plasma etch deposition area to form a etched pattern therein, comprising:

providing said multi-layer substrate having a plurality of layers comprising a silicon dioxide layer formed on an underlying silicon or metal silicide layer;

forming on a major surface of the silicon dioxide layer a carbon-containing, etch mask defining a plurality of openings in a predetermined pattern, said plurality of openings exposing a plurality of areas of a major surface of the silicon dioxide layer;

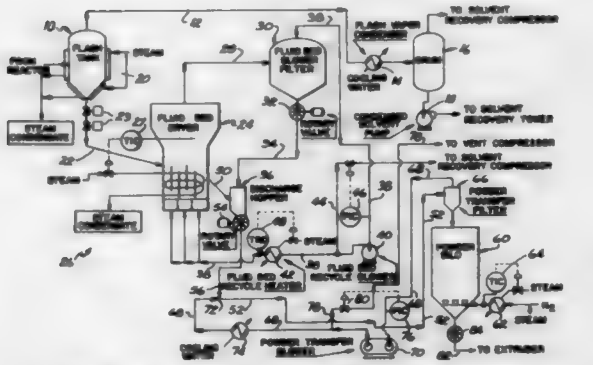
selectively plasma etching the plurality of exposed areas of the major surface of the silicon dioxide layer, selective to said silicon or metal silicide layer, with a carbon-free chemical etchant feed gas system comprising a halogen-containing chemical etching material and a hydrogen-containing material, at a relatively higher etch rate of the silicon dioxide than the underlying layer, selective to said underlying silicon or metal silicide layer, the hydrogen-containing material reacting with the halogen-containing material and the carbon-containing, chemical etchant protective patterned layer to form in situ a polyhalocarbon material reacting with oxygen which is released from the silicon dioxide layer to form gaseous by-products which are readily removed from the multi-layer substrate thereby exposing the surface of the silicon dioxide layer for continued etching of the silicon dioxide layer by said chemical etchant system; and

exposing the silicon or metal silicide layer and, due to an absence of an oxygen source in the underlying silicon or metal silicon layer to react with said polyhalocarbon material being formed, retarding the etching process in said silicon or metal silicide layer by depositing said polyhalocarbon material on said silicon or metal silicide layer, thereby etching selectively said silicon dioxide layer so that the selectivity of the SiO_2 etch to the Si or metal silicide layer is maximized.

5,314,579
PROCESS FOR REMOVING HYDROCARBONS FROM POLYMER SLURRIES

Chieh-Yuan F. Sung, Cincinnati, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Continuation of Ser. No. 820,157, Jan. 13, 1992, abandoned. This application Dec. 22, 1992, Ser. No. 995,356
Int. Cl.⁵ B01D *1/00, 3/06*
U.S. Cl. 159—47.1 **15 Claims**



1. A process for removing a hydrocarbon from a polymer slurry comprising the steps of:

feeding a hydrocarbon-containing polymer slurry to a flash tank operated at a pressure sufficiently above atmospheric pressure, in the approximate range of about 70–120 psig, to flash at least about 80% of the hydrocarbon from the slurry;

feeding the resulting slurry from the flash tank to a fluid bed dryer operated at a pressure in the approximate range of about 1–2 psig;

stripping additional hydrocarbon from the polymer in the fluid bed dryer utilizing heated hydrocarbon as the stripping gas;

transferring the resulting polymer from the fluid bed dryer to a powder silo wherein additional hydrocarbon is removed from the polymer utilizing a heated purge gas flowing countercurrent to the polymer;

venting the hydrocarbon flashed from the slurry in the flash tank and recovering a major portion of said hydrocarbon in a cooling water condenser; and

collecting from the powder silo polymer powder having a hydrocarbon content below about 100 ppm.

15. A process for removing a hydrocarbon from a polymer slurry comprising the steps of:

feeding a hydrocarbon-containing polymer slurry to a flash tank operated at a pressure sufficiently above atmospheric pressure, in the range of about 70–120 psig and at a temperature in the range of about 110°–135° F., to flash at least about 80% of the hydrocarbon from the slurry;

feeding the resulting slurry from a flash tank to a fluid bed dryer operated at a pressure of about 1–2 psig;

stripping additional hydrocarbon from the polymer in the fluid bed dryer utilizing heated hydrocarbon as the stripping gas;

transferring the resulting polymer from the fluid bed dryer to a powder silo wherein additional hydrocarbon is removed from the polymer utilizing a heated purge gas flowing countercurrent to the polymer;

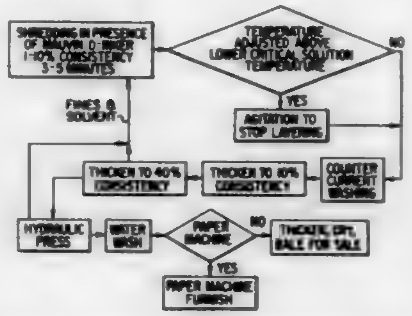
venting the hydrocarbon flashed from the slurry in the flash tank and recovering a major portion of said hydrocarbon in a cooling water condenser; and

collecting from the powder silo polymer powder having a hydrocarbon content below about 100 ppm.

5,314,580
PROCESS FOR THE REMOVAL OF INK, RESIN, AND ADHESIVE RESIDUES FROM PAPER, TEXTILE FABRICS AND SOLID SURFACES

Venanzio Di Tullio, Perth, Canada, assignor to Mauvin Material & Chemical Processing Limited, Perth, Canada

Filed Jul. 8, 1992, Ser. No. 910,411
Int. Cl.⁵ D21C *5/02*
U.S. Cl. 162—5 **9 Claims**


SHREDDING IN PRESENCE OF MAUVIN D-INKER 1-10% CONSISTENCY 3-5 MINUTES
TEMPERATURE ADJUSTED ABOVE LOWER CRITICAL SOLUTION TEMPERATURE
NO
YES
FINES & SOLVENT
AGITATION TO STOP LAYERING
THICKEN TO 40% CONSISTENCY
THICKEN TO 10% CONSISTENCY
COUNTER CURRENT WASHING
HYDRAULIC PRESS
WATER WASH
PAPER MACHINE
NO
THICKEN, DRY, BALE FOR SALE
YES
PAPER MACHINE FURNISH

1. A method of de-inking or cleaning paper and of recycling a liquid composition comprising:

Alkyl phenol polyethoxylate	0–10%
Sodium silicate	1–2.5%
Sodium hydroxide	up to 2.5%
Alkyl or dialkyl glycol or diglycol ether and/or propyl glycol ether	10–40%
Alkyl acetate	0–10%
Hydrogen peroxide or sodium or calcium hypochlorite	0–3%
Triethylamine and/or diethylmethylamine and/or dimethylpyridine and/or methyl pyridine and/or methyl piperidine	0–10%
Water	to 100%

having a lower critical solution temperature between 0° C. and 100° C. which method comprises:

a) treating a pulp slurry of the paper with the liquid composition wherein a single phase to remove ink from the paper slurry and the liquid composition;

b) separating cleaned paper slurry from the liquid composition;

c) heating the liquid composition resulting from step (a) to above its lower critical solution temperature to give an aqueous phase and an organic phase;

d) separating and purifying at least one of the aqueous phase and the organic phase for reuse.

5,314,581
APPARATUS FOR SIMULATING PROCESSING PARAMETERS AND PREDICTING VARIABLES IN A PAPERMAKING OPERATION INCLUDING SEQUENTIAL PULSATION, GRAVITY AND VACUUM DRAINAGE, FINES RETENTION AND PAPER FORMATION

John T. Lin; Michael A. Schuster; Richard A. Hobirk, and Alan J. Schellhamer, all of Jacksonville, Fla., assignors to Betz PaperChem, Inc., Jacksonville, Fla.

Filed Dec. 10, 1991, Ser. No. 805,266
Int. Cl.⁵ D21C *7/00;* G01N *11/00*
U.S. Cl. 162—263 **5 Claims**

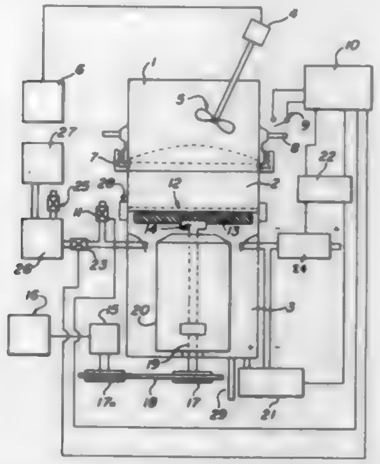
1. An apparatus to evaluate the drainage, retention and formation characteristics of a paper pulp furnish during the formation of a paper sheet comprising:

a furnish delivery chamber disposed above a paper sheet forming chamber and a white water collection and vacuum chamber,

a furnish delivery valve disposed between the furnish delivery chamber and the paper sheet forming chamber consisting of a cone-shaped flow distributor,

a stationary paper forming surface disposed between the paper sheet forming chamber and white water collection and vacuum chamber,

a rotatable blade said blade being substantially the same size as the paper forming surface disposed in the white water collection and vacuum chamber underneath and in close proximity to the paper forming surface to generate a pulsation force consisting of alternating positive hydraulic pressure and negative suction pressure on the furnish above the paper forming surface,



means for measuring the white water collected in the white water collection and vacuum chamber,

means for measuring the pressure in the white water collection and vacuum chamber,

means for determining drainage and formation characteristics from said measured values of the white water collected and the pressure, and

means for sampling the white water for fines retention analysis.

5,314,582

CELLULOSIC FIBER OF IMPROVED WETTABILITY

Hien V. Nguyen, East Windsor, and Cecilia Vargas, Colonia, both of N.J., assignors to Chicopee, Milltown, N.J.

Filed Jul. 22, 1992, Ser. No. 918,321

Int. Cl.^{5} D21H *17/63*

U.S. Cl. 162—9 **6 Claims**

1. A method of improving the wettability of cellulosic fibers comprising:

a) collecting individualized dry cellulosic fibers on a collection means,

b) applying a solution of ionic salt to said collection of individualized dry cellulosic fibers, and

c) drying the wetted fibers so as to form discrete crystal domains of said ionic salt on the surface of said cellulosic fibers.

5,314,583

PROCESS FOR THE COMMINUTION OF MATERIALS AND PLANT FOR CARRYING OUT THE PROCESS

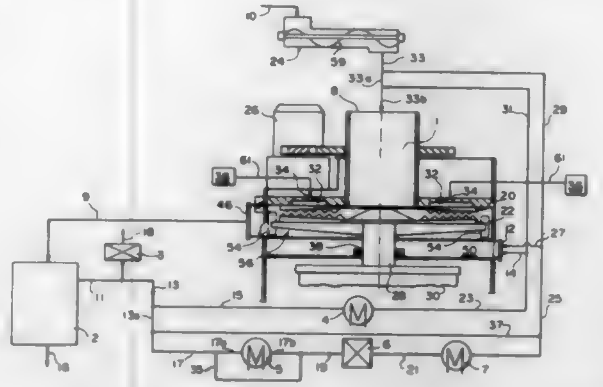
Johannes Kappel, Graz, Austria, assignor to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Aug. 16, 1990, Ser. No. 568,136

Claims priority, application Austria, Aug. 16, 1989, 1940/89

Int. Cl.^{5} D21B *1/16*

U.S. Cl. 162—25 **10 Claims**



1. A process for treating high consistency fibrous materials, which comprises

contacting fibrous material, a reaction agent and a carrier gas in a comminuting zone under a closed system to separate said fibrous material into smaller segments and react with said reaction agent;

passing said segmented fibrous material, reaction agent and carrier gas to a reaction zone for further reaction between said segmented fibrous material and said reaction agent;

separating said reaction agent in a liquid phase from said carrier gas to produce a remaining gaseous fraction including vapors of said reaction agent;

separating said gaseous fraction of said reaction agent and said carrier gas from said reaction zone and recycling said gaseous fraction to said comminuting zone for further reaction;

and discharging reacted, segmented fibrous material from said reaction zone.

5,314,584

FIBROUS PAPER COVER STOCK WITH TEXTURED SURFACE PATTERN AND METHOD OF MANUFACTURING THE SAME

Gary C. Grinnell, Northampton, Mass.; Bernard G. Klowak, Neenah, and Michael P. Bouchette, Appleton, both of Wis., assignors to James River Corporation, Richmond, Va.

Division of Ser. No. 693,030, Apr. 30, 1991, Pat. No. 5,223,092, which is a continuation of Ser. No. 479,207, Feb. 19, 1990, abandoned, which is a continuation of Ser. No. 177,785, Apr. 5, 1988, abandoned. This application Dec. 17, 1992, Ser. No. 991,952

Int. Cl.^{5} D21H *27/18*

U.S. Cl. 162—109 **8 Claims**

1. A method of manufacturing paper cover stock having a textured surface pattern, comprising the steps of:

(a) forming a wet fibrous web;

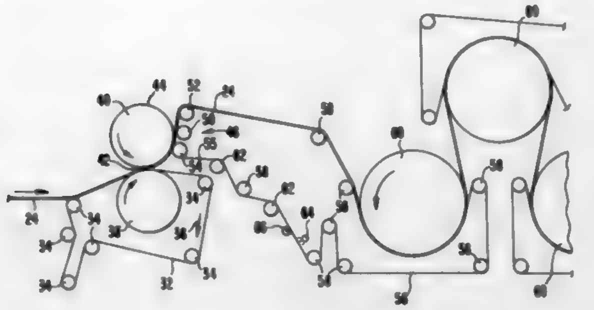
(b) partially dewatering the web to between about 30% and about 60% solids;

(c) conveying the partially dewatered web on a roll rotating at a surface speed to a compression nip defined by the roll and a fabric material having a textured surface pattern;

(d) moving said fabric material at a speed of about 10% to about 40% less than the surface speed of said roll;

(e) compressing said web in said nip by forcing said fabric material against said web on said roll to directly transfer said web from said roll to said fabric material, said fabric

material being compressed against said web with a compression force of at least about 5 lbs/linear inch, the average pressure in the compression nip being at least about 20 psi, said fabric material imprinting a textured pattern on a surface of said web, said web being further compressed and textured by the difference in speed between said fabric material and the surface of said roll; and



(f) drying said web, said dried web having an apparent density greater than about 4 lb ream/caliper pt. in mils.

5,314,585

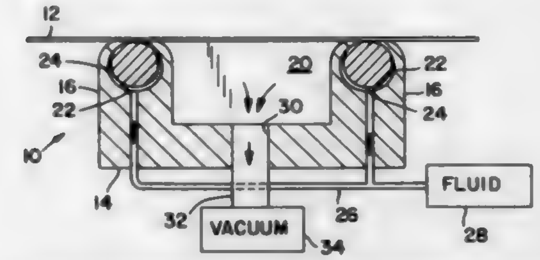
LOW SHEAR UHLE BOX

Kevin C. Ward, Carthage, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed May 10, 1993, Ser. No. 58,309

Int. Cl.^{5} D21F *1/48*

U.S. Cl. 162—274 **6 Claims**



1. An Uhle box apparatus for extracting moisture from a wet felt in a paper making process comprising:

an elongated wet felt support structure of generally U-shaped configuration including an elongated base and a pair of vertically extending, spaced support arms, the upper portion of each support arm defining an elongated cylindrical recess;

a cylinder rotatably disposed in the elongated cylindrical recess of each support arm;

deckle inserts disposed at the opposite ends of the U-shaped wet felt support structure to define therewith a vacuum zone intermediate the vertically extending support arms;

vacuum means connected to said support structure and in communication with said vacuum zone; and

lubrication means in communication with each cylindrical recess for facilitating rotation of said cylinder therein, said lubrication means includes a source of lubricating fluid and a distribution system interconnecting said source of lubricating fluid to each cylindrical recess for providing lubrication between the rotatable cylinder and the associated cylindrical recess, whereby as the wet felt passes over the vacuum zone of said apparatus and is supported by said rotating cylinders, moisture is extracted from the wet felt.

5,314,586

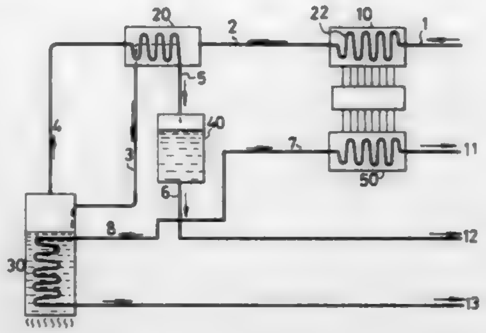
PURIFYING AND ENERGY-SAVING WATER FOUNTAIN CAPABLE OF SUPPLYING ICY, WARM AND HOT DISTILLED WATER

Chan-Ming Chen, 1F, No. 16, Alley 3, Lane 80, Sec. 4, Min-Sheng E. Rd., Taipei, Taiwan

Filed Oct. 16, 1992, Ser. No. 962,114

Int. Cl.^{5} B01D *3/02;* **C02F** *1/04*

U.S. Cl. 202—177 **2 Claims**



1. A distilled water fountain system comprising:

a water infeed pipe;

a first heat exchanger for heating water supplied from the water infeed pipe to a temperature above 25° C.;

a second heat exchanger for re-heating the water flowing out from the said first exchanger to a temperature about 90° C.;

a first pipe connecting an outlet of the first heat exchanger to an inlet of the second heat exchanger;

a steam generator for re-heating the water flowing out from said second exchanger to become vaporized steam;

a second pipe connecting an outlet of the second heat exchanger to an inlet of the stem generator;

a conduit for permitting said vaporized steam to flow back to the second exchanger, said vaporized steam transferring heat to the water from the first exchanger so as to cause the vaporized steam to be condensed into distilled water;

a distilled water storage tank for storing the distilled water which exits the second exchanger;

an electronic chilling device having an electronic chilling semi-conductor and eutectic melting salt, said electronic chilling semiconductor reducing the temperature of the eutectic melting salt to a level at which the physical state of the eutectic melting salt turns into a solid phase or a solid and liquid co-existence phase so that distilled water flowing through a coil pipe submerged in the eutectic melting salt may be cooled into icy water;

a first outlet pipe being connected to the distilled water storage tank;

a second outlet pipe coupling the distilled water storage tank to the electronic chilling device; and

a third outlet pipe being connected to the distilled water storage tank with a portion thereof submerged in the steam generator.

5,314,587

METHOD FOR MEASURING REFLUX FLOW IN A DISTILLATION PROCESS

Gerald L. Smith, Galveston, Tex., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

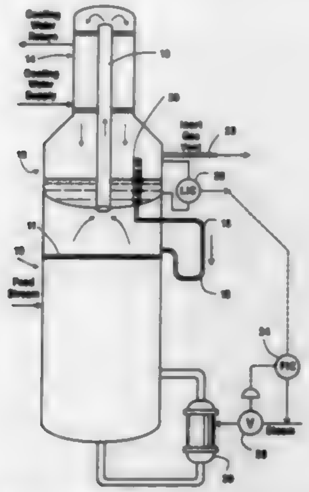
Division of Ser. No. 802,203, Dec. 4, 1991, Pat. No. 5,205,909. This application Jan. 13, 1993, Ser. No. 4,132

Int. Cl.^{5} B01D *3/42, 5/00*

U.S. Cl. 203—1 **2 Claims**

1. A method for controlling the operation of a distillation column by regulating heat input to the column wherein reflux is provided to said column by gravity flow which comprises:

introducing a feed stream to a distillation column;
providing heat energy to said column to generate vapor;
passing a vapor stream from said distillation column to a condensing zone to form condensate;
collecting the condensate in an accumulator which has a standpipe mounted therein on an outlet from the accumulator to a reflux line, said standpipe having a pattern of openings around the surface thereof for permitting accumulated condensate to flow into the reflux line from said accumulator to the top stage of said distillation column;



measuring the liquid level of condensate in the accumulator;
passing and controlling the flow rate of condensate from the accumulator back to the distillation column;
generating a signal in response to the measured condensate level; and
operating a controlled device in response to said signal to change the energy level provided to said distillation column, thereby changing the amount of vapor passing through said column.

5,314,588

PROCESS FOR RECOVERING POLYSOCYANATES FROM THE DISTILLATION RESIDUES OBTAINED IN THE PRODUCTION OF TOLYLENE DIISOCYANATE

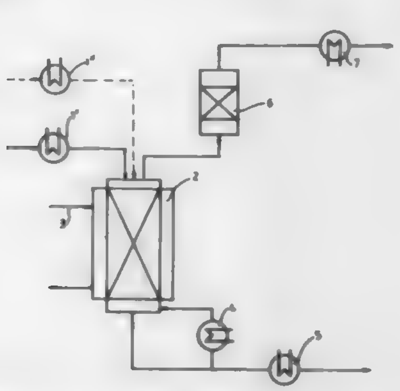
Uwe J. Zarnack, Brunsbuettel; Volker Weintritt, Marne, and Christian König, Kaarst, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 11, 1992, Ser. No. 928,561

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1991, 4127514

Int. Cl.^{5} B01D *3/10*

U.S. Cl. 203—38 **3 Claims**



1. A process for recovering a distillate consisting essentially of tolylene diisocyanate and isocyanate-group-containing bottom product having a tolylene diisocyanate content of less than 200 ppm (by weight) from A) a distillation residue from the production of tolylene diisocyanate by mixing of the distillation residue A) with B) a urethane-and/or allophonate-modified polyisocyanate or polyisocyanate mixture of diphenyl methane series having an NCO content of at least 15% by weight, and working up of the mixture by distillation comprising heating the mixture to temperatures of 190° to 250° C. before or during working up by distillation so that reversibly bound tolylene diisocyanate in the distillation residue A) is largely substituted by polyisocyanate B); the process is carried out in a single stage in a continuous reactor (2) linked to a distillation column under a pressure kept at 2 to 100 mbar.

3. A process for recovering a distillate consisting essentially of tolylene diisocyanate and isocyanate-group-containing bottom product having a tolylene diisocyanate content of less than 200 ppm (by weight) from A) a distillation residue from the production of tolylene diisocyanate by mixing of the distillation residue A) with B) a urethane-and/or allophonate-modified polyisocyanate or polyisocyanate mixture of diphenyl methane series having an NCO content of at least 15% by weight, and working up of the mixture by distillation comprising heating the mixture to temperatures of 190° to 250° C. before or during working up by distillation so that reversibly bound tolylene diisocyanate in the distillation residue A) is largely substituted by polyisocyanate B); the bottom product which accumulates with a temperature of at least 190° C. is quenched to a temperature below 80° C. in at most 1 minute.

5,314,589

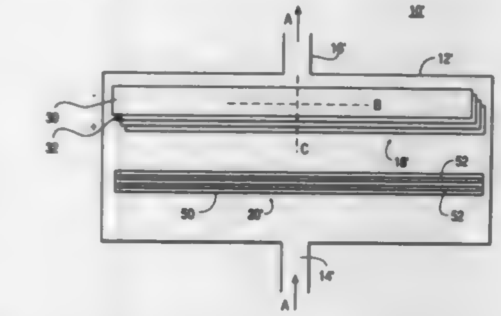
ION GENERATOR AND METHOD OF GENERATING IONS

MacDonald Hawley, 2659 Bridger Ct., Evergreen, Colo. 80439

Filed Oct. 15, 1992, Ser. No. 961,381

Int. Cl.^{5} C25B *1/24, 9/00;* **C02F** *1/46*

U.S. Cl. 204—128 **20 Claims**



10. A method for generating halogen ions from a halide salt/water solution, comprising the steps of:
forming a housing with an inlet including a halide salt/water solution and an outlet;
forming a first electrode in the housing;
forming a second electrode adjacent the first electrode in the housing;
forming each first and second electrode to have a first longitudinal axis and a second, relatively narrower transverse axis;
orienting the first longitudinal axis of each first and second electrode transverse to the flow of the salt/water solution;
orienting the second narrower axis of each first and second electrode parallel to the flow of salt/water;
providing electric current to the first and second electrodes; and
causing the salt/water solution to flow against the electrodes;
wherein the halogen ions are generated at the electrodes and enter the salt/water solution.

5,314,590

METHOD FOR CLEANING AND DISINFECTING SOFT CONTACT LENS AND TREATING SOLUTION FOR SOFT CONTACT LENSES

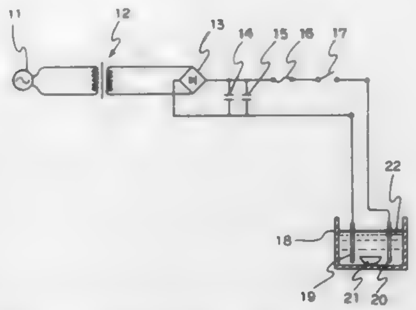
Hideaki Kamiya, Gifu, and Makoto Nakagawa, Aichi, both of Japan, assignors to Tomei Sangyo Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 700,177, May 20, 1991, Pat. No. 5,246,552. This application Mar. 29, 1993, Ser. No. 38,300

Claims priority, application Japan, Sep. 21, 1989, 1-246798; Apr. 28, 1990, 2-114463; Jul. 4, 1990, 2-178043

Int. Cl.^{5} C25B *1/00*

U.S. Cl. 204—131 **3 Claims**



1. A method for cleaning and disinfecting a soft contact lens which comprises:
immersing a soft contact lens in a treating solution which is an aqueous solution of an electrolyte, the concentration of said electrolyte being 0.001 to 0.5 mol/l and said electrolyte being at least one member selected from the group consisting of a boric acid salt buffer, a phosphoric acid salt buffer, a citric acid salt buffer, an oxalic acid salt buffer, a succinic acid salt buffer, a tartaric acid salt buffer, K_2CO_2, Na_2CO_3, $NaHCO_3$, Na_2SO_4 and sodium acetate and having a pH of 6 to 7.5; and
applying a direct current of 0.1 to 5 A to the treating solution to raise the temperature of the treating solution to at least 80° C. and to remove stains from the soft contact lens.

5,314,591

ELECTROLYZER AND METHOD OF PRODUCTION

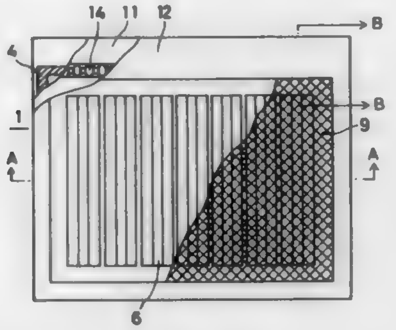
Shinji Katayama, Tamano, and Yoshinari Take, Okayama, both of Japan, assignors to Chlorine Engineers Corp., Ltd, Tokyo, Japan

Filed Jun. 25, 1992, Ser. No. 904,251

Claims priority, application Japan, Jun. 26, 1991, 3-154687; Jun. 26, 1991, 3-154688; Jul. 1, 1991, 3-160260

Int. Cl.^{5} C25B *9/00, 11/02, 15/08*

U.S. Cl. 204—257 **10 Claims**



1. An electrolyzer, comprising:
a stack composed of a plurality of upright electrolytic cell units, each including an electrolytic cell unit frame bounding a pair of electrode sheets, said pair of electrode sheets being anode- and cathode-side partitions having opposed recesses and projections that are engaged in nesting relationship with each other; and
a gas-liquid separation chamber which is integral with an upper edge of said electrolytic cell unit frame.

5,314,592

METHOD FOR ENRICHMENT OF OXYGEN 18 WITH A LASER

Tetsuro Majima; Kyoko Sugita, both of Wako, and Shigeyoshi Arai, Kyoto, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

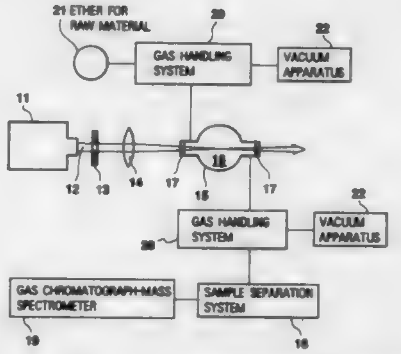
PCT No. PCT/JP90/01093, § 371 Date Feb. 13, 1992, § 102(e) Date Feb. 13, 1992, PCT Pub. No. WO91/03308, PCT Pub. Date Mar. 21, 1991

PCT Filed Aug. 29, 1990, Ser. No. 828,966

Claims priority, application Japan, Aug. 30, 1989, 1-223887; Jun. 25, 1990, 2-166254

Int. Cl.^{5} B01D *5/00*

U.S. Cl. 204—157.2 **12 Claims**



1. A method for enrichment of oxygen 18, which comprises the steps of
(a) irradiating an oxygen 18-containing saturated aliphatic ether other than dimethyl ether, an oxygen 18-containing saturated cyclic ether, or a mixture thereof with laser light to induce oxygen 18 selective photodecomposition and
(b) separating oxygen 18-containing products from the photodissociated products.

5,314,593

CAPILLARY TUBE WITH REVERSIBLE PROTEIN INTERACTION AND METHOD

Sally A. Swedberg, Waldbronn, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 18, 1993, Ser. No. 32,913

Int. Cl.^{5} G01N *27/26, 27/447*

U.S. Cl. 204—180.1 **11 Claims**

5. A method for treating a solid silica inner wall surface of an electrophoresis capillary exposable to protein solutes comprising the steps of:
depositing an interfacial layer on the inner wall surface; and
depositing, by covalently bonding, an outer layer containing agarose on the interfacial layer;
whereby interactions between the protein solutes and the inner wall are reversible.

5,314,594

CATHODIC ELECTRODEPOSITION COATINGS HAVING AN ADDITIVE FOR IMPROVED THROWING POWER

Ding Y. Chung, Rochester Hills, and Kenneth S. Kirshenbaum, West Bloomfield, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 9, 1992, Ser. No. 988,436

Int. Cl.^{5} C25D *13/10*

U.S. Cl. 204—181.4 **11 Claims**

11. An improved method of preparing a cathodic electrocoating composition containing film forming binder comprising the following steps in any workable order:
(a) preparing an epoxy-amine adduct;
(b) preparing a blocked polyisocyanate crosslinking agent;
(c) blending the epoxy amine adduct with the blocked polyisocyanate crosslinking agent;
(d) neutralizing the epoxy-amine adduct with an organic acid to form an emulsion;
(e) blending the emulsion with a pigment paste; and the improvement consisting essentially of use of an effective amount of an additive of an alkyl thioester to provide the composition having improved throwing power.

5,314,595

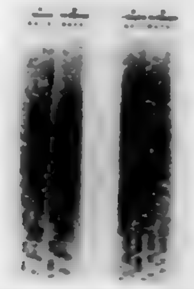
ELECTROPHORESIS OF NUCLEIC ACID FRAGMENTS

Carl M. Fuller, Cleveland Heights, Ohio, assignor to United States Biochemical Corporation, Cleveland, Ohio

Filed Apr. 3, 1992, Ser. No. 862,734

Int. Cl.^{5} G01N *27/26, 27/447*

U.S. Cl. 204—182.8 **3 Claims**



1. A method for electrophoresis, through a gel comprising polyacrylamide, of nucleic acid fragments produced during an enzymatic DNA sequencing reaction present in a solution comprising at least 0.2% (w/v) of a reagent selected from the group consisting of glycerol, dithiothreitol, trehalose, and ethylene glycol comprising the steps of:
applying said solution to an electrophoretic gel, wherein said gel is a DNA sequencing gel comprising polyacrylamide and electrophoresing said fragments into said gel in the presence of a buffer lacking boric acid or borate or a derivative thereof which interacts with said reagent to form said complex.

5,314,596

PROCESS FOR FABRICATING MAGNETIC FILM RECORDING HEAD FOR USE WITH A MAGNETIC RECORDING MEDIA

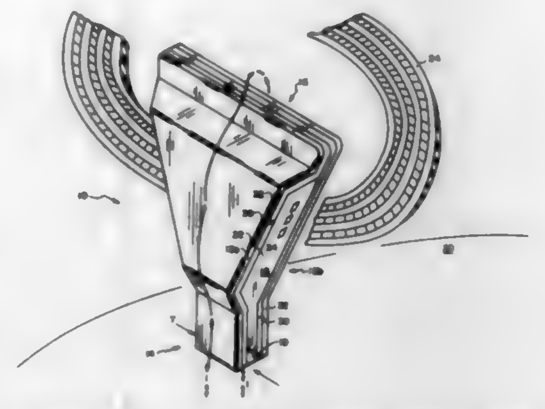
Harold B. Shukovsky, Framingham; Sharat Batra, Shrewsbury, and Michael L. Mallary, Berlin, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 546,280, Jun. 29, 1990, Pat. No. 5,157,570. This application May 26, 1992, Ser. No. 888,105

Int. Cl.^{5} C23C *14/34*

U.S. Cl. 204—192.2 **19 Claims**

1. A process for fabricating a magnetic recording head, the head including at least one pole member having a tip portion and a yoke portion, the process of fabricating the pole comprising the steps of laying down, onto a substrate, in succession:
a first flux-conductive layer of a high anisotropy (H_k) and low permeability (μ) material;



a non-magnetic, electrically insulating material layer for preventing domain flux coupling in the tip portion; and
a second flux-conductive layer having low H_k and high μ.

5,314,597

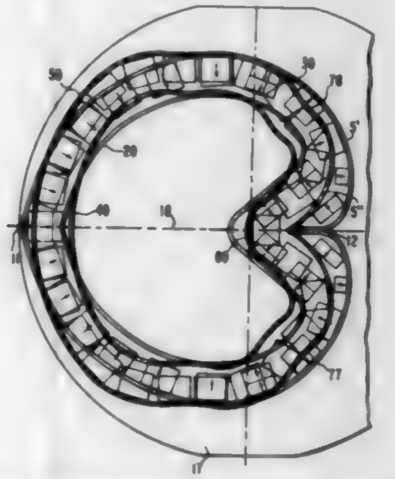
SPUTTERING APPARATUS WITH A MAGNET ARRAY HAVING A GEOMETRY FOR A SPECIFIED TARGET EROSION PROFILE

David J. Harra, San Francisco, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 20, 1992, Ser. No. 855,988

Int. Cl.^{5} C23C *14/34*

U.S. Cl. 204—192.13 **30 Claims**



1. A magnetron sputtering source for depositing a thin film layer on a substrate comprising:
a target having a face from which material is sputtered,
rotatable magnet means having a magnetic array and its centerline positioned behind said target and generally conforming to the shape of said target, said rotatable magnet means having a shape such that when said magnet means is held stationary it produces a static erosion pattern which is offset from the centerline of the magnet array and said static erosion pattern having a groove a substantial portion of which lies on a curve selected to produce a desired erosion pattern in the surface of the sputter target when said magnet means is rotated.

5,314,598

ELECTROCHEMICAL BROACHING APPARATUS

Derek A. Glew; Alan D. Staines, both of Bristol; Alan J. Cannon, Chepstow, and Roger N. Dunlop, Bristol, all of Great Britain, assignors to Rolls Royce PLC, England

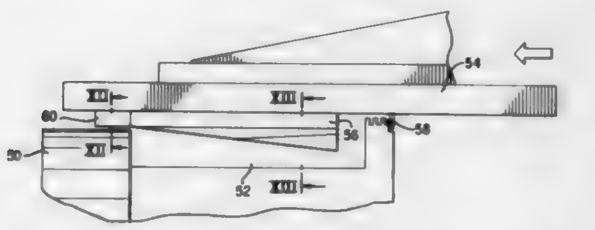
PCT No. PCT/GB92/00229, § 371 Date Sep. 29, 1992, § 102(e) Date Sep. 29, 1992, PCT Pub. No. WO92/13667, PCT Pub. Date Aug. 20, 1992

PCT Filed Feb. 6, 1992, Ser. No. 927,490

Claims priority, application United Kingdom, Feb. 7, 1991, 9102671

Int. Cl.^{5} B23H *3/00, 3/04, 7/26*

U.S. Cl. 204—224 M **10 Claims**



1. An electrochemical broaching apparatus comprising: (a) a bath adapted for holding an electrolyte, the bath having first and second end walls, the first end wall being provided by a workpiece of electrically conductive material to be broached, (b) an elongate broaching tool, and (c) an elongate horizontally disposed support member adapted to carry underneath it the broaching tool, the workpiece providing the anode of an electrochemical broaching operation and the broaching tool having at least one cathodic portion providing the cathode of the broaching operation, wherein the support member is arranged to be supported by the second end wall and to be moved in its elongate direction over the bath and over the workpiece, one end of the broaching tool being near the first end wall at the start of the broaching operation and the remainder of the tool being arranged for immersion when said electrolyte is present in the bath.

5,314,599

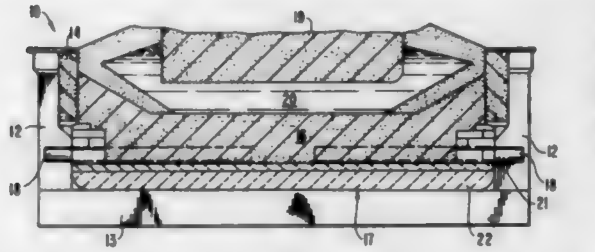
BARRIER LAYER AGAINST FLUORIDE DIFFUSION IN LININGS OF ALUMINUM REDUCTION CELLS

Claude Allaire, Chicoutimi-Nord, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jul. 28, 1992, Ser. No. 921,294

Int. Cl.^{5} C25C *3/08;* **C21B** *7/04;* **F27B** *14/10;* **C04B** *35/02*

U.S. Cl. 204—243 R **16 Claims**



1. Apparatus for containing a molten fluoride-containing salt material at high temperature comprising an outer shell partially surrounding an interior space for containing said salt mixture, said shell having a lower wall, an internal lining for said shell, at least adjacent to said lower shell wall, made of a material substantially impermeable to said molten salt mateiral, and at least one layer of refractory material between said lining and said lower shell wall, wherein said at least one refractory layer comprises a continuous barrier layer of CaO adjacent to said lining material.

3. Apparatus according to claim 1 forming an aluminum reduction cell containing electrodes for electrolyzing a substance contained in said molten salt material and wherein said lining of impermeable material is a carbon layer acting as a cathode of said cell.

5,314,600

EDGE STRIP

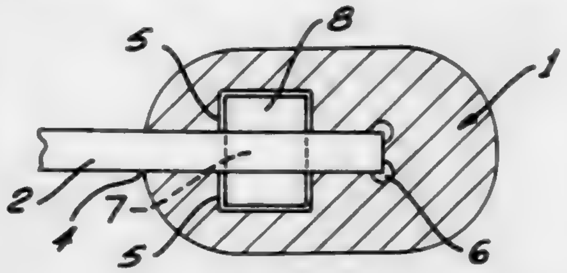
Wayne K. Webb, Bowen; Martin K. Schonfeldt, Pimlico, and Damian G. Lillicrap, Mysterton Estate, all of Australia, assignors to Copper Refineries Pty. Ltd., Queensland, Australia

Filed Apr. 16, 1992, Ser. No. 868,768

Claims priority, application Australia, Apr. 23, 1991, 75360/91

Int. Cl.^{5} C25C *7/08;* **C25D** *17/00*

U.S. Cl. 204.1—279 **8 Claims**



1. A cathode plate edge strip comprising:
a non-inflatable elongate body of a thermoplastic material and including a longitudinal opening on one side of said body to accommodate an edge of the cathode plate;
at least one continuous longitudinal internal groove on an inside surface of the opening; and
at least one expansion channel on the inside surface of the opening to allow for thermal expansion of the cathode plate.

5,314,601

ELECTRODES OF IMPROVED SERVICE LIFE

Kenneth L. Hardee, Middlefield; Lynne M. Ernes, Willoughby, and Richard C. Carlson, Euclid, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 633,914, Dec. 26, 1990, abandoned, Continuation-in-part of Ser. No. 374,429, Jun. 30, 1989, abandoned. This application Jun. 25, 1992, Ser. No. 904,314

Int. Cl.^{5} C25B *11/00, 11/02*

U.S. Cl. 204—290 R **44 Claims**

1. An electrode metal substrate providing an electrode of enhanced service life with low electrode coating weights, which metal substrate has: (A) a roughened surface having a profilometer-measured average surface roughness of at least about 250 microinches and an average surface peaks per inch of at least about 40, said roughened surface being provided by one or more of the following means:
(a) intergranular etching of said substrate metal, which etching provides three-dimensional grains with deep grain boundaries; or
(b) melt spray application of a valve metal layer onto said metal substrate; or
(c) melt spraying of ceramic oxide particles onto said metal substrate; or
(d) grit blasting of the metal substrate surface with sharp grit to provide a three-dimensional surface;
there being with said roughened surface; (B) a ceramic oxide barrier layer with, said barrier layer being established in means (c) where there is subsequently established after any of means (a), (b), and (d), said ceramic oxide barrier layer on said roughened surface, which barrier layer is provided by one or more of:
(1) heating said roughened surface in an oxygen atmosphere

to an elevated temperature in excess of about 450° C. for a time of at least about 15 minutes; or

(2) applying a metal oxide precursor substituent, with or without doping agent, to said roughened surface, said metal oxide precursor substituent providing a metal oxide on heating, followed by thermally treating said substituent at an elevated temperature sufficient to convert metal oxide precursor substituent to metal oxide; or

(3) establishing on said roughened surface a suboxide layer by chemical vapor deposition of a volatile starting material, with or without doping compounds, which is transported via an inert gas carrier to the surface that is heated to a temperature of at least about 250° C.; or

(4) melt spraying ceramic oxide particles onto said roughened surface;

with there being maintained for said barrier-layer-containing surface a profilometer-measured average surface roughness of at least about 250 microinches and an average surface peaks per inch of at least about 40.

5,314,602

DNA DETECTOR AND DNA DETECTION METHOD

Hideki Kambara, Hachiouji, and Keiichi Nagai, Higashiyamato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

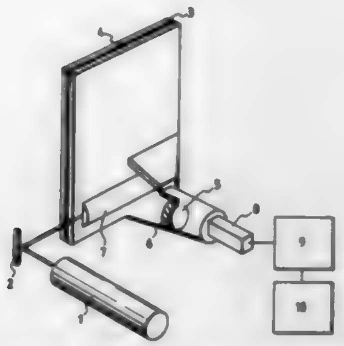
Continuation of Ser. No. 843,232, Feb. 28, 1992, Pat. No. 5,268,080. This application Mar. 5, 1993, Ser. No. 26,592

Claims priority, application Japan, Feb. 28, 1991, 3-034006

The portion of the term of this patent subsequent to Dec. 7, 2010, has been disclaimed.

Int. Cl.⁵ G01N *27/26, 27/447*

U.S. Cl. 204—299 R **8 Claims**



1. A fluorescence detection type electrophoresis DNA detector comprising:

an electrophoresis separation portion including gel for producing gel migration of DNA fragments labeled with a fluorophore introduced into the electrophoresis separation portion, thereby producing migration tracks;

a He-Ne laser emitting a laser beam having a wavelength of 594 nm for irradiating the migration tracks to excite the fluorophore, thereby causing the fluorophore to emit fluorescence;

a filter for receiving light from the migration tracks including the fluorescence emitted by the fluorophore and passing substantially only the fluorescence emitted by the fluorophore; and

a photodetector for detecting the fluorescence emitted by the fluorophore passed by the filter.

5,314,603

PLASMA PROCESSING APPARATUS CAPABLE OF DETECTING AND REGULATING ACTUAL RF POWER AT ELECTRODE WITHIN CHAMBER

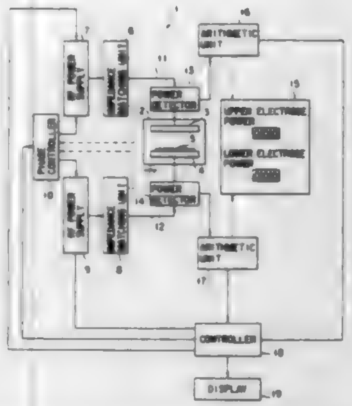
Kazuhiko Sugiyama, Nirasaki; Masafumi Shimizu, Yamanashi; Yukio Naito, Kofu; Eiichi Nishimura, and Kouichi Oshima, both of Yamanashi, all of Japan, assignors to Tokyo Electron Yamanashi Limited, Nirasaki, Japan

Filed Jul. 24, 1992, Ser. No. 918,045

Claims priority, application Japan, Jul. 24, 1991, 3-184804

Int. Cl.⁵ C23C *14/34;* C23F *1/02*

U.S. Cl. 204—298.32 **21 Claims**



1. A plasma processing apparatus, comprising:

plasma processing means including a processing chamber and upper and lower electrodes which are located in the processing chamber and which face each other;

an RF power source, located away from the plasma processing means by a predetermined distance, for outputting RF power and applying the RF power to the lower electrode located in the processing chamber through a cable transmission line of a predetermined length;

impedance matching means, inserted at an intermediate point of the cable transmission line, for impedance matching;

power detecting means, provided at that end of the cable transmission line which is located in the vicinity of the plasma processing means, for detecting a value of the RF power actually applied to the lower electrode,

said power detecting means including:

(a) a current detector comprising a current transformer coupled to the end of the cable transmission line that is located in the vicinity of the plasma processing means, a voltage transformer coupled to the current transformer, and a resistor connected to the voltage transformer, said current detector detecting a current component of the RF power actually applied to the lower electrode by means of the resistor;

(b) a voltage detector comprising a capacitor having a first end coupled to the end of the cable transmission line that is located in the vicinity of the plasma processing chamber and a resistor circuit coupled to a second end of the capacitor, said voltage detector detecting a voltage component of the RF power actually applied to the lower electrode by means of the resistor circuit; and

(c) an operation section for multiplying the current component detected by the current detector by the voltage component detected by the voltage detector, for extracting an effective value component of the RF power actually applied to the lower electrode from results of multiplication, and for outputting the effective value component at predetermined intervals; and

control means for controlling the RF power output from the RF power source so that the RF power output has a desirable value in accordance with the effective value component extracted from the operation section of the

power detecting means, whereby the RF power output is compensated for power loss occurring at least in the cable transmission line and the impedance matching means.

5,314,604

SENSOR ELEMENT FOR LIMIT CURRENT SENSORS TO DETERMINE THE LAMBDA-VALUE OF GAS MIXTURES

Karl-Hermann Friese, Leonberg; Werner Gruenwald, Gerlingen, and Hans-Martin Wiedenmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

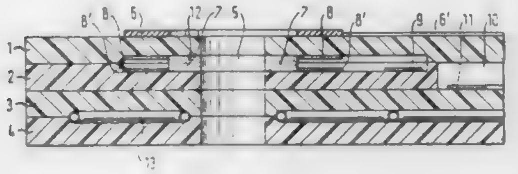
PCT No. PCT/DE91/00752, § 371 Date Apr. 12, 1993, § 102(e) Date Apr. 12, 1993, PCT Pub. No. WO92/07252, PCT Pub. Date Apr. 30, 1992

PCT Filed Sep. 21, 1991, Ser. No. 39,135

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1990, 4032436

Int. Cl.⁵ G01N *27/26*

U.S. Cl. 204—410 **7 Claims**



1. Sensor element for limit current sensors to determine the λ-value of gas mixtures, in particular, of exhaust gases from internal combustion engines; the sensor including an exterior and an interior pump electrode arranged on O_2^- ion-conducting solid electrolyte sheet, with the interior pump electrode being arranged in a diffusion channel for the measuring gas and being short-circuited to a second interior pump electrode arranged in the diffusion channel, and the interior pump electrode and the exterior pump electrode being arranged annularly around the measuring gas supply, with the interior pump electrodes facing each other in the diffusion channel, characterized in that the diffusion channel contains a filling which acts as diffusion barrier and which is positioned in the direction of the incoming gas upstream of the interior pump electrodes and that an exhaust gas electrode and an air reference electrode form a Nerst Cell, wherein the exhaust gas electrode is arranged in the diffusion channel downstream from interior pump electrodes.

5,314,605

MEASURING CELL FOR ELECTROCHEMICALLY DETECTING A GAS

Hans Matthiessen, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck

Continuation of Ser. No. 541,942, Jun. 22, 1990, Pat. No. 5,183,550. This application Nov. 25, 1992, Ser. No. 981,486

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921528

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.⁵ G01N *27/404*

U.S. Cl. 204—415 **9 Claims**

1. A measuring cell for electrochemically detecting a gas sample, the measuring cell comprising:

a housing having an opening directed toward the gas sample to be detected and defining an electrolyte chamber;

an electrolyte contained in said chamber;

a measuring electrode and a counter electrode disposed in said chamber so as to be in spaced relationship to each other;

a diffusion membrane interposed between said opening and said electrolyte and being permeable to the gas sample;

said diffusion membrane being impermeable to said electrolyte and having a lower surface facing said electrolyte;

said measuring electrode being configured as a measuring electrode layer disposed at said lower surface of said diffusion membrane;

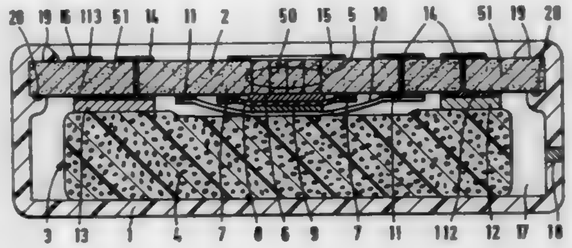
said diffusion membrane having an upper surface facing toward the gas sample;

a protective disc interposed between said opening and said upper surface of said diffusion membrane;

said protective disc having a first component region permeable to the gas sample and a second component region impermeable to the gas sample and to said electrolyte;

said first component region having an upper surface area directed toward the gas sample and a lower surface area facing toward said electrolyte;

said first component region including a plurality of capillary passages formed in said protective disc and extending between said upper and lower surface areas of said first component region;



said second component region having a lower surface area facing toward said electrolyte and said counter electrode being applied to said lower surface area of said second component region so as to be excluded from any access to the gas sample;

said counter electrode layer being electrically isolated from said measuring electrode and being in permanent electrical contact with said electrolyte;

said measuring electrode layer and said diffusion membrane being disposed at said lower surface area of said first component region of said protective disc so as to communicate with each other and with said capillary passages; and

said diffusion membrane being configured so as to be substantially confined to said lower surface area of said first component region while also being separated from and not in direct contact with said counter electrode.

5,314,606

LEADLESS CERAMIC PACKAGE WITH IMPROVED SOLDERABILITY

Taka Irie, and Aki Nomura, both of San Diego, Calif., assignors to Kyocera America, Inc., San Diego, Calif.

Filed Feb. 16, 1993, Ser. No. 18,012

Int. Cl.⁵ C25D *5/02*

U.S. Cl. 205—128 **11 Claims**

2. A method of fabricating at least one ceramic package, comprising the steps of:

(1) forming an array comprising a plurality of attached individual ceramic packages, each including electrically conductive traces formed of base metal;

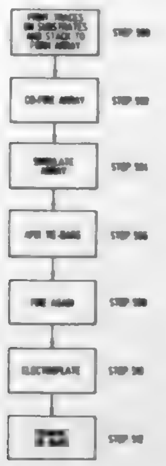
(2) co-firing the ceramic packages;

(3) singulating individual ceramic packages from the array;

(4) attaching at least one electrically-conductive tie-bar to at least one singulated package;

(5) electroplating at least one metal layer on exposed base

metal conductive traces of the at least one singulated ceramic package; and



(6) removing each said tie-bar from the at least one individual ceramic package.

5,314,607
APPARATUS AND METHOD FOR ANODIZING SUPPORTS FOR LITHOGRAPHIC PRINTING PLATE

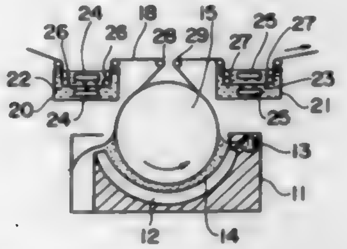
Nobuyoshi Kaneko; Tsutomu Kakei, and Akio Uesugi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 22, 1992, Ser. No. 901,674

Claims priority, application Japan, Jun. 21, 1991, 3-150083; Nov. 6, 1991, 3-289849

Int. Cl.^{5} C25D *5/00*

U.S. Cl. 205—139 **8 Claims**



1. An apparatus for anodizing one side of a support for a lithographic printing plate, said support comprising a web made of aluminum or an alloy thereof, said apparatus comprising:

a backing roller which guides said web in a state of contacting the backing roller;

at least one electrode which is arranged along the peripheral surface of the backing roller in a concentric arc acting as a cathode;

at least two guide rollers, which contact said web, for feeding electric current directly to said web, at least one of said guide rollers being provided upstream from the backing roller with respect to a direction in which said web travels, at least one of said guide rollers being provided downstream from said backing roller with respect to said direction in which said web travels; and

an electrolyte solution which substantially fills the space between the backing roller and the electrode for establishing electrical contact between said web and said electrode,

wherein said side of said web to be anodized is a side facing said electrode in a portion of said web disposed in said electrolyte solution.

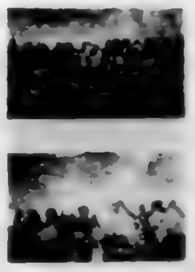
5,314,608
NICKEL-COBALT-BORON ALLOY, IMPLEMENT, PLATING SOLUTION AND METHOD FOR MAKING SAME

Luis X. Caballero, Mexico City, Mexico, assignor to Diamond Technologies Company, Louisville, Ky.

Division of Ser. No. 594,570, Oct. 9, 1990, Pat. No. 5,213,907. This application Apr. 9, 1993, Ser. No. 45,977

Int. Cl.^{5} C25D *3/56*

U.S. Cl. 205—238 **14 Claims**



1. A method of depositing a ternary alloy consisting essentially of nickel, cobalt, and boron on a substrate, the method comprising:

preparing a plating bath of nickel, cobalt and boron ions;

placing a catalyst in the plating bath, the catalyst being selected from the group consisting of the elements of group VIII of the periodic Table, except nickel;

electrolytically depositing the nickel, cobalt, and boron ions forming a coating of the ternary alloy on the substrate.

5,314,609
PROCESS FOR PREPARING DEBENZOLIZED TAR AND LOW-BENZENE CENTRIFUGED TAR SLUDGE

John Stipanovich, Jr., Monroeville, and David Q. Wible, North Huntingdon Township, Westmoreland County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 7, 1992, Ser. No. 926,204

Int. Cl.^{5} C10C *1/04, 1/10, 1/12*

U.S. Cl. 208—41 **6 Claims**

1. Method of making a coal tar having less than about 100 ppm of benzene comprising (a) distilling said tar, said distillation characterized by (i) retaining naphthalenes in the tar, (ii) refluxing the light components thereof, (iii) reboiling the heavier components thereof, and (iv) removing benzene therefrom, and (b) recovering a tar having a benzene content less than about 100 ppm.

5,314,610
STAGED CATALYTIC CRACKING PROCESS

Robert J. Gartside, Summit, N.J., assignor to ABB Lummus Crest Inc., Bloomfield, N.J.

Filed May 29, 1992, Ser. No. 890,196

Int. Cl.^{5} C10G *51/06, 11/00*

U.S. Cl. 208—80 **15 Claims**

1. A method of cracking hydrocarbonaceous feedstock, the method comprising the steps of:

a) separating said hydrocarbonaceous feedstock into at least a first feed portion having a lower molecular weight and a second feed portion having a higher molecular weight;

b) passing hot regenerated catalyst particles from a catalyst regenerator to the bottom portion of a first riser reactor and injecting the first feed portion so as to form a catalyst to feed weight ratio of at least 15;

c) passing said catalyst particles and first feed portion up through said first riser reactor and into a first reactor vessel whereby said first feed portion is cracked and said catalyst particles are partially spent;

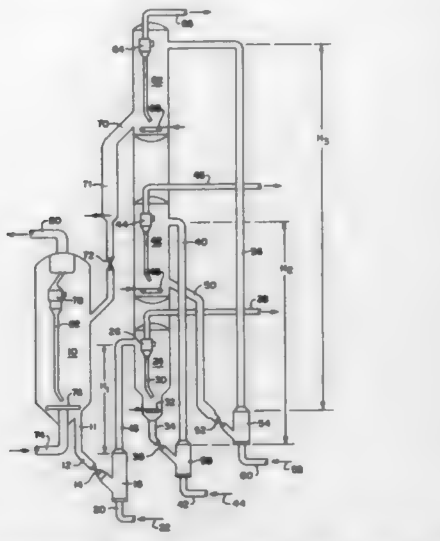
d) separating said cracked first feed portion from said catalyst particles and discharging said cracked first feed portion;

e) passing said catalyst particles from said first reactor vessel to the bottom portion of a second riser reactor and injecting the second feed portion so as to form a catalyst to feed weight ratio of at least 15;

f) passing said catalyst particles and second feed portion up through said second riser reactor and into a second reactor vessel whereby said second feed portion is cracked and said catalyst particles are further spent;

g) separating said cracked second feed portion from said catalyst particles and discharging said cracked second feed portion; and

h) returning said catalyst particles to said regenerator and regenerating said catalyst particles.



5,314,611
EXTERNAL INTEGRATED DISENGAGER STRIPPER AND ITS USE IN FLUIDIZED CATALYTIC CRACKING PROCESS

Ismail B. Cetinkaya, Palatine, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 613,037, Nov. 15, 1990, Pat. No. 5,158,669. This application Oct. 27, 1992, Ser. No. 966,776

The portion of the term of this patent subsequent to Oct. 27, 2009, has been disclaimed.

Int. Cl.^{5} C10G *11/18*

U.S. Cl. 208—113 **24 Claims**

1. A fluid catalytic cracking apparatus comprising:

(a) a tubular riser having an inlet end for receiving feed and catalyst and an outlet end;

(b) an elongated disengaging vessel having an upper end and a lower end, means for tangentially directing the outlet end of said riser into an upper end of said disengaging vessel, and a gas outlet at the top of said disengaging vessel, said lower end of said disengaging vessel having an open bottom wherein the outermost portion of said open bottom is unoccluded to permit unobstructed fluid and particulate flow;

(c) a stripping vessel located directly below said disengaging vessel, said stripping vessel having an inlet in open communication with said open bottom of said disengaging vessel and an outlet for withdrawing catalyst from the stripping vessel;

(d) means for adding stripping gas to said stripping vessel; and,

(e) a segregation zone located in said stripping vessel comprising means for dissipating turbulent flow below said open bottom of said disengaging vessel.

18. A process for the fluidized catalytic cracking (FCC) of an FCC feedstream, said process comprising:

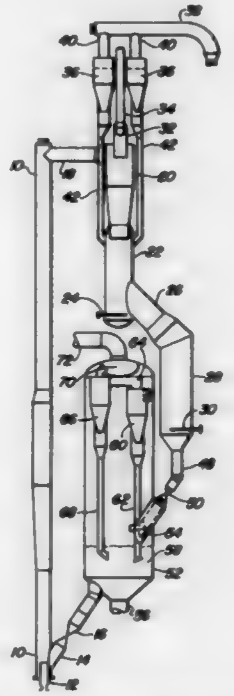
(a) passing FCC catalyst and said FCC feedstream to a riser reaction zone and contacting said feedstream with said FCC catalyst in said riser reaction zone to convert said feedstream to product vapors;

(b) discharging a mixture of said product vapors and spent FCC catalyst from said riser directly into a disengaging vessel and directing said mixture tangentially into said disengaging vessel to form at least an outer vortex in said disengaging vessel;

(c) emptying catalyst particles in closed communication from the bottom of said disengaging vessel directly into the top of a subadjacent stripping vessel;

(d) injecting a stripping gas into said stripping vessel and contacting said catalyst particles with said stripping gas to desorb hydrocarbons from said catalyst particles;

(e) discharging a gaseous stream of desorbed hydrocarbons and stripping gas upwardly from said stripping vessel, dissipating the turbulent flow of fluid and catalyst particles at the top of said stripping vessel, and passing said desorbed hydrocarbons and stripping gas out of the top of said stripping vessel and into the bottom of said disengaging vessel;



(f) maintaining a relatively dense bed of catalyst below the top of said stripping vessel;

(g) withdrawing said product vapors and said gaseous stream from the top of said disengaging vessel through an outlet;

(h) passing said product vapor and said gaseous stream from said outlet to a separator to recover additional catalyst particles;

(i) recovering a product stream from said separator;

(j) transferring catalyst particles from said separator to said stripping vessel;

(k) removing spent FCC catalyst from the lower end of said stripping vessel and transferring said spent catalyst to a regeneration zone;

(l) regenerating said FCC catalyst in said regeneration zone by the oxidative removal of coke; and,

(m) transferring FCC catalyst from said regeneration zone to said riser reaction zone.

5,314,612

FLUID CATALYTIC CRACKING PROCESS FOR PRODUCING LOW EMISSIONS FUELS

Paul E. Eberly, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 30, 1992, Ser. No. 982,935

Int. Cl.^{5} C10G *11/00, 11/02*

U.S. Cl. 208—120 **5 Claims**

1. A fluid catalytic cracking process for producing low emissions fuel products, which process comprises:

(a) introducing a hydrocarbonaceous feedstock into a reaction zone of a catalytic cracking unit comprised of a reaction zone and a regeneration zone, which feedstock is characterized as having: a boiling point from about 230° C. to about 350° C., with end points up to about 620° C.; a nitrogen content less than about 50 wppm; a hydrogen content in excess of about 13 wt. %; a 2+ ring aromatic core content of less than about 7.5 wt. %; and an overall aromatic core content of less than about 15 wt. %;

(b) catalytically cracking said feedstock in said reaction zone at a temperature from about 450° C. to about 600° C., by causing the feedstock to be in contact with a cracking catalyst for a contact time of about 0.5 to 5 seconds, which cracking catalyst is a mixture of an effective amount of zeolite Y and zeolite beta; thereby producing lower boiling hydrocarbonaceous products and a partially coked catalyst; and

(c) stripping said spent catalyst in a stripping zone with a stripping medium thereby removing at least a portion of said hydrocarbonaceous material; and

(d) recovering the stripped hydrocarbonaceous material from the stripping zone and passing the stripped spent catalyst to a regeneration zone; and

(e) regenerating said spent catalyst in the regeneration zone by burning off a substantial amount of the coke on said catalyst, and with any added fuel component, to maintain the regenerated catalyst at a temperature which will maintain the catalytic cracking reactor at a temperature from about 450° C. to about 600° C.; and

(f) recycling said regenerated catalyst to the reaction zone.

5,314,613

PROCESS AND APPARATUS FOR OIL DECONTAMINATION

Gaetano Russo, 6 Monaco St., Parkdale, Vic 3194, Australia

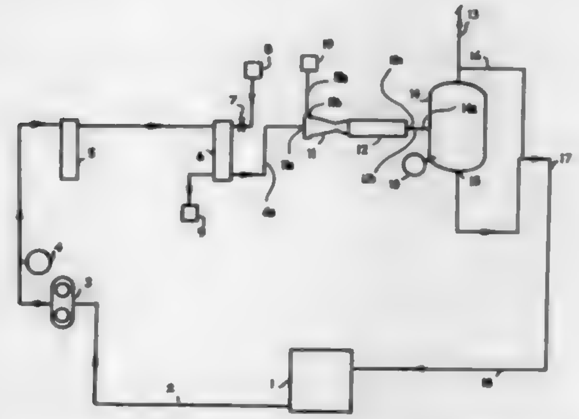
PCT No. PCT/AU90/00446, § 371 Date May 18, 1992, § 102(e) Date May 18, 1992, PCT Pub. No. WO91/04309, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 25, 1990, Ser. No. 842,135

Claims priority, application Australia, Sep. 25, 1989, PJ 6543

Int. Cl.^{5} C10M *175/02;* **C10G** *31/06;* **B01D** *19/00*

U.S. Cl. 208—184 **16 Claims**



8. A process for the decontamination of oil which can be lubricating oil, seal oil, hydraulic oil or transformer oil, with the contaminants being water and/or dissolved fuels and/or dissolved gases, said process comprising providing a jet compressor having a converging section defining a low pressure region; directing oil through an oil jet located in said converging section and drawing air or inert gas from said low pressure region for compression in said converging section; said jet compressor having a mixing section downstream of said converging section and said jet compressor further including a diverging section downstream of said mixing section; and further providing a residence time chamber directly connected to said diverging section; directing contaminated oil through said oil jet into said mixing chamber and drawing air or inert gas into the converging section as the contaminated oil is directed into the converging section; thereafter passing the contaminated oil and the air or inert gas into said mixing chamber for producing a first mixing therebetween; thereafter passing the first mixture of air and oil into the diverging section for producing a second mixing therebetween and discharging the second mixing of air and oil into the residence time chamber so that air or inert gas such as nitrogen is intimately mixed with said oil in said mixing section and said diverging section and said mixed oil and gas are maintained in their mixed state within said residence time chamber where a period of time is provided to allow for mass and heat transfer between oil droplets and surrounding air or inert gas prior to separation of the gas from the oil such that the gas is saturated to between 95% and 100% of theoretical saturation, to thereby achieve decontamination in the oil, providing a separation drum, and passing the decontaminated oil out from the bottom of the separation drum and passing the contaminants and the gas from the top of the separation drum.

5,314,614

PROCESS FOR HYDROTREATING AN ORGANIC FEEDSTOCK CONTAINING OLEFINIC COMPOUNDS AND A HALOGEN COMPONENT

Mark D. Moser, Elk Grove; Tom N. Kalnes, La Grange; Chwu-Ching Jan, Elk Grove, and George R. Hibel, Schaumburg, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jun. 17, 1992, Ser. No. 899,804

Int. Cl.^{5} C10G *15/02*

U.S. Cl. 208—262.1 **10 Claims**

1. A process for hydrotreating an organic feedstock containing thermally unstable compounds and a halogen component while minimizing the thermal decomposition of said thermally unstable compounds and stabilizing the activity of the hydrotreating catalyst which process comprises the following steps:

(a) contacting said organic feedstock, containing thermally unstable compounds and a halogen component, and a gaseous recycle stream, comprising hydrogen and a hydrogen halide compound, with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation reaction conditions to increase the hydrogen content of the organic feedstock and to produce a hydrogen halide compound;

(b) condensing at least a portion of the resulting effluent from said hydrogenation reaction zone to produce a gaseous stream comprising hydrogen and a hydrogen halide compound, and a liquid stream comprising hydrocarbonaceous compounds;

(c) recycling at least a portion of said gaseous stream comprising hydrogen and a hydrogen halide compound recovered in step (b) to said hydrogenation reaction zone in step (a); and

(d) recovering a stream comprising hydrocarbonaceous compounds and having a reduced level of a halogen component.

5,314,615

IN-SITU REDUCTION OF OIL VISCOSITY DURING STEAM INJECTION PROCESS IN EOR

Rafael E. Campos, and Jose A. Hernandez, both of El Tambor, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Division of Ser. No. 801,474, Dec. 2, 1991, Pat. No. 5,209,295. This application Jan. 25, 1993, Ser. No. 8,682

Int. Cl.^{5} C10G *1/00*

U.S. Cl. 208—370 **3 Claims**

1. A method for lowering the viscosity of a heavy hydrocarbon outside of a well formation wherein said heavy hydrocarbon has an API° gravity in the range between 6 and 12 and a dynamic viscosity about 300 centipoises @ 195° F. so as to make pumpable with conventional pumping equipment comprising:

mixing said hydrocarbon at a temperature range between 400° and 500° F. with steam, urea and an additive selected from the group consisting of nickel, iron or mixtures thereof.

5,314,616

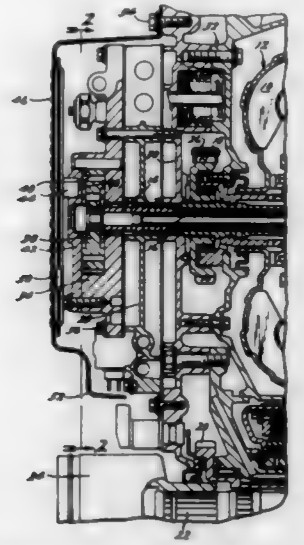
PARTIAL FLOW FILTER SYSTEM FOR AN AUTOMATIC POWER TRANSMISSION MECHANISM

Lyle B. Smith, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1992, Ser. No. 968,135

Int. Cl.^{5} B01D *29/60, 29/56, 35/147*

U.S. Cl. 210—130 **9 Claims**



1. A transmission fluid filtering system configured and arranged for use in an automatic power transmission mechanism comprising a positive displacement fluid pump in a fluid sump with a high pressure side and a low pressure side;

a fluid supply passage means for supplying fluid from said sump to said low pressure side of said pump;

a primary filter in said supply passage means;

a flow metering passage in communication with said high pressure side of said pump;

a secondary filter communicating with said flow metering passage whereby a portion of the fluid delivered by said pump is bypassed through said metering passage to said secondary filter;

means for returning fluid bypassed to said secondary filter to said sump, said pump being a variable displacement sump comprising a movable pump displacement control member; and

valve means responsive to movement of said displacement control member toward a maximum displacement position for decreasing the flow through said metering passage in response to the flow delivery rate of said pump increasing.

5,314,617

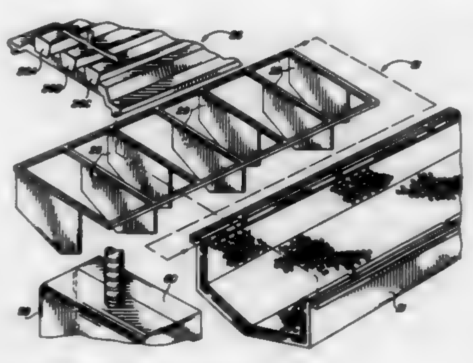
ACCUMULATOR FOR OIL SLICK SKIMMER

Don S. Karterman, 675 Birch St., Anchorage, Ak. 99501

Division of Ser. No. 846,840, Mar. 6, 1992, Pat. No. 5,215,634. This application Dec. 21, 1992, Ser. No. 994,306

Int. Cl.^{5} E02B *15/04*

U.S. Cl. 210—242.3 **3 Claims**



1. An accumulator comprising:

an elongated hull,

an inlet at one end thereof and an outlet at the other end thereof,

said inlet being positioned at the top of said hull,

said outlet being positioned at the bottom of said hull,

said inlet comprising a sluice gate,

a cover fitting over and sealing said hull,

said cover comprising float means for controlling the vertical position and buoyancy of said accumulator,

said float means comprising three parallelly arranged flotation shells extending longitudinally of said cover, and

control means for filling and expelling sea water from said float means for controlling the buoyancy of the accumulator.

5,314,618

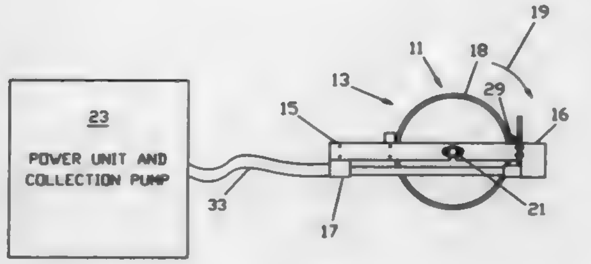
OIL SKIMMER

Timothy R. Kaylor, and Donald R. Weaver, both of Highway 5 South, P.O. Box 1856, Blue Ridge, Ga. 30513

Filed Mar. 29, 1993, Ser. No. 38,641

Int. Cl.^{5} C02F *1/40*

U.S. Cl. 210—242.3 **6 Claims**



1. An apparatus for removing oil from the surface of a body of water comprising:

a pair of spaced-apart hulls,

a support frame of generally rectangular shape having a front, a back, and two sides, said frame adjustably supported by said hulls, said front forming an oil collection reservoir, and having a top opening, and a front opening therein, and having a door pivoted thereon for closing said front opening in a first position and for forming a weir skimmer in a second position, and said back having a pair of oil removal drain holes at opposite ends thereof,

a rotatable drum having an external oil collecting surface, with upper and lower portions and a longitudinal center line, means for rotatably mounting and rotating said drum in a partially submerged position with at least a portion of the lower surface being positioned in the water, said upper portion being positioned out of the water, and with the longitudinal line of said drum extending in a direction across the space between said sides,

scraper means mounted on said front of said support frame above said top opening of said reservoir and positioned to engage said upper portion of said drum for removing oil from said drum and deflecting oil into said reservoir,

conduit means affixed at a first end to said oil collection reservoir and communicating with said oil removal drain holes, and connected at a second end to a "tee" fitting, and

power means connected to said means for rotating said drum, and collection means connected to said "tee" fitting for pumping the collected oil for further processing or disposal.

5,314,619

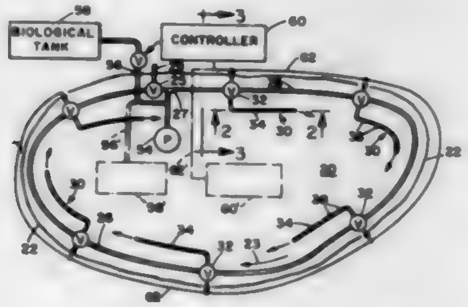
METHOD AND APPARATUS FOR POND WATER CLARIFICATION AND MAINTENANCE

Larry Runyon, Temecula, Calif., assignor to Eco-Soil Systems, Inc., San Diego, Calif.

Filed Mar. 22, 1993, Ser. No. 35,064

Int. Cl.^{5} C02F *7/00*

U.S. Cl. 210—606 **14 Claims**



1. A process for improvement of water quality in a body of water, which comprises:

providing a mixture of microorganisms, enzymes and nutrients therefor;

incorporating said mixture into a water stream;

passing said stream into a distribution system comprising a plurality of distribution conduits disposed at spaced apart intervals around at least a portion of the perimeter of said body of water; and

causing said stream of water containing said mixture to be discharged into said body of water sequentially through individual ones of said conduits;

whereby said sequential individual discharges cause water in said body to circulate and said mixture to become distributed substantially throughout said body of water, said mixture thereupon acting to clarify said body of water of contaminants contained therein and to maintain said water quality thereafter.

5,314,620

CUTTING OIL TREATMENT

Robert Staniec, Playa del Rey, Calif., assignor to Harvey Universal, Inc., Torrance, Calif.

Filed Apr. 2, 1993, Ser. No. 42,120

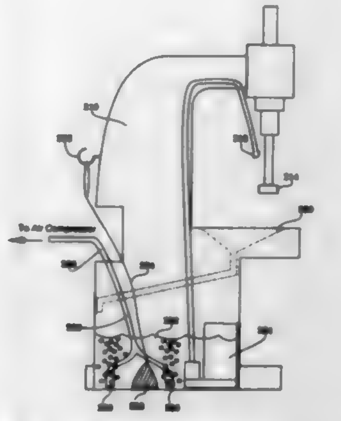
Int. Cl.^{5} C02F *3/34;* B23Q *11/10*

U.S. Cl. 210—611 **5 Claims**

1. A method for the biological purification of cutting oil, said method comprising:

(a) aerating cutting oil;

(b) introducing nitrifying bacteria into the aerated cutting oil; and



(c) supporting the proliferation of the introduced bacteria.

5,314,621

METHOD FOR THE BIOLOGICAL PURIFICATION OF WASTEWATER

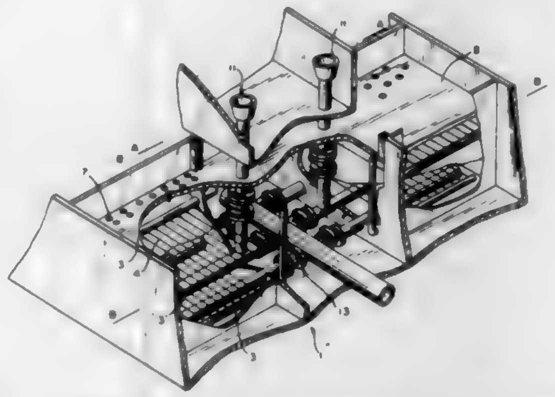
Franck Rogalla, Paris, France, assignor to OTV (Omnium De Traitements Et De Valorisation), Courbevoie, France

Filed Mar. 13, 1992, Ser. No. 850,610

Claims priority, application France, Mar. 15, 1991, 91 03160

Int. Cl.^{5} C02F *3/10*

U.S. Cl. 210—618 **2 Claims**



1. A method for biological purification of waste water, comprising:

providing a biological filter within a biological purification reactor, said biological filter comprising a bacteria support medium constituting a packed bed of particles retained in a lower part of said reactor by a perforated retention ceiling against upward movement, said support medium comprising expanded particles having a bulk density of 35–65 kg/m^3, a bulk specific gravity of 0.035–0.065, and a granulometric size of 2–6 mm;

passing water to be biologically purified upwardly through said reactor and through said packed bed of particles constituting said biological filter and simultaneously injecting oxygenated gas within said packed bed and passing said oxygenated gas upwardly in a co-current flow direction with said water to be biologically purified through said biological filter;

periodically backwashing said packed bed by using rapid outflow, in a counter-current flow direction, of the water treated and stored in an upper part of said reactor, said backwashing being carried out at a water outflow rate of 30–80 mh, and said injecting of oxygenated gas being maintained during said backwashing of said bed; and

periodically carrying out brief-miniwashing flushing operations to loosen suspended solids within said packed bed and enable a deeper penetration of impurities into said packed bed.

5,314,622

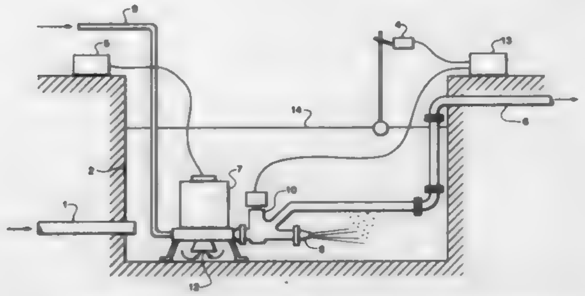
DUAL PURPOSE OXYGENATOR

Thomas E. Stirling, Sugarloaf, Pa., assignor to Hazleton Environmental, Hazleton, Pa.

Division of Ser. No. 39,989, Apr. 20, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 387,208

Int. Cl.^{5} C02F *3/02*

U.S. Cl. 210—629 **1 Claim**



1. A process for increasing the efficiency of absorption of oxygen by a biodegradable waste in a continuous operation in a waste collection station and for removing the oxygen enriched waste from the collection station, comprising (1) separately introducing the waste and oxygen into a collector; (2) agitating the oxygen and waste under pressure in the collector by a partially recessed vortex type impeller as back pressure is provided to the collector either by a nozzle means or an outlet means, wherein the collector is mis-matched relative to the impeller to increase the retention and mixing time of the air and waste in the collector; and (3) removing the oxygen enriched waste from the collector either by the nozzle means into the waste water in which the apparatus may be immersed, or the outlet means, wherein said outlet means also serves to remove the waste from the collection station, said nozzle means and said outlet means being alternatively actuated with regard to the passage of waste therethrough from the collector by a valve means.

5,314,623

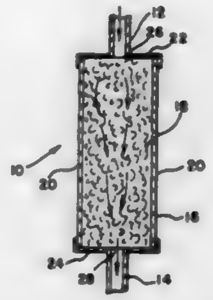
METHOD FOR TREATING FLUIDS

Don E. Heskett, Constantine, Mich., assignor to KDF Fluid Treatment, Inc., Constantine, Mich.

Division of Ser. No. 980,316, Nov. 19, 1992, Pat. No. 5,275,737, which is a continuation of Ser. No. 528,682, May 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 352,719, May 12, 1989, abandoned, which is a continuation of Ser. No. 205,628, May 31, 1988, abandoned, which is a continuation of Ser. No. 72,591, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 779,226, Sep. 23, 1985, abandoned, which is a continuation of Ser. No. 605,652, Apr. 30, 1984, abandoned. This application Jul. 28, 1993, Ser. No. 98,463

Int. Cl.^{5} C02F *1/28, 1/70, 1/72, 5/00*

U.S. Cl. 210—638 **7 Claims**



1. A method of lowering either or both calcium and magnesium hardness of water said method comprising passing said water through a bed of metal particles comprising copper and zinc sufficient to lower said hardness.

5,314,624

PROCESS FOR FILTERING PLASMA AND REGENERATING A SECONDARY FILTER THEREFOR

Akio Kawakura; Motoki Yonekawa, both of Sapporo; Eiji Sakashita, and Hiroshi Kamogawa, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Naruto, Japan

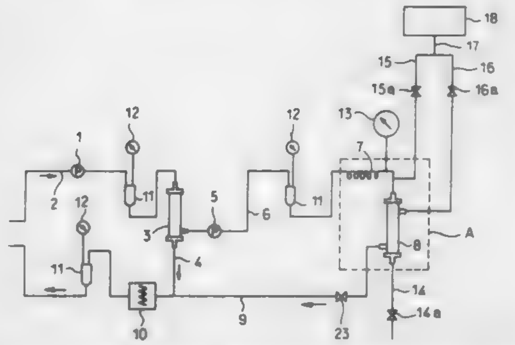
PCT No. PCT/JP92/00353, § 371 Date Nov. 10, 1992, § 102(e) Date Nov. 10, 1992, PCT Pub. No. WO92/17220, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 24, 1992, Ser. No. 946,331

Claims priority, application Japan, Mar. 26, 1991, 3-061747

Int. Cl.^{5} B01D *61/00, 41/00*

U.S. Cl. 210—645 **8 Claims**

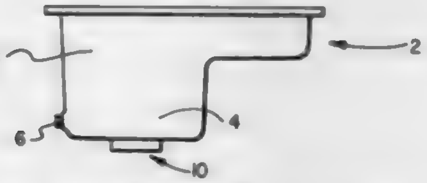


1. A process for filtering plasma by separating blood from a supply source into blood cells and plasma by a primary filter, introducing the separated plasma into a secondary filter from supply line, passing the plasma through the secondary filter from an inner chamber of the secondary filter to an outer chamber of the secondary filter to thereby filter off macromolecules from the plasma as harmful components and purify the plasma, and returning the purified plasma from the secondary filter through a return line to the supply source while mixing

the purified plasma with the separated blood cells from the primary filter into blood, wherein the secondary filter is washed and regenerated by executing a pressure lowering procedure of opening the inner chamber of the secondary filter to the atmosphere every time increase of the internal pressure of the inner chamber to an upper limit value due to an increasing plugging tendency of the secondary filter is detected, and washing the interior of the secondary filter from both sides of the inner and outer chambers simultaneously with a wash liquor after the internal pressure of the inner chamber has lowered while discharging wash from the inner chamber to outside the secondary filter, the regeneration of the secondary filter being followed by a usual operation again.

5,314,625
EXTERNAL OIL PAN MAGNET

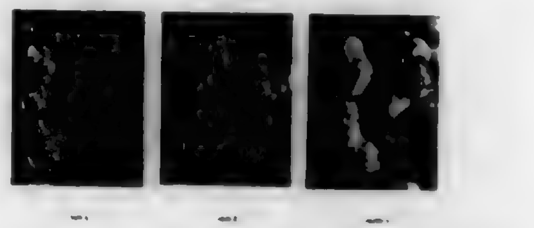
Michael Farnelli, 18050 Kelly Blvd., Dallas, Tex. 75287
Filed Dec. 29, 1992, Ser. No. 998,411
Int. Cl.⁵ B01D *35/06*
U.S. Cl. 210—695 **3 Claims**



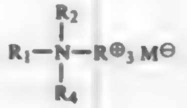
1. A method of removing metal filings suspended in a fluid in an oil pan, said method comprising:
(a) coupling a magnet assembly to an external surface of the oil pan;
(b) removing the fluid from the pan through a sealable hole;
(c) sliding the magnet across the external surface of the oil pan to a position over the sealable hole; and
(d) removing the metal filings attracted to the magnet through the sealable hole.

5,314,626
METHOD FOR THE ALTERATION OF SILICEOUS MATERIALS FROM BAYER PROCESS LIQUIDS

Peter A. Dimas, Wheaton, Ill., assignor to Nalco Chemical Company, Naperville, Ill.
Continuation-in-part of Ser. No. 811,723, Dec. 23, 1991, abandoned. This application Aug. 3, 1992, Ser. No. 925,222
Int. Cl.⁵ C01F *7/02*
U.S. Cl. 210—698 **15 Claims**



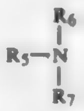
1. A method for modifying the morphological characteristics of sodium aluminosilicate crystals in a Bayer Process liquor to reduce their tendency to adhere to equipment surfaces, the method including the step of adding to the liquor from about 50 to about 10,000 parts per million of at least one compound selected from the group consisting of ammonium compounds, aromatic amine compounds and amine compounds, said ammonium compounds having the formula:



$$R_1-\overset{R_2}{\underset{R_4}{N}}-R^{\oplus}_3\ M^{\ominus}$$

wherein: R_1, R_2, R_3, and R_4 are, individually, a straight or branched chain C_1–C_6 aliphatic group, a straight or branched chain C_1–C_6 carboxyl group, a straight or branched chain C_1–C_6 hydroxyalkyl group, an aromatic group, an alkylaryl group or a hydrogen atom; and M is an anion;

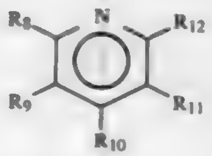
said amine compound having the formula:



$$R_5-\overset{R_6}{\underset{R_7}{N}}$$

wherein R_5, R_6, and R_7 are, individually, a straight or branched chain C_1–C_6 aliphatic group, a straight or branched chain C_1–C_6 carboxyl group, a straight or branched chain C_1–C_6 hydroxyalkyl group, an aromatic group, an alkylaryl group, or a hydrogen atom;

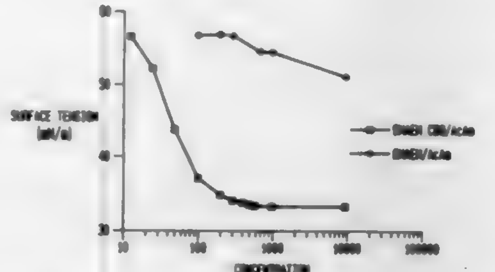
and said aromatic amine compound having the following formula:



wherein R_8, R_9, R_{10}, R_{11} and R_{12} are, individually, a straight or branched chain C_1–C_6 aliphatic group, a straight or branched chain C_1–C_6 carboxyl group, a straight or branched chain C_1–C_6 hydroxyalkyl group, a hydroxyl group, or a hydrogen atom.

5,314,627
HYDROPHOBIC POLYELECTROLYTES USED IN COLOR REMOVAL

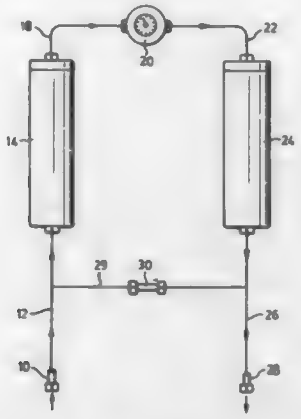
Manian Ramesh, Naperville; Chandrashekar S. Shetty, Lisle, and Martha R. Finck, Countryside, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.
Division of Ser. No. 913,244, Jul. 14, 1992, Pat. No. 5,292,793. This application Sep. 13, 1993, Ser. No. 119,943
Int. Cl.⁵ C02F *1/56*
U.S. Cl. 210—734 **6 Claims**



1. A method for removing color bodies from a paper mill waste effluent which comprises the step of adding an effective amount of a hydrophobic polyelectrolyte copolymer to said effluent to flocculate said color bodies, said hydrophobic polyelectrolyte copolymer being formed from a mixture consisting of an acrylamide, a hydrophobic monomer selected from the group consisting of: dialkylaminoalkylacrylates having C8 to C20 quaternaries and dialkylaminoalkylmethacrylates having C8 to C20 quaternaries, water and a polymer initiator, and removing the flocculated color bodies from the effluent.

5,314,628
DE-CHLORINATED WATER SUPPLY METHODS

Frank P. Sloan, 1601-19 Lascelles Blvd., Toronto, Ontario, Canada M4V 2B7
Filed Sep. 14, 1992, Ser. No. 944,375
Int. Cl.⁵ C02F *1/76*
U.S. Cl. 210—754 **3 Claims**

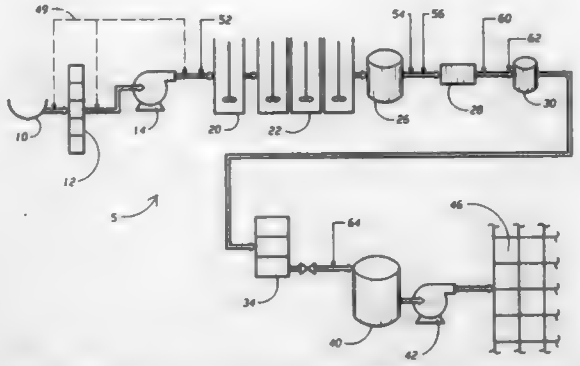


1. A method of reducing proliferation of micro-organisms in a downstream conduit connecting an outlet of a chlorine filter to a de-chlorinated water outlet in a chlorinated water supply system when no water is flowing in said conduit, comprising providing a by-pass conduit between an upstream conduit connecting a chlorinated water inlet from said supply system to the chlorine filter inlet and the downstream conduit and also providing a valve in said by-pass conduit, closing said valve by water pressure difference between the upstream conduit and the downstream conduit by flowing said water from the chlorinated water inlet through the upstream conduit, the filter and the downstream conduit to the de-chlorinated water outlet and opening said valve in the absence of water pressure difference between the upstream conduit and the downstream conduit by shutting off flow of said water from the chlorinated water inlet through the upstream conduit, the filter and the downstream conduit to the de-chlorinated water outlet for a sufficient time to enable chlorine in the chlorinated water in the upstream conduit to migrate through water in the by-pass conduit and the open valve into the de-chlorinated water in the downstream conduit to reduce proliferation of micro-organisms therein.

5,314,629
METHOD AND SYSTEM FOR TREATING DRINKING WATER

Mark H. Griese, Evansville, and Ronald S. Bialosky, Newburgh, both of Ind., assignors to Evansville Water & Sewer Utility, Evansville, Ind.
Filed Nov. 6, 1992, Ser. No. 972,795
Int. Cl.⁵ C02F *1/76*
U.S. Cl. 210—754 **14 Claims**

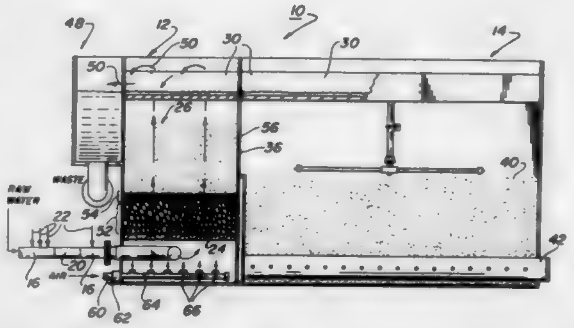
1. A method of treating drinking water to decrease residual concentrations of chlorine dioxide or chlorite ion contained within such water comprising:
(A) providing a water treatment plant having: (i) a source of chlorine dioxide for treating such water; (ii) a sedimentation operation for treating such water; (iii) a contactor located prior to such sedimentation operation; and (iv) a filtering operation for processing such water located subsequent to such sedimentation operation;
(B) providing a source of ferrous chloride;
(C) providing a source of an oxidizing agent for the oxidation of residual ferrous chloride;
(D) treating such water with such ferrous chloride prior to such sedimentation operation; and



(E) treating such water with such oxidizing agent after it has been treated with such ferrous chloride and prior to such sedimentation operation.

5,314,630
SYSTEMS AND METHODS FOR CLARIFYING LIQUIDS

Annabelle Kim, Rosemont, and R. Lee Roberts, Boothwyn, both of Pa., assignors to Roberts Filter Manufacturing Company, Darby, Pa.
Division of Ser. No. 819,916, Jan. 13, 1992, Pat. No. 5,198,124, which is a division of Ser. No. 576,023, Aug. 31, 1990, Pat. No. 5,080,808, which is a continuation-in-part of Ser. No. 561,030, Aug. 1, 1990, abandoned. This application Mar. 26, 1993, Ser. No. 38,590
The portion of the term of this patent subsequent to Mar. 30, 2010, has been disclaimed.
Int. Cl.⁵ B01D *24/46*
U.S. Cl. 210—794 **7 Claims**



1. In a method for clarifying water is a filter system wherein during a filtering mode step influent water is passed upwardly in a first zone through first particulate filter media contained therein and then sequentially is passed downward through a second zone through second particulate filter media contained therein, and during a backwash mode step liquid is passed upwardly through said particulate filter media in both said first and second zones, the improvement which comprises:

providing said first particulate media with a filter layer in the form of solid particles having a specific gravity in excess of 2 and an effective size greater than 1 millimeter; and

during backwashing of said first zone, causing a combination of air and liquid to flow upwardly through the filter layer with the liquid flow rate being less than the minimum fluidization velocity of the filter layer and with the air flow rate being in the range of approximately 1–9 $Scfm/ft.^2$.

5,314,631

STATIONARY BAR CODE READER WHICH CAN BE DETECTED AND SEPARATED INTO A HAND-HELD BAR CODE READER

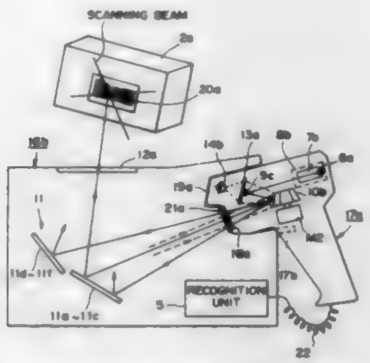
Hiroaki Katoh, Sagamihara; Yoshitaka Murakawa, Fuchu; Toshimasa Miyazaki, Yamato; Nobuyuki Kitamura, and Shinichi Sato, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 957,062, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 603,321, Oct. 25, 1991, abandoned. This application May 27, 1993, Ser. No. 68,611

Claims priority, application Japan, Oct. 25, 1989, 1-277589

Int. Cl.⁵ G06K *7/10*

U.S. Cl. 235—467 **11 Claims**



1. A bar code reader for reading a bar code on an object, comprising:

light-emitting means for emitting an outgoing ray of light;

scanning means for reflecting the outgoing ray of light from said light-emitting means to form a scanning beam;

a scanning-pattern-forming mirror unit responsive to the scanning beam from said scanning means for forming a plurality of scanning beams of different patterns;

conversion means for receiving reflected light resulting from scanning a bar code printed on the object with the scanning beam and the scanning beams of the different patterns and for converting the received reflected light to an electrical signal;

a separable unit, including:
- said light-emitting means,
- said scanning means,
- said conversion means, and
- a scanning window for directing the scanning beam formed by said scanning means outside of said separable unit; and

a main-body unit, including:
- a mounting portion on which said separable unit is detachably mounted,
- a light-receiving window for receiving the scanning beam emitted through said scanning window of said separable unit when said separable unit is mounted on said mounting portion,
- said scanning-pattern-forming mirror unit disposed in position to form the scanning beams of the different patterns from the scanning beam received through said light-receiving window, and
- a reading window for transmitting the scanning beams of the different patterns formed by said scanning-pattern-forming mirror unit outside of said main-body unit, the bar code on the object being scanned by the scanning beams of the different patterns emitted from said reading window when said separable unit is mounted on said mounting portion of said main-body unit and the bar code being scanned by the scanning beam emitted from said scanning window when said separable unit is separated from said mounting portion of said main-body unit.

5,314,632

COMBINING DISPERSANT VISCOSITY INDEX IMPROVER AND DETERGENT ADDITIVES FOR LUBRICANTS

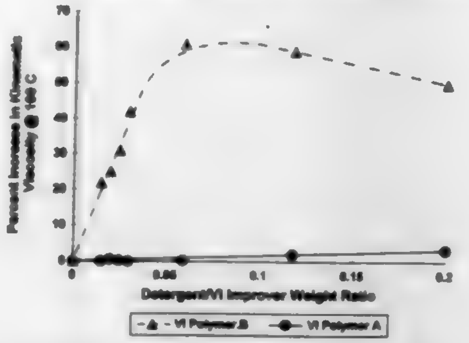
Brian L. Papke; Isaac D. Rubin, both of Wappingers Falls, and John Castrogiovanni, Jr., Milton, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 5, 1992, Ser. No. 894,390

Int. Cl.⁵ C10M *135/10, 133/58*

U.S. Cl. 252—18 **13 Claims**

Effect of Detergent/VI Improver Ratio on 100 C Relative Kinematic Viscosity.



1. A process for making a lubricant composition by:

(1) combining:
- (a) dispersant viscosity index polymer, which is a polyolefin of ethylene, C_{3-20} α-monoolefin, and optionally polyene, having a number average molecular weight of at least about 10,000, which is grafted with ethylenically unsaturated, carboxyl-containing compound and dispersancy substituent, with;
- (b) detergent, which is an overbased, oil-soluble, calcium sulfonate; to make a premix, followed by;

(2) combining the premix with lubricating oil and dispersant package to make a lubricant composition with enhanced viscosification.

5,314,633

LOW PRESSURE DERIVED MIXED PHOSPHOROUS- AND SULFUR- CONTAINING REACTION PRODUCTS USEFUL IN POWER TRANSMITTING COMPOSITIONS AND PROCESS FOR PREPARING SAME

Jack Ryer, East Brunswick; Antonio Gutierrez, Mercerville; James S. Puckace, Freehold; Raymond F. Watts, Long Valley; Craig W. Gleason, Scotch Plains; Daniel R. Mills, Somerville, all of N.J.; Edmund H. Braun, II, Orangeburg, N.Y., and Stanley J. Brois, Westfield, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 560,675, Jul. 31, 1990, Pat. No. 5,185,090, which is a continuation-in-part of Ser. No. 370,315, Jun. 22, 1989, Pat. No. 5,242,612, which is a continuation-in-part of Ser. No. 210,831, Jun. 24, 1988, abandoned. This application Oct. 20, 1992, Ser. No. 963,971

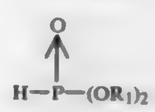
Int. Cl.⁵ C10M *137/00, 153/00*

U.S. Cl. 252—46.7 **10 Claims**

1. A hydrocarbon soluble or dispersible mixture of compounds comprising phosphorous- and sulfur-containing reaction product prepared by reacting an admixture comprising:

(1) at least one organic phosphite ester selected from esters represented by at least one of the formulas II, III or IV:

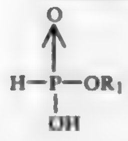
$$P(OR_1)_3 \qquad \text{II}$$



$$H-\overset{\overset{O}{\uparrow}}{P}-(OR_1)_2$$

III

-continued

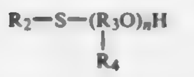


$$H-\overset{\overset{O}{\uparrow}}{\underset{\underset{OH}{|}}{P}}-OR_1$$

IV

wherein R_1, independently, represents the same or different C_1–C_5 saturated or unsaturated, straight or branched chain aliphatic hydrocarbyl radical;

(2) hydrocarbyl thioalkanol represented by at least one of the following formulas V or VI:



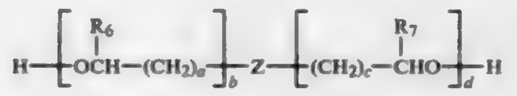
$$R_2-S-\underset{\underset{R_4}{|}}{(R_3O)_nH}$$

V

$$R_2-S-R_5-OH \qquad \text{VI}$$

wherein R_2 represents a C_8–C_{30} saturated or unsaturated, substituted or unsubstituted straight or branched chain hydrocarbyl radical having at most two unsaturated linkages; R_3 represents a C_2–C_4 alkanetriyl radical; R_4 represents H or a C_1–C_{18} saturated or unsaturated, substituted or unsubstituted straight or branched chain hydrocarbyl radical; R_5 represents a C_2–C_{30} saturated or unsaturated, substituted or unsubstituted straight or branched chain hydrocarbyl radical; and n represents a number of from about 1 to 6; and

(3) heterodialkanol having the following formula VII:



$$H-\left[O\underset{}{\overset{R_6}{\overset{|}{C}}}H-(CH_2)_a\right]_b-Z-\left[(CH_2)_c-\overset{R_7}{\overset{|}{C}}HO\right]_d-H$$

VII

wherein R_6 and R_7 each independently represent hydrogen, or a C_1–C_{12} alkyl; Z is a linking group selected from —S—, —O—, and $>NR_{18}$, wherein R_{18} is hydrogen, C_1–C_4 alkyl, or monohydroxy-substituted C_1–C_{12} alkyl; and; a, b, c and d each independently represent the same or different number 1–3; said reaction having been conducted at a temperature of from about 70° to about 130° C. for a period of from about 1 to about 10 hours at reduced pressure of from about −40 KPa to about −100 KPa so as to form said dispersible mixture of compounds comprising less than about 45 mole %, based on the entire mixture, of thioether containing species.

5,314,634

POLYESTER VISCOSITY INDEX IMPROVER

Dirk Kenbeek, Oudewater; Ramires R. Poulina, Gouda, and Gijsbert Van der Waal, Bergambacht, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Mar. 17, 1989, Ser. No. 324,821

Claims priority, application European Pat. Off., Mar. 18, 1988, 88200519.2

Int. Cl.⁵ C10M *129/95*

U.S. Cl. 252—56 R **7 Claims**

1. A polyester consisting essentially of:

a dimeric fatty acid containing 36 carbon atoms obtained by dimerization of C18 unsaturated fatty acids, and

a glycol without hydrogen atoms at an alpha carbon atom, wherein said polyester contains a C3-C12 monoalcohol chainstopper and said polyester contains approximately equivalent quantities of acid and alcohol groups.

5,314,635

BLEACH ACTIVATION

Ronald Hage, Leiden, and Jan E. Iburg, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

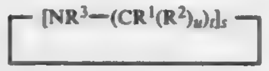
Filed Dec. 19, 1992, Ser. No. 992,215

Claims priority, application United Kingdom, Dec. 20, 1991, 9127060; Mar. 4, 1992, 9204706

Int. Cl.⁵ C11D *3/28, 3/39, 3/395;* **D06L** *3/02*

U.S. Cl. 252—102 **20 Claims**

1. A cleaning composition comprising from about 1 to 50% by weight of a surface active material and from 0.0015 to about 1.5% by weight of a ligand L, uncomplexed with manganese prior to addition to a wash medium, of formula (I):



$$[NR^3-(CR^1(R^2)_u)_t]_s$$

(I)

wherein:
- t is an integer from 2 or 3:
- s is an integer from 3 to 4;
- u is zero or one;
- R^1, R^2 and R^3 are each optionally substituted and independently selected from the group consisting of hydrogen alkyl, and aryl.

5,314,636

LIQUID CLEANING PRODUCTS

Johannes H. Rek, Vlaardingen; Mark P. Houghton, Rotterdam, and Rudolf C. Verheul, Utrecht, all of Netherlands, assignors to Lever Industrial Company, Division of Indopco Inc., Bridgewater, N.J.

Filed Nov. 16, 1992, Ser. No. 977,310

Claims priority, application United Kingdom, Nov. 18, 1991, 9124489

Int. Cl.⁵ C11D *3/08*

U.S. Cl. 252—139 **7 Claims**

1. A substantially non-aqueous liquid detergent composition comprising:

a liquid phase having an organic polar solvent and a particular solid phase dispersed within the liquid phase, the solid phase comprising from about 10% to about 60% by weight based on the total weight of the composition of a substantially amorphous sodium metasilicate having at most 10% by weight of a crystalline sodium metasilicate and less than 6% by weight of water,

wherein the non-aqueous liquid detergent composition contains less than 10% by weight of water.

5,314,637

DETERGENT COMPRISING ISOLATED CELLULASE FROM *BACILLUS* FERM BP-3431 OR A MUTANT STRAIN THEREOF, SURFACTANT AND BUILDER

Kiyoshi Saito; Masahiko Seko, and Eiko Masatsuji, all of Tokyo, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 734,662, Jul. 23, 1991, Pat. No. 5,231,022. This application Mar. 11, 1993, Ser. No. 29,623

Claims priority, application Japan, Jul. 24, 1990, 2-193883

Int. Cl.⁵ C11D *17/00;* **C12N** *9/42, 1/20, 1/00*

U.S. Cl. 252—174.12 **1 Claim**

1. A detergent comprising:

(a) an isolated cellulase produced by a Bacillus strain FERM BP-4331, or a mutant strain thereof, having the following properties:

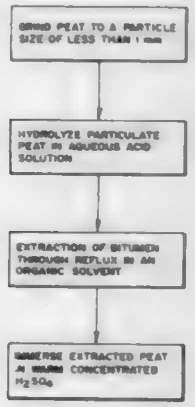
(1) an optimum pH range of 9.5 to 10.5 as measured using carboxymethylcellulose as a substrate;

(2) a stable pH range of 6 to 11 as measured using carboxymethylcellulose as a substrate;
(3) an optimum temperature of about 55° C. as measured using carboxymethylcellulose as a substrate;
(4) influence of a surfactant being such that residual activity is 90% or more after treatment at 30° C. and pH of 9.0 for 2 hours in the presence of a sodium n-alkylbenzenesulfonate;
(5) a molecular weight of 52,000±2,000 as measured by SDS-PAGE;
(6) an isoelectric point of 4.2±0.2 as measured by PAGE;
(b) a surfactant; and
(c) a builder.

5,314,638
ION EXCHANGE MATERIALS PRODUCED FROM HYDROLYZED, DEBITUMINIZED, SULFONATED PEAT

Gerald H. Morine, and Steven A. Spigarelli, both of Bemidji, Minn., assignors to Bemidji State University Foundation, Bemidji, Minn.

Filed Aug. 30, 1991, Ser. No. 753,386
Int. Cl.^{5} C01B *31/16*
U.S. Cl. 252—184 **5 Claims**


GRIND PEAT TO A PARTICLE SIZE OF LESS THAN 1 mm
HYDROLYZE PARTICULATE PEAT IN AQUEOUS ACID SOLUTION
EXTRACTION OF BITUMEN THROUGH REFLUX IN AN ORGANIC SOLVENT
IMMERSE EXTRACTED PEAT IN WARM CONCENTRATED H_2SO_4

1. The method of preparing a cation exchange material from peat which includes the steps of:
(a) passing a supply of dried peat through a treating chamber to reduce the particle size to less than about 1 mm;
(b) hydrolyzing the particulate peat in an aqueous solution having a pH of less than about 2 to separate the soluble components therefrom;
(c) refluxing the residual hydrolyzed peat in an organic solvent selected from the group consisting of petroleum ether, 2-butanone, 2-propanol, toluene, and mixtures of 2-propanol and toluene to extract solvent soluble bitumen therefrom, and thereafter drying the refluxed peat of residual solvent; and
(d) thereafter reacting the solvent-free treated peat with concentrated sulfuric acid at a temperature greater than about 100 degrees C. for at least about one hour, and thereafter removing the remaining sulfuric acid.

5,314,639
AGGLOMERATION OF SOLID PEROXIDES

Reinder Torenbeek, Terwolde, Netherlands, assignor to Akzo N.V., Netherlands

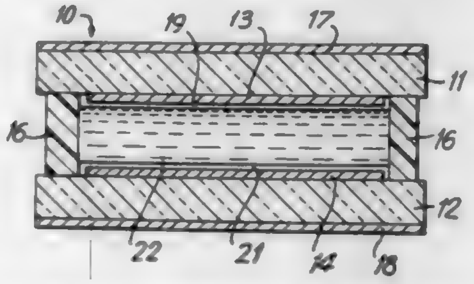
Filed Jan. 28, 1991, Ser. No. 647,336
Claims priority, application European Pat. Off., Feb. 7, 1990, 90200265.8
Int. Cl.^{5} C01B *15/00*
U.S. Cl. 252—186.23 **8 Claims**

1. A process for the production of agglomerates of organic peroxides that are solid at room temperature and which decompose rapidly when heated to their melting point, said process comprising agitating an aqueous suspension comprising a solid first peroxide which decomposes rapidly when heated to its melting point and a solid second peroxide which does not rapidly decompose when heated to its melting point and has a melting point which is substantially lower than the temperature at which said first peroxide rapidly decomposes, at a temperature sufficient to at least partially melt said second peroxide and below the decomposition temperature of said first peroxide, wherein said second peroxide is present in the aqueous suspension in an amount of from 5–100% by weight, based on said first peroxide continuing said agitating to produce agglomerates comprised of both said first peroxide and second peroxide; cooling with continued agitation the aqueous suspension having agglomerates to a temperature at which said second peroxide turns solid; and isolating the agglomerates.

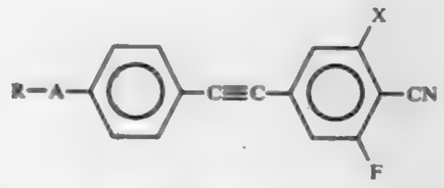
5,314,640
TOLAN DERIVATIVES, LIQUID CRYSTAL COMPOSITIONS INCLUDING SAME, LIQUID CRYSTAL DISPLAY DEVICES INCLUDING THE COMPOSITIONS AND METHOD OF PREPARATION

Shuhei Yamada, Suwa, Japan, assignor to Seiko Epson Corporation, Nagano, Japan

Filed Feb. 8, 1991, Ser. No. 652,818
Claims priority, application Japan, Feb. 16, 1990, 2-35692; Feb. 23, 1990, 2-55570; Apr. 12, 1990, 2-96916; Jun. 5, 1990, 2-146766; Jun. 6, 1990, 2-148095
Int. Cl.^{5} C09K *19/06, 19/30, 19/12;* C07C *255/00*
U.S. Cl. 252—299.6 **26 Claims**

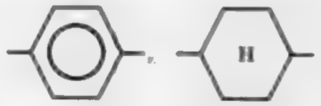


1. A tolan derivative represented by the general formula:



(1)

wherein R is a straight chain alkyl group having from 1 to 10 carbon atoms, A is either



or a single bond, and X is hydrogen or fluorine.

5,314,641
PRODUCTION OF CRYSTALLITES OF CERIUM/LANTHANUM/TERBIUM PHOSPHATES FROM INSOLUBLE RARE EARTH SALTS

Marie-Pierre Collin, Epinay sur Seine; Denis Huguenin, Levallois, and Anne-Marie Le Govic, Paris, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 20, 1992, Ser. No. 914,594
Claims priority, application France, Jul. 19, 1991, 91 09142
Int. Cl.^{5} C09K *11/81*
U.S. Cl. 252—301.4 P **9 Claims**

1. A process for the production of needle-shaped crystallites of a cerium lanthanum terbium phosphate having the formula (I):

$$La_xCe_yTb_{(1-x-y)}PO_4 \qquad (I)$$

in which x and y are numbers, with x being in a range of from 0.4 to 0.6 and x+y being greater than 0.8, the LaCeTb phosphate crystallites having lengths in the range of from 50 nm to 200 nm and widths in the range of from 10 nm to 50 nm comprising (a) admixing a phosphate containing not more than one unneutralized acidic functional group with an aqueous suspension of a cerium lanthanum terbium oxalate or of a mixture of lanthanum, cerium and terbium oxalates to form a reaction mixture, (b) heating and maintaining the reaction medium thus formed at a temperature of at least 70° C., and (c) separating the resulting precipitate from said reaction medium and, optionally, drying same.

5,314,642
INTERACTION SYSTEM COMPRISING A SURFACTANT-STABILIZED AQUEOUS PHASE CONTAINING AN ANTIBODY FRAGMENT

Charles N. Durfor, Rockville, Md.; Richard J. Bolin, Fairfax; Allen R. Schantz, II, Reston, both of Va., and Richard J. Massey, Rockville, Md., assignors to IGEN, Inc., Rockville, Md.

Continuation of Ser. No. 188,251, Apr. 29, 1988, abandoned, and a continuation-in-part of Ser. No. 674,253, Nov. 27, 1984, Pat. No. 4,888,281. This application Aug. 31, 1992, Ser. No. 938,489
Int. Cl.^{5} B01J *13/00*
U.S. Cl. 252—309 **40 Claims**

1. An interaction system, including an antibody or antibody fragment having functional capability, which comprises a surfactant-stabilized microheterogeneous dispersion of aqueous phase in a water-immiscible medium, said aqueous phase containing an amount of said antibody or said fragment in a functional state sufficient to effect the interaction; wherein said antibody or antibody fragment is adapted to effect a catalytic conversion of one or more reactants into one or more products.

5,314,643
HIGH TEMPERATURE CORROSION INHIBITOR

James G. Edmondson, Conroe, and S. Blake Pruett, Montgomery, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

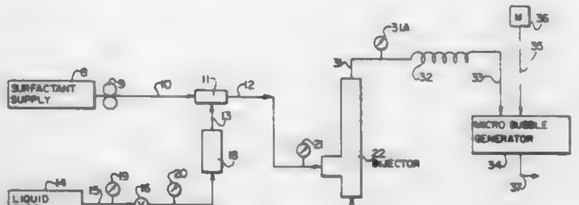
Filed Mar. 29, 1993, Ser. No. 38,431
Int. Cl.^{5} C23F *11/16*
U.S. Cl. 252—389.23 **8 Claims**

1. A process or inhibiting the corrosion of the internal metallic surfaces of the equipment used in the processing of crude oil at temperatures between 400° F. and 790° comprising adding to the crude oil a corrosion inhibiting amount of a composition comprising a trialkylphosphate containing an alkyl moiety of C_1–C_{12} and an alkaline earth metal phosphonate-phenate sulfide in which from 20–40 percent of the phenol hydroxy groups have been phosphonated.

5,314,644
MICROBUBBLE GENERATOR

Donald L. Michelsen, Blacksburg, and Felix Sebba, late of Blacksburg, Va. by Thomas M. Murphy, executor, assignors to Virginia Polytechnic Institute and State University, Blacksburg, Va.

Filed Oct. 19, 1992, Ser. No. 962,903
Int. Cl.^{5} B01F *3/04*
U.S. Cl. 261—84 **12 Claims**

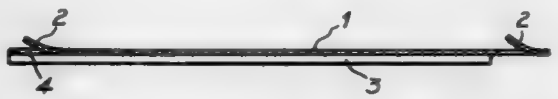


1. Apparatus for continuously generating a liquid fine dispersion of small micron-size gas bubbles, comprising:
a chamber having a cylindrical inner side wall surface, a longitudinal axis, first and second opposite ends, an inlet at said first end for admitting a liquid course dispersion into said chamber, and an outlet at said second end;
an elongated cylindrical rotor rotationally mounted within said chamber between said chamber first and second ends for forming a microbubble fine dispersion from the liquid course dispersion in said chamber, said rotor being coaxial with said chamber and having an outer side wall surface, said outer side wall surface defining with said inner side wall surface of said chamber an annular space between said outer side wall surface and said inner side wall surface;
crossing helical members extending radially outwardly substantially equal distances from said outer side wall surface of said rotor; and
a plurality of baffle plates spaced apart around said rotor and extending longitudinally in said annular space between said rotor outer side wall surface and said chamber inner side wall surface, said baffle plates being mounted in said chamber independently of said rotor and being oriented radially with respect to said longitudinal axis, and said baffle plates having an inner longitudinal edge spaced from said outer side wall surface of said rotor to define an inner gap.

5,314,645
PACKING ELEMENT

Frank Rukovena, Tallmadge, Ohio, assignor to Norton Chemical Process Products Corp., Worcester, Mass.

Filed Jan. 22, 1993, Ser. No. 7,866
Int. Cl.^{5} B01F *3/04*
U.S. Cl. 261—94 **6 Claims**



1. A packing element formed by bending a metal strip into a generally cylindrical shape with overlapping ends, said ends being provided with attachment means which releasably engage to hold the ends together when overlapped, wherein the attachment means comprises at least one pair of flaps projecting from the plane of the strip at essentially the same angle and in the same direction, with each flap located adjacent an end of

the strip in the region of overlap when the element is formed, and at least one cooperating slot adjacent one of the flaps such that the flap formed on the opposed end engages with the slot when the element is formed.

5,314,646

METHOD FOR THE PRODUCTION OF A CERAMIC MOULDING

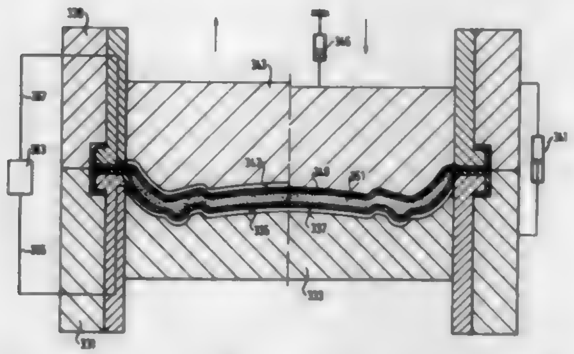
Klaus Strobel, and Karl Schwarzmeier, both of Selb, Fed. Rep. of Germany, assignors to Hutschenreuther AG, Selb, Fed. Rep. of Germany

Filed Apr. 19, 1991, Ser. No. 688,166

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1990, 4012700

Int. Cl.⁵ C04B *33/32, 33/34;* **B28B** *7/34*

U.S. Cl. 264—6 **34 Claims**



1. A method for making a ceramic product, comprising shaping a ceramic moulding composition into a moulding of stable form and firing of the moulding, wherein shaping comprises:

a first shaping operation in which the moulding composition is shaped to a pre-moulding of stable form geometrically similar to the moulding, performed in a mould cavity comprising a substantially rigid shaping surface and while the moulding composition, is in shaping contact with the substantially rigid shaping surface; and

a second shaping operation in which the pre-moulding is reduced in volume and reshaped into the moulding while enclosed by a protective skin system, performed by pressing with a pressing fluid acting on all sides of the pre-moulding and as the enclosed pre-moulding is substantially out of contact with the substantially rigid shaping surface, the protective skin system having such thickness and flexibility as to have substantially no influence on the reshaping;

the protective skin system being formed by first and second diaphragms, each having a side remote from the moulding composition, and the second shaping operation comprising subjecting the diaphragms to fluid pressure on the respective sides remote from the pre-moulding.

5,314,647

METHOD OF MAKING CELLULOSE ESTER PHOTOGRAPHIC FILM BASE

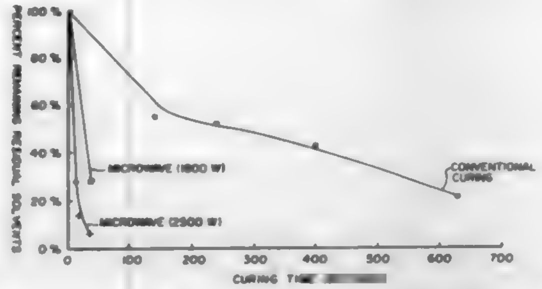
John E. Rieth, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1992, Ser. No. 915,223

Int. Cl.⁵ B29D *7/01;* **B29C** *35/10;* **B29K** *1/00*

U.S. Cl. 264—25 **9 Claims**

1. In a method of making a cellulose ester photographic film base which comprises casting a cellulose ester polymer in a solvent onto a moving surface, stripping the film from the surface and drying in hot air the improvement which comprises removing the final portion of the solvent present in the film by subjecting the film to microwave radiation.



5,314,648

TIRE VULCANIZING MACHINE AND METHOD

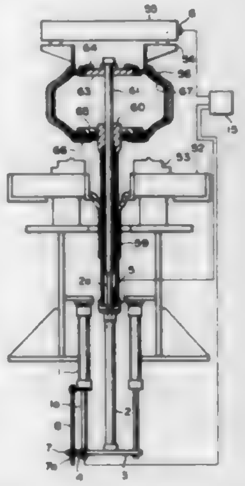
Katsumi Ichikawa; Keiji Ozaki, and Hisanori Ohshiba, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 16, 1992, Ser. No. 991,598

Claims priority, application Japan, Dec. 16, 1991, 3-353305; Dec. 16, 1991, 3-353306

Int. Cl.⁵ B29C *35/00*

U.S. Cl. 264—40.5 **3 Claims**



1. A tire vulcanizing machine comprising:

a bladder;

a lower clamping ring for holding the bladder at the lower end thereof;

an upper clamping ring for holding the bladder at the upper end thereof;

a lower bead ring for fastening the lower end of the bladder to the lower clamping ring;

an upper bead ring for fastening the upper end of the bladder to the upper clamping ring;

a first lifting mechanism for vertically moving the lower clamping ring;

a second lifting mechanism for vertically moving the upper clamping ring;

a loader provided with a chuck, for disposing a green tire held by the chuck so as to surround the bladder extended between the upper and lower clamping rings and for locating the green tire so that the horizontal center plane thereof coincides with the middle point between the upper and lower ends of the bladder;

a third lifting mechanism for vertically moving the loader; and

a controller for controlling the operation of the first, second and third lifting mechanisms;

wherein a first position detecting means is placed in connection with the first lifting mechanism to detect the stroke of the first lifting mechanism, a second position detecting means is placed in connection with the second lifting mechanism to detect the stroke of the second lifting mechanism, a third position detecting means is placed in connection with the loader to detect the vertical position of the loader, and the controller controls the operation of the first and second lifting mechanisms according to detection signals provided by the first and second position detecting means so that the upper and lower clamping rings are moved synchronously toward each other respectively at equal moving speeds and the horizontal center plane of the green tire held on the loader is kept in coincidence with the middle point between the upper and lower ends of the bladder as the bladder is inflated.

2. A method of shaping a green tire on a tire vulcanizing machine comprising a bladder, a vertically movable lower clamping ring, a vertically movable upper clamping ring, a lower bead ring fastening the lower end of the bladder to the lower clamping ring, an upper bead ring fastening the upper end of the bladder to the upper clamping ring, and a loader for holding a green tire, said method comprising steps of:

extending the bladder between the upper and lower clamping rings;

placing the green tire held by the loader so as to surround the bladder extended between the upper and lower clamping rings with the horizontal center plane of the green tire in coincidence with the middle point between the upper and lower ends of the bladder;

supplying a pressurized fluid into the bladder to expand the bladder so that the bladder conforms to the inner surface of the green tire to shape the green tire;

detecting the positions of the upper and lower clamping rings; and

moving the upper and lower clamping rings synchronously toward each other respectively at equal moving speeds as the bladder is expanded and in accordance with the detected positions thereof so that the middle point between the upper and lower ends of the bladder is kept in coincidence with the horizontal center plane of the green tire, and the upper and lower clamping rings and the loader holding the green tire are lowered simultaneously to seat the green tire on a bottom mold for vulcanization after the green tire has been shaped.

5,314,649

Patent Not Issued For This Number

5,314,650

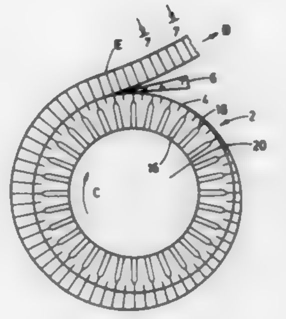
METHOD FOR EXTRUDING HONEYCOMBS

Meryle D. W. Adler, Corning; Rodney D. Bagley, Big Flats; Rodney I. Frost, Corning, all of N.Y.; John G. Lanning, New Bedford, Mass., and H. Gordon Shafer, Jr., Rockstream, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Feb. 23, 1993, Ser. No. 21,255

Int. Cl.⁵ B29C *47/00*

U.S. Cl. 264—56 **15 Claims**



1. A method of forming honeycomb structures in sheet form comprising:

providing an extrusion system comprising:

an extrusion die with a continuous outer surface and having intersecting passages configured to discharge material extruded from said extrusion die in a honeycomb configuration and

cutting means positionable proximate to the outer surface of said extrusion die to cut material extruded through the intersecting passages;

advancing formable material to said extrusion die, through the intersecting passages, and outwardly from the outer surface to form a honeycomb extrudate; and

imparting relative rotation between said extrusion die and said cutting means, whereby said cutting means removes the honeycomb extrudate from the outer surface of said extrusion die as an elongate sheet.

5,314,651

FINE-GRAIN PYROELECTRIC DETECTOR MATERIAL AND METHOD

Bernard M. Kulwicki, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1992, Ser. No. 890,891

Int. Cl.⁵ F27D *7/02;* **C04B** *35/46*

U.S. Cl. 264—65 **14 Claims**

1. A method of forming a pyroelectric material for use in a thermal detector comprising the steps of:

combining barium acetate, strontium acetate, calcium nitrate, a nitrate salt of a donor ion selected from the group consisting of Nb, Ta, Bi, Sb, Y, La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, Er and combinations thereof, tetraisopropyl titanate, lactic acid and water to form a common solution;

directly pyrolizing said common solution to form a mixed oxide;

crushing said mixed oxide to form a fine powder;

pressing said fine powder into a block; and

sintering said block in oxygen to form a ceramic.

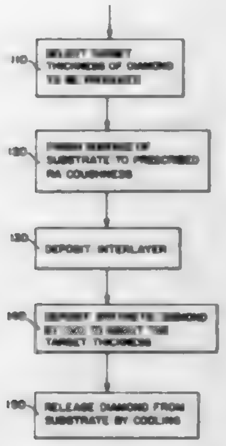
5,314,652
METHOD FOR MAKING FREE-STANDING DIAMOND FILM

Matthew Simpson, Arlington, and Robert M. Frey, Worcester, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Nov. 10, 1992, Ser. No. 973,994

Int. Cl.^{5} B29C *41/42, 41/48;* **C23C** *16/76, 16/50*

U.S. Cl. 264—81 **18 Claims**



1. A method for making a free-standing synthetic diamond film of a target thickness, comprising the steps of:

providing a substrate;

selecting a target thickness of diamond to be produced, said target thickness being in the range 200 microns to 1000 microns;

finishing a surface of the substrate to a roughness, R_A, that is a function of the target thickness, said roughness being determined from

$$0.38t/600\ \mu m \leqq R_A \leqq 0.50\ \mu m \quad 200\ \mu m < t \leqq 600\ \mu m$$

$$0.38\ \mu m \leqq R_A \leqq 0.50\ \mu m \quad 600\ \mu m < t < 1000\ \mu m$$

where t is the target thickness;

depositing an interlayer on said substrate, the interlayer having a thickness in the range from 1 to 20 microns;

depositing synthetic diamond on said interlayer, by chemical vapor deposition, to about the target thickness; and

cooling said synthetic diamond to effect the release thereof.

5,314,653
UNIFORMLY EXPANDABLE MOLD AND METHOD

Constantine Haralambopoulos, Rochester, N.Y., assignor to Harold Gell, P.C., Silver Spring, Md.

Filed Oct. 21, 1992, Ser. No. 964,285

Int. Cl.^{5} B29C *41/14*

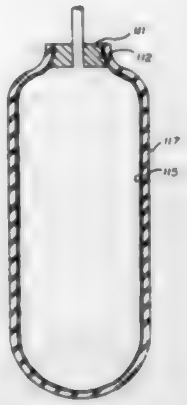
U.S. Cl. 264—301 **17 Claims**

12. A method for fabricating an article, including the steps of:

applying a curable liquid elastomeric material to a mold core;

uniformly expanding said mold core and said elastomeric material after said elastomeric material is at least partially cured;

coating said elastomeric material on said mold core with a second material;



returning said mold core and said elastomeric material to their original relaxed state.

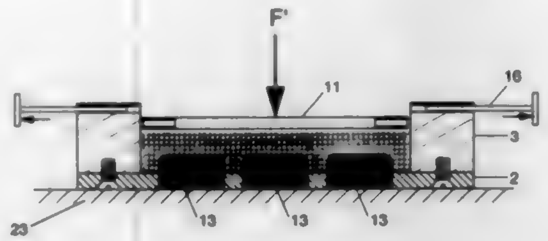
5,314,654
METHOD FOR FORMING STRUCTURAL COMPONENTS FROM DRY WOOD FIBER FURNISH

Dennis E. Gunderson, Madison, and Roland L. Gleisner, Jefferson, both of Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 675,979, Mar. 25, 1991, Pat. No. 5,198,236. This application Nov. 16, 1992, Ser. No. 976,821

Int. Cl.^{5} B29C *43/02*

U.S. Cl. 264—517 **10 Claims**



1. A method of forming a product of wood fiber, said product having non-uniform cross-sectional shapes and a substantially uniform density, comprising the steps of pretreating said wood fiber with adhesive, providing mold means, providing movable porous mandrels within said mold means, providing removable perforated plate means in said mold means through which said mandrels may move, providing removable compacted mat forming means on said plate means, causing an air flow through said mold means and said mandrels, supplying said pretreated wood fiber in a dry condition into said air flow to cause said wood fibers to deposit in the spaces between said mandrels on said plate means while said mandrels on said plate means while said mandrels are in a first position in said mold means, first compacting said deposited wood fiber, repeating said air flow step and said supplying wood fiber step while said mandrels are in a second position in said mold means, again compacting said wood fiber while simultaneously moving said mandrels out of contact with the thus compacted mat of wood fiber, removing said mat with said plate means and said frame means from said mold means with said mat being held in said compacted condition by said plate means and said frame means, and completing the forming of said product from said mat by inserting a rubber pillow and a solid block into the cavity and producing additional vertical compaction before deforming the pillow on said mat using said frame means and said plate means externally of said mold means.

5,314,655
METHOD AND APPARATUS FOR PRODUCING CONTINUOUS POWDER METALLURGY COMPACTS

Geoffrey Greetham, Ipswich, England, assignor to Manganese Bronze Limited, Ipswich, England

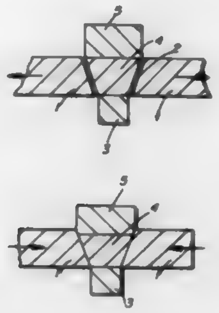
PCT No. PCT/GB89/01437, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO90/06199, PCT Pub. Date Jun. 14, 1990

PCT Filed Dec. 10, 1989, Ser. No. 689,915

Claims priority, application United Kingdom, Dec. 2, 1988, 8828123

Int. Cl.^{5} B22F *3/02*

U.S. Cl. 419—3 **18 Claims**



1. An apparatus for producing continuous powder metallurgy compacts, which apparatus comprises:

a one-piece forming die for charging a metal having an inlet for charging a metal powder to be compacted into the die and an outlet for said compacted powder charge; a powder consolidation region disposed between said inlet and said outlet and tapered about a first axis in the direction towards said outlet;

means for stopping the outlet in the forming die at start up to retain in said consolidation region metal powder introduced initially into the said region;

means for effecting ultrasonic radial vibration in said forming die along axes radiating from said first axis in a plane substantially normal to said first axis to consolidate a powder charge in said consolidation region; and

restrainer means located above said powder charge for preventing movement of said charge within the consolidation region away from said outlet during the said radial vibration in the forming die.

11. A method for producing continuous powder metallurgy compacts, which method comprises:

introducing a metal powder charge into a powder consolidation region of a unitary forming die, which consolidation region is tapered about a first axis in a direction towards an outlet in the forming die;

inducing ultrasonic radial vibration in said forming die along axes radiating from said first axis in a plane substantially normal to said first axis to consolidate said powder charge;

preventing movement of said metal powder charge within the consolidation region in a direction away from the outlet in the forming die during vibration in the forming die; and

removing consolidated powder from the consolidation region through the outlet in the forming die.

5,314,656
SYNTHESIS OF TRANSITION METAL CARBONITRIDES

Zuhair A. R. Munir, and Maryam Eslamloo-Grami, both of Davis, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Nov. 20, 1992, Ser. No. 979,025

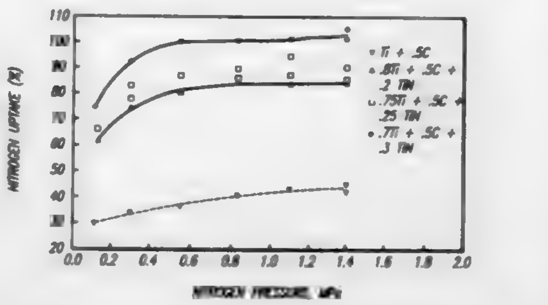
Int. Cl.^{5} B22F *1/00*

U.S. Cl. 419—13 **6 Claims**

1. A method for preparing a single-phase transition metal carbonitride, comprising:

forming a mixture of at least one transition metal powder and a transition metal nitride as an additional source of transition metal with elemental carbon in an atomic ratio of metal:carbon corresponding to that in said transition metal carbonitride;

pressing the powder mixture to form a compressed green body; and



initiating a self-propagating wave reaction in said green body by imparting energy to said green body at an end thereof under an atmosphere of essentially pure nitrogen at a pressure in the range of about 0.1 to about 1.4 Mpa.

5,314,657
SINTERED CARBONITRIDE ALLOY WITH IMPROVED TOUGHNESS BEHAVIOR AND METHOD OF PRODUCING SAME

Ake Ostlund, Taby, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Jul. 6, 1993, Ser. No. 86,132

Claims priority, application Sweden, Jul. 6, 1992, 9202090

Int. Cl.^{5} C22C *29/04*

U.S. Cl. 419—15 **8 Claims**

1. A method of manufacturing a titanium-based carbonitride alloy comprising hard constituents in a binder phase based on a metal taken from the group consisting of cobalt, nickel and mixtures thereof where the composition of the hard constituent phase is represented by the formula with molar indexes:

$$(Ti_a,Ta_b,Nb_c,V_d)_x(Mo_e,W_f)_y(C_g,N_h)_z$$

where:

$0.88<a<0.96$;
$0.04<b<0.08$;
$0 \leqq c<0.04$;
$0 \leqq d<0.04$;
$0.60<f<0.73$;
$0.80<x<0.90$;
$0.31<h<0.40$;
$a+b+c+d=1$;
$e+f=1$;
$g+h=1$;
$x+y=1$; and
$0<z<1$;

comprising forming a powder mixture containing the following powders:

23–28% by weight Ti(C,N) with a nitrogen content between 9 and 13% by weight;

13–17% by weight (Ti,Ta)(C,N) with a Ti/Ta ratio of 80/20;

14–18% by weight (Ti,Ta)C with a Ti/Ta ratio of 50/50;

15–20% by weight WC; and

3–7% by weight Mo_2C provided that the total amount of said powders is >78% by weight and <83% by weight and the remaining starting materials are added as TiN, NbC, VC, Co and/or Ni, pressing the powder mixture and sintering the pressed mixture to form the said carbonitride alloy.

5,314,658

CONDITIONING METAL POWDER FOR INJECTION MOLDING

David N. Meendering, Willoughby Hills, Ohio; Deepak Malhotra, Golden, and Linda K. Baltich, Arvada, both of Colo., assignors to AMAX, Inc., New York, N.Y.

Filed Apr. 3, 1992, Ser. No. 869,724

Int. Cl.^{5} B22F *1/00*

U.S. Cl. 419—33 **23 Claims**

1. A process for providing a metal powder feedstock, comprising:

A. providing an as-received metal powder having a non-spherical particle shape; and

B. conditioning the as-received metal powder using a fluid energy mill effective to provide a metal powder feedstock suitable for injection molding.

5,314,659

HARD FACING CHROMIUM-BASE ALLOYS

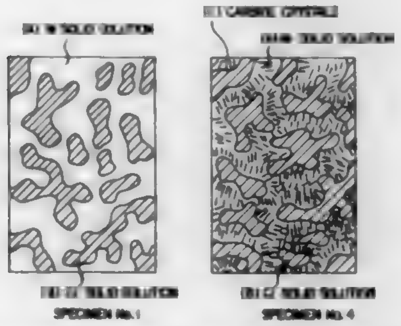
Kensuke Hidaka, Kyoto; Kanichi Tanaka, Yawata; Yoshio Kohira, Uji; Hideshi Yamaguchi, Ichinomiya; Yoshinao Suzuki; Masahiro Nakagawa, both of Toyota; Yoshio Fuwa, Toyota; Kazuhiko Mori, Toyota; Yoshihiko Ito, Toyota, and Atsushi Taguchi, Oobu, all of Japan, assignors to Fukuda Metal Foil & Powder Co., Ltd., Kyoto, Japan

Filed May 15, 1992, Ser. No. 883,960

Claims priority, application Japan, Aug. 27, 1991, 3-214026; Dec. 13, 1991, 3-329196; Dec. 13, 1991, 3-329197; Dec. 13, 1991, 3-329198; Dec. 13, 1991, 3-329199; Dec. 13, 1991, 3-329200; Jan. 31, 1992, 4-015995; Mar. 31, 1992, 4-076631

Int. Cl.^{5} C22C *27/06*

U.S. Cl. 420—428 **7 Claims**



1. A hard facing chromium-base alloy consisting essentially of 30.0 to 48.0% by weight of nickel, at least one member selected from the group consisting of 1.5 to 15.0% by weight of tungsten and 1.0 to less than 6.5% by weight of molybdenum, one or more of 15.0 or less % by weight of iron and 10.0 or less % by weight of cobalt, at least one member selected from the group consisting of 0.3 to 2.0% by weight of carbon, 0.1 to 1.5% by weight of boron and 0.1 to 1.5% by weight of silicon, 0.5 to 2.5% by weight of aluminum, the balance comprising 40.0 or more % by weight of chromium and unavoidable impurities, the maximum sum of tungsten and molybdenum being less than 15.0% by weight, the maximum sum of iron and cobalt being 20% by weight, the and the weight ratio of chromium to nickel being at least 1.

5,314,660

USE OF CATIONIC ALKYL-PHOSPHONIUM SALTS AS CORROSION INHIBITORS IN OPEN RECIRCULATING SYSTEMS

Brian E. Clark, Aurora, and Ronald L. Oleka, Oakville, both of Canada, assignors to Grace Dearborn Inc., Mississauga, Canada

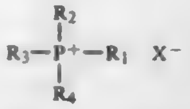
Filed Jan. 28, 1993, Ser. No. 10,201

Claims priority, application Canada, Feb. 14, 1992, 2061249-5

Int. Cl.^{5} C23F *11/00*

U.S. Cl. 422—15 **10 Claims**

1. A method for inhibiting corrosion of metals which are in contact with an aqueous system which comprises adding to the system, in a dosage range between 0.1 ppm to 500 ppm, a water soluble, cationic alkyl phosphonium salt having the formula:



$$R_3-\overset{\displaystyle R_2}{\overset{|}{\underset{\underset{\displaystyle R_4}{|}}{P^+}}}-R_1 \quad X^-$$

wherein R_1, R_2, R_3, and R_4 are each independently selected from the group consisting of C_1 to C_{18} alkyl, C_5 to C_7 cycloalkyl or aryl, and wherein X is an anion selected from the group consisting of halide, alkosulfate, tosylate, carboxylate, sulfonate, sulfate, phosphate, phosphonate, acetate, or nitrate; monitoring the corrosion rate of the metals in the system, and if the corrosion rate is unacceptable, modifying the dosage of the cationic alkyl phosphonium salt to a dosage which effectively inhibits corrosion of the metals.

5,314,661

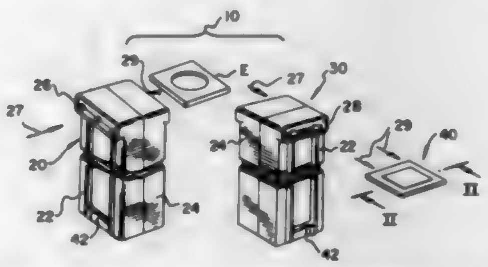
KIT OF TEST ELEMENTS AND LIQUID-BEARING CONTAINERS

Paul J. Mulqueen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 14, 1992, Ser. No. 990,164

Int. Cl.^{5} G01N *1/28;* **B65D** *83/10*

U.S. Cl. 422—57 **6 Claims**



1. A kit of slide articles for use in an analyzer, said kit comprising:

a stack of slide test elements, each element comprising dried layers at least one of which comprises at least one reagent necessary to produce a detectable change in the presence of an analyte, and a frame around said layers; and

a stack of sealed slide containers bearidg a predetermined reagent liquid, said containers having substantially the same outside dimensions of width, length and thickness as said slide test elements so that said containers are processable in an analyzer just like a slide test element.

5,314,662

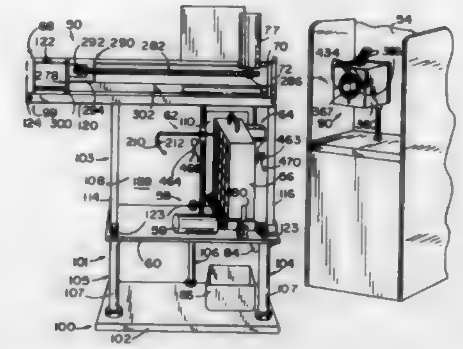
SAMPLE AUTOLOADER FOR USE WITH AN ANALYTICAL COMBUSTION FURNACE

Wayne R. Hemzy, St. Joseph, and Thomas G. Knapp, Coloma, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 8, 1993, Ser. No. 28,787

Int. Cl.^{5} G01N *31/00;* **B65G** *25/00;* **B66C** *17/08*

U.S. Cl. 422—62 **21 Claims**



1. An automatic sample loader for use with an analytical combustion furnace having a horizontal combustion tube comprising:

a first frame member comprising a first horizontal plate vertically separated from a second horizontal plate by a plurality of vertical column members;

a guide rail mounted on said first horizontal plate;

a first carriage member movably mounted on said guide rail;

a hotel member removably mounted on said carriage member, said hotel member comprising a frame having a top and a bottom member vertically spaced by attached end members with a plurality of vertically spaced horizontal plates connected at each end to said end members for carrying a plurality of combustion tools;

motor means for moving said carriage member;

a second frame member attached to and vertically spaced above said first frame member;

a pair of horizontally spaced vertical end plates on said second frame member with one of said end plates having an aperture therein;

a pair of spaced horizontal guide rods supported by said end plates;

a second carriage member movably supported on said guide rods, said second carriage member comprising a furnace seal member having an aperture therein and a guide member spaced from said furnace seal member;

a rotary actuator support member on said guide rods, and a rotary actuator member carried on said rotary actuator support member;

a motor on said second carriage member for reversibly moving said rotary actuator support member;

a boat retrieval rod supported by said rotary actuator member, said boat retrieval rod extending through said furnace seal member, a hook member on the distal end of said boat retrieval rod, said rotary actuator member for reversibly rotating said boat retrieval rod and hook member from a first position where said hook member extends horizontally to a second position where said hook member extends downwardly;

a first vertical guide rail mounted on one side of said first carriage ember;

a first actuator member movably supported on said first vertical guide rail, said actuator member comprising a pneumatic cylinder having a horizontally extendible rod member for pushing combustion boats from said hotel member;

motor means for reversibly vertically moving said first actuator member on said first vertical guide rail;

a second vertical guide rail mounted on the other side of said first carriage member; and

an elevator means movably mounted on said second vertical guide rail for receiving combustion boats from said hotel member and for delivering said combustion boats to a position where said combustion boats can be pushed by said boat retrieval rod.

5,314,663

AUTOMATIC ANALYSIS APPARATUS FOR CLINICAL EXAMINATION

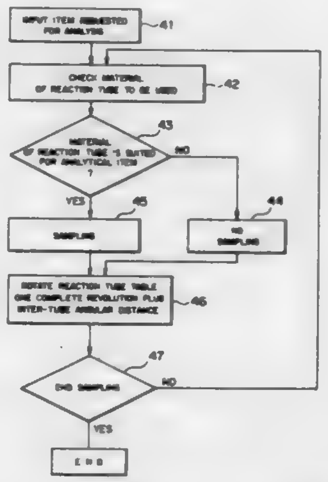
Tomonori Mimura, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1992, Ser. No. 944,933

Claims priority, application Japan, Sep. 18, 1991, 3-238181

Int. Cl.^{5} G01N *35/02*

U.S. Cl. 422—67 **12 Claims**


INPUT ITEM REQUESTED FOR ANALYSIS
41
CHECK MATERIAL OF REACTION TUBE TO BE USED
42
43
MATERIAL OF REACTION TUBE IS SUITED FOR ANALYTICAL ITEM ?
NO
YES
45
44
SAMPLING
NO SAMPLING
ROTATE REACTION TUBE TABLE ONE COMPLETE REVOLUTION PLUS INTER-TUBE ANGULAR DISTANCE
46
47
END SAMPLING
NO
YES
END

1. An automatic analysis apparatus for clinical examination, comprising:

sample holding means for holding a plurality of samples;

reagent holding means for holding a plurality of reagents;

a reaction tube holding unit for holding reaction tubes to conduct reactions between said samples and said reagents;

input means for inputting analytical items for the respective samples;

a sample pipetting unit for pipetting one of said samples into one of said reaction tubes;

a reagent pipetting unit for pipetting one of said reagent into said one reaction tube;

a mixing unit for mixing the sample and the reagent pipetted into said reaction tube;

a light intensity measuring unit for measuring absorbance of a reactant liquid within said reaction tube;

a reaction tube cleaning unit for discharging the reactant liquid from said reaction tube and cleaning said reaction tube; and

a control unit for controlling operations of the automatic analysis apparatus as a whole;

wherein said reaction tube holding unit includes means or holding plural types of reaction tubes, said plural types of reaction tubes including at least one reaction tube made of a different material than at least one other reaction tube; and

wherein said control unit includes selecting means for selecting a reaction tube form said plural types of reaction tubes based on the type of material of said selected reaction tube, the selected reaction tube being made of a material to which one of said reagents to be used for one of said analytical items of a sample as inputted through said input means does not adhere after cleaning by said reaction tube cleaning unit.

5,314,664
SAMPLE SUPPLY SYSTEM HAVING INTEGRATED MICROWAVE DISINTEGRATION

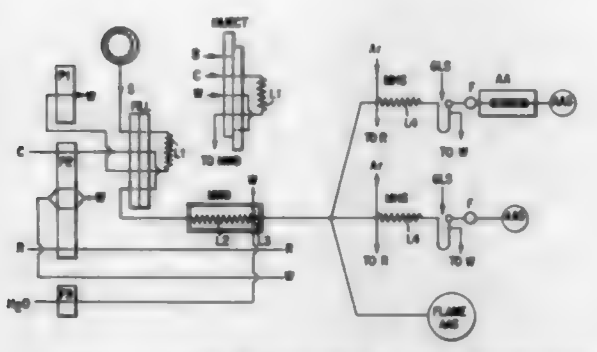
Michael Sperling, Sipplingen, and Dimiter L. Tsalev, Bulgarien, both of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 1, 1992, Ser. No. 861,751

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1991, 4110735

Int. Cl.^{5} G01N *1/00*

U.S. Cl. 422—78 **14 Claims**



1. A system for disintegrating samples and for supplying the disintegrated samples to an analytical instrument, comprising
a microwave oven having a radiation cavity and containing a flow-through reactor having an inlet and an outlet,
pump means for pumping a mixture of sample and a disintegrating agent through said flow-through reactor,
said reactor outlet being adapted to be connected to sample inlet means of said analytical instrument,
said flow-through reactor including a flow-through conduit coil having a plurality of turns,
each turn of said flow-through conduit coil having a first portion of its length extending into said radiation cavity and a second portion located outside said radiation cavity, so that said mixture of sample and disintegrating agent flowing through said flow-through conduit coil alternatingly passes a plurality of times inside said radiation cavity, where it is heated by the microwave energy of said oven, and outside said radiation cavity, where it is not heated.

5,314,665
CATALYTIC CONVERTER

Yoshio Iwasa, Nagareyama, Japan, assignor to Nissan Motor Co., Ltd., Tokyo, Japan

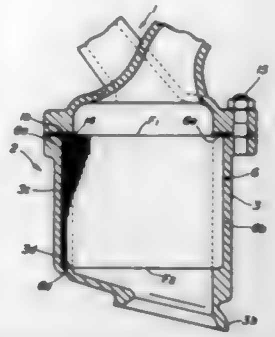
Continuation of Ser. No. 492,379, Mar. 12, 1990, abandoned, which is a continuation of Ser. No. 223,962, Jul. 26, 1988, abandoned. This application Dec. 6, 1990, Ser. No. 622,313

Claims priority, application Japan, Jul. 27, 1987, 62-114926

Int. Cl.^{5} B01D *50/00*

U.S. Cl. 422—180 **8 Claims**

1. A catalytic converter for purifying exhaust gas from an internal combustion engine, comprising:
a casing;
a honeycomb monolithic catalytic element disposed in said casing and including a metallic honeycomb carrier including flat and corrugated metallic sheets which are put one upon another and spirally wound to form therebetween elongate openings, wherein the spirally wound carrier is formed such that said flat sheet forms an outer peripheral surface which contacts an inner peripheral surface of said casing, and catalyst supported on the surfaces of said flat and corrugated metallic sheets defining said elongate openings, said catalyst supported on the surfaces of said flat and corrugated metallic sheets defining gas passages through which exhaust gas from the engine passes, a gas passage being formed in each elongate opening;
wherein said outer peripheral surface which contacts said inner peripheral surface of said casing is an exposed metallic surface with no catalyst supported or disposed thereon such that said exposed metallic surface of said honeycomb monolithic catalytic element is in direct contact with said inner peripheral surface of said casing with no catalyst therebetween.



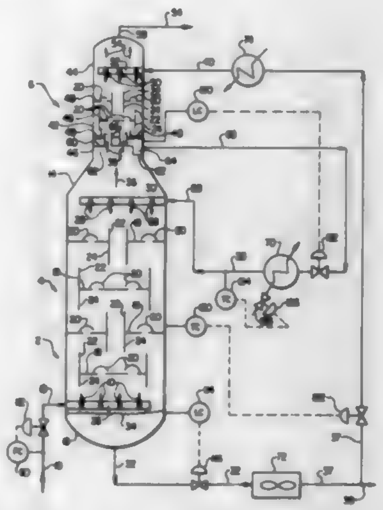
5,314,666
METHOD AND APPARATUS FOR TREATING HYDROCARBON GAS STREAMS CONTAMINATED WITH CARBONYL SULFIDE

S. Travis Palomares, Aliso Viejo, and Thomas G. Morrison, Placentia, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 941,509, Sep. 8, 1992, Pat. No. 5,298,228. This application Feb. 5, 1993, Ser. No. 15,967

Int. Cl.^{5} B01J *8/04*

U.S. Cl. 422—191 **3 Claims**



1. An apparatus for treating hydrocarbon gas containing carbonyl sulfide with hot aqueous absorbent at hydrolysis reaction temperature for hydrolysis of carbonyl sulfide to carbon dioxide and hydrogen sulfide and formation of hydrolysis product gas, and for cooling said hydrolysis product gas with cool absorbent at cooling temperature, said apparatus comprising:
a. a hydrolysis section, comprising a hydrolysis column having an upper and lower zone and a plurality of trays within said hydrolysis column, said trays comprising gas-to-absorbent contactors, weirs, and absorbent downcomers, a hydrocarbon gas feed conduit positioned in said lower zone of said hydrolysis column, a hot aqueous absorbent feed conduit positioned in said upper zone of said hydrolysis column, and a withdrawal conduit to withdraw absorbent from said lower zone of said hydrolysis column;
b. a cooling section, positioned above said hydrolysis section, comprising a cooling column having an upper and lower zone and a plurality of trays within said cooling column, said trays comprising gas-to-absorbent contactors, weirs, and absorbent downcomers, and a cool product gas withdrawal conduit positioned in said upper zone of said cooling column;
c. a chimney tray positioned below said lower zone of said cooling section an above said upper zone of said hydrolysis section, said chimney tray separating absorbent of said cooling section from absorbent of said hydrolysis section and comprising a pan base adapted to collect absorbent from said lower zone of said cooling column, a chimney riser adapted to pass hydrolysis product gas from said top zone of said hydrolysis column to said lower zone of said cooling column without passing said hydrolysis product gas through said absorbent on said pan base, and a withdrawal conduit adapted to withdraw absorbent from said pan base;
d. a heater to heat said absorbent withdrawn from said pan base to hot aqueous absorbent at hydrolysis reaction temperature;
e. a cooler to cool said absorbent withdrawn from said hydrolysis section to form cool absorbent at cooling temperature;
f. a conduit to direct said hot aqueous absorbent to said hydrolysis section; and
g. a conduit to direct said cool absorbent at cooling temperature to said cooling section.

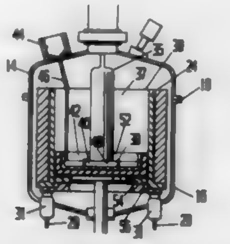
5,314,667
METHOD AND APPARATUS FOR SINGLE CRYSTAL SILICON PRODUCTION

John C. Lim, 2589 N. Mountain Ave., Claremont, Calif. 91711, and William A. Koch, 1781 Alicante, Pomona, Calif. 91768

Continuation-in-part of Ser. No. 663,605, Mar. 4, 1991, abandoned. This application Mar. 23, 1992, Ser. No. 854,726

Int. Cl.^{5} B07D *9/00*

U.S. Cl. 117—213 **8 Claims**



5. In a Czochralski process furnace and vacuum chamber wherein a housing is provided with evacuation means to maintain its interior as a vacuum chamber and said housing has a centrally located cylindrical furnace which surrounds a crucible nested within a graphite cup which are mounted on a platform supported on a central shaft for rotational movement, and wherein said housing also has a communicating boule withdrawal chamber extending vertically axially therefrom, the improvement which comprises:
a. a substantially flat-bottomed crucible having a cylindrical side wall and mounted on said platform and an annular bottom plate heater located beneath said flat-bottomed crucible; and
b. a quartz ring weir concentrically received within said crucible and having a diameter from about 20 to 50 percent the diameter of said crucible and a height from about 2.25 to 3.5 inches and from about 18.75 to 31.5 percent of the diameter of said ring and supported therein above said bottom wall of said crucible a slight distance to divide said crucible into an outer annular zone and a central zone;
c. a solids material supply conduit extending form a solids supply zone external of said housing and extending into said housing along the internal side wall of said crucible with its lowermost end terminating within said outer annular zones, for conveying granular polycrystalline material from said supply zone to said annular zone; and
d. a shallow molten pool of silicon within said crucible having a depth no greater than 2 inches, and with its upper level beneath the upper edge of said ring.

5,314,668
METHOD OF AUTOMATICALLY DISINFECTING DOOR HANDLES OF DISINFECTING UNITS

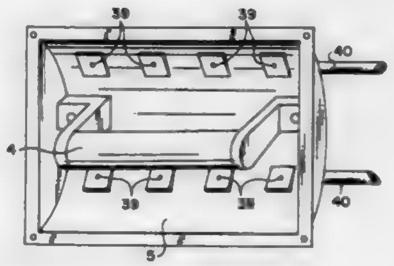
Stephan Biermaier, Ulrichstrasse 47, 8904 Friedberg 3, Fed. Rep. of Germany

Continuation of Ser. No. 672,902, Mar. 21, 1991, abandoned. This application Mar. 19, 1993, Ser. No. 34,165

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009454

Int. Cl.^{5} A61L *2/00, 9/00*

U.S. Cl. 422—292 **10 Claims**



1. A disinfecting system comprising:
a disinfecting apparatus comprising wall means defining a disinfection chamber, a door for providing selective access to said disinfection chamber, means for disinfecting objects placed within said chamber, and a handle mounted to one of said wall means and said door and accessible from an exterior of said disinfecting apparatus;
wherein an improvement comprises:
handle disinfecting means for selectively, automatically disinfecting said handle while said handle remains mounted to said one of said wall means and said door, said handle disinfecting means including a source of liquid disinfectant, at least one spray nozzle provided on at least one of said door and said wall means, and separate from said handle, mounted upon the exterior of said disinfecting apparatus and for directing a liquid disinfectant toward and onto a surface of the handle, and means for conveying liquid disinfectant from said source to said at least one spray nozzle; and
control means for controlling an operation of said handle disinfecting means, so that said liquid disinfectant is conveyed to said handle disinfecting means one of at predetermined time intervals and in response to the disinfecting apparatus entering a specified state.

5,314,669
METHOD AND APPARATUS FOR DISPENSING A SCENT INTO THE AIR

Randy Hamilton, 8621 S. Kenwood La., Tempe, Ariz. 85284

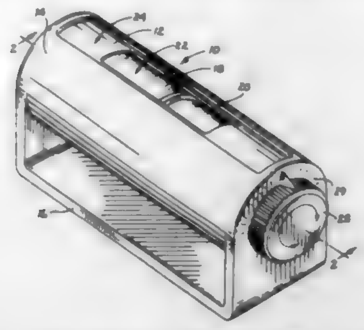
Filed Jun. 15, 1992, Ser. No. 898,483

Int. Cl.^{5} A61L *9/03*

U.S. Cl. 422—305 **6 Claims**

1. An air freshening apparatus comprising:
an outer cylindrical member comprising a first closed end, a second open end, and at least one rectangular shaped longitudinal opening passing through said outer cylindrical member;
an inner cylindrical member comprising a first closed end, a second open end, and at least one step-shaped longitudinal opening passing through said inner cylindrical member,

wherein said inner cylindrical member fits concentrically within said outer cylindrical member forming a frictional interface between said inner and outer cylindrical members, and where said inner cylindrical member is greater in length than said outer cylindrical member such that said open end of said inner cylindrical member extends beyond said open end of said outer cylindrical member;



at least two replaceable scent filled media containers which are cylindrical in shape and concentrically retained within said inner cylindrical member; and

means for aligning said at least one step-shaped opening in said inner cylindrical member with said at least one rectangular opening of said outer cylindrical member such that said two replaceable scent filled media containers may be exposed to an air interface either selectively or simultaneously.

5,314,670

RECOVERY OF RHODIUM VALUES

Weimar W. White, Canaseraga, and Gary G. Kiehl, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US91/07979, § 371 Date Oct. 30, 1991, § 102(e) Date Oct. 30, 1991, PCT Pub. No. WO93/09063, PCT Pub. Date May 13, 1993

PCT Filed Oct. 30, 1991, Ser. No. 778,122

Int. Cl.^{5} C01G *55/00;* **C22B** *11/00;* **C01B** *9/00*

U.S. Cl. 423—22 **2 Claims**

2. A process for the recovery of rhodium values from a process liquor effluent containing dissolved $(NH_4)_2RhCl_5(H_2O)$, $(NH_4Cl)RhCl_4(H_2O_2$ and $RhCl_3$, said process comprising reacting said $(NH_4)_2RhCl_5(H_2O)$ in said liquor with cesium chloride to precipitate $Cs_2RhCl_5(H_2O)$, and separating said $Cs_2RhCl_5(H_2O)$ from the thereby produced reaction mixture, said liquor being characterized by being 80–90 volume percent ethanol in water, and having sufficient HCl to make the acid content of the water portion thereof, 4–5N HCl.

5,314,671

PROCESS AND DEVICE FOR REMOVAL OF H_2S

Jean Elgue, Billere, and Jacques Tournier-Lasserve, Pau, both of France, assignors to Elf Aqutaine Production, Paris, France

Division of Ser. No. 465,067, Jan. 19, 1990, abandoned. This application Jan. 3, 1992, Ser. No. 816,221

Int. Cl.^{5} C01B *17/16*

U.S. Cl. 423—220 **40 Claims**

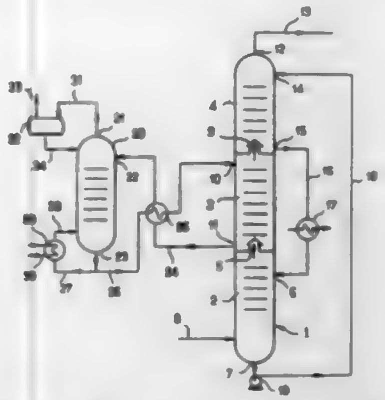
1. A process for the removal of H_2S present at low concentration in a gas also containing 5 to 60% by volume of water vapor, which comprises the steps of:

a) cooling the H_2S-containing gas to a temperature below the dew point of the water, thereby condensing the water vapor, separating substantially all of the water and forming a cooled H_2S-containing gas substantially free of the water,

b) scrubbing the cooled H_2S-containing gas substantially free of the water at a temperature below the dew point of the water present in the gas to be treated with an H_2S-absorbent liquid which is free of the condensed water of step a), forming (i) an absorbent liquid charged with H_2S and (ii) a purified gas substantially free of water and H_2S, and

c) contacting the (ii) purified gas with an excess of water including heated condensed water from step a), the temperature of the heated condensed water being such that the purified gas is rehydrated, so that the water content as water vapor corresponds to a mass flow rate of water substantially equal to the mass flow rate of the water present in the H_2S-containing gas before cooling said gas and removing excess water not necessary for the adjustment of the water to correspond to that of the water present in the H_2S containing gas before cooling said gas, and

d) incinerating the rehydrated purified gas prior to discharge into the atmosphere.



5,314,672

COMPOSITION AND METHOD FOR SWEETENING HYDROCARBONS

James F. Vasil, Houston, Tex., assignor to Sweetchem Corp., Houston, Tex.

Continuation-in-part of Ser. No. 887,676, May 22, 1992, abandoned. This application Jul. 27, 1993, Ser. No. 97,716

Int. Cl.^{5} B01D *53/14*

U.S. Cl. 423—228 **10 Claims**

1. A method for substantially eliminating H_2S and organic sulfides present in a gaseous hydrocarbon stream containing H_2S at a level of up to 1000 p.p.m. or more comprising

contacting said stream with an alcohol-free sweetening composition which is an aqueous mixture consisting essentially of water and a reaction product of (i) undiluted commercially pure 99% ethylene diamine with (ii) 50% aqueous uninhibited formaldehyde, said reaction product being substantially free of formaldehyde, in a proportion of about 3:1 by weight reaction product/H_2S, for a period of time sufficient to substantially eliminate H_2S and organic sulfides in said stream without foaming or producing solids, whereby H_2S and organic sulfide in said gaseous hydrocarbon stream are reduced to a level of less than 4 p.p.m.

5,314,673

PROCESS FOR THE CONVERSION OF N_2O

Kristi Anseth, Williston, N. Dak., and Theodore A. Koch, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1992, Ser. No. 836,566

Int. Cl.^{5} B01J *8/00;* **C01B** *17/00, 21/00*

U.S. Cl. 423—239.1 **4 Claims**

1. A process for the conversion of N_2O to nitrogen and oxygen which comprises contacting the N_2O with a catalyst consisting essentially of nickel oxide and cobalt oxide on a zirconia substrate in which the amount of nickel oxide plus the amount of cobalt oxide in the catalyst is 10 to 80 percent of the total weight of the catalyst at a temperature of at least about 280 degrees C., and producing nitrogen and oxygen.

5,314,674

PROCESS FOR THE SYNTHESIS OF A ZEOLITE OF MTT TYPE, PRODUCTS OBTAINED AND THEIR APPLICATION IN ADSORPTION AND CATALYSTS

Di Renzo Di R Francesco; Fajula Fran ois, both of Montplellier; Des Courieres Thierry, Lyons, and Anglerot Didier, Lons, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Nov. 9, 1992, Ser. No. 973,767

Claims priority, application France, Nov. 8, 1991, 91 13816

Int. Cl.^{5} C01B *33/26*

U.S. Cl. 423—328.2 **25 Claims**

1. Process for the synthesis of a zeolite of an MTT structure which comprises forming a nitrogen template-free reaction mixture of water, a source of tetravalent silicon and ethanol, maintaining this mixture at a temperature above 80° C. and at a pressure at least equal to the autogenous pressure for a sufficient period for the crystallization of the reaction mixture as a precursor of zeolite to occur and converting the precursor into zeolite by removal of the ethanol and of the water of hydration of cation.

5,314,675

PROCESS FOR DIRECT NITRIDING OF METALS OF LOW MELTING POINT

Dominique Dubots, 107, rue des Moranches, Chedde 74190 Passy, and Pierre Faure, Le Gite, 38210 Saint Quentin sur Isere, both of France

Filed Jan. 3, 1992, Ser. No. 816,235

Claims priority, application France, Jan. 3, 1991, 91 00376

Int. Cl.^{5} C04B *35/56;* **C01B** *21/06*

U.S. Cl. 423—344 **9 Claims**

1. A process for mass producing products based on metallic nitride or oxynitride, said process comprising the steps of:

(a) mixing a metallic powder comprising at least one metal with a refractory powder infusible and inert with respect to said metallic powder in operating conditions of said process to obtain a bulk mixture, the metallic powder content of said bulk mixture not exceeding 66.67% of said bulk mixture;

(b) heating said bulk mixture in a furnace under a flow of nitrogen-containing gas at approximately atmospheric pressure until a rapid and exothermic nitriding reaction of said metal begins;

(c) controlling a nitriding temperature of said nitriding reaction at which said metallic powder melts at least partially by means of said flow of nitrogen-containing gas so as to self-maintain said nitriding reaction until said powder is completely nitrided and to avoid any apparent trace of melting in said bulk mixture; and

(d) obtaining said products in the form of a highly porous bulk solid which is easy to grind and which is capable of being melted.

5,314,676

INTERMETALLIC COMPOUNDS HYDRIDES

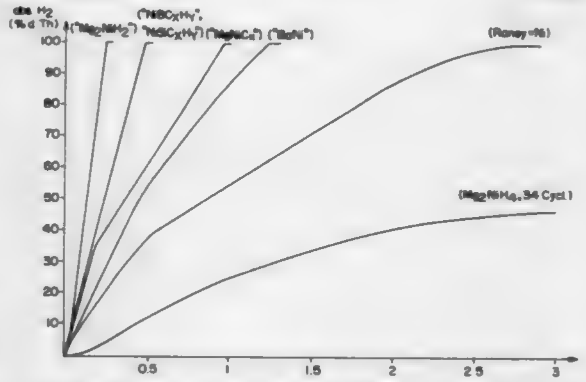
Borislav Bogdanovic, and Ursula Wilczok, Mülheim/Ruhr, both of Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle MBH, Mulheim/Ruhr, Fed. Rep. of Germany

Division of Ser. No. 857,362, Mar. 25, 1992, Pat. No. 5,215,710, which is a division of Ser. No. 547,403, Jul. 2, 1990, Pat. No. 5,133,921, which is a continuation of Ser. No. 304,994, Feb. 1, 1989, abandoned, which is a division of Ser. No. 639,495, Apr. 16, 1987, Pat. No. 4,828,606. This application Jan. 21, 1993, Ser. No. 6,430

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613532

Int. Cl.^{5} C01B *6/04*

U.S. Cl. 423—644 **4 Claims**



1. An intermetallic compound hydride selected from the group consisting of

a) amorphous or crystalline $MgPdH_2$,

b) Mg_2PtH_2, and

c) Ca_2Pd hydride.

5,314,677

Patent Not Issued For This Number

5,314,678

SODIUM IODIDE ^{131}I CAPSULES

Glenn D. Grummon, St. Louis, and David E. Helling, St. Charles, both of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Filed Jan. 28, 1992, Ser. No. 827,132

Int. Cl.^{5} A61K *43/00, 49/02*

U.S. Cl. 424—1.25 **5 Claims**

1. A ^{131}I capsule having improved stability and reduced volatility, said capsule having a matrix material and a radioiodide loading solution, wherein said matrix material comprises a 10% blend ascorbic acid in anhydrous sodium pyrophosphate, and said radioiodide loading solution is made 0.25 M in both sodium thiosulfate and sodium ascorbate and further includes fructose.

5,314,679

VASCULAR MAGNETIC RESONANCE IMAGING AGENT COMPRISING NANOPARTICLES

Jerome M. Lewis, Newton; Edward T. Menz, Quincy; Francis E. Kenny, Watertown; Ernest V. Groman, Brookline, and Lee Josephson, Arlington, all of Mass., assignors to Advanced Magnetics Inc., Cambridge, Mass.

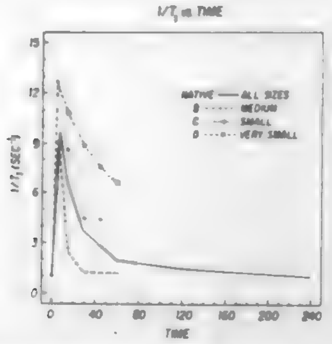
Continuation of Ser. No. 769,310, Oct. 1, 1991, abandoned, which is a division of Ser. No. 233,177, Aug. 16, 1988, Pat. No. 5,055,288, which is a continuation-in-part of Ser. No. 67,586, Jun. 26, 1987, Pat. No. 4,827,945, which is a continuation-in-part of Ser. No. 882,044, Jul. 3, 1986, Pat. No. 4,770,183. This application Dec. 22, 1992, Ser. No. 995,111

Int. Cl.^{5} A61B *5/055;* **A61K** *33/26, 37/14, 31/715*

U.S. Cl. 424—9 **42 Claims**

1. A magnetic resonance imaging contrast agent in a physiologically acceptable medium, which contrast agent:

i) comprises a population of biodegradable superparamagnetic metal oxide particles, wherein said particles (a) are capable of being metabolized or excreted by a subject within about 1 week after administration, as evidenced by a return by proton relaxation rates of an affected organ or tissue of the subject to pre-administration levels; and (b) are associated with a protein; and



ii) has a blood half-life in the rate of at least about 17 minutes at a dose of about 2 mg of metal per kg of rat.

5,314,680

POLYAZAMACROCYCLES FOR MAGNETIC RESONANCE IMAGING

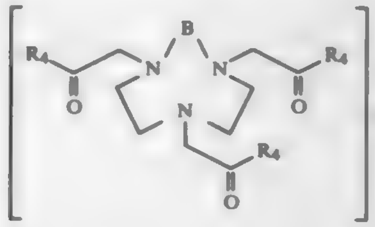
Raghavan Rajagopalan, Maryland Heights; Rebecca A. Wallace, Manchester, and Muthunadar P. Periasamy, Creve Coeur, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 893,157, Jun. 6, 1992, Pat. No. 5,217,706, which is a division of Ser. No. 616,459, Nov. 21, 1990, Pat. No. 5,141,740. This application May 4, 1993, Ser. No. 12,185

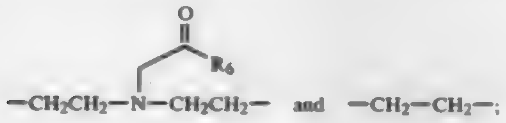
Int. Cl.⁵ A61B *5/055;* **C07D** *255/02*

U.S. Cl. 424—9 **33 Claims**

1. A complex comprising the formula:

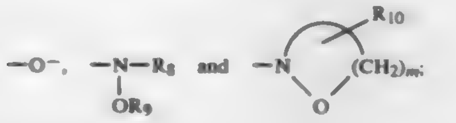


wherein M^{z+} is a paramagnetic ion of an element with an atomic number 21–29, 42–44, or 58–70 and a valence, z, of 2+ or 3+; B is selected from a group consisting of

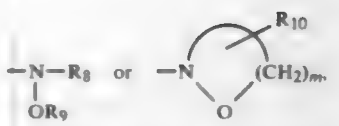


$$-CH_2CH_2-\underset{|}{N}(CH_2C(=O)R_6)-CH_2CH_2- \quad \text{and} \quad -CH_2-CH_2-;$$

the R_6 groups are selected from a group consisting of



wherein at least one R_6 group is



the R_8, R_9, and R_{10} groups may be the same or different selected from a group consisting of hydrogen, alkyl, acyl, aryl, mono- or poly- hydroxyalkyl, mono- or polyalkoxyalkyl, aminoalkyl and acylaminoalkyl; the carbon-containing R groups preferably contain 1 to 6 carbon atoms and m varies from preferably 1 to 6.

5,314,681

COMPOSITION OF POSITIVE & NEGATIVE CONTRAST AGENTS FOR ELECTRON SPIN RESONANCE ENHANCED MAGNETIC RESONANCE IMAGING

Ib Leunbach, Dragör; Klaes Golman, Rungsted, both of Denmark, and Jo Klaveness, Oslo, Norway, assignors to Nycomed Innovation AB, Malmo, Sweden

Continuation of Ser. No. 688,496, May 28, 1991, abandoned. This application Mar. 22, 1993, Ser. No. 34,662

Claims priority, application United Kingdom, Dec. 23, 1988, 8830215

Int. Cl.⁵ A61B *5/055;* **A61K** *31/445, 31/40;* **G01V** *3/00*

U.S. Cl. 424—9 **19 Claims**

1. An electron spin resonance enhancing magnetic resonance imaging contrast medium comprising two separate contrast agents wherein the first contrast agent is an electron spin resonance enhancing magnetic resonance imaging signal enhancing agent, and the second contrast agent is an electron spin resonance enhancing magnetic resonance imaging signal suppressing agent of said first agent to increase contrast in different parts of a magnetic image generated using said contrast medium.

5,314,682

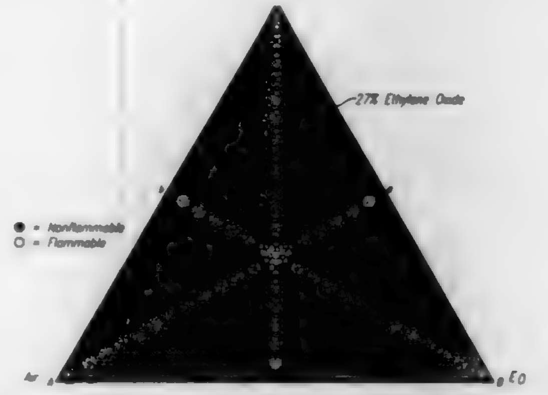
OZONE FRIENDLY STERILANT MIXTURE

Mark A. Sweval, Lafayette; W. Douglas Register, West Lafayette; Mark L. Robin, West Lafayette, and Yuichi Iikubo, West Lafayette, all of Ind., assignors to Great Lakes Chemical Corp., W. Lafayette, Ind.

Filed Sep. 21, 1992, Ser. No. 948,094

Int. Cl.⁵ A61L *9/04;* **A01N** *31/00*

U.S. Cl. 424—45 **8 Claims**



1. A nonflammable sterilant mixture comprising a sterilizing effective amount of ethylene oxide and 1,1,1,2,3,3,3-heptafluoropropane.

5,314,683

METHOD OF COUPLING COSMETIC MATERIALS AND COSMETICS CONTAINING COUPLED MATERIALS

David S. Schlossman, 250 Gorge Rd., Cliffside Park, N.J. 07010

Filed May 14, 1990, Ser. No. 523,315

Int. Cl.⁵ A61K *7/021*

U.S. Cl. 424—6.3 **2 Claims**

1. An improved hydrophobic, low bulk density dispersible, high-loading cosmetic material with a low surface area-to-volume ratio, comprising a pulverized inorganic cosmetic pigment material coating coupled to from 15 to 35% of an organic polymeric microspherical powder of diameter less than 100 microns said microspherical powder being selected from the group consisting of polyethylene, polymethylmethacrylate and nylon copolymers by from 1 to 5% of a titanate coupling agent said coupling agent wherein the inorganic material has a particle size sufficiently smaller than the organic microspheres that the coupled product has a generally spherical particulate shape, said inorganic cosmetic material and said cosmetic material being capable of being coupled by said titanate coupling agent.

5,314,684

WATER-BASED FIXATIVE COMPOSITION

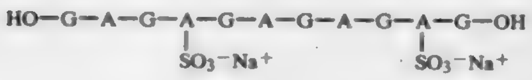
John R. Horoschak, Hamden, and Paul S. Wallace, Cos Cob, both of Conn., assignors to Clairol Inc., New York, N.Y.

Continuation of Ser. No. 735,578, Jul. 25, 1991, abandoned. This application Oct. 21, 1992, Ser. No. 964,580

Int. Cl.⁵ A61K *7/11*

U.S. Cl. 424—71 **25 Claims**

1. A hair fixative composition containing
(i) from about 2 to about 10 weight %, based on the weight of the composition, of a water-dispersible amorphous thermoplastic hair fixative polyester whose polymer chain is represented by the structure



$$HO-G-A-G-\underset{\underset{SO_3^-Na^+}{|}}{A}-G-A-G-A-G-\underset{\underset{SO_3^-Na^+}{|}}{A}-G-OH$$

wherein A is an aromatic dicarboxylic acid moiety, G is an aliphatic or cycloaliphatic glycol residue, on the average there being 5 to 8 sodiosulfo substituents per molecule, said fixative polyester being in colloidal suspension in the composition;
(ii) from about 0.1 to about 3 weight %, based on the weight of the composition, of an amount of copolymer containing dimethylpolysiloxane and organo-modified methylsiloxane moieties, said amount being sufficient to cause the composition to spread out on a hair shaft when the composition is applied to same;
(iii) from 0 to about 25 weight %, based on the weight of the composition, of a lower alcohol; and
(iv) sufficient water to bring the composition to 100 weight %.

5,314,685

ANHYDROUS FORMULATIONS FOR ADMINISTERING LIPOPHILIC AGENTS

Praveen Tyle, and Kenneth R. Freebern, both of San Diego, Calif., assignors to Agouron Pharmaceuticals, Inc., San Diego, Calif.

Filed May 11, 1992, Ser. No. 881,085

Int. Cl.⁵ A61K *7/02, 31/74*

U.S. Cl. 424—401 **4 Claims**

1. A method of making an anhydrous formulation, comprising the steps of:
(a) preparing an anhydrous hydrophilic phase comprising least one hydrophilic vehicle suitable for solubilizing at least one lipophilic, pharmaceutically active agent for administering to a host in need of treatment;
(b) preparing an oily phase comprising at least one oily component which is partially miscible with said at least one hydrophilic vehicle; and
(c) combining said oily phase with said anhydrous hydrophilic phase to form said anhydrous formulation.

5,314,686

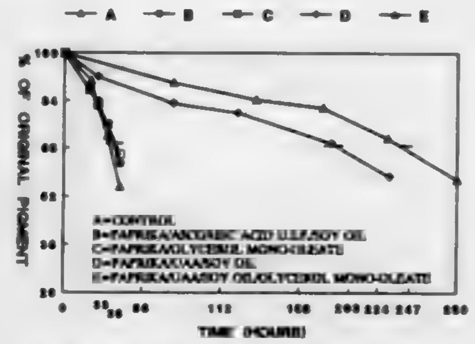
LOW MICRON-SIZED ASCORBIC ACID PARTICLES, ESPECIALLY A SUSPENSION THEREOF IN A MEDIUM IN WHICH THEY ARE INSOLUBLE, AND THE USE THEREOF AS AN ANTIOXIDANT FOR MEDIUMS IN WHICH THE PARTICLES REMAIN INSOLUBLE

Paul H. Todd, Jr., Kalamazoo, Mich., assignor to Kalamazoo Holdings, Inc., Kalamazoo, Mich.

Division of Ser. No. 717,926, Jun. 20, 1991, Pat. No. 5,230,836. This application Oct. 14, 1992, Ser. No. 960,715

Int. Cl.⁵ A61K *7/00, 9/14*

U.S. Cl. 424—401 **11 Claims**



1. A method of stabilizing the fatty phase of a cosmetic or an essential oil having a fatty phase by admixing said fatty phase with ar oxidation-protective amount of an antioxidant composition consisting essentially of solid ascorbic acid particles which are less than about 38 microns in size on their longest dimension, optionally suspended in a medium in which they are insoluble.

5,314,687

PEROXYACID ANTIMICROBIAL COMPOSITION

Thomas R. Oakes, Lake Elmo; Patricia M. Stanley, Minneapolis, and Jerome D. Keller, Eagan, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 734,580, Jul. 23, 1991, Pat. No. 5,200,189. This application Aug. 20, 1992, Ser. No. 932,612

The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.

Int. Cl.⁵ A01N *37/02*

U.S. Cl. 424—405 **39 Claims**

1. A peroxyacid antimicrobial concentrate composition comprising:
(a) an effective biocidal amount of a C_1–C_4 peroxycarboxylic acid; and

(b) an effective biocidal amount of an aliphatic C_6–C_{18} peroxyacid;

wherein the concentrate composition has a proportional weight ratio of about 20 to 1 parts of (a) per part of (b) and is capable of being diluted with a major proportion of water to form an antimicrobial use solution having a pH in the range of about 2 to 8 and having a greater than additive antimicrobial activity.

5,314,688
LOCAL DELIVERY OF DIPYRIDAMOLE FOR THE TREATMENT OF PROLIFERATIVE DISEASES

Raymond F. Kauffman, and Jai P. Singh, both of Carmel, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 795,434, Nov. 21, 1991, Pat. No. 5,270,047. This application Feb. 9, 1993, Ser. No. 15,486

Int. Cl.^{5} A61F *2/04, 2/06;* **A61M** *25/01;* **A61K** *9/14*

U.S. Cl. 424—423 **6 Claims**

1. A method of inhibiting cell proliferation in mammals in need thereof, which comprises the local delivery of a therapeutic amount of dipyridamole sufficient to inhibit cell proliferation wherein the local delivery is by a local delivery catheter, a site specific carrier, or an implant.

5,314,689
ACYL-CARNITINE FOR THE TREATMENT AND PREVENTION OF VIRAL INFECTIONS

Laura Scandurra, Catania, Italy, and Laure Aurelian, Baltimore, Md., assignors to Attilio Bernardini, Switzerland

PCT No. PCT/CH89/00097, § 371 Date Mar. 21, 1990, § 102(e) Date Mar. 21, 1990, PCT Pub. No. WO89/11276, PCT Pub. Date Nov. 30, 1989

PCT Filed May 25, 1989, Ser. No. 459,785

Claims priority, application Switzerland, May 26, 1988, 1984/88

Int. Cl.^{5} A61F *13/00*

U.S. Cl. 424—433 **4 Claims**

1. A process for treating or preventing viral infections in cases involving herpes simplex virus types I and II, cytomegalovirus, adenovirus, varicella-zoster virus, respiratory syncytial virus, polio virus, coxsackie virus, enterovirus, or vaccinia virus in human cells comprising topically treating a quantity of human cells with an amount of L-acetyl-carnitine effective to treat or to prevent viral infections in said human cells.

5,314,690
METHOD AND COMPOSITION FOR TREATING IGE-MEDIATED ALLERGIES

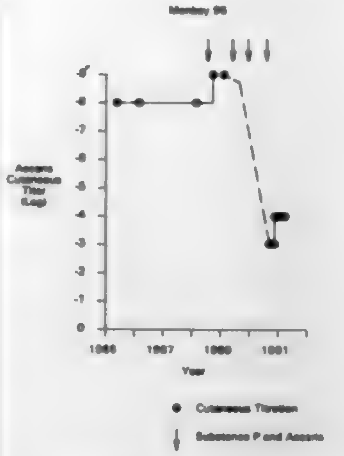
Roy Patterson, Wilmette, and Kathleen E. Harris, Glenview, both of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 705,071, May 24, 1991, abandoned. This application Aug. 21, 1992, Ser. No. 934,553

Int. Cl.^{5} A61K *37/24, 39/35, 39/36*

U.S. Cl. 424—88 **10 Claims**

1. A method of treating a mammal having an IgE mediated allergy to a specific allergen, comprising administering said allergen to said mammal by a non-oral route which results in systemic absorption of the allergen, and concurrently therewith also administering substance P to said mammal by a non-oral route which results in systemic absorption of substance P, said allergen and said substance P being administered in amounts effective to reduce the mammal's skin allergic reaction to the allergen.



5,314,691
BIOLOGICAL CONTROL OF PHYTOPHTHORA ON PLANTS AND IN SOIL WITH *MYROTHECIUM RORIDUM* ATCC 20963, 20964 OR 20965

Michael D. Coffey, Riverside, Calif., and René Gees, Schönenbuch, Switzerland, assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 434,701, Nov. 9, 1989, abandoned. This application Jun. 12, 1992, Ser. No. 898,222

Int. Cl.^{5} A01N *63/00;* **C12N** *1/14*

U.S. Cl. 424—93 Q **22 Claims**

4. A method for biological control of Phytophthora on plants and in soil, the method comprising adding to soil or plant surfaces containing Phytophthora an inoculum comprising a biologically pure strain of *Myrothecium* rodium selected from the group consisting of ATCC Nos. 20963, 20964 and 20965 and a substrate for carrying said *Myrothecium roridum.*

5,314,692
ENZYME PREMIX FOR FEED AND METHOD

Asko N. O. Haarasilta, Vantaa; Pirkko L. A. Riikonen, Kirkkonummi, and Leo Vuorenlinna, Helsinki, all of Finland, assignors to Cultor Ltd., Helsinki, Finland

Continuation of Ser. No. 88,675, Aug. 24, 1987, abandoned. This application May 2, 1991, Ser. No. 697,920

Int. Cl.^{5} A61K *37/62, 37/54;* **C12N** *11/02*

U.S. Cl. 424—94.2 **6 Claims**

1. A thermostable premix for animal feed consisting of: a physiologically acceptable carrier capable of evenly absorbing an aqueous enzyme solution and β-glucanase and xylanase, alone or in combination with one or more enzymes taken from the group consisting of alpha-amylase, glucoamylase, cellobiase, cellulase, lipase and protease, which enzymes are not inherently thermostable at temperatures of about 70° C. or higher, said premix:

a. being free-flowing
b. having an even dispersion of the enzymes throughout the carrier
c. having a water content of less than about 10% by weight
d. retaining an effective, bioactive level of enzyme activities following processing to incorporate said premix into animal feed which utilizes temperatures of between about 70° C. to about 95° C. for between about three minutes to about thirty minutes, and subsequent pelletization.

5,314,693
PEST CONTROL CHEMICALS AGAINST PINE WOOD NEMATODES

Takayuki Suga, Hiroshima, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Feb. 3, 1993, Ser. No. 12,588

Claims priority, application Japan, Feb. 7, 1992, 4-022203; Dec. 11, 1992, 4-331755

Int. Cl.^{5} A01N *65/00, 31/08, 29/04, 27/00*

U.S. Cl. 424—196.1 **9 Claims**

1. A process for preparing a hydroxystilbene or a salt thereof, said process comprising:

reacting a benzyl phosphonate and a methoxybenzaldehyde in the presence of a base by Wittig-Horner reaction to form a methoxystilbene; and

conducting a demethylation of the resulting methoxystilbene in the presence of Lewis acid to form the hydroxystilbene or the salt thereof.

5,314,694
TRANSDERMAL FORMULATIONS, METHODS AND DEVICES

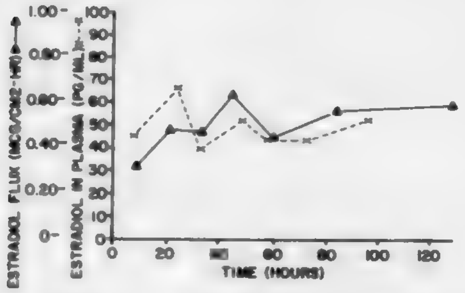
Robert M. Gale; Diane E. Nedberge, both of Los Altos, and Linda E. Atkinson, Portola Valley, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 848,578, Mar. 9, 1992, Pat. No. 5,198,223, which is a continuation-in-part of Ser. No. 605,726, Oct. 29, 1990, Pat. No. 5,122,382. This application Mar. 26, 1993, Ser. No. 39,593

The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.

Int. Cl.^{5} A61F *13/02*

U.S. Cl. 424—448 **20 Claims**



1. A composition of matter for the transdermal administration of a drug formulation comprised of an estrogen and ST-1435, the composition comprising, in combination, an amount of the drug formulation to deliver at least 10 μg/day of estrogen and at least 20 μg/day of ST-1435 and a skin permeation-enhancing amount of a suitable permeation enhancer, the permeation enhancer being selected from C_{2-4}alcohols, polyethylene glycol monolaurate, polyethylene glycol-3-lauramide, dimethyl lauramide, lauric diethanolamide, lauryl lactate, esters of fatty acids, monoglycerides of fatty acids, diglycerides of fatty acids, triglycerides of fatty acids, acetylated monoglycerides, and lactylated monoglycerides, and mixtures thereof.

5,314,695
TISSUE FACTOR BASED PROTHROMBIN TIME REAGENT

Scott M. Brown, San Diego, Calif., assignor to Corvas International, Inc., San Diego, Calif.

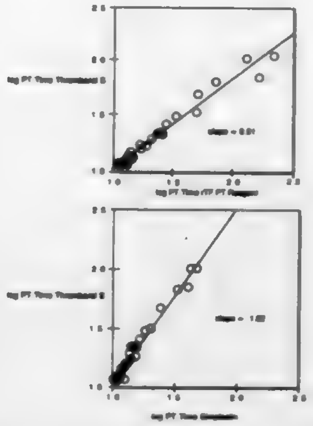
Continuation-in-part of Ser. No. 612,118, Nov. 13, 1990, abandoned. This application Oct. 29, 1991, Ser. No. 784,326

Int. Cl.^{5} A61K *9/127*

U.S. Cl. 424—450 **9 Claims**

1. A prothrombin time reagent containing purified natural or recombinant tissue factor which comprises a liposome composition comprising:

(a) a phospholipid mixture comprising:
  (i) from about 20 to about 95 mole percent phosphatidylcholine,
  (ii) from about 2.5 to about 50 mole percent phosphatidylethanolamine,



  (iii) from about 2.5 to about 50 mole percent phosphatidylserine, and
  (iv) from about 0 to 40 mole percent phosphatidylglycerol; and

(b) from about 0.1 μg to about 3 μg of tissue factor per mg phospholipid mixture.

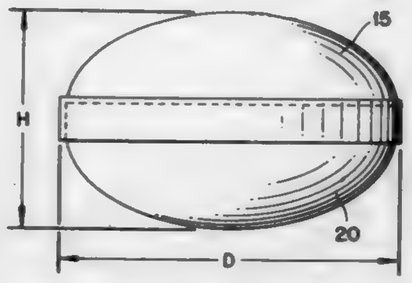
5,314,696
METHODS FOR MAKING AND ADMINISTERING A BLINDED ORAL DOSAGE FORM AND BLINDED ORAL DOSAGE FORM THEREFOR

Manley A. Paulos, 15626 Cold Spring Ct., Granger, Ind. 46530

Filed Jun. 27, 1991, Ser. No. 722,155

Int. Cl.^{5} A61K *9/48*

U.S. Cl. 424—453 **5 Claims**



1. A method for blinding a tableted medication comprising placing said tableted medication within a cylindrical, ingestible capsule effective for administering a tableted medication having interlocking cylindrical body and cap portions, said body portion comprising an open end and an oppositely positioned closed end, said open end being defined by a circumferential edge, said circumferential edge lying in a first plane, said body portion being configured such that the greatest straight line distance connecting two points on said circumferential edge is greater than the perpendicular distance between said first plane and a second plane which contacts an outer surface of the closed end of the body portion and which is parallel to the first plane; and then closing the capsule.

5,314,697

STABLE EXTENDED RELEASE ORAL DOSAGE COMPOSITION COMPRISING LORATADINE AND PSEUDOEPHEDRINE

Henry K. Kwan, Summit, and Stephen M. Liebowitz, Neshanic Station, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 23, 1992, Ser. No. 965,470

Int. Cl.⁵ A61K *9/36*

U.S. Cl. 424—480 **7 Claims**

1. A film-coated extended release oral dosage composition comprising:

a. a matrix core comprising:

	mg/core
Pseudoephedrine Sulfate	120-360
Hydroxypropyl Methylcellulose 2208 100,000 cps	160-480
Ethylcellulose	40-120
Dibasic Calcium Phosphate Dihydrate	56-164
Povidone	20-60
Silicon Dioxide	6-12
and	
Magnesium Stearate	2-6
Matrix Core Weight Range:	400-1200 mg

and

b. a coating on said core comprising:

	mg/tablet
Loratadine	5-15
Hydroxypropyl Methylcellulose 2910 6 cps	17-50
Polyethylene Glycol 400	0.25-5.0
Polyethylene Glycol 3350	3.4-10.15
Approximate Coating Weight Range:	26-80.0 mg
Approximate Composition Weight Range:	427-1280 mg

5,314,698

ISOLATION OF BRUSH BORDER MEMBRANE VESICLES FROM WHOLE INSECT LARVAE

Susan C. MacIntosh, Woodland, Calif., assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Feb. 7, 1992, Ser. No. 846,265

Int. Cl.⁵ A61K *35/64*

U.S. Cl. 424—538 **11 Claims**

1. A method for isolating brush border membranes from insect larvae comprising:

(a) blending whole insect larvae in a buffer solution which does not have metal binding characteristics;

(b) removing the insect larvae exoskeleton from the blended solution;

(c) homogenizing the blended solution containing the whole insect larvae without the exoskeleton to form a homogenate;

(d) mixing the homogenate with a metal salt to form a mixture and incubating for a sufficient amount of time to precipitate the brush border membranes;

(e) centrifuging the mixture a speed between about 2,000 and about 3,000×g to form a supernatant containing said brush border membranes; and

(f) centrifuging the supernatant containing said brush border membranes at least 30,000×g to form a pellet of said brush border membranes.

5,314,699

METHOD FOR FLEA AND INSECT CONTROL

Jeffrey Baden, 452 Page Ave., NE., Atlanta, Ga. 30307

Continuation of Ser. No. 471,829, Jan. 29, 1990, abandoned. This application Feb. 28, 1992, Ser. No. 843,586

Int. Cl.⁵ A01N *59/14*

U.S. Cl. 424—660 **6 Claims**

1. A method for controlling adult insects and larvae in a substrate comprising the steps of:

preparing a liquid solution for introduction into said substrate;

adding disodium octaborate tetrahydrate to said solution in the amount of approximately four to eight ounces per gallon;

impregnating said substrate with said solution; and

allowing said substrate to dry whereupon a portion of said disodium octaborate tetrahydrate remains in said substrate and dries to a crystalline form for regulating growth by coating the food supply and abrading the exoskeleton of the larvae and insects as they contact said crystalline form of said disodium octaborate tetrahydrate to effect desiccation and thereby death.

5,314,700

POULTRY FEED COMPONENT

Dewey G. Barnes, and Sebastian M. Laurent, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 28, 1991, Ser. No. 647,285

Int. Cl.⁵ A01N *59/06, 55/00, 43/54, 43/16*

U.S. Cl. 424—684 **25 Claims**

1. A method of enhancing the effectiveness of an ionophoric coccidiostat in reducing coccidial-induced intestinal lesions in poultry comprising administering to said poultry said ionophoric coccidiostat and a zeolite, the weight ratio of said coccidiostat to said zeolite being from about 0.2 weight percent to about 15 weight percent, such that said ionophoric coccidiostat and said zeolite coexist in said poultry.

5,314,701

SUGAR-FREE "HARD CANDY" AND PROCESS FOR ITS MANUFACTURE

Léon Mentink, Estaires, and Michel Serpelloni, Beuvry-les-Bethune, both of France, assignors to Roquette Freres, France

Filed Jun. 11, 1992, Ser. No. 896,004

Claims priority, application France, Jun. 14, 1991, 91 07330

Int. Cl.⁵ A23G *3/00*

U.S. Cl. 426—103 **10 Claims**

1. A sugar-free hard candy, which has a double layer structure in which the external layer represents at most 35% by weight of the candy and wherein said external layer consists of at least two components A and B, component A being present in a proportion of 5 to 92% by dry weight and being selected from the group consisting of hydrogenated starch hydrolysates, xylitol, polymers of low-calorie saccharides and mixtures thereof, and component B being present in a proportion of 8 to 95% by dry weight and being selected from the group consisting of hydrogenated isomaltulose or isomalt, isomaltulose, mannitol, erythritol and mixtures thereof.

5,314,702

VENTED DOUGH CAN

Daniel J. Lewandowski, Burnsville, and David A. Kirk, Brooklyn Park, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 16, 1992, Ser. No. 852,079

Int. Cl.⁵ B65D *85/72*

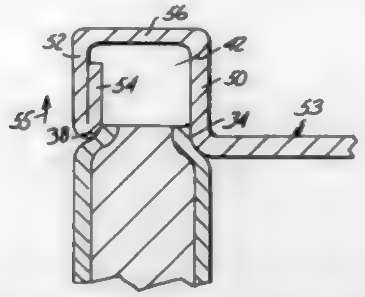
U.S. Cl. 426—128 **10 Claims**

1. A refrigerated dough container comprising:

a substantially cylindrical container body having a first and second end, the first end having an inner sealing surface, an outer sealing surface and an upper sealing surface;

a first end cap attached to the first end, the end cap having an inner edge contacting the inner sealing surface, an outer edge contacting the outer sealing surface and a folded edge having a plurality of depressions, defined by an intersection of the inner and outer edges, which partially contact the upper surface;

a second end cap attached to the second end; and



means for venting internal gases during proofing until the dough substantially fills an inner cavity defined by an inner surface of the cylindrical container body, an inner surface of the first end cap and an inner surface of the second end cap, comprising at least one vent opening located within a portion of the inner sealing surface formed between at least one of the end caps and the corresponding end.

5,314,703

METHOD FOR BEVERAGE BLENDING IN PROPORTIONING

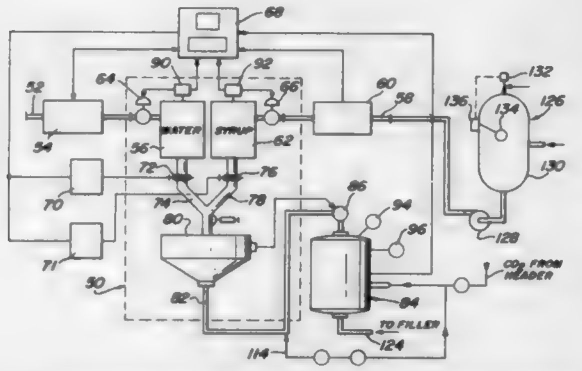
Michael W. Gibney, Ingleside; Lawrence M. Lucas, Corpus Christi, and Roy Culver, Jr., Ingleside, all of Tex., assignors to Micro-Blend, Inc., Ingleside, Tex.

Continuation-in-part of Ser. No. 798,824, Nov. 22, 1991, which is a division of Ser. No. 482,363, Feb. 20, 1990, Pat. No. 5,068,116, which is a continuation-in-part of Ser. No. 416,813, Oct. 3, 1989, abandoned. This application Jun. 26, 1992, Ser. No. 904,421

The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.

Int. Cl.⁵ A23L *2/00*

U.S. Cl. 426—231 **23 Claims**



1. A method of proportioning and blending a blended beverage comprising the steps of: (a) providing a flow of water, (b) providing a flow of beverage syrup, (c) determining the volumetric flow rate of the water, (d) measuring the mass flow rate of the syrup, (e) calculating a volumetric flow rate for the syrup as a function of the mass flow rate of the syrup, and (f) blending the water and syrup flows, and (g) adjusting the proportion of the water flow to the syrup flow as a function of the flow rates for the water and beverage syrup components of the blended beverage as compared to a previously set value for the beverage.

5,314,704

DEHYDRATED MEAT PRODUCT PROTECTED AGAINST OXIDATION

Eldon C. Lee, New Milford, Conn., assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 367,202, Jun. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 189,771, May 3, 1988, abandoned. This application Jan. 2, 1991, Ser. No. 637,986

Int. Cl.⁵ A23L *2/26*

U.S. Cl. 426—534 **17 Claims**

1. A process for inhibiting oxidation of cooked, dehydrated meat comprising incorporating compositions into meat which comprise a combination of (i) ascorbic acid in a form selected from a group of ascorbic acid forms consisting of L-ascorbic acid and D-isoascorbic acid, food acceptable salts thereof and combinations thereof, and (ii) a Maillard meat flavor reaction product prepared from reactants comprising at least one reducing sugar and at least one sulfur-containing amino acid, cooking the meat having the compositions incorporated therein and then dehydrating the cooked meat for obtaining a dehydrated meat.

5,314,705

PROCESS FOR PREPARING A FROZEN MEAL

Lars E. A. Hansson, Aengelholm, and Sven I. Palmquist, Bjuv, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Jun. 26, 1992, Ser. No. 905,033

Claims priority, application European Pat. Off., Jul. 1, 1991, 91110859.5

Int. Cl.⁵ A23L *1/314*

U.S. Cl. 426—574 **14 Claims**

1. A process for preparing a frozen meal comprising:

cooking meat pieces to obtain cooked meat pieces and a bouillon and then separating the cooked meat pieces from the bouillon;

cooling the cooked meat pieces to a temperature so that the cooked meat pieces are at least chilled to obtain cooled meat pieces;

mixing a thickening agent with a sauce at a temperature of from 60° C. to 80° C. to obtain a sauce-thickening agent mixture;

cooling and allowing the sauce-thickening agent mixture

cooling and allowing the sauce-thickening agent mixture to stand to gel the thickening agent to obtain a cooled gelled sauce;

mixing the cooled gelled sauce with the cooled meat pieces in a mixer to obtain a meat and gelled sauce mixture;

forming the meat and gelled sauce mixture into a block;

freezing the block to obtain a frozen block; and

packing the frozen block in a tray package together with at least one vegetable,

wherein the thickening agent is a gelling agent which breaks down at a temperature at which the frozen block is heated for consumption so that upon heating for consumption, the cooked meat and sauce mixture spreads out.

5,314,706

HEAT-STABLE OIL AND WATER EMULSION AND PREPARATION THEREOF

Ladislas Colarow, Savigny; Gérard Masson, Cully, both of Switzerland, and Hans U. Trueck, Stuttgart, Fed. Rep. of Germany, assignors to Nestec S.A., Vevey, Switzerland

Filed Dec. 2, 1992, Ser. No. 985,132

Claims priority, application European Pat. Off., Dec. 12, 1991, 91121318.9

Int. Cl.⁵ A23D *7/00;* **A23J** *7/00*

U.S. Cl. 426—605 **17 Claims**

1. A process for the preparation of an oil and water emulsion comprising hydrolyzing phospholipids of soybean origin with phospholipase A2 to obtain an homogenate containing lysophospholipids and lysophosphatidylcholine, adding a proteolytic enzyme suitable for inactivating the phospholipase A2

and the homogenate to inactive the phospholipase A2 and then heating the homogenate to a temperature of from 80° C. to 90° C. to inactivate the proteolytic enzyme, combining the enzyme-inactivated homogenate with egg yolk stabilized with a substance selected from the group consisting of salt and sucrose to obtain a mixture, homogenizing the mixture to obtain egg yolk fortified with lysophosphatidylcholine, mixing the fortified egg yolk with oil, water and acetic acid to form an emulsion and sterilizing the emulsion.

5,314,707

POLYOL FATTY ACID POLYESTER COOKING MEDIUMS

Jeffrey J. Kester, West Chester; Joseph J. Elsen, Cincinnati; Thomas J. Wehmeier, Cincinnati, and Jerry D. Young, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 24, 1991, Ser. No. 705,194

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.^{5} A23D *9/00*

U.S. Cl. 426—611 **43 Claims**

1. A reduced calorie cooking and frying fat composition having improved cooking characteristics, said fat composition comprising:

(A) from about 50% to about 100% of the composition of a polyol fatty acid polyester fraction comprising:

1) from about 70% to about 99% of the fraction of a liquid polyol fatty acid ester component, wherein the polyols used to synthesize the polyesters of the liquid polyester component contain at least 4 hydroxyl groups, at least 4 of which are esterified; wherein the fatty acid ester groups forming the polyesters of the liquid polyester component contain from about 2 to about 24 carbon atoms; and wherein at least about 90% of said fatty acid ester groups are formed from saturated fatty acid radicals containing not more than 14 carbon atoms; and

2) from about 1% to about 30% of the fraction of a solid polyol fatty acid polyester component having a complete melting point above about 37° C., wherein the polyols used to synthesize the polyester of the solid polyester component contain at least 4 hydroxyl groups at least 4 of which are esterified; and

(B) from 0% to about 50% of the composition of a triglyceride fraction.

5,314,708

PROCESS FOR THE PRODUCTION OF HARD CANDY

Michel H. A. Gonze, Bruxelles; Freddy M. L. Van der Schueren, Aalst, and André L. I. Rapille, Knokke-Heist, all of Belgium, assignors to Cerestar Holding B.V., Belgium

Filed Aug. 5, 1992, Ser. No. 924,963

Claims priority, application United Kingdom, Aug. 15, 1991, 9117617

Int. Cl.^{5} A23G *3/00*

U.S. Cl. 426—660 **17 Claims**

1. A process for the production of a hard candy which comprises heating a maltitol-containing mixture of sugar alcohols at an elevated temperature, the maltitol content of the sugar alcohol mixture being more than 77% but less than 86% by weight based on dry substance.

5,314,709

UNZIPPABLE POLYMER MASK FOR SCREENING OPERATIONS

Fuad E. Doany, Katonah; Gary W. Grube, Washingtonville, and Ravi Saraf, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1991, Ser. No. 672,248

Int. Cl.^{5} H01L *21/00*

U.S. Cl. 427—96 **18 Claims**

1. A process for forming a pattern on a substrate comprising:

(a) laser ablating a polymer film coated on a substrate, said film comprising at least one thermally unzippable polymer, to form the desired pattern or mask;

(b) screening a conductive or resistive paste through the ablated features of the mask and onto the substrate;

(c) heating the substrate/polymer mask to a temperature effective to substantially eliminate the adhesion between said mask and said substrate; and

(d) removing said polymer mask leaving behind the conductive or resistive solid of said paste adhered to the substrate in the desired pattern.

5,314,710

INSULATION LAYER FORMING METHOD

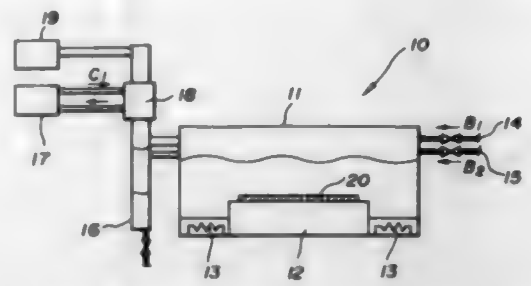
Masakazu Muroyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 30, 1992, Ser. No. 954,344

Claims priority, application Japan, Oct. 2, 1991, 3-254003; Oct. 30, 1991, 3-283432; Aug. 13, 1992, 4-215326

Int. Cl.^{5} B05D *5/12*

U.S. Cl. 427—96 **14 Claims**



1. An insulation layer forming method for processing a substrate having a first surface area covered with a photo resist mask pattern and a second surface area uncovered with the photo resist mask pattern to form a siloxane insulation layer on the second surface area of the substrate, the method comprising the steps of:

dipping the substrate in an organic solvent having no compatibility with water and photo resist;

recirculating the organic solvent under heat to remove water from substrate;

solving an organic silicone compound in the organic solvent; and

recirculating the organic solvent having the organic silicon compound under heat to form the siloxane insulation layer while removing a by-product.

5,314,711

METHOD AND APPARATUS FOR PRINTING GREEN-TAPE FOIL CIRCUITS

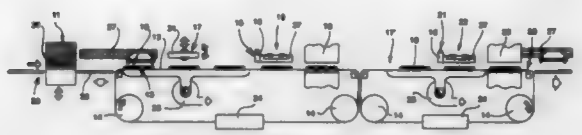
Gisulfo Baccini, Via Duca d'Aosta 1, Mignagola di Carbonera (TV), Italy

Filed Aug. 18, 1992, Ser. No. 931,314

Claims priority, application Italy, Sep. 30, 1991, UD91A000155

Int. Cl.^{5} B05D *5/12;* **B05C** *3/20*

U.S. Cl. 427—97 **9 Claims**



1. Method of printing green-tape foil circuits, whereby through contacts and electrical circuits are obtained on a green-tape foil of alumina containing reference holes or marks and connecting micro-holes by means of a printing process with a conductive material, the green-tape foils arriving from a wound roll of foil or from a stock of already cut foils, the method comprising the steps of:

placing a green-tape foil complete with through connecting holes and reference holes or marks on a conveyor belt said conveyor belt including at least specific zones of transpirable material, said foils located upon said transpirable material;

identifying a position of said green-tape foil in relation to the belt;

adjusting a printing means in response to said identified position of said foil on said belt and printing said green tape foil with said printing means, and

drying and discharging said printed green-tape foil.

5,314,712

METHOD OF MAKING TWISTED PAIRS OF INSULATED METALLIC CONDUCTORS FOR TRANSMITTING HIGH FREQUENCY SIGNALS

Larry L. Bleich, Omaha, Nebr.; Wendell G. Nutt, Dunwoody, Ga., and Stephen T. Zerbs, Gretna, Nebr., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 722,786, Jun. 29, 1991, Pat. No. 5,187,329. This application Nov. 16, 1992, Ser. No. 976,596

Int. Cl.^{5} B05D *1/02;* **H01B** *11/00*

U.S. Cl. 427—118 **9 Claims**

1. A method of making an electrically matched, twisted pair of insulated metallic conductors, said method comprising the steps of:

causing relative motion between a length of metallic conductor and a source of insulating material along a path of travel in a direction along the longitudinal axis of the metallic conductor; while

applying a substantially non-porous insulating material and a colorant material on the surface of the insulating material to successive portions of the length of metallic conductor to provide a length of insulated metallic conductor;

causing a portion of the length of the insulated metallic conductor to be distinguishable from the insulation material and surface colorant of a successive portion of the length such that the dielectric constant of the insulation material and surface colorant which is disposed about the metallic conductor of said portion and any identifying colorant associated therewith is substantially equal to the dielectric constant of the insulation material and surface colorant which is disposed about the metallic conductor of said successive portion and any identifying colorant associated therewith; and

twisting together the successive portions of the length of the insulated metallic conductor to provide an electrically matched pair.

5,314,713

METHOD FOR PRODUCING RECORDING MEDIUM

Takahiro Mori, and Hiroshi Sato, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 611,538, Nov. 13, 1990, abandoned. This application Jan. 11, 1993, Ser. No. 3,852

Claims priority, application Japan, Nov. 14, 1989, 1-293900; Aug. 14, 1990, 2-213697; Sep. 6, 1990, 2-234604

Int. Cl.^{5} B41M *3/12*

U.S. Cl. 427—152 **28 Claims**

1. A method for producing a recording medium having (1) a substrate and (2) an ink-receiving layer comprising a water-soluble high molecular organic compound having a molecular weight of not less than 5,000, and a water-insoluble low-molecular organic compound having a molecular weight of less than 5,000 and being formed on the substrate, wherein said method comprises the steps of (a) dissolving a plurality of organic compounds comprising a water-soluble high molecular organic compound having a molecular weight of not less than 5,000 and which has a solubility of not less than 10 g in 100 g of pure water at 25° C., and a water-insoluble low-molecular organic compound having a molecular weight of less than 5,000 and which has a solubility of less than 1 g in 100 g of pure water at 25° C. in a first solvent which is a good solvent in common for all of the organic compounds to form a solution, applying the solution onto a substrate and evaporating the first solvent off to form an ink-receiving layer, and then (b) applying onto the ink-receiving layer a second solvent which is a poor solvent for at least one of the organic compounds and is a good solvent for the rest of the organic compounds and evaporating the second solvent off.

5,314,714

PROCESS FOR INCREASING THE DENSITY AND IMPROVING THE HOMOGENEITY OF CHEVREL PHASE POWDERS AND CHEVREL PHASE WIRE OBTAINED USING SAID PROCESS

Bernd Seeber, Geneva; Oystein Fischer, Coppet, and Michel Decroux, Geneva, all of Switzerland, assignors to Promogap, Switzerland

PCT No. PCT/CH89/00011, § 371 Date Sep. 3, 1989, § 102(e) Date Sep. 3, 1989, PCT Pub. No. WO89/06864, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 20, 1989, Ser. No. 445,853

Claims priority, application France, Jan. 22, 1988, 88 00900

Int. Cl.^{5} B05D *5/12;* **B22F** *7/02*

U.S. Cl. 427—62 **6 Claims**

5. A process for increasing the specific mass and improving the critical current density of a Chevrel phase material having superconducting properties and formed from Chevrel phase powders, said process comprising the steps of:

adding metallic additives to said Chevrel phase powders, said metallic additives having a melting temperature which is lower than a synthesis temperature of said Chevrel phase powders;

said metallic additives being added in a range of from about 0.5% to 20% by weight, said metallic additives being selected from the group consisting of a metal, a mixture of several metals or a mixture of several metal alloys, and said metallic additives functioning as bonding agents to increase bonding of said Chevrel phase powders for ensuring a better homogeneity of the resulting Chevrel phase material;

introducing said metallic additives in the form of powder;

mixing together said metallic additive powders with said Chevrel phase powders;

performing one of a physical evaporation process and a chemical evaporation process so as to overlap the Chevrel phase powders with a coating of said metallic additive; and

sintering the resulting mixture of said metallic additives and said Chevrel phase powders in one of a liquid zone and vapor zone at a temperature of between 500° C. and 1700° C.

5,314,715
COATING PROCESS

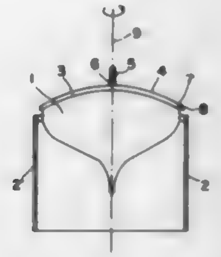
Nanning Arfsten, Ockenheim; Hermann Piehlke, Nackenheim, and Reinhard Kaufmann, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Feb. 12, 1993, Ser. No. 17,189

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1992, 4204637

Int. Cl.^{5} B05D *3/12*

U.S. Cl. 427—240 **13 Claims**



1. A process for coating material on large-surface, arched objects by centrifugal coating, wherein during the centrifuging process, a disk matched to approximately the shape of the surface to be coated rotates with the arched objects at a distance of 1 to 10 mm above the surface to be coated at approximately the centrifugal speed equidirectional with the surface to be coated as the coating solution is applied.

5,314,716
NITROGEN DOPED CARBON FILMS

James W. Proscia, Dearborn; Gang G. Wen; Keith B. Williams, both of Detroit; Charles H. Winter, Grosse Pointe Park, and Gene P. Reck, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 8, 1993, Ser. No. 2,005

Int. Cl.^{5} C23C *16/00;* **C01B** *21/06*

U.S. Cl. 427—248.1 **12 Claims**

1. A process for preparing nitrogen doped polymeric carbon, comprising contacting stannic chloride with a primary amine at a temperature sufficient to form nitrogen doped polymeric carbon comprising at least about 40 mole percent carbon.

5,314,717
PROCESS AND APPARATUS FOR COATING MOTOR PISTONS

Peter Alt, Rindelbacher Strasse 38, D-7090 Ellwangen/Jagst, Fed. Rep. of Germany

Filed Jul. 11, 1991, Ser. No. 728,495

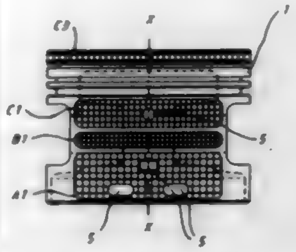
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1990, 4023135

Int. Cl.^{5} B05D *1/32, 5/00*

U.S. Cl. 427—282 **17 Claims**

1. A process for coating the cylindrical peripheral surface of engine pistons with a coating compound, comprising the steps of:

disposing a printing stencil to the cylindrical peripheral surface of a piston, and applying the coating compound through said printing stencil to print the coating compound on said peripheral cylindrical surfaces, such that one or more coated surfaces are printed on a portion of said peripheral cylindrical surface and one or more uncoated areas in the form of slits, holes, recesses or strips



are encompassed within at least one of said coated surfaces.

5,314,718
FIBER FINISHING METHODS

F. Norman Tuller, Simpsonville, and Michael E. Allen, Greenville, both of S.C., assignors to Henkel Corporation, Ambler, Pa.

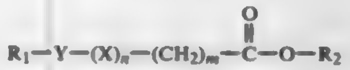
Continuation-in-part of Ser. No. 843,135, Feb. 28, 1992, Pat. No. 5,240,743. This application Jan. 21, 1993, Ser. No. 7,314

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.^{5} B05D *5/00*

U.S. Cl. 427—394 **18 Claims**

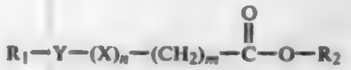
1. A method for imparting lubricity in a fiber which comprises applying to said fiber a compound having the general formula



$$R_1-Y-(X)_n-(CH_2)_m-\overset{\overset{\displaystyle O}{\|}}{C}-O-R_2 \qquad (I)$$

wherein R_1 is an alkyl group from 1 to 23 carbon atoms, R_2 is an alkyl group from 1 to 23 carbon atoms, n is a number from 3 to 15, m is a number from 1 to 6, Y is —O— or —S—, and X is $—C_2H_4O—$ or $—C_3H_6O—$, or a mixture of $—C_2H_4O—$ and $—C_3H_6O—$, and said compound is in an amount effective to provide lubrication.

13. A method for imparting lubricity to a fiber which comprises applying to said fiber a compound having the general formula



$$R_1-Y-(X)_n-(CH_2)_m-\overset{\overset{\displaystyle O}{\|}}{C}-O-R_2 \qquad (I)$$

wherein R_1 is an alkyl group from 6 to 20 carbon atoms, R_2 is an alkyl group from 1 to 3 carbon atoms, n is a number from 3 to 15, m is a number from 1 to about 6, Y is —O— or —S—, and X is $—C_2H_4O—$, and said compound is in an amount effective to provide lubrication.

5,314,719
FUNGICIDAL PROTECTIVE COATING FOR AIR HANDLING EQUIPMENT

Vernon Batdorf, Minneapolis, and William J. Brendle, Maple Grove, both of Minn., assignors to Foster Products Corporation, Minneapolis, Minn.

Filed Mar. 18, 1993, Ser. No. 33,492

Int. Cl.^{5} C09D *5/14*

U.S. Cl. 427—385.5 **20 Claims**

10. A method of protecting a surface from fungal colonization in a location subject to buildup of media for growth of fungus, the method comprising applying to the surface a latex coating formulation at a wet thickness of 5–30 mils (0.13–0.76 mm) and allowing the formulation to dry to a dried coating, the latex coating formulation being free of arsenic, mercury, lead, tin, chlorine and bromine, and comprising an emulsion of a polymer having sufficient adherence and flexibility so that the dried coating does not crack, blister or peel off under typical service conditions for said surface, said emulsion having suspended therein a mixture of fungicides, the fungicide mixture including a barium metaborate fungicide and a second fungicide selected from the group consisting of iodo alkynyl alkyl carbamates, diiodomethyl-p-tolylsulfone, 2-4-thiazolylbenzimidazole, 2-n-octyl-4-isothiazolin-3-one, zinc dimethyldithiocarbamate, zinc 2-mercaptobenzothiazole, potassium n-hydroxymethyl-n-methyldithiocarbamate, sodium 2-mercaptobenzothiazole, 5-hydroxymethoxymethyl-1-aza-3,7-dioxabicyclooctane, 2,3,5,6-tetrachloro-4-pyridine, zinc 2-pyridinethiol-1-oxide and N-trichloromethylthiophthalimide, the fungicides in said emulsion being present at a level sufficient to provide a zone of inhibition in the dried coating against growth of fungi of at least 1 mm.

5,314,720
CURE INHIBITED EPOXY RESIN COMPOSITIONS AND LAMINATES PREPARED FROM THE COMPOSITIONS

Joseph Gan, Strasbourg, France, and James L. Bertram, lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 526,487, May 21, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 848,477

Int. Cl.^{5} B05D *3/02*

U.S. Cl. 427—386 **10 Claims**

1. A process for coating an epoxy resin composition on a reinforcing material comprising contacting a reinforcing material with an intimately mixed composition comprising
- i) a polyepoxide;
- ii) a curing agent which does not contain phenolic hydroxyl moieties;
- iii) cure inhibitor comprising boric acid; and
- iv) a compound which catalyzes the curing of the polyepoxide with the curing agent; and

wherein said curing agent is employed in an amount of from about 0.5 to about 30 parts per 100 parts of said polyepoxide.

5,314,721
PROCESS FOR SIZING PAPER

Michael Müller, Bergisch Gladbach; Joachim Probst, Leverkusen; Heinrich Alberts; Joachim König, both of Odenthal; Heinz Bäumgen, Leverkusen, and Fritz Puchner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 5, 1993, Ser. No. 751

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1992, 4200715

Int. Cl.^{5} B05D *3/02*

U.S. Cl. 427—386 **13 Claims**

1. A process for sizing paper which comprises contacting the paper with a vinyl polymer dispersion obtained by emulsion polymerization, initiated by free radicals, of olefinically unsaturated monomers in an aqueous medium, the olefinically unsaturated monomers comprising
- a) 5 to 95% by weight of acrylonitrile, methacrylonitrile, styrene or mixtures thereof and
- b) 5 to 95% by weight of a (meth)acrylic acid ester having 1 to 12 C atoms in the alcohol radical,

the sum of components a) and b) totalling 100% by weight, and the emulsifier in said emulsion polymerization comprising a cationic polyamidoamine which has been rendered hydrophobic, has a content of cationic groups of between 0.01 and 0.3 charge equivalent per 100 g, a content of hydrophobic groups of between 0.5 and 50% by weight and a content of basic nitrogen atoms of between 0 and 3% by weight, in each case based on the cationic polyamidoamine which has been rendered hydrophobic, the polyamidoamine having been obtained by reaction of a basic polyamidoamine (A) with a monocarboxylic acid (B) and at least one of subsequent protonation with an acid (C) and quaternization with a monoepoxide (D).

5,314,722
METHOD OF APPLYING A MATERIAL TO A ROTATING OBJECT BY USING A ROBOT

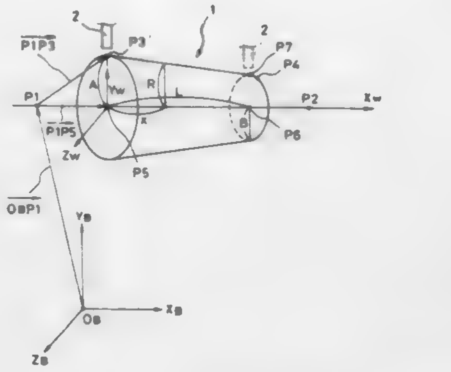
Hirohiko Kobayashi, Minamitsuru, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 646,724, Jan. 29, 1991, abandoned. This application Jan. 28, 1993, Ser. No. 13,666

Claims priority, application Japan, Jun. 29, 1989, 1-165325

Int. Cl.^{5} B05D *1/02*

U.S. Cl. 427—425 **2 Claims**



1. A method of applying a material to a rotating object by using a robot, comprising the steps of:
- (a) setting a flow rate of the material, a thickness to which the material is to be attached, and a relationship formula expressing an outer diameter of the rotating object as a function of a position in a direction of a rotation axis thereof, in a robot control device:
- (b) rotating the rotating object about its rotation axis at a fixed speed;
- (c) discharging the material from a material discharging device having a nozzle mounted on a distal end of an arm of a robot body, toward the rotating object at the flow rate;
- (d) calculating by the robot control device repeatedly with a time period, to determine a target moving amount of the nozzle in the direction of the rotation axis and a target moving amount of the nozzle in a radial direction of the rotating object, to apply the material to the rotating object to the thickness while the nozzle moves for the time period using position of the nozzle in the direction of the rotation axis, the flow rate, the thickness and the relationship formula; and
- (e) supplying control outputs periodically from the robot control device to the robot body to move the nozzle in the direction of the rotation axis and in the radial direction by the target moving amounts calculated in step (d) during the time period.

5,314,723
METHOD OF COATING PHOSPHORS ON FLUORESCENT LAMP GLASS

Arunava Dutta, Chestnut Hill, and Leonard V. Dullea, Peabody, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jun. 9, 1992, Ser. No. 895,762

Int. Cl.^{5} B05D *5/06*

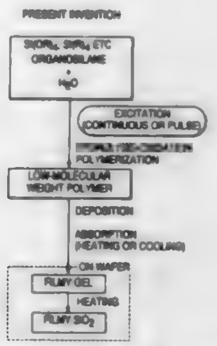
U.S. Cl. 427—476 **34 Claims**

1. A method for forming a coating of phosphor particles on a fluorescent lamp glass comprising entraining polymer treated phosphor particles in a carrier gas, said polymer having a decomposition temperature and a polymer softening temperature, heating the fluorescent lamp glass to a temperature above the polymer softening temperature for adhering the polymer to the fluorescent lamp glass, depositing the polymer treated phosphor particles on the fluorescent lamp glass and forming a

coated fluorescent lamp glass, heating the coated fluorescent lamp glass to a temperature above the decomposition temperature of the polymer for removing the polymer and forming a coating of phosphor particles on a fluorescent lamp glass.

5,314,724
PROCESS FOR FORMING SILICON OXIDE FILM

Atuhiro Tsukune; Yuji Furumura, and Hatanaka Masanobu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VISI Limited, Kasugai, both of Japan
PCT No. PCT/JP91/01739, § 371 Date Aug. 27, 1992, § 102(e) Date Aug. 27, 1992, PCT Pub. No. WO92/12535, PCT Pub. Date Jul. 23, 1992
PCT Filed Dec. 19, 1991, Ser. No. 923,882
Claims priority, application Japan, Jan. 8, 1991, 3-000734; Mar. 26, 1991, 3-062133
Int. Cl.⁵ B05D *3/06*
U.S. Cl. 427—489 **26 Claims**


PRESENT INVENTION
ORGANOSILANE
H₂O
EXCITATION (CONTINUOUS OR PULSE)
POLYMERIZATION
LOW-MOLECULAR WEIGHT POLYMER
DEPOSITION
ABSORPTION (HEATING OR COOLING)
ON WAFER
FILMY GEL
HEATING
FILMY SiO₂

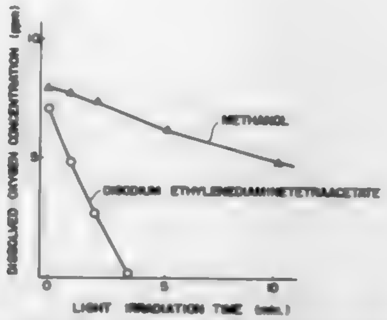
1. A process for the formation of a silicon oxide film, comprising the steps of:

exciting a gas, comprising an organosilane or organosiloxane gas constituent and a gas constituent containing H and OH, above a substrate in a reaction chamber thereby to cause the gas constituents to react with each other in a gaseous phase or on the substrate and thereby to deposit a thin film of an organic-group-containing silanol, silanol polymer, or siloxane-bonded polymer on the substrate; and

removing the organic groups from the thin film to obtain a silicon oxide film.

5,314,725
PHOTO-PLATING PROCESS

Shinya Morishita, Aichi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed Feb. 17, 1993, Ser. No. 18,560
Claims priority, application Japan, Feb. 17, 1992, 4-069165; Sep. 11, 1992, 4-269519
Int. Cl.⁵ B05D *3/02*
U.S. Cl. 427—553 **15 Claims**



1. A process for photo-plating only a light-irradiated portion of a dye layer formed on a substrate, which comprises:

forming a dye layer comprising dye molecules on the surface of a substrate;

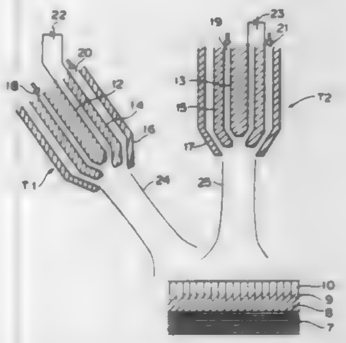
immersing the substrate with said dye layer into an electroless plating solution comprising a sacrificial reagent for supplying electrons by irreversible oxidative decomposition, and at least one member selected from the group consisting of copper ions, nickel ions, cobalt ions, and tin ions; and

irradiating the surface of said dye layer with light having an energy higher than the exciting energy of the dye in the dye layer,

thereby forming a coating containing at least one of copper, nickel, cobalt, and tin on the light-irradiated portion of the dye layer.

5,314,726
PROCESS FOR FORMING A MIXED LAYER OF A PLASMA SPRAYED MATERIAL AND DIAMOND

Kazuaki Kurihara, Atsugi; Motonobu Kawarada, Sagamihara; Ken-ichi Sasaki, Atsugi, and Akitomo Teshima, Isehara, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan
Filed Sep. 30, 1991, Ser. No. 767,890
Claims priority, application Japan, Oct. 17, 1990, 2-278229
Int. Cl.⁵ B05D *3/06, 1/00*
U.S. Cl. 427—577 **4 Claims**

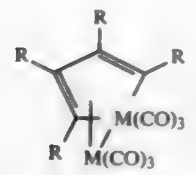


1. A process for the production of a coating film having a mixed layer of a plasma spraying material and diamond, the process using a plasma spraying first torch and a plasma CVD second torch, the first and second torches being structurally distinct and having respective, separately controlled plasma generation operating conditions, and comprising simultaneously conducting plasma spraying of the plasma spraying material using an inert gas as a plasma forming gas by the plasma spraying torch, and plasma CVD of a diamond forming material using hydrogen gas and hydrocarbon gas by the CVD plasma torch, thereby to form said mixed layer on a substrate.

5,314,727
CHEMICAL VAPOR DEPOSITION OF IRON, RUTHENIUM, AND OSMIUM

Fred B. McCormick, Maplewood; Wayne L. Gladfelter, St. Paul, and Yoshihide Senzaki, Minneapolis, all of Minn., assignors to Minnesota Mining & Mfg. Co./Regents of the University of Minnesota, Minneapolis, Minn.
Filed Jul. 28, 1992, Ser. No. 920,771
Int. Cl.⁵ B05D *3/06*
U.S. Cl. 427—584 **17 Claims**

1. A method for applying a metal film on the surface of a substrate comprising employing the techniques of chemical vapor deposition to decompose a vapor comprising a compound of the formula:



wherein

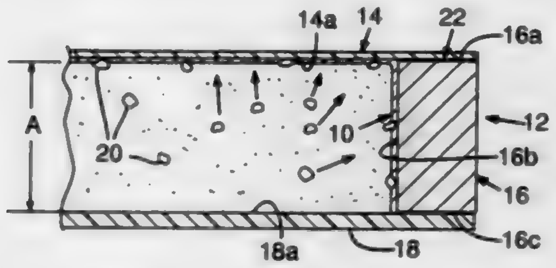
(a) each M is Fe, Ru or Os; and

(b) each R is H, OH, halo, (C_1-C_{10})alkyl, (C_1-C_{10})perfluoroalkyl, (C_6-C_{10})aryl or two R taken together are benzo;

so as to deposit a film comprising Fe, Ru, Os or mixtures thereof on said surface.

5,314,728
CAPTURE LAYER AND METHOD FOR DELAYED ENTRAPMENT OF CONTAMINANT PARTICLES

Yung-Tsai Yen, 196 Tuscaloosa Ave., Atherton, Calif. 94025
Filed Apr. 1, 1993, Ser. No. 41,831
Int. Cl.⁵ A47G *1/12*
U.S. Cl. 428—14 **20 Claims**



1. In a pellicle having an outer surface and an inner surface, and that includes a pellicle membrane with an underside that is tensed and bonded over a peripheral pellicle frame, a capture layer for delayed entrapment of contaminant particles that may accumulate on a pellicle during and after it is fabricated, comprising:

delay curable material residing on the inner surface of the pellicle and being selectively curable to entrap such contaminant particles.

5,314,729
ARTIFICIAL MARBLE

Mitsunori Ikezoe, and Shigeru Motomiya, both of Osaka, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Filed Jul. 29, 1991, Ser. No. 736,444
Claims priority, application Japan, Jul. 30, 1990, 2-201705
Int. Cl.⁵ C08L *67/06;* **B32B** *27/36*
U.S. Cl. 428—15 **4 Claims**

1. An artificial marble formed by molding a material, in which said material comprises:

an unsaturated polyester, which consists essentially of an acid component, wherein said acid component contains a first compound selected from the group consisting of α, β-unsaturated dibasic acids and anhydrides thereof and a second compound selected from the group consisting of aromatic saturated dibasic acids and anhydrides thereof, and

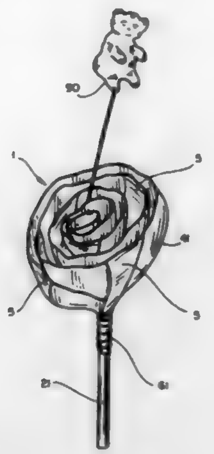
an alcohol component, wherein said alcohol component contains 5 mole percent or mole of at least a glycol selected from the group consisting of 2-methylpropane-1,3-diol, 3-methylpentane-1,5-diol, 3-methyl-2-pentane-1,5-diol, 2-isopropylidene-1,3-propanediol, 2-isopropyl-1,3-propanediol, and 2-methylene-1,3-propanediol,

an unsaturated polymerizable monomer, and

a filler.

5,314,730
ARTIFICIAL ORNAMENTAL FLOWER AND METHOD FOR MAKING AN ARTIFICIAL ORNAMENTAL FLOWER

Erlinda V. Flores, 1064 Billings Blvd., San Leandro, Calif. 94577
Filed Jul. 30, 1992, Ser. No. 921,940
Int. Cl.⁵ A41G *1/00*
U.S. Cl. 428—24 **18 Claims**



1. An artificial flower, comprising:

stem means for supporting an artificial flower portion, the stem means including a ribbon engaging means at an upper end thereof for engaging the artificial flower portion, the ribbon engaging means defining a top end of the stem means;

a ribbon for forming the artificial flower portion, the ribbon engaging means of the stem means extending through the ribbon to engage the stem means and the ribbon, the ribbon being repeatedly diagonally folded to form a plurality of diagonal folds at a plurality of positions along a longitudinal length of the ribbon, the diagonal folds being folded at predetermined angles and forming a descending spiral, at least a portion of each diagonal fold facing an outer edge of the descending spiral, the descending spiral being wound around the stem means such that the outer edge of the descending spiral is positioned at a predetermined height relative to the top end of the stem means to form the desired flower; and

binding means for binding at least a portion of an inner edge of the descending spiral and an end of the wound, folded ribbon to a portion of the stem means,

wherein the folded, wound, and bound ribbon is adapted to simulate flowers in desired stages of bloom by turning the stem means relative to the binding means.

5,314,731
SURFACE-TREATED SUBSTRATE

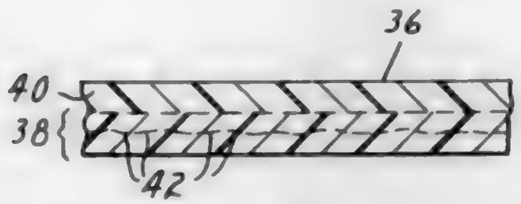
Takashige Yoneda; Tsuneo Wakabayashi, and Yukiko Takano, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan
Filed May 15, 1992, Ser. No. 883,391
Claims priority, application Japan, May 17, 1991, 3-141413; May 17, 1991, 3-141414; May 17, 1991, 3-141415; May 17, 1991, 3-141416; Nov. 20, 1991, 3-331367
Int. Cl.⁵ B32B *9/00*
U.S. Cl. 428—429 **20 Claims**

1. A surface-treated substrate consisting essentially of a substrate having at least two different treated surface layers wherein the first layer constituting the outermost layer among the treated surface layers is a layer obtained by treatment with a compound (I) containing at least one Si—NCO group capable of forming a surface having a contact angle of at least 70° against water, and the second layer constituting an underlayer in contact with the outermost layer is a layer obtained by

treatment with at least one reactive silane compound (II) selected from the group consisting of isocyanate silane compounds and hydrolyzable silane compounds.

5,314,732
FLEXIBLE, TRANSPARENT FILM FOR ELECTROSTATIC SHIELDING

Orville M. Wiste, Round Rock, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 28, 1991, Ser. No. 722,956
The portion of the term of this patent subsequent to Nov. 24, 2009, has been disclaimed.
Int. Cl.^{5} B32B *1/08, 5/16;* **B65D** *30/00*
U.S. Cl. 428—35.3 **19 Claims**



1. A film for providing static shielding, comprising;
a first layer of a carrier material which is electrically insulative, flexible, and transparent;
a second layer of a homogenous polymeric material which is electrically insulative, flexible, transparent, and thermoplastic, said first layer being bonded to said second layer; and said second layer having a melting temperature which is lower than that of said carrier material; and
a plurality of overlapping conductive slivers suspended in said second layer, forming an essentially two-dimensional, conductive network, said slivers having a melting temperature above the melting temperature of said polymeric material.

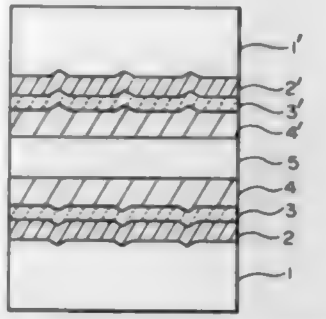
5,314,733
MULTI-LAYER CONTAINER

Keiichi Saito, and Koji Nishida, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan
Filed Jun. 12, 1992, Ser. No. 897,826
Claims priority, application Japan, Jun. 12, 1991, 3-140307
Int. Cl.^{5} B65D *1/00*
U.S. Cl. 428—36.6 **11 Claims**

1. A low temperature impact resistant multi-layer container which is impermeable to hydrocarbon solvents comprising a layer A comprising a polyolefin resin having a melt flow rate, measured at 190° C. under a load of 2.16 kg, of from 0.001 to 0.02 dg/min, a layer B comprising a modified polyolefin resin modified with a maleic anhydride having a maleic anhydride content of from 0.01 to 5% by weight and a melt flow rate of 0.001 to 20 dg/min, and a layer C comprising a polyamide-based resin composition, wherein said resin composition comprises
(C-1) from 40 to 90% by weight of a polyamide resin having a relative viscosity of from 2.0 to 8.0,
(C-2) from 10 to 60% by weight of a polyphenylene ether resin having an intrinsic viscosity of from 0.25 to 0.90 dl/g,
(C-3) from 5 to 50 parts by weight, per 100 parts by weight of the sum of (C-1) and (C-2), of a compatibilizer, an impact modifier, and
(C-4) from 0.05 to 30 parts by weight, per 100 parts by weight of the sum of (C-1) and (C-2), of a compatibilizer,
wherein said polyphenylene ether resin forms a dispersed phase having a number average particle size of not more than 1 μm, and said polyamide resin forms a continuous phase and has a crystallinity of at least 20% and wherein said layers A, B, and C are in the order of A/B/C or A/B/C/B/A.

5,314,734
INFORMATION-RECORDING MEDIUM

Tetsuya Nishida, Hachioji, and Shinkichi Horigome, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Maxell, Ltd., Ibaraki, both of Japan
Filed Feb. 10, 1993, Ser. No. 15,854
Claims priority, application Japan, Feb. 10, 1992, 4-023566
Int. Cl.^{5} B32B *3/02*
U.S. Cl. 428—64 **25 Claims**



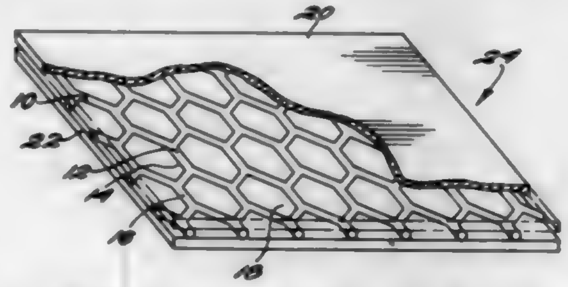
1. An information-recording medium comprising a substrate, a recording layer provided on the substrate, said recording layer changing in atomic arrangement upon irradiation with a recording energy beam, and a reflective layer which is provided on the side of the recording layer reverse to the side irradiated with the recording energy beam, wherein said recording layer and said reflective layer are contiguous to each other and the recording layer has an average composition represented by the following formula:

$$A_wD_xSb_ySe_z$$

wherein w, x, y and z are in the range of $0 \leqq w \leqq 30$, $3 \leqq x \leqq 57$, $3 \leqq y \leqq 57$ and $40 \leqq z \leqq 90$ in atomic percent, D represents at least one element of Sn, In, Ge, Pb, Si, Bi, Ga and Au, and A represents at least one element other than Sb, Se and the elements represented by D; and wherein said recording layer has a thickness of 5 to 500 nm and said reflective layer has a thickness of 10 to 500 nm.

5,314,735
SURFACE COATING FOR PREVENTION OF CRUST FORMATION

James W. Kronberg, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jul. 16, 1991, Ser. No. 730,423
Int. Cl.^{5} B32B *3/12*
U.S. Cl. 428—116 **12 Claims**



1. A multilayer protective flexible laminate for preventing the build-up of solids deposited on a surface, said laminate comprising:
a flexible outer layer; and
a flexible substrate composed of a multiplicity of strands and open cells, said substrate having an outer side and an inner side, said outer side of said substrate bonded to said outer layer and said substrate having zone to zone variation in compressibility by varying the composition of one or more cells in each of said zone in said substrate for varying the compressive strengths of adjacent zones of said substrate so that, as said solids are deposited on said substrate, said substrate flexes thereby preventing said solids from building up on said surface.

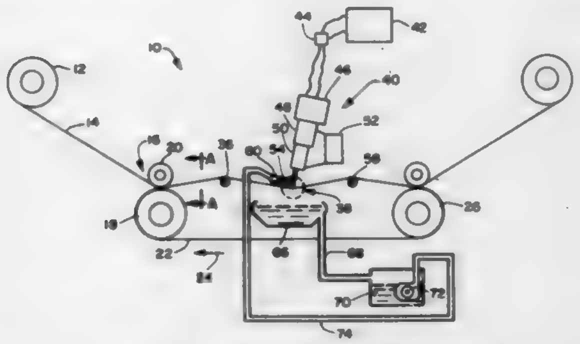
5,314,736
POLYETHYLENE TEREPHTHALATE FILM FOR MAGNETIC RECORDING MEDIUM CONTAINING THREE DIFFERENT KINDS OF PARTICLES

Chikakazu Kawaguchi, Atsugi; Yoshio Meguro, Machida, and Takashi Harada, Yokohama, all of Japan, assignors to Diafoil Hoechst Co., Ltd., Tokyo, Japan
Filed Feb. 21, 1992, Ser. No. 838,665
Claims priority, application Japan, Feb. 22, 1991, 3-28645
Int. Cl.^{5} D07N *7/04*
U.S. Cl. 428—143 **10 Claims**

1. A polyethylene terephthalate film for magnetic recording medium, which contains 0.1 to 1.0% by weight based on the film of aggregated silicon oxide particles having an average particle size of 0.03 to 0.2 μm, the primary particle of which has an average particle size of 0.005 to 0.05 μm, 0.1 to 1.0% by weight based on the film of aggregated aluminium oxide particles having an average particle size of 0.03 to 0.2 μm, the primary particle of which has an average particle size of 0.005 to 0.05 μm, and 0.005 to 0.3% by weight based on the film of a crosslinked polymer having an average particle size of 0.2 to 0.8 μm, said film having a center line average surface roughness of 0.003 to 0.015 μm and a sum of F-5 values in both the machine direction and the transverse direction of at least 25.0 kg/mm^2.

5,314,737
AREA THINNED THIN SHEET MATERIALS

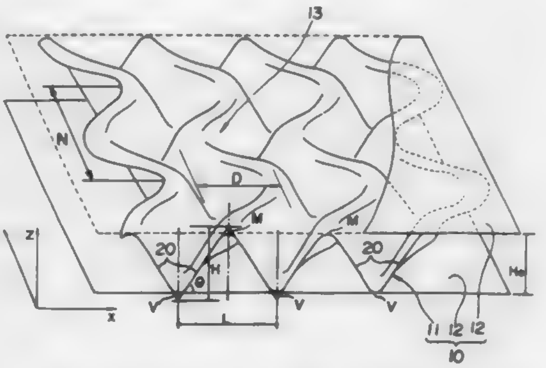
Bernard Cohen, Berkley Lake, and Lee K. Jameson, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sep. 30, 1991, Ser. No. 767,727
Int. Cl.^{5} B32B *3/00*
U.S. Cl. 428—156 **55 Claims**



1. A sheet material, having an average thickness of less than about ten mils, with at least a portion thereof having a generally uniform pattern of at least 1,000 thinned areas per square inch, wherein each of the thinned areas has a thickness which is at least 25 percent less than the thickness of the surrounding sheet material.

5,314,738
REINFORCED COMPOSITE CORRUGATE BODY

Hiroo Ichikawa, 18-9, Nishi-Waseda 3-chome, Shinjuku-ku, Tokyo 160, Japan
PCT No. PCT/JP89/00266, § 371 Date Nov. 6, 1990, § 102(e) Date Nov. 6, 1990, PCT Pub. No. WO90/10537, PCT Pub. Date Sep. 20, 1990
Continuation of Ser. No. 613,536, Nov. 6, 1990, abandoned. This PCT application Mar. 10, 1989, Ser. No. 796,916
Int. Cl.^{5} B32B *3/28*
U.S. Cl. 428—182 **5 Claims**



1. A reinforced composite corrugated body comprising:
a corrugated body formed of a sheet material having formed therein corrugate lines including, with respect to an x-y-z coordinate system, ridges and grooves formed alternately in an x direction and located in respective planes spaced in a z direction and parallel to an x-y plane, each said ridge and groove of each said corrugate line having a smooth meandering waveform in a y direction as viewed in said x-y plane, and said ridges and grooves defining a smooth meandering sectional waveform in said x direction as viewed in an x-z plane;
said sectional waveform having an amplitude H in said z direction and a wavelength L in said x direction defining a substantial amplitude ratio H/L such that $0.4 \leqq H/L \leqq 1.4$;
said meandering waveform of each said corrugate line having an amplitude D in said x direction and a wavelength N in said y direction defining a substantial meandering ratio $D/N \leqq 0.35$;
said corrugate lines defining a substantial meandering overlapping ratio $D/L \geqq 0.5$;
said corrugate lines being formed without substantial wrinkling or breakage thereof in said x direction as a result of said corrugate lines having a width narrowing ratio i, equal to an amount of contraction of said sheet material in said y direction after formation therein of said corrugate lines to a width in said y direction of said sheet material in the form of a flat sheet before formation therein of said corrugate lines, $\leqq 8\%$ plus a stretch strain ratio of said sheet material;
said width narrowing ratio i, said substantial amplitude ratio H/L and said meandering ratio D/N substantially satisfying a profile curve relationship such that the values of H/L and D/N change proportionally when i is changed;
said waveform of each said corrugate line having crest and bottom portions spaced in said y direction, each said crest and bottom portion being curved or chamfered and having a relatively small dimension in said y direction; and
a flat liner adhered to at least one opposite face of said corrugated body.

5,314,739

SECURITY PAPER FOR BANK NOTES AND OTHER DOCUMENTS

Juan Teodoro Vidal, Burgos, Spain, assignor to Fabrica Nacional de Moneda Y Timbre, Madrid, Spain

PCT No. PCT/ES92/00005, § 371 Date Dec. 15, 1992, § 102(e) Date Dec. 15, 1992, PCT Pub. No. WO92/12293, PCT Pub. Date Jul. 23, 1992

PCT Filed Jan. 10, 1992, Ser. No. 923,994

Claims priority, application Spain, Jan. 10, 1991, 9100063

Int. Cl.^{5} B32B *3/00*

U.S. Cl. 428—195 **2 Claims**

1. An improvement in security paper having opposite surfaces for bank notes and other documents embedded with security yarns that can be microprinted or have fluorescent or iridescent characteristics, the improvement wherein said yarns make up groups, of at least three in number, with the yarns in each group braided together to form a braid having a thickness in excess of one hundred microns and extending above a surface of the paper and allowing the easy detection thereof using the sense of touch.

5,314,740

BASE BOARD FOR PRINTED CIRCUIT BOARD

Kenji Ishii; Yoshinori Kondo; Hiroyuki Matsumoto, and Norio Sayama, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 27, 1992, Ser. No. 935,245

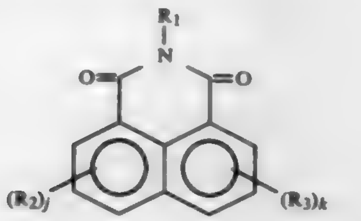
Claims priority, application Japan, Aug. 28, 1991, 3-242779; Aug. 28, 1991, 3-242780; Aug. 28, 1991, 3-242781

Int. Cl.^{5} B32B *9/00*

U.S. Cl. 428—209 **17 Claims**

1. A base board for a printed circuit board, which has an insulating layer containing 5.0 to 0.00001% by weight of at least one compound selected from the group consisting of compounds of the formulae (1), (2) and (3),

(1)



wherein R_1 is hydrogen, alkyl, substituted alkyl, aryl or substituted aryl,

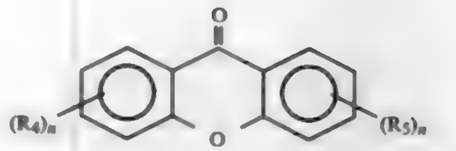
each of R_2 and R_3 is, independently of the other, hydroxyl, amino, carboxyl, sulfone,

a salt of hydroxyl, a salt of amino, a salt of carboxyl, a salt of sulfone,

hydroxyl to which alkyl or substituted alkyl is bonded,
amino to which alkyl or substituted alkyl is bonded,
carboxyl to which alkyl or substituted alkyl is bonded,
sulfone to which alkyl or substituted alkyl is bonded,
hydroxyl to which aryl or substituted aryl is bonded,
amino to which aryl or substituted aryl is bonded,
carboxyl to which aryl or substituted aryl is bonded,
sulfone to which aryl or substituted aryl is bonded,
hydroxyl to which acyl or substituted acyl is bonded,
amino to which acyl or substituted acyl is bonded,
carboxyl to which acyl or substituted acyl is bonded,
sulfone to which acyl or substituted acyl is bonded,
a salt of alkyl, a salt of aryl, a salt of acyl, halogen, alkyl, substituted alkyl
aryl or substituted aryl,

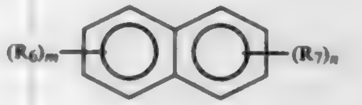
and each of j and k is an integer of 0 to 3,

(2)



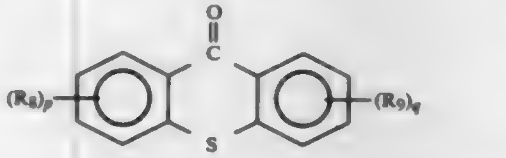
wherein each of R_4 and R_5 is, independently of the other, hydroxyl, saccharide, substituted saccharide, alkoxy, substituted alkoxy, acyl, substituted acyl, acyloxy, substituted acyloxy, alkyl, substituted alkyl, aryl or substituted aryl, and each of m and n is an integer of 0 to 4, provided that m and n are defined by $m+n \geqq 1$, and

(3)



wherein each of R_6 and R_7 is, independently of the other, hydroxy, amino, sulfone, nitro or a salt of any one of these, provided that at least one of R_6 and R_7 is sulfone, nitro or a salt of these and each of m and n is an integer of 0 to 4, provided that m and n are defined by $m+n \geqq 1$; wherein said insulating layer comprises a laminated product of a prepreg formed from a reinforcing substrate and a thermosetting resin, and said thermosetting resin comprises an alkylthioxanthone of the formula (4),

(4)



wherein each of R_8 and R_9 is alkyl, each of p and q is an integer of 0 to 4, and $p+q \geqq 1$.

5,314,741

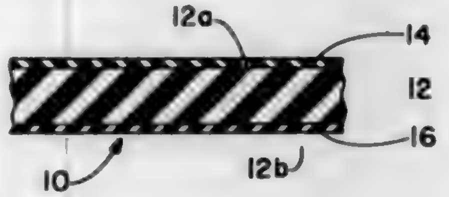
RUBBER ARTICLE HAVING PROTECTIVE COATING

Robert F. Roberts, Uniontown; Dane K. Parker, Massillon, and James R. Purdon, Jr., Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 7, 1992, Ser. No. 957,121

Int. Cl.^{5} B32B *27/08;* **B05D** *3/02*

U.S. Cl. 428—215 **20 Claims**



1. A composite laminate comprising:

(a) a polymer substrate having an exposed surface wherein the polymer of the substrate is a conjugated diene-containing polymer or a polymer derived from a monounsaturated monomer or a mixture of monounsaturated monomers, and wherein said polymer contains residual unsaturation and is subject to attack by oxygen, ozone and ultraviolet light; and

(b) a protective elastomer coating of a highly saturated polymer which is adhered to said surface of said substrate and completely covers said surface, wherein the highly saturated polymer of the coating is elastomeric and is a curable hydrogenated polymer obtained by hydrogenating a latex of an unsaturated polymer of about 5 of 100% by weight of 1,3-butadiene and 0 to about 95% by weight of one or more ethylenically unsaturated comonomers, and wherein said hydrogenated polymer contains not more than about 20% of the unsaturation of said unsaturated polymer, or a vulcanizate of said curable hydrogenated polymer, said protective coating protecting the substrate from attack by oxygen, ozone and ultraviolet light.

5,314,742

RESIN IMPREGNATED LAMINATE FOR WIRING BOARD APPLICATIONS

Birol Kirayoglu, Wilmington, Del.; William J. Sillivan, Richmond, Va., and Melvin P. Zussman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1993, Ser. No. 41,417

Int. Cl.^{5} B33B *17/00*

U.S. Cl. 428—285 **4 Claims**

1. Nonwoven aramid sheet useful as reinforcement in electronic printed wiring board laminates having a coefficient of thermal expansion of less than 10 ppm per ° C, said sheet comprised of from 5 to 25 weight percent poly(m-phenylene isophthalamide) fibrids and 75 to 95 weight percent p-aramid floc and having a basis weight of between 0.8 and 4.0 oz/yd^2 and a density between 0.5 and 1.0 g/cc and a Gurley Hill Porosity of less than 10 seconds.

5,314,743

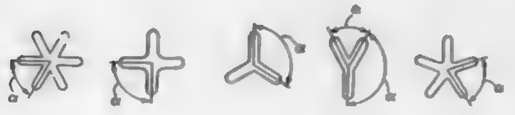
NONWOVEN WEB CONTAINING SHAPED FIBERS

Randy E. Meirowitz, Neenah; Jerome W. Riese, and Robert J. Phelan, both of Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 17, 1990, Ser. No. 628,782

Int. Cl.^{5} B32B *5/06*

U.S. Cl. 428—297 **26 Claims**



1. A nonwoven web for absorbing and transporting a liquid, said nonwoven web being capable interfiber and intrafiber liquid transport, said nonwoven web comprising:

a shaped fiber, said shaped fiber defining a notch, said notch defining an angle alpha such that

$\alpha < 180$ degrees $- 2\theta$ wherein θ is the contact angle between said liquid and said shaped fiber; and

a high-absorbency material, in liquid communication with said nonwoven web in an area of intrafiber liquid transport;

wherein said nonwoven web has a density of from about 0.01 gram per cubic centimeter to about 0.5 gram per cubic centimeter, and, further, whereby a liquid applied to said nonwoven web is subjected to interfiber liquid transport and to intrafiber liquid transport.

5,314,744

DOUBLE COATED FREE AGGREGATE USABLE IN WOOD CONCRETE TECHNOLOGY AND METHOD OF MAKING THE SAME

Hansruedi Walter, and Leni M. Walter-Gurzeler, both of Windsor, S.C., assignors to Insul Holz-Beton Systems Inc., Windsor, S.C.

Filed Nov. 13, 1991, Ser. No. 791,272

The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.

Int. Cl.^{5} B32B *5/16*

U.S. Cl. 428—326 **3 Claims**

1. A free aggregate usable in forming wood concrete products, comprising:

a plurality of individual chips of fibrous organic material, wherein at least a portion of volatile oils in the pores of the chips have been allowed to evaporate; and

a two layer kaolin mineralizing coating encasing the individual chips to a degree sufficient to seal in water-soluble organic matter held in the pores of said chips and prevent the leaching thereof, while maintaining said individual chips in a free aggregate form.

5,314,745

MAGNETIC RECORDING MEDIUM HAVING A GLASS SUBSTRATE, HEAT RETAINING NON MAGNETIC METAL LAYER FORMED OVER THE SUBSTRATE, AMORPHOUS NIP LAYER, CR LAYER AND MAGNETIC LAYER

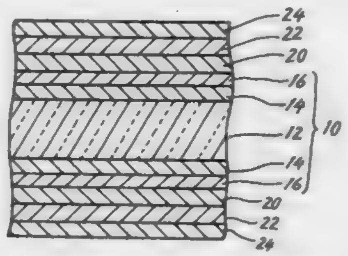
Yoshinobu Okumura, Amagasaki, Japan, assignor to Kubota Corporation, Osaka, Japan

Filed Aug. 18, 1992, Ser. No. 931,366

Claims priority, application Japan, Jan. 17, 1992, 4-006791

Int. Cl.^{5} G11B *5/00*

U.S. Cl. 428—336 **6 Claims**



1. A magnetic recording medium comprising a substrate, a ground layer being made of a material containing at least 95% by weight of Cr and formed over one surface of the substrate, and a magnetic layer formed over the ground layer; said substrate comprising:

a base of glass plate;

a nomagnetic metal layer formed over the ground layer; said substrate comprising:

a base of glass plate;

a nonmagnetic metal layer formed over the glass base and having a thickness sufficient for retention of heat wherein the substrate is heated by infrared electromagnetic waves for forming the ground layer; and

an amorphous NiP layer formed over the nonmagnetic metal layer and having a thickness of about 250 to 1000 angstroms.

5,314,746

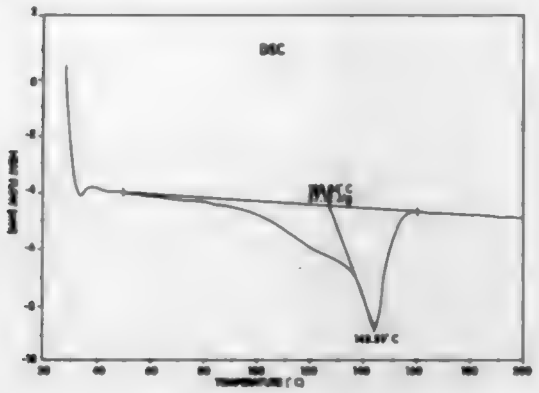
SOFT, PUNCTURE- AND TEAR-RESISTANT POLYOLEFIN FILMS

Lisa K. Johnson, Mason; Paul E. Bowen, Loveland, both of Ohio; Thaddeus W. Klimek, Orland Park, and Michael B. Edwards, Minooka, both of Ill., assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Nov. 12, 1992, Ser. No. 975,483

Int. Cl.^{5} B32B *27/08;* C08F *297/08*

U.S. Cl. 428—338 **11 Claims**



1. A puncture-resistant propylene-ethylene copolymer film having a 1% secant modulus from 5,000 psi to 70,000 psi and Elmendorf tear value greater than 100 grams per mil thickness in both the machine direction and the transverse direction, said copolymer containing from 3 to 47 weight percent ethylene and having a melt flow from 0.01 to 500 dg/min and melting point from 115° C. to 160° C.

5,314,747

RECORDING SHEETS CONTAINING CATIONIC SULFUR COMPOUNDS

Shadi L. Malhotra, Mississauga, and Brent S. Bryant, Milton, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1993, Ser. No. 34,943

Int. Cl.^{5} B41M *5/00*

U.S. Cl. 428—341 **22 Claims**

1. An imaged recording sheet which comprises (a) a substrate; and (b) a recording layer comprising a cationic sulfur compound selected from the group consisting of sulfonium compounds, thiazolium compounds, benzothiazolium compounds, and mixtures thereof, an optional binder, and an optional pigment, said recording layer containing an image applied from an aqueous ink.

5,314,748

RADIATION-CURABLE SILICONE ELASTOMERS AND PRESSURE SENSITIVE ADHESIVES

Mieczyslaw H. Mazurek, Roseville; Steven S. Kantner, St. Paul; Charles M. Leir, Falcon Heights, all of Minn.; Yvan A. Bogaert, Gent, Belgium; Robert K. Galkiewicz, Roseville, and Audrey A. Sherman, St. Paul, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

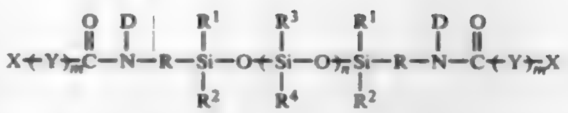
Division of Ser. No. 792,437, Nov. 15, 1991, Pat. No. 5,237,082, which is a division of Ser. No. 671,172, Mar. 15, 1991, Pat. No. 5,091,483, which is a continuation of Ser. No. 411,410, Sep. 22, 1989, abandoned. This application Aug. 16, 1993, Ser. No. 109,004

Int. Cl.^{5} B32B *7/12, 9/04*

U.S. Cl. 428—345 **21 Claims**

1. A flexible sheet coated on at least a portion of at least one major surface with a composition which is curable to a pressure-sensitive adhesive, the composition comprising:

(a) a polymer or mixture of polymers of the formula



$$X\left(Y\right)_m\overset{O}{\overset{\|}{C}}-\overset{D}{\overset{|}{N}}-R-\underset{R^2}{\underset{|}{\overset{R^1}{\overset{|}{Si}}}}-O\left(\underset{R^4}{\underset{|}{\overset{R^3}{\overset{|}{Si}}}}-O\right)_n\underset{R^2}{\underset{|}{\overset{R^1}{\overset{|}{Si}}}}-R-\overset{D}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}\left(Y\right)_m X \qquad \text{I}$$

wherein:

X are monovalent moieties having ethylenic unsaturation which can be the same or different;

Y are divalent linking groups which can be the same or different;

m is an integer of 0 to 1;

D are monovalent moieties which can be the same or different selected from the group consisting of hydrogen, an alkyl group of 1 to about 10 carbon atoms, aryl, and substituted aryl;

R are divalent hydrocarbon groups which can be the same or different;

R^1 are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, aryl, and substituted aryl;

R^2 are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, aryl, and substituted aryl;

R^3 are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, vinyl, aryl, and substituted aryl; and

R^4 are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, vinyl, aryl, and substituted aryl; and

n is an integer of about 270 to about 1000; and

(b) sufficient tackifier to endow the cured composition with adhesive tack at the use temperature.

5,314,749

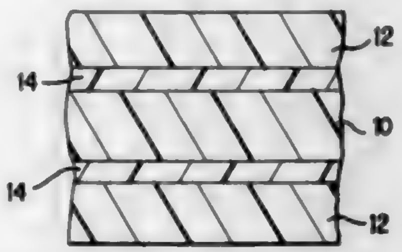
HIGH DENSITY POLYETHYLENE SHRINK FILM

Gautam P. Shah, Simpsonville, S.C., assignor to W.R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 529,068, May 25, 1990, abandoned. This application Mar. 19, 1993, Ser. No. 34,006

Int. Cl.^{5} B32B *7/12, 27/68;* B65D *33/00*

U.S. Cl. 428—349 **5 Claims**



1. A biaxially oriented multilayer shrink film comprising:

(a) an internal layer consisting essentially of a high density polyethylene; and

(b) two outer layers each comprising olefinic polymer or copolymer;

wherein the two outer layers each comprise an olefinic polymer or copolymer selected from the group consisting of ethylene vinyl acetate copolymer, ethylene alkyl acrylate copolymer, linear medium density polyethylene, linear low density polyethylene, and very low density polyethylene.

5,314,750

MAGNETIC IRON OXIDE PARTICLES AND METHOD OF PRODUCING SAME

Atsushi Takedoi; Mamoru Tanihara; Tosiharu Harada; Masaru Isoai, and Kazuhiro Fujita, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Continuation of Ser. No. 342,152, Apr. 24, 1989, abandoned. This application Oct. 27, 1992, Ser. No. 967,522

Claims priority, application Japan, Dec. 29, 1988, 63-333108; Dec. 29, 1988, 63-333109; Feb. 27, 1989, 1-48028; Feb. 27, 1989, 48029

Int. Cl.^{5} C01G *49/02;* H01F *1/06*

U.S. Cl. 428—402 **8 Claims**

1. Magnetic iron oxide particles comprising spindle-shaped magnetite ($FeO_x.Fe_2O_3$, $0<x\leqq 1$) particles having a major axial diameter of 0.1 to 0.3 μm, an axial ratio (major axial diameter/minor axial diameter) of not less than 7, and a print-through characteristic of not less than 45 dB and showing a substantially uniform particle size, said particles produced by a process comprising:

(a) aging an aqueous solution containing $FeCO_3$ obtained by reacting an aqueous alkali carbonate with an aqueous ferrous salt solution in a non-oxidizing atmosphere at a temperature of 40° to 60° C. for 50 to 100 minutes, the amount of aqueous alkali carbonate being 1.5 to 3.5 times equivalent based on Fe^{2+} in said aqueous ferrous salt solution;

(b) blowing an oxygen-containing gas into the suspension containing said $FeCo_3$ to oxidize it and produce spindle-shaped goethite particles;

(c) providing spindle-shaped goethite particles coated with a sintering preventing material; and

(d) reducing either said spindle-shaped goethite particles with the sintering preventing material, or spindle-shaped hematitie particles obtained by heating said spindle-shaped goethite particles coated with the sintering preventing material in a reducing gas.

5,314,751

COATING PROCESS AND PRODUCT

Eric Nield, Beaconsfield; Riaz Ahmed, High Wycombe, and Riaz A. Choudhery, Slough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 709,578, Jun. 5, 1991, abandoned. This application Jul. 13, 1993, Ser. No. 91,820

Claims priority, application United Kingdom, Jun. 19, 1990, 9013663

Int. Cl.^{5} B32B *27/36*

U.S. Cl. 428—412 **7 Claims**

1. A process for forming a coating on a surface of a substrate which comprises:

(i) applying a layer of composition comprising a polymer phase in dispersion in a non-aqueous continuous diluent, in which the polymer phase comprises an effective film-forming amount of a crystallisable polymer, selected from polyesters, polyamides, and polycarbonates, in intimate admixture with a non-crosslinkable solvent for the crystallisable polymer, said polymer phase and diluent being immiscible so as to provide the dispersion thereof and an effective amount of a stabilizer sufficient to maintain the polymer phase dispersed in the diluent and

(ii) heating the applied layer to a temperature at least high enough to cause film formation.

5,314,752

AUTOMOTIVE WEATHERSTRIPPING

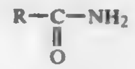
Angela E. Bova, Woodbury, and Donald W. Tredinnick, Ansonia, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 718,147, Jun. 20, 1991, abandoned. This application Jun. 3, 1993, Ser. No. 72,356

Int. Cl.^{5} B32B *27/00*

U.S. Cl. 428—424.2 **4 Claims**

1. A weatherstripping material comprising a cocured bilayer of (a) a curable elastomer base layer in adherent contact with (b) a curable elastomer freeze release layer containing an organopolysiloxane and a freeze release additive comprising a fatty acid amide of the formula



$$R-\underset{O}{\underset{\|}{C}}-NH_2$$

wherein R has from 12 to 50 carbon atoms and from 0 to 4 carbon-to-carbon double bonds.

5,314,753

PRINTING PAPER AND A PROCESS FOR ITS MANUFACTURE

Werner Bergmann, Brüggen, Fed. Rep. of Germany, assignor to Stora Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 687,896, Jul. 1, 1991, abandoned. This application Nov. 12, 1992, Ser. No. 974,451

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841199; PCT Int'l Appl., Dec. 1, 1989, PCT/EP89/01428

Int. Cl.^{5} B32B *23/04*

U.S. Cl. 428—511 **10 Claims**

1. A matte printing paper consisting essentially of a raw coating paper coated with a coating composition containing 25 to 70% by weight of calcium carbonate as a coating pigment, 10 to 65% by weight of ungelatinized starch granules, except rice starch granules, and no more than 15% by weight of a binding agent for the absorption of printing ink, based on the total weight of said coating composition.

5,314,754

STARCH DERIVED SHAPED ARTICLES

Adrian T. Knight, Lane Cove, Australia, assignor to Goodman Fielder Wattie Australia Limited, Gladsville, Australia

PCT No. PCT/AU90/00237, § 371 Date Nov. 25, 1991, § 102(e) Date Nov. 25, 1991, PCT Pub. No. WO90/14938, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 1, 1990, Ser. No. 777,331

Claims priority, application Australia, Jun. 1, 1989, PJ4504; Jun. 1, 1989, PJ4505

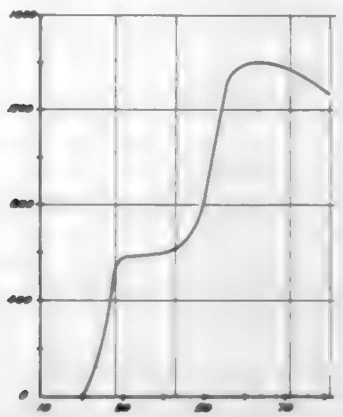
Int. Cl.^{5} B32B *23/00;* C08B *31/00*

U.S. Cl. 428—532 **36 Claims**

1. A method of manufacturing a starch derived shaped article comprising the steps of:

(1) preparing a hot melt by heating a composition comprising (a) a high amylosic material, or a derivative thereof, said derivative being selected from the group consisting of amylosic ethers, amylosic esters and combinations thereof and (b) water, the water being present in an amount of less then 24% by weight, at an elevated temperature and pressure below the temperature and pressure at which the material or derivative decomposes to provide a homogeneous melt;

(2) extruding the hot melt from an extruder to form a shaped article; and



(3) subjecting the hot melt to a subatmospheric pressure prior to issue from the extruder whereby to remove water from the shaped article.

5,314,755
METHOD TO REDUCE SCALING DUE TO FREEZING AND THAWING IN CONCRETE

Bernard Mairic, Hudson; Réjean Beaudoin, and Chantal Berthelot, both of Vaudreuil, all of Canada, assignors to Domtar, Inc., Montreal, Canada

Continuation of Ser. No. 655,793, Feb. 14, 1991, abandoned.
This application Oct. 15, 1992, Ser. No. 962,044
Int. Cl.^{5} C09K *3/18, 9/02;* **B32B** *9/00*
U.S. Cl. 428—540 **21 Claims**

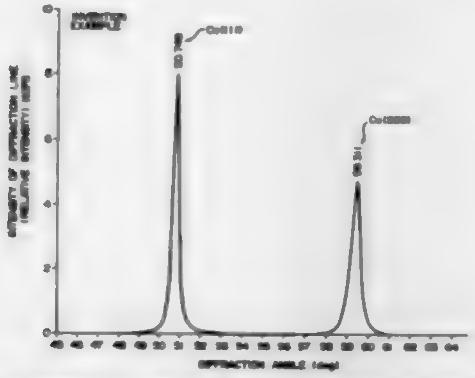
1. A method for reducing scaling on a concrete surface due to freezing and thawing, comprising:

contacting a surface of said concrete with a system containing at least sodium fluorophosphate.

5,314,756
PERMANENT MAGNET OF RARE-EARTH-ELEMENT/TRANSITION-METAL SYSTEM HAVING IMPROVED CORROSION RESISTANCE AND MANUFACTURING METHOD THEREOF

Atsushi Tagaya, Kumagaya, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 25, 1992, Ser. No. 981,864
Claims priority, application Japan, Nov. 27, 1991, 03-337741
Int. Cl.^{5} B22F *7/00*
U.S. Cl. 428—548 **16 Claims**

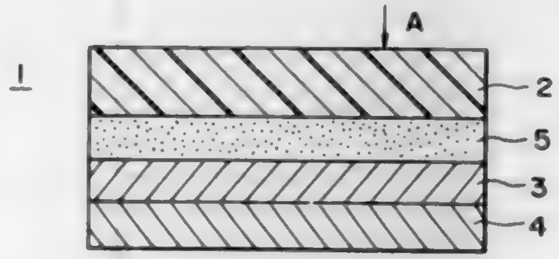


1. A permanent magnet of the rare-earth-element/transition-metal system having improved corrosion resistance containing one or more of rare earth elements including yttrium and transition metals mainly comprising iron, wherein a conductive underlayer having a thickness in the range of 0.1 to 10 μm is coated on the surface of the permanent magnet, and an electroplated copper layer having a thickness in the range of 2 to 20 μm and an average crystal grain size of not larger than 0.9 μm is coated on said underlayer, wherein the conductive underlayer is any one of an electroplated nickel layer, an electroless-plated copper layer and an electroplated copper layer.

5,314,757
INFORMATION RECORDING MEDIA

Kiyotaka Shindo; Koichi Igarashi; Kunihiko Mizumoto, and Hidehiko Hashimoto, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 527,364, May 23, 1990, Pat. No. 5,041,341. This application Jun. 4, 1991, Ser. No. 709,816
Claims priority, application Japan, May 23, 1989, 1-129552; May 23, 1989, 1-129555; Jun. 20, 1989, 1-157532
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.^{5} B32B *15/04;* **H01F** *1/00*
U.S. Cl. 428—627 **14 Claims**



1. An information recording medium comprising a substrate, a protecting layer, a recording layer and a metallic layer wherein the recording layer is a magnetooptical recording layer, and the metallic layer is composed of an aluminum alloy containing 0.1–9.5 atom % of titanium and 0.1–5 atom % of chromium based on all atoms constituting the aluminum alloy, the combined content of said titanium and chromium being not more than 10 atom %.

5,314,758
HOT DIP TERNE COATED ROOFING MATERIAL

Jay F. Carey, II, Follansbee, W. Va., and Mehrooz Zamanzadeh, Pittsburgh, Pa., assignors to The Louis Berkman Company, Steubenville, Ohio

Filed Mar. 27, 1992, Ser. No. 858,662
Int. Cl.^{5} B32B *15/18;* **C22C** *13/02*
U.S. Cl. 428—648 **16 Claims**

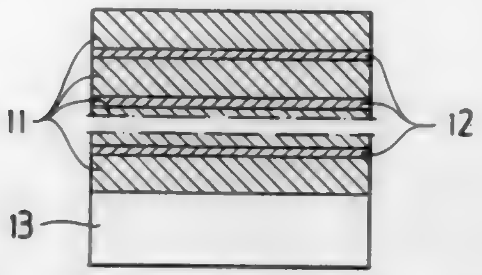
1. A coated metal roofing material formed of carbon steel or stainless steel sheet metal roofing materials coated with a terne coating forming a highly corrosive resistant coated roofing material, said terne coating having a low lead formulation and includes at least 0.05 weight percent stabilizing agent, said terne consisting of:

Tin	91–99.9%
Lead	0.001–0.1%
Bismuth	0.0–1.7%
Antimony	0.0–7.2%
Zinc	0.0–1.5%
Iron	0.0–0.1%
Copper	0.0–2.7%

5,314,759
PHOSPHOR LAYER OF AN ELECTROLUMINESCENT COMPONENT

Gitte Harkonen; Kari Harkonen, and Runar Tornquist, all of Espoo, Finland, assignors to Planar International Oy, Espoo, Finland

Filed Jul. 9, 1991, Ser. No. 727,662
Claims priority, application Finland, Jul. 18, 1990, 903633
Int. Cl.^{5} H05B *33/14*
U.S. Cl. 428—690 **17 Claims**



1. A phosphor layer of an electroluminescent component, the layer being comprised of superimposed host matrix material layers to accelerate electrons and activator-containing doping layers capable of producing light emission alternately placed between the host matrix layers, the phosphor layer comprising at least two of said host matrix material layers and at least one activator-containing doping layer, the at least one activator-containing doping layer including a matching layer having a thickness less than 10 nm, such that the at least one activator-containing doping layer matches epitaxially on the host matrix layers while essentially avoiding disturbance of the crystal structure growth of the host matrix material layers that accelerate electrons.

5,314,760
ELECTROCHEMICAL CELL ELECTRODE

Yu-Min Tsou, Taiwan, China; Robert D. Door, Clute, Tex., and Glenn A. Eisman, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

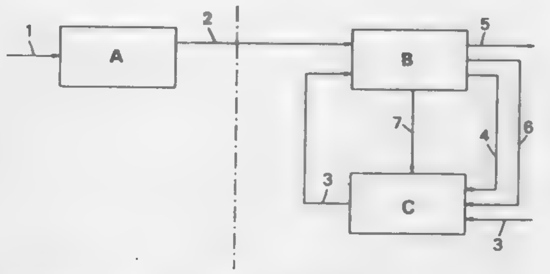
Continuation-in-part of Ser. No. 638,940, Jan. 9, 1991, Pat. No. 5,171,644. This application Aug. 28, 1992, Ser. No. 937,915
The portion of the term of this patent subsequent to Dec. 15, 2009, has been disclaimed.
Int. Cl.^{5} H01M *4/86*
U.S. Cl. 429—12 **15 Claims**

4. An electrochemical cell comprising electrodes consisting of an anodic electrode, a cathodic electrode, and an electrolyte and at least one of said electrodes comprising a current collector combined with a layer of a mixture of a binder and a transition metal or noble metal catalyst on a support material, said catalyst comprising a residue remaining after heating at about 500 to about 800 degrees centigrade a mixture of a transition or noble metal salt and a polymer selected from the group consisting of polymers and copolymers of poly(4-vinylpyridine), poly(2-vinylpyridine), poly(ethyleneimine), poly(aminostyrene), poly(vinylcarbazole), poly(acrylonitrile), poly(methacrylonitrile), and (poly(allylamine).

5,314,761
PROCESS AND INSTALLATION FOR GENERATING ELECTRICAL ENERGY

Paolo Pietrogrande, and Francesco Giacobbe, both of Rome, Italy, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany and Kinetics Technology International Group B.V., Zoetermeer, Netherlands

PCT No. PCT/DE90/00687, § 371 Date May 6, 1992, § 102(e) Date May 6, 1992, PCT Pub. No. WO91/03844, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 5, 1990, Ser. No. 838,424
Claims priority, application Italy, Sep. 6, 1989, 48335 A/89
Int. Cl.^{5} H01M *8/04*
U.S. Cl. 429—17 **20 Claims**



1. Installation for generating electrical energy, said installation comprising:

a fuel cell system for generating electrical energy, said fuel cell system having an anode chamber and a cathode chamber;

said fuel cell system being configured for operation at a temperature under 200 degrees Celsius;

means for providing a gas containing oxygen;

means for feeding the gas containing oxygen to said cathode chamber;

means for providing a gas containing hydrogen;

means for feeding the gas containing hydrogen from said means for providing a gas containing hydrogen to said anode chamber, said means for feeding the gas containing hydrogen being the only means in the electrical energy generation for providing fluid flow between said means for providing a gas containing hydrogen and said fuel cell system; and

said installation having no means in the electrical energy generation of providing fluid flow between said means for providing a gas containing hydrogen and said means for providing a gas containing oxygen.

5,314,762
PORTABLE POWER SOURCE

Akira Hamada; Nobuyoshi Nishizawa; Hiroshi Mukai; Isao Furukawa; Takashi Oda; Akira Watanabe, and Takaaki Matsubayashi, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 30, 1992, Ser. No. 906,362
Claims priority, application Japan, May 12, 1992, 4-119030
Int. Cl.^{5} H01M *8/02, 8/22*
U.S. Cl. 429—37 **19 Claims**

1. A portable power source comprising:

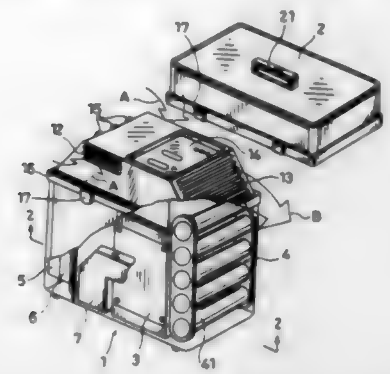
a fuel cell generating electricity using hydrogen as fuel;

a hydrogen storage unit filled with hydrogen absorbing alloy for supplying hydrogen to the fuel cell;

a case having an internal surface enclosing the fuel cell and hydrogen storage unit; and

a lid for sealing a part of the case when the portable power source is not in use,

wherein the lid seals a surface of the case on which at least one air inlet for taking in the air necessary for the fuel cell to generate electricity and a reactant gas outlet for exhausting reactant gas produced by the generation of electricity are formed.



5,314,763

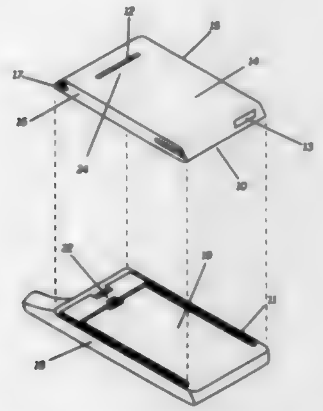
BATTERY LATCH

Adnan Aksoy, Boca Raton; Micheal M. Austin, Pompano Beach, and Russell E. Gyenes, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 20, 1993, Ser. No. 95,074

Int. Cl.^{5} H01M *2/10*

U.S. Cl. 429—97 **8 Claims**



1. A removable battery package having a latch mechanism for attaching the battery package to a radio, the battery package comprising:

a housing having an interior surface, an exterior surface and sidewalls;

engagement means located on the interior surface of the housing for engaging a receiving means located on the radio;

activating means for activating the latch wherein

the activating means comprises a recessed portion located in the exterior surface of the housing transverse to the engagement means,

the recessed portion is designed so that by pressing the sidewalls of the housing a portion of the housing is temporarily outwardly deformed thereby disengaging the engagement means.

5,314,764

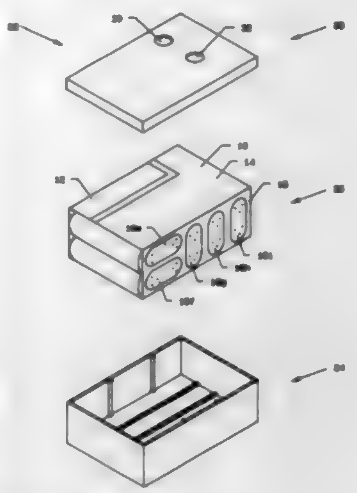
FLEXIBLE WELDING BOARD FOR BATTERY PACK

Richard B. Alexandres, Clear Lake, Iowa, assignor to Alexander Manufacturing Company, Mason City, Iowa

Continuation of Ser. No. 618,454, Nov. 27, 1990, abandoned. This application Oct. 13, 1992, Ser. No. 959,406

Int. Cl.^{5} H01M *2/26, 6/00, 2/10*

U.S. Cl. 429—121 **10 Claims**



1. A battery pack comprising:

a. a U-shaped polymer substrate;

b. at least two strips of conductive material laminated by adhesive means to said substrate;

c. at least one battery cell having positive and negative terminals at opposite ends disposed within said U-shaped substrate; and,

d. welds securing one of said strips to the negative terminal and the other of said strips to the positive terminal.

5,314,765

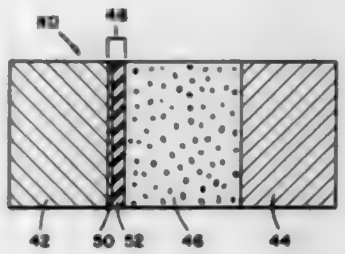
PROTECTIVE LITHIUM ION CONDUCTING CERAMIC COATING FOR LITHIUM METAL ANODES AND ASSOCIATE METHOD

John B. Bates, Oak Ridge, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Oct. 14, 1993, Ser. No. 137,285

Int. Cl.^{5} H01M *10/40*

U.S. Cl. 429—194 **15 Claims**



1. In a battery including a cathode, a lithium anode, and an electrolyte interposed between the cathode and anode, the improvement comprising:

a protective film including a layer of lithium phosphorus oxynitride overlying and coating the lithium anode so that the lithium anode is separated from the electrolyte by the lithium phosphorus oxynitride layer.

5,314,766

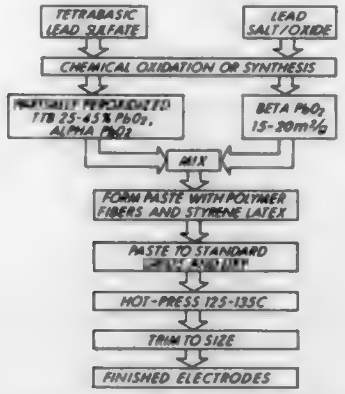
LEAD-ACID BATTERY ELECTRODE AND METHOD OF MANUFACTURE

Romeo R. Witherspoon, Shelby Township, Utica County, and Armand R. Poirier, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 19, 1992, Ser. No. 963,172

Int. Cl.^{5} H01M *4/46*

U.S. Cl. 429—227 **20 Claims**



1. A pre-charged positive electrode comprising at least about 50% by weight at least partially oxidized tetrabasic lead sulfate ($4\ PbO_n\ .\ PbSO_4$) intermingled with beta lead dioxide ($B\text{-}PbO_2$), the beta lead dioxide being present in an amount up to about 50% by weight wherein the oxide (PbO_n) portion of the tetrabasic lead sulfate is at least in part alpha lead dioxide ($alpha - PbO_2$).

5,314,767

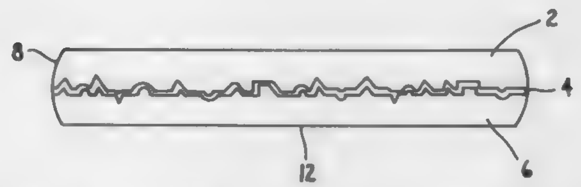
HOLOGRAPHIC PRODUCTS WITH IMPROVED SEALS

Janice W. Bussard, 201 N. Fruitport Rd., Spring Lake, Mich. 49456

Continuation-in-part of Ser. No. 883,285, May 14, 1992, which is a continuation-in-part of Ser. No. 647,512, Jan. 28, 1991, abandoned, which is a continuation of Ser. No. 292,826, Jan. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 147,492, Jan. 25, 1988, Pat. No. 4,838,965. This application Feb. 5, 1993, Ser. No. 14,370

Int. Cl.^{5} B32B *31/02*

U.S. Cl. 430—1 **21 Claims**



1. Edge sealed holographic products suitable for attachment to a substrate comprising a transparent moisture impermeable abrasion resistant plastic top layer, a moisture impermeable adhesive bottom layer, an intermediate reflective layer of a metallic or nonmetallic material which engages the plastic top layer to form a surface capable of reflecting a multi-colored image or pattern through the said top layer in the presence of light, and a seal along the entire perimeter of the assembly wherein the said seal was produced by a hot cutting tool and is capable of preventing separation of the said three layers of said assembly by either ordinary wear and tear or penetration by moisture between the layers before and after said assembly is attached to a substrate.

5,314,768

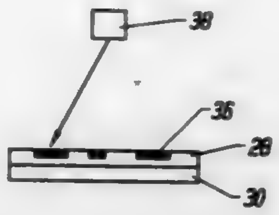
THIN FILM MASK FOR USE IN AN X-RAY LITHOGRAPHIC PROCESS AND ITS METHOD OF MANUFACTURE BY FORMING OPAQUE PATTERN OF IONS IN A DIAMOND LAYER

Rakesh B. Sethi, Campbell, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 19, 1993, Ser. No. 34,554

Int. Cl.^{5} G03F *9/00*

U.S. Cl. 430—5 **10 Claims**



1. A thin film mask for use in an X-ray lithographic process, said mask comprising:

(a) a non-diamond substrate which is transparent to X-rays;

(b) a diamond thin film layer approximately between 100 and 1,000 Å in thickness, supported by said substrate on one surface thereof; and

(c) a predetermined pattern of ions of a substance opaque to X-rays introduced into said diamond thin film layer.

5,314,769

METHOD FOR PRODUCING COLOR FILTER

Yukio Yamasita, Yokohama; Haruyoshi Sato, Kawasaki; Toru Nakamura, Yokohama; Hitoshi Yuasa, Yokohama, and Yutaka Otsuki, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

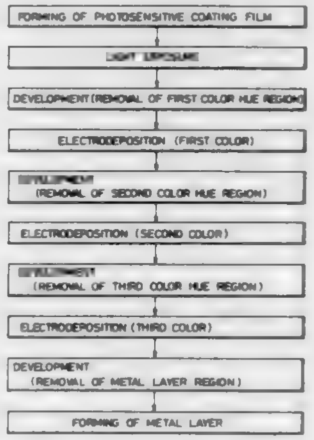
Filed Apr. 22, 1992, Ser. No. 872,612

Claims priority, application Japan, Apr. 25, 1991, 3-95630; Apr. 26, 1991, 3-97281

The portion of the term of this patent subsequent to May 25, 2010, has been disclaimed.

Int. Cl.^{5} G03F *9/00*

U.S. Cl. 430—7 **42 Claims**


FORMING OF PHOTOSENSITIVE COATING FILM
LIGHT EXPOSURE
DEVELOPMENT (REMOVAL OF FIRST COLOR HUE REGION)
ELECTRODEPOSITION (FIRST COLOR)
(REMOVAL OF SECOND COLOR HUE REGION)
ELECTRODEPOSITION (SECOND COLOR)
(REMOVAL OF THIRD COLOR HUE REGION)
ELECTRODEPOSITION (THIRD COLOR)
DEVELOPMENT (REMOVAL OF METAL LAYER REGION)
FORMING OF METAL LAYER

1. A method for producing a color filter comprising the steps of:

(A) forming a photosensitive coating film on a transparent electrically conductive layer formed on a surface of a transparent substrate and exposing said photosensitive coating film through a mask having patterns of at least three different degrees of light transmittances;

(B) developing and removing a photosensitive coating film region corresponding to a pattern selected from the group consisting of a pattern having the smallest degree of light transmittance and a pattern having the largest degree of light transmittance for exposing said transparent electrically conductive layer and electrodepositing a colored coating on the exposed transparent electrically conductive layer for forming a colored layer thereon, operation of developing and removing the photosensitive coating film and electrodepositing the colored coating being repeated for the respective patterns having different degrees of light transmittances in one sequence selected from the group consisting of increasing light transmittance and decreasing light transmittance to form different colored layers, respectively; and

(C) selectively forming a metal layer on at least one exposed region of said transparent electrically conductive layer.

5,314,770

METHOD FOR PRODUCING COLOR FILTER

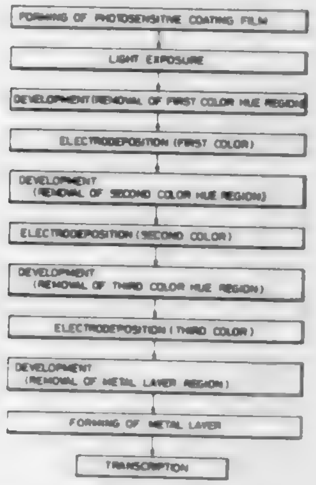
Yukio Yamasita, Yokohama; Haruyoshi Sato, Kawasaki; Toru Nakamura, Yokohama; Hitoshi Yuasa, Yokohama, and Yutaka Otsuki, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1992, Ser. No. 872,615

Claims priority, application Japan, Apr. 26, 1991, 3-097280; Apr. 26, 1991, 3-097282

Int. Cl.^{5} G03F *9/00*

U.S. Cl. 430—7 **45 Claims**


FORMING OF PHOTOSENSITIVE COATING FILM
LIGHT EXPOSURE
DEVELOPMENT (REMOVAL OF FIRST COLOR HUE REGION)
ELECTRODEPOSITION (FIRST COLOR)
DEVELOPMENT (REMOVAL OF SECOND COLOR HUE REGION)
ELECTRODEPOSITION (SECOND COLOR)
DEVELOPMENT (REMOVAL OF THIRD COLOR HUE REGION)
ELECTRODEPOSITION (THIRD COLOR)
DEVELOPMENT (REMOVAL OF METAL LAYER REGION)
FORMING OF METAL LAYER
TRANSCRIPTION

1. A method for producing a color filter comprising the steps of:

(A) forming a photosensitive coating film on an electrically conductive layer formed on a surface of a substrate, and exposing said photosensitive coating film through a mask having patterns of at least three different degrees of light transmittances;

(B) developing and removing a photosensitive coating film portion corresponding to a pattern selected from the group consisting of a pattern having the smallest degree of light transmittance and a pattern having the largest degree of light transmittance for exposing said electrically conductive layer and electrodepositing a colored coating on the exposed electrically conductive layer for forming a colored layer thereon, operation of developing and removing the photosensitive coating film followed by electrodeposition being repeated for the respective patterns having different degrees of light transmittances in one sequence selected form the group consisting of increasing light transmittance and decreasing light transmittance for producing different colored layers, respectively;

(C) selectively forming a metal layer interstices present between the colored layers, and

(D) transcribing said colored layers and said metal layer onto another substrate.

5,314,771

METHOD OF MANUFACTURING COLOR-FILTER-FITTED BOARD FOR LIQUID CRYSTAL DISPLAY

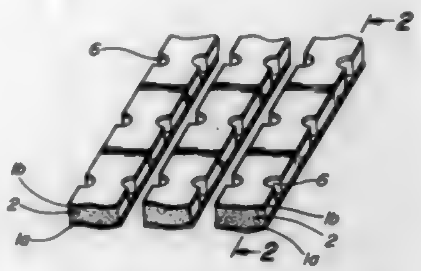
Shigekazu Yamauchi, Sagamihara; Shinji Kanagawa, Isehara, and Hisao Sekine, Sagamihara, all of Japan, assignors to Stanley Electric Company Limited, Tokyo, Japan

Filed May 18, 1992, Ser. No. 885,160

Claims priority, application Japan, May 20, 1991, 3-114314

Int. Cl.^{5} G03F *9/00*

U.S. Cl. 430—7 **2 Claims**



1. A method of manufacturing a color filter on a board composed of liquid crystal cells, said method comprising the steps of:

applying a first transparent electrode layer having a side on said board;

coating a photoresist on portions of said first transparent layer so that at least one portion of said photoresist is in contact with the side of the first electrode layer;

layering a color-filter on said first electrode layer and around said portions of said photoresist;

removing said photoresist to create at least one contact hole open to the side of said first electrode layer; and

applying a second transparent electrode layer on said color filter so that said contact hole electrically connects said second electrode layer to said first electrode layer.

5,314,772

HIGH RESOLUTION, MULTI-LAYER RESIST FOR MICROLITHOGRAPHY AND METHOD THEREFOR

Michael N. Kozicki, Phoenix, and Shao-Wen Hsia, Tempe, both of Ariz., assignors to Arizona Board of Regents, Tempe, Ariz. Continuation of Ser. No. 594,299, Oct. 9, 1990, abandoned. This application Jun. 8, 1992, Ser. No. 895,576

Int. Cl.^{5} G03C *3/00, 5/00;* G03F *7/26*

U.S. Cl. 430—14 **26 Claims**

1. A method for forming a multi-layer resist material for microlithography, comprising the steps of:

depositing a planarized layer onto a substrate,

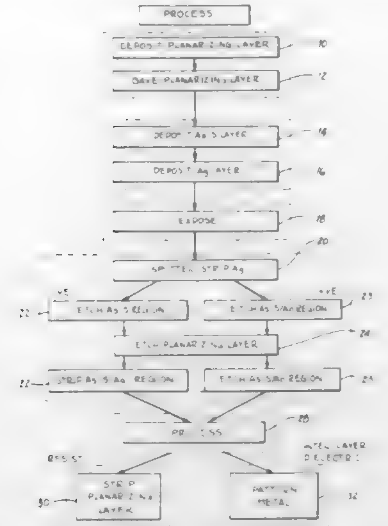
depositing an active layer onto the surface of the planarized layer, said active layer comprising a layer of arsenic sulfide and a layer of silver metal, said layer of arsenic sulfide consisting essentially of about 28–37 at % As and about 63–72 at % S;

exposing said active layer to radiation, thereby doping exposed portions of said silver layer into said arsenic sulfide layer and forming an silver-doped arsenic sulfide region,

removing unexposed silver from said arsenic sulfide layer,

etching one of said arsenic sulfide layer or said silver-doped arsenic sulfide region,

etching said planarized layer underlying said etched arsenic sulfide or said silver-doped arsenic sulfide region, at least one of stripping said arsenic sulfide silver doped area or etching said silver-doped arsenic sulfide region, thereby forming a resist pattern capable of better than one-half micron resolution microlithography.



5,314,773

BLACK TONER FOR ELECTROPHOTOGRAPHY

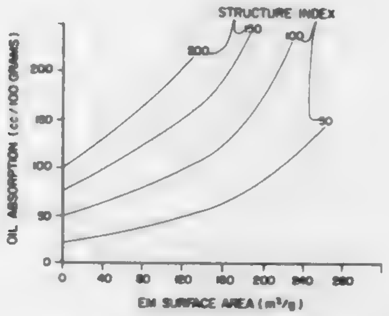
Masahiko Kubo, Yao; Akihiro Watanabe, Nara; Takafumi Nagai, Higashiosaka, and Hironori Maruyama, Kadoma, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 6, 1992, Ser. No. 909,564

Claims priority, application Japan, Jul. 17, 1991, 3-176496

Int. Cl.^{5} G03G *13/01*

U.S. Cl. 430—45 **14 Claims**



1. Black toner for electrophotography used for visualizing an electrostatic latent image formed on an image-holding body together with color toner, the black toner comprising:

a resin binder and carbon black dispersed in the resin binder, the carbon black having a volatile component content of 4% or more, a structure index of 100 or more, and a mean grain size in the range of 20 to 35 nm,

wherein the conductivity ratio of the black toner to the color toner is 2.0 or less.

5,314,774

METHOD AND APPARATUS FOR DEVELOPING COLOR IMAGES USING DRY TONERS AND AN INTERMEDIATE TRANSFER MEMBER

Thomas Camis, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 22, 1992, Ser. No. 888,566

Int. Cl.^{5} G03G *13/01*

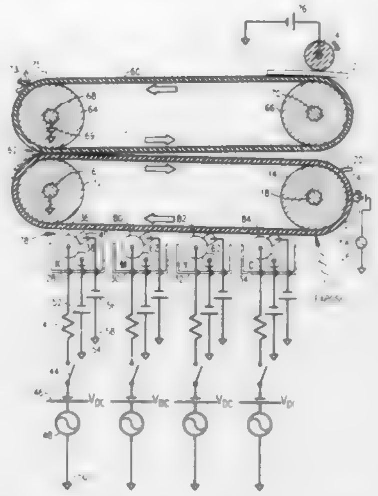
U.S. Cl. 430—47 **6 Claims**

1. Apparatus for developing and printing color images including, in combination:

a. a photoconductive member,

b. a plurality of color toner projection units spaced a certain distance from said photoconductive member and operative for projecting dry color toners onto the surface of said photoconductive member,

c. an intermediate transfer member positioned in direct contact with said photoconductive member and being operatively driven to sequentially receive color toners in each of a plurality of color planes, and



d. image transfer means for driving a print medium against said intermediate transfer member and for transferring a composite color image onto the surface of said print medium.

5,314,775

PHOTOSENSITIVE MEMBER COMPRISING A DIAMINO COMPOUND

Hideaki Ueda, Kawanishi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

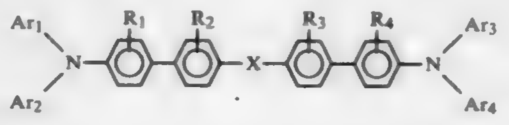
Filed Aug. 10, 1992, Ser. No. 926,284

Claims priority, application Japan, Aug. 15, 1991, 3-205203

Int. Cl.^{5} G03G *5/04*

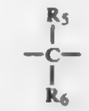
U.S. Cl. 430—59 **9 Claims**

1. A photosensitive member having a photosensitive layer on an electrically conductive substrate, characterized by that the photosensitive layer comprises a diamino compound represented by the following general formula [I]:



[I]

in which Ar_1, Ar_2, Ar_3 and Ar_4 represent respectively an alkyl group, an aralkyl group, an aryl group, a biphenyl group or a heterocyclic group, each of which may have a substituent; R_1, R_2, R_3 and R_4 represent respectively a hydrogen atom, an alkyl group, an alkoxy group or a halogen atom; X represents —O—, —S— or



$$-\overset{R_5}{\underset{R_6}{\overset{|}{\underset{|}{C}}}}-$$

in which R_5 and R_6 represent respectively a hydrogen atom, an alkyl group or an aryl group.

5,314,776

MULTI-LAYERED PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY

Shinichi Nomura, Hatano; Yoichi Fukuda, Sagamihara; Atsushi Nagasaki, and Fumiyuki Suda, both of Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1992, Ser. No. 866,742

Claims priority, application Japan, Apr. 16, 1991, 3-111191

Int. Cl.^{5} G03G *5/10*

U.S. Cl. 430—65 **5 Claims**

1. A photoreceptor for electrophotography comprising, in order:

a substrate which comprises an electroconductive support or a support having an electroconductive film formed thereon;

an under coat layer including a material selected from a group consisting of silicon dioxide and other silicon oxides formed on said substrate;

a carrier generation layer formed on said under coat layer; and

a carrier transport layer formed on said carrier generation layer.

5,314,777

NEGATIVELY CHARGEABLE TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

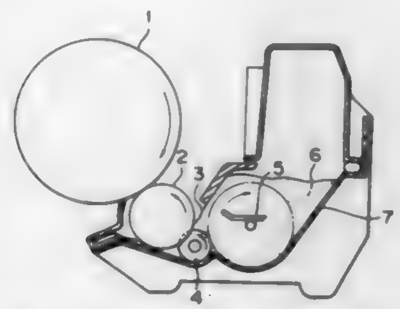
Kazuhito Watanabe, Numazu; Toshiki Nanya, Mishima, and Yasuaki Iwamoto, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 14, 1993, Ser. No. 76,406

Claims priority, application Japan, Jun. 16, 1992, 4-181722

Int. Cl.^{5} G03G *9/09, 9/097*

U.S. Cl. 430—106 **11 Claims**



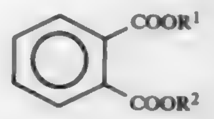
1. A negatively chargeable toner for developing latent electrostatic images comprising:

a coloring agent;

a releasing agent;

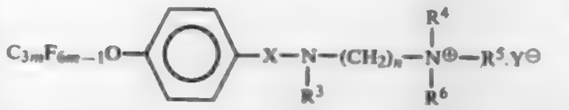
a binder resin comprising a polyester and a styrene-acryl-based polymer component at a mixing ratio by weight in the range of (95:5) to (50:50), said styrene-acryl-based polymer component having a weight-average molecular weight of 50,000 to 150,000, a number-average molecular weight of 2,000 to 12,000, and a glass transition temperature of 55° to 70° C.; and

a charge controlling agent comprising at least one pthalic ester of general formula (I) which is mixed with said styrene-acryl-based polymer component:



(I)

wherein R^1 and R^2 each represent a saturated or unsaturated hydrocarbon group having 1 to 20 carbon atoms, a phenyl group, or a phenyl-group-containing saturated or unsaturated hydrocarbon group having 1 to 20 carbon atoms, and at least one fluorine-containing quaternary ammonium salt of general formula (II):



(II)

wherein X represents —SO_2— or —CO—; R^3, R^4, R^5 and R^6 each represent hydrogen, an alkyl group having 1 to 10 carbon atoms, or an aryl group; Y represents iodine or bromine; and m and n are integers of 1 to 20.

8. The negatively chargeable toner as claimed in claim 1, wherein said charge controlling agent further comprises a metal-containing azo dye.

5,314,778

TONER COMPOSITIONS CONTAINING COMPLEXED IONOMERIC MATERIALS

Thomas W. Smith, Penfield; David J. Luca, Rochester, and Paul C. Julien, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1992, Ser. No. 896,035

Int. Cl.^{5} G03G *9/087*

U.S. Cl. 430—111 **28 Claims**

1. A toner composition comprised of resin particles, pigment particles, submicron colloidal domains of an ionomeric polymer or an interpolymer complex comprising a first polymer and a second polymer dispersed in the resin particles, and a Lewis acid, a salt, or an ion thereof attached to the ionomeric polymer or to the interpolymer complex.

5,314,779

IMAGING MEMBERS AND PROCESSES FOR THE PREPARATION THEREOF

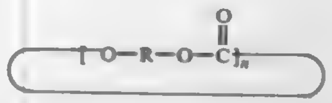
Peter G. Odell, Mississauga, and Trevor I. Martin, Burlington, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1992, Ser. No. 933,844

Int. Cl.^{5} G03G *5/00*

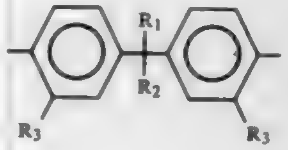
U.S. Cl. 430—127 **22 Claims**

1. An in situ process for the preparation of layered photoconductive imaging members consisting essentially of forming layers comprised of a mixture of cyclic oligomers with degrees of polymerization of from about 2 to about 20 and a catalyst, wherein one layer contains a conductive filler present in a supporting substrate layer, the second layer contains a photogenerating pigment and the third layer contains charge transporting molecules, and heating said layers to convert the cyclic oligomer mixture in each layer to a polycarbonate resin; and wherein said cyclic oligomeric mixture is represented by the formula



$$\left[O-R-O-\overset{O}{\overset{\|}{C}} \right]_n$$

wherein n represents the degree of polymerization and is a number of form 2 to about 20, and R represents the principle repetition unit of the formula



wherein R_1, R_2, and R_3 are independently selected from the group consisting of hydrogen, alkyl and aryl, halogen, and halogen substituted alkyl and halogen substituted aryl.

5,314,780

METHOD FOR TREATING METAL SUBSTRATE FOR ELECTRO-PHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND METHOD FOR MANUFACTURING ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Tetsuya Takei; Hirokazu Ohtoshi, both of Nagahama; Ryuji Okamura; Hiroyuki Katagiri, both of Shiga, and Yasuyoshi Takai, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1992, Ser. No. 841,989

Claims priority, application Japan, Feb. 28, 1991, 3-55598; May 30, 1991, 3-153720; May 30, 1991, 3-153748; May 30, 1991, 3-153753; Jul. 3, 1991, 3-188300

Int. Cl.^{5} G03G *5/00*

U.S. Cl. 430—128 **46 Claims**

37. A method of manufacturing an electrophotographic photosensitive member by a process comprising the steps of:

(a) cutting the surface of a metal substrate in a given precision;

(b) cleaning the cut surface of said substrate with water;

(c) bringing the cleaned surface of said substrate into contact with pure water having a temperature of from 5° C. to 90° C., having a resistivity of not less than 11M Ω-cm at 25° C., containing fine particles with a particle diameter of not smaller than 0.2 μm in a quantity of not more than 10,000 particles per milliliter, containing microorganisms in a total viable cell count of not more than 100 per milliliter and containing an organic matter in a quantity of not more than 10 mg per liter, for 10 seconds to 30 minutes to clean the surface.

5,314,781

PROCESS FOR DEVELOPING BLUEPRINTS UTILIZING AMMONIA DEVELOPER CONTAINING SODIUM CHLORITE TO REDUCE AMMONIA ODOR IN THE DEVELOPED BLUEPRINT PAPER

Ronald L. Balk, 3440 Eastern, NE., Grand Rapids, Mich. 49505

Filed Sep. 11, 1991, Ser. No. 757,556

Int. Cl.^{5} G03F *7/26*

U.S. Cl. 430—150 **20 Claims**

1. An improved ammonia developing solution for developing blueprints, wherein the developing solution comprises an effective amount of sodium chlorite to reduce the ammonia odor in the developed blueprint paper without eliminating the characteristic warning odor of ammonia in the developing solution.

5,314,782

DEEP UV SENSITIVE RESISTANT TO LATENT IMAGE DECAY COMPRISING A DIAZONAPHTHOQUINONE SULFONATE OF A NITROBENZYL DERIVATIVE

Richard M. Lazarus, Mission Viejo, and Thomas A. Koes, Riverside, both of Calif., assignors to Morton International, Inc., Chicago, Ill.

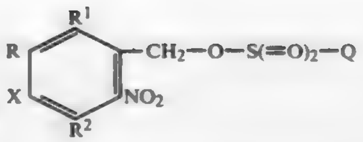
Filed Mar. 5, 1993, Ser. No. 26,934

Int. Cl.^{5} G03F *7/023, 7/30*

U.S. Cl. 430—165 **21 Claims**

15. A radiation sensitive recording material which comprises a support and a recording layer thereon, said recording layer comprising, in admixture:

an acid stable polymer insoluble in water but normally soluble in an aqueous alkaline medium; a photo acid generator having the formula:



wherein Q is a diazonaphthoquinone moiety; R is hydrogen or the —CH_2—$OS(=O)_2$—Q moiety; R^1 is hydrogen, hydroxyl, or —O—$S(=O)_2$—Q; R^2 is hydrogen or lower alkyl; X is hydrogen or a nitro group, with the proviso that R^2 is lower alkyl when X is a nitro group; and

a mixed carbonate ester of tertiary butyl alcohol and a polyhydric phenol.

5,314,783

PHOTOSENSITIVE QUINONE DIAZIDE AND RESIN COMPOSITION HAVING HIGH ABSORBENCY FOR A WAVELENGTH OF 365 NM CONTAINING A BENZOTRIAZOLE ULTRAVIOLET ABSORBING COMPOUND

Shigeru Koibuchi; Asao Isobe, both of Hitachi, and Michiaki Hashimoto, Sayama, all of Japan, assignors to Hitachi Chemical Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 326,740, Mar. 21, 1989, Pat. No. 5,215,858. This application Nov. 2, 1992, Ser. No. 970,031

Claims priority, application Japan, Mar. 23, 1988, 63-68465

Int. Cl.^{5} G03F *7/023;* **G03C** *1/61*

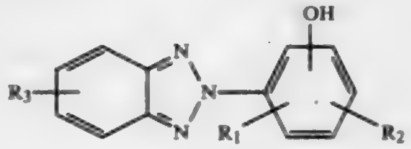
U.S. Cl. 430—191 **10 Claims**

1. A photosensitive resin composition providing a film having a high absorbency for a wavelength of 365 nm comprising an admixture of

(A) an alkaline aqueous solution-soluble novalak resin,

(B) a photosensitizer obtained by reacting tetrahydroxybenzophenone, with 1,2-naphthoquinone-(2)-diazido-5-sulfonyl chloride or 1,2-naphthoquinone-(2)-diazido-4-sulfonyl chloride, and

(C) an ultraviolet absorber represented by the formula:



(I)

wherein R_1 and R_2 are independently a hydrogen atom or an alkyl group having 1 to 10 carbon atoms; and R_3 is a hydrogen atom or a halogen atom,

the amount of (A) being 90 to 71 parts by weight and the amount of (B) being 10 to 29 parts by weight, a total of (A) and (B) being 100 parts by weight, and the amount of (C) being 0.1 to 10 parts by weight based on 100 parts by weight of the total of (A) and (B).

5,314,784

PROCESS FOR DETACKIFYING TRANSFERRED TONED IMAGES

Robert P. Held, Englishtown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 661,752, Feb. 27, 1991, Pat. No. 5,219,702. This application Mar. 4, 1993, Ser. No. 26,377

The portion of the term of this patent subsequent to Jun. 15, 2010, has been disclaimed.

Int. Cl.^{5} G03F *3/10, 7/28*

U.S. Cl. 430—254 **5 Claims**

1. A process for forming an image from an element having a latent image, said image having toner receptive and background areas, which comprises:

(a) applying to the- latent image of the element a prolonged tack toner to produce a non-tacky toned image;

(b) heating the toned image to a temperature sufficient to activate the toner by rendering the toner tacky;

(c) bringing the tacky toned element into intimate contact with an image receptor, and, while the toner is still activated;

(d) separating the element and image receptor whereby a portion of the activated prolonged tack toner transfers imagewise to the receptor;

(e) reducing the temperature of the tacky toned image on the image receptor below the activating temperature of the prolonged tack toner wherein the toner remains tacky;

(f) applying dry particulate prolonged tack toner over the still tacky image on the image receptor to increase the density of the toned transferred image;

(g) heating the toned image to a temperature sufficient to activate the toner by rendering the toner tacky;

(h) applying a colorless, fusible, finely divided particulate material to the transferred toned image on the receptor, said particulate material having a melting point greater than the melting point and transfer temperature of the prolonged tack toner; and

(i) heating the transferred toned image on the receptor to a temperature above the melting point of the colorless, fusible, finely divided particulate material.

5,314,785

PHOTOSENSITIVE MATERIALS

Dennis E. Vogel, and John J. Stofko, Jr., both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 817,528, Jan. 6, 1992, Pat. No. 5,225,316. This application Mar. 19, 1993, Ser. No. 34,696

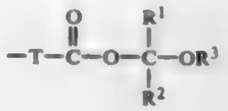
Int. Cl.^{5} G03C *5/00*

U.S. Cl. 430—269 **9 Claims**

1. A process for forming an imaged article comprising exposing an imageable article comprising a photosensitive composition coated on a substrate, said photosensitive composition comprising:

(a) a photoinitiator which generates an acid upon exposure to radiation; and

(b) a polymer having acid labile groups pendant from the polymer backbone, said acid labile pendant groups being represented by the following formula:



$$-T-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{R^1}{|}}{\underset{\underset{R^2}{|}}{C}}-OR^3$$

wherein:

R^1 and R^2 each represent hydrogen or a C_1 to C_{18} alkyl group with the proviso that at least one of R^1 and R^2 must be hydrogen; R^3 represents a C_1 to C_{18} alkyl group; or any two of R^1, R^2, and R^3 together form a substituted or unsubstituted ring containing from 2 to 36 carbon atoms; and T represents a divalent linking group connected to the polymer backbone and contains a total of from 0 to about 18 carbon atoms where up to one of each three carbon atoms can be replaced with nitrogen, oxygen, or sulfur atoms, or combinations thereof, to radiation within a range absorbed by said photoinitiator to form a latent image bearing article, and applying ink to said latent image bearing article, thereby forming an imaged article.

5,314,786

POSITIVE-WORKING RADIATION SENSITIVE MIXTURE COMPRISING SULFONIC ACID ESTERS OF 2,4,6-TRIS-(2-HYDROXYETHOXY)-[1,3,5]TRIAZINE, AND RECORDING MATERIAL CONTAINING THESE ESTERS

Horst Roeschert, ober-Hilbersheim; Georg Pawlowski, Wiesbaden, and Juergen Fuchs, Wicker, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1992, Ser. No. 871,034

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1991, 4112971

Int. Cl.^{5} G03F *7/004, 7/039*

U.S. Cl. 430—270 **20 Claims**

1. A positive-working radiation-sensitive mixture comprising

a) a 2,4,6-tris-(2-hydroxyethoxy)-[1,3,5]triazine esterified with two or three acids selected from the group consisting of arylsulfonic acids, heteroarylsulfonic acids, and mixtures thereof, which generates a strong acid under the action of actinic radiation,

b) at least one compound having at least one acid-cleavable C—O—C or C—O—Si bond and

c) at least one polymeric binder which is insoluble in water and soluble or at least swellable in aqueous alkaline solutions.

5,314,787

PROCESS FOR TREATING LITHOGRAPHIC PRINTING FORMS AND LITHOGRAPHIC PRINTING FORMS PRODUCED THEREBY

Andreas Elsaesser, Idstein, and Michael Brenk, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1992, Ser. No. 952,092

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1991, 4134143

Int. Cl.^{5} B41N *1/08*

U.S. Cl. 430—302 **21 Claims**

1. A process for treating grained, and anodized lithographic printing plates so as to reduce the amount of degradation of the metal oxide layer formed during the anodization, comprising the steps of hydrophilizing the plate with polyvinylphosphonic acid and treating the hydrophilized plate with a slat solution containing divalent or polyvalent cations in a concentration of not less than 0.02 mol/l, wherein the salt solution contains at least one salt selected from the group consisting of $MgCl_2$, $Mg(NO_3)_2$, $CaCl_2$, $Ca(NO_3)_2$, Ca acetate, $SrCl_2$, Sr laevulinate, $BaCl_2$, $Ba(NO_3)_2$, $ScCl_3$, $Sc_2(SO_4)_3$, $LaCl_3$, $La(NO_3)_3$, $TiCl_3$, VSO_4, $CrCl_2$, $MnBr_2$, $CuCl_2$, $ZnSO_4$, $AlCl_3$, $SnCl_2$, and Pb acetate.

5,314,788

MATRIX PRINTED BOARD AND PROCESS OF FORMING THE SAME

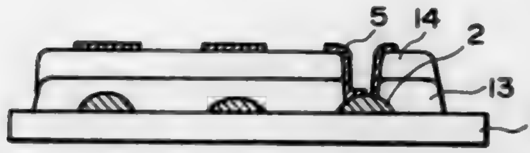
Hideyuki Suzuki, Machida; Masashi Kitani, Hiratsuka; Yuichi Masaki, Kawasaki, and Kenji Morimoto, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 782,764, Oct. 22, 1991, abandoned, which is a continuation of Ser. No. 562,444, Aug. 2, 1990, abandoned, which is a continuation of Ser. No. 308,941, Feb. 8, 1989, abandoned, which is a continuation of Ser. No. 168,550, Mar. 9, 1988, abandoned, which is a continuation of Ser. No. 5,828, Jan. 22, 1987, abandoned. This application Jun. 15, 1993, Ser. No. 76,705

Claims priority, application Japan, Jan. 24, 1986, 61-11983; Jan. 24, 1986, 61-11984; Jan. 24, 1986, 61-11985; Jan. 24, 1986, 61-11986

Int. Cl.^{5} B32B *9/00*

U.S. Cl. 430—313 **7 Claims**



1. A process of manufacturing a matrix printed board, comprising the steps of:

forming a first conductive layer on a substrate by screen printing:

forming a first insulating layer on said first conductive layer, said first insulating layer having a hole through which an electrical contact portion of said first conductive layer is exposed;

forming a second insulating layer on said first insulating layer, said second insulating layer having a hole corresponding to the hole in said first insulating layer through which an electrical contact portion of said first conductive layer is exposed, wherein an angle of inclination, with respect to an upper surface of the substrate, of the hole formed by said first insulating layer is greater than an angle of inclination of the hole formed by said second insulating layer; and

forming a second conductive layer on said second insulating layer.

5,314,789

METHOD OF FORMING A RELIEF IMAGE COMPRISING AMPHOTERIC COMPOSITIONS

R[illegible]ert E. Hawkins, Upton, and Daniel Y. Pai, Millbury, both of Mass., assignors to Shipley Company Inc., Marlborough, Mass.

Filed Oct. 1, 1991, Ser. No. 770,016

Int. Cl.^{5} G03F *7/30;* **G03C** *1/73;* **C25D** *13/06*

U.S. Cl. 430—325 **30 Claims**

1. A method for forming a relief image on a conductive surface of a substrate, comprising

(a) electrophoretically applying a layer of a negative-acting photoresist composition on the conductive surface, the photoresist composition comprising a crosslinker, a radiation sensitive component that causes crosslinking of the crosslinker upon exposure to activating radiation, and a polymer comprising cataphoretic carrier groups and anaphoretic carrier groups in an amount sufficient to enable i) either anaphoretic or cataphoretic deposition of the photoresist composition, and (ii) development of the photoresist composition with either an alkaline agent or an acidic agent after imagewise exposure of the photoresist to activating radiation;

(b) imagewise exposing the composition layer to activating radiation to form a crosslinked image in those areas of the composition layer exposed to activating radiation; and

(c) developing the composition layer to remove those areas of the composition layer not exposed to activating radiation to thereby yield a relief image on the conductive surface.

5,314,790

TONE CONTROL OF PHOTOGRAPHIC SILVER IMAGES

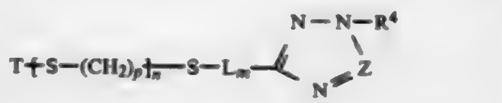
Stephen A. Hershey, Fairport; J. Ramon Vargas, Webster, and Paul A. Burns, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 3, 1992, Ser. No. 892,846

Int. Cl.^{5} G03C *5/00*

U.S. Cl. 430—356 **18 Claims**

14. A process comprised of developing a photographic element comprised of an emulsion layer containing radiation sensitive silver chlorobromide fine grains containing less than 70 mole percent chloride and having a mean equivalent circular diameter of less than 0.3 μm to produce a silver image of modified tone in the presence of an azole in a concentration effective to modify the tone of the developed silver image, the azole having the formula:



(I)

wherein

Z is —N= or —C(R^5)=;

L is a divalent aliphatic linking group containing 1 to 8 carbon atoms;

T is an aliphatic terminal group containing 1 to 8 carbon atoms;

m is 0 or 1;

n is an integer of 2 to 4;

p is an integer of 2 to 4; and

R^4 and R^5 together complete a 5 or 6 member heterocyclic nucleus containing 1 to 3 ring nitrogen atoms or

R^4 is hydrogen, an aliphatic group of 1 to 8 carbon atoms or an aromatic group of 1 to 8 carbon atoms and

R^5 is hydrogen, —NH_2, an aliphatic group of 1 to 8 carbon atoms or an aromatic group of 1 to 8 carbon atoms.

5,314,791

PROCESSING SOLUTION FOR LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND PROCESSING METHOD USING THE SAME

Masao Ishikawa; Yutaka Ueda, and Shigeharu Koboshi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 649,914, Feb. 4, 1991, abandoned. This application Sep. 8, 1992, Ser. No. 940,783

Claims priority, application Japan, Feb. 7, 1990, 2-29308; Mar. 6, 1990, 2-56270

Int. Cl.^{5} G03C *7/42*

U.S. Cl. 430—393 **22 Claims**

1. A processing method of a light-sensitive silver halide color negative film photographic material which comprises, after image-wise exposure, subjecting a light-sensitive silver halide color photographic material to a color developing, bleaching and fixing processing, followed by washing or stabilizing processing, the improvement wherein a fixing solution used in the fixing processing contains a water-soluble surfactant selected from the group consisting of surfactants represented by formula (I) and (V) presented below, said surfactant being present in an amount of 0.05 to 10 g/l, and an amount of thiosulfate in the range of 0.2 mole/liter to 3.0 mole/liter; and, during processing, the fixing solution is replenished in an amount of 20 to 1000 ml per 1 m^2 of the light-sensitive material;

Formula (I):

$$A_2—O—(B)_m—(C)_n—X_1 \qquad (I)$$

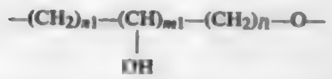
wherein A_2 represents a monovalent organic group selected from the group consisting of an alkyl group having 6 to 50 carbon atoms, and an aryl group substituted by an alkyl group having 3 to 35 carbon atoms or by an alkenyl group having 2 to 35 carbon atoms, and X_1 is hydrogen;

Formula (V):

$$A_2{-}O{+}CH_2CH_2O{+_n}SO_3M \qquad (V)$$

wherein M represents an alkali metal, n is 1 to 100, A_2 represents a monovalent organic group selected form the group consisting of an alkyl group having 6 to 20 carbon atoms, and an aryl group substituted by an alkyl group having 3 to 20 carbon atoms,

B or C is ethylene oxide or propylene oxide, or



$$-(CH_2)_{n1}-\underset{\textstyle OH}{\underset{|}{(CH)_{m1}}}-(CH_2)_{l1}-O-$$

wherein n_1, $m_1$and l_1 each represent 0, 1, 2 or 3; and m and n each represent an integer of 0 to 100.

5,314,792
PHOTOGRAPHIC ELEMENT AND PROCESS PROVIDING IMPROVED COLOR RENDITION

James P. Merrill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1993, Ser. No. 11,032

Int. Cl.^{5} G03C *1/46*

U.S. Cl. 430—505 **17 Claims**

1. A photographic element comprising at least two light sensitive silver halide layers sensitized to green light and having differeing degrees of light sensitivity, comprsing in association with a higher sensitivity layer a yellow dye forming DIR coupler which releases a development inhibitor containing a weak inhibitor fragment, and further comprising in association with the lower sensitivity layer a cyan dye forming DIR coupler with a timing group containing a strong inhibitor fragment which releases a precursor of the development inhibitor fragment.

5,314,793
MULTICOLOR PHOTOGRAPHIC ELEMENTS EXHIBITING AN ENHANCED SPEED-GRANULARITY RELATIONSHIP

Elizabeth P. Chang, Webster, and James A. Friday, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1992, Ser. No. 870,000

Int. Cl.^{5} G03C *1/46*

U.S. Cl. 430—506 **12 Claims**

1. A multicolor photographic element comprised of a support and at least three dye image forming layer units each containing an image dye or dye precursor capable of forming a dye image of a different hue,

characterized in that at least one of the dye image forming layer units capable of forming a visible dye image contains at least three superimposed radiation sensitive emulsion layers in which

a first emulsion layer located farthest from the support of the three emulsion layers contains silver bromoiodide grains of from 1 to 20 mole percent iodide, based on silver,

a second emulsion layer at least one half stop slower in speed than the first emulsion layer is located between the first emulsion layer and the support and contains silver bromoiodide grains of from 1 to 20 mole percent iodide, and

a third emulsion layer at least at least one stop slower in speed than the second emulsion layer is located between the second emulsion layer and the support and contains silver bromide or bromoiodide grains of up to 60 percent the average iodide content of the second emulsion layer,

greater than 50 percent of the total projected area of the grains of each of the first, second and third emulsion layers being accounted for by tabular grains having a thickness of less than 0.3 μm and average tabularity of greater than 25, tabularity (T) being defined as

$$T = ECD/t^2$$

where

ECD is the average equivalent circular diameter of the tabular grains in μm and

t is the average thickness in μm of the tabular grains,

tabular grains of at least the first and second emulsion layers containing a non-uniform iodide distribution, the tabular grains being comprised of a central portion and a laterally offset higher iodide portion, the tabular grains being capable of producing, when exposed to 325 nm electromagnetic radiation of 6° K., a stimulated fluorescent emission at 575 nm that is at least one third the intensity of an identically stimulated fluorescent emission maximum within the wavelength range of from 490 to 560 nm, and

the tabular grains of the third emulsion layer contain less than 20 percent of the iodide content of tabular grains of the second emulsion layer.

5,314,794
ELEMENTS AND PROCESSES FOR PRODUCING SUPERIOR PHOTOGRAPHIC RECORDS

James E. Sutton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 26, 1992, Ser. No. 905,597

Int. Cl.^{5} G03C *1/46*

U.S. Cl. 430—506 **16 Claims**

1. A photographic element comprised of a support and two silver halide emulsion layers differing in threshold sensitivities for recording exposures within the same region of the spectrum, wherein

one of said emulsion layers exhibits a slower speed and a lower granularity than said emulsions layer remaining and

only one of said emulsion layers contains a dye image providing material.

5,314,795
THERMAL-DYE-BLEACH CONSTRUCTION COMPRISING A POLYMETHINE DYE AND A THERMAL CARBANION-GENERATING AGENT

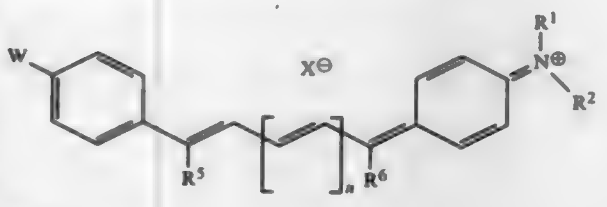
Randall H. Helland, Maplewood; Sylvia A. Farnum, Lakeland, both of Minn.; Mark P. Kirk, Bishop's Stortford, England; Jonathan P. Kitchin, White Bear Lake, Minn.; Roger A. Mader, Stillwater, Minn.; Mark B. Mizen; Richard A. Newmark, both of St. Paul, Minn.; William D. Ramsden, Afton, Minn.; Kumars Sakizadeh, Woodbury, Minn.; Terence D. Spawn, Maplewood, Minn.; Dian E. Stevenson, Saffron Walden, England, and George V. Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1992, Ser. No. 993,650

Int. Cl.^{5} G03C *1/06, 1/815, 1/825*

U.S. Cl. 430—517 **19 Claims**

1. A thermal-dye-bleach construction comprising a polymethine dye having a nucleus of formula:



wherein:

n is 0, 1, 2 or 3;

W is selected from: hydrogen, alkyl groups of up to 10 carbon atoms, alkoxy and alkylthio groups of up to 10 carbon atoms, aryloxy and arylthio groups of up to 10 carbon atoms, NR^1R^2, and NR^3R^4;

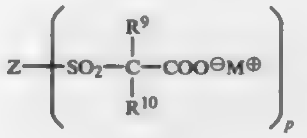
R^1 to R^4 are each independently selected from: alkyl groups of up to 20 carbon atoms, alkenyl groups of up to 20 carbon atoms, and aryl groups of up to 14 carbon atoms; or

R^1 and R^2 together and/or R^3 and R^4 together may represent the necessary atoms to complete a 5-, 6-, or 7-membered heterocyclic ring group; or one or more of R^1 to R^4 may represent the atoms necessary to complete a 5- or 6-membered heterocyclic ring group fused to the phenyl ring on which the NR^1R^2 or NR^3R^4 group is attached;

R^5 and R^6 are each independently selected from: hydrogen atoms, alkyl groups of up to 20 carbon atoms, aryl groups of up to 20 carbon atoms, heterocyclic ring groups comprising up to 6 ring atoms, carbocyclic ring groups comprising up to 6 carbon atoms and fused ring and bridging groups comprising up to 14 ring atoms;

and, X^- is an anion;

in association with a thermal-carbanion-generating agent of general formula:



$$Z{-}\left(SO_2-\underset{\textstyle R^{10}}{\underset{|}{\overset{\textstyle R^9}{\overset{|}{C}}}}-COO^{\ominus}M^{\oplus}\right)_p$$

wherein:

R^9 and R^{10} are individually selected from: hydrogen, an alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, an aryl group, and a heterocyclic group;

M^+ is a cation which will not react with the carbanion generated from said thermal carbanion generating agent in such manner as to render said carbanion ineffective as a bleaching agent for said polymethine dye;

p is one or two, and when p is one, Z is a monovalent group selected from: an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group, and a heterocyclic group, and; when p is two, Z is a divalent group selected from: an alkylene group, arylene group, a cycloalkylene group, an alkynylene group, an aralkylene group, an alkenylene group, and a heterocyclic group.

5,314,796
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Kazuhiro Murai; Makoto Kajiwara, both of Odawara; Hirokazu Sato, Hino; Shinri Tanaka, Hino, and Mitsuhiro Okumura, Hino, all of Japan, assignors to Konica Corporation, Tokyo, Japan

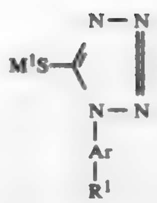
Filed Mar. 26, 1993, Ser. No. 37,894

Claims priority, application Japan, Apr. 2, 1992, 4-080949; Apr. 2, 1992, 4-080951

Int. Cl.^{5} G03C *1/06*

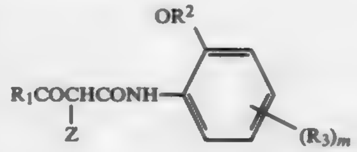
U.S. Cl. 430—522 **12 Claims**

1. A silver halide color photographic light sensitive material comprising a support bearing thereon photographic component layers including at least one light sensitive silver halide emulsion layer, wherein at least one of said component layers contains a compound represented by the following Formula [I], said silver halide emulsion contains a compound represented by the following Formula [II] and at least one of said component layers contains a compound represented by the following Formula [III],



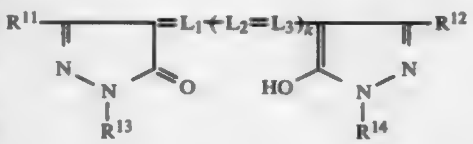
Formula [I]

wherein Ar represents an aromatic group; and R^1 represents $—OR^2$, $—N(R^3)SO_2R^4$ or $—COOM^2$ in which R^2 represents a hydrocarbon group having 2 or more carbon atoms, R^3 represents a hydrogen atom or a hydrocarbon group, and R^4 represents a hydrocarbon group; and wherein M^1 and M^2 represent each a hydrogen atom, an alkali metal atom, an alkaline earth metal atom or an ammonium group



Formula [II]

wherein R_1 represents an alkyl group or a cycloalkyl group; R^2 represents an alkyl group, a cycloalkyl group or an aryl group; R_3 represents a group substitutable on a benzene ring; and m is an integer of 0 to 4, provided that when m is 2 or more, R_3s may be the same with or different from each other; and Z represents a hydrogen atom or a group capable of splitting off upon reaction with the oxidized product of a developing agent,



Formula [III]

wherein R^{11} and R^{12} represent each —CN, $—COR^{15}$, $—COOR^{15}$ or $—CONR^{16}R^{17}$; R^{13} and R^{14} represent each a hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group or a heterocyclic group; L_1, L_2 and L_3 represent each a methine group; k is an integer of 0, 1 or 2, provided that when k is 2, $—(L_2{=}L_3)—$ groups may be the same or different from each other; and R^{15} represents an alkyl group or an aryl group; $R^{16}$and R^{17}represent each a hydrogen atom, an alkyl group, an alkenyl group, an aryl group or a heterocyclic group, provided that R^{16}, R^{17} and a nitrogen atom adjacent thereto may couple to form a 5- or 6-membered ring and that R^{16} and R^{17} does not represent hydrogen atoms at the same time.

5,314,797
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING AT LEAST ONE ACYLACETAMIDE YELLOW DYE-FORMING COUPLER

Yasuhiro Yoshioka; Yoshio Shimura, and Hidetoshi Kobayashi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 12, 1991, Ser. No. 743,780

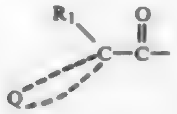
Claims priority, application Japan, Aug. 13, 1990, 2-214060

Int. Cl.^{5} G03C *7/36, 7/388*

U.S. Cl. 430—546 **20 Claims**

1. A silver halide color photographic material having at least one -photosensitive silver halide emulsion layer on a base, which comprises at least one of said photosensitive silver halide emulsion layers that contains at least one acylacetamide

yellow dye-forming coupler whose acyl group is represented by the following formula (I):



Formula (I)

wherein R_1 represents a monovalent group, Q represents a group of non-metallic atoms required to form together with the C a substituted or unsubstituted 3- to 5-membered membered cyclic hydrocarbon group or a substituted or unsubstututed 3- to 5-membered heterocyclic group having in the group at least one hetero atom selected from the group consisting of N, O, S, and P, provided that R_1 is not a hydrogen atom and it does not bond to Q to form a ring, and that contains a high-boiling organic solvent of which weight ratio to the dye-forming coupler contained in said layer is 0 to 0.3.

5,314,798
IODIDE BANDED TABULAR GRAIN EMULSION

Thomas B. Brust, Spencerport, and Mark R. Mis, North Tonawanda, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1993, Ser. No. 48,434
Int. Cl.^{5} G03C *1/035*
U.S. Cl. 430—567 **11 Claims**

1. A radiation sensitive emulsion containing a silver halide grain population comprised of at least 50 mole percent chloride, based on silver, wherein at least 50 percent of the grain population projected area is accounted for by tabular grains

(1) bounded by {100} major faces having adjacent edge ratios of less than 10 and
(2) each having an aspect ratio of at least 2; wherein
(3) each of the tabular grains is comprised of a core and a surrounding band containing a higher level of iodide ions and containing up to 30 percent of the silver in the tabular grain.

5,314,799
METHOD FOR PREPARING A FOGGED TYPED DIRECT POSITIVE SILVER HALIDE EMULSION

Yoshihiro Takagi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1993, Ser. No. 43,735
Claims priority, application Japan, Apr. 8, 1992, 4-087169
Int. Cl.^{5} G03C *1/015*
U.S. Cl. 430—569 **17 Claims**

1. A method for preparing a fogging type direct positive silver halide emulsion comprising the steps of:

(a) forming an emulsion containing silver halide grains;
(b) fogging surfaces of the grains with a reducing agent to form silver nuclei;
(c) performing at least one of an adjustment of pH of the emulsion to 4.5 or less and an adjustment of pAg of the emulsion to 8.1 or more; and then
(d) adjusting the pH of the emulsion to a value within a range of 5.0 to 8.0 and/or adjusting the pAg of the emulsion to a value within a range of 7.8 to 5.5, to stabilize the silver nuclei.

5,314,800
PURIFIED HUMAN CYTOMEGALOVIRUS PROTEIN

Lacy E. Rasmussen, Menlo Park, and Thomas C. Merigan, Portola Valley, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 104,392, Oct. 2, 1987, Pat. No. 5,194,256, which is a continuation of Ser. No. 642,828, Aug. 21, 1984, Pat. No. 4,743,562. This application Feb. 12, 1993, Ser. No. 17,509

The portion of the term of this patent subsequent to Sep. 5, 2005, has been disclaimed.

Int. Cl.^{5} C12Q *1/70;* C12N *5/20;* C07K *3/18*
U.S. Cl. 435—4 **4 Claims**

2. A method of determining the presence of human CMV neutralizing antibodies in a sample of human serum comprising:

incubating the sample with a purified human CMV virion protein (i) having a molecular weight of approximately 86,000 daltons as measured by SDS-PAGE; (ii) having in vivo immunizing activity, as evidenced by the capability of eliciting an in vivo neutralizing immune response; (iii) being substantially free of other CMV proteins; and (iv) having an epitope that specifically binds to monoclonal antibody IG6, under conditions that permit antigen-antibody binding; and

detecting the presence of immune complexes in the incubate.

5,314,801
PROBES TO *MYCOBACTERIUM AVIUM, MYCOBACTERIUM INTRACELLULARE,* AND *MYCOBACTERIUM PARATUBERCULOSIS*

Colleen M. Nycz, Raleigh; James L. Schram, Knightdale; Daryl D. Shank, Durham, and Glenn P. Vonk, Fuquay-Varina, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 6, 1992, Ser. No. 973,342
Int. Cl.^{5} C12Q *1/68;* C12P *19/34;* C07H *21/00*
U.S. Cl. 435—6 **24 Claims**

1. An oligonucleotide consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, or ribonucleic acid forms thereof.

19. A method of amplifying *Mycobacterium avium, Mycobacterium intracellulare,* or *Mycobacterium paratuberculosis* nucleic acid sequences and detecting the amplified products which comprises hybridizing an oligonucleotide primer consisting of ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, or ribonucleic acid forms thereof.

5,314,802
LIGHT EMISSION- OR ABSORBANCE-BASED BINDING ASSAYS

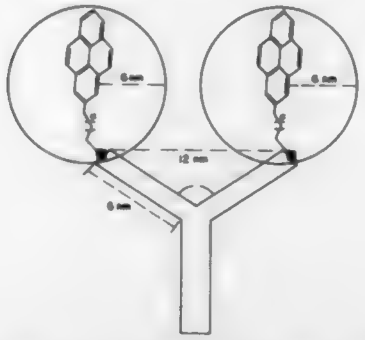
David A. Kidwell, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1992, Ser. No. 865,526
Int. Cl.^{5} G01N *33/533*
U.S. Cl. 435—7.1 **19 Claims**

1. A method for detecting the presence of a substance having binding sites for at least two molecules, in a sample suspected of including said substance, comprising the steps of:

adding to the sample which specifically binds said at least two binding sites of the substance and which is attached to a polycyclic aromatic label wherein, when at least two of said labelled molecules bind to said at least two binding sites, said labels of said two labelled molecules electronically interact with each other to form an excimer and thus vary the wavelength dependance of their spectra; and

determining whether said excimer has formed by detecting any said variation int he spectra of the label;



wherein detection of said variation of said spectra of the label indicates the formation of said excimer and the presence or absence of said substance in said sample.

5,314,803
PROCESS AND TEST CARRIER FOR THE DETERMINATION OF AN ENZYME FROM AN ISOENZYME MIXTURE

Hans-Erich Wilk; Anselm Rothe, and Erich Schneider, all of Mannheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 473,007, Jan. 31, 1990, abandoned. This application Dec. 10, 1992, Ser. No. 989,875

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903114

The portion of the term of this patent subsequent to Dec. 1, 2008, has been disclaimed.

Int. Cl.^{5} C12Q *1/25, 1/40;* G01N *33/573, 21/00*
U.S. Cl. 435—7.4 **20 Claims**

1. A process for the determination of a specific isoenzyme present in an isoenzyme mixture such as a body fluid sample, wherein any other isoenzymes present in the mixture are inhibited, and the specific isoenzyme is determined in less than five minutes, with no requisite step for removal of the inhibited isoenzymes, comprising

contacting the sample with one or more substances which bind to and are capable of inhibiting all but the specific isoenzyme so that the entire sample remains soluble,

transferring the entire sample to a small-pored reaction medium with a pore size less than 25 μm,

inhibiting all but the specific isoenzyme while maintaining the entire sample in solution, and

carrying out the determination of the specific isoenzyme in the presence of the inhibited isoenzymes which remain in solution.

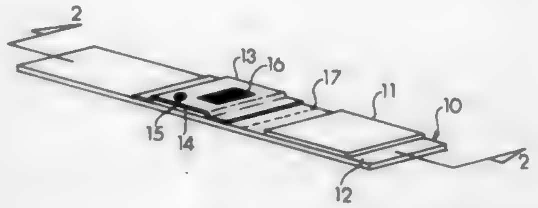
5,314,804
TEST FOR HELICOBACTER PYLORI

Robert C. Boguslaski, and Robert J. Carrico, both of Elkhart, Ind., assignors to Serim Research Corporation, Elkhart, Ind.

Filed Mar. 24, 1992, Ser. No. 856,992
Int. Cl.^{5} C12Q *1/58, 1/62, 1/04*
U.S. Cl. 435—12 **9 Claims**

1. A method for detecting urease in a biological tissue specimen comprising:

A. positioning the tissue specimen on one side of a diffusion element permeable to ammonia;
B. contacting the specimen with a pH optimized urease substrate comprising a solution of urea and a buffer having a pH of about from 7.0 to 9.0, said contacting producing ammonia;
C. allowing the ammonia to permeate through the diffusion element to contact an indicator element positioned to the opposite side of and in contiguous relationship to the diffusion element, said indicator element comprising a matrix containing a pH indicator having a pKa of about 2.0 to 6.0; and,



D. observing the reaction of the ammonia with the indicator element.

5,314,805
DUAL-FLUORESCENCE CELL VIABILITY ASSAY USING ETHIDIUM HOMODIMER AND CALCEIN AM

Richard P. Haugland, Eugene, Oreg.; Ian C. MacCoubrey, Blacksburg, Va., and Patrick L. Moore, West Roxbury, Mass., assignors to Molecular Probes, Inc., Eugene, Oreg.

Filed Oct. 28, 1991, Ser. No. 783,182
Int. Cl.^{5} C12Q *1/02, 1/68, 1/04*
U.S. Cl. 435—29 **20 Claims**

1. A method for evaluating the viability of cells in a sample, comprising:

a) combining a sample containing cells with a concentration of calcein AM sufficient to yield detectable green fluorescence in any live cells present in said sample and a concentration of ethidium homodimer sufficient to yield detectable red fluorescence in any dead cells present in said sample;
b) viewing the sample with means for detecting the red and green fluorescence of cells.

5,314,806
BIOLOGICAL DEGRADATION OF SODIUM OXALATE WITH *BACILLUS* AGAL N91/005579

Robert A. Morton, Australind; Michael J. Dilworth, and Barbara Wienecke, both of Murdoch, all of Australia, assignors to Worsley Alumina Pty. Limited, Collie, Australia

PCT No. PCT/AU91/00051, § 371 Date Jun. 6, 1991, § 102(e) Date Jun. 6, 1991, PCT Pub. No. WO91/12207, PCT Pub. Date Aug. 22, 1991

PCT Filed Feb. 13, 1991, Ser. No. 687,872
Claims priority, application Australia, Feb. 13, 1990, PJ8576
Int. Cl.^{5} C12P *1/00;* C12N *1/20;* C02F *1/00;* C12M *1/04*
U.S. Cl. 435—41 **8 Claims**

1. A biologically pure culture of Bacillus species AGAL N91/005579.

2. A method of biological disposal of sodium oxalate produced as a by-product of the Bayer process in an alumina refinery, the method comprising:

introducing the sodium oxalate into a biological reactor comprising an aqueous solution in which an alkalophilic oxalate-degrading aerobic micro-organism is present, wherein said alkalophilic oxalate-degrading micro-organism is Bacillus AGAL N91/005579; and,

maintaining the aqueous solution in an aerobic condition such that the sodium oxalate in the reactor can be degraded by the alkalophilic oxalate-degrading aerobic micro-organism.

5,314,807

METHOD FOR PRODUCING AN ANGIOTENSIN CONVERTING ENZYME INHIBITOR-CONTAINING COMPOSITION

Masaaki Yoshikawa, Joyo; Keiichi Yokoyama; Masayasu Hasegawa, both of Kyoto; Ryouichi Yasumoto, Kawachinagano, and Hiroyuki Fujita, Suita, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 27, 1992, Ser. No. 858,842

Claims priority, application Japan, Mar. 29, 1991, 3-142283; Oct. 17, 1991, 3-298060

Int. Cl.^{5} C10P *21/00;* **C12N** *9/56, 9/58*

U.S. Cl. 435—68.1 **5 Claims**

1. A method of producing an angiotensin converting enzyme inhibitor peptide composition comprising Ile-Trp-His-His-Thr, Ala-Leu-Pro-His-Ala and Ile-Lys-Trp, said composition having an IC_{50} value of 110 μg/ml or less, which comprises forming a solution by hydrolyzing dried bonito protein with water in the presence of a protease derived from a microorganism of the genus Bacillus, Aspergillus or Rhizopus, or a protease of papaya origin, and recovering the solution containing the peptide composition.

5,314,808

METHOD FOR THE TRANSFORMATION OF CELLS, PARTICULARLY EUKARYOTES BY A DNA ORIGINATING FROM VIRUSES OF HEPATITIS, MORE PARTICULARLY FROM VIRUS OF A B VIRAL HEPATITIS, AND PREPARATIONS CONTAINING THE EXPRESSION PRODUCTS OF SAID DNAS

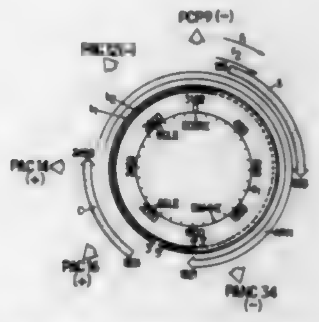
Pierre Tiollais; Charles Chany, both of Paris; Marie-Francoise Dubois, Versailles; Christine Pourcel, and Anne Louise, both of Paris, all of France, assignors to Institut Pasteur and Institut Nationale de la Sante et de la Recherche Medicale, both of Paris, France

Continuation of Ser. No. 256,126, Apr. 21, 1981. This application Apr. 5, 1983, Ser. No. 482,322

Claims priority, application France, Apr. 22, 1980, 80 9041; Dec. 9, 1980, 80 26132

Int. Cl.^{5} C12P *21/06;* **C12N** *15/00;* **A61K** *39/12*

U.S. Cl. 435—69.3 **6 Claims**



1. Genetically engineered spherical particles having sizes in the range of about 18 to about 25 nm, which particles are totally free of human components, are free of DNA polymerase, totally free of Dane particles, of HB_e and HB_c antigens, are agglutinated by antibodies which agglutinate HB_sAg of human serum, are not detected by anti-HB_c antibodies and by anti-HB_e antibodies, which particles are immunogenic and have vaccinating properties against hepatitis B virus, and are incapable of causing infectious hepatitis.

5,314,809

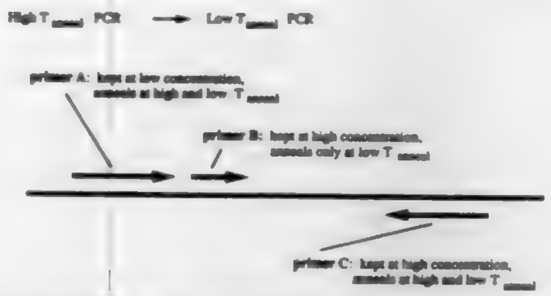
METHODS FOR NUCLEIC ACID AMPLIFICATION

Henry A. Erlich, Oakland, and Russell G. Higuchi, San Francisco, both of Calif., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 718,576, Jul. 20, 1991, abandoned. This application Mar. 10, 1993, Ser. No. 33,072

Int. Cl.^{5} C12Q *1/68;* **C12P** *19/34;* **C07H** *15/12*

U.S. Cl. 435—91.2 **18 Claims**


High T anneal PCR → Low T anneal PCR
primer A: kept at low concentration, anneals at high and low T anneal
primer B: kept at high concentration, anneals only at low T anneal
primer C: kept at high concentration, anneals at high and low T anneal

1. A method for nested amplification of a sequence within a target nucleic acid in a sample, the method comprises:

(a) simultaneously mixing said sample in an amplification reaction mixture containing an outer primer pair and an inner primer pair, wherein said outer primer pair is capable of amplifying a target nucleic acid to provide an amplified target sequence, and said inner primer pair is capable of amplifying a subsequence within said target sequence;

(b) treating the amplification reaction mixture of step (a) in an amplification reaction at a temperature for annealing and extending said outer primer pair on said target nucleic acid and at a temperature for denaturing the extension products of said outer primer pair to provide an amplified target sequence, wherein said temperature for annealing and extending said outer primer pair is higher than the temperature for annealing and extending said inner primer pair to said target nucleic acid and said temperature does not allow efficient extension of at least one member of said inner primer pair; and

(c) treating the mixture of step (b) in an amplification reaction at said temperature for annealing and extending said inner primer pair on said amplified target sequence, and at an temperature for denaturing the extension products of said inner primer pair to provide an amplified subsequence.

5,314,810

FRUCTOSE TRANSFERRING ENZYME ABSORBED ON A GRANULAR CARRIER FOR PRODUCTION OF FRUCTOOLIGOSACCHARIDES

Toshiaki Kono; Goichi Yamaguchi, and Hidemasa Hidaka, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 766,970, Sep. 26, 1991, abandoned, which is a continuation of Ser. No. 275,496, Nov. 23, 1988, abandoned. This application May 19, 1992, Ser. No. 885,001

Claims priority, application Japan, Nov. 25, 1987, 62-295299

Int. Cl.^{5} C12P *19/18;* **C12N** *11/10, 11/08*

U.S. Cl. 435—97 **21 Claims**

1. An immobilized enzyme adsorbed to a granular carrier, said immobilized enzyme being produced by a process consisting essentially of the step of immobilizing free enzyme having fructose transferring activity by adsorbing the free enzyme onto the granular carrier, said immobilizing step being carried out without the use of a crosslinking agent, wherein said carrier is selected from the group consisting of epoxy polymers, vinyl polymers and chitosan derivatives, each containing at least one primary, secondary, or tertiary amine.

5,314,811

PROCESS FOR CONVERTING LIPID-CONTAINING BACTERIAL CAPSULAR POLYSACCHARIDE INTO LIPID-FREE POLYSACCHARIDE

Ann L. Lee; Mark S. Rienstra, both of Lansdale; Walter E. Manger, Harleysville, and Robert D. Sitrin, Lafayette Hill, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 13, 1992, Ser. No. 909,346

Int. Cl.^{5} C12P *19/04, 1/04;* **C12R** *1/21*

U.S. Cl. 435—101 **14 Claims**

1. A process for preparing lipid and endotoxin free capsular polysaccharide from a crude or purified preparation comprising both lipid-free and lipo-capsular polysaccharide, derived from bacteria, without substantial loss of the capsular polysaccharide, which comprises converting substantially all the lipo-capsular polysaccharide into lipid-free capsular polysaccharide by cleaving the lipid from the lipo-capsular polysaccharide, removing free lipid and endotoxin contaminants, and recovering the lipid-free capsular polysaccharide.

5,314,812

MICROBIOLOGICAL PROCESS FOR PRODUCTION OF FATTY ACIDS HAVING HIGH DEGREE OF UNSATURATION WITH ECHINOSPORANGIUM

Kengo Akimoto, Mishima; Yoshifumi Shinmen, Otokuni; Hideaki Yamada, and Sakayu Shimizu, both of Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

Continuation of Ser. No. 378,295, Jul. 11, 1989, abandoned. This application Feb. 1, 1991, Ser. No. 649,144

Claims priority, application Japan, Jul. 13, 1988, 63-172589

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.^{5} C12P *7/64;* **C12N** *1/14, 9/60*

U.S. Cl. 435—134 **10 Claims**

1. A process for production of a highly unsaturated fatty acid, comprising the steps of:

culturing a microorganism capable of synthesizing a highly unsaturated fatty acid containing at least three double bonds in the carbon chain and having 20 or 22 carbon atoms, said microorganism belonging to the genus Echinosporangium; and

recovering the highly unsaturated fatty acid so produced, said acid having at least three double bonds in the carbon chain and having 20 or 22 carbon atoms.

5,314,813

DROSOPHILA CELL LINES EXPRESSING GENES ENCODING MHC CLASS I ANTIGENS AND B2-MICROGLOBULIN AND CAPABLE OF ASSEMBLING EMPTY COMPLEXES AND METHODS OF MAKING SAID CELL LINES

Per A. Peterson, LaJolla; Michael Jackson, and Pierre Langlade-Demoyen, both of Del Mar, all of Calif., assignors to Scripps Research Institute, LaJolla, Calif.

Filed Feb. 19, 1992, Ser. No. 841,662

Int. Cl.^{5} C12N *15/00, 5/00*

U.S. Cl. 435—172.3 **9 Claims**

1. A stable cell line comprising:

a human class I MHC gene, operably linked to an inducible promoter, capable of expressing a human class I MHC antigen on induction of said promoter;

a human β-2-microglobulin gene, operably linked to a second inducible promoter, capable of expressing a human β-2-microglobulin protein, on induction of said second promoter;

wherein said ell is capable of assembling said MHC class I antigen and said β-2-microglobulin protein into empty complexes, and transporting and anchoring said empty complexes to the surface of the cell in sufficient numbers to activate a population of T-cell lymphocytes against a selected peptide when said peptide is bound to said complexes.

5,314,814

PREPARATION OF NOVEL IMMOBILIZED BIOCATALYSTS

Abraham Harder, Berkel en Rodenrijs; Ben R. DeHaan, Rijswijk; Johannes B. Van der Plaat, Leiderdrop, all of Netherlands, and Marsha Cummings, Gastonia, N.C., assignors to Gist-Brocades, Netherlands

Division of Ser. No. 547,868, Jul. 2, 1990, Pat. No. 5,137,818, which is a continuation-in-part of Ser. No. 88,849, Jul. 8, 1987, abandoned. This application Feb. 3, 1992, Ser. No. 829,980

Claims priority, application European Pat. Off., Nov. 15, 1985, 85-201883.7; Jun. 13, 1986, 86-304578.7

Int. Cl.^{5} C12N *11/02, 11/12, 11/04*

U.S. Cl. 435—177 **5 Claims**

1. A method of preparing an immobilized water-soluble biocatalyst comprising living cells in particulate form consisting essentially of the steps of:

(a) suspending the living cells in an aqueous solution of a gelling agent,

(b) combining the mixture so obtained with an organic liquid poorly miscible or immiscible in water to form a suspension in the organic liquid of aqueous particles comprising the living cells and gelling agent,

(c) treating the suspension to gel the gelling agent in the particles,

(d) treating the particles obtained in step (c) with a bi- or polyfunctional cross-linking agent to covalently crosslink the gelling agent in the particles, and

(e) removing at least part of the water from the particles obtained in step (d) to obtain particles with a dry matter content of at least 15% by weight.

5,314,815

METHOD FOR TEMPORARILY INHIBITING OR DEACTIVATING SERINE HYDROLASE AND ADDUCT OF SERINE HYDROLASE WITH A PHOSPHONATE OR PHOSPHATE COMPOUND

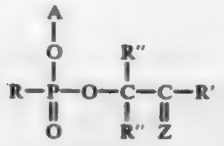
Ildiko M. Kovach, Montgomery County, Md., assignor to The Catholic University of America, Washington, D.C.

Filed Mar. 4, 1992, Ser. No. 850,112

Int. Cl.^{5} C12N *9/99, 9/100, 9/96*

U.S. Cl. 435—184 **14 Claims**

1. An adduct of a serine hydrolase with a phosphonate or phosphate represented by the formula



$$\begin{array}{ccccccccc} & & A & & & & & & \\ & & | & & & & & & \\ & & O & & R'' & & & & \\ & & | & & | & & & & \\ R & - & P & -O- & C & - & C & - & R' \\ & & \| & & | & & \| & & \\ & & O & & R'' & & Z & & \end{array}$$

wherein R is an alkyl or alkoxy radical, A is a phenyl or a naphthyl radical, R′ is a phenyl or alkyl radical, R″ is hydrogen or methyl, and Z is an electronegative group, wherein the adduct deactivates the serine hydrolase and is dephosphonylated by intramolecular catalysis to reactivate the serine hydrolase.

5,314,816

METHOD OF PREPARING LYSOZYME DIMERS

Peter Uerrmann, and Peter Klein, both of Itingen, Switzerland, assignors to Nika Health Products Ltd., Liechtenstein

PCT No. PCT/US90/00140, § 371 Date Jul. 8, 1992, § 102(e) Date Jul. 8, 1992, PCT Pub. No. WO91/10731, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 8, 1990, Ser. No. 867,706

Int. Cl.^{5} C12N *9/36;* **H61K** *37/48, 37/54*

U.S. Cl. 435—188 **18 Claims**

1. A method of preparing a purified lysozyme dimer product comprising the steps of:

(a) preparing a lysozyme solution by adding monomeric

lysozyme to a buffer solution and adjusting the pH to at least 9;
(b) adding a suberimidate coupling reagent to dimerize the lysozyme monomers in the lysozyme solution while maintaining the pH at least 9;
(c) stopping the dimerization reaction at a given point by lowering the pH to about 7;
(d) purifying the dimerized lysozyme solution by carrying out a first elution step in which the solution is eluted through an ion exchange column containing an agarose matrix and collecting the fractions which are substantially comprised of the dimeric form of lysozyme;
(e) filtering the collected fractions from the first elution step through an ion exchange column containing a dextran matrix; and
(f) collecting the highly purified dimeric lysozyme product resulting from the second elution step.

5,314,817
CATALYTIC AND REACTIVE POLYPEPTIDES AND METHODS FOR THEIR PREPARATION AND USE

Peter Schultz, Oakland, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 404,920, Sep. 8, 1989, Pat. No. 5,215,889, which is a continuation-in-part of Ser. No. 273,455, Nov. 18, 1988, abandoned. This application Dec. 10, 1992, Ser. No. 988,652

Int. Cl.^{5} C12N *9/00*

U.S. Cl. 435—188.5 **3 Claims**

1. A method for preparing an antibody or antibody fragment capable of promoting a chemical reaction involving the conversion of one or more reactants to one or more products, said method comprising:

eliciting an antibody against a hapten which is a reactant, a reactant analog, a transition state analog, or a multisubstrate analog and which further possesses structural and electronic features which generate at least one preselected amino acid proximate the antibody combining site, wherein the side chain of said preselected amino acid is capable of promoting the reaction rate when the antibody or a fragment thereof is exposed to the reactants.

5,314,818
HUMAN TISSUE PLASMINOGEN ACTIVATOR VARIANTS

Stephen P. Anderson; Deborah L. Higgins, both of San Mateo; Adair J. Hotchkiss, Half Moon Bay, and Cara B. Marks, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 170,510, Mar. 21, 1988, Pat. No. 5,094,953. This application Feb. 19, 1992, Ser. No. 846,245

Int. Cl.^{5} C12N *15/58, 15/00*

U.S. Cl. 435—226 **3 Claims**

1. A human tissue plasminogen activator (t-PA) comprising the structure des 1-44K213E275 t-PA or des 1-44K210E275 t-PA.

5,314,819
PROTEIN HAVING NITRILE HYDRATASE ACTIVITY OBTAINED FROM RHIZOBIUM, GENE ENCODING THE SAME, AND A METHOD FOR PRODUCING AMIDES FROM NITRILES VIA A TRANSFORMANT CONTAINING THE GENE

Kazunori Yamada, Kanagawa; Masanori Ochiai, Hokkaido; Yoshihisa Yotsumoto, Kanagawa; Yuuki Morimoto, Tokyo, and Yutaka Teranishi, Kanagawa, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Apr. 27, 1993, Ser. No. 52,681

Claims priority, application Japan, Apr. 28, 1992, 3-110244

Int. Cl.^{5} C12N *9/88, 15/60, 15/70*

U.S. Cl. 435—232 **4 Claims**

1. An isolated and purified protein from Rhizobium sp. MCI2643 characterized by having the following physicochemical properties:
i. a water-soluble enzyme composed of three subunits and having a molecular weight of about 110,000 determined by gel filtration, wherein the molecular weights of the subunits determined by SDS-polyacrylamide gel electrophoresis are as follows:
(a) molecular weight of subunit α; 26,000±500 Dalton
(b) molecular weight of subunit β; 15,000±500 Dalton
(c) molecular weight of subunit γ; 16,500±500 Dalton; and
ii. having nitrile hydratase activity.

5,314,820
PROCESS AND MICROORGANISMS FOR PRODUCING SINGLE CELL PROTEIN

Ibrahim Y. Hamdan; Amin S. ElNawawy; Ibrahim M. Banat, and Nader M. Al-Awadhi, all of Kuwait City, Kuwait, assignors to Kuwait Institute for Scientific Research, Kuwait City, Kuwait

Filed Nov. 13, 1987, Ser. No. 120,322

Int. Cl.^{5} C12N *1/20;* **C12P** *21/04*

U.S. Cl. 435—252.1 **4 Claims**

1. A purified and isolated methanol-utilizing bacterium selected from the group consisting of Methylophilus KISRI 5 (NCIB 12135), Methylophilus KISRI 6.1 (NCIB 12136), Methylophilus KISRI 512 (NCIB 12137), Methylophilus. KISRI 5112 (NCIB 12138).

5,314,821
METHOD OF SEPARATING BACTERIA FROM FREE LIVING AMOEBAE

Richard L. Tyndall, Clinton, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Continuation of Ser. No. 693,998, Apr. 26, 1991, abandoned. This application Feb. 1, 1993, Ser. No. 11,841

Int. Cl.^{5} C12N *1/12, 1/20;* **F27D** *3/00*

U.S. Cl. 435—252.1 **2 Claims**

1. A method of separating a heterotrophic bacterium from a free living amoeba/bacteria consortium comprising:

providing a free living amoeba/bacteria consortium including a heterotrophic bacterium, said amoeba/bacteria consortium being selected from the group consisting of ATCC 55120, ATCC 40908, ATCC 55342, ATCC 55343, a mutant of one of these consortia possessing all the identifying characteristics of said one of these consortia and mixtures thereof; and

placing said amoeba/bacteria consortium in contact with a medium which is selective for said heterotrophic bacterium to separate said heterotrophic bacterium from said amoeba/bacteria consortium.

5,314,822
METHOD OF CLONAL GROWTH OF *STREPTOCOCCUS PNEUMONIAE*

Fred J. Bailey, Hatfield, and Wayne K. Herber, Center Valley, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 15, 1992, Ser. No. 961,587

Int. Cl.^{5} C12N *1/20*

U.S. Cl. 435—253.4 **2 Claims**

1. A method for clonal growth of *Streptococcus pneumoniae* from the single colony stage in a medium containing no bovine derived, ovine derived or crude blood derived products which comprises:
(a) preparing an agar plate of said medium streaked with said *Streptococcus pneumoniae*, and growing said *Streptococcus pneumoniae*, wherein said agar plate comprises agar, Yeast Extract, Soy Peptone, salts to maintain buffering and osmolarity, Vitamin K if known to be required for the particular strain being isolated, Hemin, Sodium Bicarbonate, L-cysteine HCl, Glucose, a buffer to maintain the pH at between about pH 7.3–7.8, but no bovine derived, ovine derived or crude blood-derived products; and
(b) selecting a single colony for expansion by growing in a culture of the same medium used in step (a) absent the agar, and optionally storing the culture as a frozen glycerol stock.

5,314,823
METHOD FOR CLEANING A CONTACT LENS

Akira Nakagawa, Nagoya, Japan, assignor to Tomei Sangyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 20, 1992, Ser. No. 963,671

Claims priority, application Japan, Sep. 10, 1992, 4-268156

Int. Cl.^{5} D06M *16/00;* **C02F** *5/00;* **C11D** *3/00*

U.S. Cl. 435—264 **9 Claims**

1. A method for cleaning a contact lens, which comprises immersing said contact lens under conditions suitable for and for a time sufficient to clean protein deposits from said lens in a treating solution comprising:
(A) an enzyme-containing aqueous solution comprising
  (i) a serine protease and
  (ii) from 30 and 95% by weight of glycerol as suitable to stabilize the enzyme during solution storage; and
(B) a diluting solution comprising
  (i) from 0.05–5% by weight of an anionic surfactant having no polyoxyethylene glycol units and
  (ii) from 0.005–0.1% by weight of ethylenediamine tetraacetate;
wherein the proportion of (A) to (B) in said treating solution is such that the glycerol concentration is not higher than 5% by weight and the concentration of serine protease is in an amount effective to clean a contact lens.

5,314,824
METHOD OF SETTING UP A FLOW CYTOMETER

Abraham Schwartz, Hato Rey, P.R., assignor to Caribbean Microparticles Corporation, Hato Rey, P.R.

Continuation-in-part of Ser. No. 671,198, Mar. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 620,530, Nov. 21, 1990, Pat. No. 5,089,416, which is a continuation-in-part of Ser. No. 516,056, Apr. 27, 1990, Pat. No. 5,084,394, which is a continuation-in-part of Ser. No. 128,786, Dec. 4, 1987, Pat. No. 4,857,451, which is a continuation-in-part of Ser. No. 805,654, Dec. 11, 1985, Pat. No. 4,774,189, which is a continuation-in-part of Ser. No. 685,464, Dec. 24, 1984, Pat. No. 4,767,206. This application Oct. 27, 1992, Ser. No. 966,937

Int. Cl.^{5} G01N *33/547*

U.S. Cl. 436—10 **11 Claims**

1. A method of determining Target Channels for a flow cytometer having photomultiplier tubes (PMTs) with adjustable voltages, adjustable compensation circuit and a plurality of fluorescence channels, at each of at least two wavelengths such that the noise level is on scale and the compensation is uniform across the intensity ranges of the said fluorescence channels for use with fluorescent-labeled cells fluorescing at a plurality of wavelengths, comprising:
(a) providing blank microbeads;
(b) providing a set of control cell populations for each of said wavelengths, each control cell population being singly labeled with a fluorescent compound which fluoresces at one of said wavelengths;
(c) providing a population of microbeads fluorescing at said wavelengths;
(d) running the said blank microbeads on said flow cytometer and adjusting the PMT voltages so that the blank microbeads are on scale on the flow cytometer;
(e) running said control cell populations for each said wavelengths on said flow cytometer and gating the control cell population to yield singlet cell populations;
(f) adjusting the compensation so that the singlet cell populations fall orthogonally to unstained cells in secondary fluorescence channels; and
(g) running said population of microbeads fluorescing at said wavelengths and determining Target Channels for the flow cytometer.

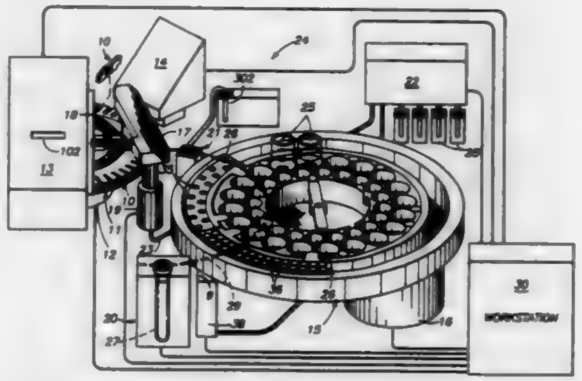
5,314,825
CHEMICAL ANALYZER

Bruce Weyrauch, Newman Lake; Norman Kelln; Thomas Tiffany, both of Spokane, and Robin Olson, Veradale, all of Wash., assignors to Schiapparelli Biosystems, Inc., Fairfield, N.J.

Filed Jul. 16, 1992, Ser. No. 916,466

Int. Cl.^{5} G01N *35/00*

U.S. Cl. 436—43 **43 Claims**



1. A method for operating a chemistry instrument, comprising:

releasably mounting a plurality of individually disposable cuvettes, each having an upper end including an opening providing access to its interior for receipt of liquids, into equiangularly spaced radial compartments of a turntable that is rotatable about a first vertical axis;

sequentially indexing the turntable to a stationary angular position about the first vertical axis with any randomly selected cuvette positioned at a cuvette access station or at a cuvette insertion station and then turning it about the first vertical axis while mixing or centrifuging the contents of cuvettes mounted to it;

analyzing the contents of any randomly selected cuvettes mounted on the turntable as their contents are being centrifuged;

indexing a tray containing a plurality of containers about a second vertical axis parallel to and spaced from the first vertical axis to a stationary angular position about the second vertical axis with any selected container positioned at a container access station;

moving a pipette along an arcuate path centered about a third vertical axis that is parallel to the first vertical axis and intersects both the cuvette access station and the container access station to thereby selectively transfer liquids from any randomly accessed container positioned on the tray at the container access station to any randomly selected cuvette positioned on the turntable at the cuvette access station; and

selectively inserting an individual cuvette into any randomly selected compartment of the turntable at the cuvette insertion station.

5,314,826
PLATELET ACTIVATION AND FUNCTION EVALUATION TECHNIQUE

Robert F. Baugh, Parker, Colo., assignor to Medtronic Hemotec, Inc., Englewood, Colo.

Filed Aug. 23, 1991, Ser. No. 749,211

Int. Cl.^{5} G01N *33/86*

U.S. Cl. 436—69 **44 Claims**

1. A method for performing an activated clotting time test

on a sample of blood containing platelets, comprising the steps of:

combining at a single predetermined point in time an activating reagent and the sample of blood to be tested to form a test mixture at the start of the activated clotting time test;

controllably activating the platelets of the sample during a first phase of the test by manipulating the test mixture to a predetermined degree immediately following the combining of the reagent and the sample to achieve a predetermined rate of contribution from platelet activation to the activated clotting time test;

continuing the activated clotting time test during a second phase of the test by manipulating the test mixture to a predetermined degree difference from the predetermined degree in the first phase immediately after achieving the predetermined rate of contribution;

terminating the activated clotting time test upon detecting a predetermined change in a property of the test mixture during the second phase which occurs as a result of the predetermined rate of contribution from platelet activation achieved during the first phase; and

calculating the activated clotting time in specific relation to and by accounting for the predetermined rate of contribution from the platelet activation during the test.

5,314,827

ISOTOPIC COMPOSITION ANALYZER

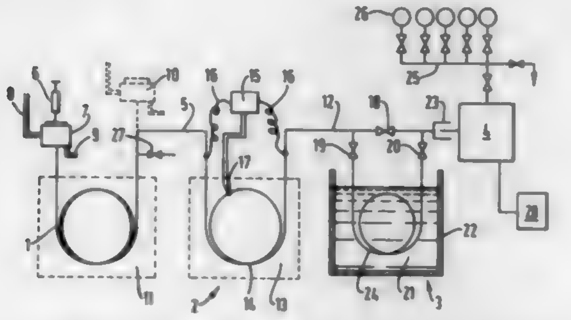
Hanns-Ludwig Schmidt, Landshut, and Ramiro Medina, Marzling, both of Fed. Rep. of Germany, assignors to Fisons plc, Ipswich, England

Filed Sep. 18, 1990, Ser. No. 584,179

Claims priority, application United Kingdom, Sep. 20, 1989, 8921285

Int. Cl.^{5} B01D *59/44*

U.S. Cl. 436—106 **9 Claims**



1. A method of determining the isotopic composition of carbon comprised in a sample, said method comprising the steps of:

i) introducing said sample into a flow of non-carbonaceous carrier gas and conveying said carrier gas to a catalytic reactor, said reactor containing elemental carbon, wherein said sample is pyrolyzed to deposit elemental carbon in said reactor;

ii) introducing into said catalytic reactor a non-carbonaceous oxygenated compound which reacts with said elemental carbon to produce carbon monoxide;

iii) conveying at least some of the gases emerging from said catalytic reactor into a mass spectrometer;

iv) determining the isotopic composition of the carbon comprised in said sample by said spectrometric measurements made on said carbon monoxide.

5,314,828

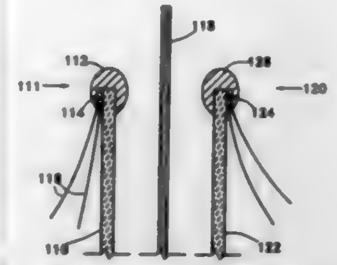
NO_x SENSOR AND PROCESS FOR DETECTING NO_x

Ralph A. Dalla Betta, Mountain View; David R. Sheridan, Menlo Park, both of Calif., and Daniel L. Reed, Boulder, Colo., assignors to Catalytica, Inc., Mountain View, Calif.

Filed Jun. 12, 1990, Ser. No. 536,895

Int. Cl.^{5} G01N *25/22, 27/50, 25/20*

U.S. Cl. 436—118 **22 Claims**



14. A process for measuring various nitrogen oxides (NO_x) in a flowing gas stream comprising the steps of:

a. introducing a NO_x reductant into the flowing gas stream containing NO_x to produce a mixed stream,

b. controlling the temperature of the flowing gas stream to an appropriate operating temperature, and

c. passing the mixed stream to a catalytic sensor comprising a catalyst for reducing NO_x to N_2 with the NO_x reductant upon contacting the mixed stream and a temperature measuring device where the catalyst and temperature measuring device are situated so that the heat produced by reducing NO_x with the catalyst raises the temperature of the temperature measuring device substantially proportional to the NO_x concentration in the mixed stream where the temperature measuring device provides a measurable output related to the temperature rise.

5,314,829

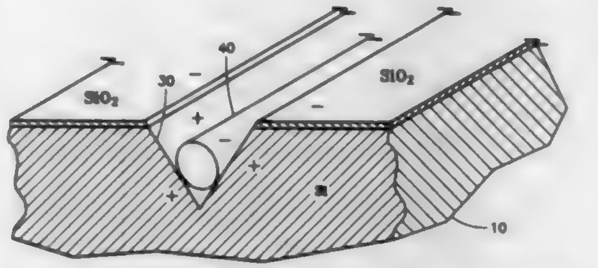
METHOD FOR IMAGING INFORMATIONAL BIOLOGICAL MOLECULES ON A SEMICONDUCTOR SUBSTRATE

L. Stephen Coles, Marina Del Rey, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Dec. 18, 1992, Ser. No. 992,601

Int. Cl.^{5} G01N *21/03*

U.S. Cl. 436—165 **13 Claims**



1. A method of imaging molecular strands using a substrate having a plurality of straight grooves in a top surface of said substrate, each of said grooves being of a size capable of holding only a single individual one of said molecular strands along any one section of a length of the groove, and being capable of forcing single individual molecular strands into a straight position when positioned in one of said plurality of grooves, said method comprising:

preparing a specimen of said molecular strands and depositing said specimen onto said top surface;

aligning and depositing individual ones of said molecular strands into individual ones of said plurality of grooves whereby the shape and size of each groove forces the molecular strands into a straight position; and

recording a first image of a selected section of said top surface of said substrate having at least one of said molecular strands in one of said grooves using an atomic imaging device.

5,314,830

IMMOBILIZED HYDROPHOBICALLY-MODIFIED ANTIBODIES

William L. Anderson, and Dennis Otero, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Oct. 30, 1992, Ser. No. 968,076

Int. Cl.^{5} G01N *33/552, 33/531;* **C07K** *15/28, 17/00*

U.S. Cl. 436—524 **24 Claims**

1. A protein modified with a hydrophobic moiety attached to the protein by a spacer comprising a water-soluble polymer, directly adsorbed onto an unprimed microporous mineral body surface.

21. A method for preparing an immunoreactive surface, comprising coating an unprimed microporous mineral body surface with an antigen or antibody modified with a hydrophobic moiety attached to the antigen or antibody by a spacer comprising a water-soluble polymer by drying the modified antigen or antibody onto the unprimed surface.

5,314,831

METHOD OF AND APPARATUS FOR EVALUATING CRYSTAL RATE IN SILICON THIN FILM

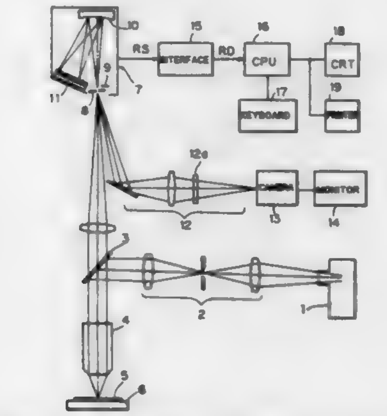
Sadao Hirae; Noriyuki Kondo, and Seiichiro Sato, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Oct. 23, 1992, Ser. No. 965,996

Claims priority, application Japan, Oct. 24, 1991, 3-306820

Int. Cl.^{5} H01L *21/66*

U.S. Cl. 437—8 **11 Claims**



1. A method of evaluating a crystal rate in an objective silicon film including a crystal phase and an amorphous phase, said method comprising the steps of:

(a) preparing a first sample of at least one single-crystal silicon and a second sample of pure amorphous silicon;

(b) applying ultraviolet light to said first sample to obtain a first reflection intensity Ic of said ultraviolet light reflected by said first sample;

(c) applying said ultraviolet light to said second sample to obtain a second reflection intensity Ia of said ultraviolet light reflected by said pure amorphous silicon;

(d) applying said ultraviolet light to said objective silicon film that is being evaluated to obtain a third reflection intensity Is of said ultraviolet light reflected by said objective silicon film;

(e) comparing said first and second reflection intensities Ic and Ia with each other to obtain a first index value ΔKa;

(f) comparing said first and third reflection intensities Ic and Is with each other to obtain a second index value ΔKa; and

(g) comparing said first and second index values ΔKa and ΔKs with each other to evaluate said crystal rate in said objective silicon film.

5,314,832

PROCESS FOR THE PRODUCTION OF A HIGH VOLTAGE MIS INTEGRATED CIRCUIT

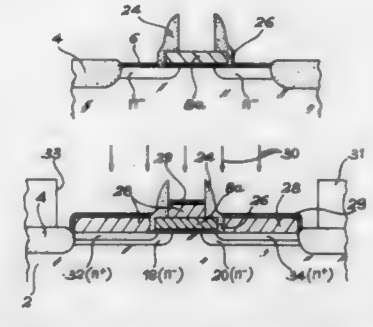
Simon Deleonibus, Claix, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 585,599, Sep. 20, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 835,106

Claims priority, application France, Sep. 28, 1989, 89 12697

Int. Cl.^{5} H01L *21/266*

U.S. Cl. 437—27 **17 Claims**



1. A process for producing an integrated circuit on a semiconductor substrate having MIS transistors, whose sources (**18,32**) and drains (**20,34**) consist of double junctions and whose gates (**18*a***) are formed in a semiconductive layer (**8**), said process comprising the following successive steps:

a) producing lateral electrical insulations (**4**) of the transistors,

b) forming a layer of a first insulant (**6**) at least between the lateral insulations, said first insulant constituting the insulant for the gates (**18*a***) to be formed in the semiconducting layer (**8**),

c) depositing, on the structure obtained in step b), said semiconductive layer (**8**), which can be selectively doped and etched with respect to the lateral insulations, the first insulant and insulating spacing strips (**24**),

d) producing, on the semiconductive layer, a mask (**10*a***) of at least one material which can be selectively etched with respect to the lateral insulations, the first insulant, the semiconductive layer, a second insulating material (**26**) and said spacing strips (**24**), thereby masking the gates (**8*a***) of the transistors to be produced in the semiconductive layer,

e) performing a first implantation (**14**) of ions at a low dose in the semiconductive layer (**8**) and in the substrate (**2**), which are not masked, in order to form in the substrate first source (**18**) and drain (**20**) junctions of the transistors, said ions having a conductivity type,

f) producing said spacing strips (**24**) only on the mask (**10*a***) edges,

g) etching the semiconductive layer (**8**) in order to eliminate therefrom the regions not covered by the mask and the spacing strips, thus forming the gates (**8*a***) of the transistors,

h) insulating (**26**) the etched edges of the semiconductive layer with the second insulant,

i) eliminating the mask (**10*a***),

j) eliminating the regions of the first insulant bared during step g),

k) epitaxy of a conductive layer (**28*a*, 28*b***) only on the source (**18**) and drain (**20**) regions bared during step j) and on the gates (**8*a***) of the transistors,

l) depositing an intermediate conductive layer (**29*a*, 29*b***) on said epitaxied layer in a selective manner with respect to the spacing strips, the lateral insulations and the second insulant,

m) performing a second implantation (**30**) of ions in the epitaxied conductive layer and in the source and drain regions in order to form said double junctions partly in the epitaxied layer and partly in the substrate, said ions having the same conductivity as the ions of the first implantation and said second implantation being made at a higher dose than that of the first implantation,

n) depositing a conductive material (*38a, 38b*) on the intermediate conductive layer in order to obtain at the end of the process overlapping electrical contacts (*44a, 44b*) on said source and drain junctions, said conductive material being deposited in a selective manner with respect to the spacing strips, the lateral insulations and the second insulant, in order to form gate, source and drain shunts,

o) depositing on the complete structure obtained in step n) an insulating layer (*40a, 40b*),

p) forming contact holes (*42a, 42b*) in said insulating layer facing the gates (*8a*), the sources (18, 32) and the drains (20, 34) to be connected, and

q) depositing a conductive material *44a, 44b*) in a selective manner in the contact holes (*42a, 42b*) with respect to the insulating layer, in order to form electrical contacts on the gates, sources and drains, the electrical contacts on the sources and drains overlapping said lateral insulations.

5,314,833
METHOD OF MANUFACTURING GAAS METAL SEMICONDUCTOR FIELD EFFECT TRANSISTOR

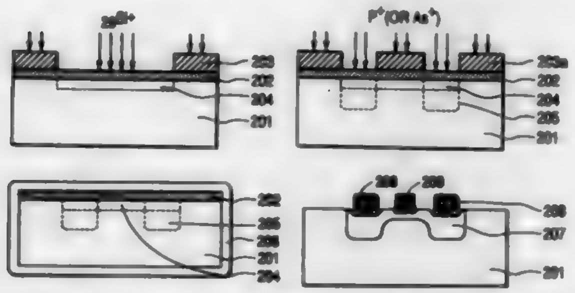
Kyung-Ho Lee; Kyoung-Ik Cho, and Yong-Tak Lee, all of Daejeon-shi, Rep. of Korea, assignors to Electronics & Telecommunications Research Institute, Daejeon-shi, Rep. of Korea

Filed Dec. 23, 1992, Ser. No. 996,052

Claims priority, application Rep. of Korea, Dec. 26, 1991, 91-24510

Int. Cl.⁵ H01L *21/265*

U.S. Cl. 437—41 **6 Claims**



1. A method for manufacturing a GaAs field effect transistor, comprising the steps of:

providing a semi-insulating GaAs semiconductor substrate;

depositing a silicon film on a major surface of said substrate;

forming a first sensitive film pattern on said silicon film to define a channel region;

ion-implanting a first impurity into said substrate to form a channel layer as an active layer;

removing said first sensitive film pattern;

forming a second sensitive film pattern on said silicon film to define spaced ohmic contact areas, and implanting a second impurity through said silicon film into said substrate in only said ohmic contact areas to define spaced high concentration impurity regions beneath said the channel layer and to damage an interface of said silicon film and said substrate only in said ohmic contact areas;

removing said second sensitive film pattern;

forming a passivation film over said substrate after removal of said second sensitive film pattern and performing an activation annealing process so as to diffuse silicon from said silicon film into said channel layer and said high concentration impurity regions, wherein the damage to the interface of the silicon film and the substrate in the ohmic contact areas allows a greater diffusion of silicon in said high concentration impurity areas than in a remainder of said channel layer;

sequentially removing said passivation film and said silicon film;

forming a third sensitive film pattern on said substrate to define source/drain ohmic contact regions at a surface of said high concentration impurity regions;

etching an upper surface portion of said impurity regions within said source/drain ohmic contact regions to form recessed portions therein;

forming ohmic contact electrodes on recessed portions in said source-drain ohmic contact regions;

etching an upper surface portion of said channel layer using a gate mask to form a recessed gate contact region; and

forming a gate electrode on said recessed gate contact region.

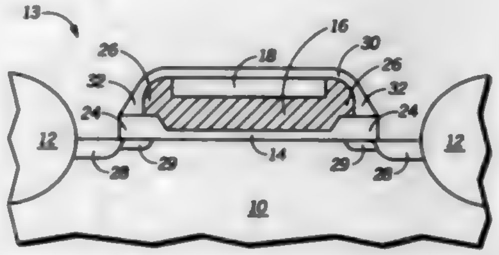
5,314,834
FIELD EFFECT TRANSISTOR HAVING A GATE DIELECTRIC WITH VARIABLE THICKNESS

Carlos A. Mazuré, and Marius K. Orlowski, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 26, 1991, Ser. No. 750,155

Int. Cl.⁵ H01L *21/265, 29/68*

U.S. Cl. 437—43 **5 Claims**



1. A process for forming a field effect transistor having a gate dielectric with variable thickness, comprising the steps of:

providing a semiconductor substrate;

forming a dielectric overlying the substrate and having a first thickness;

forming a control electrode on the dielectric with a first predetermined width;

forming a non-oxidizing film of material around the control electrode;

increasing the first thickness of the dielectric to a second thickness adjacent a perimeter of the control electrode;

removing the non-oxidizing film of material from the control electrode after the second thickness of the dielectric has been formed;

extending the first predetermined width of the control electrode by laterally enlarging the control electrode to a second predetermined width after the second thickness of the dielectric is formed so that the dielectric which is below the control electrode has a thickness in a central portion beneath the control electrode which is less than an outer perimeter portion beneath the control electrode; and

forming first and second current electrodes in the semiconductor substrate to form a channel region underlying the control electrode.

5,314,835
SEMICONDUCTOR MEMORY DEVICE

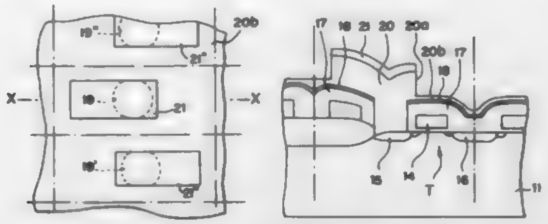
Katsuji Iguchi, Yamatokoriyama; Seizo Kakimoto, Nara, and Naoyuki Shinmura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 794,846, Nov. 21, 1991, which is a continuation of Ser. No. 540,759, Jun. 20, 1990, abandoned. This application Nov. 6, 1992, Ser. No. 972,914

Claims priority, application Japan, Jun. 20, 1989, 1-158028

Int. Cl.⁵ H01L *21/70*

U.S. Cl. 437—52 **4 Claims**



1. A method of making a memory cell having a transistor and a stacked capacitor, comprising the steps of:

(a) forming a first conductive film over a semiconductor substrate after an insulating film has been deposited over the transistor formed on said semiconductor substrate and a contact hole has subsequently been formed in said insulating film;

(b) forming a first mask pattern on said first conductive film and anisotropically etching substantially halfway said first conductive film, with said first mask pattern used as a mask, so as to leave a bottom thereof;

(c) forming a second mask film only on a side wall portion of said first conductive film which has been formed by a partial etching, and depositing a second conductive film over an entire surface of said second mask film;

(d) anisotropically etching an entire surface of said second conductive film so as to leave a portion of said second conductive film on a side wall portion of said second mask film while permitting said second conductive film to be connected with the bottom of said first conductive film;

(e) removing a bottom portion of said first conductive film which fails to be covered by said second conductive film, said second mask film and said first mask pattern; and

(f) after said first mask pattern and said second mask film have been removed, forming a capacitor insulating film over an entire surface followed by a formation of a third conductive film over said capacitor insulating film, whereby lower and upper electrodes of the capacitor are formed by said first and second conductive films, respectively.

5,314,836
METHOD OF MAKING A SINGLE ELECTRODE LEVEL CCD

James P. Lavine, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 15, 1992, Ser. No. 945,073

Int. Cl.⁵ H01L *21/339*

U.S. Cl. 437—53 **19 Claims**

1. A method of making a CCD comprising the steps of:

forming a layer of a conductive material over and insulated from a surface of a body of a semiconductor material of one conductivity type;

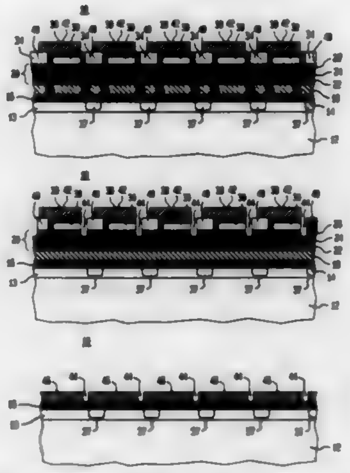
forming a first masking layer over the conductive layer;

forming spaced strips of a material which can be oxidized and which can be etched by an etchant which does not effectively etch the material of the first masking layer on the surface of the first masking layer;

forming a layer of an oxide over each of the strips with the oxide layer extending across the end edges of the strips so as to extend partially across the spaces between the strips;

forming a layer of a non-single crystalline silicon on the surface of the first masking layer in the remaining portions of the spaces between the strips with the surface of the non-single crystalline silicon layer being substantially planar with the surface of the oxide layer over each of the strips;

forming a second masking layer over each of the strips which extends over the portion of the oxide layer at one end of the strips leaving exposed the portion of the oxide layer at the other end of the strips;



etching away the exposed portions of the oxide layers at the other end of each strip to expose a portion of the first masking layer thereunder;

etching through the exposed portions of the first masking layer to the conductive material layer to form spaced grooves in the first masking layer which expose portions of the surface of the conductive layer; and then

using the spaced grooves as a guide, dividing the conductive material layer into spaced gate electrodes.

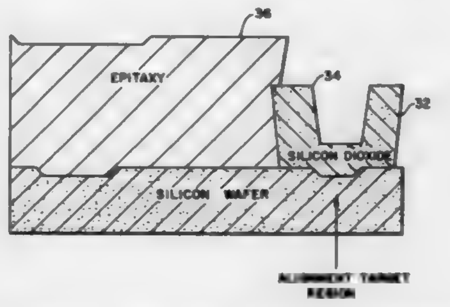
5,314,837
METHOD OF MAKING A REGISTRATION MARK ON A SEMICONDUCTOR

Herbert J. Barber, Winchendon, and Pamela A. Mayernik, Peabody, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Jun. 8, 1992, Ser. No. 894,265

Int. Cl.⁵ H01L *21/20*

U.S. Cl. 437—89 **12 Claims**



1. For making a registration mark on a semiconductive substrate to be used for alignment purposes during integrated-circuit processing of the substrate, the method comprising the steps of:

developing a distinctive characteristic defining a particular location on said substrate;

placing over said substrate at said location an epitaxial-resistant material serving to present an optically-recognizable mark representing said distinctive characteristic so as to identify said location; and

growing on said substrate an epitaxial layer the growth of which is prevented at said location by said epitaxial-resistant material.

5,314,838

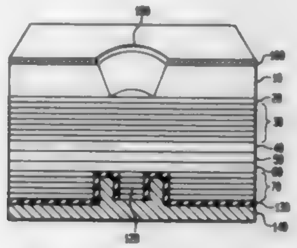
METHOD FOR MAKING A SEMICONDUCTOR LASER

Alfred Y. Cho, Summit; Sung-Nee G. Chu, Murray Hill; Kuochou Tai, North Plainfield, and Yeong-Her Wang, Scotch Plains, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 628,285, Dec. 14, 1990, abandoned. This application Sep. 10, 1992, Ser. No. 943,103

Int. Cl.^{5} H01L *21/20*

U.S. Cl. 437—105 **7 Claims**



1. A method for manufacturing a vertical cavity, surface-emitting laser (to be referred to as a VCSEL), the method comprising the steps of providing a gallium arsenide substrate having approximately a (100) growth surface, epitaxially growing a distributed Bragg reflector (to be referred to as a DBR) on the growth surface, and performing at least one additional step toward completion of the VCSEL, CHARACTERIZED IN THAT

the growth surface is tilted by at least 1°, and not more than about 7°, from the orientation of a (100) surface toward the orientation of a (111)A surface;

the DBR comprises at least ten layers of alternating composition;

the DBR layers of alternating composition comprise, in alternation, $Al_xGa_{1-x}As$ and $Al_yGa_{1-y}As$, wherein one of x and y is greater than 0.35, and the other of x and y is less than or equal to 0.35; and

during the step of epitaxially growing the DBR, the substrate temperature is less than 600° C.

5,314,839

SOLID STATE DEVICE FABRICATION METHOD INCLUDING A SURFACE TREATMENT STEP WITH A NEUTRAL PARTICLE BEAM WITH AN ENERGY BETWEEN 10EV AND 100EV

Tatsumi Mizutani, Tokyo; Takashi Yunogami, Fujimi; Kenetsu Yokokawa, Tokyo, and Nobuyoshi Kobayashi, Kawagoe, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 756,274

Claims priority, application Japan, Sep. 12, 1990, 2-239823

Int. Cl.^{5} H01L *21/26*

U.S. Cl. 437—173 **45 Claims**

1. A surface treatment method, comprising:

projecting a neutral particle beam having kinetic energy of at least 10 eV and no more than 100 eV onto the surface of an oxide or fluoride sufficiently to enhance at least one of surface layer density, surface layer refractive index, surface layer dielectric constant, and surface layer resistance to reduction.

5,314,840

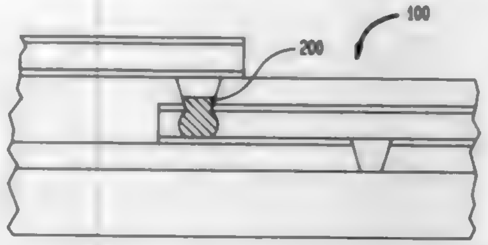
METHOD FOR FORMING AN ANTIFUSE ELEMENT WITH ELECTRICAL OR OPTICAL PROGRAMMING

Dominic J. Schepis; Kris V. Srikrishnan, bothof Wappingers Falls; Seshardi Subbanna, Hopewell Junction, and Manu J. Tijwani, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1992, Ser. No. 996,767

Int. Cl.^{5} H01L *21/44, 21/48*

U.S. Cl. 437—194 **10 Claims**



1. A method of fabricating a programmable connection including the steps of

depositing a body containing aluminum,

depositing a body of germanium adjacent said body of aluminum, and

selectively heating at least a portion of each of said bodies of germanium and aluminum to a temperature in excess of approximately 420° C. to cause diffusion of said portion of each of said bodies of germanium and aluminum.

5,314,841

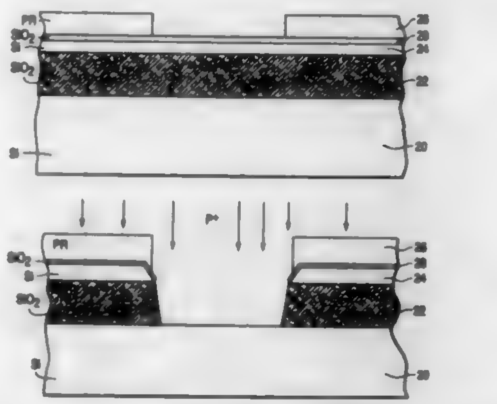
METHOD OF FORMING A FRONTSIDE CONTACT TO THE SILICON SUBSTRATE OF A SOI WAFER

Frederick T. Brady, Chantilly, and Nadim F. Haddad, Oakton, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1993, Ser. No. 54,992

Int. Cl.^{5} H01L *21/44*

U.S. Cl. 437—203 **5 Claims**



1. A method of fabricating a frontside contact to a silicon-on-insulator substrate, the substrate having a dopant type, comprising the steps of:

defining a trench region on the surface of the SOI substrate before normal semiconductor device processing;

etching the SOI layers down to the substrate;

removing any trench defining material and continuing with normal device processing;

opening the trench region during ion implantation of a dopant species of the same type as the substrate;

covering the trench region during ion implantation of a dopant species of a different type as the substrate; and

depositing metal in portions of the trench region during normal device processing to form an ohmic contact to the frontside of the SOI substrate.

5,314,842

RESIN-SEALED TYPE SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

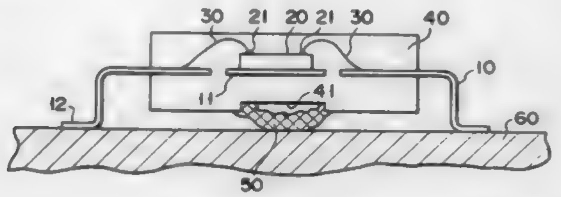
Hiromichi Sawaya, and Toshio Ishigami, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 406,065, Sep. 12, 1989, abandoned. This application Sep. 14, 1992, Ser. No. 944,366

Claims priority, application Japan, Sep. 30, 1988, 63-247191

Int. Cl.^{5} H01L *21/60*

U.S. Cl. 437—211 **4 Claims**



1. A method for manufacturing a resin-sealed type semiconductor device, comprising the steps of:

preparing a lead frame having a bed and external leads,

mounting a semiconductor element on the bed, said semiconductor element having at least one electrode;

electrically connecting the lead frame to the electrode by a fine metal wire;

fixedly sealing said semiconductor element, said fine metal wire and a portion of said lead frame with a resin layer formed in a mold; and

forming a recess having a controlled depth of about 60 μm or less in the resin layer by knocking the resin layer out of the mold with an ejector pin, the controlled depth being sufficiently shallow to substantially prevent cracks from occurring in the bottom of the recess during a subsequent soldering process.

5,314,843

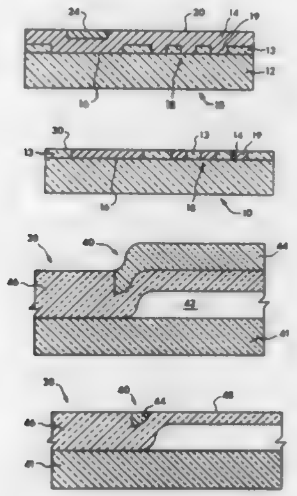
INTEGRATED CIRCUIT POLISHING METHOD

Chris C. Yu; Gurtej S. Sandhu, and Trung T. Doan, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Mar. 27, 1992, Ser. No. 858,670

Int. Cl.^{5} H01L *21/302*

U.S. Cl. 437—225 **23 Claims**



1. A method of fabrication of an integrated circuit, said method comprising the steps of:

providing a semiconductor wafer having a surface layer of a material to be planarized in a chemical mechanical polishing process;

masking said surface layer to define first and second laterally adjacent portions of said surface layer;

altering only said first portion of said surface layer of material to polish at a different removal rate in the chemical mechanical polishing process than said second portion of said surface layer; and

polishing said surface layer in said chemical mechanical polishing process.

5,314,844

METHOD FOR DICING A SEMICONDUCTOR WAFER

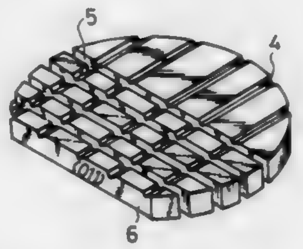
Souichi Imamura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 4, 1992, Ser. No. 845,945

Claims priority, application Japan, Mar. 4, 1991, 3-062550

Int. Cl.^{5} H01L *21/302, 21/304*

U.S. Cl. 437—226 **9 Claims**



1. A method for dicing a wafer of III–V compound semiconductor material, the method comprising the steps of:

forming a scribe line on a surface of the wafer orthogonal to a crystal plane (011) by means of a scribing method;

forming a groove in the semiconductor wafer in parallel to the crystal plane (011) by means of a grinding-cutting method; and

breaking the semiconductor wafer along the scribe line and the groove.

5,314,845

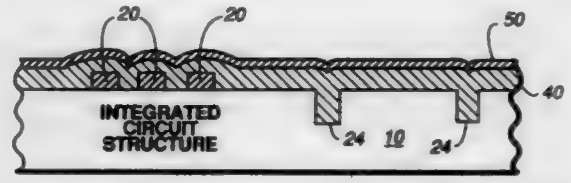
TWO STEP PROCESS FOR FORMING VOID-FREE OXIDE LAYER OVER STEPPED SURFACE OF SEMICONDUCTOR WAFER

Peter W. Lee, Fremont; David N. Wang, Saratoga, both of Calif.; Makoto Nagashima, Machida, Japan; Kazuto Fukuma, Ibaraki, Japan, and Tatsuya Sato, Narita, Japan, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 413,800, Sep. 28, 1989, abandoned. This application Feb. 2, 1990, Ser. No. 474,177

Int. Cl.^{5} H01L *21/00, 21/02, 21/302, 21/463*

U.S. Cl. 437—238 **24 Claims**



1. A two step process for forming a silicon oxide layer over a stepped surface of a semiconductor wafer while inhibiting the formation of voids in the oxide layer which comprises:

a) depositing a void-free first layer of an oxide of silicon over said stepped surface of said semiconductor wafer in a CVD chamber by flowing into said chamber a gaseous mixture comprising a source of oxygen and tetraethylorthosilicate as the gaseous source of silicon, while maintaining the pressure in said CVD chamber within a range of from about 250 Torr to about 760 Torr to form said void-free oxide layer; and

b) depositing a second layer of oxide over said void-free first oxide layer in said CVD chamber by flowing into said chamber a gaseous mixture comprising a source of oxygen and tetraethylorthosilicate as the gaseous source of silicone, while maintaining said CVD chamber at a pressure within a range of from about 40 Torr to below about 250 Torr.

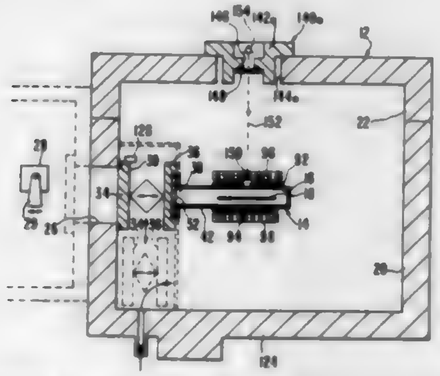
5,314,846
METHOD FOR PROCESSING A SEMICONDUCTOR WAFER

Charles Boitnott, Half Moon Bay, Calif., assignor to Atomel Products Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 616,465, Nov. 21, 1990, abandoned, which is a division of Ser. No. 311,686, Feb. 15, 1989, Pat. No. 5,167,717. This application Sep. 11, 1992, Ser. No. 943,996

Int. Cl.^{5} H01L *21/283*

U.S. Cl. 437—238 **9 Claims**



1. A method for processing a semiconductor wafer comprising:

providing a first space surrounding a second space with the spaces having respective first and second tubular exhaust zones in fluid communication with each other, said first exhaust zone surrounding the second exhaust zone;

inserting a semiconductor wafer in the second space;

closing the spaces to the atmosphere;

filling the first space with an inert gas under pressure;

filling the second space with an oxidant under pressure from a source outside of the second space;

heating the oxidant to a processing temperature;

cooling the wafer in the second space after the wafer has been processed; and

substantially equilibrating the pressures in the first and second spaces, said equilibrating step including sensing the temperature of the oxidant at the outer end of the second exhaust zone.

5,314,847
SEMICONDUCTOR SUBSTRATE SURFACE PROCESSING METHOD USING COMBUSTION FLAME

Tohru Watanabe, and Katsuya Okumura, both of Yokohama, Japan, assigners to Kabushiki Kaisha Toshiba, Kawasaki, Japan

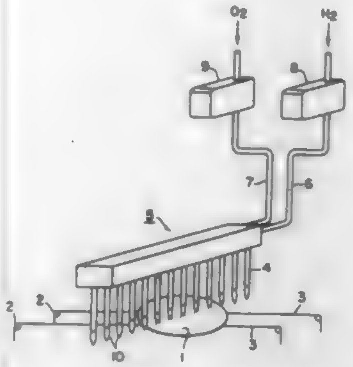
PCT No. PCT/JP91/00215, § 371 Date Oct. 18, 1991, § 102(e) Date Oct. 18, 1991, PCT Pub. No. WO91/13461, PCT Pub. Date Sep. 5, 1991

PCT Filed Feb. 20, 1991, Ser. No. 768,611

Claims priority, application Japan, Feb. 20, 1990, 2-38577; Feb. 19, 1991, 3-24850

Int. Cl.^{5} H01L *21/02*

U.S. Cl. 437—239 **12 Claims**



1. A semiconductor substrate surface processing method characterized in that a combustion flame formed of a gas that is a mixture of hydrogen and oxygen is applied to a semiconductor substrate surface, and that only said substrate surface is heated thereby.

5,314,848
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE USING A HEAT TREATMENT ACCORDING TO A TEMPERATURE PROFILE THAT PREVENTS GRAIN OR PARTICLE PRECIPITATION DURING REFLOW

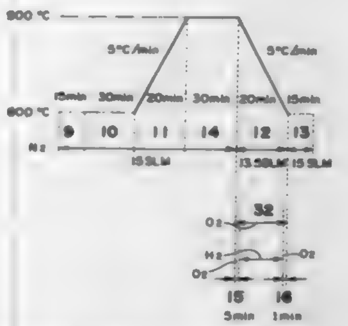
Takatoshi Yasui; Chiaki Kudo; Ichiro Nakao; Toyokazu Fujii; Yuka Terai; Shinichi Imai, all of Osaka; Hiroshi Yamamoto, Chiba, and Yasushi Naito, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 24, 1991, Ser. No. 764,846

Claims priority, application Japan, Sep. 25, 1990, 2-255827; Sep. 25, 1990, 2-255828

Int. Cl.^{5} H01L *21/00, 21/02, 21/324, 21/477*

U.S. Cl. 437—248 **11 Claims**



1. A manufacturing method for semiconductor devices comprising the steps of: (a) charging a plurality of semiconductor substrates into a heat treatment furnace, said semiconductor substrates being arranged on a jig for conveying them at a pitch; and (b) subjecting said plurality of semiconductor substrates to a heat treatment according to a temperature profile, thereby flattening the surface of said semiconductor substrates by reflowing an insulating film containing impurities formed thereon, at least a part of said heat treatment using an atmosphere including at least one compound selected from a group consisting of water vapor and halogen compounds.

5,314,849
Patent Not Issued For This Number

5,314,850
ALUMINUM NITRIDE SINTERED BODY AND PRODUCTION THEREOF

Kenichiro Miyahara, Kokubu, Japan, assignor to Kyocera Corporation, Kyoto, Japan

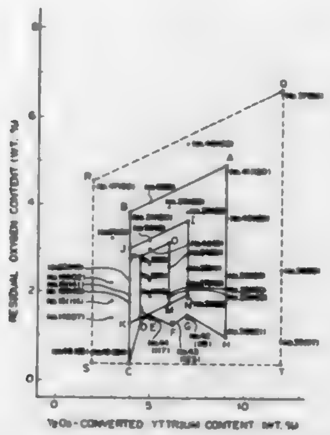
Continuation of Ser. No. 924,916, Oct. 29, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 222,381

Claims priority, application Japan, Oct. 31, 1985, 60-244647; Nov. 25, 1985, 60-265692; Jan. 31, 1986, 61-020721; Apr. 18, 1986, 61-088265; Aug. 26, 1986, 61-200803

The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.^{5} C04B *35/58*

U.S. Cl. 501—96 **48 Claims**



1. An aluminum nitride sintered body produced by baking an aluminum nitride starting powder with a sintering additive selected from compounds of Group IIa, IIIa, and IIIb metals of the periodic table, said aluminum nitride starting powder being derived by direct nitriding of metallic aluminum and having an oxygen content of not greater than 1.8% by weight and a Si content of not greater than 0.2% by weight, and said aluminum nitride sintered body having a thermal conductivity of at least 100 W/mK and a relative density of at least 95%.

5,314,851
REACTIVATION OF SOLID OXIDATION CATALYSTS

Francis Huba, 5521 80th St. N. #312, St. Petersburg, Fla. 33709

Continuation-in-part of Ser. No. 972,859, Nov. 6, 1992, abandoned. This application Jun. 21, 1993, Ser. No. 78,359

Int. Cl.^{5} B01J *38/48, 38/52, 38/12;* **F01N** *3/10*

U.S. Cl. 502—22 **13 Claims**

1. A process for regenerating the activity of an oxidation catalyst used for reducing the content of undesired pollutants in the exhaust from an internal combustion engine in which oxidation catalyst activity has been reduced by use, said process comprising the steps of (a) maintaining the oxidation catalyst at a temperature encountered when said engine is operated, (b) passing into intimate contact with said oxidation catalyst a solution of a peroxide which decomposes at the temperature at which said oxidation catalyst is maintained, the temperature at which said oxidation catalyst is maintained being in the range of 100° C. to 1200° C., the solvent in which said peroxide is dissolved in said solution being selected from the class consisting of water, a mixture of water and ethanol, and a mixture of water and isopropanol, each said mixture containing at least 50 percent by weight of water, the concentration of said peroxide in said solution being in the range of 1 percent by weight to 18 percent by weight, and the proportion of volume of peroxide solution to volume of catalyst being in the range of 0.5 volume to one volume of said solution per volume of said catalyst, and (c) terminating said passing of said solution of peroxide after said catalyst has been sufficiently regenerated.

5,314,852
CHEMICALLY IMPREGNATED ZEOLITE AND METHOD FOR CHEMICALLY IMPREGNATING AND COATING ZEOLITE

Fred Klatte, Two Spruce St., San Francisco, Calif. 94118

Continuation-in-part of Ser. No. 975,680, Nov. 13, 1992, Pat. No. 5,278,112. This application Jan. 5, 1993, Ser. No. 750

Int. Cl.^{5} B01J *20/18, 29/06;* **A23K** *1/16, 1/22*

U.S. Cl. 502—60 **56 Claims**

13. A method for producing a treated zeolite product, including the steps of:

(a) producing impregnated zeolite crystals by impregnating zeolite crystals with an aqueous solution of one or more water soluble vitamins; and

(b) after step (a), producing coated, impregnated zeolite crystals by coating the impregnated zeolite crystals with a quaternary ammonium cation.

14. A treated zeolite product produced by performing the method of claim 13.

5,314,853
HIGH TEMPERATURE SORBENTS FOR OXYGEN

Pramod K. Sharma, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 16, 1992, Ser. No. 991,003

Int. Cl.^{5} B01J *29/06, 37/30*

U.S. Cl. 502—66 **9 Claims**

1. A regenerable sorbent for the removal of trace amounts of oxygen from a gas comprising;

a porous alumino-silicate zeolite support in which the atomic ratio of Si to Al is no more than 2.6/1;

from 1 to 10% by weight of a transition metal ion selected from cobalt or copper exchanged with the support; and

0.05 to 1.0% by weight of a platinum group metal deposited on the support as an activator.

5,314,854
STABLE, HIGH-YIELD REFORMING CATALYST

Leonid B. Galperin, Chicago, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 12, 1992, Ser. No. 974,544

Int. Cl.^{5} B01J *29/10, 29/32*

U.S. Cl. 502—66 **7 Claims**

7. A bed of catalyst particles for the conversion of hydrocarbons comprising:

(a) a uniformly dispersed platinum component and a surface-layer palladium component;

(b) a nonacidic L-zeolite; and,

(c) a silica binder.

5,314,855
ADSORBENT COMPOSITIONS AND METHODS OF MANUFACTURE

Thurman C. Thorpe, Durham, and John F. Weaver, Raleigh, both of N.C., assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 9, 1992, Ser. No. 973,862

Int. Cl.^{5} B01J *21/16*

U.S. Cl. 502—80 **5 Claims**

1. An adsorbent composition comprising a adsorbents activated carbon bound to fuller's earth with from about 20% to about 80% of activated carbon and about 20% to about 80% fuller's earth, said activated carbon and fuller's earth being bound together electrostatically using a mixture of resin comprising about 0.1% to about 0.7% powdered anion exchange resin, about 0.3% to about 1.3% cationic polyelectrolyte and about 0.01% to about 0.12% anionic polyelectrolyte, wherein all proportions are given as weight percents of the total composition.

5,314,856

PREPARATION OF ALTERNATING OLEFIN/CARBON MONOXIDE COPOLYMERS BY MEANS OF A HETEROGENEOUS SUPPORTED CATALYST

Anna Sommazzi, S. Margherita; Gabriele Lugli, San Donato Milanese; Fabio Garbassi, Novara; Fausto Calderazzo, Ghezzano, and Daniela B. Dell'Amico, Pisa, all of Italy, assignors to Enichem S.p.A., Milan, Italy

Filed Mar. 4, 1993, Ser. No. 26,022

Claims priority, application Italy, Mar. 5, 1992, MI92 A 000484

Int. Cl.⁵ B01J *31/00*

U.S. Cl. 502—167 **14 Claims**

1. Heterogeneous catalytic system active in the preparation of alternating copolymers of olefins with carbon monoxide (CO), constituted by:

(a) the solid compound produced from the interaction of

$Pd(O_2CNEt_2)_2(NHet_2)_2$

with a solid carrier,

(b) a mono- or bidentate ligand containing one or two nitrogen or phosphorous atoms, capable of binding to Pd atoms through dative bonds, wherein said monodentate ligand is an aliphatic, cycloaliphatic, or aromatic monophosphine, or an aliphatic or aromatic amine, and wherein said bidentate ligand forms a complex with Pd through both of its heteroatoms,

(c) a mineral or organic acid having a pKa less than 5.

5,314,857

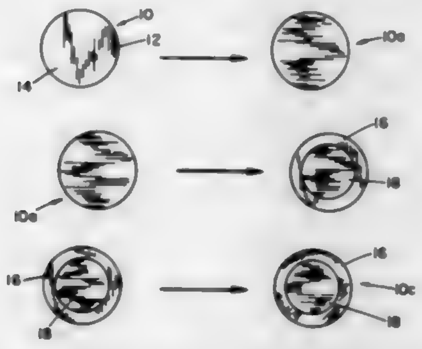
MICROPOROUS STRUCTURE WITH LAYERED INTERSTITIAL SURFACE TREATMENT, AND METHOD AND APPARATUS FOR PREPARATION THEREOF

Steven L. Koontz, League City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 894,505, Jun. 2, 1992, Pat. No. 5,215,790, which is a division of Ser. No. 429,739, Oct. 31, 1989, Pat. No. 5,141,806. This application Dec. 22, 1992, Ser. No. 995,612

Int. Cl.⁵ B01J *29/00*

U.S. Cl. 502—258 **4 Claims**



1. A method of activating an aerogel catalyst, comprising:

exposing an aerogel catalyst comprising a porous refractory metal oxide selected from the group consisting of silica and alumina having a transition metal oxide supported thereon, said transition metal oxide selected from the group consisting of an oxide of iron, cobalt, and nickel to an oxidizing gas containing atomic oxygen or hydroxy radicals at a temperature below about 100° C.; and

recovering an aerogel catalyst activated by said exposure.

5,314,858

VINYL ACETATE CATALYST PREPARATION METHOD

Philip M. Colling, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 14, 1992, Ser. No. 961,739

Int. Cl.⁵ B01J *37/03, 23/44, 23/52*

U.S. Cl. 502—330 **12 Claims**

1. In a method of preparing a catalyst composed of a porous support containing thereon precious metals comprising; impregnating said support with water soluble compounds of said precious metals, converting said water soluble precious metal compounds to water insoluble precious metal compounds by contacting said impregnated support with a water soluble compound to precipitate an insoluble precious metal compound on said support, and reducing said water insoluble precious metal compounds with a reducing gas to form free precious metals on said support, the improvement which comprises converting the precious metal to an insoluble precious metal compound in two steps, a first fixing stage with a solution containing a compound reactive with said water soluble precious metal compounds to precipitate on said support said water insoluble precious metal compounds, then contacting said supports with additional solution containing a compound reactive with said water soluble compounds in a second fixing stage to further precipitate on said support said water insoluble precious metal compounds.

5,314,859

THERMOSENSITIVE RECORDING MATERIAL

Yoshiyuki Takahashi, Kawasaki; Makoto Nishioka, Tokyo; Kunitaka Toyofuku, Chiba, and Kyoko Uchida, Machida, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1992, Ser. No. 976,515

Claims priority, application Japan, Nov. 15, 1991, 3-300491; Dec. 25, 1991, 3-342814; Dec. 25, 1991, 3-342837; May 27, 1992, 4-135117

The portion of the term of this patent subsequent to Oct. 26, 2010, has been disclaimed.

Int. Cl.⁵ B41M *5/30*

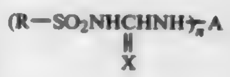
U.S. Cl. 503—207 **19 Claims**

1. A thermosensitive recording material comprising:

a sheet substrate and

a thermosensitive colored image-forming layer formed on a surface of the sheet substrate and comprising a substantially colorless dye precursor, a color developing agent reactive with the dye precursor upon heating to thereby develop a color, and a binder,

said color developing agent comprising at least one compound of the formula (I):


(I)

$$\left(\mathrm{R{-}SO_2NH}\underset{\underset{\mathrm{X}}{\|}}{\mathrm{C}}\mathrm{HNH}\right)_n\mathrm{A}\qquad\mathrm{(I)}$$

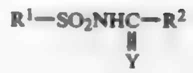
wherein X represents a member selected from the group consisting of oxygen and sulfur atoms, R represents a member selected from the group consisting of unsubstituted aromatic hydrocarbon groups and substituted aromatic hydrocarbon groups having at least one susbstituent selected from the group consisting of lower alkyl groups and halogen atoms; A represents a multivalent group, and n represents an integer of 2 or more, and

said thermosensitive colored image-forming layer further comprising an additive comprising at least one member selected from the group consisting of:

(1) aromatic epoxy compounds having at least one epoxy group per molecule thereof,

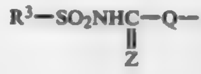
(2) aromatic aziridine compounds having at least one aziridinyl group per molecule thereof,

(3) aromatic compounds of the formulae (II), (III) and (IV):


(II)

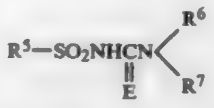
$$\mathrm{R^1{-}SO_2NH}\underset{\underset{\mathrm{Y}}{\|}}{\mathrm{C}}\mathrm{{-}R^2}\qquad\mathrm{(II)}$$

wherein Y represents a member selected from the group consisting of oxygen and sulfur atoms, R^1 represents a member selected from the group consisting of unsubstituted aromatic ring groups, and substituted benzene ring groups having at least one substituent selected from the group consisting of lower alkyl groups and halogen atoms, and R^2 represents a member selected from the group consisting of alkyl grcups, aralkyl groups, unsubstituted aromatic ring groups, and substituted aromatic ring groups having at least one substituent selected from the groups consisting of alkyl; groups, aryl groups, aralkyl groups and halogen atoms,


(III)

$$\mathrm{R^3{-}SO_2NH}\underset{\underset{\mathrm{Z}}{\|}}{\mathrm{C}}\mathrm{{-}Q{-}R^4}\qquad\mathrm{(III)}$$

wherein Z and Q respectively and independently from each other represent a member selected from the group consisting of oxygen and sulfur atoms; R^3 represents a member selected from the group consisting of unsubstituted benzene ring groups, unsubstituted aromatic ring groups and substituted benzene ring groups having at least one substituent selected from the group consisting of lower alkyl groups, aryl groups and halogen atoms, and R^4 represents a member selected from the group consisting of (i) aralky groups, (ii) alkyl groups substituted with an aryloxy group, (iii) substituted benzene ring groups, (iv) substituted polynuclear aromatic ring groups, (v) unsubstituted benzene ring groups and (vi) unsubstituted polynuclear aromatic ring groups, wherein each or the substituted benzene ring groups (iii) and the substituted polynuclear aromatic ring groups (iv) has at least one substituent selected from the group consisting of alkyl, alkenyl, aryl, aralkyl, alkyloxy, aryloxy, aralkyloxy, alkylmercapto, arylmercapto, aralkylmercapto, alkyloxycarbonyl, aryloxycarbonyl, aralkyloxycarbonyl groups and halogen atoms, and


(IV)

$$\mathrm{R^5{-}SO_2NH}\underset{\underset{\mathrm{E}}{\|}}{\mathrm{C}}\mathrm{N}\begin{array}{l}\diagup\mathrm{R^6}\\ \diagdown\mathrm{R^7}\end{array}\qquad\mathrm{(IV)}$$

wherein E represents a member selected from the group consisting of oxygen and sulfur atoms; R^5 represents a member selected from the group consisting of unsubstituted aromatic ring groups, and substituted benzene ring groups having at least one substituent selected from the group consisting of lower alkyl groups and halogen atoms, and R^6 and R^7 respectively and independently from each other represents a member selected from the group consisting of a hydrogen atom, unsubstituted alkyl groups, aralkyl groups, alkyl groups substituted with an aryloxy group, unsubstituted aromatic ring groups, and unsubstituted aromatic ring groups having at least one substituent selected from the group consisting of alkyl, aryl, aralkyl, alkyloxy, alkyloxycarbonyl, aryloxycarbonyl, aralkyloxycarbonyl, arylsulfonyl and halogen,

(4) aromatic sulfonyl compounds different from the compounds of the formulae (I), (II), (III) and (IV), provided with at least one sulfonyl group per molecule thereof and having a melting point of from 60° C. to 160° C., and

(5) basic white pigments.

5,314,860

METHOD OF STABILIZING A MATERIAL FOR USE IN A THERMAL DYE TRANSFER IMAGING PROCESS

Luc J. Vanmaele, Lochristi, and Wilhelmus Janssens, Aarschot, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jan. 16, 1992, Ser. No. 821,564

Claims priority, application European Pat. Off., Feb. 4, 1991, 90200218.5

Int. Cl.⁵ B41M *5/035, 5/38*

U.S. Cl. 503—227 **21 Claims**

1. Method of stabilizing a material for use in a thermal dye transfer diffusion process, by incorporating a compound satisfying the formula A-X wherein A stands for acyl, and X stands for the conjugated base of an acid with a pKa≦14, in a dye layer of a dye-donor element and/or in a receiving layer of a receiving element for use in carrying out said process.

5,314,861

SUBLIMATION TYPE THERMAL IMAGE TRANSFER IMAGE RECEIVING MEDIUM

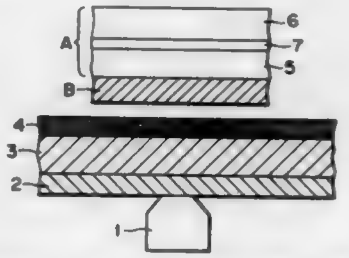
Naoya Morohoshi; Hiroyuki Uemura, both of Numazu, and Chiharu Nogawa, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 9, 1992, Ser. No. 958,762

Claims priority, application Japan, Oct. 9, 1991, 3-262000; Oct. 11, 1991, 3-292215; Nov. 28, 1991, 3-314535; Dec. 19, 1991, 3-355101; Jul. 16, 1992, 4-212096

Int. Cl.⁵ B41M *5/035, 5/38*

U.S. Cl. 503—227 **22 Claims**



1. A sublimation thermal image transfer image receiving medium, comprising a substrate and a dye receiving layer formed thereon, said substrate comprising a first laminated sheet on which said dye receiving layer is provided and a second laminated sheet, with an elastic adhesive layer or a plastic adhesive layer interposed between said first laminated sheet and said second laminated sheet,

and wherein said first laminated sheet on which said dye receiving layer is provided is a void-containing film, which is an air-bubble containing film, wherein a density, D_2, of said air-bubble-containing film and a density, D_1, of an air-bubble free film made of the same material as that of said air-bubble-containing film have the relationship of:

$$\frac{D_1 - D_2}{D_2} > 0.30$$

5,314,862

THERMAL TRANSFER RECORDING SHEET

Takao Hirota, Machida; Hideo Shinohara, and Katsuhiko Kuroda, both of Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Nov. 12, 1992, Ser. No. 974,896

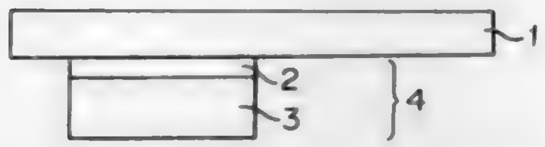
Claims priority, application Japan, Nov. 15, 1991, 3-300753

Int. Cl.⁵ B41M *5/035, 5/38*

U.S. Cl. 503—227 **11 Claims**

1. A thermal transfer recording sheet comprising a substrate and an image-receiving layer formed thereon, which is thermally transferable onto a record sheet, wherein the image-

receiving layer comprises a transparent receptive layer and a white opacifying layer laminated in this order on the substrate,



said opacifying layer comprising one part by weight of a white pigment, from 0.1 to 20 parts by weight of a binder resin and from 0.01 to 10 parts by weight of a plasticizer.

5,314,863

ISOXAZOLINES, THEIR PREPARATION, AND THEIR USE AS PLANT-PROTECTING AGENTS

Heinz J. Löber, Hofheim am Taunus; Wilfried Schwab, Wiesbaden; Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein/-Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP90/01966, § 371 Date Jun. 25, 1992, § 102(e) Date Jun. 25, 1992, PCT Pub. No. WO91/08202, PCT Pub. Date Jun. 13, 1991

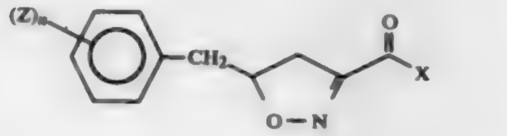
PCT Filed Nov. 17, 1990, Ser. No. 856,204

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939010

Int. Cl.^{5} A01N *43/40, 43/80;* C07D *413/06, 263/08*

U.S. Cl. 504—100 **11 Claims**

1. A compound of the formula (I) or a salt thereof



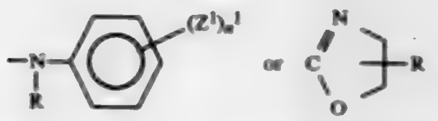
(I)

where

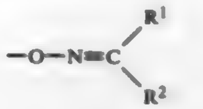
the Z radicals independently of one another are halogen, nitro, cyano, or alkyl, alkoxy, alkylthio or cycloalkyl, the four last-mentioned radicals being unsubstituted or monosubstituted or polysubstituted by alkoxy, hydroxyl or halogen, or furthermore are amino, mono- or dialkylamino, phenyl or phenoxy, phenyl and phenoxy independently of one another being unsubstituted or monosubstituted or polysubstituted by halogen or halogenoalkyl, or two adjacent substituents Z together are a divalent group of the formula —OCH$_2$O—, —S—CH$_2$—O— or —S—CH$_2$—S—, which group is unsubstituted or substituted by alkyl,

n is an integer from 0 to 5,

X is hydroxyl or alkoxy, alkenyloxy, alkynyloxy, alkylthio or cycloalkoxy, the five last-mentioned radicals being unsubstituted or monosubstituted or polysubstituted by radicals from the group comprising alkoxy, alkylthio, mono- and dialkylamino, phenyl, cyano and halogen, or is furthermore phenoxy, or is furthermore trialkylsilylmethoxy, a radical of the formula

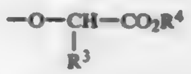


where R in each case is hydrogen or alkyl, Z^1 independently of Z has the meanings mentioned above in the case of Z, and n^1 is an integer from 0 to 5, or is furthermore amino, mono- or dialkylamino, cycloalkylamino, hydrazino, alkyl- or dialkylhydrazino, pyridino, morpholino, dimethylmorpholino, a radical of the formula



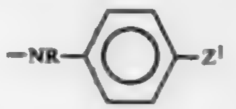
$$-O-N=C\begin{matrix}R^1\\R^2\end{matrix}$$

where R^1 and R^2 independently of one another are alkyl radicals or R^1 and R^2 together with the carbon tom linking them form a cycloalkyl radical, or is furthermore a radical of the formula



$$-O-\underset{\displaystyle R^3}{\underset{|}{CH}}-CO_2R^4$$

where R^3 and R^4 independently of one another are hydrogen or alkyl, with the exception of a compound of formula (I) in which n is zero and X is a radical of the formula



in which R is hydrogen, and Z^1 is hydrogen or chlorine.

5,314,864

N-AMINOURACIL DERIVATIVES, AND THEIR PRODUCTION AND USE

Masayuki Enomoto, Nishinomiya; Eiki Nagano, Itami; Ryo Sato, and Masaharu Sakaki, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

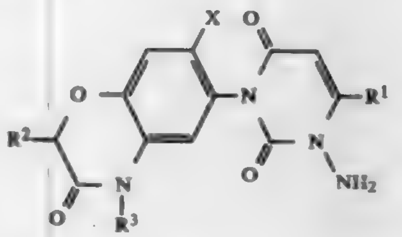
Continuation of Ser. No. 742,021, Aug. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 586,229, Sep. 21, 1990, abandoned. This application Sep. 21, 1992, Ser. No. 947,978

Claims priority, application Japan, Sep. 26, 1989, 1-250320; May 24, 1990, 2-136496

Int. Cl.^{5} C07D *498/00;* A01N *43/84*

U.S. Cl. 504—225 **18 Claims**

1. A compound of the formula:



wherein R^1 is a trifluoromethyl group or a pentafluoroethyl group, R^2 is a hydrogen atom or a methyl group, R^3 is a C$_1$–C$_7$ alkyl group, a C$_3$–C$_7$ alkenyl group, or a C$_3$–C$_7$ alkynyl group, and X is a hydrogen atom or a fluorine atom.

5,314,865

CERTAIN ALKYLIDINE AMINOOXYAMIDE COMPOUNDS USEFUL AS HERBICIDES

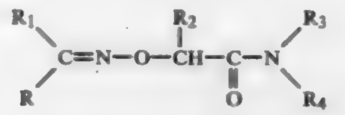
Francis H. Walker, Mill Valley, and Don R. Baker, Orinda, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 632,890, Dec. 24, 1990, abandoned, which is a division of Ser. No. 287,979, Dec. 21, 1988, Pat. No. 5,002,605. This application Apr. 10, 1992, Ser. No. 866,912

Int. Cl.^{5} A01N *43/40;* C07D *213/75*

U.S. Cl. 504—244 **15 Claims**

1. A compound having the formula



$$\begin{matrix}R_1\\R\end{matrix}C=N-O-\overset{\displaystyle R_2}{\overset{|}{CH}}-\underset{\displaystyle O}{\underset{\|}{C}}-N\begin{matrix}R_3\\R_4\end{matrix}$$

wherein:

R is phenyl or phenyl substituted with one or more C$_1$–C$_6$ alkyl, C$_1$–C$_4$ alkoxy, halo, C$_1$–C$_6$ haloalkyl, cyano, nitro or C$_1$–C$_6$ alkylsulfonyl;

R$_1$ is hydrogen or C$_1$–C$_6$ alkyl;

R$_2$ is hydrogen, C$_1$–C$_6$ alkyl, C$_3$–C$_6$ cycloalkyl or lower alkylalkoxy; and

one of R$_3$ and R$_4$ is pyridyl or pyridyl substituted with one or more halogen or C$_1$–C$_6$ alkyl; and the other is hydrogen, C$_1$–C$_6$ alkyl, C$_2$–C$_6$ alkenyl or C$_2$–C$_6$ alkynyl.

5,314,866

FORMATION OF SUPERCONDUCTING BI-SR-CA-CU-O FILMS BY ORGANOMETALLIC CHEMICAL VAPOR DEPOSITION

Alan D. Berry, Springfield; David K. Gaskill; Ronald T. Holm, both of Alexandria; Edward J. Cukauskas, Vienna; Raphael Kaplan, Arlington, all of Va., and Richard L. Henry, Fort Washington, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1989, Ser. No. 352,325

Int. Cl.^{5} C23C *16/00;* B05D *5/12*

U.S. Cl. 505—447 **2 Claims**

1. A method of coating at least one film of a superconductor composition on a substrate comprising the steps of:

(a) providing triphenylbismuth, strontium 2,2,6,6-tetramethyl-3,5-heptanedionate, calcium 2,2,6,6-tetramethyl-3,5-heptanedionate and copper acetylacetonate as organometallic precursors;

(b) flowing a carrier gas free of hydrolyzing agents over said organometallic precursors at a rate sufficient to take up an amount of said organometallic precursors;

(c) transporting said organometallic precursors under conditions free of hydrolyzing agents to a deposition chamber;

(d) mixing oxygen and said organometallic precursors in the deposition chamber to decompose said organometallic precursors and deposit mixed oxides on said substrate

(e) sintering the mixed oxides at a temperature between about 500° C. and 900° C. to form a coated substrate;

(f) cooling the coated substrate to ambient temperature to produce said substrate coated with at least one said film of said superconductor composition.

5,314,867

PROCESS FOR MAKING TL-BA-CA-CU-O SUPERCONDUCTORS USING THALLIUM VAPOR

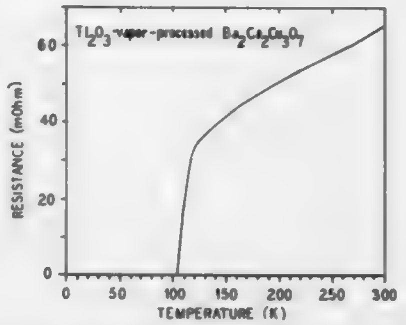
Allen M. Hermann, and Zhengzhi Sheng, both of Fayetteville, Ark., assignors to University of Arkansas, Little Rock, Ark.

Division of Ser. No. 236,507, Aug. 25, 1988, Pat. No. 5,082,825. This application Jul. 25, 1991, Ser. No. 735,850

The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.

Int. Cl.^{5} C01F *11/02;* C01G *3/02, 15/00*

U.S. Cl. 505—430 **6 Claims**



1. A method for making high temperature superconductors, comprising the steps of:

a. preparing Ba—Ca—Cu-oxides; and thereafter

b. reacting Tl$_2$O$_3$ vapor and solid Ba—Ca—Cu-oxides to form Tl—Ba—Ca—Cu—O superconductors.

5,314,868

BEARING DEVICE

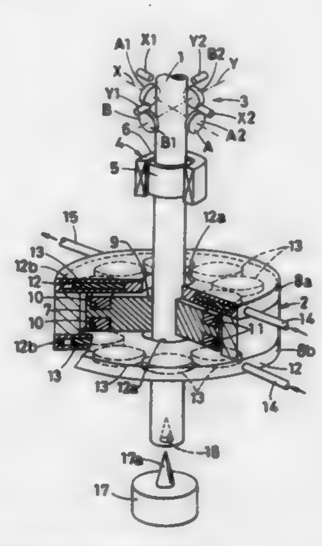
Ryoichi Takahata, Yamatotakada, and Hirochika Ueyama, Hirakata, both of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Aug. 6, 1992, Ser. No. 924,873

Claims priority, application Japan, Aug. 6, 1991, 3-196548; Jul. 15, 1992, 4-187928

Int. Cl.^{5} H01B *12/00*

U.S. Cl. 505—166 **15 Claims**



1. A bearing device comprising:

a rotary body in the form of a shaft,

a superconducting bearing assembly for supporting the rotary body in axial and radial directions relative to a fixed portion without contacting the rotary body, the superconducting bearing assembly including an annular permanent magnet portion fixedly mounted on the rotary body concentrically therewith and an annular superconductor portion disposed adjacently facing the permanent magnet portion,

magnetic bearing means for supporting the rotary body for rotation about an axis of rotation relative to the fixed portion without contacting the rotary body, the magnetic bearing means being positioned axially away from the superconducting bearing assembly and including electromagnets for controlling positioning of the rotary body with respect to two radial directions orthogonal to each other, and

a control unit for selectively energizing the electromagnets of the magnetic bearing means in response to resonation of the rotary body,

whereby the electromagnets are driven only when the rotary body resonates.

5,314,869

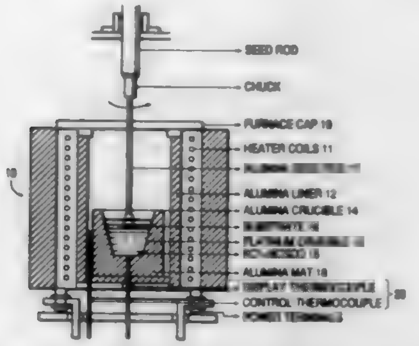
METHOD FOR FORMING SINGLE PHASE, SINGLE CRYSTALLINE 2122 BCSCO SUPERCONDUCTOR THIN FILMS BY LIQUID PHASE EPITAXY

Raghvendra K. Pandey; Kanwal Raina, and Narayanan Solayappan, all of College Station, Tex., assignors to The Texas A & M University System, College Station, Tex.

Filed Sep. 16, 1992, Ser. No. 945,504

Int. Cl.^{5} C30B *19/02*

U.S. Cl. 505—452 **13 Claims**



1. A method for growing a substantially single phase, single crystalline highly epitaxial film of the 80 K BiCaSrCu-oxide superconductor phase on a single crystal lattice-matched substrate with no intergrowth comprising the steps of:

(a) forming a dilute supercooled molten solution of a single phase superconducting mixture of oxides of Bi, Ca, Sr, and Cu having an atomic ratio of about 2:1:2:2 in nonreactive flux;

(b) introducing said substrate into said molten solution at a temperature of about 850° C.;

(c) slowly cooling said molten solution from about 850° C. to about 830° C. to cause the growth on said substrate of said single phase, single crystalline, highly epitaxial film of the 80 K BiCaSrCu-oxide superconductor phase; and

(d) rapidly cooling the film-coated substrate to a room temperature at a rate sufficient to maintain the single phase, single crystalline structure of the superconducting film.

5,314,870

PREPARING THIN FILM OF OXIDE SUPERCONDUCTOR

Takashi Matsuura; Kenjiro Higaki, and Hideo Itozaki, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 720,161, Jun. 27, 1991, abandoned. This application Oct. 19, 1992, Ser. No. 963,261

Claims priority, application Japan, Jun. 28, 1990, 2-170993

Int. Cl.^{5} B05D *5/12;* **C23C** *14/34*

U.S. Cl. 505—476 **8 Claims**

1. A process for preparing a film of oxide superconductor on a single crystal substrate of semiconductor, which comprises depositing firstly by RF sputtering an under-layer of a superconducting oxide material having a thickness of 50 to 200 Å on said single crystal substrate of semiconductor at a substrate temperature between 300° and 500° C., and depositing secondly by RF sputtering an upper-layer of a superconducting oxide material on said under-layer at a substrate temperature of higher than 600° C., said upper-layer of superconducting oxide material having a thickness which is more than 500 Å thicker than said under-layer wherein both said under-layer and said upper-layer are deposited in a same vacuum chamber.

5,314,871

SUBSTRATE OF SINGLE CRYSTAL OF OXIDE, DEVICE USING SAID SUBSTRATE AND METHOD OF PRODUCING SAID SUPERCONDUCTIVE DEVICE

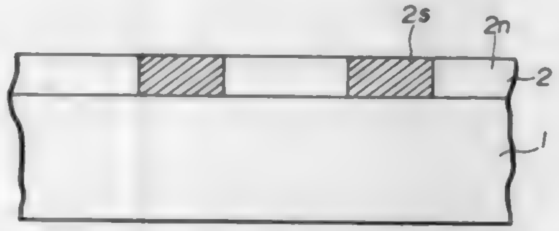
Kozo Nakamura, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Hiratsuka, Japan

Division of Ser. No. 689,947, Jul. 24, 1991, Pat. No. 5,240,902. This application May 21, 1993, Ser. No. 65,939

Claims priority, application Japan, Sep. 26, 1989, 249930; Apr. 17, 1990, 100837

Int. Cl.^{5} B05D *5/12;* **B32B** *18/00;* **C30B** *25/02;* **H01L** *39/00*

U.S. Cl. 505—238 **10 Claims**



1. A superconductive device, wherein said device comprises;

a substrate of a single crystal, said single crystal comprising at least one element selected from the group consisting of calcium having a mol ratio relative to strontium within the range of 0.00001 to 0.1 mol, lanthanum having a mol ratio relative to neodymium within the range of 0.00001 to 0.1 mol, chrominum having a mol ratio relative to gallium within the range of 0.00001 to 0.1 mol and mixtures thereof, wherein said elements are added to a compound having the formula $SrNdGaO_4$, said compound having a K_2NiF_4 type crystal structure, and

a superconductive thin film formed on said substrate, said thin film being composed of an oxide.

5,314,872

GLUCAN SULFATE, STABILIZED FIBROBLAST GROWTH FACTOR COMPOSITION

Koichi Kato, Kawanishi; Kenji Kawahara, Izumi, and Tomoko Kajio, Minoo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 2, 1989, Ser. No. 360,602

Claims priority, application Japan, Jun. 6, 1988, 63-138907; Jul. 25, 1988, 63-185772

Int. Cl.^{5} A61K *37/36, 37/24*

U.S. Cl. 514—12 **15 Claims**

1. A stabilized composition which comprises fibroblast growth factor (FGF) or a mutein consisting of a deletion mutein of FGF and a substitution mutein of FGF which exhibits its pharmacological or physiological activities similar to those of FGF and a stabilizing amount of a glucan sulfate.

5,314,873

MILK-PROTEIN HYDROLYZATES AND COMPOSITIONS FOR USE AS HAIR AND SKIN TREATING AGENT

Mamoru Tomita, Yokohama; Takesi Kitazawa, Setagaya; Seiji Kawaura, Yotsukaido; Yasuo Fukuwatari, Kawasaki, and Masanobu Nojiri, Machida, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo and Iwase Cosfa Co., Ltd., Ohsaka, both of Japan

Filed May 17, 1991, Ser. No. 701,866

Claims priority, application Japan, May 18, 1990, 2-128363; May 18, 1990, 2-128364

Int. Cl.^{5} A61K *37/02;* **C07K** *1/12, 3/10*

U.S. Cl. 514—21 **4 Claims**

1. A milk-protein hydrolyzate obtained by the enzymatic hydrolysis of milk-protein, said hydrolyzate consisting of a mixture of peptides and free amino acids, said hydrolyzate having proliferation activating property on human cutaneous cells but not having antigenicity of the milk protein, said peptides having molecular weights less than 1000 daltons, said hydrolyzate having a free aromatic amino acid/total aromatic amino acid ratios of at least 90%; or a physiologically acceptable salt thereof.

5,314,874

INTRACORPOREALLY INJECTABLE COMPOSITION FOR IMPLANTING HIGHLY CONCENTRATED CROSS-LINKED ATELOCOLLAGEN

Teruo Miyata, and Tadatomo Kawai, both of Tokyo, Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1992, Ser. No. 872,722

Claims priority, application Japan, Apr. 19, 1991, 3-113660

Int. Cl.^{5} A61L *33/00;* **C08B** *37/10;* **C07K** *15/20;* **A61K** *7/12*

U.S. Cl. 514—21 **6 Claims**

1. A composition comprising an aqueous suspension of atelocollagen adjusted for physiological conditions by a buffer to a concentration of 55 to 75 mg/ml of said atelocollagen, wherein said atelocollagen is cross-linked with a polyepoxy compound in an amount of 20 to 100% by weight and not less than 10% of amino side chain groups of atelocollagen contained in said cross-linked atelocollagen are cross-linked with said polyepoxy compound, said polyepoxy compound is a member selected from the group consisting of glycerol diglycidyl ether, glycerol triglycidyl ether, diglycerol tetraglycidyl ether, triglycerol pentaglycidy ether, poly (methylene glycol) diglycidyl ether (1–10 polymerization degree), poly (ethylene glycol) diglycidyl ether (1–10 polymerization degree), poly (trimethylene glycol) diglycidyl ether (1–8 polymerization degree) and poly (propylene glycol) diglycidyl ether (1–8 polymerization degree), said cross-linked atelocollagen has a transition point of not less than 40° C. as measured by a differential scanning calorimeter, and said composition has a viscosity sufficient for injection through a needle.

5,314,875

METHOD FOR TREATING SWINE DYSENTERY WITH THE DERIVATIVES OF THE ANTIBIOTIC A82810

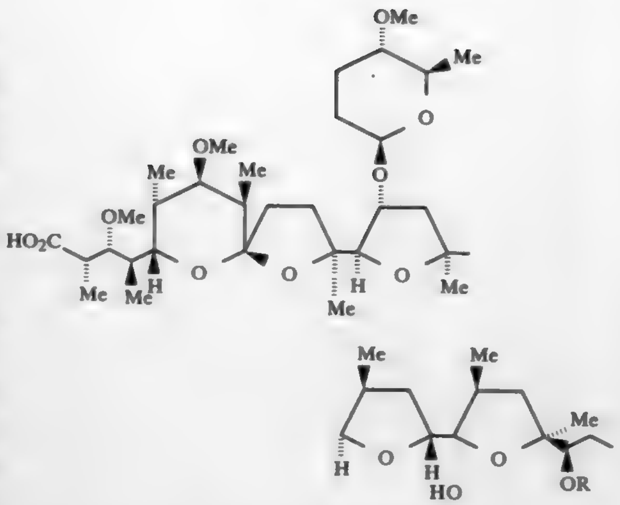
Robert L. Hamill, Greenwood, and Raymond C. Yao, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 335,332, Apr. 10, 1989, Pat. No. 5,098,834, which is a continuation-in-part of Ser. No. 189,499, May 2, 1988, abandoned. This application Aug. 30, 1991, Ser. No. 752,816

Int. Cl.^{5} A61K *31/70*

U.S. Cl. 514—25 **1 Claim**

1. A method for treating swine dysentery which comprises administering to swine suffering from or exposed to swine dysentery an effective amount of a compound of the formula



wherein R is —$CONHR_1$ and R_1 is alkyl, aryl, alkyl-aryl, arylalkyl, haloaryl, nitroaryl, haloaryl-alkyl, alkoxyaryl, aryloxyaryl, arylcycloalkyl, acylaryl and cycloalkyl; or a pharmaceutically acceptable salt thereof.

5,314,876

HIGH MOLECULAR MASS N,O-SULPHATED HEPAROSANS, PROCESS FOR THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Jean-Claude Lormeau, Kremlin Bicetre; Bruno Chevallier, Villejuif, and Marc Louis Victor Salome, Castanet-Tolosan, all of France, assignors to Elf Sanofi, Paris, France

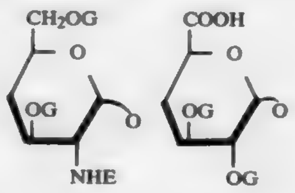
Filed Nov. 30, 1992, Ser. No. 983,371

Claims priority, application France, Nov. 28, 1991, 91 14725

Int. Cl.^{5} C08B *37/00;* **C12P** *19/04;* **C12N** *1/20;* **D61K** *31/725*

U.S. Cl. 514—56 **13 Claims**

1. N,O-sulphated heparosans of chains or a mixture of chains of molecular mass between 1.5×10^4 and 4.0×10^6 Da, the molecular mass being determined by exclusion HPLC, which comprise repeated disaccharide units of formula I:



(I)

in which:

E represents an acetyl group in 0 to 80% of the disaccharide units, and a sulphate group or a hydrogen atom in the remaining disaccharide units,

G represents a hydrogen atom or a sulphate group, or pharmaceutically acceptable salts thereof.

5,314,877

WATER-SOLUBLE PENTACYCLIC TRITERPENE COMPOSITION AND METHOD FOR PRODUCING THE SAME

Hiroshi Suzuki, Tokyo; Sigeru Watano, Yokohama; Tadashi Sasazuka, and Taira Tsutsumi, both of Kitami, all of Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

PCT No. PCT/JP91/01577, § 371 Date Oct. 23, 1992, § 102(e) Date Oct. 23, 1992, PCT Pub. No. WO92/09553, PCT Pub. Date Nov. 6, 1992

PCT Filed Nov. 19, 1991, Ser. No. 938,235

Claims priority, application Japan, Nov. 21, 1990, 2-314412

Int. Cl.^{5} A61K *7/16;* **C07C** *62/32, 51/50;* **A23L** *1/03*

U.S. Cl. 514—58 **7 Claims**

1. Water-soluble pentacyclic triterpene composition made by subjecting a pentacyclic triterpene compound having pharmacological activity to inclusion in a cyclodextrin, wherein said composition retains the pharmacological activity of said pentacyclic triterpene.

5,314,878

COMPOSITION FOR REMOVING OR INACTIVATING HARMFUL COMPONENTS IN BLOOD OR OTHER EXTRACELLULAR BODY FLUIDS

Henry M. Christensen, Roskilde; Hans B. Andreasen, Viby, both of Denmark, assignors to A/S af 18. juni 1990, Roskilde, Denmark

Filed Dec. 13, 1991, Ser. No. 806,206

Claims priority, application Denmark, Jun. 14, 1989, 2913/89

Int. Cl.^{5} A61K *31/715;* **C08B** *31/10;* **C07D** *321/00, 321/10*

U.S. Cl. 514—59 **13 Claims**

1. A compound for removing or inactivating harmful components from human or animal blood or from other extracellular body fluids, comprising a crownether able to bind the harmful components, which crownether is chemically bonded to a polysaccharide selected from the group consisting of dextran, hydroxyethyl starch, and inuline.

5,314,879

SILANYL OXYPROPYLAMINES ENDOWED WITH ANTIFUNGAL ACTIVITY

Giovanni Camaggi, Novara; Lucio Filippini, Saronno; Marilena Gusmeroli, Monza; Carlo Garavaglia, Cuggiono, and Luigi Mirenna, Milan, all of Italy, assignors to Ministero Dell 'Universita' E Della Ricerca Scientifica E Tecnologica, Rome, Italy

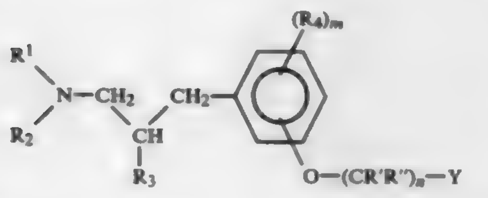
Filed Feb. 28, 1991, Ser. No. 661,935

Claims priority, application Italy, Mar. 2, 1990, 19540 A/90

Int. Cl.^{5} A01N *55/00;* **C07F** *7/10, 7/18*

U.S. Cl. 514—63 **9 Claims**

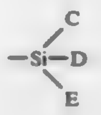
1. Antifungal compounds useful in the agricultural field having the formula:



(I)

wherein:

- R_1 and R_2, which may be either equal to, or different from, each other, represent H atoms, either linear or branched (C_1–C_6)-alkyl groups,
  - Ar-B groups in which Ar is a (C_6, C_{10})-aryl or (C_6, C_{10})-halo-aryl group and
  - B is a (C_1–C_4)-alkylene or (C_1–C_2)-alkyl-(C_1–C_4)-alkylene group,
  - or R_1 and R_2 taken together with the N atom form a (C_3–C_8)-heterocyclic group or a (C_2–C_7)-heterocyclic group containing a second heteroatom selected from among O and S, said heterocyclic groups being optionally substituted with one or more C_1–C_4 alkyl groups, (C_6–C_{10})-aryl groups, halogens, or Ar-B groups in which the symbols Ar and B have the same meanings are defined above;
- R_3 represents a (C_1–C_3)-alkyl group;
- R_4 which, when m is greater than 1, may be either different from, or equal to, one another, represent halogen atoms, (C_1–C_3)-alkyl groups or (C_1–C_3)-halo-alkyl groups;
- m is an integer within the range of from 0 to 4; R', R'', which may be either equal to, or different from, each other, represent H, (C_1–C_3)-alkyl group or halogen atoms;
- n is an integer within the range of from 0 to 3;
- Y represents a



group in which

- C, D, E, either equal to, or different from, one another, represent H atoms, (C_1–C_4) alkyl groups, (C_1–C_4-)haloalkyl groups, (C_1–C_4) alkoxy groups, (C_1–C_4)-halo-alkoxy groups, (C_6,C_{10}) -aryl groups, and (C_6, C_{10})-haloaryl groups;

their enantiomers and diastereoisomers and corresponding metal salts and complexes.

5,314,880

BENZIMIDAZOLE DERIVATIVES

Mark Whittaker, Oxford; Christopher D. Floyd; Jonathan P. Dickens, both of Buckinghamshire, and Alan H. Davidson, Oxfordshire, all of England, assignors to British Bio-technology Limited, Oxford, England

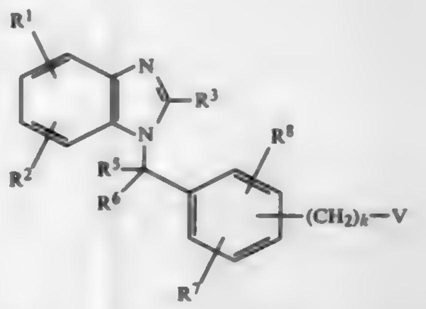
Filed Sep. 30, 1991, Ser. No. 752,443

Claims priority, application United Kingdom, Feb. 23, 1989, 8904174

Int. Cl.^{5} A61K *31/415, 31/44;* **C07D** *235/04, 417/12*

U.S. Cl. 514—80 **27 Claims**

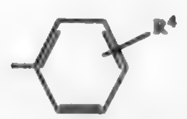
1. A compound of general formula I:



I.

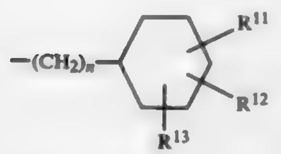
wherein:

- each of R^1 and R^2 represents independently hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, halogen, CN, CO_2H, CO_2(-C_1–C_6) alkyl, CO_2(C_3–C_8)cycloalkyl, $CONH_2$, CHO, CH_2OH, CF_3, C_1–C_6 alkoxy, C_1–C_6 alkylthio, SO(C_1–C_6)alkyl, SO_2(C_1–C_6) alkyl, SO_3H, NH_2, NHCOMe, or NO_2 or R^1 and R^2 together with the carbon atoms to which they are attached form a fused phenyl ring;
- R^3 represents a hydrogen, C_1–C_6 alkyl, C_1–C_6 alkenyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkoxy (C_1–C_6) alkyl, C_1–C_6 alkylthio (C_1–C_6) alkyl, SO(C_1–C_6) alkyl, SO_2(C_1–C_6) alkyl, CF_3, phenyl (C_1–C_6) alkyl, thiophenyl, thiazole, pyridyl or a

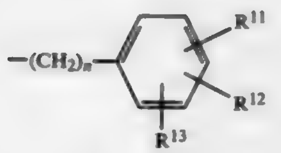


group wherein R^4 represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, halogen, OH, SH, CN, CO_2H, CO_2(-C_1–C_6) alkyl, $CONH_2$, CHO, CH_2OH, CF_3, C_1–C_6 alkoxy, C_1–C_6 alkylthio, SO(C_1–C_6) alkyl, (SO_2(C_1–C_6) alkyl, NH_2, NHCOMe, or NO_2;

- each of R^5 and R^6 represents independently hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, CO_2(C_1–C_6) alkyl, C_1–C_6 alkylthio, SO(C_1–C_6) alkyl, SO_2(C_1–C_6) alkyl, C_1–C_6 alkylthio (C_1–C_6) alkyl, C_1–C_6 alkoxy (C_1–C_6) alkyl, phenyl (C_1–C_6) alkyl and thiophenyl;
- k is an integer from 0 to 2;
- each of R^7 and R^8 independently represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkoxy (C_1–C_6) alkyl, C_1–C_6 alkylthio (C_1–C_6) alkyl, halogen, CF_3, CN, OH, SH, CH_2OH, CH_2SH or $CONH_2$;
- V represents;
  - a) a YNR^9R^{10} group wherein Y is SO_2, PO_2, CO or CS and each of R^9 and R^{10} is independently hydrogen, C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_3–C_8 cycloalkyl, C_4–C_8 cycloalkenyl, phenyl (C_1–C_6) alkyl, adamantyl, decalynyl, naphthyl, C_3–C_8 cycloalkyl (C_1–C_6) alkyl, C_4–C_8 cycloalkenyl (C_1–C_6) alkyl or a group G wherein G represents a group:



or a group:



wherein n is an integer of from 1 to 6 and each of R^{11}, R^{12} and R^{13} is independently hydrogen, halogen, C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_3–C_8 cycloalkyl, C_4–C_8 cycloalkenyl, phenyl (C_1–C_6) alkyl, C_3–C_8 cycloalkyl (C_1–C_6) alkyl, C_4–C_8 cycloalkenyl (C_1–C_6) alkyl or a C_1–C_6 alkoxy, benzoxy, C_1–C_6 alkylthio, benzthio or benzoyl; or

- b) a ZR^{19} group wherein Z represents tetrazole, CO, CO_2, $NR^{20}CO$, $NR^{20}CO_2$, SO_2, $NR^{20}SO_2$, O_2C, or $OCONR^{20}$ and each of R^{19} and R^{20} independently represents hydrogen, C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_3–C_8 cycloalkyl, C_4–C_8 cycloalkenyl, adamantyl, decalynyl, phenyl (C_1–C_6) alkyl, C_3–C_8 cycloalkyl (C_1–C_6) alkyl, C_4–C_8 cycloalkenyl, (C_1–C_6) alkyl, naphthyl, or a group G as defined above;
- c) an $NR^{21}POR^{22}R^{23}$ group wherein each R^{21}, R^{22} and R^{23} independently represents hydrogen, C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_3–C_8 cycloalkyl, C_4–C_8 cycloalkenyl, adamantyl, decalynyl, phenyl (C_1–C_6) alkyl, C_3–C_8 cycloalkyl (C_1–C_6) alkyl, C_4–C_8 cycloalkenyl (C_1–C_6) alkyl, naphthyl or a group G as defined above;

or a pharmaceutically or veterinarily acceptable acid addition salt or hydrate thereof, provided that one of the following conditions is met:

- a) when either of R^1 or R^2 is hydrogen the other is not halogen or (C_1–C_6) alkyl; or
- b) R^1 and R^2 are not both halogen or (C_1–C_6) alkyl; or
- c) R^3 is not H or (C_1–C_6) alkyl; or
- d) when either of R^5 or R^6 is hydrogen the other is not hydrogen or (C_1–C_6) alkyl; or
- e) R^7 and R^8 are not both hydrogen; or
- f) when $k=0$, $V=ZR^{19}$ and $Z=SO_2$, R^{19} is not phenyl(-C_1–C_6)alkyl.

5,314,881

USE OF PHOSPHOMYCIN AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF AS A TOPICAL CICATRIZER

Nunzio Rapisarda, Via Duca Abruzzi 10, Palagonia-Catania, Italy, assignor to Nunzio Rapisarda, Palagonia Catania; Francia Farmaceutici Industria Farmaco-Biologica S.R.L., Milan and Salvatore Pignataro, Catania, all of Italy, a part interest

Continuation of Ser. No. 729,541, Jul. 15, 1991, abandoned. This application Feb. 18, 1993, Ser. No. 19,345

Claims priority, application Italy, Jul. 31, 1990, 21138 A/90

Int. Cl.^{5} A61K *31/665*

U.S. Cl. 514—99 **6 Claims**

1. A method of promoting or accelerating wound healing in a patient in need thereof, comprising covering the whole of said wound with a powder consisting essentially of an amount of a pharmaceutically acceptable salt of phosphomycin effective to promote or accelerate said wound healing.

5,314,882

METHOD FOR PROMOTING GROWTH AND IMPROVED MEAT QUALITY IN MEAT PRODUCING ANIMALS WITH FEMALE STEROIDAL HORMONES

Vladimir Pantic, Belgrade; Nestor Sijacki, Novi Sad, and Svetislav Kolaric, Sombor, all of Yugoslavia, assignors to International Foundation for Biochemical Endocrinology, Boca Raton, Fla.

Continuation of Ser. No. 582,774, Sep. 14, 1990, abandoned, which is a continuation of Ser. No. 210,168, Jun. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 696,563, Jan. 30, 1985, abandoned. This application May 4, 1992, Ser. No. 879,104

Claims priority, application Yugoslavia, Jan. 3, 1984, 166/84

Int. Cl.^{5} A61K *31/56*

U.S. Cl. 514—170 **10 Claims**

1. The method for treating sexually intact meat-producing domestic non-ruminant animals, to improve the yield and increase the proportion of lean to fat meat obtained therefrom when the animal is slaughtered after achieving a desired body weight, which comprises the step of non-implantatively administering to the animal to be treated at a time during substantially its neonatal stage at least one dosage of a combination consisting essentially of a pharmacologically acceptable estradiol ester and a pharmacologically acceptable progesterone ester in which the weight of said progesterone ester exceeds that of said estradiol ester, in an amount which is sufficient to produce in the animal an essentially immediate, temporary substantial increase in the level of each of said estradiol ester and said progesterone ester in the animal's system, such dosage being effective to delay sexual maturation of the animal so that sexual maturation does not occur prior to the date of slaughter of the animal while its primary sexual development and growth function remain substantially unimpaired, the duration of said increase being sufficiently short relative to the interval between the time of administration and the date of slaughter that said animal is at least substantially free of any residual amount of the thus-administered estradiol ester and progesterone ester at the time of slaughter.

5,314,883

5-HETEROARYLAMINO-6-OXY-SUBSTITUTED 3(2H)-PYRIDAZINONES

Keizo Tanikawa; Akira Saito; Takashi Matsumoto; Ryozo Sakoda, all of Funabashi; Nobutomo Tsuruzoe, and Ken-ichi Shikada, both of Shiraoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

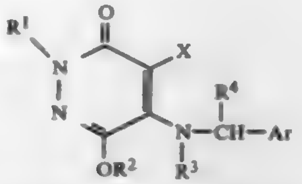
Division of Ser. No. 768,182, Oct. 16, 1991, Pat. No. 5,202,323. This application Dec. 21, 1992, Ser. No. 994,404

Claims priority, application Japan, Apr. 25, 1990, 2-109914

Int. Cl.^{5} A61K *31/50*

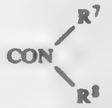
U.S. Cl. 514—236.5 **15 Claims**

1. A 3(2H)-pyridazinone of the formula:

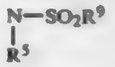


wherein R^1 is a hydrogen atom, a straight chain or branched C_1–C_4 alkyl group, a C_3–C_4 alkenyl group or $(CH_2)_nCO_2R^5$ where n is an integer from 1 to 4, R^5 is a hydrogen atom or a straight chain or branched C_1–C_4 alkyl group;

R^1 is A^1-Y^1 where A^1 is a straight chain or branched C_1–C_{12} alkylene group, Y^1 is CO_2R^5, a cyano group, OR^6 where R^6 is a hydrogen atom, a straight chain or branched C_1–C_4 alkyl group or a phenyl group, a thienyl or pyridyl group,

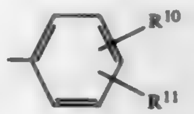


where R^7 and R^8 are independently a hydrogen atom, a straight chain or branched C_1–C_4 alkyl group, a C_3–C_8 cycloalkyl group, a phenyl group, a thiazolyl or thiadiazolyl group, or R^7 and R^8 together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain or branched C_1–C_3 alkyl group or a phenyl group, or form a morpholine ring with a nitrogen atom,

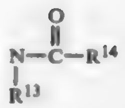


$$\underset{\displaystyle R^5}{\overset{|}{N}}-SO_2R^9$$

where R^5 is as defined above and R^9 is a straight chain or branched C_1–C_4 alkyl group or a phenyl group which is unsubstituted or substituted with a straight chain or branched C_1–C_4 alkyl group or a halogen atom,

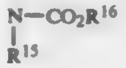


where R^{10} and R^{11} are independently a hydrogen atom, a halogen atom, a straight chain or branched C_1–C_4 alkyl group, a C_1–C_4 acylamino group, OR^5, $NHSO_2R^9$ or $S(O)_m$—R^{12} where m is an integer from 0 to 2 and R^{12} is a straight chain or branched C_1–C_4 alkyl group, provided that R^{10} and R^{11} are not hydrogen atoms at the same time,



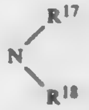
$$\underset{\displaystyle R^{13}}{\overset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}-R^{14}$$

where R^{13} is a hydrogen atom and R^{14} is a phenyl group, or R^{13} and R^{14} together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group,

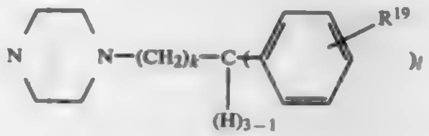


$$\underset{\displaystyle R^{15}}{\overset{|}{N}}-CO_2R^{16}$$

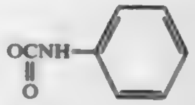
where R^{15} is a hydrogen atom or a straight chain or branched C_1–C_4 alkyl group, R^{16} is a straight chain or branched C_1–C_4 alkyl group, or R^{15} and R^{16} together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group,



where R^{17} and R^{18} are independently a straight chain or branched C_1–C_4 alkyl group, or R^{17} and R^{18} together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group,



where l is 1 or 2, k is an integer from 0 to 3, and R^{19} is a hydrogen atom or a halogen atom, or

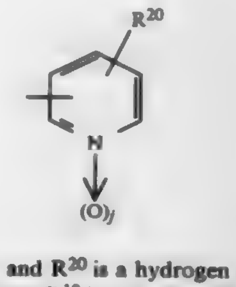


or R^2 is A^2-Y^2 where A^2 is a C_2–C_{10} alkylodene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group, except where a carbon chain connecting an oxygen atom with Y^2 has one carbon, and Y^2 is a phenyl group;

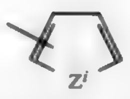
R^3 and R^4 are independently a hydrogen atom or a straight chain or branched C_1–C_3 alkyl group;

X is a chlorine atom, a bromine atom, a hydrogen atom or a cyano group; and

Ar is



where j is 0 or 1 and R^{20} is a hydrogen atom, a halogen atom or OR^{12} where R^{12} is as defined above,



where Z^1 is an oxygen atom or sulfur atom; and a pharmaceutically acceptable salt thereof.

5,314,884

2-PYRIMIDINYL-1-PIPERAZINE DERIVATIVES PROCESSES FOR THEIR PREPARATION AND MEDICAMENTS CONTAINING THEM

Peter-Rudolf Seidel, Cologne; Harald Horstmann, Wuppertal; Jorg Traber, Lohmar; Wolfgang Dompert, Roesrath-Forsbach; Thomas Glaser, Cologne, and Teunis Schuurman, Overath, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., Cologne, Fed. Rep. of Germany

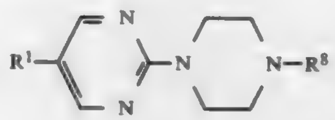
Division of Ser. No. 619,270, Nov. 28, 1990, Pat. No. 5,103,967, which is a division of Ser. No. 482,580, Feb. 21, 1990, Pat. No. 4,988,809, which is a division of Ser. No. 247,813, Sep. 22, 1988, Pat. No. 4,937,343, which is a division of Ser. No. 838,238, Mar. 10, 1986, Pat. No. 4,818,756, which is a division of Ser. No. 617,858, Jun. 6, 1984, abandoned. This application Aug. 31, 1992, Ser. No. 938,187

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3321969

Int. Cl.^{5} A61K *31/505;* **C07D** *403/04*

U.S. Cl. 514—252 **6 Claims**

1. A compound of the formula



in which

R^1 represents iodine, chlorine, trifluoromethyl, phenyl, 3,4-dimethoxyphenyl, 4-methoxyphenyl, 4-chlorophenyl, 3-trifluoromethylphenyl, 2-chloro-6-fluorophenyl or 3-indolyl; and

R^8 represents methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, i-propoxycarbonyl, butoxycarbonyl or phenoxycarbonyl.

5,314,885

CYCLIC BENZYLAMINO, BENZYLAMIDO, AND BENZYLIMIDO ANTIPSYCHOTIC AGENTS

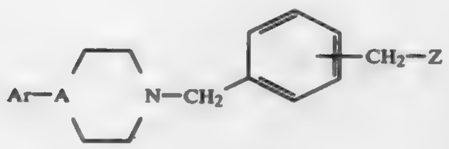
Malcolm K. Scott; Allen B. Reitz, both of Lansdale; Cynthia A. Maryanoff, New Hope, and Frank J. Villani, Jr., Perkosie, all of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Filed Sep. 11, 1992, Ser. No. 943,846

Int. Cl.^{5} A61K *31/495;* **C07D** *401/06*

U.S. Cl. 514—252 **16 Claims**

1. A compound of the formula I:



I

wherein

A is N

Ar is aryl or substituted aryl; wherein the substituted aryl is independently substituted with one or more of C_1–C_8 alkyl, C_3–C_{10} cycloalkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 alkoxy, aryloxy hydroxyl, trifluoromethyl, trifluoromethoxy, cyano, C_1–C_8 alkylthio, halogen, nitro, C_1–C_8 haloalkyl, amino or C_1–C_8 mono- or dialkylamino;

Z is piperidinyl or a pharmaceutically acceptable salt thereof.

5,314,886

N-SUBSTITUTED LACTAMS USEFUL AS CHOLECYSTOKININ ANTAGONISTS

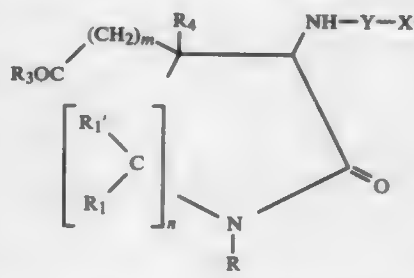
Daniel P. Becker, Glenview; Daniel L. Flynn, Mundelein, and Clara I. Villamil, Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 626,590, Dec. 11, 1990, Pat. No. 5,202,344. This application Oct. 29, 1992, Ser. No. 968,617

Int. Cl.^{5} C07D *207/273, 207/277;* **A61K** *31/40*

U.S. Cl. 514—252 **29 Claims**

1. A compound of the formula



I

and isomers thereof; or a pharmaceutically acceptable acid or base addition salt thereof:

wherein

Ar is heterounsaturated ring having 5 or 6 carbon atoms wherein one or two of the carbon atoms is replaced by nitrogen, oxygen or sulfur; substituted heterounsaturated ring having 5 or 6 carbon atoms wherein one or two of the carbon atoms is replaced by nitrogen, oxygen or sulfur which can be substituted once or more by alkyl of 1 to 6 carbon atoms, halogen or trifluoromethyl; fused heterobicyclic hydrocarbon radical having 9 or 10 carbon atoms wherein one to three of the carbon atoms is replaced by nitrogen, oxygen or sulfur; substituted fused heterobicyclic hydrocarbon radical having 9 or 10 carbon atoms wherein one to three of the carbon atoms is replaced by nitrogen, oxygen or sulfur which can be substituted once or more by alkyl of 1 to 6 carbon atoms, halogen, trifluoromethyl, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms or alkoxy wherein the alkyl is 1 to 6 carbon atoms;

R is alkyl having 1 to 8 carbon atoms wherein one of the carbon atoms may be replaced by oxygen; aryl; substituted aryl which can be substituted one or more by halogen, alkyl having 1 to 6 carbon atoms, alkoxy wherein the alkyl is 1 to 6 carbon atoms, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms, trifluoromethyl, or methylene dioxy; aralkyl wherein the alkyl is 1 to 8 carbon atoms; substituted aralkyl wherein the alkyl is 1 to 8 carbon atoms and the substituent or substituents are selected from the group consisting of halogen, alkyl having 1 to 6 carbon atoms, alkoxy wherein the alkyl is 1 to 6 carbon atoms, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms, trifluoromethyl or methylene dioxy;

X is a direct bond or a substituent selected from the group consisting of NH, oxygen or alkylene having 1 to 3 carbon atoms;

n is 1;

R_1 and R_1' are each independently hydrogen or alkyl having 1 to 4 carbon atoms;

m is an integer from 0 to 3;

R_3 is OH, OR_5 wherein R_5 is alkyl having 1 to 6 carbon atoms, NR_6R_7 wherein R_6 and R_7 are each independently hydrogen or alkyl of 1 to 6 carbon atoms or NR_8R_9 which together form a five to seven membered ring wherein R_8 and R_9

together represent an alkylene group having four to six carbon atoms and one of the carbon atoms be optionally replaced by oxygen, nitrogen or NR_{10} wherein R_{10} represents hydrogen, or alkyl having 1 to 6 carbon atoms or aralkyl wherein the alkyl is 1 to 6 carbon atoms;

R_4 is hydrogen or alkyl having 1 to 4 carbon atoms; and

Y is C═O or SO_2.

14. A method for treating and preventing cholecystokinin related disorders of the gastrointestinal, central nervous, and appetite regulatory systems of mammals comprising administering a therapeutically effective dose of at least one compound of claim 1 to a mammal in need of such treatment.

5,314,887

2-AMINO-1, 4-DIHYDROPYRIDINE DERIVATIVES WITH CALCIUM AGONIST AND ALPHLAL-ANTAGONIST ACTIVITY

Paul E. Aldrich; Richard A. Earl, both of Wilmington, Del., and Philip Ma, Chadds Ford, Pa., assignors to The Du Pont Merck Pharmaceutical Company, Wilmington, Del.

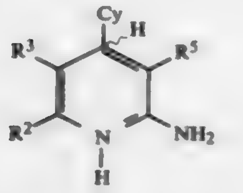
Division of Ser. No. 549,820, Jul. 9, 1990, Pat. No. 5,166,148.

This application Oct. 30, 1992, Ser. No. 968,933

Int. Cl.⁵ A61K *31/505;* **C07D** *401/14, 403/14*

U.S. Cl. 514—252 **12 Claims**

1. A compound of the formula



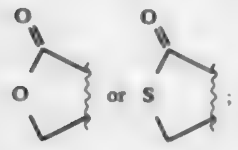
(I)

or a pharmaceutically acceptable salt thereof or an isomer or N-oxide thereof wherein:

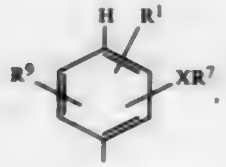
R^2 is alkyl of 1–4 carbon atoms, CN, CH_2OH, $CH_2OCH_2CH_2NH_2$ or NH_2;

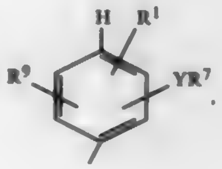
R^3 is NO_2, H, CN, $CONH_2$ or

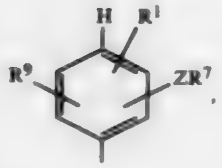
R^2 and R^3 taken together are:



Cy, when R^5 is CHO, $CO_2CH_2CHOHC_6H_5$, $CO_2CH(OCH_3)C_6H_5$, NO_2, $CONHC_6H_5$, or CO_2 alkyl of 1–10 carbon atoms, is a cyclic group selected from the group:





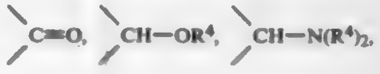


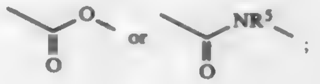
R^1 and R^9 independently are H, alkyl of 1–4 carbon atoms, haloalkyl of 1–4 carbon atoms, alkoxy of 1–10 carbon atoms, halogen, or NO_2; Cy, when R^5 is COR^7, CO_2R^7 is phenyl optionally substituted with one or two substituents independently selected from the group consisting of alkyl of 1–4 carbon atoms, haloalkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, thioalkyl of 1–4 carbon atoms, alkylsulfinyl of 1–4 carbon atoms,

alkylsulfinyl of 1–4 carbon atoms, halogen, or NO_2,

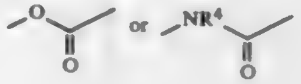
X is NR^4, O, S, SO, SO_2 or N→O;

Y is CH_2





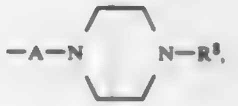
Z is

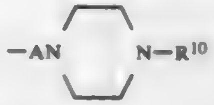


where

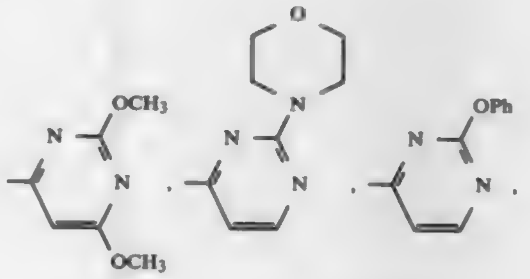
R^4 is H or an alkyl group of 1–4 carbon atoms;

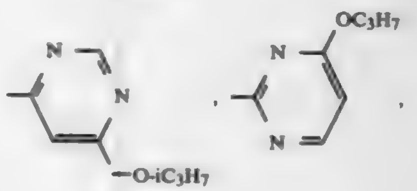
R^7 is

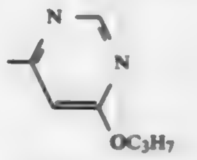




R^{10} is

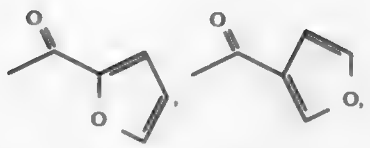


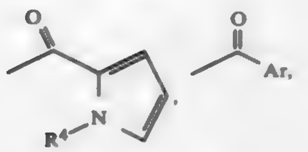


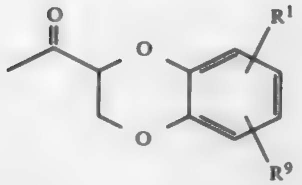


or 4-pyrimidinyl,

R^8 is Ar,







where

Ar is phenyl optionally substituted with one or two substituents independently selected from the group consisting of alkyl of 1–4 carbon atoms, haloalkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, halogen, or NO_2;

Q is $(CH_2)_q$, $(CH_2)_nO$, $(CH_2)_nNH$ or $(CH_2)_nS$;

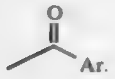
n is independently 1 to 4;

q is 0 to 2; and

r is 1 to 10 with the proviso that when R^2 is alkyl of 1–4 carbon atoms, CN, CH_2OH, $CH_2OCH_2CH_2NH_2$ or NH_2; R^3 is NO_2, H, CN, $CONH_2$,

then

R^8 cannot be:



5,314,888

VETERINARY METHOD FOR TREATING INAPPROPRIATE ELIMINATION OF URINE IN HOUSEHOLD PETS

Nicholas H. Dodman, Grafton, and Louis Shuster, Brookline, both of Mass., assignors to Trustees of Tufts College, Medford, Mass.

Continuation of Ser. No. 839,596, Feb. 21, 1992, abandoned.

This application Apr. 23, 1993, Ser. No. 52,274

Int. Cl.⁵ A61K *31/495*

U.S. Cl. 514—252 **8 Claims**

1. A veterinary method for treating inappropriate elimination of urine in household pets such as dogs and cats, said veterinary method comprising the step of:

administering to the household pet which is eliminating urine inappropriately an effective amount of at least one pharmacologically active compound selected from the class consisting of N-[(4-heteroaryl-1-piperazinyl) alkyl]-substituted imides, its analogues and derivatives.

5,314,889

HETEROCYCLIC SUBSTITUTED 2-ACYLAMINO-5-THIAZOLES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Robert Boigegrain, Assas; Roger Brodin, Montpellier; Danielle Gully, Saubens; Jean-Charles Molimard, Saint Gely Du Gesf, and Dominique Olliero, Montpellier, all of France, assignors to Elf Sanofi, Paris, France

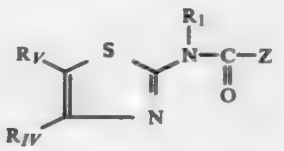
Filed May 29, 1992, Ser. No. 889,910

Claims priority, application France, Jun. 5, 1991, 91 06814

Int. Cl.⁵ A61K *31/495, 31/50, 31/425, 31/415;* **C07D** *413/00, 417/00, 405/00, 411/00*

U.S. Cl. 514—253 **11 Claims**

1. 2-Acylaminothiazole compound of the formula:

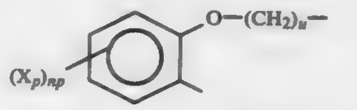


(I)

in which

R_1 is hydrogen;

R_{IV} is $(C_3–C_7)$cycloalkyl, $(C_1–C_4)$ alkyl-substituted $(C_3–C_7)$cycloalkyl phenyl, or phenyl substituted by one or more halogen, $(C_1–C_6)$alkyl, $(C_1–C_3)$alkoxy, $(C_1–C_3)$thioalkoxy, nitro, or trifluoromethyl, or R_{IV} and R_V, taken together, are:

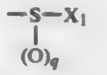


in which u is an integer from 1 to 3, np is an integer from 0–3, Xp is halogen, $(C_1–C_3)$alkyl, $(C_1–C_3)$alkoxy, nitro or trifluoromethyl, and Xp is the same or different when np is 2 or 3;

R_V is $—(CH_2)_m—X$ in which m is an integer from 0 to 5 and X is:

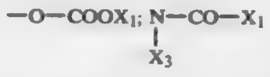
(i) halogen, hydroxyl, $(C_3–C_7)$cycloalkyl, phenyl, or phenyl substituted with halogen, $(C_1–C_3)$alkyl, $(C_1–C_3)$alkoxy, nitro, amino, hydroxyl or trifluoromethyl;

(ii) —COOH; $—COOX_1$; $—O—COX_1$; $—SCOX_1—$



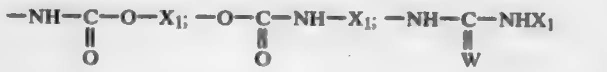
$$-\underset{(O)_q}{\underset{|}{S}}-X_1$$

wherein q is an integer from 0 to 2;



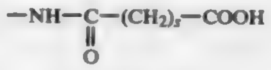
$$-O-COOX_1;\ \underset{X_3}{\underset{|}{N}}-CO-X_1$$

wherein X_3 is hydrogen or $(C_1–C_3)$alkyl;



$$-NH-\underset{O}{\underset{\|}{C}}-O-X_1;\ -O-\underset{O}{\underset{\|}{C}}-NH-X_1;\ -NH-\underset{W}{\underset{\|}{C}}-NHX_1$$

wherein W is O or S;

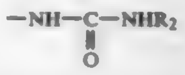


$$-NH-\underset{O}{\underset{\|}{C}}-(CH_2)_s-COOH$$

wherein s is an integer from 2 to 4; in which X_1 is $(C_1–C_3)$alkyl; phenyl; phenyl substituted by one or more halogen, (C_1-C_3)alkyl, (C_1-C_3)alkoxy, nitro, amino, hydroxyl, or trifluoromethyl; or adamantyl;

(iii) $-NX_1X_2$ or $-CONX_1X_2$ in which X_1 is hydrogen, (C_1-C_3)alkyl, phenyl, or phenyl substituted by one or more halogen, (C_1-C_3)alkyl, (C_1-C_3)alkoxy, nitro, amino, hydroxy or trifluoromethyl, and X_2 is hydrogen or (C_1-C_3)alkyl; or alternatively, X_1 and X_2 constitute, with the nitrogen atom to which they are attached, pyrrolidino or pyrrolidino substituted by oxo hydroxyl, $-O-COR$ in which R is (C_1-C_5)alkyl, $(-OCOOX_1)$, as defined above, or $(-OCONX_1X_2)$ as defined above; or alternatively,

$R\gamma$ is (C_1-C_5)alkoxy, hydroxyl, pyrrolidino, piperidino, pyrrolidino substituted by oxo or hydroxyl, piperidino substituted by oxo or hydroxyl, piperazinyl, or piperazinyl N-substituted by —COOAlk in which Alk is (C_1-C_5)alkyl; a carboxylic acid group; $-NX_2X_4$ in which X_4 is hydrogen or $-(CH_2)_t-X_5$ wherein t is an integer from 2 to 4 and X_5 is —OH, $-O-CO-R_2$, $NNCOR_2$, or



$$-NH-\overset{\overset{\textstyle O}{\|}}{C}-NHR_2$$

in which R_2 is (C_1-C_6)alkyl; or $-NR_2R_3$ wherein R_2 and R_3 are independently H, (C_1-C_6)alkyl, phenyl, phenyl substituted by one or more halogen, (C_1-C_3)alkyl, or (C_1-C_3)alkoxy, or R_2 and R_3 constitute, with the nitrogen atom to which they are attached, pyrrolidino, piperidino, pyrrolidino substituted by oxo or hydroxyl, piperidino substituted by oxo or hydroxyl, piperazinyl, or piperazinyl N-substituted by —COOAlk in which Alk is (C_1-C_5)alkyl; and

Z is indolyl, indolyl substituted by one or more halogen, (C_1-C_3)alkyl, (C_1-C_3)alkoxy, benzyloxy, nitro, amino or trifluoromethyl, indoyl N-substituted by (C_1-C_4)alkyl, or carboxyalkylene-Z_4—$COOR_{10}$ in which Z_4 is (C_1-C_4)alkylene and R_{10} is hydrogen, benzyl, or (C_1-C_6)alkyl, or indolyl substituted by one or more halogen, (C_1-C_3)alkyl, (C_1-C_3)alkoxy, benzyloxy, nitro, amino, or trifluoromethyl and N-substituted by (C_1-C_4)alkyl or carboxyalkylene-Z_4-$COOR_{10}$ is which Z_4 is (C_1-C_4)alkylene and R_{10} is hydrogen, benzyl, or (C_1-C_6)alkyl;

or a pharmaceutically acceptable salt thereof.

5,314,890

1-7 DISUBSTITUTED XANTHINE DERIVATIVES HAVING ANTIASTHMATIC ACTIVITY, THEIR PHYSIOLOGICALLY ACCEPTABLE SALTS, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PROCESS FOR THEIR PREPARATION

Orenzo Agostini; Carla Bacciarelli, both of Florence; Graziano Bonacchi, Pistoia; Mauro Fedi, Sesto Fiorentino, and Stefano Manzini, Florence, all of Italy, assignors to Malesci Istituto Farmacobiologico S.p.A., Florence, Italy

PCT No. PCT/IT91/00045, § 371 Date Nov. 17, 1992, § 102(e) Date Nov. 17, 1992, PCT Pub. No. WO91/17993, PCT Pub. Date Nov. 28, 1991

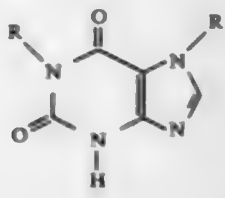
PCT Filed May 23, 1991, Ser. No. 949,507

Claims priority, application Italy, May 24, 1990, 47999 A/90

Int. Cl.^{5} A61K *31/52;* **C07D** *473/08*

U.S. Cl. 514—263 **6 Claims**

1. Xanthine derivatives having antiasthmatic activity of the formula (I):



(I)

wherein

R is a linear or branched alkyl chain group of from one to six carbon atoms, and R_1 is a linear or branched alkyl or hydroxyalkyl group of from one to six carbon atoms, provided that R_1 is not methyl, or ethyl, or propyl when R is methyl; R_1 is not methyl or ethyl when R is ethyl; R_1 is not 2-hydroxy-propyl when R is methyl or n-butyl.

5,314,891

BENZENESULPHONAMIDE DERIVATIVES

Philip N. Edwards, Bramhall; Keith Oldham, Poynton, and David Waterson, Macclesfield, all of England, assignors to Imperial Chemical Industries PLC, London, England and ICI Pharma, Cergy Cedex, France

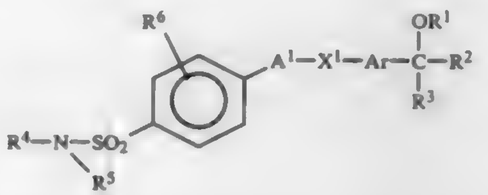
Filed Sep. 10, 1992, Ser. No. 942,778

Claims priority, application European Pat. Off., Sep. 10, 1991, 91402404.7

Int. Cl.^{5} A61K *31/505, 31/41, 31/425, 31/44;* **C07D** *239/38, 405/12, 285/08, 285/12*

U.S. Cl. 514—269 **9 Claims**

1. A benzenesulphonamide derivative of the formula I



I

wherein R^1 is (1–4C)alkyl, (3–4C)alkenyl or (3–4C)alkynyl; and wherein R^2 and R^3 together form a group of the formula $-A^2-X^2-A^3-$ which, together with the carbon atom to which A^2 and A^3 and are attached, defines a ring having 5 or 6 ring atoms, wherein A^2 and A^3, which may be the same or different each is (1–3C)alkylene and X^2 is oxy, thio, sulphinyl or sulphonyl, and which ring may bear one or two substituents, which may be the same or different, selected from hydroxy, (1–4C)alkyl and (1–4C)alkoxy;

wherein A^1 is a direct link to X^1 or is (1–3C)alkylene;

wherein X^1 is oxy, thio or imino;

wherein Ar is phenylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, trifluoromethyl, (1–4C)alkyl and (1–4C)alkoxy;

wherein R^4 is a 5- or 6-membered monocyclic heterocyclic moiety containing one or two nitrogen heteroatoms and optionally containing a further heteroatom selected from nitrogen, oxygen and sulphur, or a hydrogenated derivative thereof, which heterocyclic moiety may optionally bear one or two substituents selected from halogeno, hydroxy, amino, cyano, nitro trifluoromethyl, carbamoyl, oxo, thioxo, (1–4C)alkyl, (1–4C)alkoxy and (2–4C)alkanoylamino;

R^5 is hydrogen or (1–4C)alkyl; and

R^6 is hydrogen, halogeno, trifluoromethyl, (1–4C)alkyl or (1–4C)alkoxy;

or a pharmaceutically-acceptable salt thereof.

5,314,892

FUNGICIDAL PYRIMIDINYLOXYPHENYL-3-METHOXY PROPENOATES

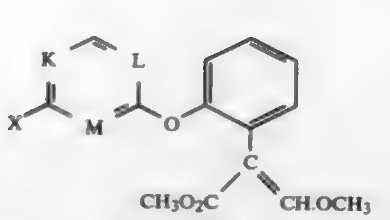
John M. Clough, Marlow; Christopher R. A. Godfrey, Bracknell; Ian T. Streeting, and David P. Bacon, both of Wokingham, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 616,454, Nov. 20, 1990, Pat. No. 5,179,098. This application Oct. 6, 1992, Ser. No. 957,232

Int. Cl.^{5} A61K *31/505*

U.S. Cl. 514—269 **10 Claims**

1. A compound having the formula (I):



in which any two of K, L and M are nitrogen and the other is CH; and X is an optionally substituted 6-membered heterocyclic ring containing at least one trivalent nitrogen atom by which it is attached to the central pyrimidine ring; the heterocyclic ring being selected from the group consisting of pyrimidinone, pyrazinone, pyridazinone, 1,2,4-triazinone, 1,3,5-triazinone and morpholine and the optional substituents being selected from the group consisting of halogen, C_{1-4} alkyl, C_{3-6} cycloalkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{2-4} alkenyloxy, C_{2-4} alkynyloxy, phenyl, benzyloxy, cyano, isocyano, isothiocyanato, nitro, oxo, NR^1R^2, $NHCOR^1$, $NHCONR^1R^2$, $NHSO_2R^1$, OR^1, $OCOR^1$, OS_2R^1, SR^1, SOR^1, SO_2R^1, COR^1, $CR^1=NOR^2$, CO_2R^1, $CONR^1R^2$ and $CSNR^1R^2$, wherein R^1 and R^2 are independently hydrogen, C_{1-4} alkyl or phenyl, and wherein the aliphatic moieties of any of the substituents are substituted with one or more of halogen, cyano, OR^1 or $OCOR^1$ and the phenyl moieties of any of the substituents being substituted with one or more of halogen, C_{1-4} alkyl, C_{1-4} alkoxy, nitro or cyano; or any two substitutents, when ortho to one another, join to form a benzene ring which is optionally substituted with one or more of the substituents recited above for the optionally substituted heterocyclic ring.

5,314,893

ANTIVIRAL TETRAHYDROPYRANS

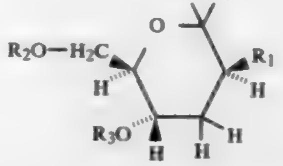
Joseph A. Tino, Robbinsville; Gregory S. Bisacchi, Lawrenceville, and Saleem Ahmad, Plainsboro, all of N.J., assignors to Bristol-Myers Squibb Co., Princeton, N.J.

Filed Jan. 25, 1993, Ser. No. 9,485

Int. Cl.^{5} A61K *31/505;* **C07D** *239/47, 239/54, 239/545*

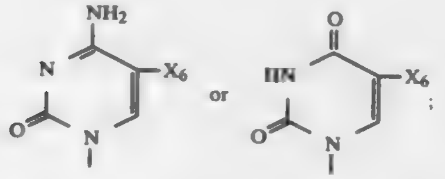
U.S. Cl. 514—274 **9 Claims**

1. A compound of the formula

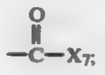


including a pharmaceutically acceptable salt thereof wherein:

R_1 is

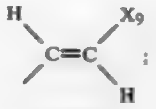


R_2 and R_3 are independently selected from hydrogen, PO_3H_2, and



$$-\overset{\overset{\textstyle O}{\|}}{C}-X_7;$$

X_6 is fluoro, chloro, bromo, iodo, hydrogen, methyl, trifluoromethyl, ethyl, n-propyl, 2-fluoroethyl, 2-chloroethyl or



(trans)

X_7 is hydrogen, alkyl, substituted alkyl, or aryl;

X_9 is chloro, bromo, iodo, hydrogen, methyl, or trifluoromethyl; and

the term "alkyl" refers to straight and branched chain groups of 1 to 10 carbons, the term "substituted alkyl" refers to such alkyl groups having one or more substituents selected from, the group consisting of chloro, bromo, fluoro, iodo, amino, azido, hydroxy, cyano, trialkylammonium (wherein each alkyl group has 1 to 6 carbons), alkoxy of 1 to 6 carbons, aryl and carboxy, and the term "aryl" refers to phenyl and phenyl substituted with one, two or three substituents selected from the group consisting of alkyl of 1 to 6 carbons, alkoxy of 1 to 6 carbons, chloro, bromo, fluoro, iodo, trifluoromethyl, amino, alkylamino of 1 to 6 carbons, dialkylamino wherein each alkyl is of 1 to 6 carbons, nitro, cyano, alkanoyloxy of 2 to 11 carbons, carboxy, carbamoyl, and hydroxy.

5,314,894

(S)-(+)-HYDROXYCHLOROQUINE

Vera J. Stecher, Dobbs Ferry, and William F. Michne, Poestenkill, both of N.Y., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed Sep. 15, 1992, Ser. No. 945,032

Int. Cl.^{5} A61K *31/47;* **C07D** *215/38*

U.S. Cl. 514—313 **12 Claims**

1. (S)-(+)-2-[[4-[(7-chloro-4-quinolinyl)amino]pentyl]ethylamino]ethanol substantially free of (R)-(−)-2-[[4-[(7-chloro-4-quinolinyl)amino]pentyl]ethylamino]ethanol, or a pharmaceutically acceptable acid-addition salt thereof.

5,314,895

BENZOPYRAN CLASS III ANTIARRHYTHMIC AGENTS

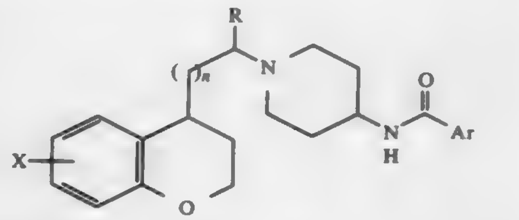
Bipinchandra N. Desai, Vernon Hills; Konrad F. Koehler, Glenview, and Mark A. Russell, Gurnee, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 810,582, Dec. 19, 1991, Pat. No. 5,240,943. This application Mar. 11, 1993, Ser. No. 29,728

Int. Cl.^{5} A61K *31/445;* **C07D** *211/06*

U.S. Cl. 514—318 **27 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt;

wherein n is 0, 1 or 2;

wherein R is H or lower alkyl of 1 to 6 carbon atoms;

wherein X is selected from the group consisting of hydrogen, methane sulfonamide, nitro, cyano, imidazolyl, alkoxy of 1 to 6 carbon atoms and hydroxy; and

wherein Ar is selected from the group consisting of pyridinyl and benzofuranyl optionally substituted by methane sulfonamide, nitro, cyano or imidazolyl.

5,314,896

1,3-SUBSTITUTED CYCLOALKENES AND CYCLOALKANES AS CENTRAL NERVOUS SYSTEM AGENTS

Bradley W. Caprathe, Redford; Dennis M. Downing, Ann Arbor; Juan C. Jaen, Plymouth; Stephen J. Johnson, Ann Arbor; William J. Smith, III, Ann Arbor; Lawrence D. Wise, Ann Arbor; Jonathan Wright, Ann Arbor, and David J. Wustrow, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 15, 1992, Ser. No. 957,277

Int. Cl.^{5} A61K *31/44;* **C07D** *211/70*

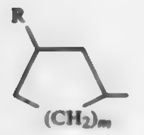
U.S. Cl. 514—332 **7 Claims**

1. A compound of Formula I

$$Z—CH_2—Y \qquad I$$

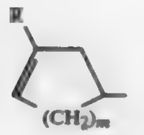
wherein

Z is

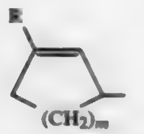


wherein R is aryl, 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, hydroxy, or halogen, and

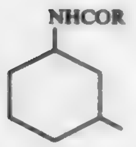
m is an integer of 1, 2, or 3,



wherein R and m are as defined above,

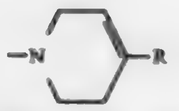


wherein R and m are as defined above,



wherein R is as defined above;

Y is



whrein R is as defined above; and corresponding isomers thereof; or a pharmaceutically acceptable acid addition salt thereof.

5,314,897

NITRO-SUBSTITUTED HETEROCYCLIC COMPOUNDS

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Koichi Moriya, Tokyo; Yumi Hattori, Tokyo; Ikuro Honda, Tokyo, and Katsuhiko Shibuya, Tokyo, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

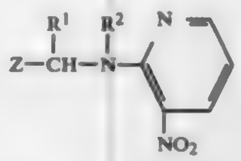
Continuation of Ser. No. 898,064, Jun. 12, 1992, abandoned, which is a division of Ser. No. 760,412, Sep. 16, 1991, abandoned, which is a division of Ser. No. 518,684, May 3, 1990, Pat. No. 5,081,132. This application Jul. 12, 1993, Ser. No. 90,566

Claims priority, application Japan, May 17, 1989, 1-121366

Int. Cl.^{5} A01N *43/40;* **C07D** *401/12*

U.S. Cl. 514—332 **6 Claims**

1. A nitro-substituted pyridine compound of the formula



wherein

R^1 represents hydrogen, cyano or C_{1-4} alkyl,

R^2 represents hydrogen or C_{1-4} alkyl, and

Z represents pyridyl optionally substituted by halogen or C_{1-4} alkyl.

5,314,898

ARYL THIOPYRANO[4,3,2-CD]INDOLES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

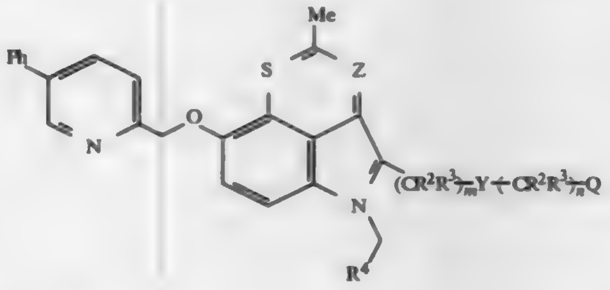
John Y. L. Chung, Edison; Robert A. Reamer, Bloomfield, both of N.J.; Yves Girard, Ile Bizard, and Pierre Hamel, Vimont, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J. and Merck Frosst Canada Inc., Kirkland, Canada

Filed Jun. 29, 1992, Ser. No. 906,062

Int. Cl.^{5} A61K *31/44;* **C07D** *495/08*

U.S. Cl. 514—338 **3 Claims**

1. A compound of the formula:



wherein:

R^2 is H, C_1–C_7 lower alkyl, hydroxy, or C_1–C_7 lower alkoxy, or two R^2 groups on adjacent carbon atoms may be a bond;

R^3 is H or lower alkyl;

m is 0 to 3;

n is 0 to 3;

R^4 is [phenyl(R^{10})2]t;

R^{10} is H, C_1–C_7 lower alkyl, or halogen;

t is 1 or 2;

Y is a bond, O or S;

Q is $—CO_2H$ or $—CONHS(O)_2R^{12}$;

R^{12} is C_1–C_7 lower alkyl, R^{10}-phenyl, CF_3, NH_2 or $N(C_1$–C_7 lower alkyl$)_2$;

Z is CHR^{20}, $CHWR^6$, or CO;

R^6 is H or C_1–C_7 lower alkyl;

R^{20} is H or C_1–C_7 lower alkyl;

W is O, S, or NR^6;

or a pharmaceutically acceptable salt thereof.

5,314,899

EPIBATIDINE AND DERIVATIVES, COMPOSITIONS AND METHODS OF TREATING PAIN

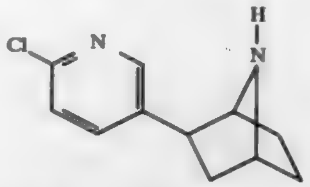
John W. Daly, Washington, D.C.; Thomas F. Spande, Bethesda, and Hugo M. Garraffo, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Mar. 3, 1992, Ser. No. 845,042

Int. Cl.^{5} C07D *401/04;* **A61K** *31/44*

U.S. Cl. 514—339 **7 Claims**

1. A purified and isolated compound having the formula:



or a pharmaceutically acceptable salt thereof.

5,314,900

ARYL THIOPYRANO[2,3,4-C,D]INDOLES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

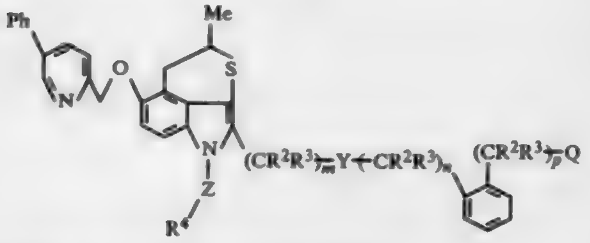
Yves Girard, Bizard; John H. Hutchinson, Montreal; Michel Therien, Laval, and Daniel Delorme, St-Lazare, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Filed Nov. 19, 1992, Ser. No. 978,834

Int. Cl.^{5} A61K *31/40, 31/44;* **C07D** *401/12*

U.S. Cl. 514—339 **9 Claims**

1. A compound of the formula:



Ib

wherein the substituents are as follows:

EX. NO.	R^4Z	$(CR^2R^3)_mY(CR^2R^3)_n$
1	$4-ClC_6H_4CH_2$	CH_2S
2	$3-ClC_6H_4CH_2$	CH_2S
3	$4-FC_6H_4CH_2$	CH_2S
4	$4-ClC_6H_4CH_2$	CH_2S
5	$4-ClC_6H_4CH_2$	CH_2O
6	$4-ClC_6H_4CH_2$	CH_2O
7	$4-ClC_6H_4CH_2$	CH_2O
8	$4-ClC_6H_4CH_2$	CH_2O
9	$4-ClC_6H_4CH_2$	CH_2O
10	$4-ClC_6H_4CH_2$	CH_2S
11	$3-ClC_6H_4CH_2$	CH_2O
12	$3-ClC_6H_4CH_2$	CH_2O
13	$4-FC_6H_4CH_2$	CH_2O
14	$4-FC_6H_4CH_2$	CH_2O
15	$3-Cl-4FC_6H_3CH_2$	CH_2O
16	C_6H_5	CH_2O
17*	$3-(C_5H_7O)C_6H_4CH_2$	CH_2O
18	$4-ClC_6H_4CH_2$	CH_2OCH_2
19	$4-ClC_6H_4CH_2$	CH_2OCH_2
20	$4-ClC_6H_4CH_2$	$(CH_2)_2OCH_2$
21	$4-ClC_6H_4CH_2$	$(CH_2)_2S$
22	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
23	$4-C;C_6H_4CH_2$	$(CH_2)_2O$
24	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
25	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
26	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
27	$3-ClC_6H_4CH_2$	$(CH_2)_2O$
28	$4-ClC_6H_4CH_2$	$(CH_2)_2S$
29	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
30	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
31	$4-ClC_6H_4CH_2$	$(CH_2)_2O$
32	$3-ClC_6H_4CH_2$	$(CH_2)_2O$
33	$3-ClC_6H_4CH_2$	$(CH_2)_2O$
(−)-enantiomer		
34	$3-ClC_6H_4CH_2$	$(CH_2)_2O$
(+)-enantiomer		
35	$4-FC_6H_4CH_2$	$(CH_2)_2O$
36	$4-FC_6H_4CH_2$	$(CH_2)_2O$
(−)-enantiomer		
37	$4-FC_6H_4CH_2$	$(CH_2)_2O$
(+)-enantiomer		
38	$4-FC_6H_4CH_2$	$(CH_2)_2O$
39	$3-FC_6H_4CH_2$	$(CH_2)_2O$
40	$4-ClC_6H_4CH_2$	S
41	$4-ClC_6H_4CH_2$	S
42	$4-ClC_6H_4CH_2$	CH═CH (E&Z isomers)
43	$4-ClC_6H_4CH_2$	$(CH_2)_2$
44	$4-ClC_6H_4CH_2$	$(CH_2)_2$
58	$4-ClC_6H_4CH_2$	CH_2O
(+)-enantiomer		
59	$4-ClC_6H_4CH_2$	CH_2O
(−)enantiomer		
60	$4-ClC_6H_4CH_2$	CH_2O
(−)enantiomer		
61	$4-FC_6H_4CH_2$	CH_2O
(+)enantiomer		
62	$4-FC_6H_4CH_2$	CH_2O
(−)enantiomer		
63	$3-I-4-N_3C_6H_3S(O)_2$	CH_2S
64	$3-ClC_6H_4CH_2$	CH_2O
(−)enantiomer		
65	$3-ClC_6H_4CH_2$	CH_2O
(+)enantiomer		

EX. NO.	$(CR^2R^3)_p$	Q
1	—	CO_2H,
2	—	CO_2H,
3	—	CO_2H,
4	—	$CONHS(O)_2Me$,
5	CH_2	CO_2H,
6	CH_2	$CONHS(O)_2Me$,
7	CH(Me)	CO_2H,
8	CH(Me)	$CONHS(O)_2Me$,
9	CH(Et)	CO_2H,
10	CH_2	CO_2H,
11	CH_2	CO_2H,
12	CH(Me)	CO_2H,
13	CH_2	CO_2H,
14	CH(Me)	CO_2H,
15	CH_2	CO_2H,
16	CH_2	CO_2H,
17*	CH_2	CO_2H,
18	—	CO_2H,
19	—	CN_4H,
20	—	CN_4H,
21	—	CO_2H,
22	—	CO_2H,
23	—	$CONHS(O)_2Me$,
24	—	CN_4H,
25	—	$S(O)_2NHCOMe$,
26	—	$S(O)_2NHCOPh$,
27	—	CO_2H,
28	CH_2	CO_2H,
29	CH_2	CO_2H,
30	CH(Me)	CO_2H,
31	CH(Et)	CO_2H,
32	CH_2	CO_2H,
33	CH_2	CO_2H,
(−)enantiomer		
34	CH_2	CO_2H,
(+)enantiomer		
35	CH_2	CO_2H,
36	CH_2	CO_2H,
(−)enantiomer		
37	CH_2	CO_2H,
(+)enantiomer		

-continued

38	CH(Me)	CO_2H,
39	CH_2	CO_2H,
40	—	CO_2H,
41	CH_2	CO_2H,
42	—	CN_4H,
43	—	CO_2H,
44	—	CN_4H,
58	CH_2	CO_2H,
(+)enantiomer		
59	CH_2	CO_2H,
(−)enantiomer		
60	CH(Me)	CO_2H,
(−)enantiomer		
61	CH(Me)	CO_2H,
(+)enantiomer		
62	CH(Me)	CO_2H,
(−)enantiomer		
63	—	CO_2H,
64	CH_2	CO_2H, or
(−)enantiomer		
65	CH_2	CO_2H,
(+)enantiomer		

*EX 17: C_5H_7O is 2H-5,6-dihydropyran-4-yl

5,314,901

1,2,5,6-TETRAHYDROPYRIDINE OXIME COMPOUNDS

Steven M. Bromidge; Barry S. Orlek, and Steven Dabbs, all of Harlow, England, assignors to Beecham Group p.l.c., England

PCT No. PCT/GB91/01456, § 371 Date Feb. 23, 1993, § 102(e) Date Feb. 23, 1993, PCT Pub. No. WO92/04323, PCT Pub. Date Mar. 19, 1992

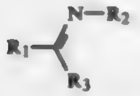
PCT Filed Aug. 29, 1991, Ser. No. 975,938

Claims priority, application United Kingdom, Sep. 1, 1990, 9019095

Int. Cl.^{5} **C07D** *213/57;* **A61K** *31/44*

U.S. Cl. 514—357 **9 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein R_1 represents a 1,2,5,6-tetrahydropyridin-3-yl group N-substituted by R_{10} wherein R_{10} represents hydrogen, C_{1-2} alkyl, prop-2-enyl, prop-2-ynyl or cyclopropyl; R_2 is a group OR_4, a group $OCOR_4$, a group $OCOR_5$ or a group NHR_6 or NR_7R_8 where R_4 is C_{1-4}alkyl, C_{2-4}alkenyl or C_{2-4}alkynyl, R_5 is hydrogen and R_6, R_7 and R_8 are independently C_{1-2}alkyl; and R_3 is chloro, fluoro, bromo, methoxy, C_{1-3} alkyl substituted by one, two or three halogen atoms, or R_3 is a group $(CH_2)_nR_9$ where R_9 is —CN, —SH or —SCH_3 and n is 0 or 1, with the proviso that when n is 0, R_9 is not —SH.

5,314,902

UREA DERIVATIVES USEFUL AS PLATELET AGGREGATION INHIBITORS

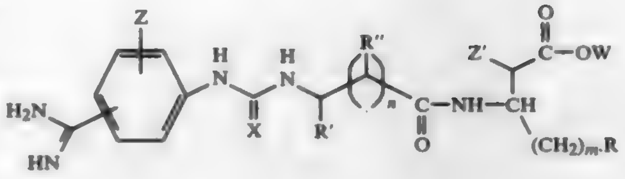
Foe S. Tjoeng, Manchester; Mihaly V. Toth, St. Louis; Dudley E. McMackins, St. Charles, all of Mo., and Steven P. Adams, Andover, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 27, 1993, Ser. No. 9,526

Int. Cl.^{5} **A61K** *31/44;* **C07D** *213/16*

U.S. Cl. 514—357 **4 Claims**

1. A compound or a pharmaceutically acceptable salt thereof having the formula:



wherein

R is pyridyl;

W is selected from the group consisting of hydrogen, and lower alkyl radicals;

Z, Z′ are hydrogen;

X is selected from the group consisting of oxygen, sulfur or nitrogen radicals, wherein nitrogen radicals may be substituted with hydrogen, and lower alkyl radicals;

R′, R″ are independently selected from the group consisting of hydrogen, lower alkyl radicals and monocyclic or bicyclic aromatic hydrocarbon radicals;

m is 0 to 1; and

n is an integer 0 to 1.

5,314,903

BENZIMIDAZOLE COMPOUNDS USEFUL AS CALCIUM CHANNEL BLOCKERS

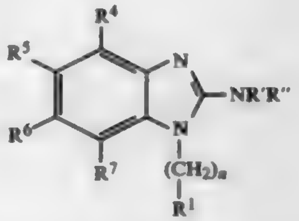
Oskar Axelsson, Malmö; Mikkel Thaning, Hjärup, both of Sweden, and Peter Moldt, Humlebaek, Denmark, assignors to NeuroSearch A/S, Glostrup, Denmark

Continuation-in-part of Ser. No. 801,754, Dec. 3, 1991, abandoned. This application Nov. 18, 1992, Ser. No. 978,131

Int. Cl.^{5} **A61K** *31/415;* **C07D** *235/30*

U.S. Cl. 514—388 **7 Claims**

1. A method of treating a disorder, which is responsive to the partial or complete blockade of calcium channels of the central nervous system, of a mammal, including a human, which comprises administering to a mammal in need thereof a therapeutically-effective amount of a compound selected from those having the formula:



wherein

R′ and R″ independently of each other are hydrogen or alkyl, or R′ and R″ together form a 3 to 6 membered alkylene chain;

n is 1 or 2;

R^1 is phenyl which may be substituted one or more times with halogen, CF_3, alkoxy, alkyl, or amino; and

R^4, R^5, R^6 and R^7 independently of each other are hydrogen, halogen, amino, CF_3, alkyl or alkoxy; or a pharmaceutically-acceptable addition salt thereof.

5,314,904

PHARMACEUTICAL COMPOSITIONS CONTAINING RIFAXIMIN FOR TREATMENT OF VAGINAL INFECTIONS

Marchi Egidio, Casalecchio di Reno; Rotini L. Gabriele, Bologna, both of Italy; Desai Subhash, Grayslake, and Grillli Massimo, Highland Park, both of Ill., assignors to Alfa Wassermann S.p.A., Alanno, Italy

Filed Jun. 16, 1992, Ser. No. 899,421

Claims priority, application Italy, Dec. 17, 1991, 000476 A/91BO

Int. Cl.^{5} **A61K** *31/415*

U.S. Cl. 514—394 **7 Claims**

1. A method of treatment of a vaginal infection which consists of administering topically to a subject in need of treatment a vaginal pharmaceutical composition containing a therapeutically effective amount of Rifaximin in the form of a foam, a cream, a gel, a vaginal ovule or a vaginal capsule.

5,314,905

PYROPHEOPHORBIDES CONJUGATES AND THEIR USE IN PHOTODYNAMIC THERAPY

Ravindra K. Pandey, Buffalo, and Thomas J. Dougherty, Grand Island, both of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

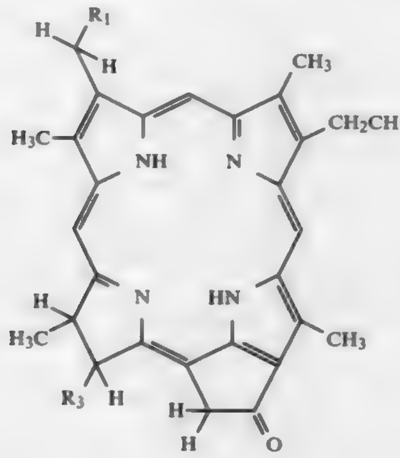
Division of Ser. No. 822,409, Jan. 17, 1992, Pat. No. 5,198,460, which is a continuation-in-part of Ser. No. 597,786, Oct. 19, 1990, Pat. No. 5,093,349, which is a continuation of Ser. No. 221,804, Jul. 20, 1988, Pat. No. 5,002,962. This application Nov. 9, 1992, Ser. No. 973,174

Int. Cl.^{5} **A61K** *31/40;* **C07D** *487/22*

U.S. Cl. 514—410 **20 Claims**

1. A conjugate comprising a target-specific component covalently bound to a compound of formula I:

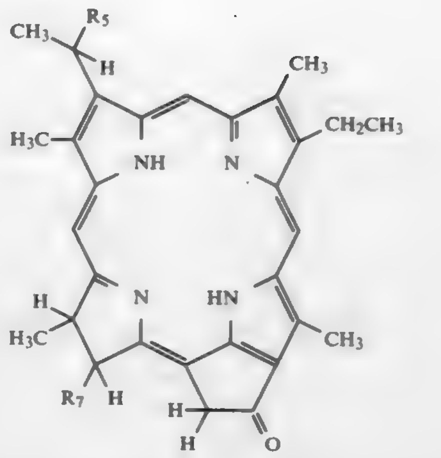
I



wherein R_1 is CH_2OR_2 where R_2 is a primary or secondary alkyl containing 1 to 20 carbons; and R_3 is —CO_2R_4 where R_4 is H or an alkyl containing 1 to 20 carbons.

9. A conjugate comprising a target-specific component covalently bound to a compound of formula II:

II



wherein R_5 is —OR_6 where R_6 is a primary or secondary alkyl containing 1 to 20 carbons and R_7 is —CO_2R_8 where R_8 is H or an alkyl containing 1 to 20 carbons.

5,314,906

DERIVATIVES OF PHYSOSTIGMINE, THEIR USE AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM

Ezio Bombardelli, Milan, Italy, assignor to Indena S.p.A., Italy

Filed Jan. 11, 1993, Ser. No. 2,794

Claims priority, application United Kingdom, Mar. 16, 1992, 9205670

Int. Cl.^{5} **C07D** *487/00;* **A61K** *31/40*

U.S. Cl. 514—411 **11 Claims**

1. A salt of physostigmine and a phosphatidic acid.

5,314,907

3-AMINOCHROAN COMPOUNDS

Gérald Guillaumet, Orleans, and Béatrice Guardiola, Neuilly sur Seine, both of France, assignors to Adir et Compagnie, Courbevoie, France

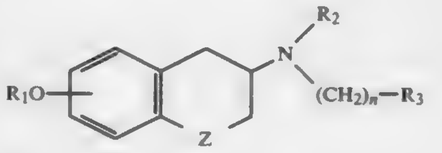
Division of Ser. No. 677,136, Mar. 29, 1991, Pat. No. 5,252,578. This application Oct. 9, 1992, Ser. No. 959,044

Claims priority, application France, Apr. 9, 1990, 90 04481

Int. Cl.^{5} **C07D** *217/22;* **A61K** *31/40*

U.S. Cl. 514—414 **8 Claims**

1. A compound selected from these of formula (I):



(I)

in which:

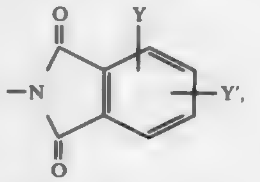
Z represents oxygen or sulfur,

R_1 represents hydrogen or (C_1–C_6) alkyl,

R_2 represents hydrogen or (C_1–C_6) alkyl,

n is an integer of 1 to 6 inclusive,

R_3 represents the following group:



in which:

Y and Y', which may be identical or different, represent hydrogen, halogen, alkyl, alkoxy, or hydroxyl, and
m is 1 or 2; and
its enantiomers, diastereoisomers and epimers and its pharmaceutically-acceptable acid.

5,314,908
COMPOUNDS USEFUL AS ANTIPROLIFERATIVE AGENTS

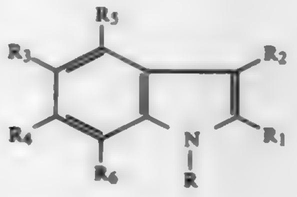
Donald A. McAfee, Richmond, Va., assignor to Whitby Research, Inc., Richmond, Va.

Division of Ser. No. 802,723, Dec. 5, 1991, Pat. No. 5,206,377. This application Nov. 17, 1992, Ser. No. 977,455

Int. Cl.^{5} C07D *209/10*

U.S. Cl. 514—415 **14 Claims**

1. A pharmaceutical composition useful for the treatment of mammals having mammary carcinogenesis comprising compounds selected from the group consisting of those of the formula



where
R is hydrogen or C_1 to C_6 linear or branched alkylene substituted with phenyl;
R_1 is benzyl or naphthylmethyl;
R_2 is 1-pyrrolyl or 1-pyrrolyl substituted with one or more alkyl or alkoxy or the group —$(CH_2)_mNHR'_2$ where m is 1 to 3 and R'_2 is phenylsulfonyl, the phenyl group optionally substituted with alkyl;
R_3, R_4, R_5 and R_6 are the same or different and are hydrogen, C_1 to C_6 linear or branched alkyl, C_1 to C_6 linear or branched alkoxy, or phenoxy or phenoxy substituted with one or more C_1 to C_6 linear or branched alkyl.

5,314,909
USE OF NON-STEROIDAL ANTIIFLAMMATORY AGENTS IN MACULAR DEGENERATION

Jens Dollerup, Lyngby, Denmark, assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 17, 1993, Ser. No. 32,366

Int. Cl.^{5} A61K *31/40, 31/21, 31/19*

U.S. Cl. 514—420 **3 Claims**

1. A method of treating macular degeneration which comprises the topical ocular administration to a patient in need of such treatment of an effective amount of an NSAID.

5,314,910
ESTER INHIBITORS

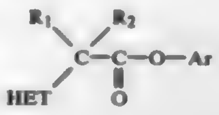
Gary P. Kirschenheuter, Arvada, Colo.; Raymond T. Cunningham, Houston, Tex., and John C. Cheronis, Lakewood, Colo., assignors to Cortech Inc., Denver, Colo.

Division of Ser. No. 866,301, Apr. 13, 1992, Pat. No. 5,240,956, which is a continuation of Ser. No. 610,207, Nov. 7, 1990, abandoned. This application Jan. 19, 1993, Ser. No. 5,282

Int. Cl.^{5} A01N *43/12, 43/08;* **C07D** *333/52, 33/02*

U.S. Cl. 514—443 **8 Claims**

1. A compound of the formula:



wherein:
R_1 and R_2, which may be the same or different, are selected from the group consisting of hydrogen, alkyl or 1–4 carbons, cycloalkyl of 3–6 carbons or together represent a methylene group —$(CH_2)_n$— where n is a whole number of 1 to 6;
Ar is phenyl or phenyl substituted with a member of the group consisting of halogen, nitro, —$C(O)CH_3$, —$S(O)_pR_9$ where p is 0, 1 or 2 and R_9 is hydroxy, —ONa, alkyl or 1–12 carbons, lower alkyl substituted with halogen, lower alkyl bearing a carboxylic group and cycloalkyl; and
HET is furanyl, thienyl, benzfuranyl and benzthienyl, provided that R_1 and R_2 are not both hydrogen.

5,314,911
IMMUNOSUPPRESSIVE AGENT

Tadashi Yoshida, Osaka; Kenzo Koizumi, Sakai; Yoshimi Kawamura, Minoo; Koichi Matsumoto, Toyonaka, and Hiroshi Itazaki, Takarazuka, all of Japan, assignors to Shionogi Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1993, Ser. No. 30,884

Claims priority, application Japan, Mar. 13, 1992, 4-089512; Apr. 28, 1992, 4-136241

Int. Cl.^{5} A61K *31/35*

U.S. Cl. 514—451 **5 Claims**

1. A compound which is (5R*,6R*)-5-ethyl-5,6-dihydro-6-[(E)-(2R*,3S*,4R*,5S*)-2-hydroxy-4-methoxy-3,5-dimethyl-7-nonenyl]-2H-pyran-2-one.

3. An immunosuppressive agent which comprises the compound of claim 1 as an effective ingredient.

5,314,912
SLIDING PROPERTY IMPROVING AGENT AND PROCESS FOR MAKING THE SAME

Shouichi Yoshitani, Aichi; Hiroki Mizutani, Handa; Nobuyoshi Suzuki; Kazumine Ohara, all of Aichi; Yasushi Ohyanagi, Tokyo, and Isamu Sekiguchi, Sagamihara, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Division of Ser. No. 632,380, Dec. 21, 1990, abandoned. This application Jan. 21, 1993, Ser. No. 7,371

Claims priority, application Japan, Dec. 22, 1989, 1-334474; Jan. 19, 1990, 2-10111; Feb. 9, 1990, 2-31174; Feb. 16, 1990, 2-35268; Mar. 6, 1990, 2-54179; Mar. 8, 1990, 2-57379; Mar. 27, 1990, 2-77997; Apr. 13, 1990, 2-96210

Int. Cl.^{5} C08K *3/20, 9/04*

U.S. Cl. 524—458 **3 Claims**

1. A method of improving the sliding property of a thermoplastic resin selected from the group consisting of a polyoxymethylene resin, a polycarbonate resin, a styrene resin, a polyester resin, a polyarylene sulfide resin, a polyamide resin, a polyphenylene ether resin, a polyarylate resin and mixtures thereof, said method comprising the steps of adding 0.1–50% by weight of a lubricating material and 0.1–50% by weight of sliding property improving agent, said agent comprising a multiphase structure thermoplastic resin made of a graft copolymer which consists of from 5 to 95 parts by weight of an ethylene polymer (a) and from 95 to 5 parts by weight of a vinyl polymer (b) formed from a monomer selected from the group consisting of an aromatic vinyl monomer, an acrylic acid ester monomer, a methacrylic acid ester monomer, a vinyl cyanide monomer, a vinyl ester monomer and mixtures thereof, said vinyl polymer (b) having a mean number degree of polymerization of from 10 to 5,000, one of ethylene polymer (a) and vinyl polymer (b) being a dispersed polymer and the other being a dispersing polymer.

5,314,913
4- OR 5-(SUBSTITUTED SULFONYL)METHYL-3(2H)-FURANONES

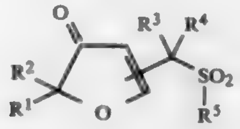
Steven W. Felman, Langhorne, Pa.; Ivo L. Jirkovsky, Plainsboro, and Kevin A. Memoli, Cranbury, both of N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Dec. 8, 1992, Ser. No. 986,644

Int. Cl.^{5} A61K *31/34;* **C07D** *307/38, 307/40*

U.S. Cl. 514—473 **6 Claims**

1. The compounds of formula (I)



(I)

wherein:
R^1 and R^2 are, independently, branched or straight chain alkyl containing 1 to 6 carbon atoms, phenyl, or halogen substituted phenyl;
R^3 and R^4 are independently hydrogen, branched or straight chain alkyl containing 1 to 6 carbon atoms;
R^5 is branched or straight chain alkyl containing 1 to 6 carbon atoms, phenyl, naphthyl or substituted phenyl wherein the substituent is selected from the group consisting of branched or straight chain alkyl containing 1 to 6 carbon atoms, halogen, methoxy, nitro and acetamide.

5,314,914
METHODS AND COMPOSITIONS FOR COMBATTING HERPES VIRUSES

Yvan Guindon, Montreal, Canada, assignor to BioMega/Boehringer Ingelheim Research Inc., Laval, Canada

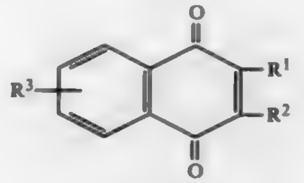
Continuation of Ser. No. 425,522, Oct. 23, 1989, abandoned. This application Feb. 19, 1992, Ser. No. 838,127

Claims priority, application Canada, Oct. 27, 1988, 581456

Int. Cl.^{5} A61K *31/275*

U.S. Cl. 514—520 **5 Claims**

1. A method for relieving herpes viral infections in a mammal which comprises administering to the mammal an effective amount of a compound of the formula



wherein R^1 and R^2 are the same and are methoxy, ethoxy, propoxy, butoxy, 2-methylpropoxy or 1,1-dimethylethoxy and R^3 is a substituent at the 5 or 6 position of the naphthoquinone ring system, the substituent being selected from the group consisting of bromo, chloro, fluoro, cyano, phenylthio, methylthio, methoxy, ethoxy, propoxy, 1-methylethoxy, butoxy, 2-methylpropyl, acetyl and benzoyl.

5,314,915
BIOADHESIVE PHARMACEUTICAL CARRIER

William F. Rencher, Devon, Pa., assignor to McNeil-PPC, Inc., Milltown, N.J.

Division of Ser. No. 766,493, Sep. 25, 1991, Pat. No. 5,192,802. This application Dec. 16, 1992, Ser. No. 991,696

The portion of the term of this patent subsequent to Mar. 9, 2010, has been disclaimed.

Int. Cl.^{5} A61K *9/00, 9/06, 31/245*

U.S. Cl. 514—535 **10 Claims**

1. A bioadhesive pharmaceutical gel, consisting essentially of:
a therapeutically effective amount of at least one anesthetic other than benzocaine;
about 0.25 to about 25 percent by weight sodium carboxymethyl cellulose;
about 0.25 to about 25 percent by weight of xanthan gum or sodium alginate; and
diluent selected from the group consisting of glycerin, propylene glycol, dioxolanes, glycerol, glycofurol, dimethylacetamide, ethyl lactate, alcohols, glycols, sorbitols, USP oils, NF oils, lecithin, lanolin, ethyl oleate, isopropyl myristate, benzyl benzoate, petrolatum, cocoa butter and mixtures thereof.

5,314,916
B_2 ADRENEGIC AGONISTS AND USE THEREOF IN THE TREATMENT OF GLAUCOMA

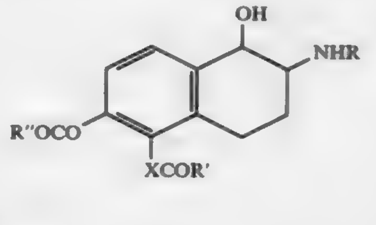
Billie M. York, Fort Worth, and Evan P. Kyba, Arlington, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Apr. 19, 1993, Ser. No. 49,462

Int. Cl.^{5} A61K *31/22, 31/24;* **C07C** *69/03, 69/757*

U.S. Cl. 514—542 **9 Claims**

4. A topical ophthalmic composition for controlling intraocular pressure, comprising an amount of a compound of the following formula effective to control intraocular pressure:



(I)

wherein:
X=O or NH;
R%32 lower alkyl, lower branched alkyl, or lower cycloalkyl;
if X=O, then R'=R"=lower branched alkyl or cycloalkyl; and
if X=NH, then R'=H, lower alkyl, branched alkyl or cycloalkyl, and R"=lower branched alkyl or cycloalkyl, or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable vehicle therefor.

5,314,917
METHOD FOR INACTIVATING ENVELOPED VIRUSES AND SPERM

Edwin B. Michaels, Milford, Conn., and Daniel Malamud, Merion, Pa., assignors to E. B. Michaels Research Associates, Inc., Milford, Conn.

Filed Mar. 22, 1991, Ser. No. 673,784

Int. Cl.^{5} A61K *31/205, 31/13*

U.S. Cl. 514—556 **32 Claims**

1. A contraceptive composition comprising as active ingredients a mixture of a) a betaine selected from the group consisting of N-alkyl-betaines, N-alkyl-sulfobetaines, N-acylbetaines, and a mixture of two or more said betaines and b) an amine oxide selected from the group consisting of alkyl-N,N-dimethylamine oxides, alkyl-N,N-dihydroxyethylamine oxides, acylamide t-amine oxides and a mixture of two or more said amine oxides and a carrier in the form of a sponge, condom, vaginal insert, contraceptive film, suppository or sustained release device.

5,314,918

LEUKOTRIENE ANTAGONISTS

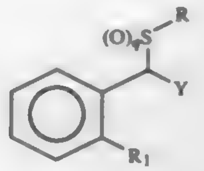
James S. Frazee, Sewell, N.J.; John G. Gleason, Downingtown, and Ralph F. Hall, Villanova, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation of Ser. No. 366,046, Jun. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 66,588, Jun. 24, 1987, abandoned. This application Apr. 2, 1992, Ser. No. 864,156

Int. Cl.⁵ A61K *31/19*

U.S. Cl. 514—570 **15 Claims**

1. A compound represented by the following structural formula (I):



(I)

wherein

q is 0, 1 or 2;

R_1 is $(L)_a$—$CH_2)_b$—$(T)_c$—M

a is 0 or 1;

b is 3 to 14;

c is 0 or 1;

L and T are independently sulfur, oxygen, or CH_2 with the proviso that L and T are not sulfur when q is 1 or 2; and

M is C_{104}alkyl, ethynyl, trifluoromethyl, isopropenyl, thienyl, cyclohexyl or phenyl unsubstituted or monosubstituted with Br, Cl, CF_3, $C_{1\text{-}4}$alkoxy, $C_{1\text{-}4}$alkyl, methylthio, or trifluoromethylthio;

Y is $(CHX)_n(CH_2)_p$—Z wherein

R_3 is OH, NH_2, aryloxy, or $C_{1\text{-}6}$alkoxy;

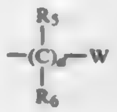
n is 0 or 1;

p is 0 or 1;

X is H, OH, $C_{1\text{-}4}$alkyl, $C_{1\text{-}4}$alkoxy, or F; and

Z is COR_3, or tetrazolyl;

R is

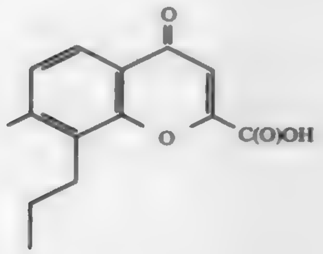


$$-\overset{R_5}{\underset{R_6}{(C)_d}}-W$$

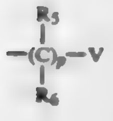
R_5 and R_6 are independently hydrogen or $C_{1\text{-}4}$alkyl at any point when d is not O;

d is 0 to 6;

W is phenyl, unsubstituted or substituted with B, C, or D; or W is



B is



$$-\overset{R_5}{\underset{R_6}{(C)_p}}-V$$

wherein R_5 and R_6 are independently hydrogen or $C_{1\text{-}4}$alkyl;

p is 0 to 6;

V is H, C1-4alkyl, COR_3, SO_3H, SO_2H, $SO_2NH_2HN_2$, $COCH_2OH$, $CHOHCH_2OH$, or tetrazolyl, with R_3 as defined above;

C and D are independently selected from H, OH, F, Cl, Br, CF_3, $C_{1\text{-}4}$alkyl, $C_{1\text{-}4}$ alkoxy, methylthio, trifluoromethylthio, NO_2, NH_2, $NHC_{1\text{-}4}$alkyl, or $C_{1\text{-}4}$alkylCO-; or a pharmaceutically acceptable salt thereof.

5,314,919

CALCIUM SUPPLEMENTS

Stephen A. Jacobs, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 515,529, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 408,453, Sep. 14, 1989, abandoned, which is a continuation of Ser. No. 90,813, Aug. 28, 1987, abandoned. This application Feb. 6, 1991, Ser. No. 652,386

Int. Cl.⁵ A61K *31/19;* **C07C** *59/245*

U.S. Cl. 514—574 **7 Claims**

1. Calcium citrate malate, having a molar ratio of calcium:citrate:malate of about 6:2:3.

5,314,920

ETHYNYL-ALANINE ARYL/ALKYLSULFONYL-TERMINATED AMINO-DIOL COMPOUNDS FOR TREATMENT OF HYPERTENSION

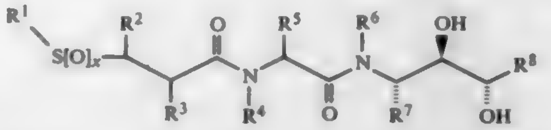
Barbara B. Chen, Glenview; Gunnar J. Hanson, Skokie, and John S. Baran, Winnetka, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 20, 1992, Ser. No. 916,447

Int. Cl.⁵ A61K *31/16*

U.S. Cl. 514—616 **25 Claims**

1. A compound of Formula I:



(I)

wherein R^1 is selected from the group consisting of alkyl, trifluoromethyl, cycloalkyl, cycloalkylalkyl, aryl, haloaryl, aralkyl and haloaralkyl; wherein x is a number selected from the group consisting of zero, one and two; wherein R^2 is selected from the group consisting of hydrido and alkyl; wherein R^3 is selected from the group consisting of hydrido, cycloalkylalkyl, aralkyl and haloaralkyl; wherein each of R^4 and R^6 is independently selected from the group consisting of hydrido and methyl; wherein R^5 is propargyl or a propargyl-containing moiety; wherein R^7 is selected from the group consisting of alkyl, cycloalkylalkyl and aralkyl; wherein R^8 is a group selected from the group consisting of hydrido, alkyl, hydroxyalkyl, cycloalkyl, cycloalkylalkyl, alkenyl and haloalkenyl; and wherein any one of said R^1 through R^8 groups having a substitutable position may be substituted with one or more groups selected from the group consisting of alkyl, hydroxy, alkoxy and alkenyl.

5,314,921

MIXED LIPID-BICARBONATE COLLOIDAL PARTICLES

David W. Yesair, 136 Main St., Byfield, Mass. 01922

Continuation of Ser. No. 567,243, Aug. 13, 1990, abandoned. This application Jun. 30, 1992, Ser. No. 908,442

Int. Cl.⁵ A61K *47/00*

U.S. Cl. 514—784 **11 Claims**

1. A composition for oral administration to an individual comprising:

a. at least one non-esterified fatty acid having 14–18 carbon atoms;

b. at least one monoglyceride which is a monoester of glycerol and a fatty acid having 14–18 carbon atoms;

c. lysophosphatidylcholine in which the fatty acid moiety has 14–18 carbon atoms; and

d. bicarbonate;

wherein said fatty acids and monoglycerides together comprise from about 70.0 mole percent to about 99.0 mole percent of the lipid composition and the molar ratio of said fatty acids to said monoglycerides, is from about 2:1 to about 1:2, and said lysophosphatidylcholine comprises from about 30.0 mole percent to about 1.0 mole percent of said lipid composition; and

wherein the composition is in the form of colloidal particles in an aqueous environment.

5,314,922

ION EXCHANGE FIBERS AND METHOD FOR MANUFACTURING THE SAME

Yousuke Takai, Hyogo, Japan, assignor to Daiwabo Create Co., Ltd., Osaka, Japan

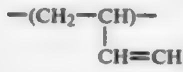
Filed Nov. 13, 1991, Ser. No. 791,240

Claims priority, application Japan, Nov. 19, 1990, 2-313716

Int. Cl.⁵ C08F *8/36*

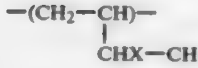
U.S. Cl. 521—33 **7 Claims**

1. Ion exchange fibers comprising a sheath and a core, wherein a polymer component of said sheath comprises a primary chain of syndiotactic poly(1,2-butadiene), and wherein said primary chain further comprises ion exchange functional groups, wherein said polymer component is represented by the following formulas:



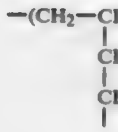
$$-(CH_2-\underset{CH=CH_2}{\underset{|}{CH}})-$$

[A]



$$-(CH_2-\underset{CHX-CH_2Y}{\underset{|}{CH}})-$$

[B]



$$-(CH_2-\underset{\underset{\underset{|}{CH_2}}{|}}{\underset{CH-}{\underset{|}{CH}}})-$$

[C]

wherein X and Y are the same or different and are selected from the group consisting of sulfonic acid groups and sulfonic acid salt groups, wherein said polymer component comprises from about 5 to about 99 mol % of the unit represented by said formula, from about 1 to about 85 mol % of the unit represented by said formula and from about 0 to about 10 mol % of the unit represented by said formula.

5,314,923

POROUS POLYMER BEADS AND PROCESS

Michael T. Cooke, New York, N.Y., and Laura J. Hiscock, Norwalk, Conn., assignors to Cytec Technology Corp.

Continuation of Ser. No. 275,256, Nov. 23, 1988, abandoned. This application Aug. 29, 1991, Ser. No. 752,915

The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.

Int. Cl.⁵ C08J *9/28*

U.S. Cl. 521—64 **14 Claims**

1. A process for the preparation of isotropic polymer beads, said process comprising:

(i) heating and mixing a polymer or copolymer selected from the group consisting of vinyl addition polymers, condensation polymers and oxidation polymers which are soluble in a liquid medium and form rigid structures at the temperatures at which said beads will be used with a mixture comprising an organic or inorganic liquid solvent capable of dissolving said polymer or copolymer without permanent chemical transformation and a liquid non-solvent which is immiscible with said polymer or copolymer to form a homogeneous solution:

(ii) breaking said homogenous solution into droplets;

(iii) cooling said droplets, optionally in the presence of an inert liquid, to bring about phase separation and solidification of the polyerm or copolymer in the droplets; and

(iv) separating the droplets from any inert liquid and the solvent-non-solvent mixture to produce isotropic porous beads.

5,314,924

ANTISTATIC POLYOLEFIN COMPOSITION

Shau-Tarng Lee, Oakland, N.J., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Filed Oct. 12, 1993, Ser. No. 133,891

Int. Cl.⁵ C08J *9/14*

U.S. Cl. 521—79 **19 Claims**

1. A process for producing a foam polyolefin product exhibiting desirable antistatic properties, comprising of the steps of:

forming a polyolefin composition comprising a polyolefin resin; a hydrocarbyl sulphonate; and an ester of a long-chain fatty acid and polyhydric alcohol, said sulphonate and said ester each being present in said composition in an amount sufficient to form a polyolefin foam product having desirable antistatic properties;

adding to said composition a blowing agent for expanding said composition; and

extruding the mixture of said composition and said blowing agent under conditions so as to produce a foamed antistatic polyolefin product.

5,314,925

USE OF POLYTETRAFLUOROETHYLENE RESINS AS A NUCLEATING AGENT FOR FOAM MOLDED THERMOPLASTICS

Ann M. Burnell, Schenectady, N.Y.; Albin P. Berzinis, Lenox; Timothy M. Conroy, Pittsfield, both of Mass., and Kim G. Balfour, Schenectady, N.Y., assignors to General Electric Company, Mass.

Filed Dec. 3, 1992, Ser. No. 984,782

Int. Cl.⁵ C08J *9/06*

U.S. Cl. 521—92 **11 Claims**

1. A process for producing structural aromatic polycarbonate thermoplastic foam articles, said process comprising: gas expansion of a melted aromatic polycarbonate thermoplastic resin composition comprising at least one foamable aromatic polycarbonate thermoplastic resin and an amount of a microfibrillar polytetrafluoroethylene nucleating agent effective to enhance the cell structure uniformity of the structural foam.

5,314,926

HYDROFLUOROCARBON COMPOSITIONS AS BLOWING AGENTS FOR CELLULAR PLASTICS

Mark L. Robin; Yuichi Iikubo, both of West Lafayette; W. Douglas Register, Lafayette, and Richard S. Rose, West Lafayette, all of Ind., assignors to Great Lakes Chemical Corporation, W. Lafayette, Ind.

Division of Ser. No. 37,029, Mar. 25, 1993, Pat. No. 5,278,196. This application Oct. 4, 1993, Ser. No. 131,974

Int. Cl.⁵ C08J *9/14*

U.S. Cl. 521—98 **5 Claims**

1. A polymer foam which is essentially free of polyisocyanate based polymers comprising:

a blowing agent consisting essentially of 1,1,1,2,3,3,3-heptafluoropropane and a halohydrocarbon selected from the group consisting of 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), 1,1,2,2-tetrafluoroethane (HFC-134), 1-chloro-1,1,-difluoroethane (HCFC-142b) and 1,1,1,2,3,3-hexafluoropropane (HFC-236ea).

5,314,927

POLYESTER FOAMED ARTICLES AND METHOD FOR PRODUCING THE SAME

Haruhiko Kondo; Mitsuhiro Imaizumi; Ryosuke Kamei; Hideharu Kimura, all of Kawasaki, and Eiichiro Takiyama, Kamakura, all of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1993, Ser. No. 48,412

Claims priority, application Japan, May 13, 1992, 4-120786; May 14, 1992, 4-122200; May 14, 1992, 4-122201; May 14, 1992, 4-122202; May 14, 1992, 4-122203; May 14, 1992, 4-122204

Int. Cl.^{5} C08G *18/00*

U.S. Cl. 521—159 **22 Claims**

1. A method for producing polyester foamed articles comprising:

obtaining a prepolymer having a number-average molecular weight of at least 10,000 from a reaction of at least an aliphatic glycol and an aliphatic dicarboxylic acid, wherein the reaction includes (a) succinic acid, or its derivatives, reacted with 1,4-butanediol, (b) succinic acid, adipic acid, or their derivatives, reacted with 1,4-butanediol, or (c) succinic acid, or its derivatives, reacted with ethylene glycol;

adding from 0.1 to 5 parts by weight of diisocyanate to 100 parts by weight of the prepolymer in a molten state to obtain a crystalline aliphatic polyester having a melt viscosity of 1.0×10^3–1.0×10^6 poises at a temperature of 190° C. and a shear rate of 100 sec^{-1}, and having a melting point of 70°–190° C.;

adding a foaming agent to the crystalline aliphatic polyester having a melt viscosity of 1.0×10^3–1.0×10^6 poises at a temperature of 190° C. and a shear rate of 100 sec^{-1}, and having a melting point of 70°–190° C.; then

heating and foaming.

5,314,928

METHOD FOR PREPARING POLYUREA - POLYURETHANE FLEXIBLE FOAMS

Gabriel Verhelst, Herent, Belgium, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 10, 1991, Ser. No. 774,442

Claims priority, application United Kingdom, Oct. 12, 1990, 9022194

Int. Cl.^{5} C08J *9/08*

U.S. Cl. 521—159 **5 Claims**

1. A method for preparing a polyurethane/polyurea flexible foam which comprises reacting:

A. an organic prepolymer-containing polyisocyanate composition of NCO content of from 2 to 15% by weight obtained by reacting an isocyanate-reactive polymer having an average nominal functionality of from 2 to 6 and an average equivalent weight of from 500 to 5000 with a stoichiometric excess of a diphenylmethane diisocyanate composition having an average isocyanate functionality in the range from 2 to 2.3; and

B. an isocyanate reactive component in which the isocyanate-reactive species comprises at least 40% by weight of water and at least one chain extender of molecular weight below 1000 which is selected from the group consisting of a Mannich condensate of phenol or phenol derivatives, formaldehyde and alkanolamines, isophorone diamine, hydrogenated methylene dianiline, diaminomenthane, hydrogenated toluene diamine, diethyl toluene diamine and N,N'-dialkyl(1-6C)-4,4'-diphenylmethane diamine; wherein the molar ratio of said isocyanate to water is from 3:1 to 1:8 and the molar ratio of said isocyanate to said chain extender is from 1:1 to 500:1.

5,314,929

RAPIDLY CURABLE VINYL ETHER RELEASE COATINGS

James V. Crivello, Clifton Park, N.Y., and James A. Dougherty, Pequannock, N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Aug. 10, 1992, Ser. No. 926,425

Int. Cl.^{5} C08F *2/50, 16/18, 216/18*

U.S. Cl. 522—31 **12 Claims**

1. A solventless, silicone free, UV curable release coating composition consisting essentially of:

(a) between about 50 and about 95 wt. % of an alkyl vinyl ether having the formula $C_nH_{2n+1}O—CH═CH_2$ where n has a value of from 12 to 20 and optionally containing up to 50 wt. % of a cationically polymerizable conomoner;

(b) between about 5 and about 50 wt. % of a poly(vinyl ether) crosslinking agent and

(c) between about 0.1 and about 10 wt. % of an onium salt initiator having the formula

$$[R—A^+][X^-]$$

wherein R is an aromatic radical selected from the group of aryl, alkaryl, aralkyl which includes mono-, di- or fused ring structures and is optionally substituted with a linear, branched or cyclic C_8 to C_{18} radical of alkyl, alkylene, alkoxy, alkyleneoxy, a nitrogen, oxygen or sulfur heterocyclic radical or a mixture thereof; A^+ is selected from the group of iodonium cation monosubstituted with C_1 to C_{20} alkyl or aryl optionally substituted with C_1 to C_{20} alkyl or alkoxy and sulfonium cation distributed with C_1 to C_{20} alkyl or aryl optionally substituted with C_1 to C_{20} alkyl or alkoxy or a mixture thereof and X^- is a non-basic, non-nucleophilic anion.

5,314,930

BETA KETO MIXED ACYLATE MONOMERS

Gerald Sugerman, 8 Cambridge Dr., Allendale, N.J. 07401

Filed Apr. 5, 1993, Ser. No. 42,534

Int. Cl.^{5} C07C *69/52;* **C08G** *2/22, 2/26, 2/16*

U.S. Cl. 522—34 **12 Claims**

1. A composition of matter comprising the class of beta keto mixed acylate monomers containing both one to three alpha-beta unsaturated carboxylate groups, and at least one other type of carboxyl derived substituent group on one or more carbon atoms beta to the carbonyl group, and which conforms to the colnposition described in Formula 1:

a,b,cCC(0)Cd,e,f   Formula I

wherein not less than one but no more than three of a,b,d and e are each independently chosen from among monovalent ligands having the structure $—CH_2O_2CCR═CR'R''$ (wherein each of R,R', and R'' is independently chosen from among hydrogen, methyl or ethyl ligands); and wherein at least one, but not more than three of a,b,d and e are each independently chosen from among monovalent ligands having the structure: $—CH_2O_2CC_nH_{2(n-x)+1}$ (wherein n is an integer from one to thirty; x is an integer from 0 to 4, but less than $[n/2-1]$); and wherein both the non acylate members of the group a,b,d, and e, as well as c and f are each independently chosen from among hydrogen, or monovalent one to 12 carbon hydrocarbyl ligands. Optionally two or more of said hydrocarbyl ligands may be conjoined to form ring structures.

5,314,931

RESIST COMPOSITIONS

Motoyuki Yamada; Tomoyoshi Furihata, both of Kawasaki; Osamu Watanabe, Jouetsu, and Fujio Yagihashi, Yokohama, all of Japan, assignors to Shin-Etsu Chemical Co., Limited, Tokyo, Japan

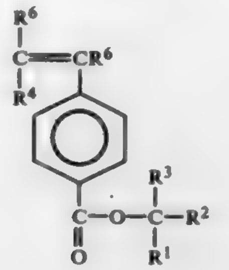
Filed May 28, 1992, Ser. No. 889,370

Claims priority, application Japan, May 28, 1991, 3-152468

Int. Cl.^{5} C08J *3/28;* **C08L** *33/06;* **C08F** *8/00, 120/10*

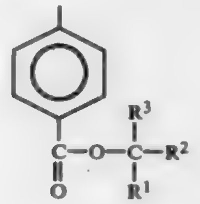
U.S. Cl. 522—127 **9 Claims**

1. A positive resist composition comprising a polymer, a photo-initiator and an inert organic solvent, said polymer being obtained by living anionic polymerization of at least one monomer having the formula (1):

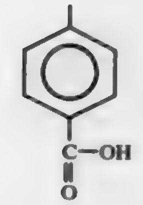


(1)

where R^1 to R^5 are independently selected from the group consisting of hydrogen and alkyl groups having 1 to 12 carbon atoms, and R^6 is hydrogen or a methyl group; said polymer having a molecular weight distribution of from 1.0 to 1.2; said photo-initiator being one which is decomposed upon exposure to light to generate a strong acid and to cause cleavage of a group having formula (3) in the living polymer into a group having formula (4),



(3)



(4)

wherein R^1 and R^3 are the same as defined above, thereby converting said polymer into an alkali soluble polymer.

5,314,932

ANTIFOULING COATING AND METHOD FOR USING SAME

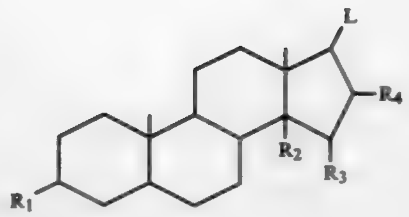
Donald J. Gerhart, Hillsborough; Dan Rittschof, Morehead City, and Joseph Bonaventura, Beaufort, all of N.C., assignors to Duke University, Durham, N.C.

Division of Ser. No. 961,158, Oct. 15, 1992, Pat. No. 5,252,630. This application Jul. 28, 1993, Ser. No. 98,507

Int. Cl.^{5} C09D *5/14;* **C07J** *43/00;* **C08K** *3/00*

U.S. Cl. 523—122 **8 Claims**

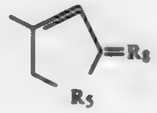
1. A cementitious composition comprising a cementitious matrix and a compound of Formula I



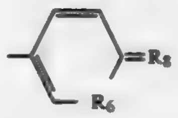
(I)

wherein

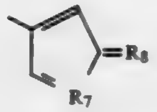
- R_1 is hydrogen, hydroxyl, C_1–C_{20} alkyl, C_1–C_{20} alkoxy, C_1–C_{20} aryl, C_1–C_{20} alkyl aryl, or carbohydrate;
- R_2 is hydrogen or hydroxyl, and R_3 is hydrogen, or R_2 and R_3 together form an epoxide;
- R_4 is hydrogen, hydroxyl, C_1–C_4 alkoxy, or C_1–C_4 carboxylic acid; and
- L is selected from the group consisting of a moiety of Formula II, a moiety of Formula III, and a moiety of Formula IV



(II)



(III)



(IV)

wherein R_5 is CH_2, NH, O or S, R_6 is CH_2, NH, O or S, R_7 is N or CH, and R_8 is NH or O, and

wherein said compound is optionally substituted from 1 to five times with halogen, hydroxyl, C_1–C_3 alkyl, or C_1–C_3 alkoxy groups at positions 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

5,314,933

ANAEROBIC CURING COMPOSITIONS COMPRISING A LUTIDINE

Deog-Il Kim, Seoul; Pil-Gyoo Kwak, and O-Gyoon Park, both of Suwon, all of Rep. of Korea, assignors to SKC Limited, Kyungki, Rep. of Korea

Filed Apr. 2, 1993, Ser. No. 42,140

Claims priority, application Rep. of Korea, Apr. 7, 1992, 92-5781

Int. Cl.^{5} C09J *4/00;* **C08F** *4/00, 4/32*

U.S. Cl. 523—176 **1 Claim**

1. An anaerobic curing composition which comprises a monofunctional of polyfunctional acrylate or methacrylate monomer having at least one vinyl functional group, 0.1 to 10 percent by weight of an organic peroxide and 0.1 to 10 percent by weight of a lutidine having a pKa value in the range of 6.5 to 9.0, based on the total weight of the monomer, wherein the organic peroxide and the lutidine are employed in an amount of equivalent mole.

5,314,934

POLYMER MIXTURE FOR PRODUCING FILMS

Ivan Tomka, Chalet Breitfeld, 1722 Bourguillon, Switzerland
PCT No. PCT/CH92/00091, § 371 Date Feb. 18, 1993, § 102(e) Date Feb. 18, 1993, PCT Pub. No. WO92/20740, PCT Pub. Date Nov. 26, 1992
PCT Filed May 12, 1992, Ser. No. 975,923
Claims priority, application Fed. Rep. of Germany, May 18, 1991, 4116404
Int. Cl.^{5} C08L *3/06*
U.S. Cl. 524—53 **17 Claims**

1. A polymer mixture consisting essentially of thermoplastically processable starch, at least one polyolefin, at least one vinyl compound carrying an anhydride substituent and an esterification product of the starch and the anhydride containing vinyl compound.

5,314,935

BITUMEN/POLYMER COMPONENT MAKING IT POSSIBLE TO OBTAIN BITUMEN/POLYMER COMPOSITIONS WITH VERY LOW THERMAL SENSITIVITY, CAPABLE OF BEING EMPLOYED FOR THE PRODUCTION OF SURFACINGS

Pierre Chaverot, Oullins, and Claude Lacour, Vienne, both of France, assignors to Elf Antar France, Courbevoie, France
PCT No. PCT/FR91/01018, § 371 Date Oct. 6, 1992, § 102(e) Date Oct. 6, 1992, PCT Pub. No. WO92/11321, PCT Pub. Date Jul. 9, 1992
PCT Filed Dec. 17, 1991, Ser. No. 920,572
Claims priority, application France, Dec. 18, 1990, 90 15788; Dec. 18, 1990, 90 15789
Int. Cl.^{5} C08L *95/00*
U.S. Cl. 524—64 **41 Claims**

1. Bitumen/polymer component comprised of a hydrocarbon matrix in which a sulphur-crosslinked elastomer is distributed homogeneously in a quantity such that it represents 5% to 20% by weight of the bitumen/polymer component, the said component exhibiting a penetration, determined according to NF standard T 66004, and a ball-and-ring softening temperature, determined according to NF standard T 66008, such that the Pfeiffer number, which links these quantities, assumes values greater than 5 for the bitumen/polymer component.

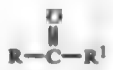
5,314,936

AQUEOUS POLYMER DISPERSIONS CONTAINING ORGANIC COMPOUNDS HAVING CARBONATE GROUPS AND CARBONYL GROUPS AND PAINTS AND COATING SYSTEMS PRODUCED THEREWITH

Manfred Schwartz, Munich; Reinhard Baecher, Bad Duerkheim; Bernhard Dotzauer, Maxdorf; Eckehardt Wistuba, Bad Duerkheim, and Andreas Boettcher, Nussloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Feb. 12, 1992, Ser. No. 834,206
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1991, 4105354
Int. Cl.^{5} C08K *5/45*
U.S. Cl. 524—82 **4 Claims**

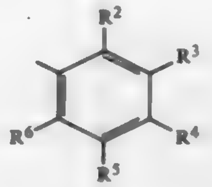
1. An aqueous polymer dispersion comprising:

A) a 20–65% w/w aqueous dispersion of a copolymer of
(a) from 0.5 to 5% w/w of units of a α–β unsaturated compound containing one or more carboxyl groups, amide groups or a mixture thereof; and
(b) units of at least two monomers selected from the group consisting of acrylates and methacrylates of C_{1-18} alkanols and vinyl aromatic compounds;
wherein the total amount w/w of units (a) and (b) total 100% w/w; and
B) from 0.1 to 5% w/w, base on the weight of the copolymer contained in component A) of at least one aromatic ketone of the formula (I)

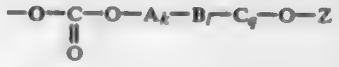


$$R-\overset{O}{\overset{\|}{C}}-R^1 \quad (I)$$

wherein
R is a straight-chain, C_1–C_4-alkyl radical, a branched-chain C_3–C_4-alkyl radical, a C_6–C_{20}-aryl radical, or a radical R^1, wherein R^1 is defined below,
R^1 is



wherein
R^2–R^6 each independently are H, C_1–C_4-alkyl or phenyl, provided that at least one, but not more than three, of the radicals R^2–R^6 stand for a radical of the formula



$$-O-\underset{\|}{\underset{O}{C}}-O-A_k-B_l-C_q-O-Z$$

wherein A, B, and C are each independently
i) a divalent oxyalkylene radical of the formula

$$-(CHR^a-CHR^b-O-)_y-$$

wherein R^a and R^b are each independently H, OH, aryl, COOH, $COOCH_3$, $COOC_2H_5$, or C_{1-4} alkyl, and
y is an integer from 1 to 80;
ii) a radical of the formula

$$-(CH_2)_n-O-(CH_2)_p-$$

where n is an integer from 1 to 5 and p is an integer from 1 to 5;
iii) a polyoxyalkylene radical of from 2 to 20 oxygen atoms linked by at least one $-CH_2-$ or $-CH_2-CH(CH_3)-$ group;
iv) a radical of the formula

$$-(CH_2)_m-O-CO-O-(CH_2)_n-,$$

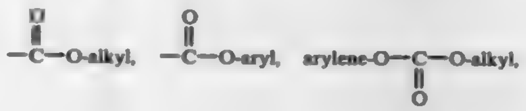
$$-(CH_2)_n-O-CO-NH-(CH_2)_m-,$$

$$-(CH_2)_n-NH-CO-O-(CH_2)_m-,$$

$$-(CH_2)_m-CO-O-(CH_2)_n-, \text{ or}$$

$$-(CH_2)_m-O-CO-(CH_2)_n-,$$

wherein m is an integer from 1 to 10 and
n is an integer from 1 to 10;
v) a C_{5-10} cycloalkylene radical, a (bis)methylenecycloalkylene radical of from 6 to 12 carbon atoms or o—, m— or p— phenylene radical; and
k, l and q are each an integer from 1 to 80; and
Z is H, C_{1-6} alkyl, phenyl, straight chain C_{1-20} alkyl substituted phenyl, branched-chain C_{1-20} alkyl substituted phenyl or a radical of the formula



$$-\overset{O}{\overset{\|}{C}}-\text{O-alkyl}, \quad -\overset{O}{\overset{\|}{C}}-\text{O-aryl}, \quad \text{arylene-O}-\underset{\|}{\underset{O}{C}}-\text{O-alkyl},$$

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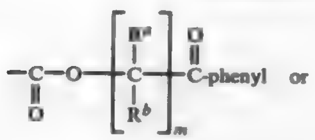
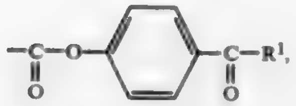


or



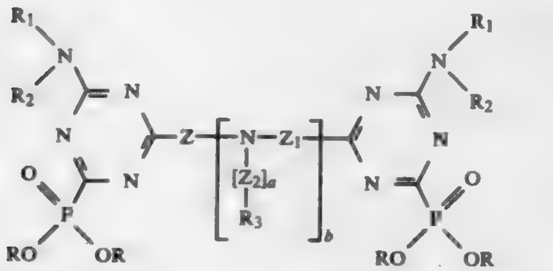
wherein the alkyl radicals contain from 1 to 8 carbon atoms and the aryl radicals contain from 6 to 18 carbon atoms, and wherein R^a, R^b, or R^1 and m are defined as above; or when R denotes an aryl radical, one of the radicals R^2 to R^6 is O, S, NH, or NR''' which links the aryl radical to R^1 in its ortho-position wherein R''' is H or a C_1–C_8-alkyl.

5,314,937

SELF-EXTINGUISHING POLYMERIC COMPOSITIONS

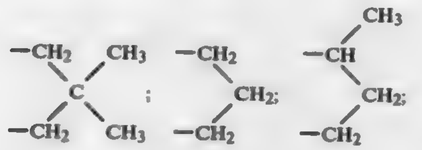
Roberto Cipolli, Novara; Enrico Masarati, Castelnuovo Valtidone; Cristina Rossi, Rome; Roberto Oriani, Milan, and Gilberto Nucida, San Giuliano Milanese, all of Italy, assignors to Ministero dell'Universita' e della Ricerca Scientifica, Rome, Italy
Filed Jan. 6, 1993, Ser. No. 1,527
Claims priority, application Italy, Jan. 10, 1992, MI92 A000030
Int. Cl.^{5} C08K *5/3492, 3/28*
U.S. Cl. 524—100 **10 Claims**

1. Self-extinguishing polymeric compositions comprising:
(a) from 90 to 40 parts by weight of a thermoplastic polymer, or of a polymer endowed with elastomeric properties;
(b) from 10 to 60 parts by weight of one or more derivatives of 2,4-diamino-1,3,5-triazinyl-6-phosphonic acid having the formula (I):



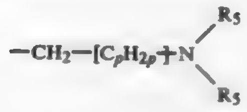
(I)

wherein:
the radicals R, which may be the same, or different from each other, are:
hydrogen; C_1–C_5 alkyl; C_3–C_5 hydroxyalkyl; C_3–C_4 alkenyl; cyclohexyl; C_6–C_{10} aryl; C_7–C_8 aralkyl; or, taken jointly, may constitute a cyclic structure, as:

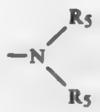


the radicals R_1 and R_2, which may be the same, or different from each other, and which may have different meanings on each triazinic ring, are:
H; C_1–C_{18} alkyl; C_2–C_8 alkenyl; C_6–C_{16} cycloalkyl or alkylcycloalkyl;

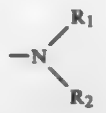
$$-CH_2-[C_mH_{2m}]-O-R_4;$$



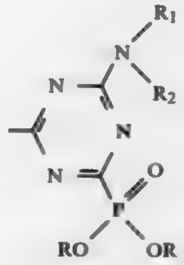
wherein:
m=an integer comprised within the range of from 1 to 7;
p=an integer comprised within the range of from 1 to 5;
R_4=H; C_1–C_8 alkyl; C_2–C_6 alkenyl; $-[-C_q-H_{2q}-]-O-R_6$ wherein q is an integer comprised within the range of from 1 to 4 and R_6 is H or C_1–C_4 alkyl; C_6–C_{12} cycloalkyl or alkylcycloalkyl;
the radicals R_5, which may be the same, or different from each other, are:
H; C_1–C_8 alkyl; C_2–C_6 alkenyl; C_6–C_{12} cycloalkyl or alkylcycloalkyl; C_1–C_4 hydroxyalkyl;
or the moiety:



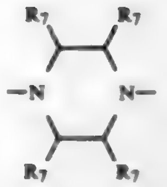
is replaced by a heterocyclic radical selected from the group consisting of aziridine; pyrrolidine; piperidine; morpholine; thiomorpholine; piperazine; 4-methylpiperazine; and 4-ethylpiperazine, linked to the alkyl chain through the nitrogen atom;
or in the general formula (I) the moiety:



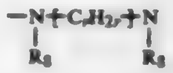
is replaced by a heterocyclic radical selected from the group consisting of aziridine, pyrrolidine; piperidine; morpholine; thiomorpholine; piperazine; 4-methylpiperazine; 4-ethylpiperazine; 2-methylpiperazine; 2,5-dimethylpiperazine; 2,3,5,6-tetramethylpiperazine; 2,2,5,5-tetramethylpiperazine; 2-ethylpiperazine; and 2,5-diethylpiperazine, linked to the triazinic ring through the nitrogen atom;
a is 0 (zero) or 1;
b is 0 (zero) or an integer comprised within the range of from 1 to 5;
R_3 is hydrogen or:



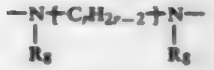
and its meaning may vary within each repeating unit; when b is 0 (zero), z is a divalent radical falling within the scope of one of the following formulae:



wherein the radicals R_7, which may be the same or different from each other, are hydrogen or C_1–C_4 alkyl;

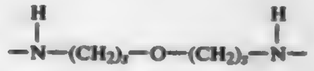


$$-\underset{R_8}{\underset{|}{N}}+C_rH_{2r}+\underset{R_8}{\underset{|}{N}}$$

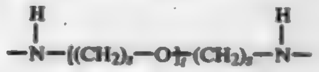


$$-\underset{R_8}{\underset{|}{N}}+C_rH_{2r-2}+\underset{R_8}{\underset{|}{N}}-$$

wherein r is an integer comprised within the range of from 2 to 14; R_8 is hydrogen; C_1–C_4 alkyl; C_2–C_6 alkenyl; C_1–C_4 hydroxyalkyl;

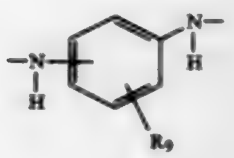


$$-\overset{H}{\overset{|}{N}}-(CH_2)_s-O-(CH_2)_s-\overset{H}{\overset{|}{N}}- \quad (V)$$

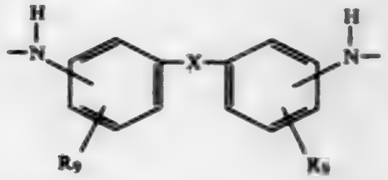


$$-\overset{H}{\overset{|}{N}}-[(CH_2)_s-O]_t(CH_2)_s-\overset{H}{\overset{|}{N}}- \quad (VI)$$

wherein s is an integer comprised within the range of from 2 to 5 and t is an integer comprised within the range of from 1 to 3;



(VII)

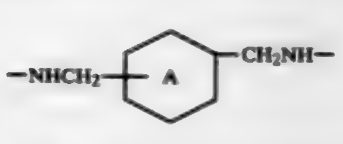


(VIII)

wherein:

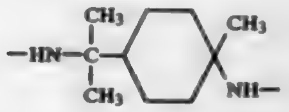
X is a direct C—C bond; O; S; S—S; SO; SO_2; NH; $NHSO_2$; NHCO; N═N; CH_2;

R_9 is hydrogen; hydroxy; C_1–C_4 alkyl; C_1–C_4 alkoxy;



(IX)

wherein A may be a saturated or unsaturated ring;



(X)

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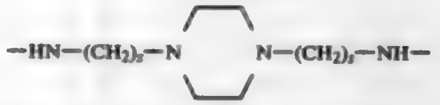
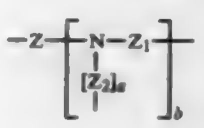


(XI)

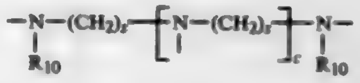
wherein s has the above defined meaning;

when, on the contrary, b is an integer comprised within the range of from 1 to 5, the moiety:



$$-Z-\left[\begin{array}{c}N-Z_1\\|\\ {[Z_2]_a}\\|\end{array}\right]_b$$

is a multivalent radical falling within the scope of one of the following formulae:

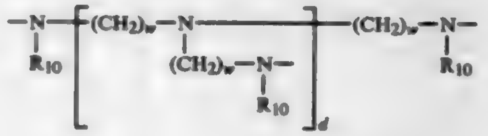


$$-\underset{R_{10}}{\underset{|}{N}}-(CH_2)_s-\left[\underset{|}{N}-(CH_2)_s\right]_c-\underset{R_{10}}{\underset{|}{N}}- \quad (XII)$$

wherein:

R_{10} is hydrogen or C_1–C_4 alkyl;

c is an integer comprised within the range of from 1 to 5; the indexes s, which may be the same, or different from each other, have the same meaning as defined above;



(XIII)

wherein:

R_{10} has the same meaning as defined above;

w is an integer comprised within the range of from 2 to 4; and

d is either 1 or 2.

5,314,938

AMELINIC COMPOUNDS AND USE THEREOF IN SELF-EXTINGUISHING POLYMERIC COMPOSITIONS

Roberto Cipolli, Novara; Gilberto Nucida, Milan; Enrico Masarati, Piacenza; Roberto Oriani, and Mario Pirozzi, both of Milan, all of Italy, assignors to Ministereo Dell'Universita' E Della Ricerca Scientifica E Technologica, Rome, Italy

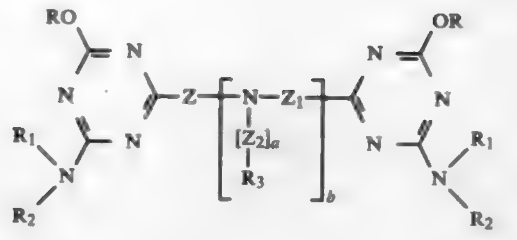
Division of Ser. No. 756,921, Sep. 9, 1991. This application Feb. 10, 1993, Ser. No. 15,856
Claims priority, application Italy, Sep. 11, 1990, 21420 A/90
Int. Cl.^{5} C08K *5/3962, 5/357*
U.S. Cl. 524—100 14 Claims

1. Self-extinguishing polymeric compositions comprising:

a) from 90 to 40 parts by weight of a thermoplastic polymer or of a polymer showing elastomeric properties;

b) from 6 to 33 parts by weight of one or more phosphates and/or phosphonates of ammonium or of an amine;

c) from 3 to 27 parts by weight of one or more polycondensed compounds derived from 2,4-diamino-6-hydroxy-1,3,-5-triazine, having the formula (I):



(I)

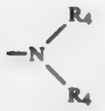
wherein:

R = H; $+C_nH_{2n}+Y$

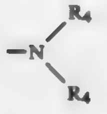
wherein

n is an integer comprised between 1 and 8;

Y is H; CN; —O—(C_1–C_4)-alkyl; —O—(C_2–C_4)-alkenyl; (C_6–C_{12})-cycloalkyl or -alkylcycloalkyl; —O—(C_6–C_{12})-aryl;



wherein radicals R_4, which may be the same or different, are: (C_1–C_4)-alkyl or (C_3–C_4)-alkenyl or the group:



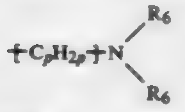
is replaced by a heterocyclic radical selected from the group consisting of pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine, 4-methylpiperazine, or 4-ethylpiperazine, said heterocyclic radical being bound to the alkyl chain through a nitrogen atom;

(C_2–C_6)-alkenyl; (C_6–C_{12})-cycloalkyl or -alkylcycloalkyl; (C_6–C_{12})-aryl or -aralkyl;

radicals R_1 and R_2, which may be the same or different and which can have different meanings on each triazine ring, are:

H; (C_1–C_{18})-alkyl; (C_2–C_8)-alkenyl; (C_6–C_{16})-cycloalkyl or -alkylcycloalkyl;

$+C_mH_{2m}+O-R_5$;



with:

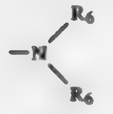
m = integer comprised between 2 and 8, preferably between 2 and 4;

p = integer comprised between 2 and 6;

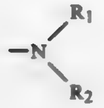
R_5 = H; (C_1-C_8)-alkyl, preferably H or (C_1-C_4)-alkyl; (C_2-C_6)-alkenyl;

$+C_qH_{2q}+O-R_7$ wherein q is an integar comprised between 1 and 4 and R_7 is H or an (C_1-C_4)-alkyl; (C_6-C_{12})-cyclo-alkyl or -alkylcycloalkyl;

radicals R_6, which can be the same or different, are: H; (C_1-C_8)-alkyl; (C_2-C_6)-alkenyl; (C_6-C_{12})-cycloalkyl or alkylcycloalkyl; (C_1-C_4)-hydroxylalkyl or the group:



is replaced by a heterocyclic radical selected from the group consisting of aziridine, pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine, 4-methylpiperazine, or 4-ethylpiperazine, said heterocyclic radical being bound to the alkyl chain through the nitrogen atom; or in the formula (I) the group:

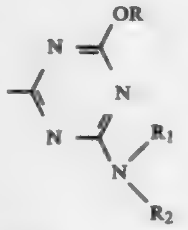


is replaced by a heterocyclic radical selected from the group consisting of aziridine, pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine, 4-methylpiperazine, 4-ethylpiperazine, 2-methylpiperazine, or 2,5-dimethylpiperazine, said heterocyclic radical being bound to the triazinic ring through a nitrogen atom;

a is 0 or 1;

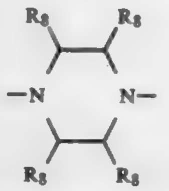
b is 0 or an integer comprised between 1 and 5;

R_3 is hydrogen or:



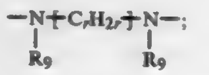
and its meaning may vary within each repeating unit;

when b is O, Z is a divalent radical comprised in one of the following formulas:

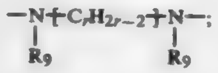


(II)

wherein radicals R_8, which may be the same or different, are hydrogen or (C_1–C_4)-alkyl;

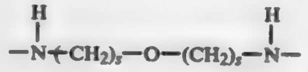


$$-\underset{R_9}{\underset{|}{N}}+C_rH_{2r}+\underset{R_9}{\underset{|}{N}}-; \quad (III)$$

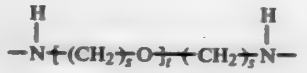


$$-\underset{R_9}{\underset{|}{N}}+C_rH_{2r-2}+\underset{R_9}{\underset{|}{N}}-; \quad (IV)$$

wherein r is an integer comprised between 2 and 14; R_9 is hydrogen; (C_1–C_4)-alkyl; (C_2–C_6)-alkenyl; (C_1–C_4)-hydroxyalkyl;

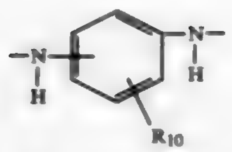


$$-\overset{H}{\overset{|}{N}}+CH_2)_s-O-(CH_2)_s-\overset{H}{\overset{|}{N}}- \quad (V)$$

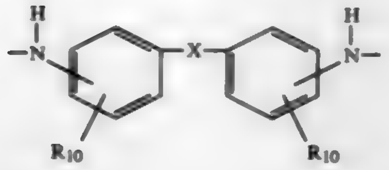


$$-\overset{H}{\overset{|}{N}}+(CH_2+_sO+_t+CH_2+_s\overset{H}{\overset{|}{N}}- \quad (VI)$$

wherein s is an integer comprised between 2 and 5 and t is an integer comprised between 1 and 3;

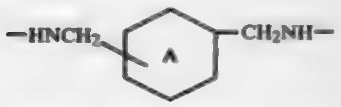


(VII)



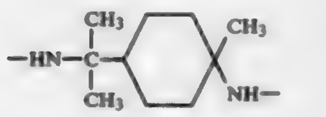
(VIII)

wherein:
X is C—C; O; S; S—S; SO; SO_2; NH; $NHSO_2$; NHCO; N═N; CH_2; R_{10} is hydrogen; hydroxy; (C_1–C_4)-alkyl; (C_1–C_4)-alkoxy;

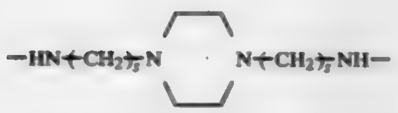


(IX)

wherein A may be either a saturated or an unsaturated ring;

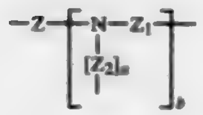


(X)

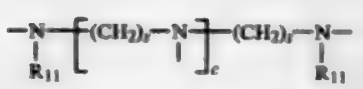


(XI)

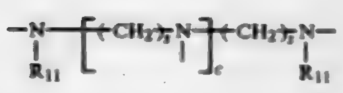
wherein s has the previously defined meaning;
when on the contrary b is an integer comprised between 1 and 5 the group:



is a polyvalent radical comprised in one of the following formulas:

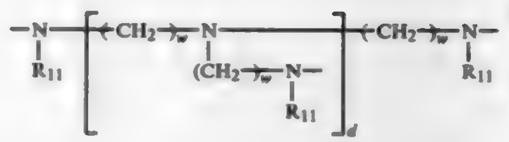


(XII)

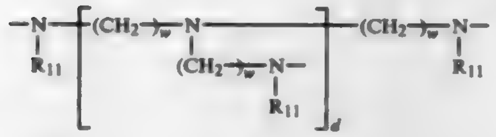


(XII)

wherein:
R_{11} is hydrogen or (C_1–C_4)-alkyl;
c is an integer comprised between 1 and 5;
indexes s, which may be the same or different, have the meaning previously defined;



(XIII)



(XIII)

wherein:
R_{11} has the previously defined meaning;
w is an integer comprised between 2 and 4;
d is 1 or 2.

5,314,939
AMORPHOUS COPOLYMERS FOR PHOTOREFRACTIVE COMPOUNDS USED IN OPTICAL SIGNAL PROCESSING

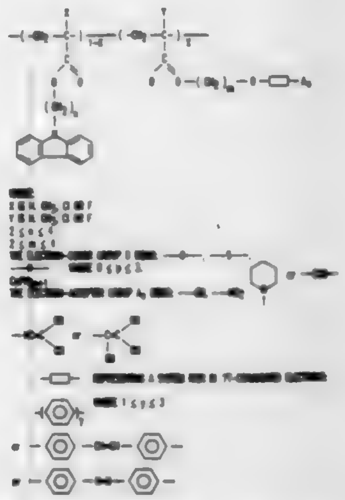
Pierre LeBarny, Orsay; Dominique Broussoux, Marcoussis, and Jean-Claude DuBois, St. Remy Les Chevreuses, all of France, assignors to Thomson-CSF, Puteaux, France

Division of Ser. No. 734,673, Jul. 23, 1991, Pat. No. 5,198,514. This application Oct. 6, 1992, Ser. No. 937,719

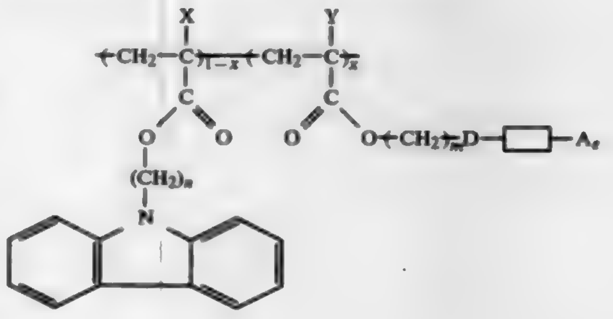
Claims priority, application France, Jul. 31, 1990, 90 09740

Int. Cl.^{5} C08L *39/04*

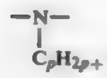
U.S. Cl. 524—241 **3 Claims**



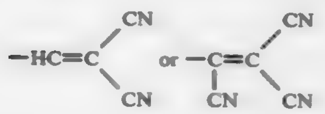
1. A photorefractive mixture of organic compounds consisting of an amorphous copolymer for photorefractive compounds having the following chemical formula:

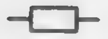


where:
X=H, CH_3, Cl or F
Y=H, CH_3, Cl or F
$2 \leqq n \leqq 4$
$2 \leqq m \leqq 4$
D is an electron donor group being —O—, —S—,

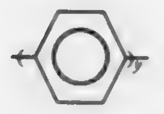


where $0 \leqq p \leqq 3$, or —COO—
A_e is an electron-acceptor group being —CN, —NO_2,

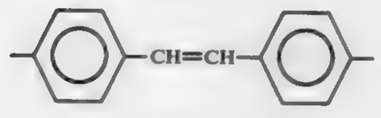




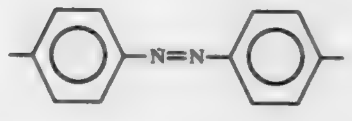
is a system rich in π conjugated electrons:



where: $1 \leq y \leq 3$



or



and a small electron-acceptor molecule C, the molar ratio of electron donor groups D to small electron-acceptor molecules C being between 0 and 1.

2. The photorefractive mixture described in claim 1 in which the small electron-acceptor molecule is 2,4,7 trinitro-9-fluorenone.

5,314,940
HIGH WET-FRICTION ELASTOMERIC COATINGS INCLUDING A THERMOPLASTIC RUBBER AND PETROLATUM

Donald D. Stone, P.O. Box 1197, Ocean City, Md. 21842

Filed Jun. 22, 1992, Ser. No. 902,595

Int. Cl.^{5} C08J *5/14;* **C08L** *53/00*

U.S. Cl. 524—271 **11 Claims**

1. A composition producing high wet-friction, highly adherent, slip resistant surfaces to which said composition is applied comprising a homogeneous mixture of:
a thermoplastic rubber block copolymer;
a slip resistant effective amount of a petrolatum; and, optionally independently,
an effective amount of a plasticizer or a tackifier, dissolved in an organic solvent carrier, without abrasive fillers.

5,314,941
THERMOPLASTIC ELASTOMER COMPOSITION OF CRYSTALLINE CHLORINATED POLYETHYLENE AND A RUBBER

Masahiro Yamanaka; Kazuya Hori; Naoki Ichikawa, and Mizuo Washimi, all of Nagoya, Japan, assignors to Mitsubishi Kasei Vinyl Company, Tokyo, Japan

Filed May 15, 1992, Ser. No. 883,394

Claims priority, application Japan, May 16, 1991, 3-111945

Int. Cl.^{5} C08J *5/10;* **C08K** *3/26;* **C08L** *23/28*

U.S. Cl. 524—425 **9 Claims**

1. A thermoplastic elastomer composition comprising, as resin components, 100 parts by weight of a crystalline chlorinated polyethylene with a chlorination degree of from 20 to 45% and a heat of crystal fusion of from 5 to 35 cal/g as measured by a DSC method and from 40 to 400 parts by weight of a rubber material having a solubility in tetrahydrofuran at 25° C. of not more than 50% by weight.

5,314,942
AQUEOUS DISPERSIONS

Richard G. Coogan, and Raznik Vartan-Boghossian, both of Wilmington, Del., assignors to ICI Americas, Inc., Wilmington, Del.

Continuation of Ser. No. 900,787, Jun. 22, 1992, abandoned, which is a continuation of Ser. No. 643,701, Jan. 22, 1991, abandoned, which is a continuation of Ser. No. 244,405, Sep. 14, 1988, abandoned. This application Jul. 2, 1993, Ser. No. 85,142

Claims priority, application United Kingdom, Sep. 14, 1987, 8721537

Int. Cl.^{5} C08J *3/02;* **C08K** *3/20;* **C08L** *75/00;* **C08G** *18/10*

U.S. Cl. 524—457 **9 Claims**

1. A non-gelled aqueous polymer dispersion containing a vinyl polymer and a nonionically-stabilised water-dispersible polyurethane having pendent polyoxyethylene chains, wherein the polyurethane is self-dispersible in water by virtue of said pendent nonionic polyoxyethylene chains, the vinyl polymer having been formed by the free radical polymerisation of at least one vinyl monomer in the presence of an aqueous dispersion of the polyurethane, and wherein further said at least one vinyl monomer includes a carboxylic acid functional monomer, and the weight ratio of polyurethane to vinyl polymer is within the range from 9:1 to 1:9.

5,314,943
LOW VISCOSITY HIGH STRENGTH ACID BINDER

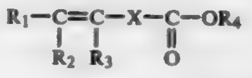
Paul J. Steinwand, Placentia, Calif., assignor to Rohm and Haax Company, Philadelphia, Pa.

Filed Nov. 30, 1990, Ser. No. 620,269

Int. Cl.^{5} C08L *33/26*

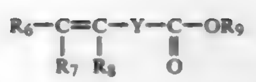
U.S. Cl. 524—501 **30 Claims**

1. A fast-curing binder for textile substrates comprising an admixture of an aqueous emulsion copolymer latex and the product of copolymerization, in aqueous solution, of a mixture comprising;
one or more first water-soluble comonomers having the general formula:



$$R_1-\underset{R_2}{\underset{|}{C}}=\underset{R_3}{\underset{|}{C}}-X-\underset{O}{\underset{\|}{C}}-OR_4$$

wherein R_1, R_2, and R_3 are independently selected from the group consisting of hydrogen, halogen, nitro, amino, and organic radicals; R_4 is hydrogen; and X is a covalent bond or an organic radical; each of said one or more first water-soluble comonomers containing at least two carboxyl groups; and
one or more second water-soluble comonomers having the general formula;



$$R_6-\underset{R_7}{\underset{|}{C}}=\underset{R_8}{\underset{|}{C}}-Y-\underset{O}{\underset{\|}{C}}-OR_9$$

wherein R_6, R_7, R_8 are independently selected from the group consisting of hydrogen, halogen, nitro, amino, and organic radicals; R_9 is hydrogen; and Y is a covalent bond or an organic radical; each of said one or more second water-soluble comonomers containing a single carboxyl group;

said one or more first water-soluble comonomers being present in said mixture in a concentration of about 40% to about 75% by weight of total monomers;

said one or more second water-soluble comonomers being present in said mixture in a concentration of about 25% to about 60% by weight of total monomers;

said product of copolymerization being present in said admixture in a concentration of about 1% to about 20%, by dry weight of said latex.

5,314,944

PRESSURE SENSITIVE ADHESIVE

Hung Y. Chao, Williamsville, N.Y., assignor to Moore Business Forms, Grand Island, N.Y.

Filed Oct. 1, 1992, Ser. No. 955,065

Int. Cl.⁵ C08J *3/02;* **C09J** *133/06;* **C08L** *33/06*

U.S. Cl. 524—501 **8 Claims**

1. A pressure sensitive adhesive composition comprising a tacky adhesive latex, a non-tacky latex or polymer, and an inert filler, wherein said components are present in an amount effective to create an adhesive that is tack-free to the touch but forms a permanent bond upon the application of pressure and wherein said inert filler is present in an amount effective to absorb oil.

5,314,945

WATERBASED COATING COMPOSITIONS OF METHYLOL(METH)ACRYLAMIDE ACRYLIC POLYMER, POLYURETHANE AND MELAMINE CROSSLINKING AGENT

Stanley K. Nickle, Blackwood, N.J., and Ervin R. Werner, Jr., Levittown, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 620,894, Dec. 3, 1990, abandoned. This application Jul. 27, 1992, Ser. No. 920,404

Int. Cl.⁵ C08F *20/58;* **C08L** *75/06*

U.S. Cl. 524—507 **19 Claims**

1. A waterbased coating composition comprising about 10–30% by weight of film forming binder dispersed in an aqueous carrier; wherein the binder consist essentially of about

a. 20–85% by weight, based on the weight of the binder, of an methylol (meth)acrylamide acrylic polymer consisting essentially of polymerized monomers of alkyl methacrylate, alkyl acrylate or mixtures thereof, 1–10% by weight, based on the weight of the acrylic polymer of methylol methacrylamide, methylol acrylamide or mixtures thereof, 0.5–10% by weight, based on the weight of the acrylic polymer of an ethylenically unsaturated carboxylic acid, 0.5–10% by weight, based on the weight of the acrylic polymer, of an ethylenically unsaturated hydroxyl containing monomer and the acrylic polymer has a glass transition temperature of −40° to +40° C. and a weight average molecular weight of 500,000 to 3,000,000; and the carboxyl groups of the carboxylic acid are reacted with ammonia to provide a pH of about 7.0–10;

b. 10–40% by weight, based on the weight of the binder, of a polyurethane selected from the group consisting of polyester urethane, polyether urethane or polyacrylourethane; and

c. 5–40% by weight, based on the weight of the binder, of a water-soluble or a water-dispersible alkylated melamine formaldehyde crosslinking agent consisting essentially of a polymeric partially methylated melamine formaldehyde resin having a degree of polymerization of about 1–3.

5,314,946

POLYOLEFIN RESIN COMPOSITIONS, METHODS OF MAKING SUCH COMPOSITIONS, AND MOLDED ARTICLES FORMED THEREOF

Yoshihisa Tajima, and Keiichi Miyawaki, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Nov. 20, 1991, Ser. No. 796,724

Claims priority, application Japan, Nov. 21, 1990, 2-320053

Int. Cl.⁵ C08K *7/28*

U.S. Cl. 524—513 **6 Claims**

1. A polyolefin molding composition comprising a melt-blend of:

(A) between 60 to 98 parts by weight of a polyolefin base resin;

(B) between 2 to 40 parts by weight of a liquid-crystal polyester resin which exhibits optical anisotropic characteristics in the melt-phase and which has a melt viscosity of 10000 to 100 Poise as determined at a temperature of 310° C. and a shear rate of 1200 sec^{-1}; and

(C) between 5 to 200 parts by weight of glass fibers having a means fiber length of at least 50μm; wherein

the liquid-crystal polyester is dispersed throughout the polyolefin base resin in the form of a three-dimensional network and wherein

the glass fibers are substantially entirely enveloped by the three-dimensional liquid-crystal polyester network.

5,314,947

COATING COMPOSITION AND ARTICLE COATED THEREBY

Fujio Sawaragi, Kanagawa, Japan, assignor to Nipon Arc Co., Ltd., Japan

Continuation of Ser. No. 703,816, May 21, 1991, abandoned. This application Sep. 2, 1992, Ser. No. 938,526

Claims priority, application Japan, Jun. 11, 1990, 2-152356; Mar. 22, 1991, 3-058749

Int. Cl.⁵ C08K *3/20*

U.S. Cl. 524—780 **2 Claims**

1. A scratch-resistant coating composition capable of forming a coating having a high refractive index on a transparent solid material, said coating composition comprising:

(A) 100 parts by weight of an epoxy group-containing silicon compound of the general formula:

$$R^1R^2{}_nSi(OR^3)_{3-n}$$

wherein R^1 is an epoxy-containing group having 2 to 12 carbon atoms, R^2 is an alkyl, alkenyl or halogenated alkyl group having 1 to 6 carbon atoms or a halogenated aryl group, R^3 is a hydrogen atom or an alkyl, acyl or alkylacyl group having 1 to 4 carbon atoms, and n is an integer of 0 to 2, or a partial hydrolysis product thereof,

(B) 0 to 100 parts by weight of an organosilicon compound of the general formula:

$$R^4{}_pR^2{}_qSi(OR^3)_{4-p-q}$$

wherein R^2 and R^3 are as defined above for (A), R^4 is an alkyl or halogenated alkyl group having 1 to 4 carbon atoms, an aryl or halogenated aryl group having 6 to 12 carbon atoms, a methacryloxalkylene group having 5 to 8 carbon atoms, or a ureidoalkylene, aromatic ureidoalkylene, halogenated aromatic alkylene or a mercaptoalkylene group having 2 to 10 carbon atoms, p is an integer of 1 to 3 and q ia an integer of 0 to 2, or a partial hydrolysis product thereof,

(C) 0 to 130 parts by weight of at least one metal oxide selected from the group consisting of antimony oxide, tin oxide and titanium oxide, said metal oxide being in the form of a sol,

(D) 0.25 to 30 parts by weight of a cross-linking agent for (A), said cross-linking agent being a polycyclic polycarboxylic acid or an anhydride thereof, or a polycyclic halogenated polycarboxylic acid or an anhydride thereof, and

(E) 0.01 to 30 parts by weight of a curing catalyst, said composition containing no metal oxide other than (C).

5,314,948

OLEFINIC IMPACT MODIFIERS FOR, AND BLENDS WITH, THERMOPLASTIC POLYESTER RESINS

Charles F. Pratt, Brasschaat, Belgium; Shrikant V. Phadke, and Errol Olivier, both of Baton Rouge, La., assignors to Copolymer Rubber and Chemical Corporation, Baton Rouge, La.

Division of Ser. No. 235,432, Aug. 23, 1988, Pat. No. 5,026,776, which is a continuation-in-part of Ser. No. 161,361, Feb. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 4,089, Jan. 16, 1987, abandoned. This application Jun. 24, 1991, Ser. No. 719,746

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.⁵ C08L *67/02, 23/16*

U.S. Cl. 525—64 **23 Claims**

1. The method of producing a masterbatch for melt blending with a polyester matrix resin to improve its knit-line strength and toughness comprising reacting:

(1) less than the full increment of a high molecular weight thermoplastic polyester matrix resin;

(2) a rubber polymer in the molten phase selected from the group consisting essentially of the interpolymerization reaction product of ethylene, one or more C_3–C_{16} monoolefins and a polyene;

(3) a composition selected from the group consisting of an epoxy functional acrylate, an epoxy functional methacrylate, an epoxy functional acrylate in combination with a C_1–C_{18} alkyl acrylate and an epoxy functional methacrylate in combination with a C_1–C_{18} alkyl acrylate; and

(4) an initiator present in an amount of at least 0.3 percent by weight of the rubber polymer to provide a reaction product having a gel content in the range of from about 10 to about 80 percent.

5,314,949

POLYCARBONATE RESIN COMPOSITION

Shiro Kozakura; Shigeki Kuze, and Kenji Tanaka, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 820,206, Jan. 13, 1992, abandoned. This application Mar. 9, 1993, Ser. No. 28,366

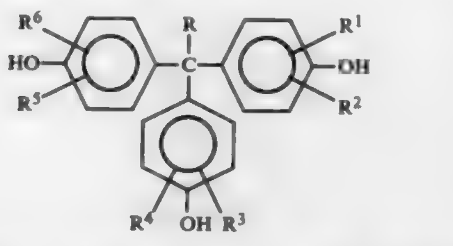
Claims priority, application Japan, Jan. 24, 1991, 3-022664; Mar. 13, 1992, 4-055199

Int. Cl.⁵ C08L *69/00, 67/02*

U.S. Cl. 525—67 **8 Claims**

1. A polycarbonate resin composition consisting essentially of

(A) 30 to 98% by weight of a branched polycarbonate having a branched nucleus structure derived from a branching agent represented by the formula (I):



(I)

wherein R is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and R^1 to R^6 are hydrogen atoms, alkyl groups having 1 to 5 carbon atoms or halogen atoms, respectively, the branched polycarbonate having a viscosity average molecular weight of 15,000 to 40,000, and an acetone-soluble matter of not more than 3.5% by weight, and

(B) 70 to 2% by weight of polybutylene terephthalate resin.

5,314,950

HEAT RESISTANT RESIN COMPOSITION COMPRISING POLYMERS OF N-(SUBSTITUTED) MALEIMIDES AND IMPROVED PROCESS FOR THE PREPARATION OF SAID MALEIMIDES

Balwant Singh, and Robert J. Tynik, both of Stamford, Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Filed Jan. 22, 1993, Ser. No. 7,225

Int. Cl.⁵ C08L *35/00, 35/06;* **C08F** *222/40, 122/40*

U.S. Cl. 525—73 **10 Claims**

1. A heat resistant, compatible resin composition comprising:

(a) a homopolymer of N-(2,3-dimethylphenyl)maleimide; and

(b1) a copolymer prepared by copolymerizing one or more monomers selected from the group consisting of aromatic monoalkenyl monomers, vinyl cyano monomers, alkylester monomers of acrylic acid, alkylester monomers of methacrylic acid, vinyl halide monomers and vinyl alkylester monomers

(b2) a graft copolymer prepared by copolymerizing (i) a rubbery polymer, (ii) N-(2,3-dimethylphenyl) maleimide, and (iii) one or more monomers selected from the group consisting of aromatic monoalkenyl monomers, vinyl cyano monomers, alkylester monomers of acrylic acid, alkylester monomers of methacrylic acid, vinyl halide monomers and vinyl alkylester monomers; or

(b3) a mixture of (b1) and (b2),

wherein said homopolymer component (a) and said copolymer component (b) (1, 2 or 3) are present in a ratio of 5:95 to 95:5 parts by weight in the resin composition.

6. A heat resistant, compatible resin composition comprising:

(a1) a copolymer comprising poly-(N-(2,3-dimethylphenyl)-maleimide-co-styrene); and

(b1) a copolymer prepared by copolymerizing one or more monomers selected from the group consisting of aromatic monoalkenyl monomers, vinyl cyano monomers, alkylester monomers of acrylic acid, alkylester monomers of methacrylic acid, vinyl halide monomers and vinyl alkylester monomers;

(b2) a graft copolymer prepared by copolymerizing (i) a rubbery polymer, (ii) N-(2,3-dimethylphenyl) maleimide, and (iii) one or more monomers selected from the group consisting of aromatic monoalkenyl monomers, vinyl cyano monomers, alkylester monomers of acrylic acid, alkylester monomers of methacrylic acid, vinyl halide monomers and vinyl alkylester monomers; or

(b3) a mixture of (b1) and (b2),

wherein said copolymer component (a1) and said copolymer component (b) (1,2 or 3) are present in a ratio of 5:95 to 95:5 parts by weight in the resin composition.

5,314,951
BRANCHED BLOCK, COPOLYMER, PROCEDURES FOR ITS PREPARATION AND USE

Sergio Castro, Ravenna, and Alessandro Zazzetta, Cesena, both of Italy, assignors to Enichem Elastomeri S.R.L., Milan, Italy
Continuation of Ser. No. 43,987, Apr. 7, 1993, which is a continuation of Ser. No. 734,773, Jul. 23, 1991, abandoned. This application Apr. 28, 1993, Ser. No. 53,201
Claims priority, application Italy, Jul. 25, 1990, 21041 A/90
The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.
Int. Cl.^{5} C08L *53/02;* **C08F** *297/04*
U.S. Cl. 525—88 10 Claims

1. An impact resistant composition comprising: a thermoplastic resin and a branched block copolymer of the formula:

$$(B_1\text{-}T\text{-}A\text{-}B_2)_nX \qquad (I)$$

where:

- B_1 and B_2 are polydienic blocks;
- A is a polyvinylaromatic block;
- T is a random copolymeric segment formed by dienic and vinylaromatic monomeric units;
- X is a coupling radical of valence n, and
- n is a whole number between 3 and 20;
- the above copolymer having a weight average molecular weight of between 60,000 and 500,000; an A block content from 20 to 80% by weight; a B_1+B_2 block content from 20 to 80% by weight; a weight ratio between blocks B_1 and B_2 from 0.1 to 1.0; and a T segment content from 4 to 40% by weight.

5,314,952
PROCESSES FOR PRODUCING HIGHLY WATER ABSORPTIVE RESINS

Su B. Choi; Huyng M. Lee; Myung J. Kim, and Tae H. Jang, all of Daejeon, Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea
PCT No. PCT/KR90/00005, § 371 Date Apr. 22, 1991, § 102(e) Date Apr. 22, 1991, PCT Pub. No. WO90/15829, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 8, 1990, Ser. No. 659,352
Claims priority, application Rep. of Korea, Jun. 21, 1989, 89-8596; Jun. 21, 1989, 89-8597; Jul. 3, 1989, 89-9405; Jul. 3, 1989, 89-9406; Jul. 27, 1989, 89-10672; Jul. 27, 1989, 89-10673; Oct. 7, 1989, 89-14440
Int. Cl.^{5} C08F *2/32, 8/00, 8/14, 20/06*
U.S. Cl. 525—119 8 Claims

1. A process for producing a highly water absorptive amorphous resin, which comprises

- (a) suspending an aqueous solution of partially neutralized alkali metal acrylate wherein about 50 to 100% by mole of the carboxyl group has been neutralized to its alkali metal salt and at least one water soluble radical polymerization initiator, in a hydrocarbon solvent containing a surfactant having a HLB value of 8～12;
- (b) subjecting the mixture to inverse suspension polymerization while raising the internal temperature of the reactor successively to 70° C., to 60°～67° C., and then to 75° C., to undergo phase-transition;
- (c) during or after the polymerization, separating the moisture from the produced polymer by azeotropic distillation to reduce the water content to about 15 to 55% by weight, and filtering to remove the solvent;
- (d) adding a crosslinking agent having three or more reactive epoxy groups which is dissolved in methanol, wherein the amount of the crosslinking agent is 0.005～15% by weight based on the produced polymer, and incubating for 1～2 hours at temperatures 70° to 85° C.; and
- (e) washing with methanol, filtering, and drying at temperatures of 90° to 175° C. to obtain the water absorptive resin.

5,314,953
CLEAR COATING COMPOSITION FOR CLEAR COAT/COLOR COAT FINISH

Patrick H. Corcoran, Cherry Hill, and Gary W. Nickel, Sewell, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 940,781, Sep. 4, 1992, Pat. No. 5,279,862, which is a continuation-in-part of Ser. No. 860,062, Mar. 30, 1992, Pat. No. Des. 340,293, which is a continuation-in-part of Ser. No. 780,062, Oct. 21, 1991. This application Sep. 8, 1993, Ser. No. 115,851
Int. Cl.^{5} C08G *18/52*
U.S. Cl. 525—123 9 Claims

1. A clear coating composition having a film forming binder solids content of about 30-70% by weight and an organic liquid carrier, wherein the binder consists essentially of about

- (A) 50–80% by weight, based on the weight of the binder, of an acrylic polymer consisting essentially of polymerized monomers of styrene, a methacrylate monomer selected from the group consisting of methyl methacrylate, isobornyl methacrylate, cyclohexyl methacrylate or any mixtures thereof, a second methacrylate monomer selected from the group consisting of n-butyl methacrylate, isobutyl methacrylate or ethyl hexyl methacrylate or any mixtures thereof and a hydroxy alkyl methacrylate or hydroxy alkyl acrylate each having 1–4 carbon atoms in the alkyl group; wherein the acrylic polymer has a number average molecular weight of about 5,000–20,000 determined by gel permeation chromatography and a calculated Tg of at least 40° C. and correspondingly,
- (B) 20–50% by weight, based on the weight of the binder, of an organic polyisocyanate;

wherein the coating composition cures to a tack free state within 3 hours of application and to a Persoz hardness of at least 30 counts.

5,314,954
PROCESS FOR PREPARING AROMATIC POLYESTER-POLYSTYRENE BLOCK COPOLYMERS

Hiroshi Ohishi; Shinji Inaba; Masao Kimura; Koichi Fujishiro; Masanao Kawabe, all of Kawasaki; Takumi Tanaka, Uji; Keizo Kyuda, Uji; Souichiro Kishimoto, Uji; Takamasa Owaki, Uji, and Akio Motoyama, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki; Nippon Steel Corporation and Nippon Steel Chemical Co. Ltd., Tokyo, all of Japan
Continuation-in-part of Ser. No. 779,493, Oct. 24, 1991, abandoned. This application Dec. 23, 1992, Ser. No. 997,367
Claims priority, application Japan, Oct. 24, 1990, 2-284470; Sep. 18, 1991, 3-265368; Oct. 3, 1991, 3-281942
Int. Cl.^{5} C08F *293/00*
U.S. Cl. 525—132 2 Claims

1. A process for preparing an aromatic polyester-poly-styrene block copolymer which comprises reacting a styrene polymer having at least one of terminal phenolic hydroxyl groups or terminal amino groups (A) with an excess of an aromatic dicarboxylic acid dihalide (C) to form a mixture containing a polycondensate having terminal acid halide groups, and then without separating the resultant polycondensate from the mixture, interfacially polymerizing the polycondensate and the excess carboxylic acid dihalide in the mixture with an aromatic dihydroxy compound (B), at a ratio of (A)/(B)+(C) of 5/95 to 80/20 by weight.

5,314,955
OIL-RESISTANT COATING COMPOSITIONS

James R. Halladay, Fairview, Pa., assignor to Lord Corporation, Erie, Pa.
Filed Jan. 21, 1993, Ser. No. 7,637
Int. Cl.^{5} C08L *61/04, 61/10, 33/18, 33/20*
U.S. Cl. 525—139 20 Claims

1. A coating composition comprising (a) a hydrogenated copolymer of a conjugated diene and an unsaturated nitrile, (b) a phenolic resin, (c) a curing component, and (d) a solvent wherein the coating composition has a total solids content ranging from about 5 to 30 percent.

5,314,956
POLYPROPYLENE RESIN COMPOSITIONS OF HIGH SYNDIOTACTICITY AND PREPARATION PROCESS THEREOF

Tadashi Asanuma, Osaka; Tetsunosuke Shiomura, Tokyo; Nobutaka Uchikawa, Osaka; Tutomu Iwatani, Osaka, and Katsumi Takeuchi, Osaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Continuation of Ser. No. 533,757, Jun. 6, 1990, Pat. No. 5,212,247. This application Jan. 29, 1993, Ser. No. 10,787
Claims priority, application Japan, Jun. 12, 1989, 1-146738
Int. Cl.^{5} C08L *23/12, 23/16*
U.S. Cl. 525—240 1 Claim

1. A polypropylene resin composition of a high syndiotacticity which comprises a substantial homopolymer of propylene, in which the ratio of the intensity of the peak attributable to the syndiotactic pentad bonds to the sum of the intensities of all the peaks attributable to the methyl groups in the spectrum of the methyl groups measured by ^{13}C-NMR is 0.7 or more, and a copolymer of ethylene and propylene, wherein the molar ratio of ethylene units to propylene units ranges from 15/85 to 85/15, and the weight ratio of said homopolymer to said copolymer ranges from 95/5 to 50/50, said polypropylene resin composition having improved transparency over a syndiotactic homopolymer of propylene and being prepared by first polymerizing propylene substantially singly in the presence of a catalyst capable of forming high syndiotactic polypropylene and then mixing said polypropylene with a copolymer of ethylene and propylene prepared separately from said polypropylene.

5,314,957
MOLDED ARTICLE OF CROSSLINKED POLYOLEFIN AND METHOD FOR PREPARING IT

Tadashi Asanuma, Yokohama, and Kazuhiko Yamamoto, Takaishi, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Dec. 17, 1992, Ser. No. 992,101
Claims priority, application Japan, Dec. 25, 1991, 343126; Feb. 13, 1992, 026470; Mar. 12, 1992, 053185; Mar. 31, 1992, 076569
Int. Cl.^{5} C08F *8/00*
U.S. Cl. 515—245 16 Claims

1. A method for preparing a molded article of a crosslinked polyolefin which comprises the steps of bringing a composition comprising a copolymer of an alkenysilane and an olefin and a compound having at least two unsaturated bonds selected from the group consisting of an aromatic vinyl compound, a polymer which contains reactive unsaturated bonds, and an ether, an ester, an amine, an amide, a carboxylic acid, an alcohol an alkoxysilicon and a silicone which has two or more unsaturated bonds into contact with a catalyst selected from the group consisting of salts of rhodium, alkoxy compounds and metallocene compounds of metals in the group IVa of the periodic table, combinations of the metallocene compounds and organic aluminum compounds, and then molding the composition, or carrying out the contact simultaneously with the molding, or molding the composition, and then bringing the molded article into contact with the catalyst, and if necessary, further heating the molded article to accelerate a crosslinking reaction.

5,314,958
PROCESS FOR PREPARING GRAFT COPOLYMERS

Shunichi Himori, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Yokkaichi, Japan
Filed May 27, 1992, Ser. No. 888,603
Claims priority, application Japan, May 27, 1991, 3-121409
Int. Cl.^{5} C08F *259/02*
U.S. Cl. 525—256 7 Claims

1. A process for preparing a graft copolymer comprising grafting an ethylenically unsaturated monomer onto a halogen-containing polymer dispersed in a polar solvent in the presence of 0.1 to 50 parts by weight, per 100 parts by weight of the halogen-containing polymer used, of a reducing agent and 0.1 to 50 parts by weight, per 100 parts by weight of the halogen-containing polymer used, of a phase transfer catalyst selected from the group consisting of onium compounds and ionophore compounds, whereby a polymerization system is formed by the reaction of the halogen-containing polymer with the reducing agent and the phase transfer catalyst so that free radicals are generated on the halogen-containing polymer thereby to polymerize said monomer by the free radicals so formed to be grafted onto the halogen-containing polymer, said polymerization being conducted at a temperature of from about 0° to about 150° C., the ratio of the weight of the halogen-containing polymer to the weight of the ethylenically unsaturated monomer being in the range of 0.05–20.

5,314,959
GRAFT COPOLYMERS CONTAINING FLUOROALIPHATIC GROUPS

Richard J. Rolando, and James E. Sax, both of Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 6, 1991, Ser. No. 665,271
Int. Cl.^{5} C08F *255/02, 255/10, 257/02, 265/06*
U.S. Cl. 525—276 8 Claims

1. A fluorochemical graft copolymer comprising: a base polymer comprising polymerized units derived from monomers having terminal olefinic double bonds, having grafted thereto a moiety of the formula

$$—CH_2—CHR—Q—R_f$$

wherein

- R is hydrogen, trifluoromethyl, or lower alkyl;
- Q is a divalent linking group that does not substantially interfere with free radical polymerization; and
- R_f is a fluoroaliphatic group comprising a fully fluorinated terminal group containing at least seven fluorine atoms.

5,314,960
SILICONE-CONTAINING POLYMERS, OXYGEN PERMEABLE HYDROPHILIC CONTACT LENSES AND METHODS FOR MAKING THESE LENSES AND TREATING PATIENTS WITH VISUAL IMPAIRMENT

Harry J. Spinelli, Wilmington; Waifong L. Anton, Claymont, both of Del.; Leonard Seidner; Henry D. Coleman, both of Brooklyn, N.Y.; Mohammed I. Ali, Aberdeen; Lester Weintraub, Mount Laurel, both of N.J., and Paul White, Winthrop, Mass., assignors to Permeable Technologies, Inc., Morganville, N.J.
Continuation-in-part of Ser. No. 595,512, Oct. 11, 1990, abandoned, and a continuation-in-part of Ser. No. 507,613, Apr. 10, 1990, Pat. No. 5,284,981. This application Oct. 9, 1991, Ser. No. 773,714
The portion of the term of this patent subsequent to Sep. 14, 2010, has been disclaimed.
Int. Cl.^{5} C08F *271/02, 275/00, 293/00*
U.S. Cl. 525—280 47 Claims

1. A composition comprising at least about 10% by weight of at least one preformed silicone-containing acrylic copolymer and no more than about 90% by weight of a matrix formed

from the polymerization of a mixture of monomers in combination with said preformed acrylic copolymer, said mixture of monomers or said preformed copolymer derived from an amount of hydrophilic monomer effective to provide a final composition which upon hydration comprises at least about 10% by weight water, said preformed acrylic copolymer being dispersed or copolymerized throughout said matrix.

5,314,961

SILICONE-CONTAINING POLYMERS, COMPOSITIONS AND IMPROVED OXYGEN PERMEABLE HYDROPHILIC CONTACT LENSES

Waifong L. Anton, Claymont, Del.; Henry D. Coleman, Brooklyn, N.Y.; Mohammed I. Ali, Aberdeen, and Lester Weintraub, Mount Laurel, both of N.J., assignors to Permeable Technologies, Inc., Morganville, N.J.

Continuation-in-part of Ser. No. 773,714, Oct. 9, 1991, which is a continuation-in-part of Ser. No. 595,512, Oct. 11, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 867,825

The portion of the term of this patent subsequent to Sep. 14, 2010, has been disclaimed.

Int. Cl.^{5} C08F *271/02, 293/00, 275/00*

U.S. Cl. 525—280 **16 Claims**

1. A composition comprising at least about 20% by weight of at least one linear diblock macromonomer comprising about 20% to about 70% by weight of at least one hydrophilic block, said hydrophilic block consisting essentially of monomeric units derived from at least one hydrophilic acrylic monomer and about 30% to about 80% by weight of at least one hydrophobic, permeable block, said hydrophobic block comprising about 80% to about 100% by weight of monomeric units derived from at least one silicone acrylate, said composition comprising no more than about 75% by weight of a matrix formed from the random polymerization of a mixture of monomers, said composition before said polymerization including about 5% to about 45% by weight of at least one silicone acrylate, said mixture of monomers including an amount of hydrophilic monomer effective to provide a final composition which upon hydration comprises at least about 10% by weight water, said composition after hydration being clear and wettable, said macromonomer being copolymerized throughout said matrix.

5,314,962

ABA TYPE BLOCK COPOLYMERS

Takayuki Otsu, Nara; Shunichi Himori, Yokkaichi, and Takashi Kiriyama, Tokyo, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

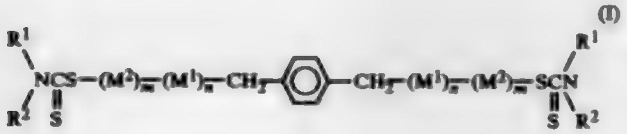
Continuation of Ser. No. 707,950, May 28, 1991, abandoned, which is a continuation of Ser. No. 549,644, Jul. 6, 1990, abandoned, which is a continuation of Ser. No. 178,222, Apr. 6, 1988, abandoned. This application Jun. 29, 1993, Ser. No. 83,326

Claims priority, application Japan, Apr. 7, 1987, 62-83926; Mar. 18, 1988, 63-65494

Int. Cl.^{5} C08F *293/00, 297/00, 2/48*

U.S. Cl. 525—280 **17 Claims**

1. An ABA block copolymer represented by the following formula I:

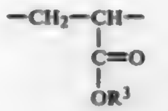


(I)

wherein:

- two R^{1}s, which may be different or identical, stand for a hydrocarbyl group having 1 to 3 carbon atoms,
- two R^{2}s, which may be different or identical, stand for a hydrogen atom or a hydrocarbyl group having 1 to 3 carbon atoms,

M^1 stands for an acrylic ester residue represented by the following formula (a):



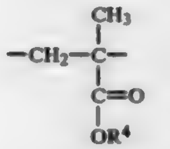
$$-CH_2-\underset{\substack{|\\C=O\\|\\OR^3}}{CH}-$$

(a)

wherein:

R^3 is a hydrocarbyl group having 1 to 18 carbon atoms, which may or may not be replaced with an alkoxy or hydroxy group, wherein M^1 contains less than 5% by weight with respect to said acrylic ester residue of at least one monomer selected from the group consisting of acrylic acid, methacrylic acid, aromatic vinyl derivatives and vinyl acetate,

M^2 stands for at least one residue selected from a methacrylic acid or ester residue represented by the following formula (b):

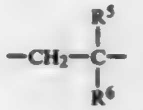


$$-CH_2-\overset{\substack{CH_3\\|}}{\underset{\substack{|\\C=O\\|\\OR^4}}{C}}-$$

(b)

wherein

R^4 is a hydrocarbyl group having 1 to 4 carbon atoms or a hydrogen atom; an aromatic vinyl residue represented by the following formula (c):



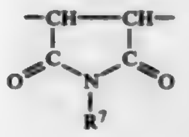
$$-CH_2-\overset{\substack{R^5\\|}}{\underset{\substack{|\\R^6}}{C}}-$$

(c)

wherein

R^5 is a hydrogen atom or a methyl group, and

R^6 is a phenyl or alkylphenyl group; or a maleimido residue represented by the following formula (d):



(d)

wherein

R^7 is a hydrocarbyl group having 1 to 12 carbon atoms, or a phenyl or alkylphenyl group, and n and m each stand for a natural number of 20 to 5000, the copolymer having two glass transition temperatures such that a first glass transition temperature is equivalent to a homopolymer of the monomer M^1 and a second glass transition temperature is equivalent to a homopolymer of the monomer M^2, the first glass transition temperature being substantially lower than the second glass transition temperature.

5,314,963

GRAFT POLYMERS CONTAINING PHOSPHORUS

Christian Lindner, and Dieter Wittmann, both of Köln, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 859,055, Mar. 27, 1992, abandoned. This application Nov. 2, 1993, Ser. No. 146,826

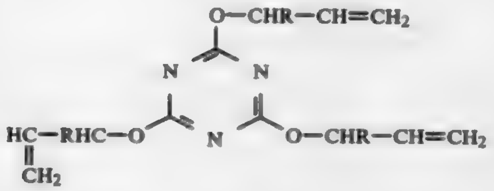
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1991, 4111391

Int. Cl.^{5} C08F *271/02;* **C08L** *51/00*

U.S. Cl. 525—281 **14 Claims**

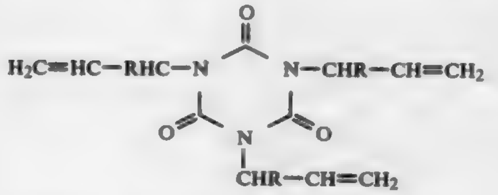
1. A graft polymer comprising:

a) from 10 to 90% by weight of a crosslinked or partially cross-linked copolymer of from 10 to 60% by weight of a compound corresponding to formula (I) or (II)



(I)

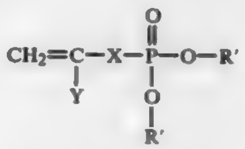
wherein R represents —H, —CH$_3$, or —C$_2$H$_5$;



(II)

wherein R represents —H, —CH$_3$, or —C$_2$H$_5$; and from 90 to 40% by weight of styrene, α-methyl styrene, acrylonitrile, C$_1$–C$_8$ alkyl acrylate, C$_1$–C$_8$-alkyl methacrylate, vinyl acetate, or mixtures thereof, as graft basis; and

b) from 90 to 10% by weight of a polymer comprising phosphonic acid derivatives corresponding to formula (III)



$$CH_2=\underset{\substack{|\\Y}}{C}-X-\overset{\substack{O\\\|}}{\underset{\substack{|\\O\\|\\R'}}{P}}-O-R'$$

(III)

wherein

Y represents —H or —CH$_3$;

X represents a single bond or —CH$_2$; and

R′ represents aryl or alkyl;

as graft superstrate.

10. A flameretardant mixture of a thermoplast and 1 to 20% by weight of the graft copolymer of claim 1.

5,314,964

LOW TEMPERATURE PROCESS FOR THE PREPARATION OF ISOPROPENYL-ALPHA, ALPHA-DIMETHYLBENZYL ISOCYANATE—GRAFTED LATEXES

Howard R. Lucas, Danbury, Conn., assignor to Cytec Technology Corp., Wilmington, Del.

Filed Nov. 2, 1990, Ser. No. 609,496

Int. Cl.^{5} C08F *265/00, 267/00*

U.S. Cl. 525—293 **35 Claims**

1. A low temperature process for preparing an isocyanate-functional homografted latex comprising the steps of:

(A) introducing, into a reaction zone containing an aqueous medium and a graftable latex, a homografting charge comprising:

  (i) isopropenyl-alpha,alpha-dimethylbenzyl isocyanate;

  (ii) a hydroperoxide, and

  (iii) a free radical redox initiator solution in an amount sufficient to decompose the hydroperoxide; and

(B) maintaining the reaction zone at a temperature and for a time sufficient to graft the isopropenyl-alpha, alpha-dimethylbenzyl isocyanate.

5,314,965

LUBRICANT FOR THERMOPLASTIC RESIN AND THERMOPLASTIC RESIN COMPOSITION COMPRISING SAID LUBRICANT

Kazuo Kishida, Ichikawa; Kiyokazu Kitai, Tokyo; Masahiro Kaneda, and Kohji Matsumoto, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Continuation of Ser. No. 426,187, Oct. 25, 1989, abandoned. This application Feb. 5, 1993, Ser. No. 13,986

Claims priority, application Japan, Oct. 31, 1988, 63-273203

Int. Cl.^{5} C08L *33/08, 33/10, 33/12*

U.S. Cl. 525—309 **8 Claims**

1. A thermoplastic resin composition comprising 100 parts by weight of a thermoplastic resin and 0.05 to 10 parts by weight of a lubricant; said lubricant being a three-stage polymer obtained by (A) polymerizing 80 to 100% by weight of methyl methacrylate and 0 to 20% by weight of other monomer copolymerizable therewith so that the reduced viscosity ηsp/C (as determined at 25° C. with respect to a solution of 0.1g of the polymer in 100 ml of chloroform) of the obtained polymer is not higher than 1.4 dl/g, (B) polymerizing 30 to 70 parts by weight of a monomer mixture comprising 20 to 80% by weight of an acrylic acid ester and 80 to 20% by weight of styrene or substituted styrene in the presence of 10 to 60 parts by weight of the polymer obtained at stage (A), so that the reduced viscosity ηsp/C of the copolymer obtained by copolymerizing the monomer mixture in the absence of the polymer obtained at stage (A) is not higher than 1 dl/g, and (C) polymerizing 5 to 30 parts by weight of a monomer or monomer mixture comprising, 50 to 100% by weight of a methacrylic acid ester and 0 to 50% by weight of other monomer copolymerizable therewith in the presence of the two-stage polymer formed through stages (A) and (B), so that the total amount of the components used at stages (A), (B) and (C) is 100 parts by weight and the reduced viscosity ηsp/C of the polymer obtained by polymerizing the monomer or monomer mixture in the absence of the two-stage polymer formed through stages (A) and (B) is not higher than 1.5 dl/g.

5,314,966

PROCESS FOR THE PREPARATION OF A FINELY DIVIDED VINYL CHLORIDE GRAFT COPOLYMER AND ITS USE AS VISCOSITY-REDUCING AGENT AND FLATTING AGENT

Peter Grauer, Burgkirchen, and Ludwig Ober, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

PCT No. PCT/EP91/01740, § 371 Date Mar. 17, 1993, § 102(e) Date Mar. 17, 1993, PCT Pub. No. WO92/05210, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 12, 1991, Ser. No. 30,287

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1990, 4029471

Int. Cl.^{5} C08F *265/04;* **C08L** *51/00;* **C08K** *5/12*

U.S. Cl. 525—317 **12 Claims**

1. Process for the preparation of a finely divided vinyl chloride graft copolymer having an average particle size of 20 to 30 μm by a suspension polymerization process in the presence of monomer-soluble free radical initiators and further conventional additives, such as buffer substances or emulsifiers, consisting essentially of polymerizing a graft monomer in the presence of 1.0 to 5.0% by weight, relative to the graft mono-

mer content, of an alkyl acrylate polymer which is initially introduced in a aqueous emulsion having a solids content of 30 to 60% by weight, and 0.1 to 1.0% by weight, relative to the graft monomer content, of a cellulose ether having a methoxy content of 15 to 25% and a hydroxypropyl content of 3 to 10% and having a viscosity of 30 to 150 mPa.s according to ASTM D 1363, which is initially introduced or metered in after addition of the graft monomer.

11. A process for reducing the viscosity of a plastisol paste comprising vinyl chloride which comprises incorporating from 5 to 50% by weight of the vinyl chloride graft copolymer of claim 1 into 50 to 95% by weight of polyvinyl chloride and 20 to 200% by weight of plasticizers, in each case the percent by weight is relative to the polymer content of the paste.

12. A process for preparing an improved thermoplastic resin or plastisol which comprises mixing from 1 to 50% by weight of the vinyl chloride graft copolymer of claim 1 with from 99 to 50% by weight of the thermoplastic resin or plastisol, the percentage is based on the polymer content of the mixture.

5,314,967

PROCESS AND ISOMERIZING AGENT FOR ISOMERIZING PARTIALLY HYDROGENATED DIENE POLYMERS

William L. Hergenrother, and John M. Doshak, both of Akron, Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Aug. 24, 1993, Ser. No. 111,359

Int. Cl.⁵ C08F *8/00*

U.S. Cl. 525—337 **10 Claims**

1. A process for isomerizing a solution of partially hydrogenated diene polymer containing at least 50 percent by weight of diene monomer contributed units and 0 to 50 percent by weight of ethynically unsaturated monomer contributed units in an inert organic solvent in the presence of a soluble hydrogenation catalyst comprising admixing an isomerizing effective amount of a borane compound having the formula:

$R_1BR_2(R_3)$

wherein R_1, R_2 and R_3 are independently selected from the group consisting of H and alkyl, cycloalkyl and aryl groups containing 1 to 20 carbon atoms and combinations thereof;

to the solution and heating the solution to isomerize the diene monomer contributed units of the partially hydrogenated diene polymer to produce a diene polymer having an unsaturation ratio of at least 3 to 1, said unsaturation ratio being defined as a ratio of a combined total of unsaturation groups in the diene monomer contributed units in an endo and an exo configuration to a combined total of unsaturation groups in the diene monomer contributed units in a 1,4-cis, 1,4-trans and vinyl configuration.

5,314,968

DISINFECTING RESIN

Moshe A. Frommer, 2a Eisenberg Street, Rehovot 76291, and Israel Dalven, 1/3 Atar Yavneh, Emanuel 44854, both of Israel

Filed Feb. 25, 1993, Ser. No. 22,214

Claims priority, application Israel, Feb. 28, 1992, 101109

Int. Cl.⁵ C08F *8/22*

U.S. Cl. 525—356 **6 Claims**

1. A process for the production of a bactericidal resin, which comprises:

contacting a Styrene-DVB based strong base granular anion exchange resin of total capacity of at least 1.0 equivalent/-liter with a mixture prepared from elemental iodine, a soluble iodide, a soluble bromide, water and a peroxymonosulfate oxidant, wherein the iodine to iodide mole ratio is more than 1 to 1 and the iodide to bromide mole ratio is at least 1.5 to 1 and the oxidant is sufficient to convert more than half the bromide to bromine,

agitating for a certain period of time, followed by a reaction period, and rinsing.

5,314,969

POLYESTER SHEET

Mitsuhiro Imaizumi; Masataka Kotani; Haruhiko Kondo; Takeshi Iwasa, all of Kawasaki, and Eiichiro Takiyama, Kamakura, all of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1993, Ser. No. 49,447

Claims priority, application Japan, May 11, 1992, 4-117658; May 13, 1992, 4-120784; May 13, 1992, 4-120785

Int. Cl.⁵ C08F *20/00*

U.S. Cl. 525—440 **9 Claims**

1. A polyester sheet comprising an aliphatic polyester having a melt viscosity of 1.0×10^3–1.0×10^6 poises at a temperature of 190° C. and a shear rate of 100 sec^{-1}, and having a melting point of 70°–190° C.,

wherein said aliphatic polyester is obtained by adding from 0.1 to 5 parts by weight of diisocyanate to 100 parts by weight of a prepolymer in a molten state,

wherein said prepolymer

is obtained from a reaction of at least an aliphatic glycol and an aliphatic dicarboxylic acid, wherein the reaction includes (a) succinic acid, or its anhydrides, reacted with 1,4-butanediol, (b) succinic acid, adipic acid, or their anhydrides, reacted with 1,4-butanediol, or (c) succinic acid, or its derivatives, reacted with ethylene glycol, and has a number-average molecular weight of at least 10,000.

5,314,970

OO-T-ALKYL O-POLYCAPROLACTONE MONOPEROXYCARBONATES

Ronald E. MacLeay, Amherst; Jennifer P. Kmiec, Tonawanda, and Robert T. Kazmierczak, Amherst, all of N.Y., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Filed Jan. 7, 1993, Ser. No. 1,925

Int. Cl.⁵ C08F *283/00*

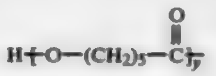
U.S. Cl. 525—450 **14 Claims**

1. Peroxy terminated poly(e-caprolactones) of formula I:

$$(A\text{-}X\text{-})_m\text{-}R\text{-}(X'\text{-}B)_n \qquad \text{I}$$

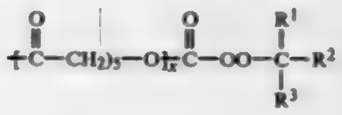
wherein

A is



$$H\left[O-(CH_2)_5-\overset{O}{\overset{\|}{C}}\right]_y$$

B is



$$\left[\overset{O}{\overset{\|}{C}}-(CH_2)_5-O\right]_x\overset{O}{\overset{\|}{C}}-OO-\underset{R^3}{\overset{R^1}{C}}-R^2$$

m is an integer of 0 to 3,

n is an integer of 1 to 4,

and m+n is an integer of 1 to 4,

R^1 and R^2 are the same or different and are selected from alkyl groups having 1 to 4 carbon atoms;

R^3 is an alkyl group having 1 to 12 carbons or an acetylenic group of 2 to 12 carbons;

y is an integer and varies from 0 to 10,000,

x is an integer and varies from 4 to 22,000, and

(y)(m)+(x)(n) is an integer and varies from 4 to 22,000;

X and X′ are the same or different and are selected from —O—, or —N(R^4)—;

R is a substituted or unsubstituted aliphatic, alicyclic, aromatic or araliphatic radical, diradical, triradical or tetraradical,

when n+m is 1, R is a substituted or unsubstituted aliphatic radical of 1 to 20 carbons, a substituted or unsubstituted alicyclic radical of 5 to 18 carbons, a substituted or unsubstituted aromatic radical of 6 to 14 carbons, a substituted or unsubstituted araliphatic radical of 7 to 22 carbons or a substituted or unsubstituted aromatic or non-aromatic heterocyclic radical of 5 to 12 carbons,

when n+m is 2, R is a substituted or unsubstituted aliphatic diradical of 2 to 20 carbons, a substituted or unsubstituted aliphatic diradical of 4 to 20 carbons or a substituted or unsubstituted aliphated diradical of 4 to 20 carbons or a substituted or unsubstituted aliphatic diradical of 4 to 20 carbons which is interrupted by one to three —O—, —S— or —N(R^4)— groups in the chain with the proviso that multiple heteroatoms must be separated from each other and the diradical chain ends by at least two carbon atoms, a substituted or unsubstituted alicyclic diradical of 5 to 18 carbons, a substituted or unsubstituted carbocyclic aromatic diradical of 6 to 12 carbons or a substituted or unsubstituted araliphatic diradical of 7 to 22 carbons, when n+m is 3, R is a substituted or unsubstituted aliphatic triradical of 3 to 20 carbons, a substituted or unsubstituted alicyclic triradical of 5 to 18 carbons, a substituted or unsubstituted aromatic triradical of 6 to 14 carbons or a substituted or unsubstituted araliphatic triradical of 7 to 22 carbons,

when n+m is 4, R is a substituted or unsubstituted aliphatic tetraradical of 4 to 20 carbons, a substituted or unsubstituted alicyclic tetraradical of 6 to 18 carbons, a substituted or unsubstituted aromatic tetraradical of 6 to 14 carbons or a substituted or unsubstituted araliphatic tetraradical of 7 to 22 carbons;

R^4 is hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–18 carbons, substituted or unsubstituted aromatic of 6–14 carbons, or substiuted or unsubstituted araliphatic of 7–22 carbons; and

substituents for R and R^4 are selected from one or more of chloro, bromo, alkyl of 1–8 carbons, alkoxy of 1–12 carbons, aryloxy of 6–10 carbons, or cyano, and additional substituents for R are selected from one or more of acyloxy of 1–4 carbons, acryloyloxy or methacryloyloxy.

5,314,971

URETHANE-MODIFIED POLYOXYALKYLENE EPOXY RESINS

Bernd Neffgen, Selm, and Wolfgang Scherzer, Ierne both of Fed. Rep. of Germany, assignors to Witco GmbH, Bergkamen, Fed. Rep. of Germany

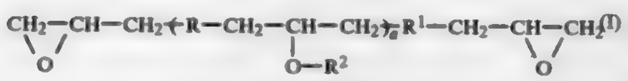
Division of Ser. No. 972,796, Nov. 6, 1992, Pat. No. 5,274,012. This application Aug. 18, 1993, Ser. No. 108,922

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1991, 4136943

Int. Cl.⁵ C08G *59/14;* **C08K** *3/20;* **C08L** *63/02, 63/04*

U.S. Cl. 525—504 **2 Claims**

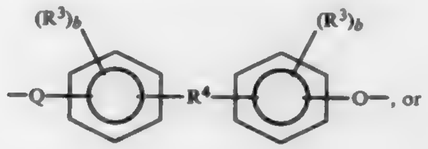
1. A compound of the general formula



(I)

$$\underset{\diagdown O \diagup}{CH_2-CH}-CH_2\left[R-CH_2-\underset{O-R^2}{\underset{|}{CH}}-CH_2\right]_a R^1-CH_2-\underset{\diagdown O \diagup}{CH-CH_2} \qquad (I)$$

where R and R^1 are, independently of one another,



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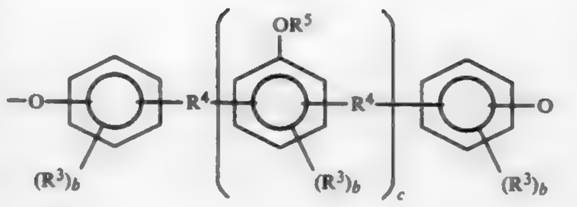
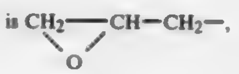


wherein

R^3 is a $C_{1\text{-}3}$ alkyl group,

R^4 is a $C_{1\text{-}4}$ alkylenemoiety,



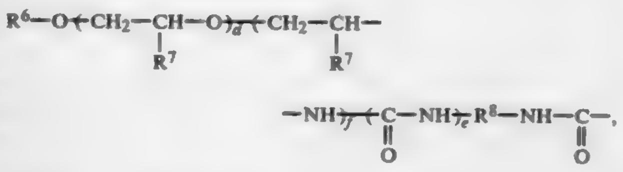
$$R^5 \text{ is } \underset{\diagdown O \diagup}{CH_2-CH}-CH_2-,$$

each b is, independently of one another, an integer from 0 to 4, and

c is 1 to 10;

a is 1 to 20, and

R_2 is H and at least once the group



$$R^6-O\left[CH_2-\underset{R^7}{\underset{|}{CH}}-O\right]_d\left[CH_2-\underset{R^7}{\underset{|}{CH}}-NH\right]_f\left[\underset{O}{\underset{\|}{C}}-NH\right]_e R^8-NH-\underset{O}{\underset{\|}{C}}-,$$

R^6 is a $C_{1\text{-}5}$ alkyl group,

R^7 is H or CH_3—,

d is 1 to 100,

e is 0 or 1,

f is 0 or 1, and

R^8 is an aliphatic, cyclic, alicyclic, aromatic or araliphatic hydrocarbon group.

5,314,972

ACID WASH OF POLYARYLENE SULFIDES

Afif M. Nesheiwat, Charham, N.J., and John F. Geibel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 158,438, Feb. 22, 1988. This application Sep. 21, 1989, Ser. No. 410,686

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁵ C08F *283/00*

U.S. Cl. 525—537 **7 Claims**

1. In a process for the preparation of polyarylene sulfide comprising subjecting an alkali metal hydrosulfide and a dihalo-aromatic compound to reaction in a polar organic compound to form a polyarylene sulfide, the improvement which comprises subjecting the polymer formed separated from the polymerization mixture to a treatment, without causing substantial cure of said polymer, with an aqueous buffer solution having a pH of about 9.25 and comprising ammonium chloride under conditions suitable for producing a polyarylene sulfide having an increased melt flow rate, said conditions including a temperature below the melting point of said polymer.

5,314,973

SILICON-BRIDGED TRANSITION METAL COMPOUNDS

Howard C. Welborn, Jr., Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

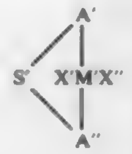
Continuation of Ser. No. 661,274, Feb. 26, 1991, Pat. No. 5,120,867, which is a division of Ser. No. 405,090, Sep. 7, 1989, Pat. No. 5,017,714, which is a continuation of Ser. No. 170,516, Mar. 21, 1988, abandoned. This application May 18, 1992, Ser. No. 884,450

Int. Cl.^{5} C08F *4/42, 4/64*

U.S. Cl. 526—126 **6 Claims**

1. A process for polymerizing α-olefins, which comprises contacting alpha-olefins having two or more carbon atoms under polymerization conditions with a catalyst system; comprising:

(a) a transition metal compound represented by formula:



wherein

M′ is a Group IV-B transition metal;

X′ and X″ are the same or different hydride, halogen, hydrocarbyl or halohydrocarbyl having up to about 6 carbon atoms;

A′ and A″ are the same or different asymmetrical mononuclear or polynuclear hydrocarbyl or silahydrocarbyl moieties; and

S′ is a bridge of 1–4 atoms selected from the group consisting of silanylene, silaalkylene, oxasilanylene and oxasilaalkylene; and

(b) an organoaluminum component.

5,314,974

METHOD FOR PRODUCING A SPHERICAL ACRYLONITRILE CROSSLINKED COPOLYMER

Tsuyoshi Ito; Junya Watanabe, both of Tokyo, and Shintaro Sawada, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Apr. 9, 1993, Ser. No. 45,603

Claims priority, application Japan, Apr. 10, 1992, 3-91177

Int. Cl.^{5} C08F *2/18, 236/20, 220/44*

U.S. Cl. 526—206 **9 Claims**

1. A method for producing an acrylonitrile crosslinked copolymer, which comprises copolymerizing, as polymerizable monomers, acrylonitrile, an alkyl ester of acrylic acid or methacrylic acid, an aliphatic or alicyclic crosslinkable unsaturated monomer having at least two allyl groups, and an aromatic crosslinkable polyunsaturated monomer, in the presence of from 10 to 45% by weight, based on the total amount of the polymerizable monomers, of an inert organic solvent having a specific gravity of at least 1.0, wherein the polymerization reaction is conducted in a state of suspension in an aqueous medium containing a suspension stabilizer.

8. The method according to claim 1, wherein the inert organic solvent having a specific gravity of at least 1.0 is selected from dichloroalkanes.

5,314,975

FLUORINATED ACRYLAMIDE SILANE MONOMERS AND POLYMERS

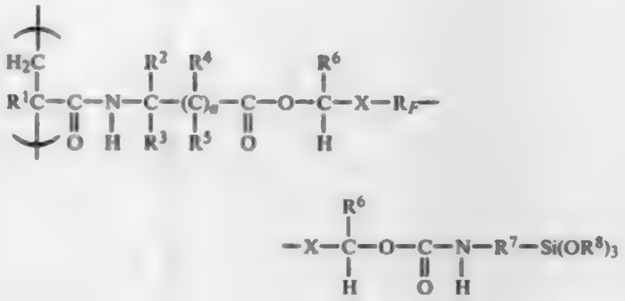
Stefan A. Babirad, St. Paul; Dean M. Moren, North St. Paul; Steven M. Heilmann, Afton; Larry R. Krepski, White Bear Lake, and Jerald K. Rasmussen, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 749,926, Aug. 26, 1991, Pat. No. 5,210,248. This application Jan. 28, 1993, Ser. No. 10,492

Int. Cl.^{5} C08F *26/00*

U.S. Cl. 526—248 **10 Claims**

1. A polymer comprising fluorinated acrylamide silane units, wherein said units have the formula



$$\left(H_2C-\underset{|}{C}R^1\right)-\underset{O}{\underset{\|}{C}}-\underset{H}{\underset{|}{N}}-\overset{R^2}{\underset{R^3}{C}}-\overset{R^4}{\underset{R^5}{(C)_a}}-\underset{O}{\underset{\|}{C}}-O-\overset{R^6}{\underset{H}{C}}-X-R_F-$$

$$-X-\overset{R^6}{\underset{H}{C}}-O-\underset{O}{\underset{\|}{C}}-\underset{H}{\underset{|}{N}}-R^7-Si(OR^8)_3$$

wherein

R^1 and R^6 are independently hydrogen or methyl;

R^2 and R^3 independently can be an alkyl, cycloalkyl, or aryl groups, or R^2 and R^3 taken together with the carbon to which they are joined can form a carbocyclic ring containing 4 to 12 ring atoms;

R^4 and R^5 are independently hydrogen or lower alkyl;

R^7 is alkylene, cycloalkylene, or arylene;

R^8 is hydrogen or lower alkyl;

a is zero or 1;

X is a carbon-to-carbon single bond, CH_2, CH_2OCH_2, or $CH_2CH_2OCH_2$; and

R_F is a substantially perfluorinated alkyl, cycloalkyl, or aryl group, comprising 0 to 6 catenary non-peroxidic oxygen atoms.

5,314,976

PHOTO-RESPONSIVE CONDUCTIVE POLYMERS AND THE PROCESSES OF MAKING THE SAME

Show-An Chen, Hsinchu, and Chien-Hsiun Liao, Feng Yuan, both of Taiwan, assignors to National Science Council, Taiwan

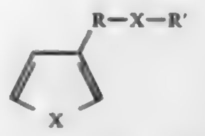
Division of Ser. No. 867,460, Apr. 13, 1992, Pat. No. 5,272,234. This application Aug. 10, 1993, Ser. No. 103,676

Int. Cl.^{5} C08F *228/06, 226/06, 230/08, 220/70*

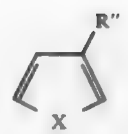
U.S. Cl. 526—256 **3 Claims**

1. A process for producing a photo-responsive conductive polymer, which comprises:

(a) dissolving a photo-responsive group containing monomers with a structural formula of

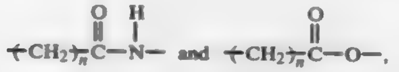


and monomers with a structural formula of



in a solvent; wherein X is selected from the group consisting of S, NH and O;

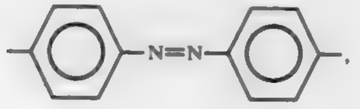
R is selected from the group consisting of $-(CH_2)_n-$, $-(CH_2-CH_2-O)_n-$, $-(Si-O)_n-$, $-(CH2)_n-O-$,

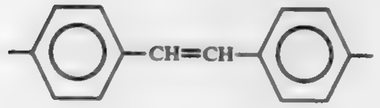


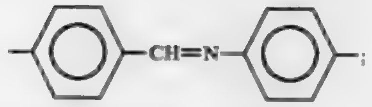
$$-\!(CH_2)_n\!-\overset{O}{\overset{\|}{C}}-\overset{H}{\overset{|}{N}}-\text{ and }-\!(CH_2)_n\!-\overset{O}{\overset{\|}{C}}-O-,$$

wherein n is an integer from 1 to 12,

Y is selected from the group consisting of







R′ is selected from the group consisting of $-OCH_3$, $-CN$, $-NO_2$, $-H$, $-OH$, $-SO_3M$, alkyl and $-COOM$, wherein M is selected from the group consisting of H, Li, Na, K, Rb, Cs and Fr;

R″ is selected from the group consisting of $-(CH2)_n-CH_3$, $-(CH_2-CH_2-O)_n-CH_3$, $-(Si-O)_n-CH_3$, wherein n is an integer from 3 to 21;

(b) adding an oxidizing agent to said solution.

5,314,977

GRAFT COPOLYMERS PREPARED BY TWO STAGED AQUEOUS EMULSION POLYMERIZATION

David R. Amick, Doylestown; William D. Emmons, Huntingdon Valley, and Dennis P. Lorah, Lansdale, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 722,562, Jun. 27, 1991, Pat. No. 5,247,040. This application Jun. 3, 1993, Ser. No. 71,902

Int. Cl.^{5} C08F *257/02, 259/02, 263/02, 265/04, 291/14, 271/02;* **C08L** *51/00*

U.S. Cl. 526—286 **24 Claims**

1. A graft copolymer comprising:

a) a macromonomer side chain with a degree of polymerization of 5 to 500 of polymerized monomer units of at least one first ethylenically unsaturated monomer;

b) a backbone of polymerized units of at least one second ethylenically unsaturated monomer; and

c) a mercapto-olefin compound attached to both the macromonomer and the backbone wherein a mercapto portion of the mercapto-olefin compound is attached to the macromonomer and a vinyl portion of the mercapto-olefin compound is attached to the backbone.

9. A method of use of the graft copolymer of claim 1 in an effective amount as a compatibilizer for physical blends of at least two polymers.

10. A polymer composition comprising a graft copolymer dispersed in water wherein the graft copolymer is composed of;

a) a macromonomer side chain with a degree of polymerization of 5 to 500 of polymerized monomer units of at least one first ethylenically unsaturated monomer;

b) a backbone of polymerized units of at least one second ethylenically unsaturated monomer; and

c) a mercapto-olefin compound attached to both the macromonomer and the backbone wherein a mercapto portion of the mercapto-olefin compound is attached to the macromonomer and a vinyl portion of the mercapto-olefin compound is attached to the backbone.

5,314,978

COPOLYMER OF SULFUR DIOXIDE AND NUCLEAR-SUBSTITUTED TRIALKYLGERMYLSTYRENE

Seong-Ju Kim, Cheonranam; Ji-Hong Kim, Busan; Seong-Geun Jang, and Dae-Youp Lee, both of Cheonranam, all of Rep. of Korea, assignors to Kumho Petrochemical Company, Limited, Seoul, Rep. of Korea

Filed Mar. 12, 1992, Ser. No. 850,261

Claims priority, application Rep. of Korea, Mar. 28, 1991, 91-4932

Int. Cl.^{5} C08G *75/22, 79/00*

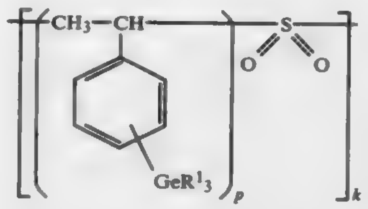
U.S. Cl. 528—9 **6 Claims**

1. A copolymer of sulfur dioxide and trialkylgermylstyrene, which comprises:

(a) about 1–50 mole % of a sulfur dioxide unit; and

(b) about 50–99 mole % of a trialkylgermylstyrene unit;

wherein the copolymer has a weight average molecular weight of 500–10,000,000 and is represented by units having the formula (1):



wherein R^1 is CH_3, C_2H_5, C_3H_7; and k is a molar ratio.

5,314,979

OPTICAL FIBERS AND CORE - FORMING COMPOSITIONS

Hiroshige Okinoshima; Shohei Kozakai, both of Annaka, and Tomiya Abe, Hitachi, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd. and Hitachi Cable Ltd., both of Tokyo, Japan

Filed Dec. 9, 1991, Ser. No. 803,552

Claims priority, application Japan, Dec. 10, 1990, 2-410033; Dec. 28, 1990, 2-417023

Int. Cl.^{5} C08G *77/04*

U.S. Cl. 528—15 **19 Claims**

1. A composition for forming optical fiber cores, comprising

(A) an organopolysiloxane having a unit of formula (1):

$$R^1SiO_{3/2} \quad (1)$$

wherein R^1 is an unsubstituted monovalent hydrocarbon group having 1 to 10 carbon atoms in its molecule or a halogenated derivative thereof and has at least 0.05 alkenyl groups, each directly attached to a silicon atom, per silicon atom,

(B) an organopolysiloxane having at least 2 hydrogen atoms each directly attached to a silicon atom per molecule,

(C′) a platinum catalyst or a radical polymerization initiator or both, and

(D) a carboxylate of formula (3):

$$CH_2{=}\overset{\overset{\textstyle R_A}{|}}{C}{-}COOR_B \qquad (3)$$

wherein R_A a hydrogen or a methyl group and R_B is hydrogen an unsubstituted monovalent hydrocarbon group having 1 to 18 carbon atoms or a halogenated monovalent hydrocarbon group having 1 to 18 carbon atoms;

wherein said carboxylate (E) is contained in an amount of about 0.5 to about 50% by weight based on the total weight of the composition.

5,314,980
EPOXY COATING COMPOSITIONS WITH METAL-CONTAINING STABILIZERS

Eric D. Morrison, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 19, 1993, Ser. No. 5,597

Int. Cl.⁵ C08G *77/04*

U.S. Cl. 528—19 **38 Claims**

1. A coating composition comprising:

(a) an epoxy component selected from the group consisting of epoxy terminated silanes, aqueous prehydrolysis products of epoxy terminated silanes, pre-polymerized epoxy terminated silanes, and epoxy terminated siloxanes;

(b) an amine hardener that can react with the epoxy component to form a cross-linked coating; and

(c) a sufficient amount of a metal component-containing stabilizer to delay crosslinking between the epoxy component and the amine hardener.

5,314,981
ROOM TEMPERATURE CURABLE ORGANOPOLYSILOXANE COMPOSITION AND CURED PRODUCT OF THE SAME

Toshio Takago; Shinichi Sato; Hitoshi Kinami, and Hirokazu Yamada, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1993, Ser. No. 37,322

Claims priority, application Japan, Mar. 27, 1992, 4-140878

Int. Cl.⁵ C08G *77/24*

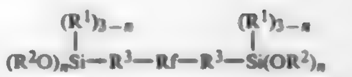
U.S. Cl. 528—36 **10 Claims**

1. A room temperature curable organopolysiloxane composition comprising:

(A) 100 parts by weight of a diorganopolysiloxane blocked by hydroxyl group at both terminal ends of its molecule,

(B) from 0.5 to 30 parts by weight of an organosilicon compound having at least three silicon-bonded hydrolyzable groups in its molecule or a partially hydrolyzed product of said organosilicon compound,

(C) from 0.1 to 15 parts by weight of an alkoxysilane having the following general formula (1):



$$(R^2O)_n\overset{\overset{\textstyle (R^1)_{3-n}}{|}}{Si}{-}R^3{-}Rf{-}R^3{-}\overset{\overset{\textstyle (R^1)_{3-n}}{|}}{Si}(OR^2)_n \qquad (1)$$

wherein R^1 and R^2 are each an unsubstituted or substituted monovalent hydrocarbon group of from 1 to 8 carbon atoms, R^3 is a divalent hydrocarbon group of from 1 to 8 carbon atoms which may contain an amide linkage (—CONH—) or an ether oxygen linkage, Rf is a divalent perfluoroalkylene group or a divalent perfluoropolyether group, and n is an integer from 1 to 3.

TABLE 12

Composition	7 days	14 days	21 days	28 days	Removability of mildew
Composition IX	–	–	–	+	A
Composition X	–	–	–	–	A
Composition XI	–	–	–	+	A
Composition XII	–	–	–	–	A

Notes:

Evaluation criteria for fungal resistance:

–: No propagation of fungi on specimen

+: Propagation of fungi on specimen was observed over an area of not more than ⅓ times the whole area.

Evaluation criteria for removability of fungi:

A: Easily removable

B: Removable

C: Difficult to remove

5,314,982
PROCESS FOR THE PREPARATION OF POLYUREA GREASES

Christian Rasp, Bergisch Gladbach; Ralf Timmermann; Hermann Perrey, both of Krefeld; Bernhard Lehmann, Aachen, and Siegfried Kussi, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 17, 1992, Ser. No. 945,867

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1991, 4131689

Int. Cl.⁵ C08G *18/08*

U.S. Cl. 528—48 **20 Claims**

1. Process for the preparation of polyurea greases, wherein

(a) polyureas which carry oleophilic groups are prepared by reaction of diisocyanates with amines either in the absence of a solvent at 80°–120° C. (variant A) or in a toluene medium at 20°–80° C. (variant B),

(b) after complete reaction, the polyureas prepared according to (a) are ground in the solid, dry state to powder form (at least 70% of the powder having particle sizes of about 100–400μ) and

(c) the powder, after being made into a paste by adding a liquid lubricant to the powder to form a mixture and raising the temperature of the mixture to 140°–180° C. and then cooling the mixture to room temperature, is processed to a grease by complete homogenisation under a pressure of 400–1,500 bar.

5,314,983
PROCESS FOR CURING POLYMERIZABLE LIQUID COMPOSITIONS BASED ON POLYISOCYANATES AND EPOXIDES

Mark T. DeMeuse, Robbinsville, N.J., and Fabrizio Parodi, Genova, Italy, assignors to Enichem S.P.A., Milan, Italy

Filed Nov. 9, 1992, Ser. No. 973,743

Int. Cl.⁵ C08G *18/58, 18/82;* **C08J** *3/28;* **C08L** *63/00*

U.S. Cl. 528—73 **15 Claims**

1. A process for curing a composition containing:

(a) at least one organic polyisocyanate;

(b) at least one polyepoxide or a monoepoxide or a mixture thereof;

(c) 0.02–3% by weight with respect to components (a) and (b) of at least one compound which can catalyze the reaction of epoxides and isocyanates to form 2-oxazolidone structure;

which comprises irradiating said composition with pulsed or continuous electromagnetic radiation in the microwave frequency range from 10^8 to 10^{11} hertz at a curing temperature between room temperature and 180° C. to produce a solid material.

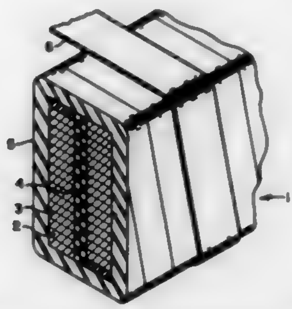
5,314,984
HEAT RESISTANT RESIN COMPOSITIONS, ARTICLES AND METHOD

Mark Markovitz, Schenectady, and Jeffrey D. Sheaffer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 629,155, Dec. 18, 1990, abandoned. This application Feb. 5, 1993, Ser. No. 14,046

Int. Cl.⁵ C08G *65/00*

U.S. Cl. 528—117 **11 Claims**



1. A solventless, vacuum-pressure impregnatable thermosetting resin composition having viscosity less than 4,500 cps at 25° C. and unique thermal stability consisting essentially of

(a) an epoxy resin composition consisting essentially of a nitrogen-free 1,2 epoxy resin having a least two epoxide groups per molecule, a small but effective amount of a phenolic accelerator and a labile halogen-free cationic catalytic hardener selected from the group consisting of a metal acetylacetonate and an organic titanate in an amount on the basis of the epoxy resin between 0.1 and 15% of the acetylacetonate and between 0.025 and 10% of the organic titanate;

(b) a bismaleimaide resin composition; and,

(c) aryl vinyl monomer as reactive diluent.

5,314,985
MOLTEN, CATALYTIC PROCESS FOR THE PREPARATION OF POLYCARBONATES

Steffen Kühling; Wolfgang Alewelt; Hermann Kauth, and Dieter Freitag, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 24, 1993, Ser. No. 66,671

Claims priority, application Fed. Rep. of Germany, May 29, 1992, 4217775

Int. Cl.⁵ C08G *64/30*

U.S. Cl. 528—198 **10 Claims**

1. A process for the preparation of an aromatic polycarbonate in the molten state comprising reacting at least one aromatic dihydroxy compound with a diaryl carbonate in the presence of a catalyst conforming to

$$M^+F_x^-$$

wherein M^+ is a member selected from the group consisting of Na^+,K^+,Rb^+,Cs^+,Ca^{2+}, Ba^{2+},Sr^{2+}, a quarternary ammonium ion and a quaternary phosphonium ion and where x is the valence of said member.

5,314,986
PHENOLIC RESINS FROM BISPHENOL A RESIDUAL RESINS AND MIXTURES OF CHLORO-SUBSTITUTED HYDROCARBONS, AND THE USE OF SPECIFIC PHENOLIC RESINS AS HOMOGENIZERS FOR RUBBER VULCANIZATES

Pieter Ooms; Heinrich Schrage; Hans-Josef Buysch, all of Krefeld; René Loix, Leimen, and Hans-Joachim Graf, Manheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1992, Ser. No. 990,282

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1991, 4142763

Int. Cl.⁵ C08G *65/38*

U.S. Cl. 528—219 **1 Claim**

1. In a process for improving the properties of a rubber vulcanizate by the addition of the reaction product of a phenolic with a mixture of partially chlorinated C_4 to C_8 hydrocarbons comprising the byproducts of butadiene chlorination in the presence of a Friedel-Crafts alkylation catalyst, the improvement which comprises employing as the phenolic a residual resin from the production of bisphenol A which contains phenol, bisphenols, chromanes, indanes and triphenols.

5,314,987
BARRIER COMPOSITIONS AND FILM MADE THEREFROM HAVING IMPROVED OPTICAL AND OXYGEN BARRIER PROPERTIES

Yong J. Kim, and Ray Germonprez, both of Neenah, Wis., assignors to American National Can Company, Chicago, Ill.

Continuation-in-part of Ser. No. 472,400, Jan. 31, 1990, Pat. No. 5,281,360. This application Sep. 18, 1991, Ser. No. 761,490

Int. Cl.⁵ C08G *63/02, 69/44, 73/16*

U.S. Cl. 528—289 **7 Claims**

1. A composition comprising a blend of (i) polyethylene terephthalate, polybutylene terephthalate, copolymers of polyethylene terephthalate, copolymers of polybutylene terephthalate or mixtures thereof, and (ii) nylon, wherein, component (i) is from a catalyst system based upon antimony and germanium, and having less than 0.1 ppm residual cobalt and manganese.

5,314,988
THERMALLY STABLE HIGHLY SENSITIVE RESISTS AND THE LIKE

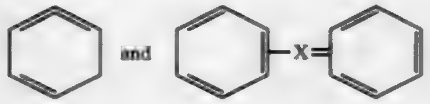
James C. W. Chien, Amherst, Mass., assignor to Academy of Applied Science, Inc., Concord, N.H., a part interest

Continuation of Ser. No. 155,919, Feb. 16, 1988, abandoned. This application Jul. 1, 1991, Ser. No. 724,435

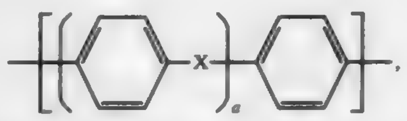
Int. Cl.⁵ C08G *69/26, 73/10*

U.S. Cl. 528—353 **10 Claims**

1. An HRP polymer radiation-sensitive resist having a repeating unit of the formula —Ar—[Z—Ar′—Z]—, wherein Ar is selected from the group consisting of



and Ar′ represents



in which each X is individually selected from the group consisting of —O—, —S—, —SO—, SO_2, —C—, —C_nF_{2n}— and —C_nF_{2n+1}—, and a is a small integer between one and three, and Z is selected from the group consisting of closed ring imide groups combined in the polymer chain as about 75 to 98 percent of the same with the remaining smaller percentage of their corresponding open-ring precursor groups, such that the said polymer chain is converted from properties of radiation inertness, to properties of sensitivity to radiation so as to serve as a radiation resist, enabling the closing of the open rings of the said smaller percentage of open-ring precursor in response to radiation directed thereupon.

5,314,989

ABSORBABLE COMPOSITION

John Kennedy, Stratford; Donald S. Kaplan, Weston, and Ross R. Muth, Brookfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

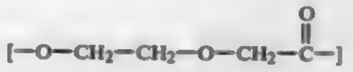
Continuation-in-part of Ser. No. 686,815, Apr. 17, 1991, Pat. No. 5,225,520. This application May 3, 1993, Ser. No. 58,515

The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.

Int. Cl.⁵ C08G *63/08*

U.S. Cl. 528—354 **30 Claims**

1. A block copolymer which comprises a proportion of units of one or more hard phase forming monomers as one of said blocks, and another of said blocks comprising a proportion of units having the formula:



$$[-O-CH_2-CH_2-O-CH_2-\overset{\overset{\large O}{\|}}{C}-]$$

randomly combined with a proportion of units of one or more hard phase forming monomers.

5,314,990

PROCESS FOR THE CONTINUOUS COAGULATION OF VINYL POLYMER LATICES

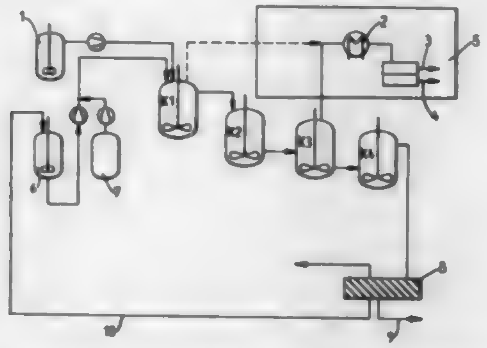
Ulrich Jansen, Dormagen; Karl-Heinz Ott, Leverkusen; Wolfgang Herrig, Bergisch Gladbach; Otto Koch, Cologne; Alfred Pischtschan, Kuerten-Eichhof, and Dieter Wittmann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 29, 1991, Ser. No. 692,496

Claims priority, application Fed. Rep. of Germany, May 12, 1990, 4015296

Int. Cl.⁵ C08F *6/16*

U.S. Cl. 528—486 **13 Claims**



1. A process for the continuous processing of vinyl polymer latices to produce thermoplastically processable vinyl polymer powders, comprising coagulating a stream of vinyl polymer latex at temperatures of 50 to 120 degrees C. by the addition of a stream of an aqueous solution of coagulant with intensive mixing and shearing in a cascade of vessels at an average residence time per vessel of from 10 to 60 minutes, removing volatile auxiliary substances and residual monomers in the polymer by steam distillation, and recycling part of the serum separated from the vinyl polymer to the stream of coagulant.

5,314,991

RECOMBINANT 40 KDA *DERMATOPHAGOIDES FARINAE* ALLERGEN

Satoru Oka; Kazuhisa Ono; Seiko Shigeta, and Takeshi Wada, all of Hiroshima, Japan, assignors to Fumakilla Limited, Tokyo and Hiroshima University, Hiroshima, both of Japan

Filed Aug. 22, 1991, Ser. No. 748,783

Claims priority, application Japan, Aug. 27, 1990, 2-225886; Nov. 27, 1990, 2-327382; Mar. 9, 1991, 3-104949

Int. Cl.⁵ C07K *15/08, 15/00, 15/12*

U.S. Cl. 530—350 **16 Claims**

2. A substantially pure recombinant mite allergen obtainable by expression of a mite-body-derived gene fragment, which contains the partial amino acid sequence shown in SEQ ID NO:4:

Phe Val Met Lys Arg Glu Pro Leu Arg Phe

Arg Asp Ile Thr Val Glu

Gly Asn Glu Asn Ala Tyr Ile Lys Asn Gly

Lys Leu His Leu Ser Leu

Met Asp Pro Ser Thr Leu Ser Leu Val Thr

Lys Ala Asp Gly Lys Ile

Asp Met Thr Val Asp Leu Ile Ser Pro Val

Thr Lys Arg Ala Ser Leu

Lys Ile Asp Ser Lys Lys Tyr Asn Leu Phe

His Glu Gly Glu Leu Ser

Ala Ser Ile Val Asn Pro Arg Leu Ser Trp

His Gln Tyr Thr Lys Arg

Asp Ser Arg Glu Tyr Lys Ser Asp Val Glu

Leu Ser Leu Arg Ser Ser

Asp Ile Ala Leu Lys Ile Thr Met Pro Asp

Tyr Asn Ser Lys Ile His

Tyr Ser Arg Gln Gly Asp Gln Ile Asn Met

Asp Ile Asp Gly Thr Leu

Ile Glu Gly His Ala Gln Gly Thr Ile Arg

Glu Gly Lys Ile His Ile

Lys Gly Arg Gln Thr Asp Phe Glu Ile Glu

Ser Asn Tyr Arg Tyr Glu

Asp Gly Lys Leu Ile Ile Glu Pro Val Lys

Ser Glu Asn Gly Lys Leu

Glu Gly Val Leu Ser Arg Lys Val Pro Ser

His Leu Thr Leu Glu Thr

Pro Arg Val Lys Met Asn Met Lys Tyr Asp

Arg Tyr Ala Pro Val Lys

Val Phe Lys Leu Asp Tyr Asp Gly Ile His

Phe Glu Lys His Thr Asp

Ile Glu Tyr Glu Pro Gly Val Arg Tyr Lys

Ile Ile Gly Asn Gly Lys

Leu Lys Asp Asp Gly Arg His Tyr Ser Ile

-continued

Asp Val Gln Gly Ile Pro

Arg Lys Ala Phe Asn Leu Asp Ala Asp Leu

Met Asp Phe Lys Leu Lys

Val Ser Lys Pro Glu Asp Ser Asn Lys Ala

Gln Phe Ser Tyr Thr Phe

Asn Glu Tyr Thr Glu Thr Glu Glu Tyr Glu

Phe Asp Pro His Arg Ala

Tyr Tyr Val Asn Trp Leu Ser Ser Ile Arg

Lys Tyr Ile Gln Asn Phe

Ile Val Glu Asp Asn.

5,314,992

LIPOCORTIN-1 RECEPTOR PROTEIN AND ITS USES

Paul M. Guyre, Hanover, N.H., and Nicolas J. Goulding, Bath, England, assignors to Trustees of Dartmouth College, Hanover, N.H.

Filed Nov. 25, 1991, Ser. No. 797,330

Int. Cl.⁵ C07K *15/00*

U.S. Cl. 530—350 **4 Claims**

1. A purified and isolated human lipocortin-1 binding molecule comprising a lipocortin-1 receptor protein which specifically binds lipocortin-1 in the presence of calcium, which is derived from the cell membrane of monocytes, which is essentially free of all other cell membrane proteins, and which has a molecular weight of about 15,000 daltons as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis under reducing conditions.

5,314,993

PROCESS FOR PREPARING HIGH PURITY PROTEIN A PREPARATION

Richard N. Love, Watertown, and Albert T. Profy, Cambridge, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Continuation of Ser. No. 489,577, Mar. 7, 1990, abandoned, which is a division of Ser. No. 83,544, Aug. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 30,934, Mar. 26, 1987, abandoned. This application Feb. 10, 1992, Ser. No. 833,584

Int. Cl.⁵ C07K *15/04, 3/24, 3/20, 3/28*

U.S. Cl. 530—350 **42 Claims**

1. A process for purifying protein A from a protein A-containing solution or other protein A preparation which comprises

(a) heating a protein A-containing solution at a temperature of about 50° C. to about 80° C. for about 30 minutes, causing some contaminating protein to precipitate;

(b) loading an ion-exchange column by passing the protein A-containing solution over said column;

(c) washing the loaded column with a solution comprising a non-ionic detergent;

(d) eluting protein A from the ion-exchange column; and

(e) precipitating the eluted protein A with ethanol to give a substantially pure preparation of protein A.

5,314,994

INHIBITOR OF TISSUE-TYPE AND UROKINASE-TYPE PLASMINOGEN ACTIVATORS

David J. Loskutoff, Solana Beach, Calif.; Tor Ny, Umea, Sweden, and Michael Sawdey, La Jolla, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 573,485, Aug. 27, 1990, abandoned, which is a division of Ser. No. 897,990, Aug. 19, 1986, Pat. No. 4,952,512, which is a continuation-in-part of Ser. No. 623,357, Jun. 22, 1984, Pat. No. 4,791,068. This application Apr. 29, 1992, Ser. No. 877,271

Int. Cl.⁵ C07K *13/00*

U.S. Cl. 530—350 **3 Claims**

1. Substantially pure recombinant, human endothelial plasminogen activator inhibitor having the amino acid residue sequence of FIG. 22 from amino acid residue position 1 through position 379, said inhibitor inhibiting the activities of both t-PA and u-PA and being a fusion polypeptide that exhibits an apparent relative molecular mass of about 180 kilodaltons in SDS-PAGE analysis.

3. Substantially pure recombinant, human endothelial plasminogen activator inhibitor having the amino acid residue sequence of FIG. 22 from amino acid residue position 1 through position 379, said inhibitor being substantially free of glycosylation and inhibiting the activities of both t-PA and u-PA.

5,314,995

THERAPEUTIC INTERLEUKIN-2-ANTIBODY BASED FUSION PROTEINS

Henry P. Fell, Jr., Redmond, and Margit A. Gayle, Woodinville, both of Wash., assignors to Oncogen, Seattle, Wash.

Filed Jan. 22, 1990, Ser. No. 468,390

Int. Cl.⁵ C07K *13/00*

U.S. Cl. 530—351 **3 Claims**

1. An antibody-based fusion protein wherein a portion of an immunoglobulin molecule comprising a variable region capable of binding to a tumor-associated antigen is joined via peptide linkage to an Il-2 molecule capable of promoting lymphocyte proliferation.

5,314,996

ISOLATED NUCLEOTIDE SEQUENCES ENCODING AN: ANTIGEN BINDING SITE OF MONOCLONAL ANTIBODY PD41; AND ANTIGEN ASSOCIATED WITH PROSTATE ADENOCARCINOMAS

George L. Wright, Jr., Norfolk, Va., assignor to Eastern Virginia Medical School of Medical College of Hampton Roads, Norfolk, Va.

Division of Ser. No. 828,057, Jan. 30, 1992, Pat. No. 5,227,471. This application Jul. 13, 1993, Ser. No. 91,628

Int. Cl.⁵ A61K *35/16;* **C07K** *15/28, 13/00;* **C07H** *17/00*

U.S. Cl. 530—387.3 **4 Claims**

1. An isolated prostate antigen which is present in human prostate carcinoma, is not found substantially in human benign prostatic hyperplasia or normal human prostate and to which a monoclonal antibody having the identifying characteristics of the monoclonal produced by hybridoma cell line PD41 having ATCC Accession No. HB 11094 binds specifically.

5,314,997

OPTICALLY ACTIVE AZO COMPOUND, PRODUCING METHOD THEREOF, AND LIQUID CRYSTAL COMPOSITION CONTAINING SAID COMPOUND

Masayuki Shoshi, and Akihiko Kanemoto, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

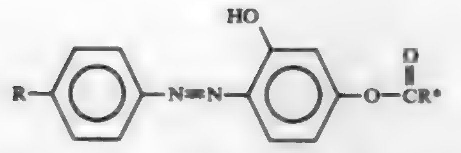
Filed Jun. 26, 1992, Ser. No. 904,555

Claims priority, application Japan, Jul. 11, 1991, 3-171227

Int. Cl.⁵ C07C *245/08;* **C09K** *19/24*

U.S. Cl. 534—577 **3 Claims**

1. An optically active azo compound represented by the following general formula (I),



(I)

where R is an alkyl group having from 1 to 20 carbon atoms, and R* is a butyl group which is substituted by one of the halogen atoms selected from the group consisting of fluorine, chlorine and bromine.

5,314,998

ORGANIC SOLVENT-SOLUBLE METAL-AZO AND METAL-AZOMETHINE DYES

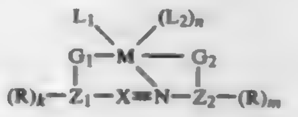
Terrance P. Smith, Woodbury, and David W. Macomber, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 8, 1992, Ser. No. 941,741

Int. Cl.^{5} C09B *45/14*

U.S. Cl. 534—701 **11 Claims**

1. A metal-containing dye having a nucleus of the formula:



wherein:

- Z_1 and Z_2 each independently represents an arene nucleus having from 5 to 14 ring atoms;
- G_1 and G_2 each independently represent a metal ligating group wherein G_1 and G_2 may be contained within or pendant from at least one of Z_1 and Z_2 and are independently selected from the group consisting of; oxygen, hydroxy, alkylthio, carboxy, sulfur, amine, substituted amine, acylamido, sulfonamido, and sulfamoyl;
- R represents a hydrogen atom, a halogen atom, an alkyl group, an acylamino group, an alkoxy group, a sulfonamido group, an aryl group, a thiol group, an alkythio group, an arylthio group, an alkylamino group, an arylamino group, an amino group, an alkoxycarbonyl group, an acyloxy group, a nitro group, a cyano group, an alkylsulfonyl, an arylsulfonyl group, an alkylsulfoxyl group, an arylsulfoxyl group, an aryloxy group, a hydroxy group, a thioamido group, a carbamoly group, a sulfamoyl group, a formyl group, an acyl group, a ureido group, an aryloxycarbonyl group, a silyl group, or a sulfoalkoxy group;
- L_1 represents a trialkyl or triaryl phosphine ligand; or L_1 represents a pyridine group free of free-radically polymerizable functionality, and free of substitution at the 2- and 6-positions of the pyridine ring group and at least one of the 3-, 4-, 5-positions of the pyridine ring group is substituted with R_1, wherein;
- R_1 represents an alkyl group, an acylamino group, an alkoxy group, a sulfonamido group, an aryl group, an alkylthio group, an alkylamino group, an alkoxycarbonyl group, an acyloxy group, an alkylsulfonyl group, an alkylsulfoxyl group, an alkylcarbamoxyl group, an alkylsulfamoyl group, a formyl group, an acyl group, a silyl group, or a sulfoalkoxy group;
- L_2 represents a non-free-radically polymerizable monodentate or polydentate ligand;
- X represents nitrogen;
- M is a divalent or polyvalent transition metal ion where the coordination number is at least 4; and
- k, m, and n are whole numbers less than or equal to 3.

5,314,999

DERIVATIVES OF BASIC POLYENE MACROLIDES AND THEIR PREPARATION

Michel Seman, Paris, and Jean F. Nicolay, Arcachon, both of France, assignors to Laboratoires Mayoly-Spindler, Chatou and Michel Seman, Paris, both of France

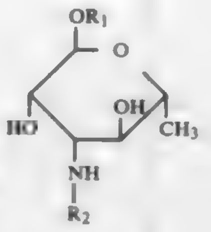
Filed Nov. 14, 1990, Ser. No. 612,474

Claims priority, application France, Nov. 14, 1989, 89 14922

Int. Cl.^{5} C07H *17/08, 15/24*

U.S. Cl. 536—6.5 **11 Claims**

1. A basic polyene macrolide compound of the formula (I)



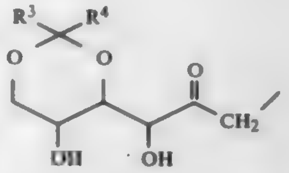
(I)

in which:

R_1 denotes the macrocylic part of amphotericin B and

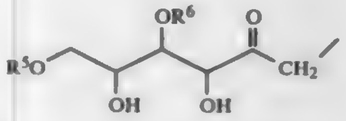
R_2 represents a member selected from the group consisting of:

(1) a structure of the formula:



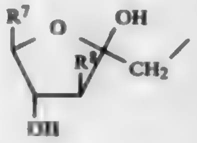
in which R^3 is selected from the group consisting of a hydrogen atom and a methyl group, and R^4 is selected from the group consisting of a hydrogen atom, a methyl, trichloromethyl, tert.-butyl, propyl, benzyl, phenyl group and a phenyl group substituted by a group selected from the group consisting of a methoxy, nitro and phosphate group,

(2) - a structure of the formula:



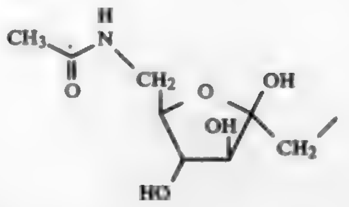
in which R^5 and R^6 are methyl groups,

(3) - a structure of the formula:



in which R^7 is selected from the group consisting of a carboxyl, amide, nitrile and trihalogenomethyl group, and R^8 is selected from the group consisting of a hydroxyl group, an amino group and a mercapto group,

(4) - a structure of the formula:



and

a salt thereof, wherein said basic polyene macrolide compound being more soluble than the unsubstituted macrolide where R_2 in formula I is hydrogen.

5,315,000

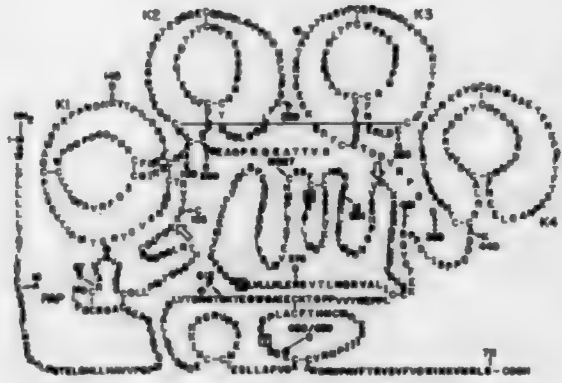
GENE ENCODING FOR A L5/3 GROWTH FACTOR AND ITS CDNA

Sandra J. Degen, Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed May 14, 1992, Ser. No. 882,925

Int. Cl.^{5} C07H *15/12;* C12N *15/00*

U.S. Cl. 536—23.5 **4 Claims**



1. A purified isolated DNA sequence from D3F15S2 locus on human chromosome 3 consisting essentially of 18 exons coding for a human growth factor said human growth factor comprising an approximately 80,000 dalton protein containing four kringle units.

5,315,001

ACYL CARRIER PROTEIN - DNA SEQUENCE AND SYNTHESIS

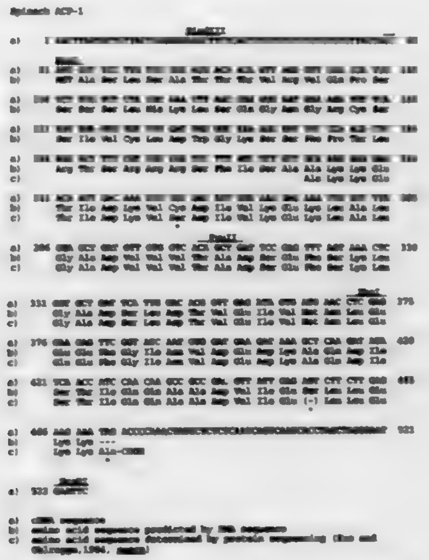
Jean C. Kridl, Davis, and Vic C. Knauf, Winters, both of Calif., assignors to Calgene Inc., Davis, Calif.

Continuation-in-part of Ser. No. 437,764, Nov. 15, 1989, Pat. No. 5,110,728, which is a continuation of Ser. No. 078,924, Jul. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 891,529, Jul. 31, 1986, abandoned. This application Jan. 28, 1992, Ser. No. 826,696

The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.

Int. Cl.^{5} C07H *21/04;* C12N *15/00;* C12P *21/00, 21/04*

U.S. Cl. 536—23.6 **8 Claims**



1. An isolated DNA sequence coding for a plant acyl carrier protein.

5,315,002

SACCHARIDE MERCAPTALS

Trevor Johnson, Frodsham, and Robert A. C. Rennie, Appleton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 885,843, May 20, 1992, abandoned. This application Jan. 25, 1993, Ser. No. 8,872

Claims priority, application United Kingdom, May 31, 1991, 9111758

Int. Cl.^{5} C07H *1/00;* C08B *37/00*

U.S. Cl. 536—122 **10 Claims**

1. A process for the preparation of a mercaptal of an oligosaccharide which process comprises the step of reacting the oligosaccharide with a thiol in the presence of a halocarboxylic or halosulphonic acid wherein the halocarboxylic acid or halosulphonic acid is neat acid or provides more than 50% v/v of an aqueous reaction mixture.

5,315,003

METHOD FOR PURIFYING POLYSACCHARIDES

Kazumasa Maruyama; Kazuyuki Yamamoto; Sigehiro Nagura, and Taira Homma, all of Nigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 886,672, May 20, 1992, abandoned. This application Jul. 28, 1993, Ser. No. 98,686

Claims priority, application Japan, May 22, 1991, 3-117582

Int. Cl.^{5} C08B *37/00;* C07H *1/06, 1/08;* D21C *7/06*

U.S. Cl. 536—124 **9 Claims**

1. A method for continuously purifying a polysaccharide comprising the steps of continuously and simultaneously feeding an aqueous solution of a polysaccharide and a hydrophilic

organic solvent which does not solubilize the polysaccharide, mixing these two kinds of liquids with a rotary turbine to precipitate the polysaccharide, cutting the precipitated polysaccharide with an interlocking cutter which comprises a fixed cutter and a rotary cutter, and continuously withdrawing a suspension of finely cut polysaccharide particles.

5,315,004

PROCESS FOR PRODUCING URETIDIONE DIMERS OF ISOCYANATES USING CATALYSTS WHICH ARE BOUND TO INORGANIC MATRICES

Stephen L. Goldstein, Cheshire; Anthony D. Hamer, Newtown; Lawrence E. Katz, Orange; Michael J. McGeary, Meriden, and Curtis P. Smith, Cheshire, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 5, 1993, Ser. No. 43,075

Int. Cl.^{5} C07D *229/00*; C08G *18/74*

U.S. Cl. 540—202 **17 Claims**

1. A process for preparing a dimer by cyclodimerizing an isocyanate, in the presence a dimerization catalyst which is covalently bound to an insoluble inorganic matrix substrate, to form an uretidione-containing cyclodimerized isocyanate.

5,315,005

PROCESS FOR THE SINGLE CRYSTALIZATION OF ENANTIOMERIC RATIO'S (2S,3S):(2R,3R) OF SUBSTITUTED 1,5-BENZOTHIAZEPINONE

Claudio Giordano, Monza; Dario Tentorio, Vigano', and Laura Russo, Milan, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Continuation of Ser. No. 547,045, Jul. 2, 1990, abandoned. This application Jan. 25, 1993, Ser. No. 8,892

Claims priority, application Italy, Jul. 12, 1989, 21166 A/89

Int. Cl.^{5} C07D *281/02*

U.S. Cl. 540—491 **3 Claims**

1. A purification process of (2S,3S)-2,3-dihydro-3-hydroxy-2-(4-methoxyphenyl)-1,5-benzothiazepin-4(5H)-one consisting of the single crystallization without conversion to diastereomers of a mixture enantiomerically enriched in the (2S,3S) enantiomer of 2,3-dihydro-3-hydroxy-2-(4-methoxyphenyl)1,5-benzothiazepin-4(5H)-one, such that the enantiomeric ratio (2S,3S):(2R,3R) is at least 75:25, in an organic solvent selected from the class consisting of lower alcohols, aromatic hydrocarbons and ketones optionally in admixture with dipolar aprotic solvents.

5,315,006

METHOD OF PREPARING POLYCYCLIC DIAMINES

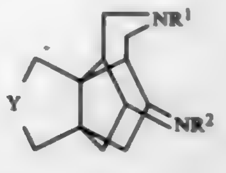
Gary J. Drtina, Woodbury, and Leif Christensen, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 620,258, Nov. 30, 1990, Pat. No. 5,124,454. This application Apr. 6, 1993, Ser. No. 43,502

Int. Cl.^{5} C07D *221/22*

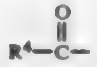
U.S. Cl. 546—43 **4 Claims**

1. A process for preparing polycyclic diamines represented by Formula I:



(I)

wherein Y is —CH$_2$—, —NR$^{3'}$—, —S—, or —O—; R^1, R^2, and R^3 are independently selected from hydrogen, alkenyl or alkenylene containing 2 to 20 carbon atoms; alkyl or alkylene containing 1 to 20 carbon atoms, aryl or arylene containing 5 to 12 ring atoms in which up to 5 of the ring atoms may be selected from S, Si, N, O, and P heteroatoms; cycloalkyl or cycloalkylene containing 3 to 12 ring atoms in which one or more ring atoms may be selected from S, Si, N, O, and P heteroatoms; and acyl, wherein acyl is

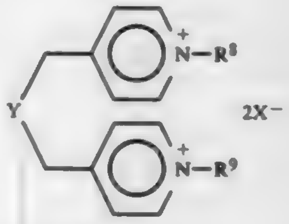


$$R^4-\overset{\overset{\large O}{\|}}{C}-$$

wherein R^4 is described as for R^1 to R^3, and further R^1, R^2, R^3, and R^4 may include functional groups selected from the group consisting of aryl, amide, thioamide, ester, thioester, ketone (including oxo-carbons), thioketone, nitrile, nitro, sulfide, sulfoxide, sulfone, disulfide, tertiary amine, ether, urethane, dithiocarbamate, quaternary ammonium and phosphonium, halogen, silyl, siloxy, wherein the functional groups requiring substituents are substituted with hydrogen, comprising the steps of:

a) mixing a bispyridine compound, and an electrolyte solution, wherein said electrolyte solution has sufficient acid strength to render said bispyridine compound essentially protonnated; and is represented by Formula IV

(IV)



Y is —CH$_2$—, —NR$^{3'}$—, —S—, or —O—; each R$^{3'}$, R^8 and R^9 are independently selected from hydrogen, or lower alkyl having 1 to 4 carbon atoms, and X is a counter-ion selected from a group consisting of chloride, bromide, iodide, sulfate, bisulfate, fluoroborate, perchlorate, and trifluoroacetate; and

b) subjecting said mixture to electroreductive coupling in an electrochemical cell.

5,315,007

PROCESS FOR MAKING DE RING INTERMEDIATES FOR THE SYNTHESIS OF CAMPTOTHECIN AND CAMPTOTHECIN ANALOGS

Daniel L. Comins, and Matthew F. Baevsky, both of Cary, N.C., assignors to North Carolina State University, Raleigh, N.C.

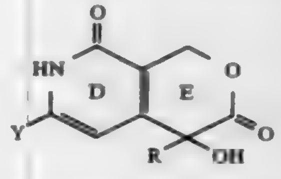
Division of Ser. No. 900,650, Jun. 18, 1992, Pat. No. 5,212,317, which is a continuation-in-part of Ser. No. 632,970, Dec. 20, 1990, Pat. No. 5,162,532. This application Apr. 1, 1993, Ser. No. 41,782

Int. Cl.^{5} C07D *491/052*

U.S. Cl. 546—116 **12 Claims**

1. A process for making a compound of the formula

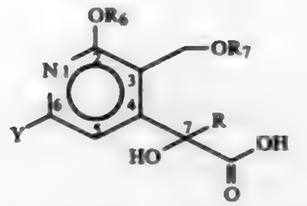
(III)



wherein R is lower alkyl, and Y is H, F or Cl, comprising the steps of:

cyclizing a compound of the formula

(XV)



wherein R$_6$ is lower alkyl, and R$_7$ is lower alkyl, with a halotrialkyl silane cyclizing compound in the presence of an aryl or alkyl amine to form an intermediate, then hydrolyzing the intermediate in aqueous acid.

5,315,008

PROCESS FOR THE PREPARATION OF ISOTHIAZOLONE

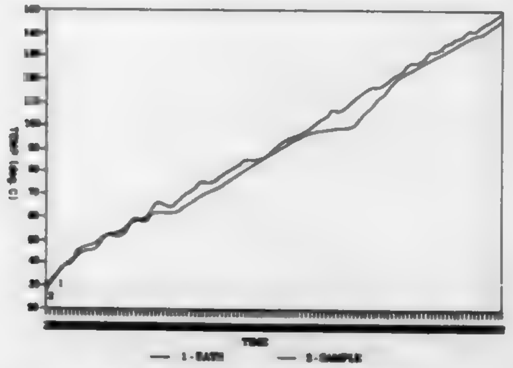
Reinhard Effenberger; Leonard Shorr, both of Haifa, and Yehuda Keren, Kiryat Motzkin, all of Israel, assignors to Bromine Compounds Ltd., Beer-Sheva, Israel

Filed Feb. 5, 1992, Ser. No. 831,465

Claims priority, application Israel, Feb. 6, 1991, 97166

Int. Cl.^{5} C07D *91/10*

U.S. Cl. 548—182 **27 Claims**



1. Process for the preparation of mixtures of 2-methyl-isothiazolin-3-one (5H-MIT) and 5-chloro-2-methyl-isothiazolin-3-one (5Cl-MIT), wherein the ratio of 5Cl-MIT to 5H-MIT is between 0.1 and 10.0 and wherein the yield loss due to 4,5-dichloro-MIT does not exceed 10%, which comprises chlorinating N-methyl-3-mercaptopropionamide (MMPA) with chlorine in a halogenated solvent in continuous operation.

5,315,009

PREPARATION OF ISOTHIAZOLINONES FROM DISULPHIDES AND DISULPHIDES FROM ISOTHIAZOLINONES

Peter W. Austin, Bury, England, and Neville Tyreman, Llanfairfechan, Wales, assignors to Imperial Chemical Industries PLC, London, England

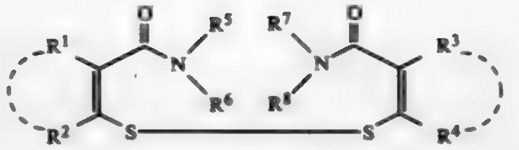
Division of Ser. No. 763,276, Sep. 20, 1991, Pat. No. 5,224,980. This application Mar. 15, 1993, Ser. No. 31,712

Claims priority, application United Kingdom, Sep. 26, 1990, 9020933

Int. Cl.^{5} C07D *275/06*; C07C *323/41*

U.S. Cl. 548—209 **8 Claims**

1. A process for making a 4,5-polymethylene-4-isothiazolin-3-one by reacting a compound of general formula I



I

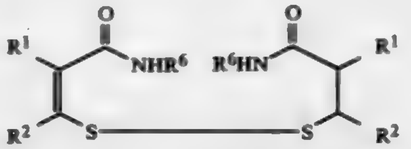
with a, oxidising agent in a solvent, wherein

R^1 and R^2 taken together, and R^3 and R^4 taken together, independently represent a polymethylene chain having 3 or 4 carbon atoms;

R^5 and R^7 are both hydrogen; and

R^6 and R^8 are independently hydrogen, hydrocarbyl or substituted hydrocarbyl.

8. A process for making a compound of general formula V



. V

by reacting a compound of general formula IV with a reducing agent in a solvent wherein

R^1 and R^2 taken together represent a polymethylene chain having 3 or 4 carbon atoms or a Polymethylene chain having 3 or 4 carbon atoms substituted by at least one lower alkyl radical having from 1 to 4 carbon atoms; and

R^6 is hydrogen, hydrocarbyl or substituted hydrocarbyl.

5,315,010

POLYASPARTIC ACID MANUFACTURE

Larry P. Koskan, Orland Park; Kim C. Low, Alsip; Abdul R. Y. Meah, Justice, and Anne M. Atencio, Riverdale, all of Ill., assignors to Donlar Corporation, Bedford Park, Ill.

Continuation-in-part of Ser. No. 660,355, Feb. 22, 1991, Pat. No. 5,221,733. This application Jun. 21, 1993, Ser. No. 80,562

Int. Cl.^{5} C07D *207/40*

U.S. Cl. 548—520 **2 Claims**

1. A method of producing polysuccinimide, comprising the steps

(a) introducing powdered L-aspartic acid onto an indirectly heated plate drier;

(b) heating the introduced powdered L-aspartic acid to a temperature of at least 370° F. to initiate a condensation reaction;

(c) thereafter elevating the temperature of said L-aspartic acid to at least 440° F.; and

(d) maintaining the temperature at at least the 440° F. until at least 80% conversion of L-aspartic acid to polysuccinimide has been achieved.

5,315,011

POLYAMIDE THERMOSETS

Brian C. Benicewicz, and Andrea E. Hoyt, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

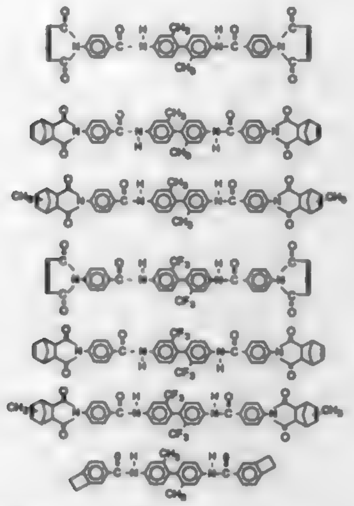
Division of Ser. No. 711,721, Jun. 7, 1991, Pat. No. 5,198,551, which is a continuation of Ser. No. 506,742, Apr. 10, 1990, abandoned. This application Sep. 8, 1992, Ser. No. 941,815

Int. Cl.^{5} C07D *403/10*

U.S. Cl. 548—521 **6 Claims**

1. A thermoset polyamide composition comprised of cured segments derived from one or more polyamide monomers represented by the formula: $R^1—A^1—B^1—A^2—B^2—A^3—R^2$ where R^1 and R^2 are the same radical selected from the group consisting of maleimide, nadimide, methyl nadimide, ethynyl, and $(C(R^3)_2)_2$ where R^3 is hydrogen with the proviso that the

two carbon atoms of $(C(R_3)_2)_2$ are bound on the aromatic ring of A^1 or A^3 to adjacent carbon atoms, A^1 and A^3 are selected from the group consisting of 1,4-phenylene and the same where said groups contain one or more substituents selected from the group consisting of halo, nitro, lower alkyl, lower alkoxy, fluoroalkoxy or fluoroalkyl, A^2 is selected from the group consisting of 1,4-phenylene, 4,4′-biphenyl, 2,6-naphthylene and the same where said groups contain one or more substituents selected from the group consisting of halo, nitro, lower alkyl, lower alkoxy, fluoroalkoxy or fluoroalkyl, and B^1 and B^2 are selected from the group consisting of —C(O)—N(-H)— and —N(H)—C(O)—, wherein at least one of the polyamide monomers is characterized as liquid crystalline.



5,315,012

TETRAHYDROINDAZOLE, TETRAHYDROCYCLOPENTAPYRAZOLE, AND HEXAHYDROCYCLOHEPTAPYRAZOLE COMPOUNDS

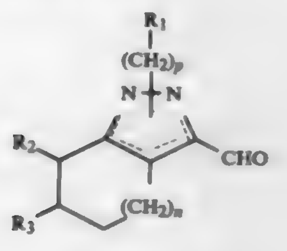
Peter J. Connolly, Morristown, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 886,569, May 20, 1992, Pat. No. 5,250,561, which is a division of Ser. No. 742,788, Aug. 8, 1991, Pat. No. 5,134,155. This application Sep. 9, 1993, Ser. No. 98,536

Int. Cl.^{5} C07D *231/54, 231/56*

U.S. Cl. 548—360.1 **1 Claim**

1. A compound of the formula X:



X

wherein R_1 is selected from any one of H, alkyl, aryl, or substituted aryl; wherein R_2 is selected from any one of alkyl, aryl, substituted aryl, aralkyl, substituted aralkyl, aralkenyl, or cycloalkyl;

wherein R_3 is H; or

wherein R_2 and R_3 may be taken together to form a benzo or naphtho ring system;

wherein n=0 to 3 and p=0 to 3 and pharmaceutically acceptable acid salts thereof.

5,315,013

SUBSTITUTED PYRAZOLE ANGIOTENSIN II ANTAGONISTS

David J. Carini; John Jonas V. Duncia, and Gregory J. Wells, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilimington, Del.

Continuation-in-part of Ser. No. 666,594, Mar. 8, 1991, abandoned, which is a division of Ser. No. 279,193, Dec. 6, 1988, Pat. No. 5,015,651, which is a continuation-in-part of Ser. No. 141,669, Jan. 7, 1988, abandoned. This application Aug. 5, 1992, Ser. No. 925,534

Int. Cl.^{5} C07D *231/12*

U.S. Cl. 548—376.1 **3 Claims**

1. A compound selected from the group consisting of 3-n-butyl-5-methoxymethyl-1-[(2′-carboxybiphenyl-4-yl)methyl]-pyrazole, 3-methoxymethyl-5-n-butyl-1-[(2′-carboxybiphenyl-4-yl)methyl] pyrazole, 3-methoxymethyl-5-(1-buten-1-yl)-1-[(2′-carboxybiphenyl-4-yl)methyl} pyrazole, 3-methoxymethyl-5-n-propyl-1-[(2′-carboxybiphenyl-4-yl)methyl] pyrazole or 5-methoxymethyl-3-n-propyl-1-[2′-carboxybiphenyl-4-yl)methyl] pyrazole; or a pharmaceutical salt thereof.

5,315,014

FUSED HETEROAROMATIC MONOMERS FOR PREPARING LOW BANDGAP POLYMERS

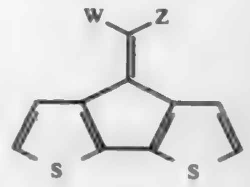
John P. Ferraris, Dallas; Tim L. Lambert, Austin, and Santiago Rodriguez, Richardson, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 758,859, Sep. 12, 1991, Pat. No. 5,274,058. This application Aug. 25, 1993, Ser. No. 112,787

Int. Cl.^{5} C07D *495/04*

U.S. Cl. 549—43 **9 Claims**

1. A compound having the structure:



where

W and Z are independently —Cn, —NO_2, —aryl, —aryl—V, —COX, SO_2R, —H, or —alkyl;

X is —OR, or —NR, R^1;

R and R^1 are independently —alkyl or —H; and

V is —halide, —NO_2, —CN, —SO_2R, or —COX;

wherein at least one of W and Z is —NO_2, —SO_2R, —CN, —COX or —aryl—V.

5,315,015

COMPOUNDS HAVING IMPROVED FLUORESCENCE IN FLUORESCENCE POLARIZATION IMMUNOASSAYS AND IMMUNOASSAYS UTILIZING SAME

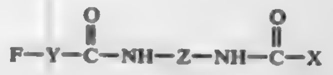
Raymond A. Hui, Lyndhurst, N.J., and Kathryn S. Schwenzer, Yardley, Pa., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 10, 1992, Ser. No. 974,397

Int. Cl.^{5} C07D *493/10*

U.S. Cl. 549—223 **13 Claims**

1. A compound of the formula:



$$F-Y-\overset{O}{\overset{\|}{C}}-NH-Z-NH-\overset{O}{\overset{\|}{C}}-X \qquad I$$

wherein F is a fluorescent group; Y is —NH— or a single covalent bond; Z is straight or branched alkylene chain of two to ten carbon atoms which is substituted with at least one hydrophilic group; Q is oxygen or sulfur; and X is a ligand-analog capable of being recognized by an antibody specific to the corresponding ligand.

5,315,016

PROCESS FOR PREPARING PURE PODOPHYLLOTOXIN

Henrik F. Hansen, Roedovre, and Kim Kjoernaes, Vaerloese, both of Denmark, assignors to Nycomed Dak A/S, Copenhagen S, Denmark

Filed Oct. 13, 1992, Ser. No. 960,102

Int. Cl.^{5} C07D *307/77*

U.S. Cl. 549—298 **52 Claims**

1. A process for preparing crystalline, anhydrous podophyllotoxin from a podophyllotoxin product selected from the group consisting of podophyllotoxin hydrates, inclusion complexes or solvates of podophyllotoxin with organic solvents, and podophyllotoxin phases having organic solvents adsorbed or occluded thereto, the process comprising the steps of:

I) in those cases where said podophyllotoxin product is a product selected from complexes or solvates of podophyllotoxin with organic solvents, and podophyllotoxin phases having organic solvents adsorbed or occluded thereto:

dissolving said podophyllotoxin product in a first non-aromatic and non-halogenated organic solvent which forms an azeotrope with the organic solvent present in said inclusion complex or said podophyllotoxin phase, and then evaporating the solvent from the resulting solution at a temperature not exceeding 130° C.,

II) where appropriate the product thus obtained to repetition of the dissolution/evaporation procedure of step I),

III) dissolving the podophyllotoxin product of steps I or II, or alternatively the hydrate, in the form in which it is present at this stage, in a second non-aromatic and non-halogenated solvent which has a boiling point at atmospheric pressure not exceeding 130° C., and which contains at the most about 1% v/v of water,

IV) cooling the resulting solution to precipitate crystals of podophyllotoxin, the cooling being continued until precipitation of crystals has substantially ceased,

V) isolating the precipitated crystals, and

VI) drying the isolated crystals at a temperature which during the drying procedure is increased but is always such that it is below the temperature at which the crystals sinter or melt, the drying being continued until the melting point is in a range of 183°–184° C. and the residual amount of solvent is at the most 500 ppm.

5,315,017

BENZOPYRAN COMPOUNDS

Guillaume Le Baut, Saint Sebastien Sur Loire; Jean-Paul Babingui, Nantes; Jacqueline Courant, Nantes; Jean-Michel Robert, Nantes; Pierre Renard, Versailles; Daniel-Henri Caignard, Paris; Jean-Francois R. de la Faverie, Chesnay, and Gérard Adam, Le Mesnil Le Roi, all of France, assignors to Adir Et Compagnie, Courbevoie, France

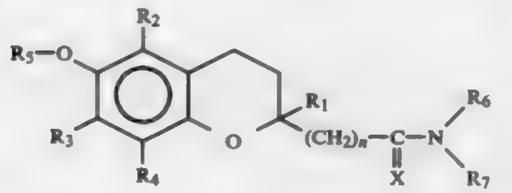
Filed May 1, 1992, Ser. No. 876,763

Claims priority, application France, May 3, 1991, 91 05418

Int. Cl.^{5} A61K *31/35, 31/44, 31/47;* **C07D** *31/04, 405/12*

U.S. Cl. 549—408 **21 Claims**

1. A compound selected from the group consisting of those of the formula (I):



(I)

in which:

n represents 0 or 1,

X represents oxygen or 2 hydrogen, atoms

R_1, R_2, R_3, and R_4, which are identical or different, each represent independently of one another hydrogen or lower alkyl R_a—, where R_a represents linear or branched alkyl having 1 to 8 inclusive carbon atoms,

R_5 represents:
hydrogen,
lower alkyl group R_a—,
lower acyl R_a—CO—,
alkoxyalkyl R_a—O—R_b—,
alkoxycarbonyl R_a—O—CO—,
alkoxycarbonylalkyl R_a—O—CO—R_b—,
carboxyalkyl HOOC—R_a—,
where R_a and Rb, which are identical or different, each represent independently of one another, linear or branched alkyl having 1 to 8 inclusive carbon atoms,

R_6 and R_7 form together with the nitrogen atom carrying them an E group or a substituted E group, wherein E is 1-oxa-2-oxo-3,8-diaza-spiro[4,5]-decan-8-yl, or which are identical or different, each representing independently of one another:
hydrogen,
lower alkyl R_a- or substituted lower alkyl R_a—,
lower alkenyl or substituted lower alkenyl where alkenyl represents an unsaturated, linear or branched hydrocarbon having 2 to 8 inclusive carbon atoms,
a group A-$(CH_2)_m$- or a substituted group A-$(CH_2)_m$-, where m is 0, 1, or 2 and A represents cycloalkyl having p carbon atoms with p being 3, 4, 5, 6, or 7, it being understood that if p is 3 or 4 then m may be 0, 1, or 2 and if p is 5, 6, or 7 then m can only be 1 or 2,
a group phenyl-$(CH_2)_q$— or a substituted group phenyl-$(CH_2)_q$—, with q as defined above,
a group heteroaryl-$(CH_2)_q$— or a substituted group heteroaryl-$(CH_2)_q$—, with q as defined above and where the heteroaryl is selected from: quinoline, isoquinoline and pyridine,

it being understood that when one of the substituents R_6 or R_7 represents hydrogen, lower alkyl having not more than 3 inclusive carbon atoms, an unsubstituted group phenyl-$(CH_2)_{q'}$—, a group phenyl-$(CH_2)_{q'}$— which is substituted by 1 or 2 radicals, an unsubstituted group pyridinyl-$(CH_2)_q$—, or a group pyridinyl-$(CH_2)_q$— which is substituted by 1 or 2 radicals, with q as defined above and q′ being 1, 2, or 3,

then at least one of the following 2 conditions is true:

either the other substituent, R_6 or R_7 as appropriate, does not represent: hydrogen, lower alkyl having not more than 3 inclusive carbon atoms, an unsubstituted group phenyl-$(CH_2)_{q'}$—, a group phenyl-$(CH_2)_{q'}$— which is substituted by 1 or 2 radicals, an unsubstituted group pyridinyl-$(CH_2)_q$—, a group pyridinyl-$(CH_2)_q$— which is substituted by 1 to 2 radicals, with q and q′ as defined above,

or the substituent R5 does not represent hydrogen, lower alkyl having not more than 4 inclusive carbon atoms, or lower acryl R'_5—CO—, with R'_5 representing lower alkyl having not more than 4 inclusive carbon atoms,

it being understood that for this description of the general formula (I), the term "substituted" concerning the groups as defined above: lower alkyl R_a—, lower alkenyl, A-$(CH_2)_m$—, phenyl-$(CH_2)_q$—, phenyl-$(CH_2)_{q'}$—, heteroaryl-$(CH_2)_q$—, means, when it is not specified, that these groups may be substituted by one or more radicals, which may be identical or different, and each one of which may represent independently of one another:
lower alkyl R_c—,
lower alkoxy R_c—O—,
lower acyl R_c—CO—,
trifluoromethyl,
carboxyl,
hydroxyl,
or halogen,
where R_c represents linear or branched alkyl having 1 to 6 inclusive carbon atoms,

an optical isomer thereof, as well as, where appropriate, an addition salt thereof with a pharmaceutically-acceptable acid or base.

5,315,018
PROCESS FOR THE FUNCTIONALIZATION OF ORGANIC MOLECULES

Stuart J. Penny, Maltby, and Roy H. Valentine, Guisborough, both of England, assignors to Roussel-Uclaf, Paris, France

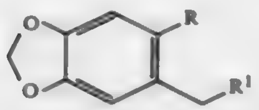
Filed Dec. 15, 1992, Ser. No. 991,076

Claims priority, application United Kingdom, Dec. 18, 1991, 91-26876

Int. Cl.^{5} **C07D** *317/54*

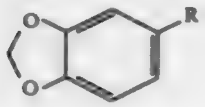
U.S. Cl. 549—445 **6 Claims**

1. A process for the preparation of a compound of the formula:



wherein R is a hydrogen atom or a C_1–C_6-alkyl group, and R^1 is a polyalkoxyalkylene group,

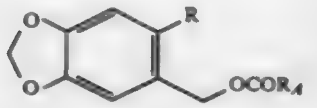
which comprises (a) reacting a compound of the formula:



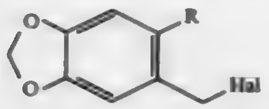
with formaldehyde in a carboxylic acid of the formula:

R_4—COOH

wherein R_4 is a C_1–C_9 hydrocarbyl group or a protected derivative thereof in the presence of an acid catalyst to produce an esterified hydroxymethylated derivative of the formula:



which is thereafter (b) halogenated to produce a compound of the formula:



wherein Hal is an halogen atom,

and thereafter (c) reacting the halogenated compound with HO—R^1 or the sodium salt thereof to produce a compound of formula I.

5,315,019
CONTINUOUS PROCESS FOR THE MANUFACTURE OF 2,5-DIHYDROFURANS FROM γ, δ-EPOXYBUTENES

Gerald W. Phillips, Longview, Tex.; Stephen N. Falling, Kingsport, Tenn.; Stephen A. Godleski, and John R. Moonier, both of Fairport, N.Y., assignors to Eastman Chemical Company, Kingsport, Tenn.

Continuation-in-part of Ser. No. 748,408, Nov. 19, 1991, abandoned. This application Oct. 19, 1992, Ser. No. 962,545

Int. Cl.^{5} **C07D** *307/28*

U.S. Cl. 549—507 **17 Claims**

1. Continuous process for the manufacture of a 2,5-dihydrofuran containing 4 to 8 carbon atoms by the steps comprising:

(1) continuously feeding a γ,δ-epoxyalkene to a reaction zone containing a solution of:

(A) a catalytic amount of a catalyst system comprising (i) an onium iodide and (ii) a Lewis acid selected from inorganic Lewis acids, an organotin (IV) compound, an organostibonium compound or a mixture thereof; and

(B) a process solvent system comprising the 2,5-dihydrofuran product and an oligomer of the γ,δ-epoxyalkene reactant; and

(2) continuously removing a vapor comprising the 2,5-dihydrofuran product from the reaction zone solution;

wherein the liquid phase of the reaction zone is maintained at a temperature of about 65° to 160° C. and the concentration of the catalyst system in the reaction zone liquid is maintained at about 10 to 95 weight percent, based on the total weight of the reaction zone liquid.

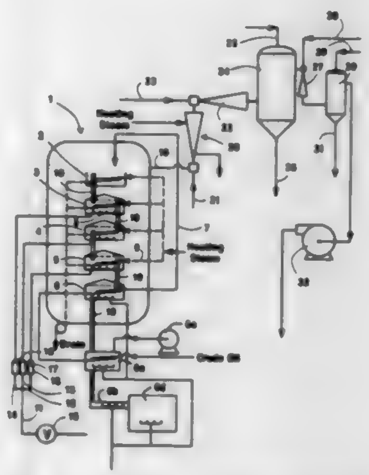
5,315,020
METHOD OF RECOVERING WASTE HEAT FROM EDIBLE OIL DEODORIZER AND IMPROVING PRODUCT STABILITY

Alan T. Y. Cheng, Livingston, N.J.; Jose R. Calvo, and Ramon R. Barrado, both of Madrid, Spain, assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jul. 29, 1992, Ser. No. 921,146

Int. Cl.^{5} **C11B** *11/00*

U.S. Cl. 554—184 **10 Claims**



1. A process comprising: deodorizing crude oil in a deodorization tower in the presence of a stripping gas selected from the group consisting of steam and mixtures of steam and non-condensible inert gas to produce hot deodorized edible oil and sparging and dissolving non-condensible inert gas into said hot deodorized edible oil as said hot deodorized edible oil is cooled to less than about 100° C., wherein the amount of said non-condensible inert gas sparged is sufficient to promote uniform cooling and stability of the resulting, cooled deodorized edible oil.

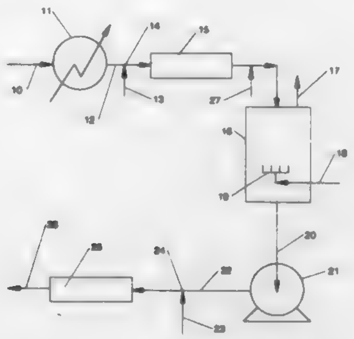
5,315,021
PROCESS FOR REMOVING CHLOROPHYLL COLOR IMPURITIES FROM VEGETABLE OILS

Christopher R. Beharry, Cincinnati, Ohio; Levente L. Diosady, Willowdale, Canada; Leon J. Rubin, Toronto, Canada, and Ahmed A. Hussein, Toronto, Canada, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 1, 1992, Ser. No. 907,415

Int. Cl.^{5} **C07C** *51/42*

U.S. Cl. 554—190 **12 Claims**



1. A process for removing up to 98% of the chlorophyll color impurities from vegetable oils comprising:

(a) dispersing a source of phosphoric acid in a vegetable oil to which has a moisture content of less the 0.1% by weight at a temperature of 70° C. to 160° C. and at a pressure of less than 10 mm of mercury, for a time sufficient to develop a precipitate of said chlorophyll color impurities; and

(b) subjecting the vegetable oil containing the chlorophyll color precipitates to further processing steps selected from the group consisting of degumming, water washing, neutralization, or bleaching; and

(c) removing the precipitated chlorophyll color impurities during the subsequent processing.

5,315,022
SILICONE TYPE CINNAMIC ACID DERIVATIVE, PREPARATION METHOD THEREOF, UV-RAY ABSORBER, AND EXTERNAL SKIN TREATMENT AGENT

Masashi Yoshida; Kenichi Umishio; Keiichi Uehara, and Tomiyuki Nanba, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 376,321, Jul. 6, 1989, Pat. No. 5,093,511. This application Mar. 27, 1991, Ser. No. 676,127

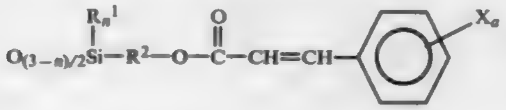
Claims priority, application Japan, Jul. 8, 1988, 63-168838; Jul. 22, 1988, 63-181500; Mar. 31, 1990, 2-86440

The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.

Int. Cl.^{5} **C07F** *7/08*

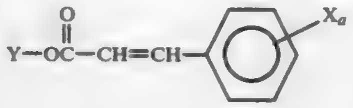
U.S. Cl. 556—437 **2 Claims**

1. A silicone type cinnamic acid derivative which is a siloxane having at least one unit represented by the formula (I):



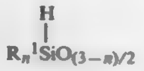
(I)

and having other units which can exist in said siloxane being represented by the formula: $O_{(4-m)/2}SiR_m^3$ wherein R^1 represents an alkyl group having 1 to 4carbon atoms, a phenyl group, or a trimethylsiloxy group, R^2 is a divalent hydrocarbon group having at least two carbon atoms, which may include a heteroatom O, X is an alkoxy group, n is an integer of 0 to 2, a is an integer of 2 or 3, R^3 is an alkyl group having 1 to 4 carbon atoms, a phenyl group, or a trimethyl siloxy group, and m is an integer of 0 to 3, which is prepared by reacting a cinnamic acid ester having the formula:



(II)

wherein y represents a monovalent hydrocarbon group having at least two carbon atoms and an olefinic unsaturated bond, which may include a heteroatom O, X is an alkoxy group, and a is 2 or 3 with a siloxane having an



$$R_n^1\overset{\displaystyle H}{\overset{|}{Si}}O_{(3-n)/2} \qquad \text{(III)}$$

unit and $R_m^3SiO_{(4-m)/2}$ unit in the presence of a platinum vinyl siloxane catalyst in an organic solvent.

5,315,023
PROCESS FOR THE PREPARATION OF GLYCEROPHOSPHOLIPIDS

Lorenzo De Ferra; Fausto Bonifacio; Guido Cifarelli; Pietro Massardo, and Oreste Piccolo, all of Cinisello Balsamo, Italy, assignors to Chemi S.p.A., Patricia, Italy

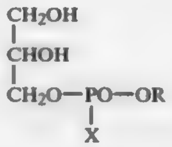
Filed Mar. 8, 1993, Ser. No. 27,946

Claims priority, application Italy, Jun. 24, 1992, MI92A001552

Int. Cl.^{5} **C07F** *9/10*

U.S. Cl. 558—146 **14 Claims**

1. A process for the preparation of single deacylated phospholipids with high purity degree of formula (I)



$$\begin{array}{l} CH_2OH \\ | \\ CHOH \\ | \\ CH_2O{-}\underset{\displaystyle X}{\underset{|}{PO}}{-}OR \end{array} \qquad \text{(I)}$$

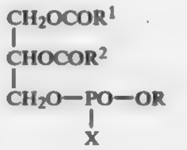
wherein R is a residue of formula (II), (III) or (IV)

$$-CH_2CH_2NH_2, \qquad \text{(II)}$$

$$-CH_2CH_2N^+(CH_3)_3, \qquad \text{(III)}$$

$$-CH_2CH(NH_2)COOH, \qquad \text{(IV)}$$

and X is OH when R is (II) or (IV) or X is O when R is (III), characterized in that acylated derivatives of formula (V) of natural or synthetic origin,



$$\begin{array}{l} CH_2OCOR^1 \\ | \\ CHOCOR^2 \\ | \\ CH_2O{-}\underset{\displaystyle X}{\underset{|}{PO}}{-}OR \end{array} \qquad \text{(V)}$$

wherein X and R are as above defined and R^1 and R^2, which can be the same or different from each other are C_{13}–C_{25} alkyl, or C_{13}–C_{25} mono or polyunsaturated alkenyl, are subjected to deacylation reaction by means of alcoholysis and fractionation in a single step in a reactor containing a basic ion-exchange resin wherein said basic ion-exchange resin is conditioned in the basic form in the presence of the alcohol used for the alcoholysis.

5,315,024
CYANO-SUBSTITUTED COMPOUND CONTAINING ETHER BOND

Haruyoshi Takatsu, Tokyo; Makoto Sasaki, Saitama, and Kiyofumi Takeuchi, Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

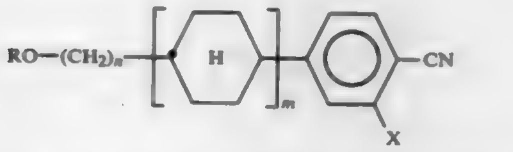
Continuation of Ser. No. 873,690, Apr. 24, 1992, abandoned, which is a continuation of Ser. No. 557,825, Jul. 26, 1990, abandoned. This application Feb. 4, 1993, Ser. No. 13,661

Claims priority, application Japan, Jul. 28, 1989, 1-196073; Oct. 9, 1989, 1-262224; Oct. 19, 1989, 1-272405; Dec. 1, 1989, 1-312864; Feb. 20, 1990, 2-39308

Int. Cl.^{5} C07C *255/54*

U.S. Cl. 558—423 **10 Claims**

1. A compound represented by formula (I):



(I)

wherein R represents a straight-chain alkyl group having from 1 to 5 carbon atoms; X represents a hydrogen atom or a fluorine atom; n represents an integer of 2 to 8; m represents 1 or 2; and the cyclohexane ring is arranged at a trans-configuration.

5,315,025
FUNGICIDES

Michael J. Bushell; Kevin Beautement, both of Wokingham; John M. Clough, High Wycombe; Vivienne M. Anthony, Upminster; Paul deFraine, Wokingham, and Christopher R. Godfrey, Bracknell, all of England, assignors to Imperial Chemical Industries PLC, London, England

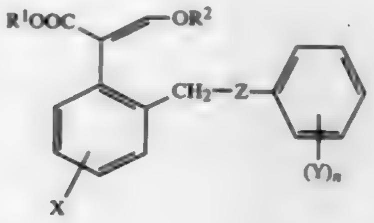
Continuation of Ser. No. 786,803, Oct. 11, 1985. This application Mar. 29, 1991, Ser. No. 677,412

Claims priority, application United Kingdom, Oct. 19, 1984, 8426473; Dec. 20, 1984, 8432265; May 23, 1985, 8513104; May 23, 1985, 8513115

Int. Cl.^{5} C07C *69/76;* A01N *37/12*

U.S. Cl. 560—60 **5 Claims**

1. An acrylate of the formula



wherein

- R^1 and R^2 independently of one another are each C_1–C_6alkyl,
- X is hydrogen, halogen, C_1–C_4-alkoxy, haloalkyl, cyano or nitro,
- Y is hydrogen, alkyl, phenyl, halogen alkoxy, cyano, NO_2, amino or carboxyl,
- n is from 1 to 3 and Z is oxygen.

5,315,026
PROCESS FOR PREPARING ARYL-SUBSTITUTED ALIPHATIC CARBOXYLIC ACIDS AND THEIR ESTERS USING CYCLIC PHOSPHINE CATALYSTS

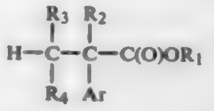
Tse-Chong Wu, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 29, 1993, Ser. No. 128,405

Int. Cl.^{5} C07C *69/76*

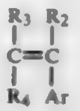
U.S. Cl. 560—105 **28 Claims**

1. A process for preparing an aryl-substituted aliphatic acid or ester thereof having the formula:



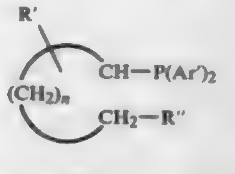
$$H-\underset{R_4}{\overset{R_3}{C}}-\underset{Ar}{\overset{R_2}{C}}-C(O)OR_1 \qquad I$$

where R_1 is hydrogen or alkyl, R_2, R_3 and R_4 are hydrogen, alkyl, cycloalkyl, alkyl-substituted cycloalkyl, aryl either substituted or unsubstituted, alkoxy, alkylthio, heteroaryl either substituted or unsubstituted, alkanoyl, aroyl either substituted or unsubstituted, heteroarylcarbonyl either substituted or unsubstituted, trifluoromethyl or halo and Ar is unsubstituted or substituted aryl which comprises treating a compound of the formula:



$$\underset{R_4}{\overset{R_3}{C}}=\underset{Ar}{\overset{R_2}{C}} \qquad II$$

where Ar, R_2, R_3 and R_4 are as previously defined and a compound of the formula R_1OH where R_1 is as previously defined with carbon monoxide at a pressure of at least about 1 atmosphere and a temperature from about 25° C. to about 200° C. in the absence of oxygen and in the presence of a catalyst that is palladium(0) or the salts of palladium having a valence of 1 or 2 or i) a mixture of said palladium (0) or said salts of palladium and the salts of copper and (ii) a ligand of the formula:



where R′ is the same or different than R″ and is alkyl or aryl either substituted or unsubstituted and Ar′ is phenyl, naphthyl, substituted phenyl or substituted naphthyl and n is an integer from 3 to 6.

5,315,027
CATALYTIC PROCESS FOR PREPARING THE ALKYL ESTERS OF IBUPROFEN

Thanikavelu Manimaran; Tse-Chong Wu, and Felix M. Oribuela, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 11, 1993, Ser. No. 62,906

Int. Cl.^{5} C07C *69/76*

U.S. Cl. 560—105 **42 Claims**

1. A process for preparing an alkyl ester of ibuprofen which comprises carbonylating a 1-halo-1-(4-isobutylphenyl)ethane with carbon monoxide in a neutral or acidic anhydrous medium containing at least about 1 mol of a source of alkoxide ions selected from the group consisting of $RC(OR_1)_3$, $(R)_2C(OR_1)_2$, $Ti(OR_1)_4$, $Al(OR_1)_3$, $B(OR_1)_3$, $HC(O)OR_1$, $P(O)(R_1)_3$ and $P(OR_1)$ where R is hydrogen or individually the same or different than R_1 and R_1 is alkyl per mol of 1-halo-1-(4-isobutylphenyl)ethane at a temperature between about 10° C. and about 200° C. and a carbon monoxide pressure of at least about one atmosphere in the presence of (a) a palladium metal or palladium compound in which the palladium has a valence of 1 or 2 and (b) at least one acid-stable ligand.

5,315,028
OLEFINIC PROCESS FOR PREPARING ARYL-SUBSTITUTED ALIPHATIC CARBOXYLIC ESTERS

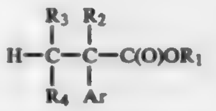
Tse-Chong Wu, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 12, 1993, Ser. No. 62,527

Int. Cl.^{5} C07C *69/76, 51/10*

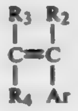
U.S. Cl. 560—105 **43 Claims**

1. A process for preparing an aryl-substituted aliphatic ester having the formula:



$$H-\underset{R_4}{\overset{R_3}{C}}-\underset{Ar}{\overset{R_2}{C}}-C(O)OR_1 \qquad I$$

where R_1 is alkyl, R_2, R_3 and R_4 are hydrogen, alkyl, cycloalkyl, alkyl-substituted cycloalkyl, aryl either substituted or unsubstituted, alkoxy, alkylthio, heteroaryl either substituted or unsubstituted, alkanoyl, aroyl either substituted or unsubstituted, heteroarylcarbonyl either substituted or unsubstituted, trifluoromethyl or halo and Ar is unsubstituted or substituted aryl which comprises treating a compound of the formula:



$$\underset{R_4}{\overset{R_3}{C}}=\underset{Ar}{\overset{R_2}{C}} \qquad II$$

where Ar, R_2, R_3 and R_4 are as previously defined and a compound of the formula R_1OH where R_1 is as previously defined with carbon monoxide at a pressure of at least about 1 atmosphere and a temperature from about 25° C. to about 200° C. in the absence of oxygen and water and in the presence of an effective amount of a catalyst that is i) a mixture of palladium (O) or the salts of palladium and the salts of copper and (ii) at least one acid stable ligand.

5,315,029
PROCESS FOR PREPARING ARYL-SUBSTITUTED ALIPHATIC CARBOXYLIC ACID ESTERS BY CARBONYLATION

Kannappan Chockalingam, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 11, 1993, Ser. No. 62,902

Int. Cl.^{5} C07C *69/76, 51/10*

U.S. Cl. 560—105 **9 Claims**

1. A process for preparing an alkyl ester of ibuprofen which comprises carbonylating a 1-halo-1-(4-isobutylphenyl)ethane with carbon monoxide in a neutral or acidic anhydrous medium containing at least about 1 mol of a C_1 to about C_6 linear or branched aliphatic alcohol per mol of 1-halo-1-(4-isobutylphenyl)ethane at a temperature between about 10° C. and about 200° C. and a carbon monoxide pressure of at least about one atmosphere in the presence, of (a) a perhaloacetic acid; (b) a catalytically effective amount of a compound selected from the group of palladium (0) and a compound in which the palladium has a valence of 0–2 and (c) at least one acid-stable ligand.

5,315,030
CATALYTIC CARBONYLATION OF ETHERS AND THIOETHERS

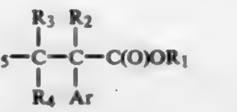
Kannappan Chockalingam, and Tse-Chong Wu, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 29, 1993, Ser. No. 128,505

Int. Cl.^{5} C07C *69/76*

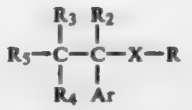
U.S. Cl. 560—105 **11 Claims**

1. A process for preparing an aryl-substituted aliphatic ester having the formula:



$$R_5-\underset{R_4}{\overset{R_3}{C}}-\underset{Ar}{\overset{R_2}{C}}-C(O)OR_1 \qquad I$$

where R_1 is alkyl, R_2, R_3, R_4 and R_5 are the same or different and are hydrogen, alkyl, cycloalkyl, alkyl-substituted cycloalkyl, aryl either substituted or unsubstituted, alkoxy, alkylthio, heteroaryl either substituted or unsubstituted, alkanoyl, aroyl either substituted or unsubstituted, heteroarylcarbonyl either substituted or unsubstituted, trifluoromethyl or halo and Ar is unsubstituted or substituted aryl which comprises treating a compound of the formula:



$$R_5-\underset{R_4}{\overset{R_3}{C}}-\underset{Ar}{\overset{R_2}{C}}-X-R \qquad II$$

where X is sulfur or oxygen and R is alkyl or aryl either substituted or unsubstituted; Ar, R_2, R_3, R_4 and R_5 are as previously defined and a compound of the formula R_1OH where R_1 is as previously defined with carbon monoxide at a pressure of at least about 1 atmosphere and a temperature from about 25° C. to about 200° C. in the absence of oxygen and water and in the presence of a catalyst that is a) palladium(0) or a compound of palladium where palladium has a valence of 1 or 2 or b) a mixture of palladium(0) or the compounds of palladium where palladium has a valence of 1 or 2 and the compounds of copper and (c) at least one acid stable ligand.

5,315,031
OLIGOMERS WITH POLYDIENE SEQUENCES AND PHOTOCROSSLINKABLE GRAFTS AND THEIR APPLICATION PARTICULARLY IN COATING METALS

Bernard Boutevin; Etienne Fleury, and Jean-Pierre Parisi, all of Montpellier, France, assignors to Atochem, Puteaux, France

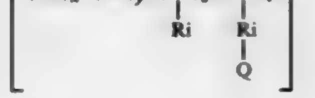
Continuation of Ser. No. 462,852, Jan. 4, 1990, abandoned, which is a continuation of Ser. No. 21,945, Mar. 5, 1987, abandoned. This application Oct. 7, 1991, Ser. No. 772,714

Claims priority, application France, Mar. 5, 1986, 86 03617

Int. Cl.^{5} C07C *321/18*

U.S. Cl. 560—154 **8 Claims**

1. An oligomer with polydiene sequences and photocrosslinkable grafts, the repeating group having the formula:



wherein:

- Xi represents a diene monomer selected from the group consisting of isoprene, butadiene and chloroprene, polymerized according to a cis- or trans-1,4-chaining;
- Yi represents a diene monomer selected from the group consisting of isoprene, butadiene and chloroprene, polymerized according to a 1,2- or 3,4-chaining;

Ri is a thio- or disulfide-containing radical having in the chain or on the end one or more NH_2, —OH, or —COOH groups;

Q is an acrylic or methacrylic derivative obtained by condensing acrylic acid, methacrylic acid, glycidyl acrylate, glycidyl methacrylate, aziridinyl acrylate or aziridinyl methacrylate with the NH_2, —OH, or —COOH group of Ri; and

$x+y+z+t$ is less than or equal to 100;

z being from 1 to 20; and

t being 0 or from 1 to 20.

5,315,032
METHOD OF PRODUCING AN N-HYDROXYCARBAMATE COMPOUND

Keigo Nishihira; Shuji Tanaka; Katsuhiko Mizutare, and Masahiro Kondo, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

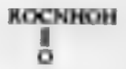
Filed May 26, 1993, Ser. No. 67,551

Claims priority, application Japan, May 26, 1992, 4-189803; Nov. 26, 1992, 4-317125

Int. Cl.^{5} C07C *261/00*

U.S. Cl. 560—157 **11 Claims**

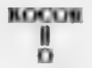
1. A method of producing an N-hydroxycarbamate compound of the formula (I):



$$RO\underset{\underset{O}{\|}}{C}NHOH \qquad (I)$$

wherein R represents a member selected from the group consisting of alkyl groups having 1 to 8 carbon atoms, cycloalkyl groups having 3 to 12 carbon atoms, aryl groups and aralkyl groups,

comprising reacting a carbonic acid diester of the formula (II):



$$RO\underset{\underset{O}{\|}}{C}OR \qquad (II)$$

wherein R is as defined above, with hydroxylamine in the presence of a basic substance.

5,315,033
ESTER HYDROLYSIS

Martin H. D. Butt, Ponca City, Okla., and Francis J. Waller, Allentown, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 788,389, Nov. 6, 1991, Pat. No. 5,233,102, which is a division of Ser. No. 388,400, Aug. 2, 1989, Pat. No. 5,094,995. This application Apr. 19, 1993, Ser. No. 47,395

Int. Cl.^{5} C07C *27/02, 55/14, 69/44*

U.S. Cl. 560—190 **3 Claims**

1. An improved process for the hydrolysis of esters wherein the improvement comprises contacting said esters with a catalytic composition comprising a perfluorinated ion-exchange polymer containing sulfonic acid groups supported on an inert carrier wherein said carrier comprises calcined shot coke and has a hydrophobic surface with a mean pore diameter of at least 1000 Å; at a temperature of from about 130° C. to about 180° C.

5,315,034
PROCEDURE FOR THE PREPARATION OF ALKYL ISOCYANATES

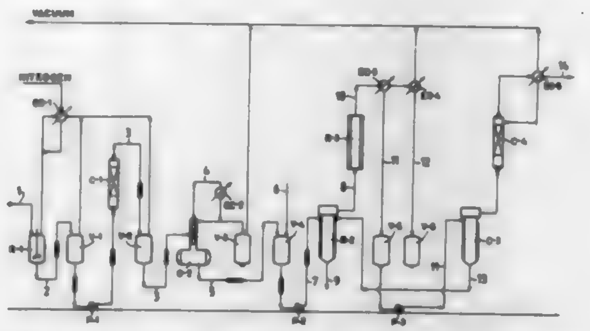
Franco Mizia; Franco Rivetti, and Ugo Romano, all of Milan, Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Filed May 11, 1993, Ser. No. 60,035

Claims priority, application Italy, May 15, 1992, MI92A001170

Int. Cl.^{5} C07C *263/00*

U.S. Cl. 560—338 **16 Claims**



1. Procedure for the preparation of alkyl mono and diisocyanates having the formula:

$R—[NCO]_x$

wherein x represents an integer selected from 1 or 2, and R represents an alkyl radical with a number of carbon atoms of up to ten, either linear or branched, simple or having substituents selected from alkoxy groups, halogens or cycloalkyl radicals; or a cycloalkyl radical with a number of carbon atoms of between 5 and 7, again either simple or having substituents selected from those specified above, which includes the following operations:

a) reaction of an amine having the formula

$R—[NH_2]_x$

with dimethylcarbonate in the presence of a basic catalyst

b) neutralization of the basic catalyst;

c) removal of the alcohol formed and any excess of dimethylcarbonate;

d) vaporization with partial cracking of the urethane obtained in step a);

e) exhaustive cracking of the urethane obtained in step d);

f) fractional distillation at reduced pressure of the cracking product obtained in step e).

5,315,035
ANILINE DERIVATIVES USEFUL AS COLOR FORMERS

Günter Frey, Ellerstadt, and Gerd Zimmermann, Mannheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

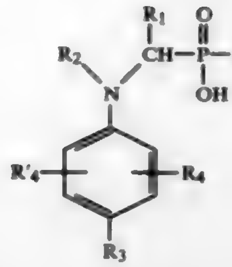
Division of Ser. No. 292,813, Jan. 3, 1989, Pat. No. 5,084,382, which is a division of Ser. No. 774,353, Sep. 10, 1985, Pat. No. 4,820,632. This application Dec. 23, 1991, Ser. No. 812,535

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433946

Int. Cl.^{5} C07F *9/38*

U.S. Cl. 562—16 **15 Claims**

1. An aniline derivative of the formula:

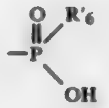


(I')

wherein

R_1 is hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl or C_6–C_{10} aryl substituted by C_1–C_6 alkyl, C_1–C_6 alkoxy, fluorine, chlorine or bromine;

R_2 is hydrogen; C_1–C_6 alkyl; C_1–C_6 alkyl substituted by hydroxyl, amino, carboxyl, lower alkoxycarbonyl, lower alkanoylamido, C_6–C_{10} aryl lower alkyl with 1 to 6 carbon in the alkyl, or C_6–C_{10} aryl, or substituted by a group of the structure:



in which R'_6 is hydroxyl, C_1–C_6 alkyl or C_6–C_{10} aryl;

R_3 is fluorine, chlorine or bromine or carboxyl;

R_4 and R'_4, which can be the same or different, are hydrogen, fluorine, chlorine, bromine, iodine, carboxyl, C_1–C_6 alkoxy or C_1–C_6 alkyl; and

the salts thereof with acids and bases

with the proviso that, R_4 and R'_4 cannot simultaneously be hydrogen.

5,315,036
PROCESS FOR THE PREPARATION OF 2-AMINOBENZENE-1,4-DISULPHONIC ACIDS AND THE NEW COMPOUND 6-CHLORO-2-AMINOBENZENE-1,4-DISULPHONIC ACID

Rolf Schimpf, Leverkusen, and Walter Horstmann, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

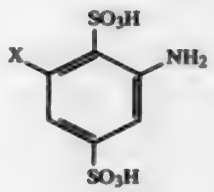
Continuation of Ser. No. 815,901, Dec. 31, 1991, abandoned, which is a continuation of Ser. No. 583,188, Oct. 5, 1990, abandoned. This application Feb. 8, 1993, Ser. No. 15,274

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937342

Int. Cl.^{5} C07C *309/46*

U.S. Cl. 562—58 **7 Claims**

1. A Process for the preparation of an 2-aminobenzene-1,4-disulphonic acid of the formula (1)

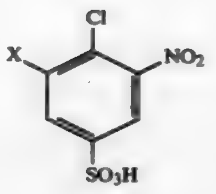


(I)

in which

X represents hydrogen or chlorine,

in which a 4-chloro-3-nitrobenzene-sulphonic acid of the formula (II)



(II)

in which

X represents hydrogen or chlorine,

is reacted with sodium sulphite in an aqueous alkaline medium and then reduced with iron, in which process the reaction with sodium sulphite is carried out at 40° to 90° C., no intermediate isolation is carried out before the reduction with iron and the 2-aminobenzene-1,4-disulphonic acid of the formula (I) is isolated after filtering off the iron oxide, after a pH of <1 has been established in the filtrate at 70° to 90° C. using mineral acid and after the filtrate has been cooled.

5,315,037
PROCESS FOR PURIFICATION OF ACRYLIC ACID

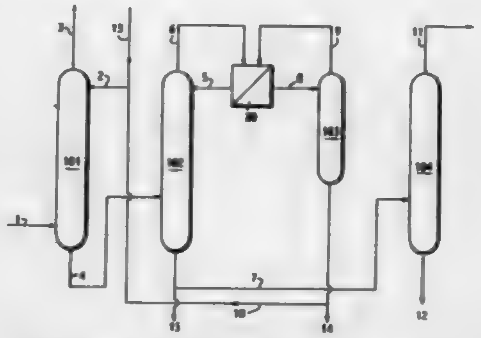
Kazuhiko Sakamoto; Hiroaki Tanaka; Masatoshi Ueoka; Yoji Akazawa, and Masao Baba, all of Himeji, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Jan. 4, 1993, Ser. No. 222

Claims priority, application Japan, Jan. 9, 1992, 4-002331

Int. Cl.^{5} C07C *51/16, 51/42*

U.S. Cl. 562—545 **24 Claims**



1. In a process for producing acrylic acid in which propylene, acrolein or a mixture thereof are subjected to catalytic gas phase oxidation with a molecular oxygen-containing gas to obtain a mixed gas, contacting the mixed gas with water in an acrylic acid absorption tower to obtain an acrylic acid aqueous solution, and introducing the acrylic acid aqueous solution into an azeotropic separation tower for distillation of the acrylic acid aqueous solution along with the azeotrope solvent to separate acrylic acid from the acrylic acid aqueous solution, the improvement wherein said azeotrope solvent is a mixed solvent consisting of at least one solvent A selected from the group consisting of diethyl ketone, methyl propyl ketone, methyl isobutyl ketone, methyl-tert-butyl ketone and n-propyl acetate and at least one solvent B selected from the group consisting of toluene, heptane and methylcyclohexane whereby a mixture consisting substantially of acetic acid, water and the azeotrope solvent is distilled off from the top of the azeotropic separation tower and acrylic acid which is substantially free of acetic acid, water and the azeotrope solvent is obtained from the bottom of the tower.

5,315,038
MICROORGANISM FOR BREAKING DOWN MOENOMYCINS, A PROCESS FOR THE BREAKDOWN, AND THE USE OF THE BREAKDOWN PRODUCTS

Werner Aretz, Königstein/Taunus; Dirk Böttger, Hünstetten; Gerhard Seibert, Darmstadt; Alois Tumulka, Königstein/Taunus; Peter Welzel, and Kurt Hobert, both of Bochum, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

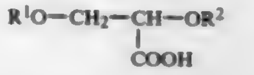
Continuation-in-part of Ser. No. 927,886, Aug. 11, 1992, Pat. No. 5,206,405, which is a continuation of Ser. No. 617,635, Nov. 26, 1990, abandoned, which is a division of Ser. No. 395,790, Aug. 18, 1989, abandoned, and a continuation-in-part of Ser. No. 938,599, Sep. 3, 1992, Pat. No. 5,260,206, which is a continuation-in-part of Ser. No. 762,262, Sep. 20, 1991, abandoned, which is a continuation of Ser. No. 711,708, Jun. 7, 1991, abandoned, which is a continuation of Ser. No. 395,790, Aug. 18, 1989, abandoned. This application Apr. 20, 1993, Ser. No. 48,511

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, 3828337

Int. Cl.⁵ C07C *59/01, 59/125*

U.S. Cl. 562—587 **4 Claims**

1. The compound of formula II



$$R^1O-CH_2-\underset{\displaystyle COOH}{\underset{|}{CH}}-OR^2 \qquad II$$

in which R^1 is hydrogen and R^2 is a branched or unbranched, unsaturated (C_5 to C_{55})-alkyl group.

5,315,039
METHOD FOR INHIBITING THERMAL DECOMPOSITION OF CYCLOALKANONE OXIMES

Hiroshi Kajikuri; Masaru Kitamura, and Yasuhiko Higashio, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 25, 1992, Ser. No. 981,472

Claims priority, application Japan, Jan. 10, 1992, 4-002840

Int. Cl.⁵ C07C *209/82*

U.S. Cl. 564—2 **9 Claims**

1. A method for inhibiting thermal decomposition of cycloalkanone oximes which comprises allowing nitrogen-containing compounds represented by the following formula (1) to coexist with cycloalkanone oximes:

$$NR_1R_2R_3 \qquad (1)$$

wherein R_1, R_2 and R_3 each represents a hydrogen atom or a lower alkyl group.

5,315,040
PRODUCTION OF AROMATIC AMINES

Kotohiro Nomura, and Masaru Ishino, both of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 604,520, Oct. 29, 1990, Pat. No. 5,112,997. This application Feb. 3, 1992, Ser. No. 829,250

Claims priority, application Japan, Oct. 31, 1989, 1-285571; May 31, 1990, 2-143377; Aug. 24, 1990, 2-222770

Int. Cl.⁵ C07C *209/36*

U.S. Cl. 564—422 **8 Claims**

1. A process for preparing aromatic amine compounds which comprises reacting aromatic nitro compounds excluding nitroanthraquinones with carbon monoxide and water in the presence of a homogeneous catalyst comprising ruthenium compounds and solvents therefor as well as amines having the formula (II)

$$HNR^4R^5 \qquad II$$

wherein R^4 and R^5 each is a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group or an aryl group but both R^4 and R^5 are not hydrogen atoms, and R^4 and R^5 may together form a ring and wherein said alkyl group, said cycloalkyl group and said aryl group may have substituents selected from the group consisting of an alkyl group, a halogen atom and an alkoxy group.

5,315,041
TERTIARY AMINOALCOHOL AND PROCESS FOR PRODUCING THE SAME, AND, POLYURETHANE AND PROCESS FOR PRODUCING THE SAME

Hiroshi Abe, Albany, Calif.; Tetsuaki Fukushima, Wakayama, Japan; Kohshiro Sotoya, Wakayama, Japan; Shoichiro Harada, Wakayama, Japan; Hiroshi Kitagawa, Wakayama, Japan; Masayoshi Morii, Ibaraki, Japan, and Yasutoshi Isayama, Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

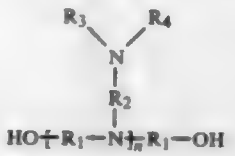
Filed Mar. 4, 1992, Ser. No. 845,594

Claims priority, application Japan, Mar. 5, 1991, 3-38574; Mar. 8, 1991, 3-43849; Feb. 19, 1992, 4-32014

Int. Cl.⁵ C07C *215/02*

U.S. Cl. 564—506 **7 Claims**

1. A tertiary aminoalcohol represented by the formula (I):



(I)

wherein each R_1 represents a straight-chain or branched alkylene group having 2 to 24 carbon atoms, a cycloalkylene group having 3 to 24 carbon atoms, a cycloalkyl alkylene group having 4 to 24 carbon atoms, an arylene group having 6 to 24 carbon atoms, an aralkylene group having 7 to 24 carbon atoms or $-(CH_2CH_2O)_p-(CH_2CH_2)_q-$, wherein p is 0 or a positive number and q is a positive number, each R_2 represents a straight-chain or branched alkylene group having 1 to 9 carbon atoms, each R_3 represents a straight-chain or branched alkyl group having 1 to 4 carbon atoms, each R_4 represents a straight-chain or branched alkyl group having 1 to 4 carbon atoms and n, which represents the average polymerization degree, is a positive number of 2 to 50.

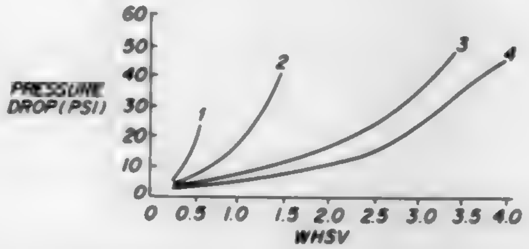
5,315,042
USE OF PARTIAL ACETONE CONVERSION FOR CAPACITY INCREASE AND QUALITY/YIELD IMPROVEMENT IN THE BISPHENOL-A REACTION

Michael J. Cipullo, Prattville, Ala.; Gaylord M. Kissinger, and Isabel M. Matos, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 22, 1993, Ser. No. 34,330

Int. Cl.⁵ C07C *37/20, 39/12*

U.S. Cl. 568—727 **26 Claims**



1. A method for the continuous production of bisphenol-A comprising the steps of:

contacting phenol and acetone in the presence of an acidic catalyst at an accelerated flow rate through the catalyst, said flow rate being sufficient to result in a decrease in acetone conversion, whereby the proportion of acetone is maintained at a high level resulting in a high reaction rate and a corresponding increase in bisphenol-A production; and a corresponding separating formed bisphenol-A and prior to depletion of the acetone whereby the residence time of the bisphenol-A is reduced and undesirable by products and color are reduced.

5,315,043
AROMATIC NUCLEOPHILIC FLUORINATION

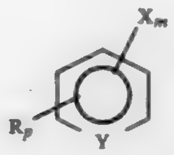
Richard E. Fernandez, Bear, Del., and Mark H. Krackov, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 5, 1992, Ser. No. 831,782

Int. Cl.⁵ C07C *17/20*

U.S. Cl. 568—932 **16 Claims**

1. A process for the nucleophilic fluorination of a starting compound having at least one replaceable non-fluorine halogen or nitro substitutent on at least one aromatic ring having the structure



where

X is non-fluorine halo and/or nitro

m is 1 to 6, R is hydrogen, hydrocarbyl, halogenated hydrocarbyl, amino, cyano and/or carbonylhalide,

Y is CH or N, p is 0 to 5 and m+p is 1 to 6,

to a compound having at least one more fluorine in the molecule than the starting compound which comprises the following steps: (1) intimately contacting the starting compound with an anhydrous molten composition containing at least 50 mole % of a compound or compounds having the formula MF.nHF wherein "M" is at least one of potassium, cesium, or rubidium, HF is hydrogen fluoride and "n" is a number from about 0.5 to about 2, at a temperature within the range of about 30° C. up to a temperature below the decomposition temperature of said starting compound or said fluorinated compound, whichever is lower, at a pressure and for a time sufficient to yield at least one reaction product wherein at least one fluorine has replaced at least one non-fluorine halogen or nitro substitutent of said starting compound and a residual molten composition and (2) isolating and recovering the fluorinated reaction product from the residual molten composition.

5,315,044
PROCESS FOR PRODUCTION OF 1,1,1-TRIFLUORO-2,2-DICHLOROETHANE

Yasuhisa Furutaka; Yukio Homoto, and Tsunetoshi Honda, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Continuation of Ser. No. 586,372, Sep. 21, 1990, Pat. No. 5,171,899, which is a continuation of Ser. No. 349,176, May 9, 1989, abandoned. This application Sep. 9, 1992, Ser. No. 942,178

Claims priority, application Japan, May 17, 1988, 63-120067

Int. Cl.⁵ C07C *17/10, 19/02*

U.S. Cl. 570—123 **4 Claims**

1. A non-catalytic thermal chlorination process for production of 1,1,1-trifluoro-2,2-dichloroethane comprising chlorinating 1,1,1-trifluoro-2-chloroethane with chlorine gas, in which a molar ratio of chlorine gas to 1,1,1-trifluoro-2-chloroethane is in the range of from 0.05 to 0.25 and a reaction temperature is in the range of from 350° C. to 450° C.

5,315,045
MANUFACTURE OF FLUOROETHYLENES AND CHLOROFLUOROETHYLENES

Bernard Berthe, Marseille, and Jean-Marie Cognion, Saint-Genis-Laval, both of France, assignors to Elf Atochem S.A., France

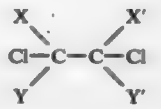
Filed Nov. 6, 1991, Ser. No. 788,388

Claims priority, application France, Nov. 6, 1990, 90 13705

Int. Cl.⁵ C07C *17/02, 17/34*

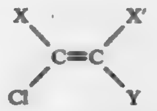
U.S. Cl. 570—153 **9 Claims**

1. Process for the manufacture of a fluoroethylene and/or a chlorofluorethylene comprising contacting a mixed catalyst consisting essentially of 1 to 20% by weight of copper and 0.1 to 10% by weight of palladium deposited on an activated carbon support with a chlorofluoroethane of



(I)

in which at least one of the symbols X, X', Y and Y' represents a fluorine atom and the others, which may be identical or different, each represents a hydrogen or chlorine atom, or with a chlorofluoroethylene of formula:



(II)

in which at least one of the symbols X, X' and Y represents a fluorine atom and the others, which may be identical or different, each represents a hydrogen or chlorine atom, at a temperature of about 100° to 401° C. with hydrogen to catalytically hydrogenolize the chlorofluoroethane or chlorofluoroethylene of formula (I) or (II) respectively.

5,315,046
PROCESS FOR PREPARING ETHANE DERIVATIVES

Guenter Fernschild, deceased, late of Hannover; Claudia Gerdan, legal representative; Werner Rudolph, Hannover, and Carsten Brosch, Seelze, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hannover, Fed. Rep. of Germany

Filed Feb. 21, 1991, Ser. No. 658,658

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4005945

Int. Cl.⁵ C07C *17/08*

U.S. Cl. 570—167 **15 Claims**

1. A process for preparing ethane derivatives of the general formula (I)

$$CF_3CHYZ \qquad (I)$$

in which Y and Z may be the same or different and Y is hydrogen, fluorine, chlorine or bromine and Z is hydrogen, fluorine, chlorine or bromine, comprising:

reacting at least one ethane derivative corresponding to the formula II:

$$CHal^1Hal^2Hal^3CHYZ \qquad (II)$$

in which Y and Z have the above meanings, Hal^1 is halogen, Hal^2 is halogen and Hal^3 is halogen with the exception of fluorine with essentially anhydrous hydrogen fluoride in liquid phase in the presence of an essentially anhydrous, catalytically active solution of a hydrogen fluoride addition compound corresponding to the formula III:

$$H_2F^+(SbCl_xF_y)^- \qquad (III)$$

in which x plus y=6, and x has an average value from 0 to

0.5 and y has an average value from 5.5 to 6, in hydrogen fluoride, and

recovering the resulting ethane derivative of formula (I) from the reaction mixture.

5,315,047

PROCESS FOR THE PREPARATION OF HEXAFLUOROBUTANE, AND INTERMEDIATES THEREBY OBTAINABLE

Norbert Lui, Cologne; Albrecht Marhold, Leverkusen, and Dietmar Bielefeldt, Ratingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 15, 1993, Ser. No. 48,103

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1992, 4213975

Int. Cl.^{5} C07C *17/08, 19/08*

U.S. Cl. 570—168 **4 Claims**

1. A process for the preparation of 1,1,1,4,4,4-hexafluorobutane, in which 1,1,3,4,4-pentachlorobuta-1,3-diene is first reacted with at least 6 mols of hydrogen fluoride per mol of pentachlorobutadiene in the presence of a Lewis acid catalyst at 60° to 180° C. to give 1,1,1,4,4,4-hexafluoro-2-chlorobutane, and converting said 1,1,1,4,4,4-hexafluoro-2-chlorobutane to 1,1,1,4,4,4-hexafluorobutane by means of elimination and hydrogenation.

5,315,048

PREPARATION OF 1,1,1,2,3-PENTAFLUOROPROPANE BY REDUCTION OF 1,2,3-TRICHLOROPENTAFLUROPROPANE

Michael Van Der Puy, Cheektowaga, and David Nalewajek, West Seneca, both of N.Y., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Sep. 30, 1993, Ser. No. 130,083

Int. Cl.^{5} C07C *17/24, 19/02*

U.S. Cl. 570—176 **14 Claims**

1. A process comprising the step of contacting 1,2,3-trichloropentafluoropropane and H_2 in the presence of a catalyst selected from the group consisting of palladium, platinum, ruthenium, rhodium, iridium and mixtures thereof supported on alumina under reaction conditions sufficient to produce 1,1,1,2,3-pentafluoropropane.

5,315,049

PROCESS FOR THE NUCLEAR CHLORINATION OF AROMATIC HYDROCARBONS

Heinrich Schrage, Krefeld, and Helmut Fiege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

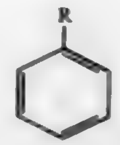
Filed Aug. 18, 1993, Ser. No. 108,367

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1992, 4228134

Int. Cl.^{5} C07C *17/12, 25/00*

U.S. Cl. 570—210 **9 Claims**

1. A process for the nuclear chlorination of an aromatic hydrocarbon of the formula (I)

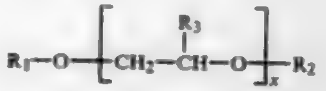


(I)

in which

R denotes a C_1–C_{12}-alkyl radical or C_3–C_8-cycloalkyl radical,

in the presence of a mixture of Friedel-Crafts catalysts and in the presence of cocatalysts and in the liquid phase, comprising employing a Friedel-Crafts catalyst which is a mixture of at least one antimony compound and at least one iron compound and a cocatalyst which is at least one compound having a polyether structure of the formula (II)



$$R_1-O-\left[CH_2-\overset{\overset{R_3}{|}}{CH}-O\right]_x-R_2 \qquad (II)$$

in which

R$_1$ and R$_2$ independently of one another in each case represent hydrogen, a C_1–C_{18}-alkyl radical or C_3–C_8-cycloalkyl radical, or R_1 and R_2 together represent the radical of a cyclising alkylene group,

R_3 denotes hydrogen, methyl or ethyl and X denotes a number from 1 to 500.

5,315,050

MANUFACTURE OF PERCHLOROETHYLENE FROM CARBON TETRACHLORIDE IN THE PRESENCE OF HYDROGEN

Jimmie T. Petrosky, Wichita, Kans., assignor to Vulcan Materials Company, Wichita, Kans.

Filed Feb. 11, 1993, Ser. No. 16,238

Int. Cl.^{5} C07C *17/04, 17/26*

U.S. Cl. 570—234 **19 Claims**

1. A noncatalytic thermal process for making perchloroethylene and hydrogen chloride from carbon tetrachloride, in the presence of hydrogen under conditions which maximize consumption of carbon tetrachloride, which process comprises introducing the following materials into a reaction zone:

(a) carbon tetrachloride as the principal reactive compound;

(b) elemental hydrogen and chlorine, the hydrogen and chlorine being introduced in amounts sufficient to provide heat for the pyrolysis of carbon tetrachloride at a reaction temperature between about 500° and about 700° C.; and

(c) excess carbon tetrachloride as a diluent in an amount sufficient to maintain the reaction temperature between about 500° and about 700° C.;

and withdrawing a product mixture from the reaction zone, condensing the product mixture, and separating perchloroethylene from the product mixture.

5,315,051

PROCESS FOR THE OXYCHLORINATION OF ETHYLENE AND CATALYST COMPOSITIONS FOR THE OXYCHLORINATION

Helmut Derleth, Nienburg; Robert Walter, Langenhagen; Günter Weidenbach, Hanover, all of Fed. Rep. of Germany, and Michel Strebelle, Brussels, Belgium, assignors to Solvay (Société Anonyme), Brussels, Belgium

Continuation of Ser. No. 67,250, Jun. 26, 1987, Pat. No. 4,910,354. This application Oct. 27, 1989, Ser. No. 427,492

Claims priority, application France, Jun. 27, 1986, 86 09504

Int. Cl.^{5} C07C *17/156*

U.S. Cl. 570—245 **14 Claims**

1. In a process for the oxychlorination of ethylene to 1,2-dichloroethane, the improvement comprising catalyzing the oxychlorination reaction by a catalyst composition consisting essentially of an alumina support on which there is deposited cupric chloride, magnesium chloride, and lithium chloride, wherein the lithium metal in the catalyst composition is employed in an atomic ratio relative to copper of between 0.0001 to 2 parts lithium per part copper.

5,315,052

CONCURRENT PRODUCTION OF TRICHLOROETHANE ISOMERS

Tommy G. Taylor, Lake Charles; J. Douglas Mansell, Sulphur; John P. Shamburger, Lake Charles, and Mark E. Woodyear, Sulfur, all of La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1993, Ser. No. 55,498

Int. Cl.^{5} C07C *17/02, 17/10*

U.S. Cl. 570—247 **21 Claims**

1. In a method for conducting liquid phase chlorination wherein:

(a) 1,1-dichloroethane and molecular chlorine are introduced to a reactor containing a liquid phase reaction mixture which comprises free radical initiator; and

(b) organic reaction product comprising 1,1,1-trichloroethane is removed from said reactor;

the improvement wherein:

(c) chloroethene is introduced to said reactor;

(d) said organic reaction product also comprises 1,1,2-trichloroethane;

(e) the molar ratio of said 1,1,2-trichloroethane to said 1,1,1-trichloroethane in said organic reaction product is in the range of from 0.2:1 to 2:1; and

(f) said 1,1,1-trichloroethane and said 1,1,1-trichloroethane together constitute at least 40 percent by weight of said organic reaction product.

5,315,053

NORMALLY LIQUID ALPHA-OLEFIN OLIGOMERS USEFUL AS BASE STOCKS AND VISCOSITY INDEX IMPROVERS, AND LUBRICATING OILS CONTAINING SAME

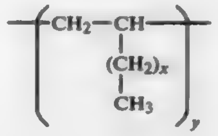
David L. Beach; Paul G. Bercik, both of Kingwood, Tex., and Neal E. Morganson, Novato, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 998,501, Dec. 30, 1992, abandoned, which is a division of Ser. No. 267,056, Nov. 4, 1988, Pat. No. 5,177,276, which is a continuation of Ser. No. 17,496, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 5,994, Jan. 21, 1987, abandoned, which is a continuation of Ser. No. 744,998, Jun. 17, 1985, abandoned. This application Jul. 6, 1993, Ser. No. 88,232

Int. Cl.^{5} C10M *143/08*

U.S. Cl. 585—7 **14 Claims**

1. A composition comprising a lubricating oil base stock and a normally liquid alpha-olefin oligomer consisting essentially of repeating units having the structural formula:



$$\left(CH_2-\underset{\substack{|\\(CH_2)_x\\|\\CH_3}}{CH}\right)_y$$

wherein

x represents an integer from 3 to 11, inclusive, and

y represents the number of repeating units in the oligomer such that the weight average molecular weight is from about 5,000 to about 20,000;

said oligomer having from about 70 to 100 percent head-to-tail alignment of the repeating units of the oligomer.

5,315,054

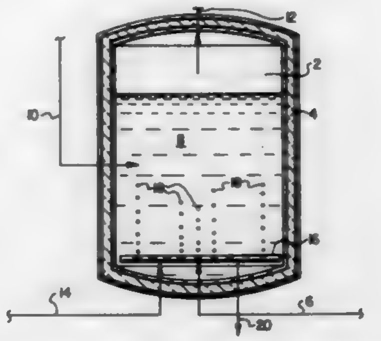
LIQUID FUEL SOLUTIONS OF METHANE AND LIQUID HYDROCARBONS

Dale Teel, Bellingham, Wash., assignor to Burnett Oil Co., Inc., Ft. Worth, Tex.

Filed Oct. 5, 1990, Ser. No. 594,385

Int. Cl.^{5} C10L *1/04, 3/12;* **C09K** *5/00*

U.S. Cl. 585—14 **19 Claims**



1. A method for providing a liquid fuel solution of methane in liquefied petroleum gas comprising:

(a) providing an accumulation of liquefied natural gas in an insulated vessel;

(b) directly mixing a liquefied petroleum gas into the liquefied natural gas contained in said insulated vessel;

(c) vaporizing part of the liquefied natural gas and cooling the liquefied petroleum gas;

(d) adding dried pipeline natural gas to be dissolved in the cooled liquefied petroleum gas; and

(e) producing a binary liquid fuel of about 45% to about 75% by volume methane and from about 55% to about 25% by volume of liquefied petroleum gas at a sufficient temperature and pressure to maintain the binary fuel in the liquid state.

5,315,055

METHOD OF CRACKING POLYMERIC MATERIALS CATALYZED BY COPPER

Jared A. Butcher, Jr., Athens, Ohio, assignor to Ohio University, Athens, Ohio

Filed Dec. 30, 1992, Ser. No. 998,327

Int. Cl.^{5} C07C *17/00*

U.S. Cl. 585—241 **4 Claims**

1. A method of depolymerizing a polymeric material, said method comprising the steps:

(a) preparing a molten mixture comprising:

  (i) a basic material selected from the group consisting of NaOH, KOH, $Na_2B_4O_7.10H_2O$, Na_3BO_3, Na_2SiO_3, K_2SiO_3, and mixtures thereof;

  (ii) a source of copper selected from the group consisting of copper metal, univalent copper, divalent copper, and mixtures thereof; and

  (iii) a polymeric material selected from the group consisting of polyethylene, polystyrene, polyvinylchloride, and polypropylene; and

(b) maintaining said molten mixture under an unpressurized air atmosphere and at a temperature sufficient to reflux said molten mixture at a temperature below about 250° C. for sufficient time to depolymerize said polymeric material.

5,315,056
CATALYST REGENERATION IN A DEHYDROGENATION PROCESS

Robert J. Feldman, Passaic; Joseph M. Dufallo, Randolph, both of N.J.; William A. Schwartz, Fogelsville, Pa., and Theodore S. Williams, Middletown, N.J., assignors to ABB Lummus Crest Inc., Bloomfield, N.J.

Filed Feb. 14, 1992, Ser. No. 837,027

Int. Cl.⁵ C07C *5/333;* **B01J** *23/92, 38/20, 38/04*

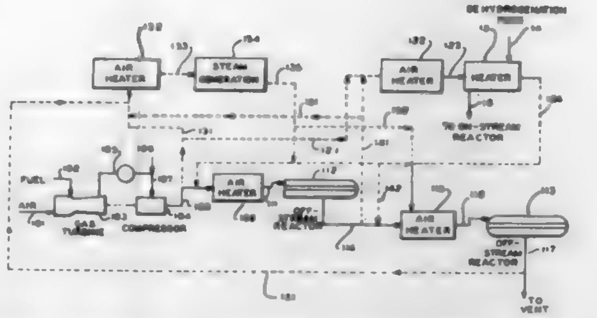
U.S. Cl. 585—659 **8 Claims**

1. In a dehydrogenation process which employs a plurality of reactors each containing a dehydrogenation catalyst wherein the dehydrogenation catalyst requires periodic regeneration by contact with heated gas and wherein the reactors are cycled between use on-stream for dehydrogenation and use off-stream for regenerating catalyst, the improvement comprising:

regenerating catalyst off-stream in at least two reactors, the first of which is in a second portion of a catalyst regeneration cycle and the second of which is in a first portion of a catalyst regeneration cycle;

heating gas to a catalyst regeneration temperature and introducing such heated gas into the first reactor for heating and regenerating catalyst therein;

reheating gas obtained from the first reactor to a catalyst regeneration temperature and introducing such reheated gas into the second reactor for heating and regenerating catalyst therein; and



after completion of the second portion regeneration cycle, removing the first reactor from the regeneration cycle for subsequent use on-stream and placing the second reactor in the second portion of the regeneration cycle.

ELECTRICAL

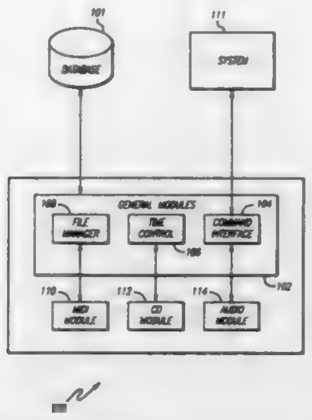
5,315,057
METHOD AND APPARATUS FOR DYNAMICALLY COMPOSING MUSIC AND SOUND EFFECTS USING A COMPUTER ENTERTAINMENT SYSTEM

Michael Z. Land, and Peter N. McConnell, both of Berkeley, Calif., assignors to LucasArts Entertainment Company, Nicasio, Calif.

Filed Nov. 25, 1991, Ser. No. 800,461

Int. Cl.⁵ G10H *1/00, 7/00*

U.S. Cl. 84—601 **32 Claims**



1. An apparatus for dynamically composing a musical sound track, said apparatus comprising:

a composition database comprising musical performance data corresponding to one or more musical sequences, said composition database further including one or more conditional messages, said conditional messages integrated with said musical performance data forming a decision tree;

means for providing real-time;

means for evaluating said decision tree depending on said real-time input; and

means for forming said musical sound track.

5,315,058
ELECTRONIC MUSICAL INSTRUMENT HAVING ARTIFICIAL STRING SOUND SOURCE WITH BOWING EFFECT

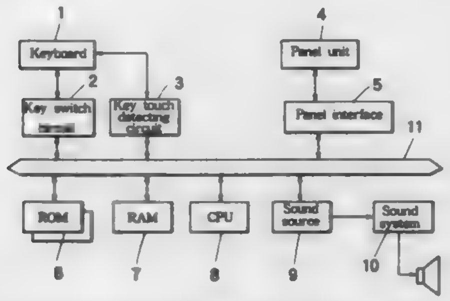
Tetsuo Okamoto, and Satoshi Usa, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 23, 1992, Ser. No. 855,800

Claims priority, application Japan, Mar. 26, 1991, 3-84421

Int. Cl.⁵ G10H *7/00, 1/02;* **G01P** *3/00*

U.S. Cl. 84—626 **27 Claims**



1. An electronic musical instrument comprising:

an artificial sound source including a loop circuit which is controllable according to tone pitch information and a characteristic parameter of the loop circuit for generating a wave signal representative of a musical tone;

input means for inputting primary performance information and tone pitch information;

memory means for storing a prescribed parameter in the form of a plurality of different time sequential data patterns; and

interpolating means operative to access the memory means for carrying out interpolation of the different time sequential data patterns according to the inputted primary performance information so as to produce secondary performance information containing a characteristic parameter effective to control the loop circuit to generate the wave signal modified in accordance with the characteristic parameter.

5,315,059
CHANNEL ASSIGNING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

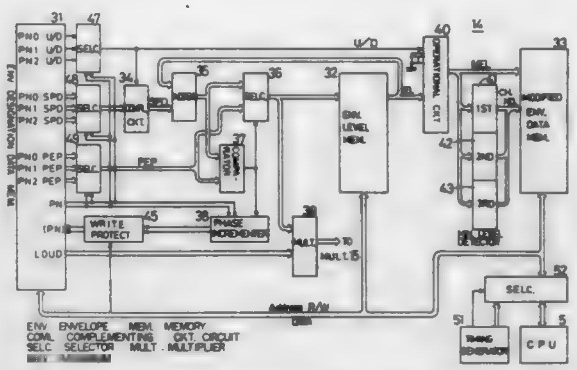
Tsutomu Saito, Iwata, Japan, assignor to Kawai Musical Inst. Manufacturing Co., Ltd., Shijouka, Japan

Continuation of Ser. No. 813,824, Dec. 27, 1991, abandoned. This application Feb. 24, 1993, Ser. No. 22,383

Claims priority, application Japan, Dec. 28, 1990, 2-409578

Int. Cl.⁵ G10H *1/057, 1/06, 1/22, 1/46*

U.S. Cl. 84—656 **29 Claims**



22. A channel assigning method for an electronic musical instrument comprising the steps of:

(A) assigning musical tone generation channels, a number of which correspond to a maximum number of musical tones capable of being sounded simultaneously, to input musical tones;

(B) detecting a musical character of the input musical tones which are assigned to said musical tone generation channels in said step (A);

(C) detecting a number of the input musical tones which are equivalent in musical character;

(D) generating weight factor data indicating a preferential degree of channel assignment for each of the input musical tones, according to a number of the musical tones which are equivalent in musical character; and

(E) selecting at least one of the musical tone generation channels according to the weight factor data generated in said step (D) and assigning a newly input musical tone to said selected channel.

5,315,060
MUSICAL INSTRUMENT PERFORMANCE SYSTEM

Fred Paroutaud, 1316 Barry Ave., #9, Los Angeles, Calif. 90025

Continuation-in-part of Ser. No. 433,652, Nov. 7, 1989. This application Jan. 17, 1992, Ser. No. 824,114

Int. Cl.⁵ G10H *3/18, 7/00, 3/14, 3/00*

U.S. Cl. 84—726 **21 Claims**

1. An electromagnetically stimulated violin comprising:

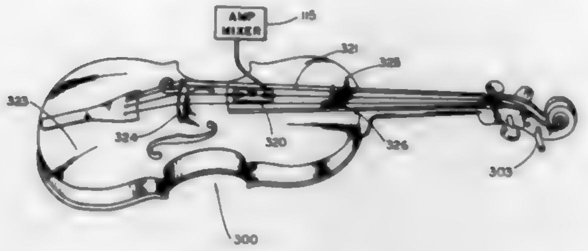
a violin having a plurality of strings, said violin mounted on a base having first and second upright support members such that said violin is supported out of contact of surfaces other than said first and second upright support members;

a plurality of coil magnet assemblies coupled to said violin;

a plurality of string dampers coupled to said violin;

each of said plurality of strings passing through one of said plurality of coil magnet assemblies and one of said plurality of string dampers;

signal generating means for producing a plurality of drive signals such that one drive signal is provided to each coil magnet assembly for electromagnetically exciting said string associated with each said coil magnet assembly to create sound from said violin.



5,315,061
DEVELOPING APPARATUS USING A DEVELOPER CARRIER CAPABLE OF FORMING MICROFIELDS

Koji Suzuki, Yokohama; Shigekazu Enoki, Kawasaki; Hiroshi Takashima, Yono; Naoki Iwata, Tokyo, and Yuichi Ueno, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

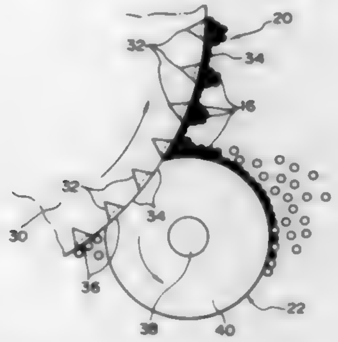
Continuation of Ser. No. 597,881, Oct. 12, 1990, abandoned. This application Apr. 27, 1992, Ser. No. 874,216

Claims priority, application Japan, Oct. 13, 1989, 1-267763; Jan. 26, 1990, 2-15110; Apr. 2, 1990, 2-84992; Apr. 5, 1990, 2-91088

The portion of the term of this patent subsequent to Dec. 15, 2009, has been disclaimed.

Int. Cl.^{5} G03G *15/06*

U.S. Cl. 118—651 **21 Claims**



1. A developing device for developing a latent image electrostatically formed on an image carrier by supplying a developer from a developer carrier to a developing region at which said developer carrier faces said image carrier, comprising a developer carrier having a plurality of surface portions, each of said surface portions having a particular characteristic, and wherein at least one of said surface portions is charged to deposit a charge thereon while the other surface portion is charged to a polarity opposite to and in an amount corresponding to a charge of said at least one of said surface portions by charge injection caused by electrostatic induction ascribable to said charge of said at least one of said surface portions to thereby deposit a charge thereon, thereby forming microfields between said charges, whereby a charged developer is carried on said surface portions by use of said microfields.

5,315,062
WIRE HARNESS CONNECTOR COVER

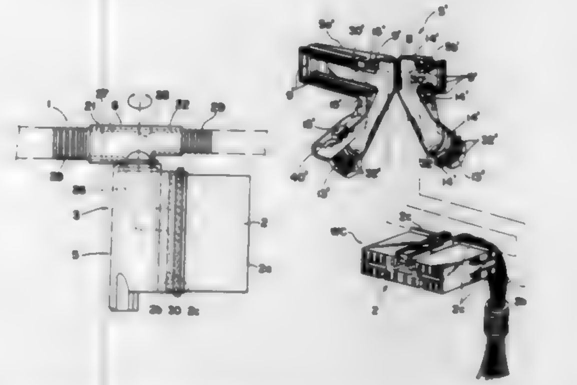
Kazuhiro Hoshino, Iwate, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Nov. 21, 1991, Ser. No. 795,545

Claims priority, application Japan, Nov. 21, 1990, 2-122554

Int. Cl.^{5} H02G *3/08;* H01R *13/627, 13/62*

U.S. Cl. 174—52.1 **2 Claims**



1. A connector cover which is used to protectively cover a wire connecting a wire harness to a connector means at a connection portion of said connector means which serves to connect said wire to electric components, said connector cover comprising;

first cover means for holding said connector and covering said wire at portions thereof which are near said connector, said first cover means comprising a pair of integrally molded half bodies connected to each other by a hinge portion each of said half bodies being provided with an arched portion at one side edge thereof and a semicircular portion at another side edge thereof, said arched portions defining an opening which is shaped so as to receive a portion of said connector and said semicircular portions defining a circular opening for allowing said wire to pass through said cover when said half bodies are closed around said hinge portion; and

a second cover means for covering said wire at portions thereof which are near said wire harness, said second cover means comprising a pair of integrally molded cylindrical half bodies connected to each other by a hinge portion, each of said half bodies being provided with a first semicylindrical portion at one side thereof and a second semicylindrical portion another side thereof so as to form an opening for allowing said wire to pass therethrough from said wire harness to said first cover means.

5,315,063
GROUND CONNECTOR

William T. Auclair, Winsted, Conn., assignor to Electric Motion Company, Inc., Winsted, Conn.

Filed Sep. 10, 1992, Ser. No. 943,297

Int. Cl.^{5} H01R *13/648, 4/14*

U.S. Cl. 174—78 **18 Claims**

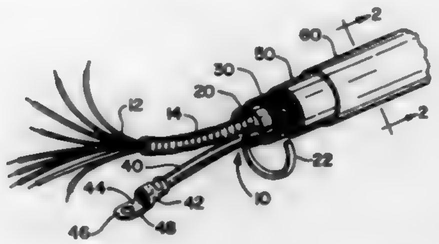
1. A ground connector assembly for grounding a cable having an exposed shield comprising:

tube means for providing a collapsible tube having an axial opening and an exterior surface, said tube means comprising a strip of material wound in a spiral having side edges connected along a tearable interface, said collapsible tube is deformed by exerting an axial pull-out force on said strip;

sleeve means comprising an electrically conductive braided sleeve surrounding said tube means;

ground lead means electrically connected to said sleeve means; and

elastomeric cover means surrounding said sleeve means, so that when said cable is inserted in said axial opening and said tube is collapsed, said cover means biases said sleeve into electrical contact against said shield.



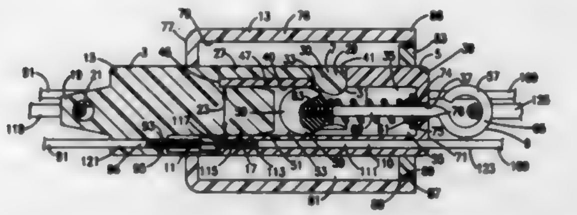
5,315,064
SUSPENDED LINE BREAKAWAY DEVICE

Dean D. Andrews, Topeka, Kans., assignor to William D. Piper, Memphis, Tenn.

Filed Nov. 8, 1991, Ser. No. 789,581

Int. Cl.^{5} H02G *7/04;* H01R *13/62*

U.S. Cl. 174—40 TD **15 Claims**



1. A breakaway device for use with a suspended line supported by a support cable having a first cable end and a second cable end, comprising:

(a) a first body portion having first connecting means for connecting to the first cable end;

(b) a second body portion having second connecting means for connecting to the second cable end;

(c) latching means for engaging said first body portion to said second body portion in a latching engagement;

(d) disengaging means for disengaging said latching means;

(e) a plurality of first component lines, each having a first end embedded in said first body portion;

(f) a plurality of second component lines, each having a second end embedded in said second body portion; each of said first component lines adapted to establish disengageable connection with a respective one of said second component lines as said first body portion and said second body portion are in said latching engagement;

(g) a plurality of connector cavities, one for each of said first component lines;

(h) a plurality of connector blocks, one disposed in each of said connector cavities; each said connector block slidable axially along respective said conductor cavity; each said connector block connected to a respective one of said component lines embedded in said first body portion; and

(i) a plurality of connector springs, one disposed in each of said connector cavities such that respective said connector block is biased toward said second body portion as said first body portion and said second body portion are in said latching engagement.

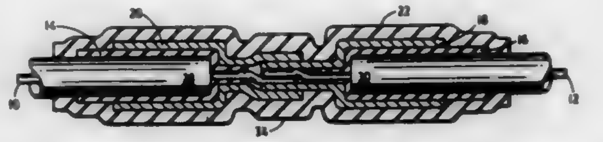
5,315,065
VERSATILE ELECTRICALLY INSULATING WATERPROOF CONNECTORS

James P. O'Donovan, 21 Huntoon St., Dorchester, Mass. 02124

Filed Aug. 21, 1992, Ser No. 933,485

Int. Cl.^{5} H01R *4/ , 43/04*

U.S. Cl. 174—84 C **7 Claims**



1. An assemblage for joining at least a first wire including a first metallic lead and a first insulating sheath, and a second wire including a second metallic lead and a second insulating sheath; said assemblage comprising:

(a) a first rubber collar for enveloping said first wire including a portion of said first metallic lead;

(b) a second rubber collar for enveloping said second wire including a portion of said second metallic lead;

(c) a female deformable metal sleeve for enveloping said first rubber collar and said first wire and centrally overlapping said first metal lead;

(d) a male deformable metal sleeve for enveloping said second rubber collar and said second wire and centrally overlapping said second metallic lead;

(e) said male deformable metal sleeve for projecting into said female deformable metal sleeve; and

(f) a rubber outer sheath for enveloping said male sleeve, said female sleeve, said first collar, said second collar, said first lead, and said second lead.

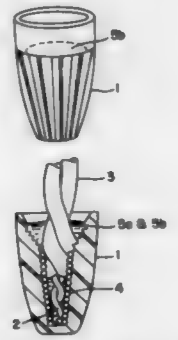
5,315,066
SEALED WIRE CONNECTOR

Joseph Spiteri, Sr., Harborcreek, Pa., assignor to Betts Industries, Inc., Warren, Pa.

Continuation of Ser. No. 863,537, Apr. 6, 1992, which is a continuation of Ser. No. 700,087, May 6, 1991, abandoned, which is a continuation of Ser. No. 256,136, Oct. 7, 1988, abandoned, which is a continuation of Ser. No. 534,737, Sep. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,407, May 3, 1982, abandoned. This application Aug. 31, 1993, Ser. No. 114,784

Int. Cl.^{5} H01R *4/22*

U.S. Cl. 174—87 **6 Claims**



1. A wire connector comprising a housing composed of insulating material and having a cavity for receiving bared ends of insulated wires, thread means composed of metal and disposed within said cavity for screwing onto the bared wire ends and effecting a connection of the bared wire ends to each other and to said thread means, at least two unmixed components which are disposed within said cavity and which are mixable as said thread means is screwed onto the bared wire ends to form a cement for sealingly bonding the connection of

bared wire ends to each other and to said thread means, and a chemical barrier layer located at the interface of the at least two unmixed components thus separating the at least two unmixed components and formed by a reaction at the interface between the at least two unmixed components, at least a portion of said thread disposed inwardly of said cavity means relative to said barrier layer, said barrier layer being pierceable by bared wire ends during insertion of the bared wire ends into said thread means for screwing of said thread means onto the bared wire ends.

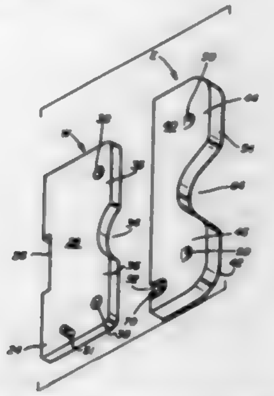
5,315,067

Patent Not Issued For This Number

5,315,068
TERMINAL BLOCK INSULATOR EXTENDER

Mary A. Barron, Cypress, and Danny R. Williams, Houston, both of Tex., assignors to Houston Industries Incorporated, Houston, Tex.

Filed Jul. 11, 1991, Ser. No. 730,278
Int. Cl.^{5} H01B *17/00;* H01R *9/24*
U.S. Cl. 174—138 F **2 Claims**

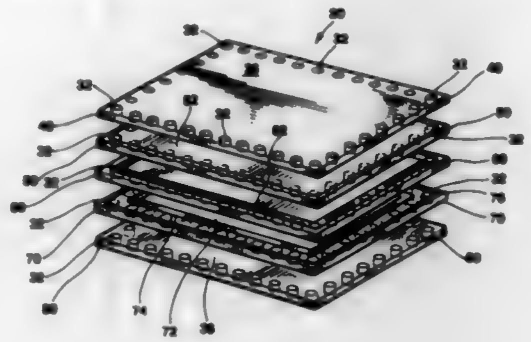


1. An extender for an insulation partition wall having openings formed therein and being mounted between adjacent connector sets in an electrical terminal block, comprising:
first and second side wall members formed to extend substantially parallel with the insulation partition wall;
a spacer body mounted between said first and second side wall members along a portion of the extent thereof;
said spacer body having a thickness substantially equal to that of the outer portion of the insulation partition wall;
said first and second side wall members and said spacer body defining an inner recess adapted to fit over an outer portion of the insulation partition wall;
mounting lugs formed extending into said inner recess from at least one of said first and second side wall members, said mounting lugs being adapted to fit within the openings in the insulation partition wall;
said inner recess being substantially equal in depth to an outer half portion of the insulation partition wall and substantially equal in length to the insulation partition wall;
said first and second side wall members and said spacer body having end portions extending beyond said inner recess in the direction of the length of the insulation partition wall at opposite ends thereof and having a recessed center portion; and
said first and second side wall members and said spacer body extending from said inner recess an amount substantially equal to the depth of said inner recess, thereby forming an extension of the insulation partition wall when same is fitted into said inner recess, said extension serving as a barrier against misconnection of different connector sets.

5,315,069
ELECTROMAGNETIC RADIATION REDUCTION TECHNIQUE USING GROUNDED CONDUCTIVE TRACES CIRCUMSCRIBING INTERNAL PLANES OF PRINTED CIRCUIT BOARDS

Ghassan R. Gehara, Spring, Tex., assignor to Compaq Computer Corp., Houston, Tex.

Filed Oct. 2, 1992, Ser. No. 955,928
Int. Cl.^{5} H05K *1/00*
U.S. Cl. 174—250 **7 Claims**

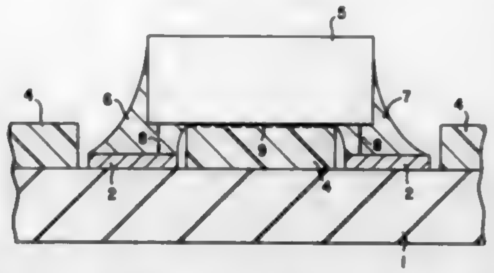


1. A printed circuit board, comprising:
a plurality of layers, each said layer having an inner component area circumscribed by a border area, wherein one of said layers is a ground plane, one of said layers is a power plane, and at least one of said layers is a signal layer;
each layer including a plurality of conductive vias penetrating said layer, said conductive vias being located between said inner component area and said border area of each said layer, wherein said conductive vias define a circuitous path circumscribing said inner component area of each said layer and wherein said layers are stacked together so that each one of said plurality of conductive vias are aligned and in conductive contact with corresponding conductive vias of every other one of said plurality of layers;
said ground plane including a conductive portion covering part of the inner component area of said ground plane, said conductive portion of said ground plane also extending to and electrically coupling to each of said plurality of conductive vias;
each said signal layer including a conductive trace routed between said border area and said inner component area of said signal layer, said signal layer conductive trace generally following said circuitous path and electrically connecting to each of said conductive vias to circumscribe the inner component area of said signal layer; and
said power plane including a conductive portion covering part of said power plane inner component area, and also including a conductive trace routed between said border area and said inner component area of said power plane, said power plane conductive trace generally following said circuitous path and electrically connecting to each of said vias to circumscribe the inner component area of said power plane, said power plane further including a nonconductive electrical isolation path between said power plane conductive portion and said power plane conductive trace.

5,315,070
PRINTED WIRING BOARD TO WHICH SOLDER HAS BEEN APPLIED

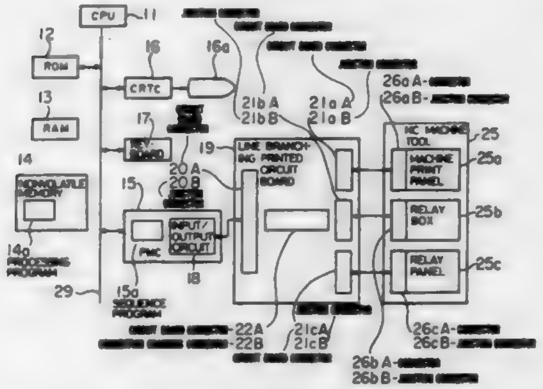
Werner Maiwald, Bad Aibling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany Division of Ser. No. 801,430, Dec. 2, 1991. This application Jun. 29, 1992, Ser. No. 905,474
Int. Cl.^{5} H05K *1/00*
U.S. Cl. 174—250 **1 Claim**

1. A printed wiring board to which solder has been applied, comprising a wiring board surface having metalized regions to be soldered with SMD components, solder applications in the form of a solid solder hump formed of molten soldering paste disposed on and covering said regions, and non-moistening partitions in the form of a dry film solder stop mask having a mask surface at a given height and separating adjacent ones of said solid solder humps from one another, said solid solder humps having a surface extended substantially parallel to said wiring board surface substantially to said given height of said mask surface, and said dry film solder stop mask forming a spacer for the SMD components and defining a soldering gap between said metalized regions and the SMD components to be soldered thereto.



5,315,071
LINE BRANCHING PRINTED CIRCUIT BOARD FOR A COMPUTER NUMERICAL CONTROLLER

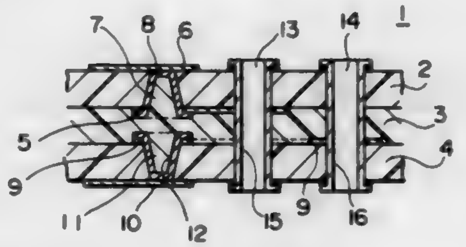
Akihiro Tanimichi, Minamitsuru, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP91/00721, § 371 Date Feb. 14, 1992, § 102(e) Date Feb. 14, 1992, PCT Pub. No. WO92/00659, PCT Pub. Date Jan. 9, 1992
PCT Filed May 28, 1991, Ser. No. 834,565
Claims priority, application Japan, Jun. 22, 1990, 2-164957
Int. Cl.^{5} H01R *23/68*
U.S. Cl. 174—254 **8 Claims**



1. A line branching printed circuit board for a computer numerical controller, which branches input/output signal lines between the computer numerical controller and a numerically controlled machine tool, comprising
a first circuit board connector coupled to a junction connector to which the input/output signal lines from the computer numerical controller are connected,
a plurality of second circuit board connectors which are coupled to junction connectors to which the input/output signal lines to said numerically controlled machine tool are connected, said plurality of second circuit board connectors having pins being directly pattern-connected to pins of said first circuit board connector,
a third circuit board connector having pins pattern-connected to spare pins of said first circuit board connector and spare pins of said plurality of second circuit board connectors, and
a connection changing connector attached to said third circuit board connector and having means for determining the connection of the pins of said third circuit board connector to each other, thereby determining the connection of the spare pins of said first circuit board connector to the spare pins of said plurality of second circuit board connectors.

5,315,072
PRINTED WIRING BOARD HAVING BLIND HOLES

Kunio Arai, Atsugi, and Yasuhiko Kanaya, Machida, both of Japan, assignors to Hitachi Seiko, Ltd., Ebina, Japan
Filed Jan. 27, 1992, Ser. No. 827,708
Int. Cl.^{5} H05K *1/00*
U.S. Cl. 174—262 **4 Claims**



1. A printed wiring board comprising:
a dielectric resin layer having first and second opposing surfaces;
a first outer layer body having inner and outer surfaces and being laminated on said dielectric resin layer with said inner surface of said first outer layer load confronting said first surface of said dielectric resin layer;
a second outer layer boad having inner and outer surfaces and being laminated on said dielectric resin layer with said inner surfaces of said second outer layer boad confronting said second surface of said dielectric resin layer;
a first conductor pad mounted between said dielectric resin layer and said first outer layer board;
a second conductor pad mounted between said dielectric resin layer and said second outer layer board;
wherein said first outer layer board comprises a first resin layer and a first conductive foil layer on an outer surface of said first resin layer;
wherein said second outer layer board comprises a second resin layer and a second conductive foil layer on an outer surface of said second resin layer;
wherein a blind hole is formed in said first resin layer of said first outer layer board and opens through an inner surface of said first resin layer; and
wherein a conductive plated layer is provided in said blind hole, is conductively connected with said first conductive foil layer, and has a portion which overlaps and conductively contacts said first conductor pad in such a manner that said first conductor pad is disposed between said inner surface of said first outer layer board and said portion of said conductive placed layer which overlaps said first conductor pad.

5,315,073
LOAD MEASURING APPARATUS, IN PARTICULAR WEIGHING SCALE

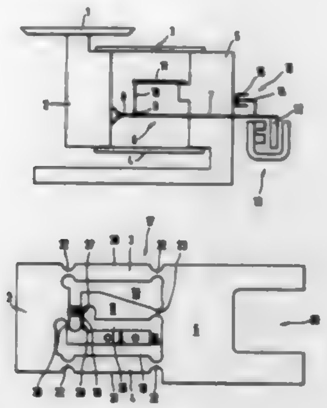
Adolf Ast; Erwin Enzmann, and Walter Holike, all of Messstetten, Fed. Rep. of Germany, assignors to Mettler-Toledo (Albstadt) GmbH, Albstadt, Fed. Rep. of Germany

Filed Feb. 11, 1993, Ser. No. 16,275

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1992, 4204480

Int. Cl.⁵ G01G *7/00, 3/08*

U.S. Cl. 177—212 10 Claims



1. A load measuring apparatus, in particular a weighing scale, comprising a load receiving member being elastically deflectably guided relative to a stationary member in the direction of the load to be measured, and magnetic compensating means including a magnet arrangement, a compensating coil located in the magnetic field generated by said magnet arrangement, a pivotable lever with two arms being elastically supported by said stationary member, said compensating coil being supported by one arm of said pivotable lever, a position sensor detecting a predetermined relative position of said lever in said load measuring apparatus, and electrical means regulating the compensating current flowing through said compensating coil depending on the output signal from said position sensor such that said predetermined relative position is held, and establishing a measuring value for the load to be measured on the basis of the regulated compensating current, characterized in that the other arm (8) of said lever (6) is mechanically coupled to said load receiving member (2), that elastic displacement of the fulcrum (9) of the lever (6) takes place in the direction of deflection of the load receiving member (2), and that said position sensor (16) detects the relative position between the magnet arrangement (13) and the compensating coil (12).

5,315,074
METHOD AND APPARATUS FOR IMPLANTING GEOPHONES INTO THE EARTH

Richard J. Berquist, Houston, Tex., assignor to Input/Output, Inc., Stafford, Tex.

Filed Feb. 23, 1993, Ser. No. 21,324

Int. Cl.⁵ G10K *11/00*

U.S. Cl. 181—0.5 27 Claims

1. Apparatus for inserting a plurality of geophones into the earth at spaced selected surface locations comprising:

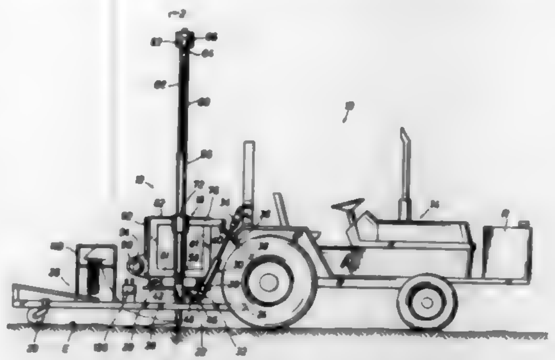
a self propelled vehicle adapted for travel along the surface of the earth;

an implanting device for the geophones mounted on said self propelled vehicle for travel with said vehicle along the surface of the earth; said device including:

a push tube having means at its lower end detachably receiving a geophone for insertion within the earth;

means to selectively raise and lower said push tube;

force exerting means for exerting a downward force on said push tube and geophone thereon for pushing the lower end of the tube with the geophone thereon to a desired depth into the earth for implanting the geophone; and



means to vibrate selectively said push tube with said geophone relative to said force exerting means.

5,315,075
EXHAUST GAS MUFFLER FOR AN INTERNAL COMBUSTION ENGINE

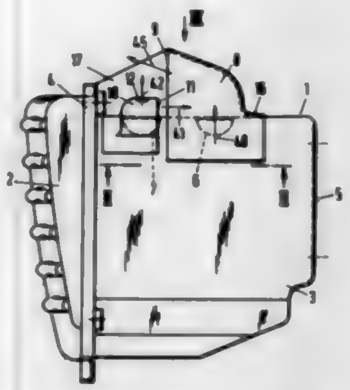
Wolfgang Junginger; Matthias Rösler, both of Waiblingen, and Thomas Rupp, Berglen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 301,549

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 8812435[U]

Int. Cl.⁵ F01N *1/06*

U.S. Cl. 181—240 14 Claims



1. An exhaust gas muffler for an internal combustion engine such as a two-stroke engine for portable handheld tools such as motor-driven chain saws, the engine including a cylinder and a piston conjointly defining a combustion chamber wherein combustion gases are generated and discharged as a flow of exhaust gas during operation of the engine, the exhaust gas muffler comprising:

a housing having a shell-like wall defining a chamber for receiving the exhaust gas from the engine;

said housing having a primary outlet opening formed in said wall for passing a primary component flow of said exhaust gas out of said chamber in a first direction;

said housing having a secondary outlet opening formed in said wall for passing a secondary component flow of said exhaust gas out of said chamber; said secondary outlet opening being disposed adjacent said primary outlet opening; and,

guide means disposed at said secondary outlet opening for guiding said secondary component flow to flow in a second direction transverse to said first direction thereby causing said secondary component flow to break up said primary component flow and mix the latter with the ambient air.

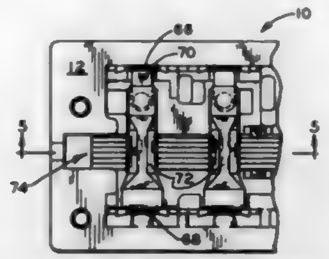
5,315,076
PUSH BUTTON MULTIPLE CIRCUIT SWITCH ASSEMBLY WITH LAMINATED SLIDERS AND MEMBRANE

Kenneth R. Renkes, and Lyle J. Bush, both of Morrison, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Oct. 13, 1992, Ser. No. 959,704

Int. Cl.⁵ H01H *9/20*

U.S. Cl. 200—5 EB 36 Claims



1. An electrical switch assembly comprising:

a housing;

switch means mounted within said housing, said switch means having a plurality of paired electrical contacts selectively movable to open and closed positions;

a plurality of push rods extending through said housing, each push rod having a first end which terminates within the housing, and a second end which terminates exteriorly of the housing, said push rods being axially movable relative to the housing; and

a plurality of generally elongate sliders movably mounted within the housing, each of said sliders having a first edge and a first plurality of cam surfaces on said first edge for interacting with the paired electrical contacts of the switch means to selectively open and close the contacts as the slider moves between first and second positions within the housing, and each of said sliders having a second edge and a second plurality of cam surfaces on said second edge for interacting with the first ends of respective ones of the push rods as said push rods are axially moved, each of said first ends of the push rods interacting with at least one of the cam surfaces on said second edges of the sliders to cause a respective one of the sliders to move;

wherein each of said cam surfaces on said second edges has a first portion having a first angle, relative to an axial centerline of a respective push rod, selected so as to require that a first predetermined level of force be applied to the push rod to cause the respective slider to begin

to move away from said first position, and a second portion having a second angle selected so as to require a second, substantially lower level of force be applied to the push rod to cause the respective slider to continue to move to said second position.

5,315,077
ROTARY SWITCH INCLUDING CAM OPERATED FLEXIBLE CONTACTS

Thomas E. Simon, Corona; Thanh Nguyen, Pomona, and Paul Gratzinger, Moreno Valley, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Apr. 5, 1993, Ser. No. 42,970

Int. Cl.⁵ H01H *19/60, 21/80*

U.S. Cl. 200—11 R 21 Claims

1. A rotary switch, comprising:

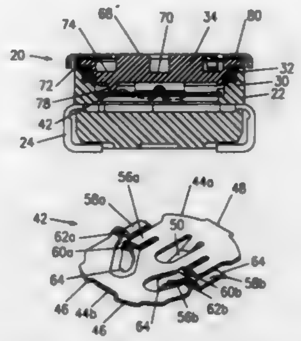
a housing defining a chamber having an open upper end;

a plurality of switching terminals fixed in the housing so as to be exposed in the chamber;

a substantially planar contact member fixed in the chamber adjacent to the switching terminals, the contact member having a central common contact finger in electrical contact with one of the switching terminals, and a plurality of spring contact arms spaced from each other so as to be individually movable axially out of the plane of the contact member into electrical contact with one of the switching terminals;

a cam follower element on each of the contact arms, at least two of the contact arms having respective cam follower elements that are equidistantly spaced, by a first distance, from the center of the contact member;

a rotor rotatably mounted in the chamber and having a top surface and a bottom surface, the rotor having an axis of rotation that is at least approximately coincident with the center of the contact member; and



a plurality of camming elements extending axially from the bottom surface of the rotor so as to be operatively engageable against the cam follower elements in a predetermined sequence as the rotor is rotated in the chamber, at least one of the camming elements being located a radial distance from the axis of rotation that is equal to the first distance;

whereby the operative engagement between a camming element and a cam follower element moves the contact arm on which the engaged cam follower element is disposed axially into electrical contact with one of the switching terminals.

5,315,078
POLARITY SWITCH FOR STEP-TRANSFORMER SELECTOR

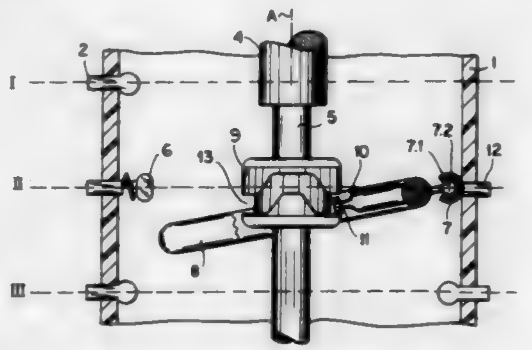
Heinrich Freymüller, Bruck, Fed. Rep. of Germany, assignor to Maschinenfabrik Reinhausen GmbH, Regensburg, Fed. Rep. of Germany

Filed Dec. 11, 1992, Ser. No. 989,343

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1991, 4141142

Int. Cl.⁵ H01H *9/00*

U.S. Cl. 200—11 TC 5 Claims



1. In step-transformer selector comprising:

a generally cylindrical drum centered on an axis and provided with an annular array of selector contacts and with at least one polarity contact offset axially from the selector contacts; and

a selector shaft extending along the drum axis in the drum and rotatable about the axis to connect to selected ones of the selector contacts;

a polarity switch comprising:
a pivot in the drum offset from the drum axis and defining a pivot axis offset from the drum axis;
a ring rockable in the drum on the pivot about the pivot axis between a connecting position touching and connecting to the polarity contact and an out-of-service position offset from and out of contact with the polarity contact;
a cam on the shaft having a cam surface; and
means including a follower mounted on the ring and riding on the cam surface for rocking the ring from its out-of-service position into its connecting position at least once during each rotation of the shaft about the drum axis.

5,315,079

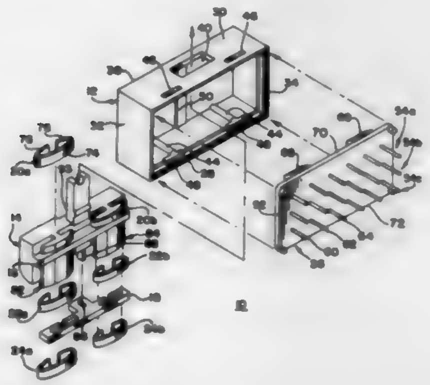
PCB MOUNTED 6PDT SLIDE SWITCH

Joseph J. Gierut, Glenview, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Jan. 4, 1993, Ser. No. 236

Int. Cl.⁵ H01H *15/00*

U.S. Cl. 200—16 D **20 Claims**



1. A slide switch comprising:
a base member having fixed therein spaced, substantially aligned first, second and third rows of terminal contacts, each row being defined by first and second sets of the terminal contacts, each set having first, second and third contact pins;
slide actuator means being formed of first and second T-shaped contact retention members and a fixed spacer bar element extending between said first and second retention members;
a first set of outer movable contact shoes being slidably mounted on said first and second retention members;
a second set of intermediate movable contact shoes being slidably mounted on said first and second retention members and being spaced from said first set of contact shoes by said fixed spacer bar element;
a separate spacer bar member being slidably mounted on said first and second retention members;
a third set of outer movable contact shoes being slidably mounted on said first and second retention members and being separated from said second set of contact shoes by said separate spacer bar member; and
a cover member for retaining together said slide actuator means, said first through third sets of contact shoes and said separate spacer bar member, said cover member being fixedly secured to said base member such that said contact shoes are electrically connected with a selected number of said terminal contacts.

5,315,080

LIMIT SWITCHING APPARATUS WITH DEFINED OVERTRAVEL FOR SPECIMEN PROTECTION ON MICROSCOPES WITH MOTORIZED FOCUSING DRIVE

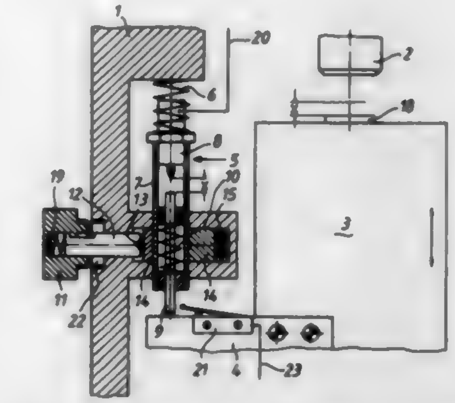
Ulrich Kaczynski, Bad Nauheim, and Roland Hedrich, Ehringshausen, both of Fed. Rep. of Germany, assignors to Leica Mikroskopie und Systems GmbH, Wetzlar, Fed. Rep. of Germany

Filed Apr. 3, 1992, Ser. No. 863,130

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1991, 4112010

Int. Cl.⁵ H01H *3/16;* **G01N** *29/00*

U.S. Cl. 200—47 **8 Claims**



1. A limit switching apparatus for limiting movement of a motorized focusing drive, comprising:
a microscope having a movable specimen stage;
a switching rod accommodating an actuating pin; and
an electric switch arranged together with the actuating pin of the switching rod;
wherein the actuating pin is non-positively connected to the specimen stage of the microscope and a free working distance is provided between the actuating pin and the electric switch for a defined overtraveling of a stored focusing position.

5,315,081

VACUUM SWITCHING TUBE FOR LOW-VOLTAGE AND MEDIUM-VOLTAGE SWITCHES, PARTICULARLY FOR VACUUM CONTACTORS

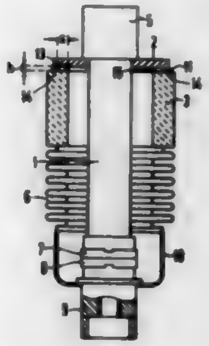
Werner Hartmann, Roettenbach, and Horst Kippenberg, Herzogenaurach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 31, 1993, Ser. No. 41,303

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1992, 4210616

Int. Cl.⁵ H01H *33/66*

U.S. Cl. 200—144 B **9 Claims**



1. In a vacuum switching tube for low-voltage and medium-voltage switches, including,
a) a first contact piece disposed in a fixed position,

b) a movable current conducting rod having a second contact piece for making an electrical contact with the first contact piece, and
c) a switching chamber, consisting of a metallic cap surrounding the contact pieces, a metal bellows connected to the metallic cap and an isolator to provide a movable vacuum seal, the movable current conducting rod being connected via a metallic flange to an end of the isolator by a high vacuum sealing technique, wherein said isolator is a ring-shaped insulator body having a vacuum side and at least one end surface at least partially on the vacuum side, the improvement comprising:
said end surface of the ring-shaped insulator body is at least partially free of metallization and faces away from metal vapor formed during switching, whereby said end surface is protected against metal vapor condensation;
said partially unmetallized end surfaces has a radial expanse on the vacuum side which is sufficient to maintain an insulating function in the vacuum switching tube;
and the metallic flange connected to said end of the ring-shaped insulator body forming a gap with said insulator end surface, said gap having a predetermined length in the radial expanse and height in the axial expanse, respectively.

5,315,082

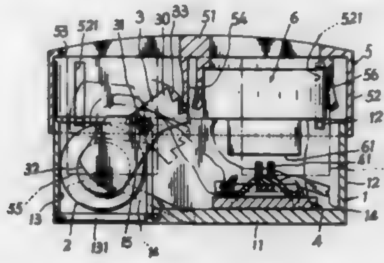
DEPRESSIBLY-ACTUATED SWITCH MEANS FOR NORMALLY DISCONNECTING POWER SOURCE OF INTEGRATED CIRCUIT

Fu-Chiang Liao, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Feb. 22, 1993, Ser. No. 20,419

Int. Cl.⁵ H02J *7/00*

U.S. Cl. 200—506 **8 Claims**



1. An electrical device comprising:
a housing;
a power source comprised of a plurality of neighboring batteries connected in series and located in the housing;
an integrated circuit mounted in said housing and powered by said batteries; and
a switch means comprising an electrically insulating barrier operatively attached to said housing and insertable between two neighboring batteries of said plurality of batteries for interrupting power through said batteries and said integrated circuit and further preventing power consumption by said integrated circuit, and an upper cover resiliently mounted on said housing for shielding said housing and operatively moving said insulating barrier from between said neighboring batteries, whereby when said cover is depressed, said insulating barrier moves from between the neighboring batteries to a position allowing a completed electrical circuit between said power source and said integrated circuit, thereby powering said integrated circuit.

5,315,083

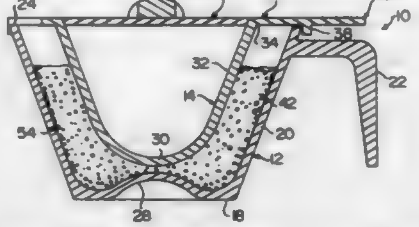
MICROWAVE COOKING UTENSIL

Robert E. Green, 909 N. Front St., Marquette, Mich. 49855

Filed May 12, 1992, Ser. No. 881,883

Int. Cl.⁵ H05B *6/80*

U.S. Cl. 219—734 **13 Claims**



1. An utensil for heating and cooking foods in a microwave oven comprising:
a first microwave transparent vessel for holding a first food material having a first microwave absorbing property, said first vessel having a bottom wall, a substantially frusto-conical side wall converging toward said bottom wall, and an upper annular edge;
a second microwave transparent vessel for holding a second food material having a second microwave absorbing property, said second vessel having a bottom wall, a frustoconical side wall having an upper end, and a depending flange extending outwardly from said upper end, said second vessel being disposed within said first vessel whereby said side walls of the first and second microwave transparent vessels are in a spaced relationship and said side wall of said second vessel compliments the side wall of said first vessel whereby a substantially uniform annular space is defined between said side walls of said first and second vessels; and
a microwave permeable cover on said second vessel.

5,315,084

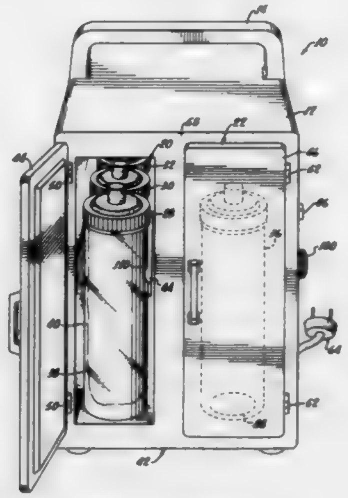
BABY BOTTLE CATERER WITH SEPARATE REFRIGERATION AND HEATING UNITS

Martin Jensen, 21 Le Conte, Laguna Niguel, Calif. 92677

Filed Feb. 10, 1993, Ser. No. 16,100

Int. Cl.⁵ H05B *6/80*

U.S. Cl. 219—689 **16 Claims**

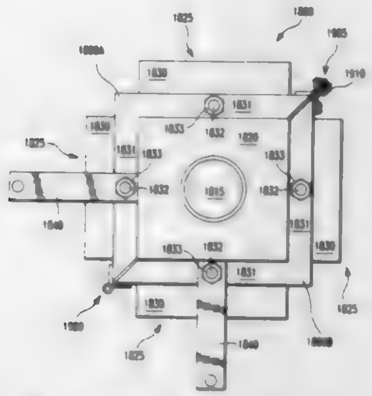


1. A baby bottle caterer comprising:
a manually transportable case;
a refrigeration unit disposed in said case and sized for containing and cooling a selected number of baby bottles in an upright orientation;

a heating unit disposed in said case and sized for containing and warming at most one baby bottle in an upright orientation, said heating unit being in a spaced apart relationship with said refrigeration unit; and
control means for running the heating unit for a sufficient time to warm said one bottle, and formula therein, to a selected temperature, said control means comprising a temperature sensor disposed in said refrigerator unit and responsive to said temperature sensor for running the heating unit for sufficient time to warm said one baby bottle, and formula therein, to said selected temperature.

5,315,085
OVEN THAT EXHIBITS BOTH SELF-RESISTIVE AND SELF-INDUCTIVE HEATING

Hugo S. Ferguson, Averill Park, N.Y., assignor to Dynamic Systems Inc., Poestenkill, N.Y.
Continuation-in-part of Ser. No. 645,190, Jan. 18, 1991, Pat. No. 5,202,542. This application Dec. 7, 1992, Ser. No. 987,368
Int. Cl.^{5} H05B *11/00, 6/12;* **F27D** *11/00*
U.S. Cl. 219—50 **18 Claims**

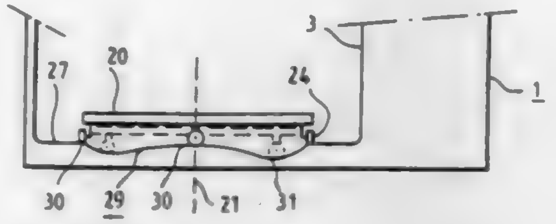


1. An oven for providing controlled heating, wherein said heating occurs in response to an alternating current flowing through the oven, said oven comprising:
a plurality of sides, each having a mid-span region which collectively form a cavity centrally located between opposing ends of the oven, each of said sides contain a conductive material capable of being self-resistively heated and having eddy current flow induced therein; and
a heating section formed in each of said sides at a location intermediate said mid-span region and at least one of said ends, wherein said heating section has a pre-defined shape and size such that said section undergoes self-induction in response to flow of the alternating current through each of said sides and generates both self-inductive and self-resistive heat therein which, in conjunction with self-resistive heat generated in the mid-span region of each of said sides by said current, establishes a pre-defined temperature within said cavity.

5,315,086
MICROWAVE OVEN WITH ROTATING TRAY

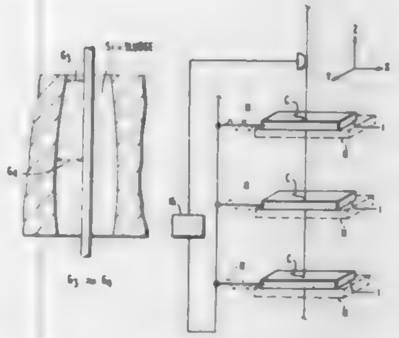
Gérard Pressouyre, Le Chateau D'Olonne, France, assignor to Thomson Electromenager, Boulogne-Billancourt, France
Division of Ser. No. 636,728, Jan. 2, 1991, abandoned. This application Sep. 30, 1992, Ser. No. 953,216
Claims priority, application France, Jan. 5, 1990, 90 00076
Int. Cl.^{5} H05B *6/78*
U.S. Cl. 219—753 **4 Claims**

1. A microwave oven, which comprises:
a chamber having a bottom wall;
a single, horizontal rotating tray located in said chamber for receiving thereon items subjected to microwaving operation, wherein said tray is rotatable about a concentric axis thereof during the operation and puts said items into motion along a non-circular path forming a three-dimensional curve in space; and
a mechanism connected to said tray for moving said tray about said concentric axis along said non-circular path while continuously maintaining said tray horizontal wherein said horizontal tray is circular and is provided, on a rim portion of a circular lower surface thereof, with at least three castor wheels with substantially horizontal axes of rotation, angularly spaced and aligned on a substantially circular line, and wherein, on said bottom wall of said chamber, a circular running track is located for the castor wheels, said track being positioned concentric to the vertical axis of rotation of said tray and having a diameter equal to that of a circular line of alignment of said castor wheels, said track also being formed by an alternating succession of angularly spaced bosses and hollows, said number of bosses and hollows being at least the same as the number of castor wheels of the horizontal tray.



5,315,087
WIRECUT ELECTRICAL DISCHARGE MACHINE UTILIZING SILICON POWDER SUSPENDED IN A DIELECTRIC MATERIAL

Tetsuro Itoh, Rolling Meadows, Ill., assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 2, 1992, Ser. No. 844,182
Int. Cl.^{5} B23H *7/02, 1/08, 7/08*
U.S. Cl. 219—69.12 **11 Claims**

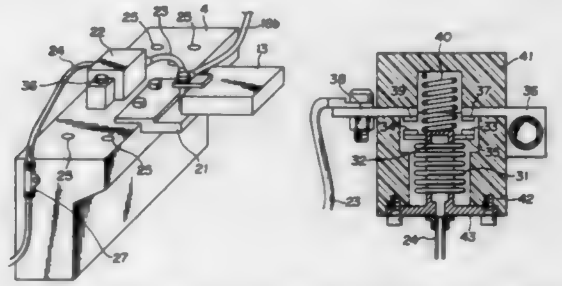


1. A wirecut electrical discharge machining apparatus for machining a workpiece, comprising:
a wire electrode that passes proximate the workpiece so as to define a gap therebetween;
a voltage source electrically connected to said electrode and the workpiece so as to create an electrical potential between said electrode and the workpiece;
a container holding a dielectric solution therein;
means for supplying said dielectric solution to said gap; and
silicon particles disposed in said gap so as to facilitate electrical discharge between said electrode and the workpiece, energy due to said electrical discharge removing portions of the workpiece so as to accomplish a desired machining process on the workpiece.

7. A wirecut electrical discharge machining apparatus for machining a plurality of workpieces simultaneously, comprising:
a wire electrode that passes proximate the workpieces so as to define gaps between said electrode and each workpiece;
a voltage source electrically connected to said electrode and the workpieces so as to create an electrical potential between said electrode and the workpieces;
a container for holding a dielectric solution;
means for supplying said dielectric solution to said gaps; wherein
each of said workpieces is mounted on a corresponding one of a plurality of movable tables, and, during machining, each of said tables is movable independently of the others so that said workpieces may be independently formed in individually unique shapes.

5,315,088
ELECTRIC DISCHARGE MACHINING APPARATUS WITH SWITCH CONNECTION BETWEEN WORKPIECE AND MOUNT

Hisashi Yamada, and Takuji Magara, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 1, 1992, Ser. No. 983,714
Claims priority, application Japan, Dec. 3, 1991, 3-319091
Int. Cl.^{5} B23H *7/04*
U.S. Cl. 219—69.12 **10 Claims**

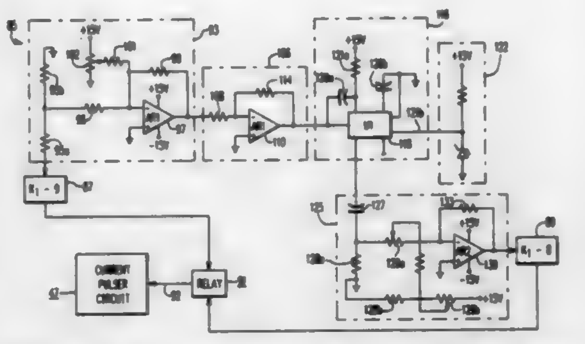


1. An electric discharge machining apparatus comprising:
a processing electrode fed while a predetermined gap is maintained with respect to a workpiece;
means for causing electric discharge to occur between a workpiece and said processing electrode, to electric-discharge-process said workpiece by the energy of said electric discharge;
mounting means for mounting said workpiece;
insulating means for electrically insulating said workpiece and said mounting means from each other; and
switching means disposed on said mounting means for selectively switching between an open-circuit and a short circuit connection between said mounting means and said workpiece said switching means having a first rigid terminal which is directly mechanically connected to said mounting means to provide an electrical connection between said switching means and said mounting means.

5,315,089
SYSTEM AND METHOD FOR CONVERTING AN AGTAW WELDER INTO AN AGMAW WELDER

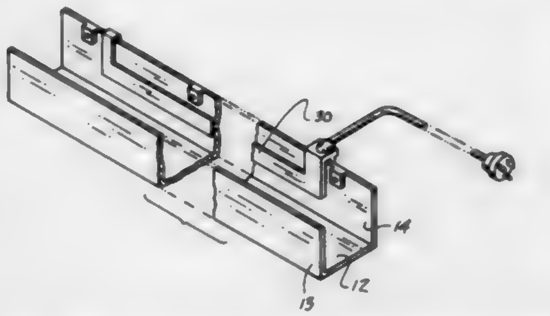
Travis K. Hughes, Madison, Ohio; Glenn W. Campbell, Green Oak, Ill.; Charles E. Burgoon; John B. Gossett, both of Kenosha, Wis., and Keith R. Spencer, West Miltmore, Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 2, 1992, Ser. No. 844,052
Int. Cl.^{5} B23K *9/09*
U.S. Cl. 219—137 PS **25 Claims**

20. A method for converting first and second AGTAW welders into an AGMAW welder, wherein each of said AGTAW welders is of the type that includes a power supply having an output, a TIG weldhead connected to the output of the power supply, and a constant current type control circuit assembly having a programmer for pulsing the power supply output current at a selected frequency, comprising the steps of:
replacing the weldhead of the first AGTAW welder with a MIG weldhead;
connecting the output of the power supplies of said first and second AGTAW welders in parallel;
connecting the control circuit assembly of said first AGTAW welder to the power supply of the second AGTAW welder such that said control assembly controls the power supplies of both of said welders; and
connecting a pulser multiplier circuit to the current pulser of the control circuit assembly of said first AGTAW welder to increase the frequency of the combined outputs of said power supplies.



5,315,090
AWNING GUTTER

John D. Lowenthal, 91-28 96 St., Woodhaven, N.Y. 11421
Filed Apr. 19, 1993, Ser. No. 48,308
Int. Cl.^{5} H05B *1/00;* **E04D** *13/00*
U.S. Cl. 219—213 **1 Claim**



1. An awning gutter arranged for securement to an awning member, wherein the awning gutter comprises,
an elongate channel, the elongate channel having a bottom wall, a first side wall, and a second side wall, wherein the first side wall and the second side wall are arranged in a coextensive spaced relationship, with the elongate channel having a channel first end spaced from a channel second end, the first side wall having a first height, and second side wall having a second height greater than said first height, with the second side wall having an uppermost end spaced from the bottom wall, wherein the uppermost end extends beyond the first side wall and above the first side wall, and includes a plurality of spaced lug members integral therewith, each of the lug members includes a support aperture, each support apertures is arranged for reception of a fastener therethrough for securement to said awning, and
an extension channel, the extension channel including an extension channel first end and the extension channel first end having a U-shaped channel, with the U-shaped channel arranged for receiving the elongate channel first end, and the elongate channel first end including a first latch

opening directed through the first side wall and the second latch opening directed through the second side wall, with the extension channel having a first L-shaped resilient latch leg extending beyond the first side wall and the U-shaped channel, and a second L-shaped resilient latch leg parallel to said first L-shaped resilient latch leg extending beyond the second side wall, with the first L-shaped resilient latch leg arranged for reception within the first latch opening, and the second L-shaped resilient latch leg is arranged for reception within the second latch opening, and

including an end cap, the end cap arranged for selective securement to the elongate channel first end, with the end cap having an end cap U-shaped channel arranged for receiving the elongate channel first end therein, wherein the end cap includes an end wall plate orthogonally oriented relative to said channel bottom wall, the channel first side wall, and the channel second side wall, with the end cap including an end cap first resilient latch leg arranged for reception within the first latch opening, and an end cap second resilient latch leg arranged for reception within the second latch opening, and

a heating grid mounted to the second side wall in facing relationship to the first side wall, with the heating grid arranged for the melting of frozen fluid contained within said channel, and

the end wall plate includes a drain tube directed therefrom in fluid communication with said elongate channel, with a reservoir housing having a housing top wall, a housing side wall, and a housing floor, with the drain tube directed into the reservoir housing through the housing top wall, and a valve mounted to the housing side wall in adjacency to the housing floor, and apertured flexible tube in fluid communication with the reservoir housing through the valve and the housing side wall, and an overflow tube projected into the reservoir housing through the top wall.

5,315,091

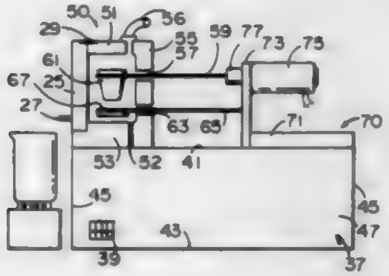
RESISTIVELY HEATED SAMPLE PREPARATION APPARATUS

Larry S. O'Brien; Gordon C. Ford, both of St. Joseph; Peter M. Willis, Benton Harbor, and Robert S. Tate, South Haven, all of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 2, 1993, Ser. No. 25,443

Int. Cl.⁵ F27D *19/00;* **B22D** *27/04*

U.S. Cl. 219—385 **18 Claims**



1. An apparatus for the preparation for analytical samples comprising:

a frame member;

an oven on said frame member, said oven having a top member and a bottom member joined together by opposite side members and a back member to form an enclosed structure having an open front;

a door member pivotally attached to said oven member for reversibly opening and closing the front of said oven;

at least one resistive heating element in said oven;

a crucible holder slidably mounted through a wall of said oven;

a casting dish holder slidably mounted through a wall of said oven; and

a movable support member for said crucible holder and said casting dish holder, said movable support member being adapted to hold a crucible and a casting dish in said oven during the melting of a sample in a crucible and the subsequent pouring of the molten sample into a casting dish.

5,315,092

APPARATUS FOR HEAT-TREATING WAFER BY LIGHT-IRRADIATION AND DEVICE FOR MEASURING TEMPERATURE OF SUBSTRATE USED IN SUCH APPARATUS

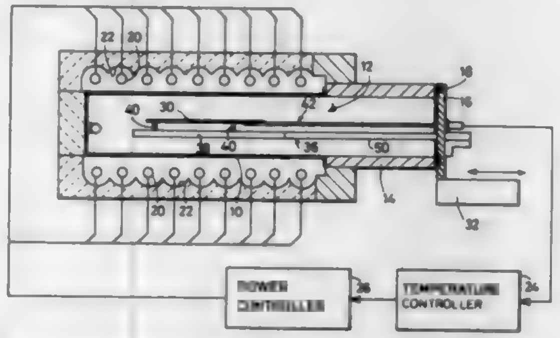
Mitsukazu Takahashi; Takatoshi Chiba, and Kiyofumi Nishii, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Oct. 11, 1991, Ser. No. 774,943

Claims priority, application Japan, Oct. 11, 1990, 2-274989

Int. Cl.⁵ H05B *1/02;* **H01L** *21/00, 21/02*

U.S. Cl. 219—497 **22 Claims**



11. An apparatus for heat treating a wafer comprising:

a hollow furnace for accommodating a wafer;

a wafer supporting means having one or more supporting points, for supporting the wafer accommodated is said furnace on said one or more supporting points;

light-irradiation heating mans for heating by light-irradiation the wafer supported by said wafer supporting means;

temperature measuring means for measuring the temperature of the wafer;

control means responsive to an output of said temperature measuring means, for controlling said light-irradiation heating means so that the temperature of the wafer is at a predetermined constant value; and

holding means for holding said temperature measuring means in said furnace in such a manner that said temperature measuring means and said one or more supporting points support the wafer, wherein

said temperature measuring means includes temperature detecting means for detecting the temperature of said wafer to be measuring, and

a covering member for covering the entire surface of said temperature detecting means and having a flat surface for coming into flat contact with a bottom surface of the wafer.

5,315,093

MARKET RESEARCH METHOD AND SYSTEM FOR COLLECTING RETAIL STORE MARKET RESEARCH DATA

Roy A. Stewart, Bedford, N.Y., assignor to A. C. Nielsen Company, Northbrook, Ill.

Filed Feb. 5, 1992, Ser. No. 831,770

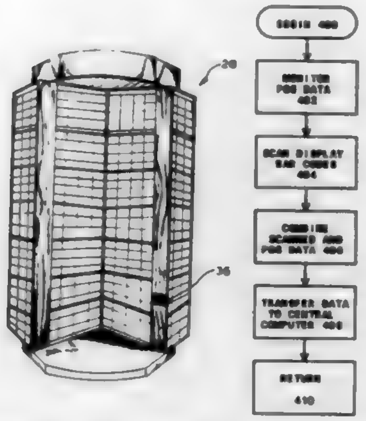
Int. Cl.⁵ G06F *7/08, 15/20*

U.S. Cl. 235—381 **13 Claims**

1. A market research system comprising:

a plurality of cooperating retail establishments in a market research test area, each cooperating retail establishment having first means for collecting and storing market research data related to point-of-sale retail sales of products

displayed by predetermined displays, said first means including means for monitoring said point-of-sale retail sales of products displayed by predetermined displays and means for scanning unique bar coded indicia carried by said predetermined displays within said cooperating retail establishments, said unique bar coded indicia designating selected causal data parameters for each of said predetermined displays; and,


20
36
MONITOR POS DATA 402
SCAN DISPLAY BAR CODES 404
COMBINE SCANNED AND POS DATA 406
TRANSFER DATA TO CENTRAL COMPUTER 408
RETURN 410

second means remotely located from said plurality of cooperating retail establishments for receiving and storing said market research data and said unique bar coded indicia.

5,315,094

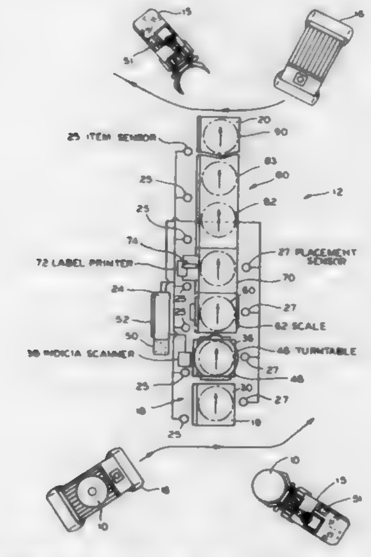
AUTOMATED RECEIVING STATION FOR INVENTORYING STOCK ITEMS

Donald J. Lisy, Downers Grove, Ill., assignor to R. R. Donnelley & Sons Co., Lisle, Ill.

Filed Sep. 23, 1991, Ser. No. 763,575

Int. Cl.⁵ G01G *19/414*

U.S. Cl. 235—385 **22 Claims**



1. An automated receiving station, comprising:

a plurality of conveyor sections arranged sequentially for moving an item along a predetermined path from a deposit end to a removal end, each of said conveyor sections being capable of moving in synchronization with an adjacent section;

a plurality of conveyor drivers for separately driving each of said conveyor sections;

control means for controlling each of said conveyor drivers, said control means being capable of coordinating the movements of adjacent conveyor sections;

scanning means positioned adjacent one of said conveyor sections for scanning an item for indicia and reading said indicia to determine identification information for said item when said item is positioned on said one of said conveyor sections;

said scanning means being in communication with computing means for automatically entering said identification is information for said item for storage in said computing means when said scanning means has read said indicia on said item, said scanning means being in communication with said control means for signalling for movement of said one of said conveyor sections and a subsequent adjacent conveyor section after said identification information has been automatically entered into said computing means; and

data entry means in communication with said computing means for manually entering said identification information for said item for storage in said computing means when said scanning means has not read said indicia on said item, said data entry means also being in communication with said control means for signalling for movement of said one of said conveyor sections and a subsequent adjacent conveyor section after said identification information been manually entered into said computing means.

5,315,095

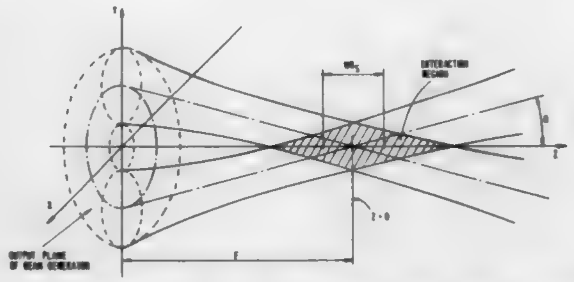
BEAM WITH EXTENDED CONFINEMENT FOR SCANNING PURPOSES

Emanuel Marom, Tel-Aviv; Naim Konforti, Holon, and David Mendlovic, Tel-Aviv, all of Israel, assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Feb. 18, 1993, Ser. No. 19,384

Int. Cl.⁵ G06K *7/10*

U.S. Cl. 235—462 **37 Claims**



1. A device for generating a narrow beam with limited spread along the beam's propagation direction, said device comprising:

(a) a radiation source;

(b) means for producing, from said radiation source, an effect of a plurality of Gaussian beams surrounding a common axis and intersecting in a common spatial region to define a synthesized long working range beam; and

(c) means for directing said synthesized long working range beam toward at least one preferred direction.

5,315,096

DEACTIVATOR FOR RESONANCE LABELS

Philipp Müller, Greifensee, and Alain Wacker, Feuerthalen, both of Switzerland, assignors to Actron Entwick Lungs AG, Rotkreutz, Switzerland

Filed Feb. 12, 1992, Ser. No. 834,469

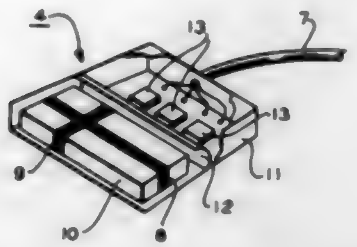
Claims priority, application Switzerland, Feb. 12, 1991, 434/91

Int. Cl.⁵ G06K *7/10*

U.S. Cl. 235—462 **16 Claims**

1. Device for use with a hand-held bar code reader for

reading bar codes at a front end thereof, said device including means for deactivating resonance labels provided with a bar code, said device comprising a transmitting antenna for deactivating said labels and a receiving antenna for receiving signals transmitted by said labels, and a casing for receiving the antennas therein, said casing including means adapted to be externally fixed to a region adjacent to the front end of the hand-held bar code reader such that the bar code reader reads said bar code and the antennas cooperate with said labels, said antennas being constructed as ferrite antennas.



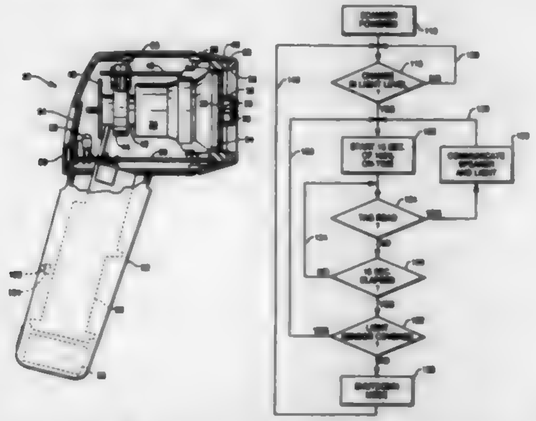
5,315,097
METHOD AND APPARATUS FOR OPERATING A TRIGGERLESS HAND-HELD OPTICAL SCANNER

Donald A. Collins, Jr.; Andrew B. Nye, III, both of Ithaca, N.Y.; Stephen J. Ames, New Concord, Ohio, and David Houggy, Allentown, Pa., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 29, 1991, Ser. No. 799,658

Int. Cl.^{5} G06K *7/10*

U.S. Cl. 235—472 **3 Claims**



1. A hand-held optical bar code scanner including a body portion and a handle portion comprising;
a scanning unit for generating a scan pattern for scanning a bar code label;
processing means mounted in said body portion for operating said scanning unit when enabled; and
sensing means mounted in said handle portion and coupled to said processing means for sensing movement of the scanner, said sensing means outputting a control signal to said processing means upon sensing the movement of the scanner enabling said processing means to operate said scanner, said sensing means including a light detector mounted in the handle portion of the scanner for detecting the occurrence of the grasping of the handle of the bar code scanner by the operator, said light detector normally sensing the ambient light impinging on the scanner and outputting said control signal to said processing means upon the grasping of the handle portion by the hand of the operator which removes said ambient light from said light detector enabling the processing means to operate the scanner.

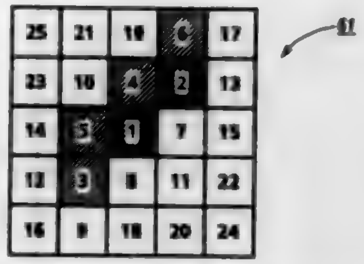
5,315,098
METHODS AND MEANS FOR EMBEDDING MACHINE READABLE DIGITAL DATA IN HALFTONE IMAGES

Robert F. Tow, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,990

Int. Cl.^{5} G06K *19/06*

U.S. Cl. 235—494 **8 Claims**



1. A system for encoding digital data in halftone images, said system comprising
a halftone generator for supplying circularly asymmetric halftone dot patterns that are size modulated in accordance with grayscale input image sample values;
pattern rotating means for angularly orienting said halftone dot patterns in accordance with respective digital data values; and
output means for writing said angularly oriented dot patterns into tiled halftone cells of predetermined size on a recording medium for producing a halftone rendering of said image with said digital data encoded in the angular orientation of the halftone dot patterns.

5,315,099
GLARE SHIELDING DEVICE AND PROCESS FOR OPERATING SAME

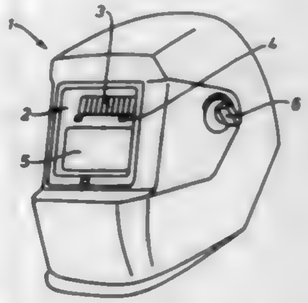
Stefan Gunz, Wädenswil, and Livio Ghisleni, Wilen, both of Switzerland, assignors to Xelux AG, Switzerland

Filed Dec. 22, 1992, Ser. No. 995,145

Claims priority, application Switzerland, Dec. 31, 1991, 03866/91

Int. Cl.^{5} G01J *1/20*

U.S. Cl. 250—201.1 **20 Claims**



1. An electro-optical glare shielding device for protective glasses, protective helmets, or protective masks, comprising:
an electro-optical glare shield including at least one liquid crystal cell;
an electronic circuit connected to said electro-optical glare shield for applying an electric operating voltage thereto for varying an optical transmission value of said at least one liquid crystal cell; and
a light sensor connected to said electronic circuit for providing an input signal thereto indicative of sensed light adjacent to said electro-optical glare shielding device;
wherein said at least one liquid crystal cell includes means for extending liquid crystal cell service life comprising at least one corrosion resistant layer and at least one of a corrosion-neutral liquid and corrosion-inhibiting additives, and wherein said electronic circuit produces an electric operating voltage such that the optical transmission value of said at least one liquid crystal cell is less than about 1% and said electric operating voltage has a frequency of less than about 32 Hertz.

5,315,100
PHOTOELECTRIC CONVERSION APPARATUS FOR DETECTING MOVEMENT OF OBJECT WITH SPATIAL FILTER ELECTRODE

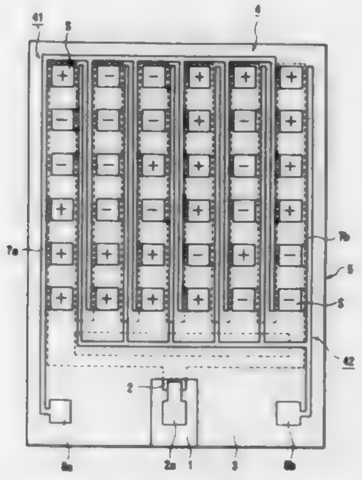
Akira Kobayashi; Takeshi Kawai, and Hiroshi Sasaki, all of Kanagawa, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1992, Ser. No. 978,756

Claims priority, application Japan, Nov. 19, 1991, 3-329835

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—208.1 **4 Claims**



1. A photoelectric conversion apparatus for performing photoelectric conversion of light from a target object to detect movement of said target object, comprising:
a pair of opposite electrodes, at least one of said opposite electrodes being divided into a set of pattern electrodes, said set of pattern electrodes comprising first and second comb electrodes combined to oppose each other at a predetermined pitch and having comb teeth connected to a plurality of cell electrodes, all of said cell electrodes being formed in matrix form; and
an amorphous silicon film sandwiched between said pair of opposite electrodes and connected to said set of pattern electrodes in electrically positive and negative directions so as to form a spatial filter electrode, said cell electrodes of each of said pattern electrodes being irregularly arranged on said amorphous silicon film.

5,315,101
METHOD OF MANUFACTURING A LARGE AREA ACTIVE MATRIX ARRAY

John R. Hughes, and Martin J. Powell, both of Horley, England, assignors to U.S. Philips Corporation, New York, N.Y.

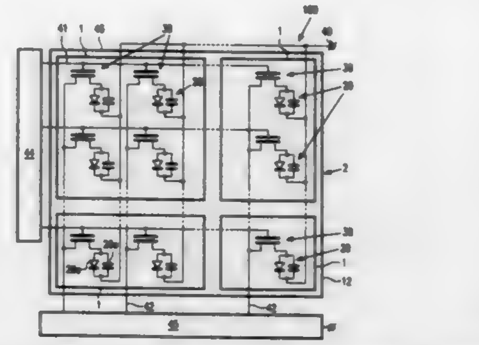
Filed Feb. 1, 1993, Ser. No. 11,935

Claims priority, application United Kingdom, Feb. 8, 1992, 9202693

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—208.1 **12 Claims**

1. A method of manufacturing a large area active matrix array, which method comprises providing four substrates each carrying an active area comprising a matrix of switching elements arranged in rows extending between first and second edges of the active area and columns extending between third and fourth edges of the active area and means for accessing individual switching elements comprising a respective row conductor connecting the switching elements of each row and terminating in connecting leads extending beyond the first and second edges of the active area and a respective column conductor connecting the switching elements of each column and terminating in connecting leads extending beyond the third and fourth edges of the active area, removing a portion of each substrate and the connecting leads carried thereby so as to form a new substrate edge adjacent each of two adjoining edges of the active area and mounting the substrates onto a support so that each new substrate edge is adjacent another new substrate edge to form the large area array.



5,315,102
DRIVING DEVICE AND METHOD FOR DRIVING TWO-DIMENSIONAL CONTACT IMAGE SENSOR

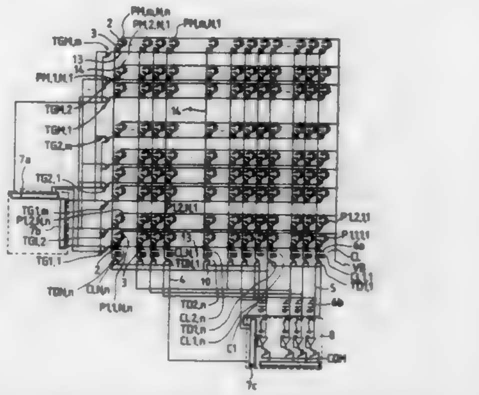
Tsutomu Abe, Kanagawa; Seigo Makida, Kanakawa, and Kenichi Kobayashi, Kanagawa, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1992, Ser. No. 940,991

Claims priority, application Japan, Sep. 5, 1991, 3-252782

Int. Cl.^{5} H01L *27/46*

U.S. Cl. 250—208.1 **4 Claims**



1. A driving device for driving a two-dimensional contact image sensor comprising:
a plurality of pixel forming light-receiving elements arranged in a two-dimensional matrix defined by a plurality of data blocks in a main scanning direction and a plurality of gate blocks in a frame scan direction for scanning an image by generating charges according to a sensed image;
charge transfer switching elements for holding charges generated by a plurality of data blocks of said light-receiving elements;
gate lines common to said charge transfer switching elements for respective pixels in the main scanning direction;
data lines for individually connecting said charge transfer switching elements to said light receiving elements in the frame scan direction;
output image signal means for outputting an output image signal according to the charges held in the charge transfer switching elements; and

controlling means for scanning an image sensed by said light-receiving elements a plurality of times without producing an output image signal from said output image signal means and then scanning the sensed image to produce an output image signal from said output image signal means.

5,315,103

RADIOLOGICAL IMAGE INTENSIFIER TUBE WITH DYED POROUS ALUMINA LAYER

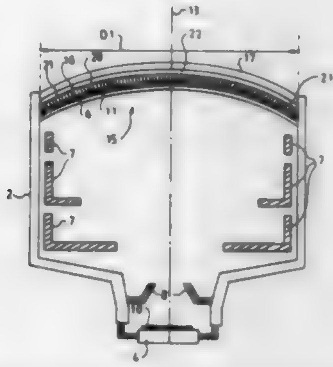
Yvan Raverdy, Bas Bernin; Christian Marillat, Saint Egreve, and Daniel Gally, Grenoble, all of France, assignors to Thomson Tubes Electroniques, Velizy, France

Filed Oct. 23, 1992, Ser. No. 966,510

Claims priority, application France, Oct. 31, 1991, 91 13487

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—214 VT **15 Claims**



1. A radiological input screen for a image intensifier tube, comprising:

a scintillator layer borne by a substrate,

a dyed porous layer of alumina interposed between the substrate and the scintillator, the dyed porous alumina layer including a substance that is absorbent at least at a wavelength emitted by the scintillator layer so that light photons emitted by the scintillator layer towards the substrate are at least partially absorbed in the dyed alumina layer.

5,315,104

PHOTODIODE PHOTODETECTOR WITH ADJUSTABLE ACTIVE AREA

Richard G. Plumb, Suffolk, England, IP8 300, assignor to BT & D Technologies, Ipswich, Suffolk, England

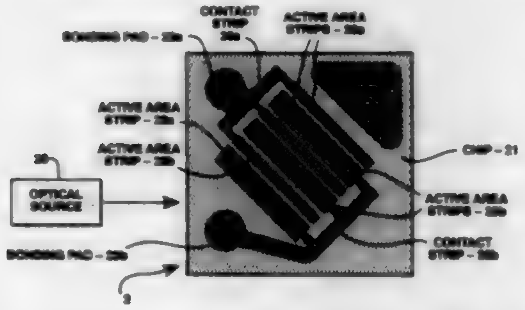
PCT No. PCT/GB91/00693, § 371 Date Nov. 10, 1992, § 102(e) Date Nov. 10, 1992, PCT Pub. No. WO91/17571, PCT Pub. Date Nov. 14, 1991

PCT Filed Apr. 30, 1991, Ser. No. 946,473

Claims priority, application United Kingdom, May 1, 1990, 9009753

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—214.1 **28 Claims**



1. A photo-diode photo-detector having a photo-sensitive region which comprises a plurality of distinct photo-diode active areas, each active area having plural electrically connected subareas distributed over said photo-sensitive region and means for selectively enabling or disabling one or more of the active areas.

5,315,105

OPTICAL OPERATIONAL MEMORY DEVICE

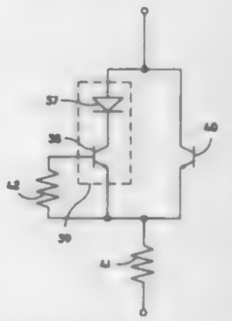
Kenichi Matsuda, and Jun Shibata, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 974,137, Nov. 10, 1992, abandoned. This application Jul. 29, 1993, Ser. No. 100,076

Claims priority, application Japan, Jan. 17, 1992, 4-006274

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—214 LS **9 Claims**



1. An optical operational memory device comprising:

an optical bistable switch including a light-emitting device and a first phototransistor connected in series, said first phototransistor detecting the light emitted from said light-emitting device,

a second phototransistor connected in parallel to said optical bistable switch, and

a load resistor connected in series to said optical bistable switch, wherein the time constant given by the product of the current gain of said second phototransistor, the base-collector capacitance of said second phototransistor, and the resistance of said load resistor is larger than the period required for recombination of the excess majority carriers in the base of said first phototransistor.

5,315,106

APPARATUS FOR EVALUATING BEACON LIGHTS, IN PARTICULAR ON RUNWAYS AND TAXIWAYS FOR AIRPLANES HAVING A LIGHT DIFFUSING REFLECTION BOX

Robert Cernon, Athis-Mons, France, assignor to Aeroport De Paris, France

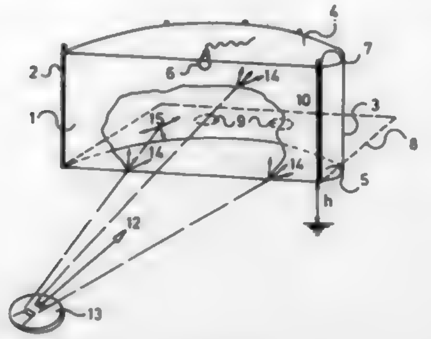
Filed Feb. 24, 1993, Ser. No. 21,772

Claims priority, application France, Feb. 25, 1992, 92 02182

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—215 **10 Claims**

1. Apparatus for in-situ elevation of the light flux of intense and narrow light beams, in particular from runway beacon lights, the apparatus comprising a towed chassis, and an encoding wheel for determining the distance travelled between two lights, which apparatus further includes a pod designated to receive a closed box in which a photoelectric sensor is disposed, said box having a translucent front face diffusing the light flux from a beam to be measured omnidirectionally inside the box, and at least one other face provided with high diffusing reflection power, wherein the light flux is reflected and diffused in uniform manner towards the sensor whose sensitive portion is located in the vicinity of said front face, but faces towards said diffusing reflection face.



5,315,107

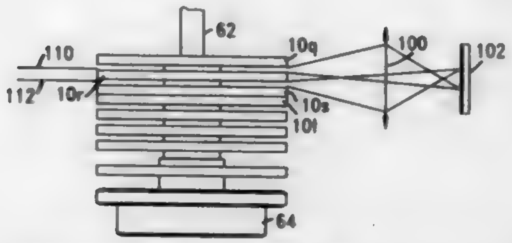
COMPACT DISC COUNTER ARRANGED TO MINIMIZE COUNTING ERRORS HAVING A PAIR OF BEAMS AND A PULSE COUNTING MEANS

Scott Smith, Scranton; Anthony Pietrzykoski, Plains, and Floyd Goss, Lake Ariel, all of Pa., assignors to WEA Manufacturing Inc., Olyphant, Pa.

Filed Apr. 23, 1993, Ser. No. 52,171

Int. Cl.^{5} H01J *40/14*

U.S. Cl. 250—222.2 **20 Claims**



1. Apparatus for counting articles disposed in a stack having a longitudinal axis with gaps normally therebetween including in combination

means for producing a pair of beams of radiation, means for spacing said beams in the direction of said axis by a distance substantially equal to the distance between a pair of adjacent normal gaps of said articles of said stack and greater than the dimension of a normal gap in said direction,

radiation detecting means,

means for mounting said radiation detecting means in operative relation to said beam producing means and with a space therebetween, and

means for moving a stack of articles relative to said beam producing means and said detecting means through said space in the direction of said stack axis and generally perpendicular to said beams to cause said beams to traverse said gaps whereby said detecting means produces a pulse each time a beam traverses a gap,

and means responsive to said pulses for producing a count of the number of articles in said stack.

5,315,108

PROCESS AND DEVICE FOR ACTING UPON MOVING CONTAINERS WITH A LASER BEAM AND CAROSEL SHAFTED MOUNTED OPTICS

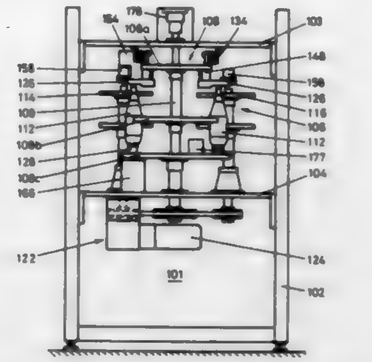
Norbert Gross, Dietikon, Switzerland, assignor to Elpatronic AG, Zug, Switzerland

Filed Oct. 15, 1992, Ser. No. 962,317

Claims priority, application Switzerland, Nov. 1, 1991, 03199/91

Int. Cl.^{5} G01N *9/04*

U.S. Cl. 250—223 B **7 Claims**



2. A machine for processing bottles with at least one laser beam comprising:

conveying means including a carousel having a hollow central shaft for moving the bottles along a conveying path;

a laser light source producing a laser beam which is directed from the source into the hollow central shaft of the carousel and then onto the bottles moved by the conveying means; and

mirror means mounted in relation to the hollow central shaft of the carousel to guide the laser beam from the shaft over at least one section of the conveying path synchronously with each container to cause the beam to act upon a bottle moving along the conveying path.

5,315,109

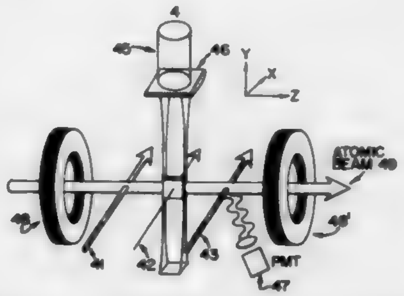
POSITION MEASUREMENT OF MOVING ATOMS USING OPTICAL FIELDS

John E. Thomas, Chapel Hill, N.C., assignor to Duke University, Durham, N.C.

Filed Oct. 6, 1992, Ser. No. 957,431

Int. Cl.^{5} H05H *3/00*

U.S. Cl. 250—251 **20 Claims**



1. A method of measuring the position of atoms in an atomic beam, comprising:

(a) emptying an atomic beam of atoms in a predetermined detectable final state; then

(b) passing the atomic beam through a transition inducing oscillating field having a frequency which induces atoms in the beam to make a transition from the initial atomic state to said detectable final atomic state while simultaneously passing the atomic beam through a spatially varying potential wherein the energy of the final atomic state of the atoms is dependent upon the position of the atoms in said spatially varying potential; then

(c) detecting the number of atoms in said detectable final state; and then

(d) repeating steps (b) and (c) with said transition inducing field having a different frequency at each repetition of (b) and (c) to generate a spectrum which corresponds to the position distribution of atoms in the atomic beam; wherein said spatially varying potential is generated by a nonresonant laser field.

5,315,110

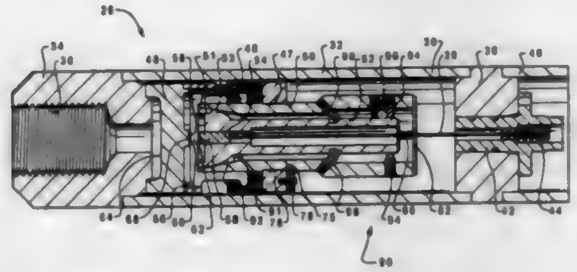
METAL CUP PRESSURE TRANSDUCER WITH A SUPPORT HAVING A PLURALITY OF THERMAL EXPANSION COEFFICIENTS

J. Douglas Smith, Houston, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.

Filed Jun. 29, 1993, Ser. No. 85,068

Int. Cl.^{5} H01J *5/16*

U.S. Cl. 250—*227.27* **29 Claims**



1. An optical interferometer for use in a wellbore to measure a wellbore pressure by passing an optical signal through an optical pathway, and detecting a change in a distance across the optical pathway, the optical interferometer comprising:

a housing for lowering within the wellbore to a downhole wellbore depth;

at least one optical fiber for providing a waveguide to direct the optical signal within the housing and to the optical transmission pathway;

a lens means secured within the housing for receiving the optical signal from the at least one optical fiber, directing at least a portion of the optical signal through the optical pathway, and further for passing the portion back into the at least one optical fiber;

a light reflector secured within the housing spaced opposite of the lens means by a gap, which defines at least a portion of the optical pathway;

the lens means and the light reflector secured within the housing for directing the portion of the optical signal from the lens means, through the gap, to the light reflector, back through the gap, and to the lens means for passing into the at least one optical fiber;

a pressure responsive means secured within the housing for urging the light reflector to move with respect to the lens means to change the gap in response to changes in the wellbore pressure for providing the change in the distance across the optical pathway; and

a support means for securing the lens means and pressure responsive means within the housing, the support means having a plurality of coefficients of thermal expansion for providing a plurality of mutually offsetting displacements in response to a temperature change, wherein the mutually offsetting displacements prevent the temperature change from changing the distance across the gap.

5,315,111

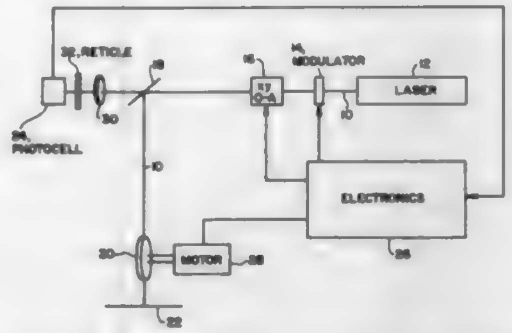
METHOD AND APPARATUS FOR LASER BEAM DRIFT COMPENSATION

Leslie L. Burns, Saratoga; William Barrett, San Jose, and Robert Tsai, Los Altos, all of Calif., assignors to Lasa Industries, Inc., San Jose

Filed Oct. 15, 1992, Ser. No. 961,514

Int. Cl.^{5} H01J *3/14*

U.S. Cl. 250—235 **25 Claims**



1. A method of compensating for laser beam drift comprising the steps of:

deflecting a laser beam to desired coordinates on a workpiece;

directing at least a portion of the laser beam to a structure having a known optical configuration;

detecting an altered laser beam which has passed through said structure and generating a position signal corresponding to an altered portion of the laser beam;

detecting, from said position signal, a position where the altered portion of the laser beam intersects said optical configuration;

comparing the position of the laser beam determined in the detecting step, to an anticipated position of the laser beam at a time when said detecting step occurs; and

compensating for deviation between the anticipated beam position and the determined beam position.

5,315,112

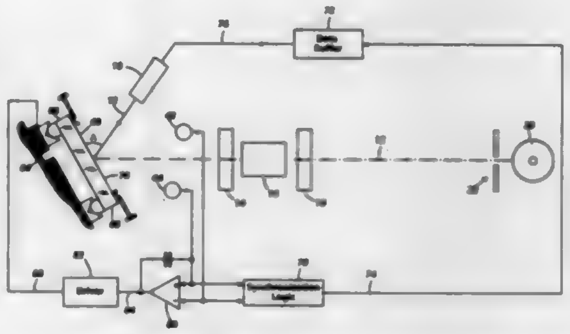
REAL TIME LASER SPOT TRACKING IN BOTH HORIZONTAL AND VERTICAL AXES

Ellis D. Harris, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 10, 1992, Ser. No. 988,505

Int. Cl.^{5} H01J *3/14*

U.S. Cl. 250—235 **10 Claims**



1. In a raster scanner where a beam is scanned along a given path:

a) first and second reflector means in the path of the scanning beam,

b) said first reflector means being located on one side of the path of the scanning beam and said second reflector means being spaced from said first reflector means and located on the opposite side of the scanning beam, said spacing between said first and second reflector means being in a direction generally perpendicular to the path of the scanning beam,

c) said first and second reflector means being arranged in such a manner that when the scanning beam is on center, each of said first and second reflector means will receive substantially equal portions of the beam and when the beam is off center, the portions of the beam received by said first and second reflector means will be unequal,

d) first and second detector means arranged to receive beam reflections from said first and second reflector means, respectively,

e) determining means operably connected to said first and second detector means for determining if said first and second reflector means receive equal or unequal portions of the beam, and

f) means responsive to said determining means when said first and second detector means receive unequal portions of said scanning beam to correct the alignment of the scanning beam until said determining means determines the said first and second reflector means receives substantially equal portions of the scanning beam.

5,315,113

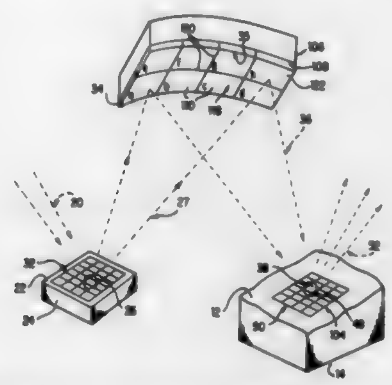
SCANNING AND HIGH RESOLUTION X-RAY PHOTOELECTRON SPECTROSCOPY AND IMAGING

Paul E. Larson, Bloomington, and Paul W. Palmberg, Edina, both of Minn., assignors to The Perkin-Elmer Corporation, Conn.

Filed Sep. 29, 1992, Ser. No. 953,429

Int. Cl.^{5} H01J *49/48*

U.S. Cl. 250—305 **34 Claims**



1. An instrument for analysis of a specimen surface, comprising:

an electron gun for producing a focused electron beam;

an anode with an anode surface disposed to receive the focused electron beam so as to generate x-rays;

directing means for selectively directing the focused electron beam to a selected anode spot on the anode surface whereby the x-rays are generated from the selected anode spot, the selected anode spot being selected from an array of anode spots on the anode surface;

focusing means receptive of the x-rays from the selected anode spot for focusing a predetermined energy band of the x-rays as an x-ray spot on a selected pixel area of the specimen surface, such that photoelectrons are emitted from the selected pixel area, the selected pixel area corresponding to the selected anode spot and thereby being selected from an array of pixel areas corresponding to the array of anode spots;

detection means receptive of the photoelectrons from the selected pixel area for producing signals representative of the photoelectrons; and

display means receptive of the representative signals for displaying specimen information associated with the photoelectrons;

wherein the focusing means comprises a base member having a polished face with a concave curvature and a monochromator crystal arrangement comprising a plurality of crystal platelets having an uniform thickness and being formed of common material, lattice structure, and crystalline orientation, the crystal platelets having a polished side bonded to the polished face juxtaposed in crystalline alignment so as to assume the concave curvature and form the monochromator.

5,315,114

INTEGRATED CIRCUIT DETECTOR ARRAY INCORPORATING BUCKET BRIGADE DEVICES FOR TIME DELAY AND INTEGRATION

Robert J. Kansy, and Ricky B. Garner, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 18, 1981, Ser. No. 332,039

Int. Cl.^{5} H01L *25/00;* **G02B** *26/10;* **H04N** *3/14*

U.S. Cl. 250—332 **11 Claims**

1. A method for improving the output signal-to-noise ratio performance of an integrated circuit infrared detector array by electronic signal processing, comprising the steps of:

scanning an integrated circuit infrared detector array relative to a target area to generate charge levels in the respective infrared detectors corresponding to the infrared energy level sensed thereby;

sampling the charge level corresponding to the infrared energy level sensed by a plurality of infrared detectors during the respective dwell times of the detectors between successive detection cycles in which the infrared energy level incident to the respective detectors is sensed in providing the charge levels to be sampled;

accumulating samples of the charge levels over a plurality of dwell times for the respective detectors;

summing successive accumulated samples of the charge levels from each detector with stored accumulated samples of the charge levels from the previous detector through a plurality of time delay and integrate stages such that a sum of accumulated samples equal to the number of detector dwell times in a column of detectors is generated; and

producing an output signal from the final time delay and integrate stage representative of the summation of the number of detector samples equal to the number of detector columns included in the processing of the summed successive accumulated samples through said plurality of time delay and integrate stages.

5,315,115

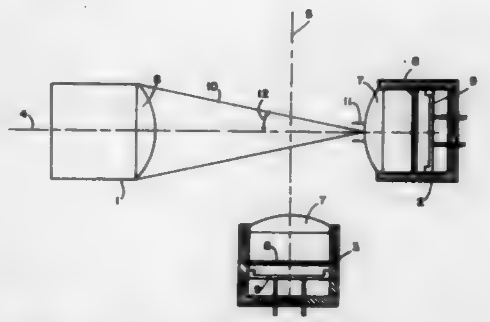
OPTICAL APPARATUS AND METHOD FOR SENSING PARTICULATES

Hermann E. Gerber, 1643 Bentana Way, Reston, Va. 22090

Filed Aug. 10, 1992, Ser. No. 926,695

Int. Cl.^{5} G01N *21/49*

U.S. Cl. 250—338.1 **7 Claims**



1. A method for measuring integrated properties of suspended particulates consisting of the following steps:

Irradiating particulates suspended in a noncollimated light beam with the light beam, measuring with a detector the light scattered by the particulates over a time interval sufficiently long that many particles contribute to the scattered light, correcting the distortion of the scattered light due to off-axis light intensity of the noncollimated beam by placing an inversion spatial filter in front of the scattered-light detector and at the focal point of the detector lens used for collecting light scattered from the particulates.

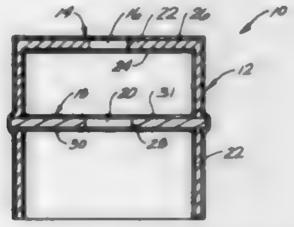
5,315,116
BAFFLED COLD SHIELDS FOR INFRARED DETECTOR

Donald G. DuPree, Alta Loma; David L. Gregory, Covina, and Robert J. Housman, Irvine, all of Calif., assignors to Optical Radiation Corporation, Azusa, Calif.

Continuation of Ser. No. 806,765, Dec. 13, 1991, abandoned. This application May 5, 1993, Ser. No. 57,448

Int. Cl.^{5} G01J *5/06*

U.S. Cl. 250—352 **11 Claims**



1. A one-piece cold shield comprising a side wall and a top wall defining an interior chamber, an aperture through the top wall and at least one baffle extending transversely across the interior chamber of the cold shield, said at least one baffle comprising an aperture in alignment with the aperture of the top wall and wherein the outer edge of the at least one baffle is encapsulated by and metallurgically bonded to the side wall.

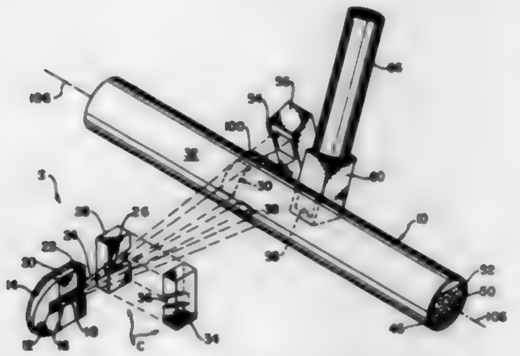
5,315,117
VOLUME METER SYSTEM

Gregory J. Hatton; David A. Helms, and Michael G. Durrett, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 4, 1993, Ser. No. 26,356

Int. Cl.^{5} G01F *23/22*

U.S. Cl. 250—356.1 **8 Claims**



1. An apparatus for determining relative volumes of phases in a multiphase fluid flow under any one of a number of commonly encountered flow regimes through a pipe, comprising:

(a) a radiation source located outside the pipe capable of emitting radiation beams toward and through the pipe;

(b) collimating means for collimating the radiation beams toward the pipe;

(c) attenuation means located in the path of the radiation beams and having a shape optimized to compensate for the pipe geometry and for the possible existence of any one of a number of commonly encountered flow regimes in the pipe;

(d) detecting means located on the pipe opposite the radiation source for sensing the gamma radiation.

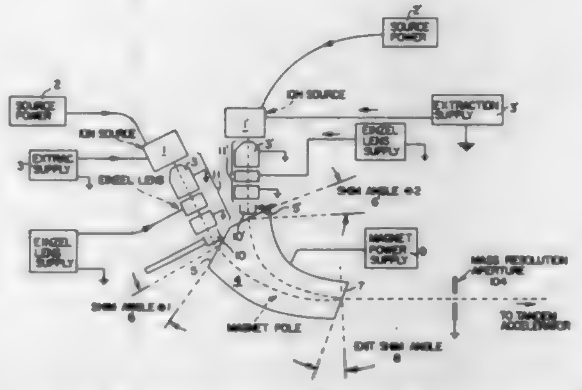
5,315,118
DUAL ION INJECTOR FOR TANDEM ACCELERATORS

Dirk J. W. Mous, Nieuwegein, Netherlands, assignor to High Voltage Engineering Europa B.V., Amersfoort, Netherlands

Filed Apr. 15, 1993, Ser. No. 47,744

Int. Cl.^{5} H01J *37/147*

U.S. Cl. 250—396 ML **13 Claims**



1. An ion generation system adapted to direct ions from any one of a plurality of ion sources through a single defining aperture, comprising in combination: at least two ion sources each having an independent ion extraction electrode and independent power sources; a single uniform field magnetic analyzer having an independent ion-entrance location for ions from said sources respectively and common ion-exit location; and means for directing ions from each source through said analyzer and thence through said single defining aperture, said analyzer having a magnetic field which is varied in an appropriate manner to deflect in the same direction ions from any one of said ion sources and through the angle necessary for passage of the said ions through said single defining aperture, said magnetic analyzer having a non-normal field boundary at said ion-exit location and a unique non-normal boundary at each of said ion-entrance locations, whereby focussing is achieved for the ions from each of said source.

5,315,119
ELECTRON BEAM IRRADIATING APPARATUS AND ELECTRIC SIGNAL DETECTING APPARATUS

Fumio Komatsu, Fuchu; Katsuya Okumura, Yokohama, and Motosuke Miyoshi, Minato, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

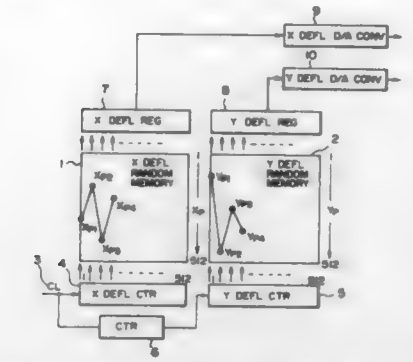
Filed Nov. 19, 1992, Ser. No. 983,229

Claims priority, application Japan, Nov. 29, 1991, 316861

Int. Cl.^{5} H01J *37/302*

U.S. Cl. 250—398 **6 Claims**

1. An electron beam irradiating apparatus comprising:position information signal outputting means for outputting position information signals, in sequence to designate positions at which an electron beam is irradiated on a plane scanned by the electron beam, so as to designate the irradiation positions at random; and



irradiation control means for controlling the electron beam to irradiate the electron beam at the irradiation positions in response to the outputted position information signals.

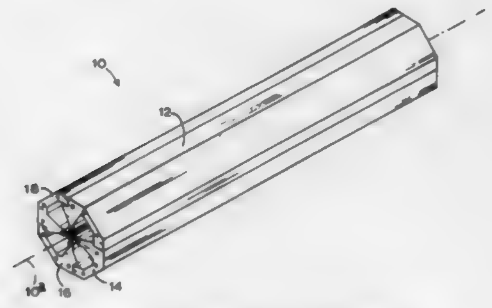
5,315,120
UNIVANE RFQ

James M. Potter, Los Alamos, N. Mex., assignor to AccSys Technology, Inc., Pleasanton, Calif.

Filed Jun. 7, 1993, Ser. No. 73,165

Int. Cl.^{5} H01J *37/147*

U.S. Cl. 250—396 R **6 Claims**



1. A radio-frequency quadrupole comprising

four elongate structural components having elongate joinder edges and joinable adjacent one another along said edges to form an elongate quadrupole body,

each of said components having the same axial cross-sectional configuration.

5,315,121
METAL ION SOURCE AND A METHOD OF PRODUCING METAL IONS

Andreas Kluge, Nuremberg, and Peter Nelle, Munich, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

PCT No. PCT/DE90/00666, § 371 Date Dec. 13, 1991, § 102(e) Date Dec. 13, 1991, PCT Pub. No. WO91/06969, PCT Pub. Date May 16, 1991

PCT Filed Aug. 31, 1990, Ser. No. 778,807

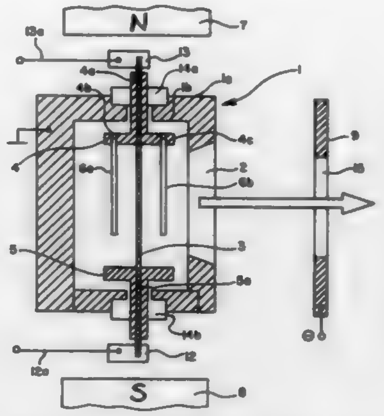
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935408

Int. Cl.^{5} H01J *37/08*

U.S. Cl. 250—423 R **7 Claims**

1. A metal ion source comprising a gas-filled ion chamber (**1***a*) for producing gas ions, an electrically heatable thermionic cathode in the form of a heating wire (**3**), which is arranged within said ion chamber (**1***a*), an anode (**1***b*) and a metallic component (**6**) adapted to give off metal ions, wherein gas ions produced in said ion chamber are accelerated onto said metallic component (**6**) and upon striking said metallic component (**6**) release metal atoms therefrom, said metal atoms being, in turn, ionized, wherein

said heating wire (**3**) and the metallic component (**6**) are at the same potential or show, relative to the voltage between the heating wire (**3**) and an anode (**1***b*), only a small difference between their potentials,



said heating wire (**3**) is arranged adjacent to said metallic component (**6**) such that said metallic component is heated by said heating wire (**3**), and

said metallic component (**6**) extends substantially parallel to said heating wire (**3**) spaced at a substantially uniform radial distance therefrom.

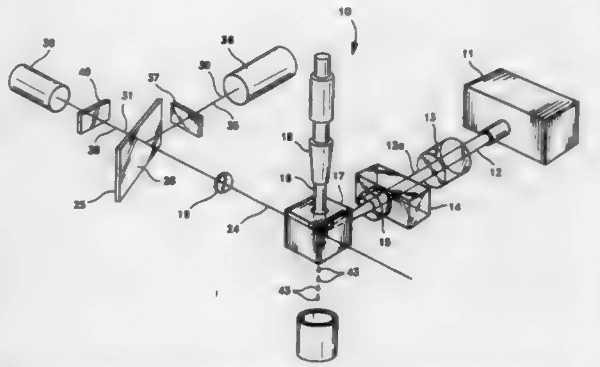
5,315,122
APPARATUS AND METHOD FOR FLUORESCENT LIFETIME MEASUREMENT

Bertram G. Pinsky, Hayward, and John J. Ladasky, Jr., San Jose, both of Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 25, 1992, Ser. No. 935,486

Int. Cl.^{5} G01N *21/64*

U.S. Cl. 250—461.2 **15 Claims**



1. A method of identifying a particle for use in a flow cytometer, the method comprising the steps of:

providing a beam of light;

intensity modulating the beam of light;

passing the particle through the beam of intensity modulated light;

collecting light from the particle for use as a reference;

collecting fluorescence emitted by the particle;

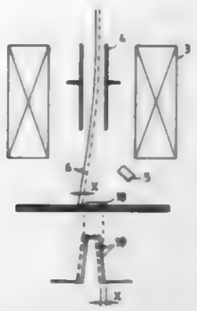
generating a first signal in response to the light collected as a reference and a second signal in response to the fluorescence collected; and

determining the difference in phase between the first signal and the second signal.

5,315,123

ELECTRON BEAM LITHOGRAPHY APPARATUS

Hiroyuki Itoh, and Minoru Sasaki, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 25, 1992, Ser. No. 950,701
Claims priority, application Japan, Sep. 25, 1991, 3-243872
Int. Cl.^{5} H01J *37/302*
U.S. Cl. 250—492.2 **21 Claims**



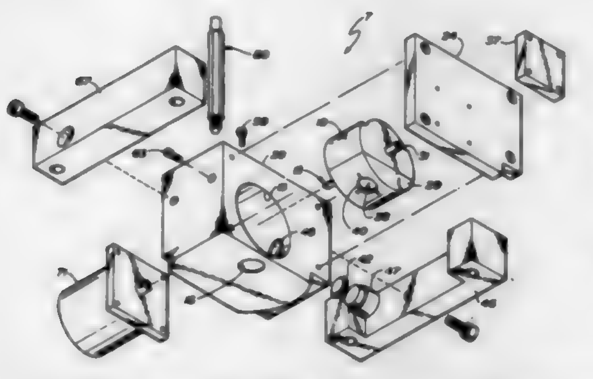
1. An electron beam lithography apparatus for obtaining lithographic patterns on a sample by applying an electron beam thereon, comprising:

- a means for obtaining drift values of an exposure position of the electron beam by detecting reflected electron signals obtained by irradiating the electron beam on a reference mark on a sample stage;
- a memory for storing a plurality of position drift values of the electron beam;
- a means for calculating a drift characteristic formula which expresses the exposure positions of the electron beam by using a plurality of drift values from the memory;
- a deflection correcting circuit for correcting the exposure positions based on the drift characteristic formula in real time at which the electron beam is irradiated; and
- means for controlling the electron beam based on the exposure positions by estimating some of the exposure positions in the real time at which the electron beam is irradiated based on the drift characteristic formula, and by calculating other of the exposure positions based on the drift characteristic formula by detecting the reference mark.

5,315,124

NUCLEAR GAUGE

John D. Goss, San Jose; Steve Axelrod, Los Altos; Mathew Boissevain, Los Altos Hills; Philip M. Hegland, San Jose, and Scott C. Wiley, Sunnyvale, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.
Filed Mar. 20, 1992, Ser. No. 856,382
Int. Cl.^{5} G21F *5/02*
U.S. Cl. 250—497.1 **16 Claims**



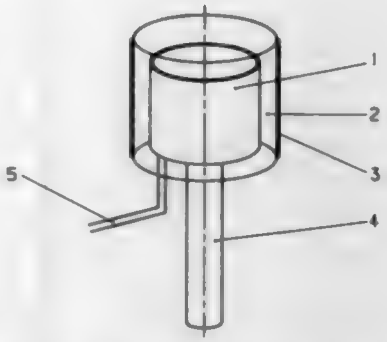
1. A nuclear gauge for making measurements of traveling webs in continuous sheet-making systems, comprising:

- an enclosure means;
- a cylindrical cavity formed in the enclosure means;
- an aperture which is formed through the enclosure means in a direction that intersects the cylindrical cavity;
- a wheel-like member rotatably mounted in the cavity;
- an encapsulated nuclear source which is mounted to be carried by the wheel-like member;
- rotating means for rotating the wheel-like member from a second position to a first position whereat the nuclear source can emit radiation directly through the aperture onto a web that travels past the aperture; and
- fire pin means for returning the wheel-like member to the second position in the event of a fire.

5,315,125

METHOD AND APPARATUS FOR PROTECTING A SHIP FROM MISSILES WITH TWO-COLOR INFRA-RED TARGET SEEKING HEADS

Heinz Bannasch, Schonau am Konigssee, Fed. Rep. of Germany, assignor to Buck Werke GmbH & Company, Uberkingen, Fed. Rep. of Germany
Filed Sep. 21, 1992, Ser. No. 948,102
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1991, 4131096
Int. Cl.^{5} G01J *1/00*
U.S. Cl. 250—504 R **17 Claims**



10. A ship assembly providing protection from missiles with two-color infra-red target seeking heads comprising:

- (a) a ship;
- (b) an interference transmitter on said ship emitting short-wave infra-red rays at least intermittently; and
- (c) means for adjusting the intensity of the radiation emitted to shift the ratio of short wave to medium wave infra-red radiation so that the ship cannot be reliably recognized as a target for a missile having two-color infra-red target seeking head.

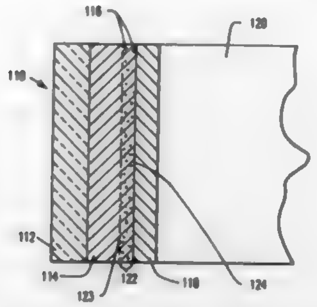
5,315,126

HIGHLY DOPED SURFACE LAYER FOR NEGATIVE ELECTRON AFFINITY DEVICES

Robert J. Field, Fincastle, Va., assignor to ITT Corporation, New York, N.Y.
Filed Oct. 13, 1992, Ser. No. 959,679
Int. Cl.^{5} H01L *29/34*
U.S. Cl. 257—10 **10 Claims**

1. A negative electron affinity device comprises:

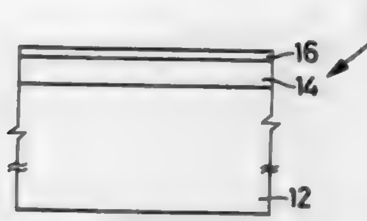
- (a) a semiconductor layer doped with an electron acceptor dopant, said semiconductor layer having an emitter face from which electrons are emitted; and
- (b) a coating of material to produce or enhance negative electron affinity deposited over said semiconductor layer emitter face, said coating setting up a depletion band in said semiconductor layer, said dopant having an increased concentration proximate said emitter face substantially within said depletion band.



5,315,127

SEMICONDUCTOR DEVICE FOR EMITTING HIGHLY SPIN-POLARIZED ELECTRON BEAM

Tsutmu Nakanishi, Nagoya; Hiromichi Horinaka, Suita; Takashi Saka, Nagoya, and Toshihiro Kato, Kasugai, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan
Filed Apr. 30, 1992, Ser. No. 876,579
Claims priority, application Japan, May 2, 1991, 3-130611; Jun. 7, 1991, 3-163642; Mar. 21, 1992, 4-094807
Int. Cl.^{5} H01L *29/161*
U.S. Cl. 257—11 **10 Claims**



1. A semiconductor device for emitting, upon receiving a light energy, a highly spin-polarized electron beam, comprising:

- a first compound semiconductor layer formed of gallium arsenide phosphide, $GaAs_{l-x}P_x$, and having a first lattice constant;
- a second compound semiconductor layer grown with gallium arsenide, GaAs, on said first compound semiconductor layer, and having a second lattice constant different from said first lattice constant and a thickness t smaller than the thickness of said first compound semiconductor layer, said second compound semiconductor layer emitting said highly spin-polarized electron beam upon receiving said light energy; and
- a fraction, x, of said gallium arsenide phosphide $GaAs_{l-x}P_x$ and said thickness, t, of said second compound semiconductor layer defining a magnitude of mismatch between said first and second lattice constants, such that said magnitude of mismatch provides a residual strain, ϵ_R, of not less than 2.0×10^{-3} in said second semiconductor layer.

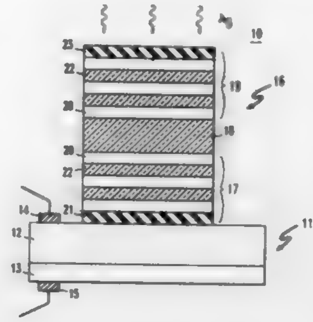
5,315,128

PHOTODETECTOR WITH A RESONANT CAVITY

Neil E. J. Hunt, Scotch Plains; Erdmann F. Schubert, New Providence, and George J. Zydzik, Columbia, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 30, 1993, Ser. No. 54,947
Int. Cl.^{5} H01L *27/14*
U.S. Cl. 257—16 **8 Claims**

1. A photodetector which comprises a photodiode comprising a substrate, a light-absorbing region and electrodes to the substrate and the light-absorbing region, said photodiode having a light-collecting surface, in which a Fabry-Perot cavity is formed upon said light-collecting surface, said Fabry-Perot cavity including, in an ascending order from said light-collecting surface, a distributed Bragg reflector (DBR) bottom mirror, an active region and a DBR top mirror, each of said top and bottom mirrors comprises a plurality of periods, each period comprising a layer of a material with higher refractive index and a layer of a material with lower refractive index than the other layer in the period, a layer with higher refractive index in one period being adjacent to a layer with lower refractive index in another period of the mirror, each of said layers in the DBR mirrors being λ/4 thick,

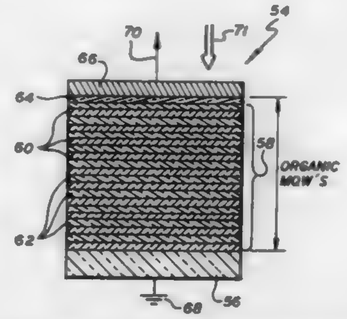
said active region having a refractive index which is different from a refractive index of each adjacent layer in the periods adjoining the light absorbing region, said active region being λ/2 thick.



5,315,129

ORGANIC OPTOELECTRONIC DEVICES AND METHODS

Stephen R. Forrest, and Franky F. So, both of Torrance, Calif., assignors to University of Southern California, Los Angeles, Calif.
Continuation-in-part of Ser. No. 570,279, Aug. 20, 1990, abandoned. This application May 1, 1991, Ser. No. 694,108
Int. Cl.^{5} H01L *29/28*
U.S. Cl. 257—21 **35 Claims**



1. An optoelectronic device formed by a process comprising the steps of:

- (a) providing a chamber (23) having an interior (24);
- (b) placing a substrate (32) in said chamber (23);
- (c) maintaining said interior (24) of said chamber (23) at a pressure less than about 10^{-6} Torr;
- (d) placing a first source material (36) in said chamber (23), said first source material (36) being a planar crystalline organic aromatic semiconductor and selected from the group of organic compounds consisting of polyacenes and porphyrins and derivatives thereof;
- (e) placing a second source material (38) in said chamber (23), said second source material (38) being a planar crystalline organic aromatic semiconductor, said second source material (38) having a generally different chemical

composition from said first source material (36) and selected from the group of organic compounds consisting of polyacenes and porphyrins and derivatives thereof;
(f) depositing a layer of said first source material (36) on top of said substrate (32) by heating said first source material (36);
(g) depositing a layer of said second source material (38) on top of siad first source material (38) by heating said second source material (38); and
(h) maintaining said substrate (32) at a temperature during deposition sufficient to provide good morphology, shart interfaces between layers, and single crystalline layers of said first and second materials.

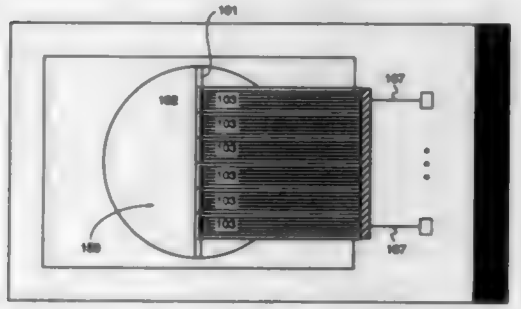
5,315,130
VERY HIGH DENSITY WAFER SCALE DEVICE ARCHITECTURE

James W. Hively, Sunnyvale; Mammen Thomas, San Jose, and Richard L. Bechtel, Sunnyvale, all of Calif., assignors to Tactical Fabs, Inc., Fremont, Calif.

Filed Mar. 30, 1990, Ser. No. 502,256

Int. Cl.^{5} H01L *27/02*

U.S. Cl. 257—48 51 Claims



1. An integrated circuit structure comprising:
a multiplicity of blocks, each block comprising:
a multiplicity of circuit elements, each of said circuit elements being capable of holding data,
means for addressing each of said circuit elements,
means for accessing data in each of said circuit elements, and
means for addressing said block;
at least one via layer formed above said multiplicity of blocks; and
a bus structure formed above said via layer and patterned to comprise an address bus comprising circuit element address lines and bank address lines and a data bus comprising data lines;
said blocks and said bus structure being arranged such that a pattern of vias can be formed in said via layer after testing of said blocks to connect said circuit element address lines to said means for addressing each of said circuit elements in selected blocks, to further connect selected ones of said data lines to said means for accessing data in said selected blocks, and to connect selected ones of said bank address lines to said means for addressing said block in said selected blocks.

5,315,131
ELECTRICALLY REPROGRAMMABLE NONVOLATILE MEMORY DEVICE

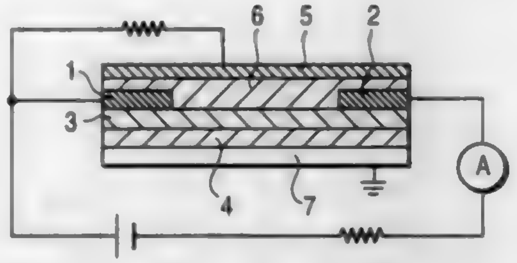
Yoshio Kishimoto, and Masaaki Suzuki, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 21, 1991, Ser. No. 795,500

Claims priority, application Japan, Nov. 22, 1990, 2-318733

Int. Cl.^{5} H01L *45/00*

U.S. Cl. 257—57 12 Claims



1. An electrically plastic device comprising:
a pair of electrodes;
an amorphous silicon semiconductor layer comprising a movable dopant support layer for imparting the electronic conductivity of said amorphous silicon semiconductor layer, said amorphous silicon semiconductor layer formed between said pair of electrodes; said movable dopant support layer comprising at least one element selected from the group consisting of an alkali ion conductor based on β-aluminum oxide, a redox ion conductor including Ag^+ or Cu^+, and a porous ceramic;
an insulating layer formed on said amorphous silicon semiconductor layer; and
at least one gate electrode formed on said insulating layer for applying an electric field to control the dopant distribution of said amorphous semiconductor layer; whereby the electronic conductivity of said amorphous semiconductor layer is variable by controlling the dopant distribution of said amorphous semiconductor layer.

5,315,132
INSULATED GATE FIELD EFFECT TRANSISTOR

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

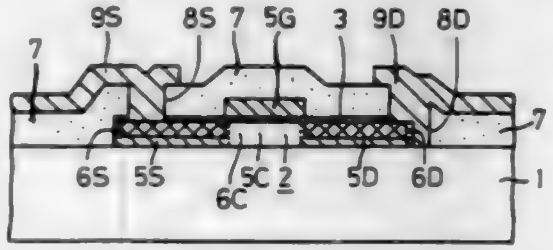
Division of Ser. No. 885,643, May 19, 1992, which is a division of Ser. No. 707,178, May 24, 1991, Pat. No. 5,142,344, which is a continuation of Ser. No. 520,756, May 9, 1990, abandoned, which is a division of Ser. No. 153,477, Feb. 3, 1988, Pat. No. 4,959,700, which is a continuation of Ser. No. 735,697, May 20, 1985, abandoned. This application Dec. 8, 1992, Ser. No. 987,179

Claims priority, application Japan, May 18, 1984, 59-100250; May 18, 1984, 59-100251; May 18, 1984, 59-100252

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.^{5} H01L *29/04, 27/02, 29/10, 29/78*

U.S. Cl. 257—66 7 Claims



1. An insulated-gate field effect transistor comprising:

a substrate having an insulating surface;
a non-single crystalline semiconductor layer of a conductivity type selected from the group consisting of n-, p-, and intrinsic types, formed on said insulating surface wherein a concentration of at least one of oxygen, carbon and nitrogen contained in said semiconductor layer is not higher than 5×10^{18} atoms/cm^3;
source and drain regions formed within said semiconductor layer by selectively doping an impurity of a type selected from the group consisting of n-type and p-type to said semicondutor layer and selectively crystallizing the doped portion;
a channel region formed within said semiconductor layer extending between said source and drain regions wherein said channel region includes an element selected from the group consisting of hydrogen and halogen elements; and
a gate electrode formed on said channel region through a gate insulator therebetween.

5,315,133
COMPOUND SEMICONDUCTOR STRUCTURE INCLUDING P-TYPE AND N-TYPE REGIONS DOPED WITH CARBON

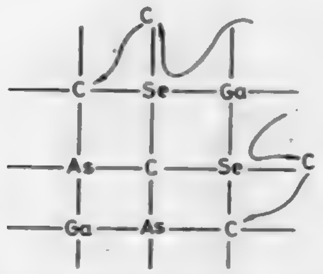
Norio Hayafuji, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1992, Ser. No. 928,746

Claims priority, application Japan, Jan. 30, 1992, 4-46253

Int. Cl.^{5} H01L *33/00*

U.S. Cl. 257—102 3 Claims



1. A III-V compound semiconductor structure including a body of gallium arsenide having an n-type region doped with a first concentration of carbon atoms and a second concentration of atoms selected from the group consisting of selenium, tellurium, and sulfur, the first concentration exceeding the second concentration, and a p-type region contacting the n-type region and doped with carbon atoms.

5,315,134
THYRISTOR WITH INSULATED GATE

Tsuneo Ogura, Yokohama; Kiminori Watanabe, Kawasaki; Akio Nakagawa, Hiratsuka; Yoshihiro Yamaguchi, Urawa; Norio Yasuhara, Yokohama, and Tomoko Matsudai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

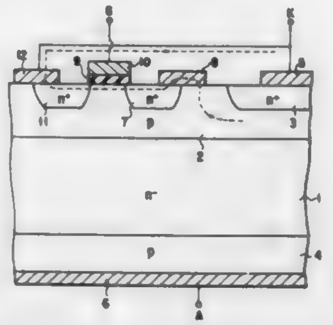
Filed Jun. 10, 1992, Ser. No. 896,422

Claims priority, application Japan, Jun. 10, 1991, 3-137894; Dec. 26, 1991, 3-345501

Int. Cl.^{5} H01L *29/74, 31/111*

U.S. Cl. 257—138 16 Claims

1. A thyristor having an insulated gate, said thyristor comprising:
a base layer of a first conductivity type having a high resistance;
a base layer of a second conductivity type formed on a surface of said base layer of said first conductivity type;
an emitter layer of said second conductivity type connected to said base layer of said second conductivity type via said base layer of said first conductivity type;
an emitter layer of said first conductivity type formed within said base layer of said second conductivity type;
a drain electrode formed on said base layer of said second conductivity type at a position adjacent to said emitter layer of said first conductivity type;
a drain layer of said first conductivity type which is formed within said base layer of said second conductivity type and which forms a short circuit with said base layer of said second conductivity type via said drain electrode;
a source layer of said first conductivity type formed within said base layer of said second conductivity type and positioned a predetermined distance from said drain layer of said first conductivity type;



a turn-off insulated gate electrode formed on a gate insulating film which is in turn formed on said base layer of said second conductivity type between said drain layer of said first conductivity type and said source layer of said first conductivity type;
a first main electrode formed on said emitter layer of said second conductivity type;
a second main electrode formed on said emitter layer of said first conductivity type; and
a source electrode formed on said source layer of said first conductivity type and connected to said second main electrode.

5,315,135
SEMICONDUCTOR DEVICE HAVING I^{2}L GATE WITH HETEROJUNCTION

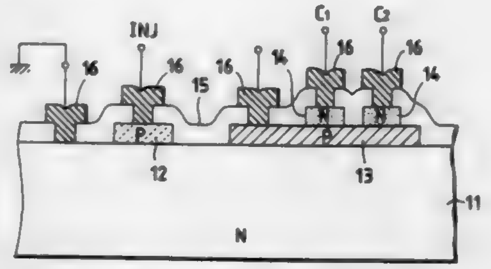
Shigeyuki Ueda, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jan. 22, 1993, Ser. No. 7,841

Claims priority, application Japan, Jan. 23, 1992, 4-34490

Int. Cl.^{5} 257 *575, 556, 77*

U.S. Cl. 257—198 2 Claims



1. A semiconductor device having I^{2}L gate, comprising:
a semiconductor layer having a first conductivity type and having a band gap;
a first semiconductor region formed on and in contact with said semiconductor layer, said first semiconductor region having a second conductivity type and a wider band gap than that of said semiconductor layer;
a second semiconductor region formed on and in contact with said semiconductor layer, said second semiconductor

region having a second conductivity type and a narrower band gap than that of said semiconductor layer; and

a third semiconductor region formed on said second semiconductor region and having a first conductivity type.

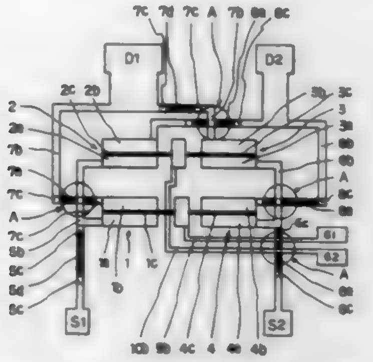
5,315,136
DOUBLE-BALANCED MIXER

Yasushi Kinugasa, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jan. 4, 1993, Ser. No. 41

Int. Cl.⁵ H01L *29/440, 29/784;* **G06G** *7/000;* **H03B** *19/000*

U.S. Cl. 257—208 **2 Claims**



1. A semiconductor integrated circuit comprising:

a double balanced mixer having first to fourth field effect transistors, wherein

(a) a source electrode of the first field effect transistor and a source electrode of the second field effect transistor are connected to a first source electrode terminal through a first interconnection line, while a source electrode of the third field effect transistor and a source electrode of the fourth field effect transistor are connected to a second source electrode terminal through a second interconnection line;

(b) a drain electrode of the first field effect transistor and a drain electrode of the third field effect transistor are connected to a first drain electrode terminal through a third interconnection line, while a drain electrode of the second field effect transistor and a drain electrode of the fourth field effect transistor are connected to a second drain electrode terminal through a fourth interconnection line; and

(c) a gate electrode of the first field effect transistor and a gate electrode of the fourth field effect transistor are connected to a first gate electrode terminal through a fifth interconnection line, while a gate electrode of the second field effect transistor and a gate electrode of the third field effect transistor are connected to a second gate electrode terminal through a sixth interconnection line,

at least the first and second interconnection lines respectively connected to the first and second source electrode terminals being made to have electrical resistance which are essentially equal to each other;

wherein if one interconnection line of the first interconnection line and the second interconnection line comprises a first layer line and a second layer line so as to cross over any of the other interconnection lines, then the other one of the first and second interconnection lines also comprises a first layer line and a second layer line regardless of whether or not said other of the first and second interconnection lines two-level crosses any of the other interconnection lines, wherein the first and second interconnection lines connected respectively to said first and second source electrode terminals are made to have electrical resistances which are essentially equal to each other.

5,315,137
CHARGE TRANSFER DEVICE, PROCESS FOR ITS MANUFACTURE, AND METHOD OF DRIVING THE DEVICE

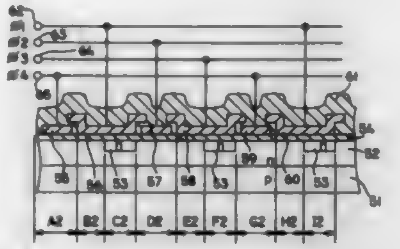
Masaji Asaumi, Kyouto, and Takao Kuroda, Ibaraki, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Nov. 12, 1991, Ser. No. 790,782

Claims priority, application Japan, Nov. 9, 1990, 2-304732

Int. Cl.⁵ H01L *29/796*

U.S. Cl. 257—221 **6 Claims**



1. A charge transfer device, comprising:

a semiconductor substrate of a certain conductivity type,

a first diffusion layer of a reverse conductivity type formed on said semiconductor substrate,

a second diffusion layer of the reverse conductivity type formed in said first diffusion layer,

an insulation film formed above said semiconductor substrate, and

first and second transfer electrodes formed on said insulating film, wherein the length of said first transfer electrode is longer than the length of said second transfer electrode,

wherein at least one of said first transfer electrodes is formed above said second diffusion layer, and said first diffusion layer is formed below one of said second transfer electrodes,

the ratio of said first transfer electrode and said second transfer electrode in width is between 1.6 and 4.0, and

the charge transfer device is four phase driven,

wherein the impurity concentration of said second diffusion layer is higher than the impurity concentration of said first diffusion layer.

5,315,138
SEMICONDUCTOR MEMORY APPARATUS

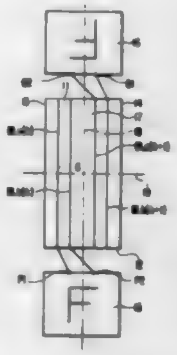
Takeshi Fukuda, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 27, 1992, Ser. No. 826,419

Claims priority, application Japan, Jan. 25, 1991, 3-025506

Int. Cl.⁵ H01L *29/92*

U.S. Cl. 257—296 **6 Claims**



1. A semiconductor memory device comprising, on the surface of a semiconductor substrate:

a plurality of memory cell forming regions each having a rectangular plane shape defined by first and second sides extending in a first direction and third and fourth sides extending in a second direction at a right angle to said first direction, said memory cell forming regions being arranged in line in said first direction;

a plurality of memory cells arranged and formed in each of said memory cell forming regions;

first and second bit line pairs formed in each of said memory cell forming regions and extending in said second direction;

a plurality of first peripheral circuits arranged in said first direction, each of said first peripheral circuits being formed outside said first side of an associated one of said memory cell forming regions and having first and second connecting points connected to said first bit line pair; and

a plurality of second peripheral circuits arranged in said first direction, each of said second peripheral circuits being formed outside said second side of an associated one of said memory cell forming regions and having third and fourth connecting points connected to said second bit line pair;

each of said first peripheral circuits being shifted toward said second bit line pair along said first side to have said first connecting point on a left side of a line crossing a center of said first side and a center of said second side and said second point on a right side of said line, and each of said second peripheral circuits being shifted toward said first bit line pair along said second side to have said third connecting point on the left side of said line and said fourth connecting point on the right side of said line.

5,315,139
POWER SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITHOUT CONCENTRATION OF ELECTRIC FIELD

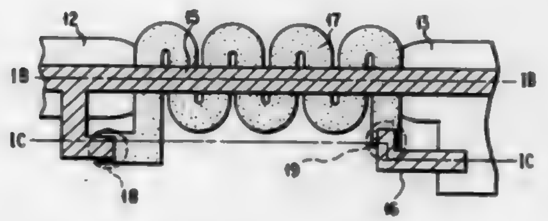
Koichi Endo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 24, 1993, Ser. No. 80,535

Claims priority, application Japan, Jun. 24, 1992, 4-165908; Jun. 14, 1993, 5-141788

Int. Cl.⁵ H01L *27/02, 29/34, 29/40*

U.S. Cl. 257—409 **14 Claims**



1. A power semiconductor integrated circuit device comprising:

a semiconductor substrate of a first conductivity type;

a first semiconductor region of said first conductivity type provided in said semiconductor substrate;

a second semiconductor region of a second conductivity type provided in said semiconductor substrate to be spaced apart from said first semiconductor region;

an insulating film provided on said semiconductor substrate to cover at least partly said first and second semiconductor regions;

a wiring layer provided on said insulating film to be connected to one of said first and second semiconductor regions and to extend over the other of said first and second semiconductor regions; and

a film resistor formed in said insulating film to be connected between said first and second semiconductor regions, said film resistor being disposed above said semiconductor substrate to be crossed by said wiring layer at least once.

5,315,140
SEMICONDUCTOR DEVICE HAVING A POLYSILICON CAPACITOR WITH LARGE GRAIN DIAMETER

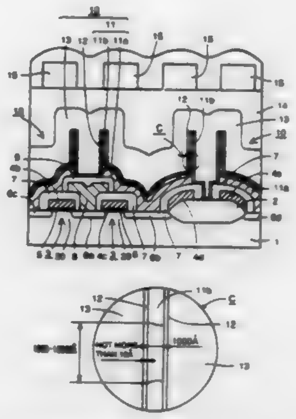
Kazuyuki Sugahara, and Hideaki Arima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1993, Ser. No. 8,020

Claims priority, application Japan, Apr. 24, 1992, 4-106759

Int. Cl.⁵ H01L *29/94*

U.S. Cl. 257—306 **9 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate of a second conductivity type having a major surface and an impurity region of a first conductivity type located in said major surface;

an insulating layer formed on said major surface of said semiconductor substrate and having an opening reaching said impurity region;

a capacitor lower electrode having a first portion, which is in contact with a surface of said impurity region and a surface of said insulating layer and is formed of silicon crystal having a first grain diameter, and a second portion, which is in contact with at least an outermost edge of said first portion, extends upwardly from said major surface of said semiconductor substrate and is formed of silicon crystal having a second grain diameter larger than said first grain diameter;

a capacitor insulating layer covering the surface of said capacitor lower electrode; and

a capacitor upper electrode covering the surface of said capacitor insulating layer.

5,315,141
SEMICONDUCTOR MEMORY DEVICE HAVING A DOUBLE-STACKED CAPACITOR STRUCTURE

Jae K. Kim, Kyoungki, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki, Rep. of Korea

Division of Ser. No. 887,544, May 22, 1992, Pat. No. 5,270,238. This application Sep. 16, 1993, Ser. No. 122,100

Claims priority, application Rep. of Korea, May 24, 1991, 91-8407

Int. Cl.⁵ H01L *29/94*

U.S. Cl. 257—308 **2 Claims**

1. A semiconductor memory device having a double-stacked capacitor structure, comprising:

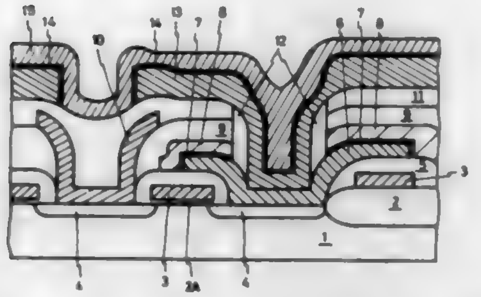
MOSFETs each with a gate electrode, a source electrode and a drain electrode formed on a substrate;

a first charge storage electrode in contact with a source electrode of said MOSFETs through a first contact hole, and extended over a part of said gate electrode, with an insulating layer between said first charge storage electrode and the MOSFETs;

a first of two stacked capacitors, said first capacitor having a first dielectric layer and a first plate electrode sequentially formed over said first charge storage electrode;

a second and third insulating layer sequentially formed over said first plate electrode, with a bit line formed between said second insulating layer and said third insulating layer, said bit line being in contact with a drain electrode of said MOSFETs through a second contact hole;

a third contact hole formed over said first charge storage electrode by removing a part of said second and third insulating layer, of said first plate electrode, and of said first dielectric layer;



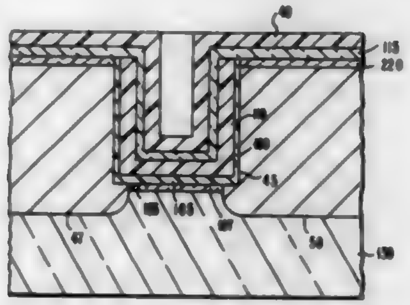
a second charge storage electrode formed over said third insulating layer and in contact with said first charge storage electrode through said third contact hole; and

a second stacked capacitor having a second dielectric layer and a second plate electrode sequentially formed over said second charge storage electrode, whereby a first and a second capacitor connected are formed in parallel respectively below and over said bit line.

5,315,142
HIGH PERFORMANCE TRENCH EEPROM CELL

Alexandre Acovic, Yorktown Heights, N.Y.; Ching-Hsiang Hsu, Hsin Chu, Taiwan, and Being S. Wu, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1992, Ser. No. 855,956
Int. Cl.^{5} H01L *29/78*
U.S. Cl. 257—316 **12 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate having a major surface, first and second sidewall surfaces, and a channel region;

said first sidewall surface forming a trench in said substrate with said second sidewall surface and said channel region, said first sidewall surface being separated from said second sidewall surface by said channel region, said channel region forming a bottom surface of said trench, said first and second sidewall surfaces being generally orthogonal with respect to said substrate major surface;

isolation material partially filling said trench and forming a first isolation sidewall and a second isolation sidewall in said trench;

said first and second sidewall surfaces being doped with a first type of dopant;

a first dielectric layer overlaying said first and second sidewall surfaces;

a floating gate;

a second dielectric layer interposed between said channel region and said floating gate, said floating gate covering said second dielectric layer, said first dielectric layer, and said isolation sidewalls;

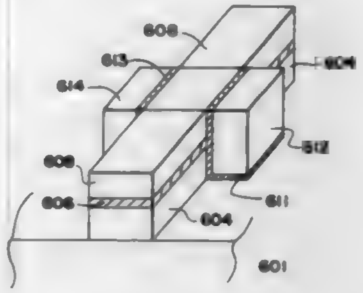
a control gate layer;

a third dielectric layer interposed between said floating gate layer and said control gate layer, said control gate layer covering said third dielectric layer at least at regions where said third dielectric layer covers said floating gate.

5,315,143
HIGH DENSITY INTEGRATED SEMICONDUCTOR DEVICE

Kazuhiko Tsuji, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 874,835, Apr. 28, 1992, abandoned. This application Jul. 8, 1993, Ser. No. 87,464
Int. Cl.^{5} H01L *27/02, 27/01, 27/13*
U.S. Cl. 257—351 **1 Claim**



1. A semiconductor device, comprising:

a first source region of a first conduction type;

a first drain region of the first conduction type;

a first channel region connecting the first source and first drain regions, the first channel region being formed on the same plane as the first source and first drain regions;

an insulator film formed above the first source, first channel and first drain regions;

a second source region of a second conduction type different from the first conduction type formed above the insulator film;

a second drain region of the second conduction type formed above the insulator film;

a second channel region connecting the second source and second drain regions, the second channel region being formed on the same plane as the second source and second drain regions above the insulator film;

a first gate electrode arranged vertically adjacent to the first and second channel regions;

a first gate oxide film interposed between the first channel region and the first gate electrode and between the second channel region and the first gate electrode;

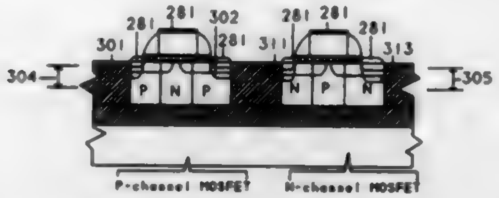
a second gate electrode arranged vertically at a side of the first and second channel regions different from that of the first gate electrode, the second gate electrode being adjacent to the first and second channel regions; and

a second gate oxide film interposed between the first channel region and the second gate electrode and between the second channel region and the second gate electrode.

5,315,144
REDUCTION OF BIPOLAR GAIN AND IMPROVEMENT IN SNAP-BACK SUSTAINING VOLTAGE IN SOI FIELD EFFECT TRANSISTOR

Richard D. Cherne, West Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 18, 1992, Ser. No. 947,177
Int. Cl.^{5} H01L *27/01, 29/76, 27/12, 29/94*
U.S. Cl. 257—351 **12 Claims**



1. An MOS SOI field effect transistor comprising:

a semiconductor-on-insulator structure having a semiconductor layer, said semiconductor layer including a channel portion of a first conductivity type, disposed upon an underlying insulator layer;

source and drain regions of a second conductivity type formed in first and second portions of said semiconductor layer spaced apart from one another by said channel portion thereof, such that said source and drain regions extend from first and second spaced apart surface portions of said semiconductor layer down to said underlying insulator layer, and such that said source and drain regions have a doping concentration that is effective to reduce gain and injection efficiency of an emitter of a parasitic lateral bipolar transistor formed of said source and drain regions and said channel portion and thereby increase a sustaining voltage threshold to a value greater than a maximum power supply voltage, so as to avoid a problem of snapback, said doping concentration being within an order of magnitude of the doping concentration of said channel portion of said semiconductor layer;

an insulated gate structure atop said channel portion of said semiconductor layer between said first and second spaced apart surface portions of said semiconductor layer, said insulated gate structure comprising a gate insulator layer and an overlying conductive gate layer;

first and second sub-regions of said second conductivity type formed in said source and drain regions down to a first depth thereof that only partially penetrates the depth of said source and drain regions, said first and second sub-regions having a doping concentration on the same order of magnitude as that of said source and drain regions and extending partially beneath said insulated gate structure so as to define a channel width of said field effect transistor;

high impurity concentration ohmic contact regions disposed in surface portions of said first and second sub-regions; and

ohmic contacts respectively contiguous with said conductive gate layer and said high impurity concentration ohmic contact regions.

5,315,145
CHARGE MONITORING DEVICE FOR USE IN SEMICONDUCTOR WAFER FABRICATION FOR UNIPOLAR OPERATION AND CHARGE MONITORING

Wieslaw A. Lukaszek, Woodside, Calif., assignor to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

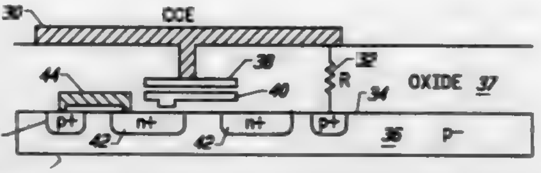
Filed Jul. 16, 1993, Ser. No. 93,430
Int. Cl.^{5} H01L *27/02, 29/68, 29/78*
U.S. Cl. 257—379 **10 Claims**

1. A unipolar charge monitoring device for use in characterizing semiconductor fabrication equipment and processes comprising:

a semiconductor substrate of one conductivity type,

a source region and a drain region formed in first and second spaced surface regions of opposite conductivity type in said substrate with a channel region between said source region and said drain region,

a control gate spaced from and in alignment with said channel region,



a floating gate between and spaced from said control gate and said channel region,

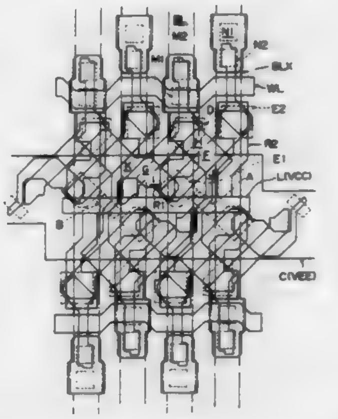
a charge collection electrode above and electrically connected to said control electrode, and

diode means connecting said charge collection electrode to said substrate whereby said charge collection electrode collects charge of only one potential.

5,315,146
SEMICONDUCTOR MEMORY DEVICE HAVING SPECIFIC LAYOUT CONFIGURATION OF N-MOS MEMORY CELLS

Yoshihide Sato, Tokorozawa, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 18, 1993, Ser. No. 33,577
Claims priority, application Japan, Mar. 19, 1992, 4-063990
Int. Cl.^{5} H01L *27/10, 27/15, 27/02*
U.S. Cl. 257—390 **9 Claims**



1. A semiconductor memory device including a plurality of memory cells arranged in a matrix on a chip, each memory cell including a flip-flop having a first set of one driver transistor and one load element, and a second set of one driver transistor and one load element, said first and second sets being cross-coupled, and a pair of transfer gate transistors connected between a pair of data retaining nodes of the flip-flop and a pair of complementary bit lines, respectively, and responsive to a potential at a corresponding word line, the semiconductor memory device comprising:

a gate region of each driver transistor arranged obliquely with respect to a first direction of the chip;

a source/drain region of each drive transistor arranged obliquely with respect to the first direction of the chip;

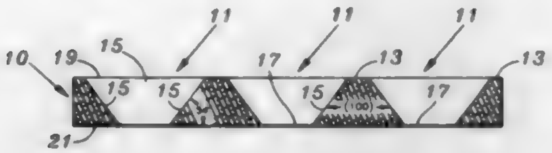
first contact windows arranged in a line substantially parallel with the first direction and connecting each source/drain region of the driver transistors to a power supply line provided in the first direction; and

second contact windows arranged every one contact window in a zigzag manner with respect to the first direction and connecting each source/drain region of the transfer gate transistors to the corresponding bit line.

5,315,147
MONOLITHIC FOCAL PLANE ARRAY

Allen L. Solomon, Fullerton, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,161
Int. Cl.^{5} H01L *27/13*
U.S. Cl. 257—448 **15 Claims**



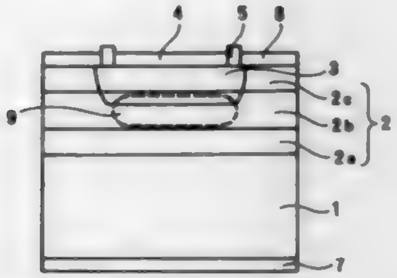
1. A single crystalline wafer having first and second surfaces, the wafer having the structural integrity required to survive the fabrication of integrated circuitry upon its first and second surfaces, the wafer comprising:

(a) at least one hollow formed in the first surface of the wafer, said hollow having a floor and beveled sides;
(b) a plurality of apertures which extend from the floor of each hollow, through the floor of the hollow, to the second surface of the wafer; and
(c) wherein the wafer is at least an order of magnitude thicker than the diameter of said apertures.

5,315,148
PHOTO-SENSING DEVICE

Yasushi Fujimura, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 751,191, Aug. 29, 1991, abandoned. This application Sep. 9, 1993, Ser. No. 124,661
Claims priority, application Japan, Aug. 31, 1990, 2-230207
Int. Cl.^{5} H01L *31/10*
U.S. Cl. 257—458 **9 Claims**



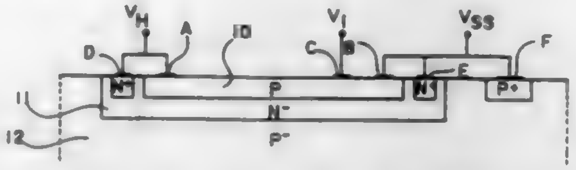
1. A photo-sensing device comprising:

a heavily doped semiconductor substrate of a first conductivity type:
a lightly doped semiconductor layer of said first conductivity type, said lightly doped semiconductor layer being formed on said heavily doped semiconductor substrate;
a heavily doped region of a second conductivity type provided in a portion of said lightly doped semiconductor layer, said heavily doped region and said semiconductor layer forming a p-n junction which provides a photo-sensing region;
an insulating layer formed directly on said lightly doped semiconductor layer and around said heavily doped region;
an electrode contacting said heavily doped region at a main surface thereof; and
a metal layer formed on said insulating layer, said metal layer also contacting said lightly doped semiconductor layer.

5,315,149
SELF-PROTECTED DIVIDING BRIDGE

Eric Compagne, La Tronche, France, assignor to Dolphin Integration S.A., Meylan, France

Filed Mar. 24, 1993, Ser. No. 35,765
Claims priority, application France, Mar. 25, 1992, 92 03972
Int. Cl.^{5} H01L *27/02*
U.S. Cl. 257—536 **5 Claims**



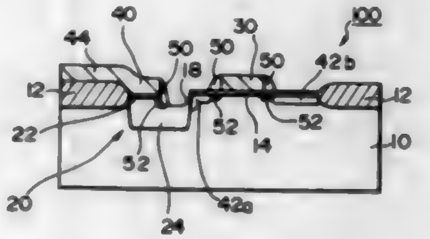
1. A self-protected divider bridge in an integrated circuit comprising:

a substrate of a first conductivity type with a low doping level,
a well of a second conductivity type with a low doping level formed in the substrate,
a region of the first conductivity type, forming a resistor, diffused in said well,
a first and a second contact respectively formed on first and second opposite peripheral portions of said diffused region and an intermediate contact formed on said diffused region,
a pad connected to said first contact and receiving an external voltage higher than a supply voltage of the integrated circuit,
a reference potential of the integrated circuit connected to said second contact and to the substrate,
a third contact formed on a third peripheral portion of the well adjacent said first peripheral portion and connected to said first contact and
a fourth contact formed on a fourth peripheral portion of the well adjacent said second peripheral portion and connected to said second contact.

5,315,150
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Tomoyuki Furuhata, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 797,919
Claims priority, application Japan, Nov. 28, 1990, 2-328095; Nov. 28, 1990, 2-328096; May 27, 1991, 3-120958; May 27, 1991, 3-120959
Int. Cl.^{5} H01L *23/48, 21/22*
U.S. Cl. 257—588 **20 Claims**



1. A semiconductor device comprising:

(a) a semiconductor substrate;
(b) an MOS element formed on a main surface of said semiconductor substrate, and having a buried contact structure; and

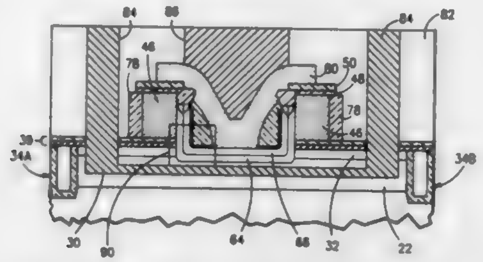
(c) said buried contact structure including a first contact diffused region formed in said main surface of said semiconductor substrate by diffusion from a polycrystalline silicon layer, and a second contact diffused region formed by diffusion, said second contact diffused region being located deeper in said semiconductor substrate than said first contact diffused region such that said first contact diffused region overlays at least a portion of said second contact diffused region;

wherein said first contact diffused region has a depth of diffusion of 0.1 to 0.3 μm and said second contact diffused region has a depth of diffusion of 0.5 to 0.8 μm, and
wherein said MOS element comprises a source/drain diffused region, said depth of diffusion of said second contact diffused region being larger than a depth of said source/drain diffused region of said MOS element.

5,315,151
TRANSISTOR STRUCTURE UTILIZING A DEPOSITED EPITAXIAL BASE REGION

Chang-Ming Hsieh; Louis L. Hsu, both of Fishkill, and Victor J. Silvestri, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 716,036, Jun. 14, 1991, abandoned. This application Feb. 22, 1993, Ser. No. 20,896
Int. Cl.^{5} H01L *29/72, 29/161*
U.S. Cl. 257—592 **9 Claims**



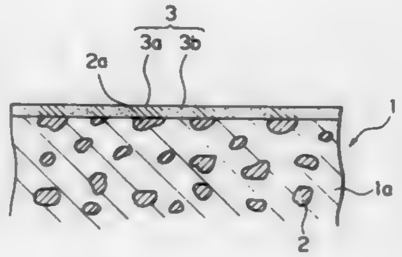
1. A buried emitter bipolar transistor comprising:

a monocrystalline semiconductor substrate of a first conductivity type;
a buried emitter region of a second conductivity type in said substrate;
a first layer of monocrystalline intrinsic semiconductor material in direct contact with said buried emitter region;
a layer of insulating material in direct contact with said first layer;
a conductive contact in direct contact with a portion of said layer of insulating material;
said conductive contact, said first layer and said layer of insulating material together defining an aperture exposing a selected portion of said emitter region;
a second layer of semiconductor material of said second conductivity type in said aperture including a monocrystalline intrinsic base region having silicon-germanium therein disposed epitaxially over and in direct contact with said selected emitter region portion and a polycrystalline extrinsic base region portion extending onto the wall of said conductive contact within said aperture and in direct contact with said intrinsic base region; and
a collector region in direct contact with said intrinsic base region, said collector region including a third layer of semiconductor material of said first conductivity type formed epitaxially over said intrinsic base region.

5,315,152
LEAD FRAME WITH IMPROVED ADHESIVENESS PROPERTY AGAINST PLASTIC AND PLASTIC SEALING TYPE SEMICONDUCTOR PACKAGING USING SAID LEAD FRAME

Takashi Kuse, and Nobuaki Nakashima, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

PCT No. PCT/JP91/00728, § 371 Date Dec. 30, 1991, § 102(e) Date Dec. 30, 1991, PCT Pub. No. WO91/19320, PCT Pub. Date Dec. 12, 1991
PCT Filed May 30, 1991, Ser. No. 778,914
Claims priority, application Japan, May 31, 1990, 2-142964
Int. Cl.^{5} H01L *23/48, 29/44, 29/60*
U.S. Cl. 257—677 **16 Claims**



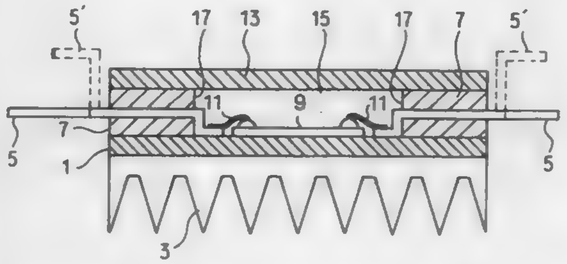
1. A lead frame having an improved adhesiveness property with plastic, comprising:

a matrix for said lead frame consisting essentially of a copper based alloy containing dispersive particles, a portion of said dispersive particles being distributed on the surface of said matrix, and a content of P in the copper based alloy being 30 ppm or less; and
an oxide layer formed on said matrix, said oxide layer containing an oxide of said dispersive particles distributed on the surface of said matrix.

5,315,153
PACKAGES FOR SEMICONDUCTOR INTEGRATED CIRCUIT

Yuji Nagai, Komae; Eiki Tanikawa, Urayasu; Hisao Ohshima, Okegawa, and Kazushige Kato, Atsugi, all of Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Osaka and Kabushiki Kaisha Enplas, Saitama, both of Japan

PCT No. PCT/JP90/00037, § 371 Date May 29, 1991, § 102(e) Date May 29, 1991
PCT Filed Jan. 12, 1990, Ser. No. 689,902
Claims priority, application Japan, Sep. 29, 1989, 1-254853
Int. Cl.^{5} H01L *23/28*
U.S. Cl. 257—701 **14 Claims**



1. A ceramic package for a semiconductor integrated circuit, the package comprising:

a substrate made of aluminum nitride,
a semiconductor integrated circuit formed on the substrate,
leads attached to the substrate,
a metal cap covering the substrate in a manner that forms a hollow space surrounding the semiconductor integrated circuit between the substrate and the metal cap,

a resin layer for adhering the substrate, the leads and the metal cap to each other, and

a coating of water-resistant material on the inner surface of the resin layer which defines the hollow space.

5,315,154

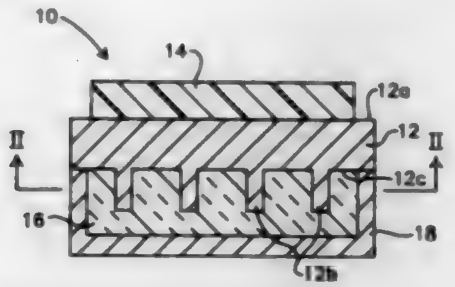
ELECTRONIC ASSEMBLY INCLUDING HEAT ABSORBING MATERIAL FOR LIMITING TEMPERATURE THROUGH ISOTHERMAL SOLID-SOLID PHASE TRANSITION

Dennis F. Elwell, San Clemente, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 14, 1993, Ser. No. 61,096

Int. Cl.⁵ H01L *23/02*

U.S. Cl. 257—707 **26 Claims**



1. An electronic assembly, comprising:

an electronic component that generates heat when operated;

a thermally conductive heat sink in direct contact with said electronic component for dissipating heat generated by said electronic component; and

a mass of a heat absorbing material in direct contact with said heat sink for absorbing heat from and limiting the temperature of said heat sink to a predetermined temperature, said heat absorbing mass having a lower thermal conductivity than said heat sink, with said heat sink interfacing between said electronic component and said heat absorbing mass, said heat absorbing mass including a solid material which exhibits an isothermal solid-solid phase transition at approximately said predetermined temperature, and absorbing heat from said electronic component through said heat absorbing mass during electrical or thermal overloads of said electronic component to limit the electronic component's temperature to approximately said predetermined temperature.

5,315,155

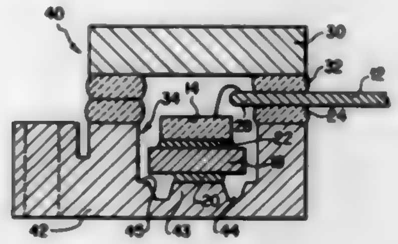
ELECTRONIC PACKAGE WITH STRESS RELIEF CHANNEL

Brian E. O'Donnelly, Branford; Brian Mravic, North Haven; Jacob Crane, Woodbridge, and Deepak Mahulikar, Madison, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 13, 1992, Ser. No. 912,535

Int. Cl.⁵ H01L *23/02, 23/12*

U.S. Cl. 257—711 **12 Claims**



1. An electronic package assembly, comprising:

a leadframe having a plurality of leads, the inner ends of which define a central region;

a base containing a recessed channel defining a pedestal disposed adjacent said central region, said recessed channel having a depth of up to 50% the depth of that portion of said base adjacent said recessed channel;

a buffer bonded to said pedestal with a portion of said buffer overhanging said pedestal; and

a sealing glass bonding said base to said leadframe.

5,315,156

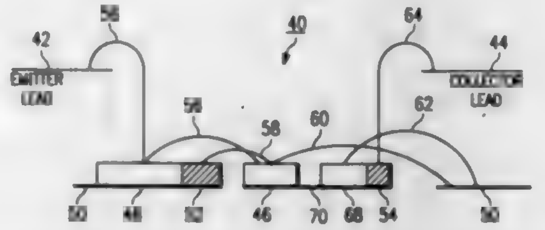
TRANSISTOR DEVICE LAYOUT

Joel M. Lott, Dublin, Pa., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Nov. 30, 1992, Ser. No. 984,221

Int. Cl.⁵ H01L *23/02, 23/12, 23/48, 29/40*

U.S. Cl. 257—728 **14 Claims**



1. A transistor layout for use in high frequency power gain circuits, comprising:

a transistor chip having a base, emitter, and collector;

a collector island connected to the collector of the transistor chip;

an emitter lead and a collector lead;

a collector contact bar mounted directly on the collector island;

an input capacitor having an attached ground bar;

a collector lead connected to the collector contact bar through a collector bondwire;

a first base connection which connects the base of the transistor chip to the input capacitor ground bar through a first base bondwire and a second base connection which connects the base of the transistor chip directly to the metal of the transistor chip package; and

an output capacitor which is mounted directly on the collector island.

5,315,157

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING VOLTAGE LEVEL CONVERTING CIRCUITS

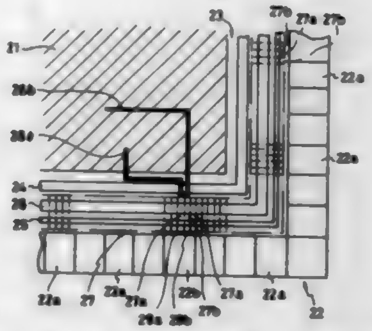
Yuuji Koizumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 20, 1992, Ser. No. 978,933

Claims priority, application Japan, Nov. 20, 1991, 3-303667

Int. Cl.⁵ H01L *23/48*

U.S. Cl. 257—734 **13 Claims**



1. A semiconductor integrated circuit device comprising:

an internal circuit region including a first circuit block and a second circuit block, said first circuit block being driven at a first power source voltage, and said second circuit block being driven at a second power source voltage different in value from said first power source voltage;

an interface region including a plurality of interface blocks;

a wiring region formed between said internal circuit region and said interface region, said wiring region including wiring lines;

at least one first voltage level converting circuit configured for converting a signal voltage level between said first circuit block and said second circuit block, said first voltage level converting circuit being formed in said writing region; and

at least one second voltage level converting circuit configured for converting a signal voltage level between said first circuit block and said second circuit block, said second voltage level converting circuit being formed in said wiring region;

wherein only one of said first voltage level converting circuit and said second voltage level converting circuit is used for voltage conversion between said first circuit block and said second circuit block is a given semiconductor integrated circuit device arrangement.

5,315,158

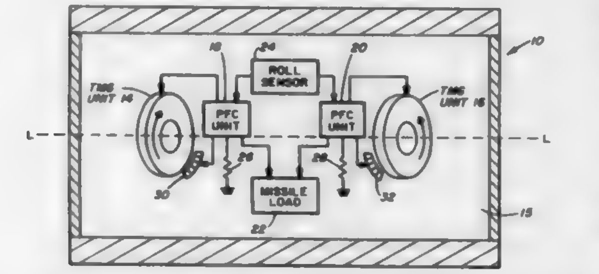
INTEGRATED ROLL CONTROL AND POWER SUPPLY SYSTEM AND METHOD

Arnold O. Danielson, P.O. Box 1322, Inyokern, Calif. 93527

Filed May 17, 1993, Ser. No. 63,225

Int. Cl.⁵ B64G *1/28*

U.S. Cl. 290—1 R **16 Claims**



1. An integrated roll control and power supply system for a missile, comprising:

(a) a pair of flywheel-motor-generator (FMG) units being axially aligned with one another and respectively operable in clockwise and counterclockwise directions so as to produce bi-directional roll torque and generate electrical power;

(b) means for sensing roll accelerations in clockwise and counterclockwise directions in an airframe of a missile and being operable to generate output signals corresponding thereto;

(c) a pair of power flow control (PFC) units connected to said sensing means and coupled between said FMG units and an electrical load in the missile, said PFC units being operable to receive said output signals from said sensing means and to cause selected dissipation of the roll torque of said FMG units by supplying electrical power from said FMG units to the electrical load in the missile and thereby produce roll-damping torques in the airframe for control of any undesirable roll in the airframe of the missile; and

(d) a first and second means coupled to the power flow control units for transferring energy directly between the two FMG units.

5,315,159

WIND TURBINE

Wilhelmus H. J. K. Gribnau, Hengelo, Netherlands, assignor to Holec Projects B.V., Hengelo, Netherlands

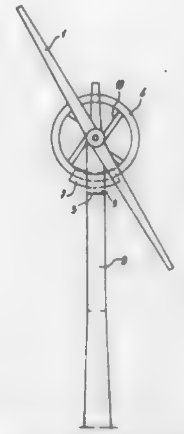
PCT No. PCT/NL90/00153, § 371 Date May 6, 1992, § 102(e) Date May 6, 1992, PCT Pub. No. WO91/05953, PCT Pub. Date May 2, 1991

PCT Filed Oct. 12, 1990, Ser. No. 855,645

Claims priority, application Netherlands, Oct. 12, 1989, 8902534

Int. Cl.⁵ F03D *9/00;* **H02K** *7/18, 41/02*

U.S. Cl. 290—55 **10 Claims**



1. A wind turbine for generating electrical energy by means of wind energy, comprising: a turbine rotor mountable on a mast and being rotatable about a rotor shaft with one or more rotor blades, and a generator of the asynchronous sector machine type equipped with a generator rotor directly coupled to the turbine rotor in the form of a continuous, uninterrupted annular ring of electrically conductive material, and one or more discrete stator sectors, the one or more discrete stator sectors extending along a portion of the annular generator rotor on opposite sides thereof.

5,315,160

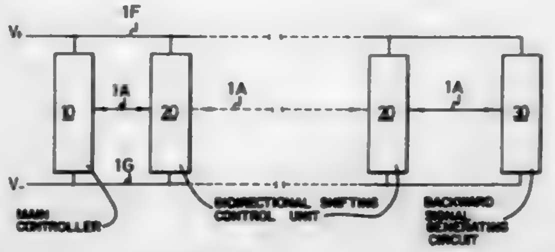
SEQUENTIALLY SHIFTING CONTROL CIRCUIT FOR EXTENDIBLE LIGHT STRINGS

Ming Cheng Chang, No. 10, Alley 48, Lane 5, Sheng li St., Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Mar. 13, 1992, Ser. No. 851,998

Int. Cl.⁵ H05B *37/00, 39/09, 41/36*

U.S. Cl. 307—41 **6 Claims**


1F
V+
1A
1A
1A
10
20
20
30
1G
V-
MAIN CONTROLLER
BIDIRECTIONAL SHIFTING CONTROL UNIT
BACKWARD SIGNAL GENERATING CIRCUIT

1. A sequentially shifting control circuit for extendible light strings comprising a main controller serially coupled with a plurality of bidirectional-shifting control units and a backward signal generating circuit, a single signal line and two power lines coupling said main controller, said bidirectional-shifting control units, and said backward signal generating circuit; synchronous signals for said control circuit having a level between 18 volts and 5 volts, forward data signals and backward data signals being synchronously interposed in a low level between zero and 5 volts and a high level between 18

volts and 30 volts, respectively, backward control signals being interposed in the synchronous signal and having a duty cycle greater than said synchronous signal, such that said signal line transmits said synchronous signal, said forward data signal, said backward data signal, and said backward control signal simultaneously;

wherein said main controller comprises a microcomputer, a synchronous signal generator, a data signal generator, a plurality of selection switches, and a plurality of drivers, said synchronous signal generator, said data signal generator and said microcomputer cooperating to generate said synchronous signal having a duty cycle and said data signals having the same period but different duty cycles.

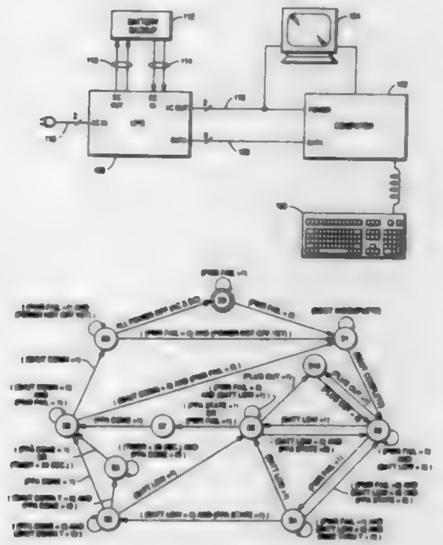
5,315,161
POWER FAILURE DETECTION AND SHUT DOWN TIMER

Thomas S. Robinson, Longwood; David E. Dieska, Lake Mary, and Carol A. Hebert-Robinson, Longwood, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 589,300, Sep. 27, 1990, abandoned. This application Jan. 5, 1993, Ser. No. 5,854

Int. Cl.^{5} G06F *1/30;* **H02H** *3/24;* **H02J** *9/06*

U.S. Cl. 307—66 **5 Claims**



1. A method for operating a computer system including a standby power supply, said standby power supply providing electrical power to said computer system from a source of stored electrical energy during disruptions in the supply of electrical power from a primary electrical power source for said computer system, the method steps comprising:

monitoring the supply of electric power from said primary electrical power source to detect disruptions in the supply of electric power from said primary source;

monitoring the supply of energy available from said stored electrical energy source;

providing power from said source of stored electrical energy to said computer to sustain normal operation of said computer after a primary power supply disruption has been detected;

providing power from said primary source to said computer upon the detection of a primary power supply restoration;

performing an orderly shut down of computer applications upon the expiration of a first predetermined period of time measured from the initial detection of said primary power supply disruption without the detection of a primary power supply restoration;

performing a critical application shut down of computer applications upon the combination of said stored energy supply decreasing below a predetermined level and the detection of a primary power supply disruption said orderly shut down of computer applications being terminated upon initiation of said critical application shut down of computer applications; and

performing an orderly shut down of computer system operations upon the first to occur of the conclusion of orderly shut down of computer application procedures or the conclusion of critical application shut down procedures.

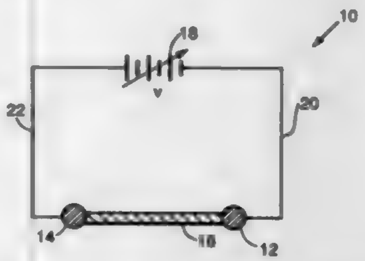
5,315,162
ELECTROCHEMICAL SYNAPSES FOR ARTIFICIAL NEURAL NETWORKS

John McHardy, Westlake Village; Carl W. Townsend, Los Angeles; Lin R. Higley, Laguna Hills, and Frank A. Ludwig, Rancho Palos Verdes, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 4, 1991, Ser. No. 770,817

Int. Cl.^{5} G06G *7/06;* **H03H** *11/00*

U.S. Cl. 307—201 **22 Claims**



1. An electrochemically regulated interconnection adapted for use in a neural network, said interconnection comprising:

an input terminal;

an output terminal located at a distance of less than 100 microns from said input terminal;

a permanent interconnect between said input and output terminals, said permanent interconnect having a pH, a conductivity and comprising a migratable metal which forms whiskers along said permanent interconnect; and

conductivity control means for regulating the conductivity of said permanent interconnect, said conductivity control means comprising means for increasing or decreasing the pH of said permanent interconnect thereby reversibly controlling the growth of said metallic whiskers.

5,315,163
ANALOGIC NEURONAL NETWORK

Pierre Karinthi, Jouy en Josas, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 23, 1993, Ser. No. 21,077

Claims priority, application France, Feb. 28, 1992, 92 02352

Int. Cl.^{5} H03K *19/195, 17/92*

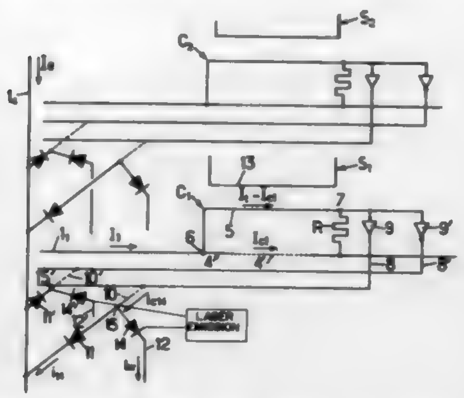
U.S. Cl. 307—201 **13 Claims**

1. An analogic neuronal network comprised of at least a first and a second cell, each cell comprising;

a first channel (4,4′) comprised of a material having selectively a superconductive state and a resistive state; p1 a refrigeration means to maintain said first channel at a temperature below that which ensures superconductivity of the material below a critical current intensity in said first channel,

a second channel (5) coupled to the first channel at one end of said second channel to form an input node, and the other end of said second channel coupled to an electrical resistance (R) to form an output node;

a first interconnection channel (8,9,10,11,14, 8′,9′,10′,11′,14′) which couples the output node of said at least first cell to the input node of said at least second cell, said first interconnection channel injecting a first current into said at least first cell from said at least second cell, and said first interconnection channel having a first voltage controlled means (w_{ij},w'_{ij}) which adjusts the intensity of said first current.



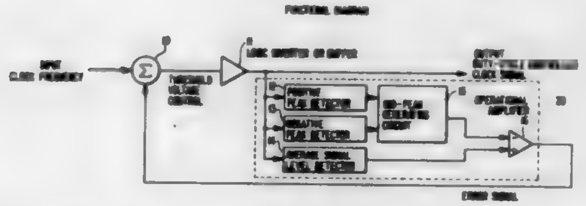
5,315,164
ADAPTIVE CLOCK DUTY CYCLE CONTROLLER

Robert S. Broughton, Beaverton, Oreg., assignor to NEC America, Inc., Hillsboro, Oreg.

Filed May 26, 1993, Ser. No. 67,069

Int. Cl.^{5} H03K *3/017, 5/153*

U.S. Cl. 307—265 **5 Claims**



1. A duty cycle controller for maintaining a predetermined duty cycle, said duty cycle controller comprising:

signal generating means for generating an output signal having a predetermined duty cycle;

a positive peak detecting means for detecting a positive peak of said output signal from said signal generating means;

a negative peak detecting means for detecting a negative peak of said output signal from said signal generating means;

a mid-peak generating means for generating a mid-peak signal based upon an output signal from said positive peak detecting means and an output signal from said negative peak detecting means;

an average signal level detecting means for detecting an average signal level of said output signal from said signal generating means; and

comparing means for comparing said mid-peak signal and said average signal level, and for generating an error signal that is supplied to an input of said signal generating means for maintaining said predetermined duty cycle of said output signal from said signal generating means.

5,315,165
OUTPUT CIRCUIT FOR OUTPUTTING CONTROL SIGNAL TO CONTROLLED APPARATUS

Masahiro Takiguchi, and Masahiro Kamiya, both of Anjyo, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 30, 1992, Ser. No. 921,633

Claims priority, application Japan, Jul. 30, 1991, 3-190155

Int. Cl.^{5} H03K *3/01, 3/42*

U.S. Cl. 307—296.1 **10 Claims**

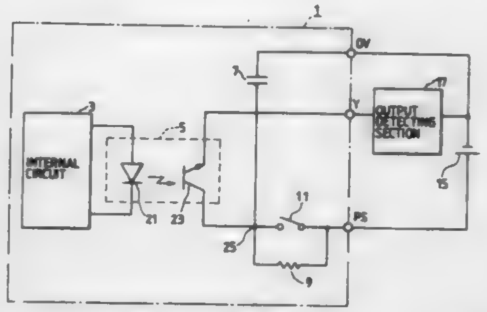
1. An output circuit for outputting a control signal to a controlled apparatus, said controlled apparatus having an output detecting section for detecting said control signal and an external power supply for supplying current to said output detecting section, said output circuit comprising:

transistor means for outputting said control signal to said controlled apparatus;

a capacitor coupled to said external power supply and coupled in parallel to an output detecting circuit comprising said output detecting section and said transistor means coupled in series to each other;

resistor means coupled to said external power supply and coupled in series to a parallel circuit comprising said output detecting circuit and said capacitor, said resistor means having a series resistance with respect to said parallel circuit for restricting instantaneous voltage development across said capacitor when power is initially supplied from said external power supply to prevent turn-on of said transistor means when power is initially supplied from said power supply; and

resistance reducing means coupled in parallel with said resistor means for substantially reducing said series resistance of said resistor means when a voltage across said capacitor increases above a predetermined value which is determined by said capacitor and resistance means.



5,315,166
SUBSTRATE VOLTAGE GENERATOR AND METHOD THEREFOR IN A SEMICONDUCTOR DEVICE HAVING SELECTIVELY ACTIVATED INTERNAL STEPPED-DOWN POWER SUPPLY VOLTAGES

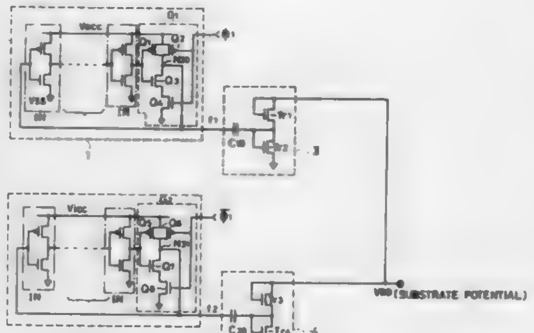
Kazutami Arimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 974,840, Nov. 16, 1992, Pat. No. 5,280,197, which is a continuation of Ser. No. 617,728, Nov. 26, 1990, abandoned. This application Apr. 28, 1993, Ser. No. 53,532

Claims priority, application Japan, Apr. 6, 1990, 2-92546

Int. Cl.^{5} H03K *3/01*

U.S. Cl. 307—296.2 **9 Claims**

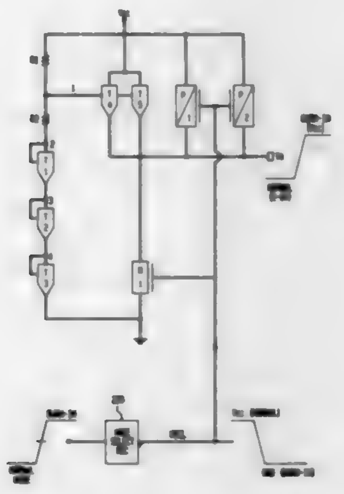


1. A substrate voltage generator in a semiconductor device having a voltage down converter for stepping down an externally applied power supply voltage to a prescribed voltage and generating an internal stepped-down power supply voltage,

said semiconductor device being formed on a semiconductor substrate, said substrate voltage generator comprising:
- first substrate voltage applying means operating with said externally applied power supply voltage as an operation power supply voltage for applying a first bias voltage to said semiconductor substrate;
- second substrate voltage applying means operating with said internal stepped-down power supply voltage as an operation power supply voltage for applying a second bias voltage to said semiconductor substrate;
- substrate potential detecting means for detecting a potential of said semiconductor substrate;
- first selective activation means responsive to an output of said substrate potential detecting means for selectively activating said first and second substrate voltage applying means;
- stable state detecting means for detecting whether said internal stepped-down voltage is in a stable state or not, and
- second selective activation means responsive to an output of said stable state detecting means for selectively activating said first and second substrate voltage applying means.

5,315,167
VOLTAGE BURN-IN SCHEME FOR BICMOS CIRCUITS
Yuen H. Chan, Poughkeepsie; Anthony R. Pelella, Highland Falls, and William R. Reohr, Glenham, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

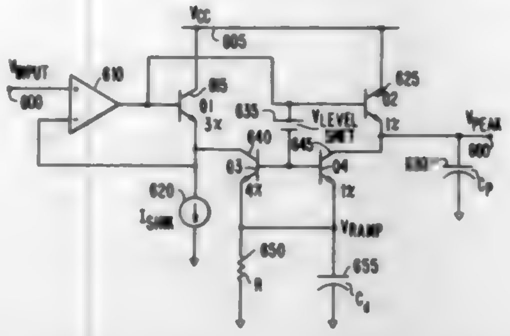
Filed Apr. 9, 1992, Ser. No. 865,591
Int. Cl.⁵ H03K *17/16*
U.S. Cl. 307—296.6 18 Claims



1. A switchable voltage generator circuit including an input voltage supply terminal,
- a voltage regulator having an input thereof connected to said input voltage supply terminal and an output, said voltage regulator including means for stabilizing an output voltage produced thereby, and
- a controllable pull-up means for selectively connecting said input and said output of said voltage regulator said controllable pull-up means including means for turning off said means for stabilizing said output voltage.

5,315,168
PEAK HOLD CIRCUIT WITH IMPROVED LINEARITY
David E. Norton, Jr., Boulder, Colo., assignor to Fujitsu Limited, Kanagawa, Japan

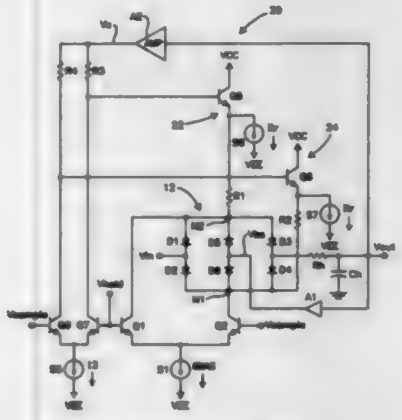
Filed Apr. 28, 1993, Ser. No. 54,035
Int. Cl.⁵ H03K *5/24*
U.S. Cl. 307—351 10 Claims



1. Apparatus for detecting peak values in an input signal, said apparatus comprising:
- operational amplifier means having a first amplifier input for receiving said input signal, a second amplifier input for receiving a feedback signal and an amplifier output for providing an amplified signal;
- first transistor means for receiving said amplified signal and having a first transistor output for providing said feedback signal;
- current sink means coupled to said first transistor output for drawing a current from said first transistor means so that said feedback signal is continually provided from said first transistor means to said second amplifier input;
- peak hold capacitor means for storing a charge representing a peak amplitude of said input signal;
- second transistor means for receiving said amplified signal and for coupling said amplified signal to said peak hold capacitor means; and
- discharge means for discharging said peak hold capacitor means.

5,315,169
POWER-EFFICIENT SAMPLE AND HOLD CIRCUIT USING BIPOLAR TRANSISTORS OF SINGLE CONDUCTIVITY TYPE
Lloyd F. Linder, Agoura Hills; Benjamin Felder, Saugus, and Dwight D. Birdsall, Norwalk, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 8, 1992, Ser. No. 894,990
Int. Cl.⁵ H03K *5/24, 17/74*
U.S. Cl. 307—353 13 Claims

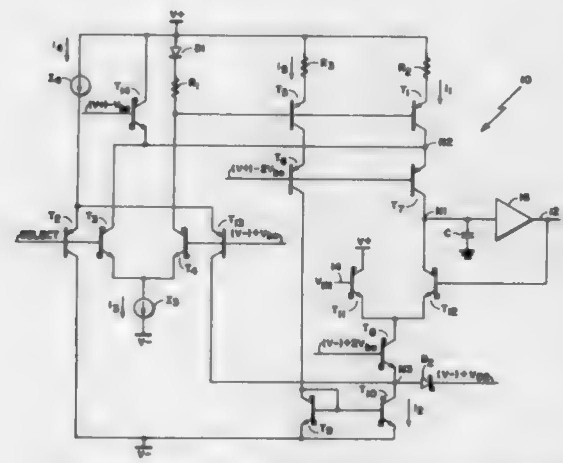


1. A sample and hold circuit, comprising:

voltage holding means;
- diode bridge means including a plurality of diodes for coupling a voltage signal to the holding means for sampling when said diodes are forward biased and uncoupling the voltage signal from the holding means for holding when said diodes are reverse biased, reverse biasing means for reverse biasing the diodes, a first bias current node and a second bias current node;
- first constant current drain means for causing a first predetermined constant bias current to flow out of the bridge means;
- first sampling switch means for connecting the first node to the first current drain means and disconnecting the second node from the first current drain means for forward biasing said diodes;
- first holding switch means for connecting the second node to the first current drain means and disconnecting the first node from the first current drain means for reverse biasing said diodes;
- first voltage-controlled current source means connected to the second node;
- second voltage-controlled current source means connected to the first node;
- bootstrap amplifier means for producing a variable control voltage which is shifted from the voltage signal by a first predetermined offset voltage selected to control the first and second voltage-controlled current source means to cause said first bias current to flow through the first or second voltage-controlled current source means into the bridge means;
- second holding switch means for coupling the control voltage to the first voltage-controlled current source means for forward biasing said diodes and inhibiting the first voltage-controlled current source means for reverse biasing said diodes; and
- second sampling switch means for coupling the control voltage to the second voltage-controlled current source means for reverse biasing said diodes and inhibiting the second current source means for forward biasing said diodes.

5,315,170
TRACK AND HOLD CIRCUIT
Charles L. Vinn, Milpitas, and Peter P. Hang, Sunnyvale, both of Calif., assignors to Raytheon Company, Lexington, Mass.

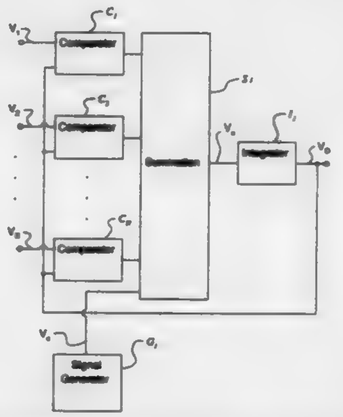
Filed Jun. 23, 1992, Ser. No. 902,603
Int. Cl.⁵ G11C *27/02*
U.S. Cl. 307—353 9 Claims



1. A track and hold circuit for producing an output voltage having a level related to the voltage level of an input voltage during a track mode and for maintaining the level of said output voltage constant during a hold mode, said circuit comprising:
- (a) means for tracking the level of the input voltage during the track mode comprising:
  - (i) a current source producing a current; and
  - (ii) means, including a capacitor, for charging the capacitor with said current or discharging the capacitor, selectively in accordance with the level of the input voltage relative to the level of the output voltage to produce at such capacitor a voltage having a level related to the level of the input voltage during the track mode, the output voltage varying in accordance with the voltage produced at the capacitor; and
- (b) means for switching off said current source and said charging and discharging means in response to a hold mode control signal, said switching means being coupled to a node between said current source and said capacitor to draw residual current from said current source during a transition period as said current source is being turned off.

5,315,171
ANALOG FEEDBACK RANK ORDER FILTER
Michael Blauer, 3589 Lorne Ave #3, Montreal, Quebec, Canada H2X 2A4 , and Martin D. Levine, 306 Strathearn Ave., Montreal West, Quebec, Canada H4X 1Y4

Filed Dec. 23, 1992, Ser. No. 995,819
Int. Cl.⁵ H03K *5/24, 5/153*
U.S. Cl. 307—355 2 Claims



1. An analog feedback rank order filter electronic circuit for receiving a number N of analog input signals ($V_1, V_2, \ldots, V_N$) and reproducing at its output (V_o) the magnitude of that one of said input signals having a magnitude which is K^{th} largest among the magnitudes of said N input signals, K being an adjustable rank parameter number in the range of 1 to N, comprising:
- means for receiving said N analog input signals ($V_1, V_2, \ldots, V_N$);
- N comparator means subcircuits ($C_1, C_2, \ldots, C_N$), each having a first input and a second input and an output and being operable to form at its output a signal having a positive magnitude X whenever the magnitude of its first input is larger than the magnitude of its second input, and a negative magnitude Y whenever the magnitude of its first input is smaller than the magnitude of its second input;
- a summation means subcircuit (S_1) having a number N+1 of inputs and an output and being operable to form at its output a signal whose magnitude is approximately the sum of the magnitudes of its inputs;
- an integrator means subcircuit (I_1) having an input and an output and being operable to form at its output a signal whose magnitude is approximately the integral with respect to time of its input;
- an analog rank signal output being supplied by the output (V_o) of said integrator subcircuit;
- a control signal generator means subcircuit having an output

(V_c) and being operable to form at its output a signal whose magnitude is approximately $(1-K)X+(K-N)Y$, K being said adjustable rank parameter, whereby causing the K^{th} rank order signal to be reproduced at the output (V_o);

said N input signals being each connected to the first input of one and only one of said N comparator subcircuits, the outputs of said N comparator subcircuits and the output (V_c) of said control signal generator being each connected to one and only one of the N+1 inputs of said summation subcircuit, the output of said summation subcircuit being connected to the input of said integrator subcircuit and the output of said integrator subcircuit (V_o) being connected to the second input of each of said N comparator subcircuits.

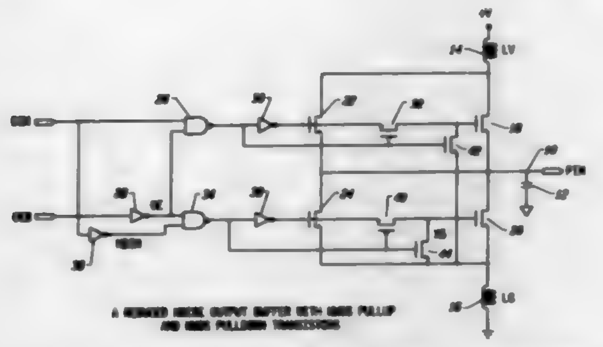
5,315,172
REDUCED NOISE OUTPUT BUFFER

Srinivas T. Reddy, Santa Clara, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Apr. 14, 1992, Ser. No. 860,399

Int. Cl.⁵ H03K *17/16*

U.S. Cl. 307—443 **20 Claims**



1. A buffer circuit for controlling the voltage on an output pin in response to a data input signal (DIN) of high and low voltage levels and an operation enable bar signal (OEB) of high and low voltage levels comprising:

a ground terminal,
a voltage supply terminal,
an output terminal,
first and second N channel FETs serially connected between said ground terminal and said voltage supply terminal and having a common terminal, said common terminal being connected to said output terminal,
third and fourth N channel FETs serially connected between said ground terminal and said voltage supply terminal and having a common terminal, said common terminal being connected to said output terminal, said third and fourth N channel FETs being smaller than said first and second N channel FETs,
first logic means responsive to said DIN signal being at a high voltage level and to said OEB signal being at a low voltage level for applying a conductive bias voltage to said third N channel FET;
second logic means responsive to said DIN signal being at a low voltage level and to said OEB signal being at a low voltage level for applying a conductive bias voltage to said fourth N channel FET,
a first P channel FET having a gate terminal connected to said first logic means coupled and responsive to said conductive bias voltage from said first logic means and coupling said conductive bias voltage on said third N channel FET to said first N channel FET, and a second P channel FET having a gate terminal connected to said second logic means coupled and responsive to said conductive bias voltage from said second logic means and coupling said conductive bias voltage on said fourth N channel FET to said second N channel FET,
said first P channel FET and said second P channel FET being weak conductors and limiting the rate at which conductive bias voltage is applied to said first N channel FET and to said second N channel FET.

5,315,173
DATA BUFFER CIRCUIT WITH DELAY CIRCUIT TO INCREASE THE LENGTH OF A SWITCHING TRANSITION PERIOD DURING DATA SIGNAL INVERSION

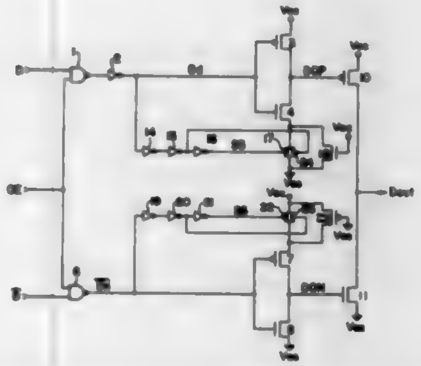
Seung-keun Lee; Choong-keun Kwak, and Chang-rae Kim, all of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi-do

Filed Jun. 15, 1992, Ser. No. 898,535

Claims priority, application Rep. of Korea, Jul. 19, 1991, 91-12384

Int. Cl.⁵ H03K *5/12, 19/0948*

U.S. Cl. 307—443 **14 Claims**



1. A parallel conduction path circuit connected to a fast-switching driving stage to slow down a signal switching transition period defined as the period of a logic state switching operation when an input signal received by the driving stage is inverted so as to transmit from a first steady-state logic level to a second steady-state logic level,

the driving stage including one of a pull-up and a pull-down circuits and being connected to detect a transition of the input signal received at an input node thereof and in response to which said logic state switching operation is initiated,
the parallel conduction path circuit comprising:
  a conducting circuit portion connected to the driving stage and serving as a variable current conduction path thereto, the conducting circuit portion providing maximum current intensity during an initial period of said switching transition period and selectively providing a non-zero current intensity, which is less than the maximum current intensity, a predetermined period of time into the switching transition period; and
  a delay circuit portion, coupled to the input node to receive the input signal simultaneously with the driving stage, said delay circuit portion controlling, in response to the input signal, the conducting circuit portion so as to provide the non-zero current intensity to said driving stage at the predetermined period of time into the switching transition period,
whereby the non-zero current intensity operates to provide a longer switching transition period than if the current intensity had not been reduced from the maximum intensity.

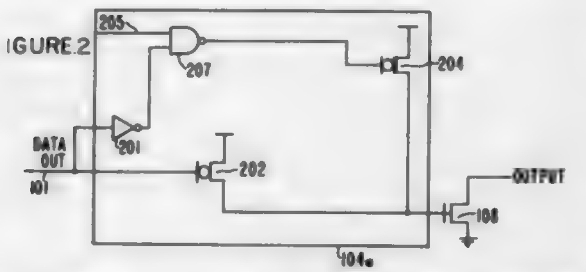
5,315,174
PROGRAMMABLE OUTPUT SLEW RATE CONTROL

Herman M. Chang, Cupertino, and Melvin Chan, Campbell, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 13, 1992, Ser. No. 930,969

Int. Cl.⁵ H03K *19/092, 17/16*

U.S. Cl. 307—443 **11 Claims**



8. An output pull-down pre-driver circuit for receiving an input signal and providing an output signal, the pre-driver circuit for reducing ground bounce at the output signal, the pre-driver circuit being coupled to an output driver transistor, the driver transistor including a gate, the pre-driver circuit comprising:

a first P-type transistor coupled to the gate of the output driver transistor for charging the driver transistor at a first rate responsive to the input signal being at a first logical level;
a second P-type transistor coupled to the gate of the output driver transistor for charging the driver transistor at a second rate responsive to the input signal being at a first logical level;
the first P-type transistor being stronger than the second P-type transistor; and
means for disabling the first P-type transistor responsive to a logic signal being provided thereto, the disabling means further comprising;
means for receiving the logic signal;
means for sensing the logic signal coupled to the receiving means; and
means for providing a disable signal to the first P-type transistor responsive to the sensing of the logic signal.

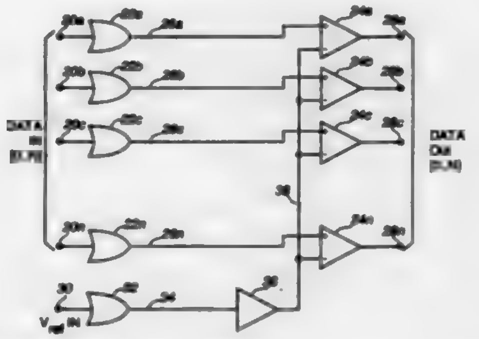
5,315,175
QUASI-DIFFERENTIAL BUS

Paul A. Langner, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 18, 1993, Ser. No. 33,222

Int. Cl.⁵ H03K *14/003*

U.S. Cl. 307—443 **5 Claims**



1. A digital data bus comprising:

a plurality of line drivers, each for accepting a data signal to be transmitted on the bus;
a plurality of data lines, each connected at a first end to the output of a respective one of the line drivers;
a plurality of differential line receivers, each connected via one of its differential inputs to a second end of a respective one of the data lines;
a reference signal line driver having impedance characteristics similar to those of the plurality of line drivers;
a reference signal line connected at a first end to the output of the reference signal line driver; and
a reference signal line receiver having impedance characteristics similar to those of the plurality of line receivers and having an input connected to the second end of the reference signal line and an output connected to each of the plurality of differential line receivers via the other of the differential inputs.

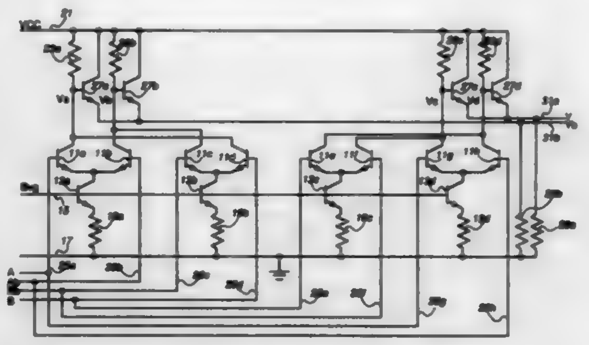
5,315,176
DIFFERENTIAL ECL CIRCUIT

Petre Popescu, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 838,171, Feb. 20, 1992, abandoned. This application Mar. 26, 1993, Ser. No. 111,961

Int. Cl.⁵ H03K *19/086, 17/16*

U.S. Cl. 307—455 **3 Claims**



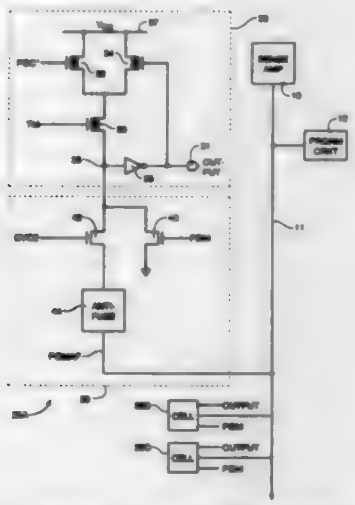
1. A differential ECL circuit comprising:

first, second, third and forth transistor pairs, each comprising first and second transistors whose emitters are connected to each other;
first, second, third and forth constant current sources, each being connected between the connected emitters of each respective transistor pair and a first potential terminal;
four load resistors connected between the first and second transistors' collectors of the first and forth transistor pairs and a second potential terminal;
the first and second transistors' collectors of the second transistor pair being connected to the second and first transistor's collectors of the first transistor pair, respectively;
the first and second transistors' collectors of the third transistor pair being connected to the second and first transistor's collectors of the forth transistor pair, respectively;
means for providing a first differential input signal between the bases of the first and second transistors of the first transistor pair and between the bases of the first and second transistors of the forth transistor pair;
means for providing a second differential input signal between the bases of the second and first transistors of the second transistor pair and between the bases of the first and second transistors of the third transistor pair; and
first, second, third and fourth emitter follower transistors, the emitters of the first and second emitter follower transistors being connected to the first potential terminal through a first emitter resistor, the emitters of the third and forth emitter follower transistors being connected to the first potential terminal through a second emitter resistor, the bases of the first and second emitter follower transistors being connected to the first and second transistors' collectors of the first transistor pair, respectively, and the bases of the third and fourth emitter follower transistors being connected to the first and second transistors' collectors of the fourth transistor pair, respectively,

whereby a differential output signal of an XOR or non-XOR logic based on the first and second differential input signals is provided across the first and second emitter resistors.

5,315,177
ONE TIME PROGRAMMABLE FULLY-TESTABLE PROGRAMMABLE LOGIC DEVICE WITH ZERO POWER AND ANTI-FUSE CELL ARCHITECTURE

Paul S. Zagar, and Kurt P. Douglas, both of Boise, Id., assignors to Micron Semiconductor, Inc., Boise, Id.
Filed Mar. 12, 1993, Ser. No. 30,896
Int. Cl.⁵ H03K *19/173*
U.S. Cl. 307—465 **12 Claims**



1. A programmable logic device, comprising:

a sense amp (10);

a programmable cells (20*a*) connected to the sense amp, having:

a) a half latch circuit (30), wherein the output (31) from the half latch circuit is used to program various portions of the programmable logic device; and

b) a fuse cell circuit (29), coupled to the half latch circuit, for setting the output of the half latch circuit to a high or low signal level.

5,315,178
IC WHICH CAN BE USED AS A PROGRAMMABLE LOGIC CELL ARRAY OR AS A REGISTER FILE

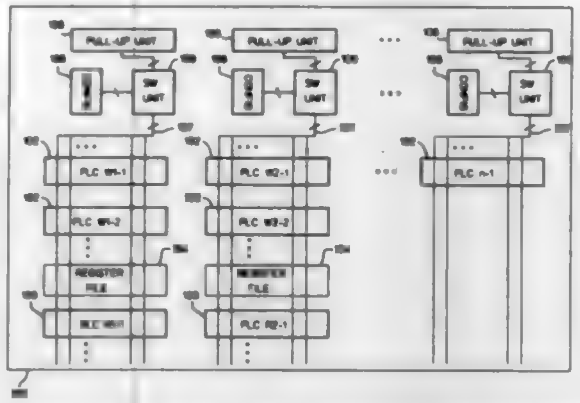
Gregory S. Snider, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 27, 1993, Ser. No. 113,578
Int. Cl.⁵ H03K *17/177, 17/687;* **G11C** *11/407*
U.S. Cl. 307—465 **15 Claims**

1. A programmable logic cell array, comprising:

programmable logic cells, each of the programmable logic cells having more inputs than outputs, and each of said programmable logic cells being capable of performing a logic function; and

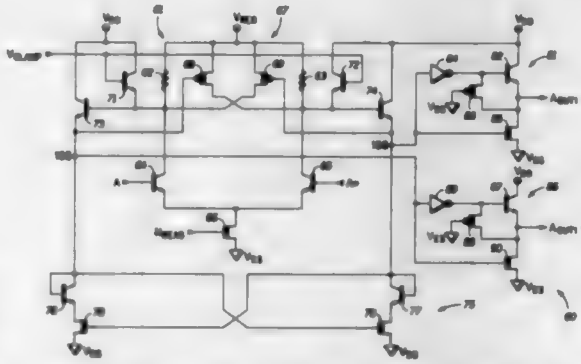
configurable routing resources to connect inputs and outputs of said programmable logic cells,

at least one of said programmable logic cells being configured to implement at least a memory and a multiplexer, wherein, in a normal mode, said memory stores data and said multiplexer selects and outputs the data and, in a backwards mode, said multiplexer operates as a demultiplexer and said memory passes data output by the demultiplexer to the inputs to said programmable logic cell which serve as outputs in the backwards mode.



5,315,179
BICMOS LEVEL CONVERTER CIRCUIT

Perry H. Pelley, III, and Hamed Ghassemi, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 28, 1992, Ser. No. 951,959
Int. Cl.⁵ H03K *19/082, 19/20*
U.S. Cl. 307—475 **14 Claims**



1. A level converter for converting signals operating within a first predetermined voltage level range to a second predetermined voltage level range, the level converter comprising:

a differential amplifier, including first and second resistors and first and second bipolar transistors, for receiving first and second input signals within said first predetermined voltage level range, and in response providing first and second differential signals, said differential amplifier coupled to a first power supply voltage terminal;

a first emitter-follower transistor, coupled to said differential amplifier, for receiving said first differential signal, and in response, providing a third signal within said second predetermined voltage level range;

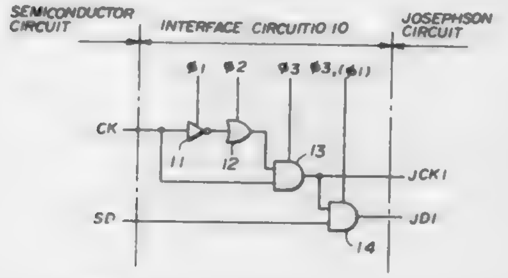
a second emitter-follower transistor, coupled to said differential amplifier, for receiving said second differential signal, and in response, providing a fourth signal within said second predetermined voltage level range; and

cross-coupled half-latch means, coupled to said first and second emitter-follower transistors, for reducing said fourth signal from a high voltage level to a low voltage level within said second predetermined voltage level range in response to a high voltage level being provided by said second emitter-follower transistor, and for reducing said third signal from a high voltage level to a low voltage level within said second predetermined voltage level range in response to a high voltage level being provided by said first emitter-follower transistor; and

cross-coupled pull-up means, coupled between said first power supply voltage terminal and a first current electrode of both of said first and second bipolar transistors, for increasing a voltage more rapidly at said first current electrode of said first bipolar transistor in response to a low voltage level being provided by said second emitter-follower transistor, and for increasing a voltage at said first current electrode of said second bipolar transistor in response to a low voltage level being provided by said first emitter-follower transistor.

5,315,180
SYNCHRONIZING INTERFACE CIRCUIT BETWEEN SEMICONDUCTOR ELEMENT CIRCUIT AND A JOSEPHSON JUNCTION ELEMENT CIRCUIT

Seigo Kotani, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 10, 1993, Ser. No. 15,842
Claims priority, application Japan, Feb. 13, 1992, 4-26949; Feb. 21, 1992, 4-34825
Int. Cl.⁵ H03K *19/00, 19/195*
U.S. Cl. 307—480 **23 Claims**



1. An interface circuit transferring a data signal from a semiconductor element circuit to a Josephson junction element circuit, said interface circuit comprising:

first means for detecting a of a change of a first clock signal supplied from the semiconductor element circuit and for generating a second clock signal in response to said change of a first clock signal;

second means, coupled to said first means, for performing an AND operation on the data signal and the second clock signal and for outputting a result of the AND operation to the Josephson junction element circuit as a second data signal; and

timing adjustment means, coupled to said first means, for adjusting a timing at which the first clock signal is applied to said first means.

5,315,181
CIRCUIT FOR SYNCHRONOUS, GLITCH-FREE CLOCK SWITCHING

Lester Schowe, Longmont, Colo., assignor to Maxtor Corporation, San Jose, Calif.
Filed Jul. 7, 1993, Ser. No. 87,980
Int. Cl.⁵ H03K *19/096, 5/13*
U.S. Cl. 307—480 **3 Claims**

1. A circuit for synchronously selecting either a first or second input clock signal as an output clock signal in response to an asynchronously generated select signal, said circuit comprising:

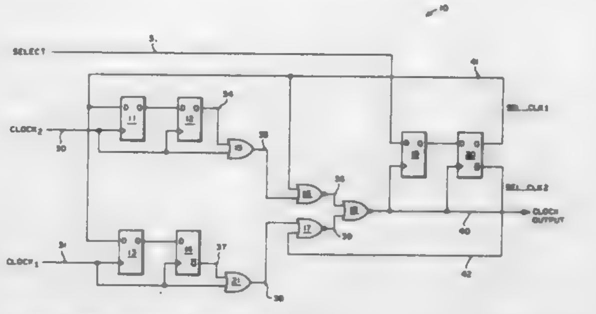
first and second flip-flops coupled in series and clocked by said first clock signal, the data input of said flip-flop being coupled to a first internal control signal;

third and fourth flip-flops coupled in series and clocked by said second clock signal, the data input of said third flip-flop being coupled to said first internal clock signal;

fifth and sixth flip-flops coupled in series and clocked by said output clock signal, the data input of said fifth flip-flop being coupled to receive said select signal, said sixth flip-flop generating said first internal control signal and a second internal control signal;

a first logic gate for gating said first clock signal with an output of said second flip-flop, and a second logic gate for gating said second clock signal with an output of said fourth flip-flop;

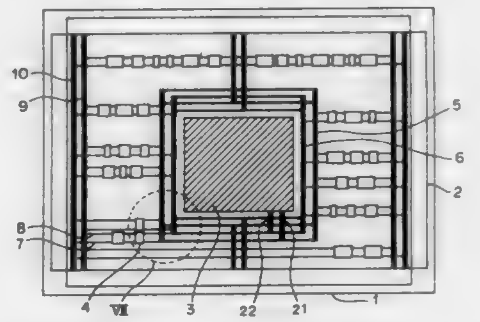
a logic network comprising third, fourth, and fifth logic gates, said third logic gate having first and second inputs coupled to an output of said first logic gate and said first control signal, said fourth logic gate having first and second inputs coupled to an output of said second logic gate and said second control signal, said fifth logic gate having first and second inputs coupled to outputs of said third and fourth logic gates, an output of said fifth logic gate generating said output clock signal;



said logic network selecting either said first or said second clock signal as said output signal in response to said first and second internal control signals, wherein when said select signal transitions from a first logic level to a second logic level, said first and second internal control signals synchronously switch logic state, thereby causing said logic network to hold said output clock signal for a predetermined time before synchronously selecting said second clock signal as said output clock signal, the switching of said output clock signal from said first to said second clock signal occurring without glitching.

5,315,182
SEMICONDUCTOR INTEGRATED CIRCUIT HAVING ANNULAR POWER SUPPLY WITH PLURAL LINES

Kazuhiro Sakashita; Terukazu Yusa; Isao Takimoto; Takeshi Hashizume, and Tatsunori Komoike, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 23, 1992, Ser. No. 918,525
Claims priority, application Japan, Jul. 30, 1991, 3-189103
Int. Cl.⁵ H03K *29/02*
U.S. Cl. 307—482.1 **11 Claims**

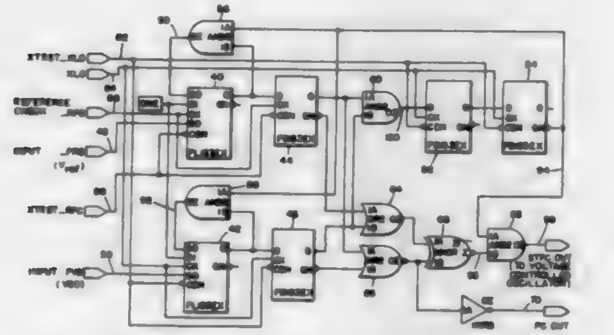


1. A semiconductor integrated circuit device having a plurality of logic circuit blocks of different sizes which are designed in advance on a logical function basis, comprising:

a first logic circuit block provided on a substrate;

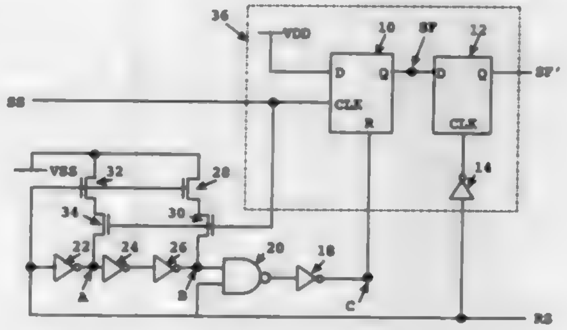
a second logic circuit block being smaller than said first logic circuit block and provided on said substrate;
an annular power supply line including a first power supply line extending in a first direction and a second power supply line extending in a second direction crossing said first direction and connected to said first power supply line, and so provided on said substrate as to surround said first logic circuit block,
said first power supply line including an interconnecting line portion extending in said first direction and divided into a plurality of lines; and
a power supply connecting line so provided on said substrate as to connect said second logic circuit block to said annular power supply line and to extend in said first direction.

5,315,183
SYNCHRONOUS PHASE DETECTOR CIRCUIT
Asko Ruotsalainen, Oulu, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland
Filed Dec. 21, 1992, Ser. No. 993,602
Int. Cl.^{5} H03L *7/00*
U.S. Cl. 307—511 **7 Claims**



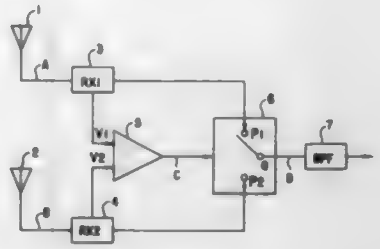
1. A phase detection means for high speed logic circuits that functions in a synchronous mode in response to first and second frequency clock signals comprising:
a voltage controlled oscillator circuit for generating a first frequency clock signal VCO,
a reference signal source for generating a second frequency clock signal V_{ref},
a source of clock signal XLO
a source of clock signal RFC,
an input signal FVD having a frequency that is a submultiple of the frequency of said first frequency clock signal VCO,
an input signal FRD having a frequency that is a submultiple of said second frequency clock signal V_{REF}, and wherein said frequency of said FRD signal is the same as said frequency of said FVD signal;
a phase detector logic circuit including an edge detector circuit responsive to said FRD, FVD, XLO and RFC signals for producing a first output signal upon the occurrence of one of said FRD and RFC or FVD and XLO signal pairs and a second output signal upon the occurrence of the other of said FRD and RFC or FVD and XLO signal pairs,
a correction circuit responsive to said first and second output signals from said edge detector circuit for producing an output pulse signal beginning in response to said first output signal from said edge detector circuit and ending in response to said second output signal from said edge detector circuit, the duration of said signal from said correction circuit being representative of the duration between the occurrence of said FRD and FVD signals
output means connected to said correction circuit and to said voltage controlled oscillator circuit, said output means responsive to and applying said output pulse signal from said correction circuit to said voltage controlled oscillator circuit to adjust the frequency of said voltage controlled oscillator signal VCO until said FRD signal and said FVD signal occur in phase
and a synchronizing means connected to the output of said correction circuit and to said XLO signal for generating a reset signal synchronous with the end of correction pulse from said correction circuit, said reset signal being connected to said edge detector circuit for resetting said edge detector circuit at the end of said correction pulse.

5,315,184
SELF ARBITRATING AUTO RESETTABLE FLAG CIRCUIT
Boubekeur Benhamida, Boise, Id., assignor to Zilog, Inc., Campbell, Calif.
Filed May 4, 1992, Ser. No. 878,201
Int. Cl.^{5} H03K *5/26*
U.S. Cl. 307—518 **20 Claims**



1. A self arbitrating flag setting, reading, and clearing circuit comprising:
a first means for receiving a plurality of inputs including a set flag signal and a read status signal, and generating a control signal in response thereof;
a second means for receiving said control signal, and generating a reset signal in response thereof;
a third means for receiving said set flag signal and said reset signal, and generating a latched output signal in response thereof; and
a fourth means for receiving said latched output signal and said read status signal, and generating a latched flag signal in response thereof.

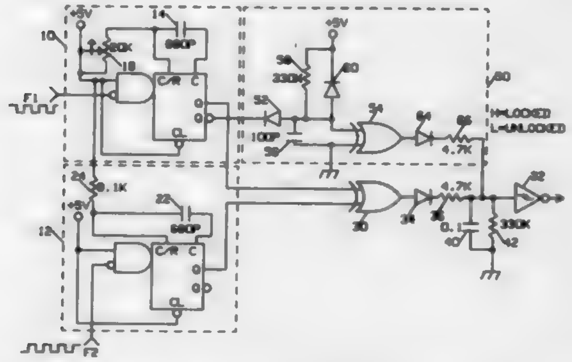
5,315,185
SWITCHING NOISE CANCELLING SYSTEM IN A SPACE DIVERSITY RECEIVING SYSTEM
Imao Usimaru, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 30, 1992, Ser. No. 952,406
Int. Cl.^{5} H04B *15/00*
U.S. Cl. 307—520 **5 Claims**



1. A switching noise cancelling system in a space diversity receiving system, comprising:
a comparator for comparing two receiving signal levels received by two antennas to provide a high level signal or a low level signal in response to the result of the comparison;

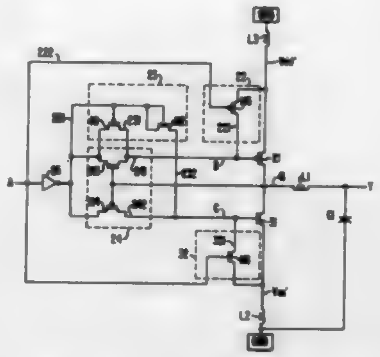
a first switch, operatively connected to the output of said comparator and to said two antennas, for selecting, in response to the output signal of said comparator, one of two signals received by said antennas;
noise generating means, operatively connected to the output of said comparator, for generating noises which are substantially the same as noises generated by said switch; and
noise cancelling means, operatively connected to the outputs of said switch and said noise generating means, for cancelling the noises generated by said first switch by using said noises generated by said noise generating means, wherein said noise generating means comprises a level adjusting unit, operably connected to the output of said comparator, for generating said noises which are substantially the same as the noises generated by said first switch.

5,315,186
FREQUENCY AND PHASE LOCK DETECTOR
Ira Baker, Miami, Fla., assignor to Sony Electronics Inc., Park Ridge, N.J.
Filed Jul. 31, 1992, Ser. No. 923,196
Int. Cl.^{5} H03L *5/26, 7/06*
U.S. Cl. 307—527 **6 Claims**



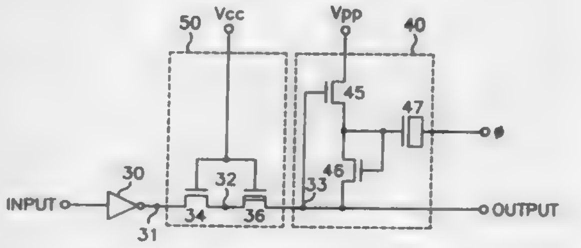
1. An improved frequency and phase lock detection circuit, comprising in combination:
first receiving means for receiving a first signal;
first shaping means including a first one-shot multi-vibrator for shaping said first signal into a first pulse train, wherein said first one-shot multi-vibrator includes means for adjusting a pulse width of pulses of said first pulse train;
second receiving means for receiving a second signal;
second shaping means including a second one-shot multi-vibrator for shaping said second signal into a second pulse train;
detecting means for detecting that one of said first and second signals is being received by one of said first and second receiving means, and for producing a detect signal indicative thereof;
comparing means for detecting that said first and second signals have substantially the same frequency and phase and for producing a compare signal indicative thereof; and
output means, receiving said detect signal and said compare signal and for producing a locked signal in response thereto which indicates that at least one of said first and second signals is being received and that said first and second signals are substantially identical in frequency and phase.

5,315,187
SELF-CONTROLLED OUTPUT STAGE WITH LOW POWER BOUNCING
Chin-Lin Cheng, Taoyuan, Taiwan, assignor to Acer Incorporated, Taipei, Taiwan
Filed Aug. 5, 1992, Ser. No. 925,507
Int. Cl.^{5} H03B *1/04;* H03K *17/16*
U.S. Cl. 307—542.1 **14 Claims**



10. An output stage with low power/ground bouncing characteristics, the output stage having a first MOS transistor and a second MOS transistor connected in cascade, the first MOS transistor having a drain terminal, a source terminal and a gate terminal, the second MOS transistor having a drain terminal, a source terminal and a gate terminal, the drain terminal of the first MOS transistor being coupled to the drain terminal of the second MOS transistor to form an output terminal, comprising:
a first control means for turning off one of the first and second MOS transistors in response to an input signal;
a second control means for making the other of the first and second MOS transistors ready for outputting an output signal at said output terminal in response to the input signal;
a first gate control means for providing a first control signal in response to the input signal;
a second gate control means for providing a second control signal in response to the input signal and the output signal;
a third gate control means for turning on said other MOS transistor partially in response to the first control signal;
a fourth gate control means for turning on said other MOS transistor entirely in response to the second control signal and the output signal;
whereby the ground or power bouncing phenomenon is reduced when the output signal is changing state.

5,315,188
HIGH VOLTAGE SWITCHING CIRCUIT
Woung-Moo Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungku, Rep. of Korea
Filed Nov. 2, 1992, Ser. No. 970,936
Int. Cl.^{5} H03K *3/01, 17/687*
U.S. Cl. 307—574 **6 Claims**



1. A high voltage switching circuit comprising:
a buffer means for buffering an input signal;

a high voltage pumping means for producing a given voltage in response to an output signal of said buffer means; and

a disconnecting means connected between said buffer means and said high voltage pumping means, for disconnecting said buffer means and high voltage pumping circuit when said output signal of said buffer means is a source voltage and said given voltage of said high voltage pumping circuit is a high voltage, said disconnecting means comprising an enhancement transistor and depletion transistor connected in series, gates of said enhancement transistor and said depletion transistor being commonly connected to said source voltage.

5,315,189

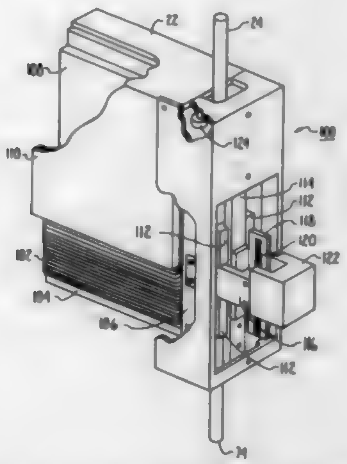
ACTUATOR WITH TRANSLATIONAL AND ROTATIONAL CONTROL

Edward A. Neff, Rancho Santa Fe; John E. Moss, San Bernardino, and Joseph S. Parcels, Irvine, all of Calif., assignors to Systems, Machines, Automation Corporation, Murrieta, Calif.

Continuation-in-part of Ser. No. 996,893, Dec. 28, 1992, which is a continuation-in-part of Ser. No. 765,130, Sep. 25, 1991, Pat. No.

Int. Cl.^{5} H02K *41/00*

U.S. Cl. 310—12 **21 Claims**



1. A device for moving and positioning an assembly component in an automated assembly operation which comprises:

a housing;

means mounted on said housing for creating a magnetic field;

an electrical coil slidably mounted on said housing for carrying a current, said coil being disposed for translational movement within said magnetic field in response to current flow through said coil;

a grip rotatably mounted on said coil for translational movement therewith, said grip being engageable with said component;

a drive motor mounted on said device;

a linkage for connecting said drive motor to said grip;

means electrically connected with said coil for providing said electrical current to move said coil in translation; and

means electrically connected with said drive motor for activating said drive motor to rotate said grip.

5,315,190

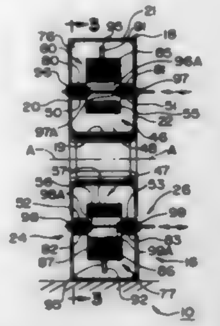
LINEAR ELECTRODYNAMIC MACHINE AND METHOD OF USING SAME

Syed A. Nasar, Lexington, Ky., assignor to Stirling Technology Company, Richland, Wash.

Filed Dec. 22, 1992, Ser. No. 994,986

Int. Cl.^{5} H02H *41/00*

U.S. Cl. 310—12 **17 Claims**



1. A linear electrodynamic machine, comprising:

inner stator means for defining a portion of a closed loop magnetic flux path;

outer stator means for defining another portion of said closed loop magnetic flux path;

magnetic means mounted at said outer stator means for producing magnetic flux extending in the substantially closed loop magnetic flux path to facilitate heat dissipation from said outer means;

winding means having conductor means linking said closed loop magnetic flux path for relative electrodynamic interaction;

said inner stator means and said outer stator means forming at least one pair of aligned spaced apart magnetic poles for defining a gap therebetween forming a portion of said closed loop magnetic flux path;

mover means;

slug means mounted on said mover means for moving reciprocatively along a linear path of travel into and out of said gap to interact with the magnetic flux within said gap so that electrodynamic interaction occurs between said winding means and said magnetic flux.

5,315,191

MINIATURE MOTOR

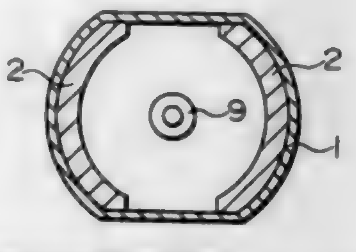
Satoshi Suzuki, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Chiba, Japan

Filed Mar. 25, 1993, Ser. No. 37,000

Claims priority, application Japan, Mar. 31, 1992, 4-075071

Int. Cl.^{5} H02K *21/26*

U.S. Cl. 310—40 MM **7 Claims**



1. A miniature motor comprising:

a housing formed into a bottomed cylindrical shape with an open end, and having an inner circumferential surface;

an end cap positioned on said open end of said housing;

a rotor rotatably supported by bearings positioned in said housing and said end cap;

first and second permanent magnets positioned on substantially opposite sides of said inner circumferential surface of said housing, said first and second magnets having a substantially identical and interchangeable external shape and being C shaped in cross section, said first and second permanent magnets being formed from a colorable rare-earth magnetic plastic material, said first permanent magnet having a higher magnetic force than said second permanent magnet, said higher magnetic force of said first permanent magnet moving said rotor towards said first permanent magnet, said first permanent magnet also containing a coloring material integrated with said colorable rare-earth magnetic plastic material.

5,315,192

THREE-PHASE HYBRID TYPE STEPPING MOTOR

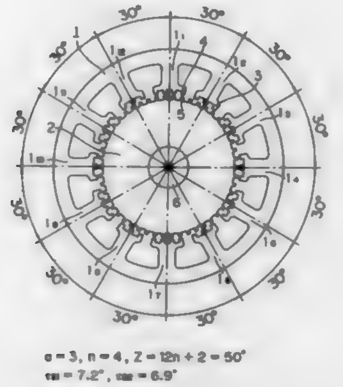
Hirobumi Satomi, Chiba, Japan, assignor to Oriental Motor Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1993, Ser. No. 21,149

Claims priority, application Japan, Feb. 27, 1992, 4-076007

Int. Cl.^{5} H02K *37/02*

U.S. Cl. 310—49 R **2 Claims**



1. A three-phase hybrid type stepping motor including a stator having 12 salient poles disposed radially and a plurality of stator teeth disposed in a surface of each of said salient poles opposite to a rotor characterized in that:

said salient poles of said stator having the number a of stator teeth and those having the number (a+1) of stator teeth are disposed alternately, and a tooth pitch τ_{s1} of the number a of stator teeth and a tooth pitch τ_{s2} of the number (a+1) of stator teeth satisfy the following relation:

$$\tau_{s1} \geqq \tau_{s2}$$

a pitch angle formed by central lines of said salient poles and said stator teeth disposed in said salient poles being an equal pitch of 30 degrees, the number Z_R of rotor teeth being given by

$$Z_R = 12n \pm 2 \text{ or } Z_R = 12n \pm 4$$

where the numbers a and n are integers equal to or larger than 1.

5,315,193

HAND-GUIDED MACHINE TOOL COMPRISING A RADIAL BLOWER

Martin Kummer, Filderstadt; Werner Rieker; Eckerhard Strötgen, both of Waldenbuch, and Eberhard Prahst, Aichwald, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

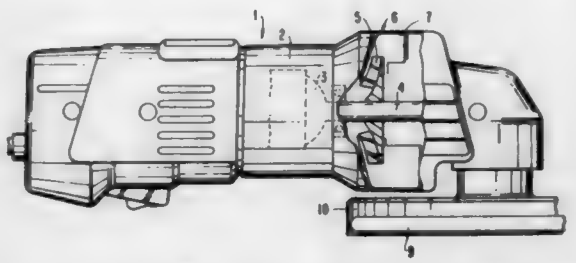
PCT No. PCT/DE90/00972, § 371 Date Jul. 15, 1992, § 102(e) Date Jul. 15, 1992, PCT Pub. No. WO91/11297, PCT Pub. Date Aug. 8, 1991

PCT Filed Dec. 19, 1990, Ser. No. 910,305

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003029

Int. Cl.^{5} H02K *7/14, 9/06*

U.S. Cl. 310—50 **17 Claims**



1. A hand-guidable electric machine tool, comprising a casing having an air guide duct; a tool part; a motor for driving said tool part; and a radial blower for cooing said motor, said radial blower having a fan wheel for forming a static pressure differential, said air guide duct being spirally wound and having an inlet opening and an outlet opening extending both in axial and radial direction and having a cross-section which continuously widens starting from said inlet opening all the way from said inlet opening to said outlet opening, and ending at said outlet opening, said outlet opening is offset in the axial direction at a greater distance from said fan wheel than said inlet opening, a cross-section measured in radial direction of said inlet opening of said air guide duct being smaller than a cross-section of said outlet opening.

5,315,194

ACTUATOR DEVICE FOR AN ELECTRIC WINDOW WINDER

Enzo Brussasco, Turin, and Giuseppe Boero, Candiolo, both of Italy, assignors to Roltra-Morse S.p.A., Cascine Vica-Rivoli, Italy

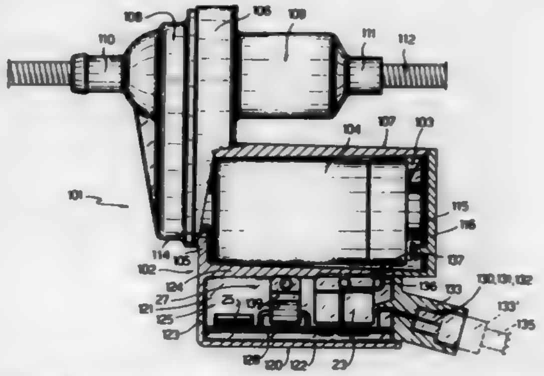
PCT No. PCT/IT90/00019, § 371 Date Sep. 9, 1991, § 102(e) Date Sep. 9, 1991, PCT Pub. No. WO90/10974, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 6, 1990, Ser. No. 752,482

Claims priority, application Italy, Mar. 7, 1989, 52922/89[U]

Int. Cl.^{5} H02K *11/00, 5/04, 9/22;* E05F *11/40*

U.S. Cl. 310—68 R **9 Claims**



1. An actuator device for an electric window winder having

an electric motor and a window displacement actuator element which is displaceable with respect to a frame of the device under action of the electric motor, comprising an electronic unit for drive and control of the electric motor, said electronic unit having active power elements and being housed in a chamber formed by a first portion of said frame, and said electric motor being housed in a chamber formed by a second portion of the frame; wherein said first and second chambers share a common intervening wall; wherein said first portion and said second portion are formed by a single one-piece body part of said frame; and wherein the power components of the electronic unit are in direct thermal contact with said first portion, which is formed of a thermally conductive metal material for the dissipation of heat from said power components, and are connected to said electric motor through an opening in said intervening wall.

5,315,195

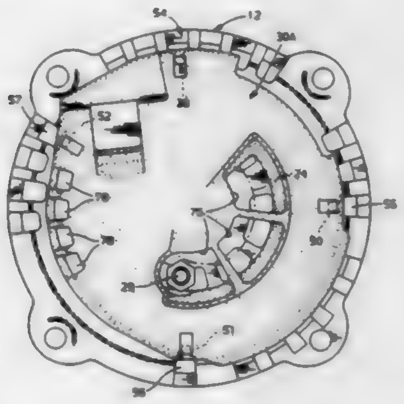
SELF-ATTACHING COVER FOR A DYNAMOELECTRIC MACHINE

Michael D. Bradfield, and Thomas R. Sowash, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1993, Ser. No. 51,744

Int. Cl.⁵ H02K *5/00*

U.S. Cl. 310—89 **6 Claims**



1. In combination, a dynamoelectric machine having an end frame, at least one electrical component supported by said end frame, a plurality of circumferentially spaced openings in said end frame, each of said openings having an edge that is comprised of a first frame surface that is located substantially parallel to a longitudinal axis of said end frame and a second slanted frame surface that is located at an angle to said first frame surface, and a onepiece cover formed of plastic material attached to said end frame to protect said electrical component from external damage, said cover having an end wall and an axially extending side wall, said side wall having an end surface that engages said end frame, said cover having a plurality of circumferentially spaced and axially extending latch arms that respectively project into said openings in said end frame, each said latch arm having a first latch arm surface and a second slanted latch arm surface that intersects said first latch arm surface, said second slanted latch arm surface located at an angle to said first latch arm surface, said second slanted latch arm surfaces respectively directly engaging said second slanted frame surfaces to cause said end surface of said side wall to tightly engage said end frame and to prevent said cover from moving axially with respect to said end frame, said first latch arm surfaces respectively directly engaging said first frame surfaces to radially clamp said cover to said end frame to thereby prevent said cover from moving radially with respect to said end frame.

5,315,196

SHAFT WITH GROOVES FOR DYNAMIC PRESSURE GENERATION AND MOTOR EMPLOYING THE SAME

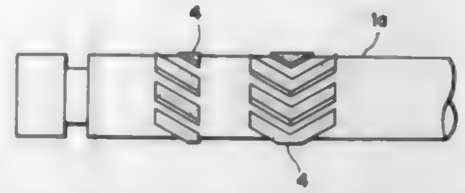
Fumio Yoshida, Toride, and Mikio Nakasugi, Chofu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1992, Ser. No. 924,926

Claims priority, application Japan, Aug. 8, 1991, 3-223371; Aug. 8, 1991, 3-223387

Int. Cl.⁵ H02K *5/16;* **F16C** *32/06*

U.S. Cl. 310—90 **3 Claims**



1. A shaft with grooves for generating dynamic pressure, comprising a shaft core member and a plated layer formed on the shaft core member in areas other than areas of said grooves, said plated layer having a thickness equal to the depth of said grooves and having a roughness substantially the same as a bottom of said grooves, the thickness of said plated layer being at least 5 μm.

5,315,197

ELECTROMAGNETIC THRUST BEARING USING PASSIVE AND ACTIVE MAGNETS, FOR COUPLING A ROTATABLE MEMBER TO A STATIONARY MEMBER

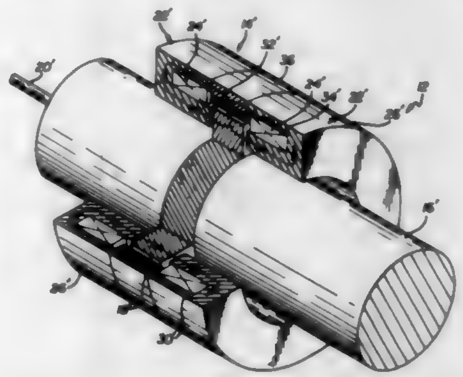
Crawford R. Meeks, Woodland Hills, and Patrick T. McMullen, Los Angeles, both of Calif., assignors to AVCON - Advance Controls Technology, Inc., Agoura Hills, Calif.

Continuation-in-part of Ser. No. 876,586, Apr. 30, 1992, Pat. No. 5,250,865. This application Aug. 16, 1993, Ser. No. 106,927

The portion of the term of this patent subsequent to Oct. 5, 2010, has been disclaimed.

Int. Cl.⁵ H02K *7/09*

U.S. Cl. 310—90.5 **28 Claims**



11. An electromagnetic thrust bearing for axially flux coupling a rotatable member relative to a stationary member, the thrust bearing comprising:

thrust disc means fixed to and extending radially from the rotatable member, the thrust disc means having first and second opposite, axially facing, sides;

first means associated with the stationary member and adjacent to the first side of the thrust disc means, for generating an axially polarized, controllable electromagnetic field;

second means associated with the stationary member and adjacent to the second side of the thrust disc means, for generating an axially polarized, controllable electromagnetic field;

means associated with the stationary member and disposed between the first and second electromagnetic field generating means, for generating a constant flux, high density magnetic field; and

means for directing substantially all magnetic flux from the first and second electromagnetic field generating means and the constant flux magnetic field generating means, axially between the thrust disc means and the stationary member, to provide controlled magnetic flux coupling of the rotatable member to the stationary member.

5,315,198

SYNCHRONOUS MACHINE

Vilmos C. Toroh, C. Miles v, 7, 18134 Lidingo, Sweden

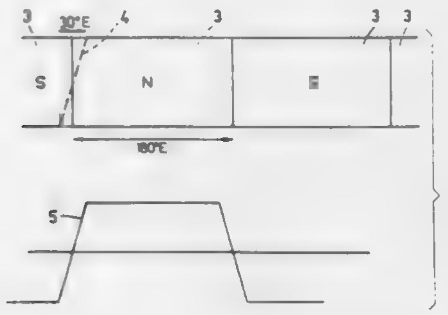
PCT No. PCT/SE91/00293, § 371 Date Dec. 16, 1992, § 102(e) Date Dec. 16, 1992, PCT Pub. No. WO91/16754, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 24, 1991, Ser. No. 958,327

Claims priority, application Sweden, Apr. 24, 1990, 9001473

Int. Cl.⁵ H02K *21/00*

U.S. Cl. 310—162 **11 Claims**



1. A synchronous machine including two relatively movable parts, each having a respective ferromagnetic core and separated by an air-gap, wherein one of said parts is provided with a symmetrical, three-phase Y-connected armature winding intended to have one of a sinusoidal line voltage and a sinewave supply current, and another of said parts is provided with a field magnet system, wherein the armature winding and the field magnet system are constructed so that an air-gap magnetic flux linked with the armature winding has a density whose mean value, as determined over an active length of the air gap in a direction perpendicular to a direction of relative movement of the two relatively movable parts, presents a variation along the air gap in said direction of relative movement in accordance with a uniform periodic function:

$$f(\alpha,\beta),$$

whose positive and negative half-periods are mirror images of each other and whose periods coincide with an extension of two pole pitches of the field magnet system in said direction of relative movement, and which have a form such that within one-half of a positive half period of a function:

$$f(\alpha,\beta)=1 \text{ for } 0\leqq\alpha\leqq\pi/2,$$

and

$$f(\alpha,\beta)=\frac{\cos(\alpha-\beta)-\sin\beta}{1-\sin\beta} \text{ for } \beta<\alpha\leqq\pi/2,$$

where α is the extension along the air gap in said direction of relative movement and varies from 0 to $\pi/2$ over said one-half of said half-period of the function, and β is a constant not greater than about 0.22π.

5,315,199

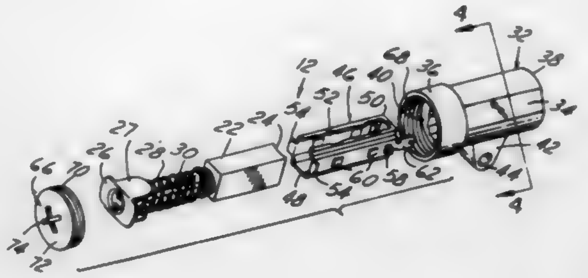
BIDIRECTIONAL BRUSH HOLDER ASSEMBLY

Robert McCracken, Easley, and Ronald C. McCurry, West Union, both of S.C., assignors to Ryobi Motor Products Corp., Easley, S.C.

Filed Apr. 30, 1993, Ser. No. 55,738

Int. Cl.⁵ H02K *13/00*

U.S. Cl. 310—239 **8 Claims**



1. A brush holder assembly adapted for selective cooperation with a plurality of types of motor housings and for holding a brush in contact with a rotatable commutator, the brush holder assembly comprising:

an elongated brush having a generally non-circular cross-section and a generally semi-cylindrical free end shaped to complementarily engage the commutator;

an elongated body having a non-circular inner bore extending along a longitudinal axis and mounting means for selectively mounting the body to a plurality of types of motor housings in at least two different angular orientations relative to the axis of the bore; and

an elongated insert adapted to be selectively received and held within the bore of the body in a plurality of different angular orientations relative to the axis of the bore, the insert defining a non-circular cavity for receiving the brush in a predetermined angular orientation with respect to the cavity;

wherein when the body is mounted to any one of the plurality of types of motor housings, the insert may be angularly aligned within the bore of the body such that the brush can only be placed within the insert with the semi-cylindrical free end of the brush in coaxial alignment with the commutator.

5,315,200

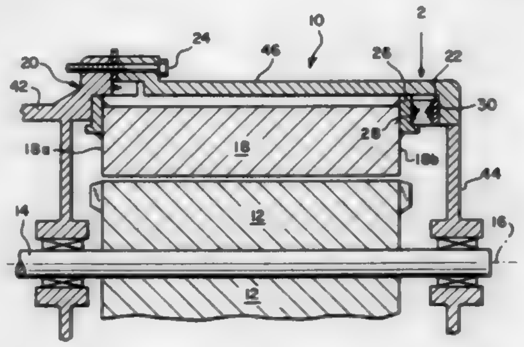
ELECTRICAL MOTOR STATOR INSTALLATION

George E. Lemieux, Livonia, and Rudolf Beim, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 16, 1992, Ser. No. 914,403

Int. Cl.⁵ H02K *1/12, 7/08*

U.S. Cl. 310—258 **20 Claims**



1. A device for securing a stator in a dynamoelectric machine, wherein said dynamoelectric machine includes a support chassis for the stator in spaced relationship to an axis of

rotor rotation and said stator positioned in said support chassis in spaced relationship around said axis, said device comprising:

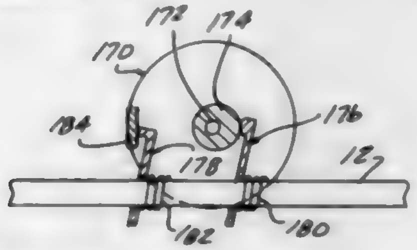
- at least one wave spring disposed on at least one end of said stator between said support chassis for the stator and said stator; and
- means for compressing said wave spring between said support chassis for the stator and said stator;
- whereby said stator is secured in a fixed position in said support chassis for the stator.

5,315,201

Patent Not Issued For This Number

5,315,202
ROTARY ACTUATED LINEAR LATCHING MOTOR

Laurence LaSota, 15645 North Park, Eastpointe, Mich. 48021
Division of Ser. No. 724,595, Jul. 1, 1991, Pat. No. 5,148,067.
This application Sep. 14, 1992, Ser. No. 944,479
The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.
Int. Cl.^{5} H02K *07/06, 33/02, 35/02, 41/02*
U.S. Cl. 310—20 **13 Claims**

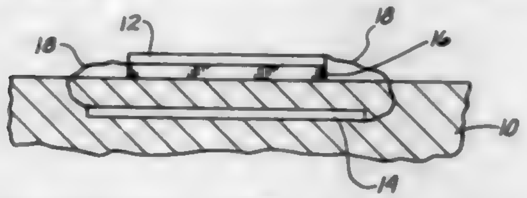


1. A linear motor comprising:

- a linearly movable output member;
- an electric motor having a rotatable output shaft;
- a cam eccentrically mounted on the output shaft and rotatable therewith, the cam providing a rotary drive force to advance the output member;
- mechanical means, selectively engaged with the cam, for engaging the output member during a predetermined angular portion of each single complete rotation of the cam and transmitting the rotary drive force of the cam to the output member to advance the output member a predetermined linear distance during each single rotation of the cam; and
- means, coupled to the output member, for retaining the output member in an incremental advance position without any movement of the output member in a direction opposite from the direction of advance of the output member so that each predetermined linear distance of advance of the output member is accumulative over successive complete rotations of the cam.

5,315,203
APPARATUS FOR PASSIVE DAMPING OF A STRUCTURE

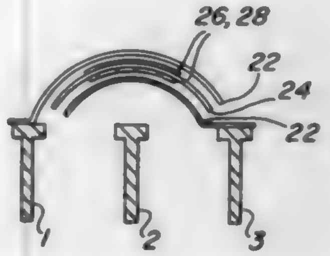
Andrew S. Bicos, Arcadia, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Apr. 7, 1992, Ser. No. 864,557
Int. Cl.^{5} H01L *41/08*
U.S. Cl. 310—326 **18 Claims**



1. An apparatus for controlling the motion of a structural member, comprising a plurality of piezoelectric elements which are physically integrated with said structural member, each of said plurality of piezoelectric elements being electrically connected to another of said piezoelectric elements, said plurality of piezoelectric elements including a driving first piezoelectric element and a constraining second piezoelectric element, said apparatus further including a layer comprised of viscoelastic material which is sandwiched between said structural member and said second piezoelectric element, wherein said second piezoelectric element has a high enough modulus to serve as a substantially stiff constraining layer to the viscoelastic material layer.

5,315,204
PIEZOELECTRIC SNAP ACTION SWITCH

Kyung T. Park, Berwyn, Pa., assignor to The Whitaker Corporation, Wilmington, Del.
Filed Apr. 16, 1990, Ser. No. 509,483
Int. Cl.^{5} H01H *13/26;* **H01L** *41/113*
U.S. Cl. 310—339 **18 Claims**

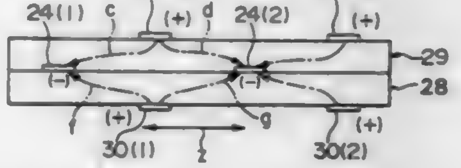


1. A non-contact piezoelectric switch comprising:

- a first snap action plate with a curved surface;
- a second snap action plate with a curved surface;
- a piezoelectric polymer film having respective surfaces disposed between said curved surfaces of said first and second snap action plates;
- first and second conductors which are respectively electrically connected to said first and second snap action plates; and
- a third conductor intermediate of said first and second conductors,
- whereby said first, second and third conductors are brought into electrical contact with each other upon depression of at least one of said snap action plates and said piezoelectric polymer film is extended or contracted along the surface thereof so as to conduct an electrical signal between said first and second snap action plates.

5,315,205
PIEZOELECTRIC VIBRATOR CAPABLE OF RELIABLY PREVENTING DIELECTRIC BREAKDOWN AND A METHOD OF MANUFACTURING THE SAME

Tomeji Ohno; Tetsuo Yoshida, and Yoshiaki Fuda, all of Sendai, Japan, assignors to Tokin Corporation, Miyagi, Japan
Filed Sep. 17, 1992, Ser. No. 946,946
Claims priority, application Japan, Sep. 25, 1991, 3-271913; Nov. 5, 1991, 3-288489; Feb. 12, 1992, 4-025093
Int. Cl.^{5} H01L *41/04*
U.S. Cl. 310—357 **7 Claims**



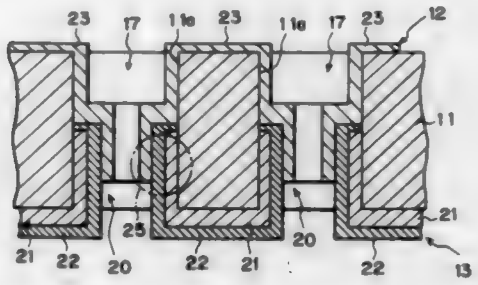
2. A piezoelectric vibrator comprising:

- a first piezoelectric sheet having a first upper and a first lower surface,

- a second piezoelectric sheet having a second upper and a second lower surface, said second piezoelectric sheet being piled on said first piezoelectric sheet with said first upper surface of said first piezoelectric sheet placed adjacent to said second lower surface of said second piezoelectric sheet,
- a plurality of elongated electrodes consisting essentially of:
  - a plurality of parallel first-set elongated electrodes on said first upper surface
  - a plurality of second-set elongated electrodes on said second upper surface in parallel with said first-set elongated electrodes, each of said second-set elongated electrodes arranged halfway between two adjacent ones of said first-set elongated electrodes, and
  - a plurality of third-set elongated electrodes on said first lower surface in parallel with said first-set elongated electrodes, each of said third-set elongated electrodes being arranged halfway between two adjacent ones of said first-set elongated electrodes,
- said first piezoelectric sheet being polarized in a direction from each of said third-set elongated electrodes to said two adjacent ones of said first-set elongated electrodes, and said second piezoelectric sheet being polarized in a direction from each of said second-set elongated electrodes to said two adjacent ones of said first-set elongated electrodes.

5,315,206
ELECTRON EMISSION ELEMENTS INTEGRATED SUBSTRATE

Yoshihiro Yoshida, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 13, 1992, Ser. No. 837,635
Claims priority, application Japan, Feb. 20, 1991, 3-026042
Int. Cl.^{5} H01J *1/30*
U.S. Cl. 313—306 **22 Claims**



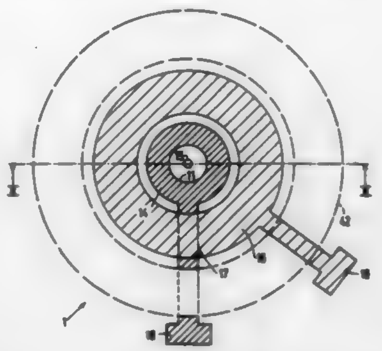
1. An electron emission elements integrated substrate comprising:

- a film having a plurality of minute holes formed therein, each hole extending in a direction of thickness of said substrate; and
- an electron emission element arranged in said each hole, said element comprising a first electrode, a second electrode and an insulating member disposed between said first and second electrodes.

5,315,207
DEVICE FOR GENERATING ELECTRONS, AND DISPLAY DEVICE

Arthur M. E. Hoeberechts; Nicolaas Lambert, and Gerardus G. P. Van Gorkom, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 4, 1990, Ser. No. 505,308
Claims priority, application Netherlands, Apr. 28, 1989, 8901075
Int. Cl.^{5} H01J *29/04*
U.S. Cl. 313—444 **13 Claims**

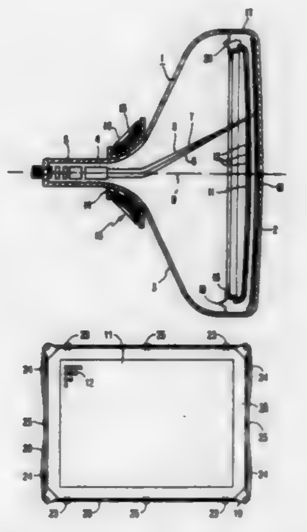
1. A device for producing an electron beam comprising a substrate supporting an insulating layer having an aperture, emission means for emitting electrons through the aperture, and beam forming means for producing an electron lens for forming the emitted electrons into said electron beam, characterized in that said beam forming means comprises:



- a. a first planar electrode substantially surrounding the aperture where the emitted electrons exit said aperture; and
- b. a second planar electrode substantially surrounding the first planar electrode.

5,315,208
COLOR DISPLAY TUBE WITH VIBRATION DAMPING IN A SUPPORTING FRAME CONNECTED TO A SHADOW MASK

Antonius J. J. M. van der Bolt; Wilhelmus M. M. van der Steen, and Martinus C. M. Verhoeven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 125,916, Nov. 27, 1987, abandoned.
This application Feb. 14, 1989, Ser. No. 310,493
Claims priority, application Netherlands, Dec. 1, 1986, 8603055
Int. Cl.^{5} H01J *29/81*
U.S. Cl. 313—407 **2 Claims**



1. A color display tube comprising an envelope having a substantially rectangular display window comprising an upright edge extending around the periphery of the display window, a substantially rectangular shadow mask comprising a large number of apertures and a skirt, a substantially rectangular supporting frame to which the skirt of the shadow mask is connected, and suspension means for suspending the supporting frame in the corners of the upright edge, characterized in that, at least near the ends of two oppositely located sides of the supporting frame, the skirt is welded to said supporting frame, and near the ends of the other two adjacent sides of the supporting frame the skirt engages said supporting frame in a weld-free frictional manner by means of a resilient element,

this arrangement causing an assymmetrical load at the corners of the supporting frame, resulting in very effective damping of vibrations.

5,315,209
COLOR CATHODE RAY TUBE WITH SELECTIVE LIGHT ABSORPTION FILM

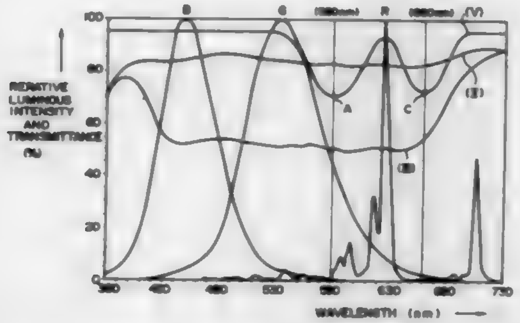
Yasuo Iwasaki, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 762,473, Sep. 19, 1991, abandoned. This application Mar. 5, 1993, Ser. No. 42,908

Claims priority, application Japan, Sep. 27, 1990, 2-259685

Int. Cl.^{5} H01J *29/88*

U.S. Cl. 313—478 **7 Claims**



1. A color cathode ray tube comprising:

a face plate including,

a blue fluorescent element of a sulfide family disposed on an inner surface for emitting a blue-colored light when an electron beam impinges the blue fluorescent element,

a green fluorescent element of a sulfide family disposed on an inner surface for emitting a green-colored light when an electron beam impinges the green fluorescent element, and

a red fluorescent element of a rare earth metals family disposed on an inner surface for emitting a red-colored light with an emission spectrum thereof being linear when an electron beam impinges the red fluorescent element; and

a selective light absorption film formed on an external surface of said face plate by applying a selective light absorption liquid onto said external surface;

said liquid consisting of a transparent base coating formed of a material from a silica family and a colored compound mixed into said base coating;

said selective light absorption film having optical characteristics including a main absorbing band and an auxiliary absorbing band, an absorption peak of said main absorbing band being in a first wavelength region between a main spectral wavelength of the emitted green-colored light and a main spectral wavelength of the emitted red-colored light, and an absorption peak of said auxiliary absorbing band being in a second wavelength region having wavelengths, said wavelengths of said second wavelength region being longer than that of a main spectral wavelength of the emitted red-colored light.

5,315,210
KLYSTRON RESONANT CAVITY OPERATING IN TM_{01x} MODE, WHERE X IS GREATER THAN ZERO

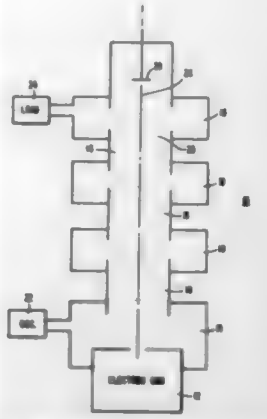
Erling L. Lien, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 12, 1992, Ser. No. 882,141

Int. Cl.^{5} H01J *25/00*

U.S. Cl. 315—5.39 **31 Claims**

1. A super-power, high voltage klystron tube comprising an electron gun for emitting an electron beam, an input cavity coupled to the beam, a drift region downstream of the input cavity through which the beam travels, an output cavity downstream of the drift region coupled to the beam, intermediate resonant cavity means between the input and output cavities, a collector for the electron beam downstream of the output cavity, the output cavity being configured relative to the frequency of oscillations induced in the beam so the cavity operates in the TM_{01x} mode, where x is greater zero.



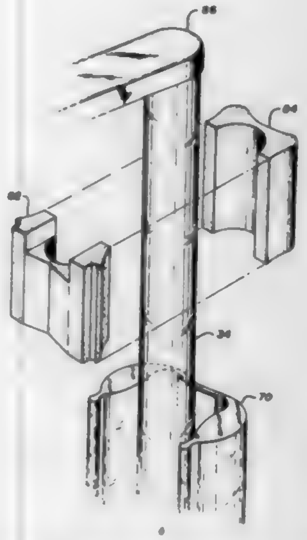
5,315,211
INSULATOR FOR FLUORESCENT LAMP

Claes Ditlevsen, Silkeborg, Denmark; Dusan P. Pope, Santa Clarita, Calif.; Artak Ter-Oganesian, Glendale, Calif., and Gary F. Paugh, Long Beach, Calif., assignors to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Filed May 29, 1992, Ser. No. 887,790

Int. Cl.^{5} H01J *61/52*

U.S. Cl. 315—50 **13 Claims**



1. An insulator for a fluorescent lamp comprising:

an insulator material placed over at least one end of a fluorescent lamp having an electrode/filament to prevent loss of heat generated by the fluorescent lamp; and

wherein said insulator extends from the end of said fluorescent lamp towards the center thereof to a point slightly past the location of the electrode/filament within the fluorescent lamp.

5,315,212
PLASMA PROCESSING APPARATUS FOR GENERATING UNIFORM STRIP-SHAPED PLASMA BY PROPAGATING MICROWAVE THROUGH RECTANGULAR SLIT

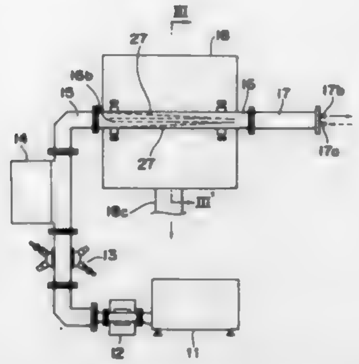
Akira Ishii, Amagasaki; Syoichiro Minomo, Takatsuki; Michio Taniguchi, Kobe, and Masato Sugiyo, Izumi, all of Japan, assignors to Daihen Corporation, Japan

Filed Feb. 12, 1993, Ser. No. 8,729

Claims priority, application Japan, Mar. 30, 1992, 4-105679; Aug. 28, 1992, 4-253666

Int. Cl.^{5} H01J *7/24*

U.S. Cl. 315—111.51 **29 Claims**



1. A plasma processing apparatus comprising:

a plasma chamber having a strip-shaped rectangular window having a longitudinal length formed in a side wall of said plasma chamber, within which an object to be processed is provided so as to be close to said window;

a coupling rectangular waveguide having a strip-shaped rectangular slit formed in an E-plane thereof so as to extend in a direction of an axis thereof, said coupling rectangular waveguide being provided so that the direction of the axis of said coupling rectangular waveguide is parallel to the longitudinal direction of said window of said plasma chamber;

a coupling member, mounted between said slit of said coupling rectangular waveguide and said window of said plasma chamber, for electromagnetically coupling said slit with said window in an airtight state, said coupling member being made of a material for propagating a microwave; and

microwave generating means, connected to said coupling rectangular waveguide, for generating and supplying a microwave into said coupling rectangular waveguide, thereby propagating the microwave through said slit of said coupling rectangular waveguide, said coupling member and said window of said plasma chamber into said plasma chamber.

5,315,213
STRUCTURE AND DRIVING METHOD OF A PLASMA DISPLAY PANEL

Dae-il Kim, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyungki, Rep. of Korea

Filed Nov. 3, 1992, Ser. No. 970,832

Claims priority, application Rep. of Korea, Nov. 4, 1991, 91-19532

Int. Cl.^{5} G09G *3/10*

U.S. Cl. 315—169.1 **18 Claims**

1. A plasma display panel comprising:

front and backing plates;

a plurality of barriers spaced from one another and arranged in a striped form on said front plate;

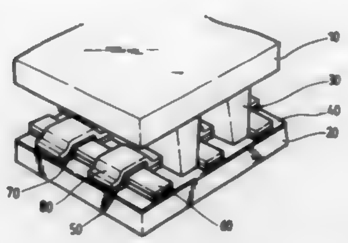
a sustaining electrode entirely covering a surface of said backing plate;

a plurality of first insulating layers disposed on said sustaining electrode in a matrix form;

a plurality of first electrodes disposed on said first insulating layers in a striped form, parallel to said plurality of barriers, and contacting said first insulating layers;

a plurality of second insulating layers spaced apart at a certain interval and disposed on said first electrodes in a striped form, perpendicular to said plurality of barriers; and

a plurality of second electrodes disposed on and contacting said second insulating layers.



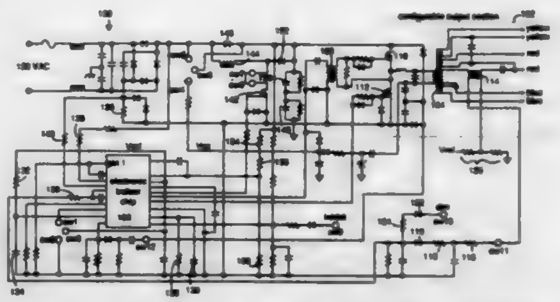
5,315,214
DIMMABLE HIGH POWER FACTOR HIGH-EFFICIENCY ELECTRONIC BALLAST CONTROLLER INTEGRATED CIRCUIT WITH AUTOMATIC AMBIENT OVER-TEMPERATURE SHUTDOWN

Ronald A. Lesea, Redwood City, Calif., assignor to Metcal, Inc., Menlo park, Calif.

Filed Jun. 10, 1992, Ser. No. 896,152

Int. Cl.^{5} H05B *37/02*

U.S. Cl. 315—209 R **16 Claims**



1. An integrated circuit (IC) for controlling a power factor correction (PFC) transistor and driving a pair of ballast transistors connected to a load network including a gaseous discharge lamp operable at a first frequency to cause filament heating in said gaseous discharge lamp and at a second frequency to generate ionizing voltages in said gaseous discharge lamp, the IC comprising:

a power supply voltage sampling input connected to receive a sample voltage V_{ac} that represents the magnitude of voltage being delivered from a power supply source;

a power supply current sampling input connected to receive a sample current i_{ac} that represents the magnitude of current being delivered from said power supply source;

a power factor correction circuit connected to the supply voltage sampling input and supply current sampling input and having a multiplier providing for an output of a product of a sample of a load voltage V_{dc} and said i_{ac} and a comparator for outputting a signal representing a difference between said product and said voltage V_{ac};

a power factor correction output drive connected to the gate of said PFC transistor whose drain is connected to a boost inductor which is placed between said power supply source and said load network and which is responsive to said difference signal received from the power factor correction circuit;

at least one ballast transistor output drive each providing for a connection to a ballast transistor in said load network and having an output signal at said first and second frequencies and a modulated frequency for controlling a level of current flowing through said load network; and

a timing circuit connected to alternate said output signal exclusively between said first and second frequencies and having an input control to adjust the duration of time said first operating frequency is initially engaged before proceeding to said second operating frequency, wherein a time sufficient to promote filament heating will elapse before and during an application of a high voltage for starting and maximizing the operating life of said gaseous discharge lamp.

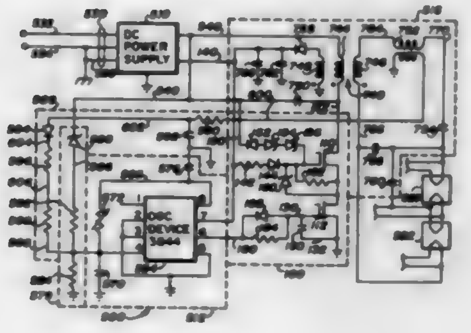
5,315,215
HIGH-VOLTAGE SWITCHING CIRCUIT

Ronald A. Lesea, Redwood City, Calif., assignor to METCAL, Inc., Menlo Park, Calif.

Filed Apr. 27, 1993, Ser. No. 53,141

Int. Cl.^{5} H05B *37/02*

U.S. Cl. 315—219 **9 Claims**



1. A switching circuit (**100**; **200**) comprising, in combination:

a first line (**132**);

a second line (**140**);

a third line (**150**);

means for developing a first DC power supply voltage between said second (**140**) and said first (**132**) lines, said first DC power supply voltage having a magnitude of a predetermined level;

means for developing a second DC power supply voltage between said third (**150**) and said first (**132**) lines, said second DC power supply voltage having a predetermined level of a magnitude greater than the magnitude of said first DC power supply voltage level;

a first transistor (**110**) having a gate, drain means and source means;

a second transistor (**112**) having a gate, drain means connected to said first transistor source means, and source means connected to said first line (**132**);

first coupling means (**140** and **144**) including a first diode (**144**) coupling said first transistor (**110**) gate to said second line (**140**);

second coupling means (**152**, **154** and **156**) including a series combination of at least a second diode (**152**) and first zener diode means (**154** and **156**) coupling said first transistor (**110**) gate to said third line (**150**);

accumulated charge discharging means (**160** and **162**) connected between said gate of the first transistor (**110**) and said source means of the first transistor (**110**);

load means (**170**) connected to both said drain means of the first transistor (**110**) and to said third line (**150**).

5,315,216
TELEVISION PICTURE DISPLAY DEVICE AND CIRCUIT FOR HORIZONTAL DEFLECTION IN SUCH A TELEVISION PICTURE DISPLAY DEVICE

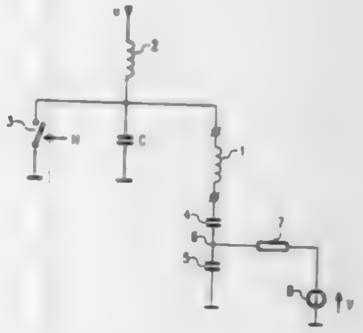
Floris B. Van Den Herik, Oosterhout, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 17, 1992, Ser. No. 991,819

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1991, 4142651

Int. Cl.^{5} G09G *1/04*

U.S. Cl. 315—370 **4 Claims**



1. A circuit for horizontal deflection in television picture display devices, said circuit including at least a horizontal deflection coil and a capacitor arranged in series with the horizontal deflection coil for correcting a tangential error in a display of a television picture display device by means of an S-shaped distortion of a deflection current applied to the horizontal deflection coil, characterized in that said capacitor comprises a series arrangement of two sub-capacitors of corresponding capacitance, at least the sub-capacitor which is not directly connected to the horizontal deflection coil having a dielectric which is dependent on an applied direct voltage, and in that said circuit further comprises means for applying a variable direct current to a junction point of said two sub-capacitors.

5,315,217

Patent Not Issued For This Number

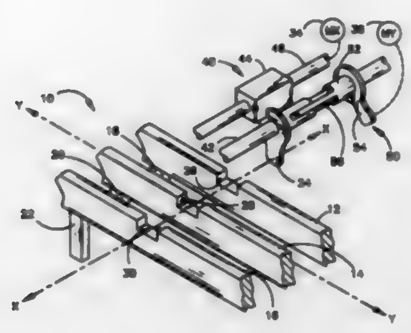
5,315,218
MOTOR CONTROLS

Glenn C. Fortune, Farmington Hills, and William L. Kelledes, Brighton, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 8, 1993, Ser. No. 27,836

Int. Cl.^{5} H02P *5/46*

U.S. Cl. 318—54 **8 Claims**



1. An electrically actuated shifting mechanism for controlling the shifting of gear in a transmission of the type having a shift member which is movable to select one shift rail of a plurality of shift rails and is movable to move the selected one of the shift rails to effect a shifting of gears, said mechanism comprising first reversible electric motor means for moving the shift member between a plurality of positions in each of which the shift member is aligned with a different shift rail of the plurality of shift rails, second reversible electric motor means for moving the shift member and a shift rail with which the shift member is aligned in either one of two directions to move a clutch element relative to the gears, and motor control means for effecting one-at-a-time operation of said first and second electric motor means, said motor control means including a plurality of switch elements each of which is operable between conducting and nonconducting conditions, said plurality of groups, a first one of said switch elements in a first group of switch elements and a first one of said switch elements in a second group of switch elements being operable to conduct electrical energy for energizing said first electric motor means to operates in a first direction to move the shift member in one direction relative to the plurality of shift rails with said second electric motor means de-energized, a second one of said switch elements in said first group of switch elements and a second of said switch elements in said second group of switch elements being operable to conduct electrical energy for energizing said first electric motor means to operate in a second direction opposite to said first direction to move the shift member in a direction opposite to the one direction relative to the plurality of shift rails with said second electric motor means de-energized, said first one of said switch elements in said second group of switch elements and a first one of said switch elements in a third group of switch elements being operable to conduct electrical energy for energizing said second electric motor means to operate in a first direction to move the shift member and a shift rail in one direction with said first electric motor means de-energized, said second one of said switch elements in said second group of switch elements and a second one of said switch elements in said third group of switch elements being operable to conduct electrical energy for energizing said second electric motor means to operate in a second direction opposite to said first direction to move the shift member and a shift rail in a direction opposite to the direction of movement of the shift member and shift rail with said first electric motor means de-energized.

5,315,219
DRIVING CIRCUIT FOR DIRECT-CURRENT (DC) MOTOR

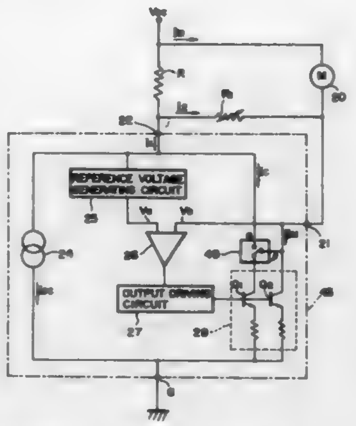
Jun Kishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1993, Ser. No. 23,101

Claims priority, application Japan, Feb. 26, 1992, 4-039814

Int. Cl.^{5} H02P *5/168*

U.S. Cl. 318—254 **4 Claims**



1. A motor driving circuit comprising:

a reference voltage generating circuit for outputting an output voltage of a value derived from addition of a reference voltage and a voltage proportional to a value of a current flowing to a motor;

a comparator circuit which receives at a first input terminal the output voltage from said reference voltage generating circuit and at a second input terminal a motor driving output voltage;

an output driving circuit for amplifying an output from said comparator circuit;

a symmetric current circuit having a first and a second output terminal, for amplifying an output from said output driving circuit and outputting said motor driving output voltage through said second output terminal; and

a switching circuit in which, during normal state of operation, the first output terminal of said symmetric current circuit is caused to be connected to an input terminal of said reference voltage generating circuit, and during specific state of operation, the first output terminal of said symmetric current circuit is caused to be connected to the second input terminal of said comparator circuit.

5,315,220
MEMORY METHOD OF DOOR OPENING AND SHUTTING STROKE VALUE IN AUTOMATIC DOOR

Akiyoshi Takimoto; Tamotsu Tanaka, and Yukio Yoshida, all of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 24, 1992, Ser. No. 903,483

Claims priority, application Japan, Jun. 26, 1991, 3-180591

Int. Cl.^{5} E05F *15/00;* **H02P** *3/20*

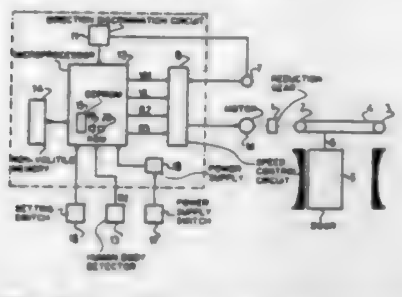
U.S. Cl. 318—282 **1 Claim**

1. A method for controlling a door opening and shutting operation of an automatic door apparatus including steps of, memorizing a door opening and shutting stroke value measured at a setting time of the automatic door in a non-volatile memory, and reading out the door opening and shutting stroke value memorized in a memory for the door stroke value of a micro-computer 12 after power is supplied,

a memory method for memorizing the door opening and shutting stroke value of said automatic door comprising the steps of:

opening and shutting a door at a low speed to measure the door stroke value when the door opening and shutting stroke value is not memorized in said non-volatile memory each time the power is supplied to the automatic door apparatus;

memorizing the door stroke value in said memory for the door stroke value of said micro-computer as the door opening and shutting stroke value;



calculating the shut side and open side door stroke values in opening and shutting said door at a low speed to measure the door stroke value; and

determining the measured stroke value as the door stroke value when both stroke values are about equal to each other.

5,315,221

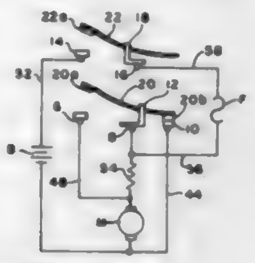
MOTOR CONTROL WITH CONTACT WELD SENSOR AND INTERRUPTER

Lawrence C. Corey, Smithfield, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 16, 1992, Ser. No. 976,865

Int. Cl.^{5} H02K *17/32*

U.S. Cl. 318—434 **11 Claims**



1. A motor control comprising:

an electric power source;

a motor;

current responsive circuit interrupter means in circuit with said source and said motor;

first switch means operable between closed and open conditions for selectively connecting and disconnecting, respectively, said motor to said source;

second switch means operable substantially coincidentally with operation from said closed condition to said open condition of said first switch means for connecting a shunt path around said motor in the event said first switch means remains in said closed condition when operated toward said open condition;

said circuit interrupter means being operable in response to increased current upon establishment of said shunt path for disconnecting said motor from said source.

5,315,222

CONTROL APPARATUS FOR INDUSTRIAL ROBOT

Fumio Kasagami, Ikoma, and Akinobu Izawa, Osaka, both of Japan, assignors to Daihen Corporation, Osaka, Japan

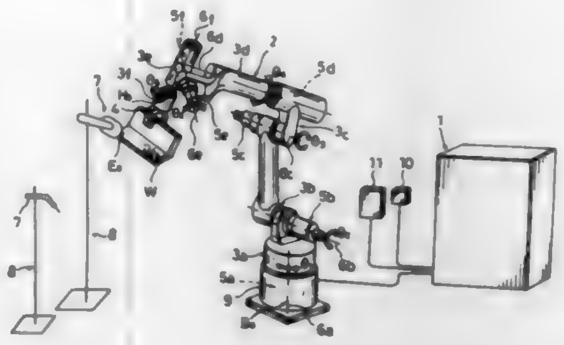
Filed Jun. 28, 1993, Ser. No. 82,728

Claims priority, application Japan, Jul. 3, 1992, 4-200232

Int. Cl.^{5} G05B *19/42*

U.S. Cl. 318—568.11 **6 Claims**

1. A control apparatus for an articulated industrial robot which holds a workpiece for movement relative to at least one fixed tool, the robot having a base reference point and a mechanical interface point, the tool having a tool tip, the workpiece having a workpiece reference point, the control apparatus comprising:



setting data input means for entering setting data which include a positional and attitudinal relation Et of the tool tip relative to the robot base reference point as well as a positional and attitudinal relation Ew of the workpiece reference point relative to the robot mechanical reference point;

means for determining a positional and attitudinal relation T of the robot mechanical interface point relative to the robot base reference point;

means for supplying a positional and attitudinal relation wXt_j of the tool tip relative to the workpiece reference point and for supplying a translation speed v_j of the workpiece relative to the tool;

task programming means for preparing and storing a task program which includes a plurality of teaching data corresponding to teaching points, each of the teaching data containing at least the relation wXt_j and the translational speed v_j;

teaching data extraction means for successively taking out the teaching data from the task program;

trajectory planning means for planning a trajectory of the workpiece relative to the tool in accordance with the teaching data taken out by the teaching data extraction means;

interpolation means for interpolating the trajectory between each two successive teaching points; and

instruction means for causing the robot to move the workpiece along the interpolated trajectory.

5,315,223

Patent Not Issued For This Number

5,315,224

METHOD AND AN ARRANGEMENT FOR STARTING AN ELECTRICAL MACHINE HAVING VARYING RELUCTANCE

Per Zellman, Stockholm, Sweden, assignor to Emotron Aktiebolag, Helsingborg, Sweden

PCT No. PCT/SE90/00875, § 371 Date Jul. 23, 1992, § 102(e) Date Jul. 23, 1992, PCT Pub. No. WO91/10281, PCT Pub. Date Jul. 11, 1991

PCT Filed Dec. 27, 1990, Ser. No. 866,175

Claims priority, application Sweden, Dec. 27, 1989, 8904370-7; Jun. 21, 1990, 9002217-9

Int. Cl.^{5} H02P *8/00*

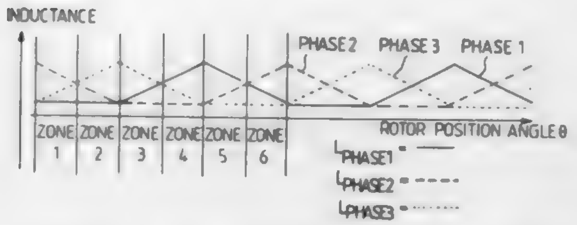
U.S. Cl. 318—701 **9 Claims**

1. A method for starting an electric variable reluctance machine of a kind having three or more phase circuits (Phase 1, Phase 2, Phase 3, F1, F2, F3) with varying reluctance in dependence on the position of a movable part, made of soft magnetic material, in relation to a stationary part of the machine,

the method comprising the steps of:

dividing a reluctance cycle of the machine into a number of rotor position angular zones (zone 1–zone 6), where there is a clear relationship between said phase circuit values within each zone;

defining rotor position angular zone boundaries as zone positions in which two phases have equally large phase circuit values;



determining said phase circuit values (L_{PHASE1}, L_{PHASE2}, L_{PHASE3}) which are relevant among said phase circuits (F1, F2, F3);

establishing by comparison a mutual order of magnitude of the determined values, and therewith establishing the zone which discloses the position of the movable part in relation to the stationary part; and

activating at least one circuit (F1, F2, F3) which produces driving in the desired direction, based on the established zone.

5,315,225

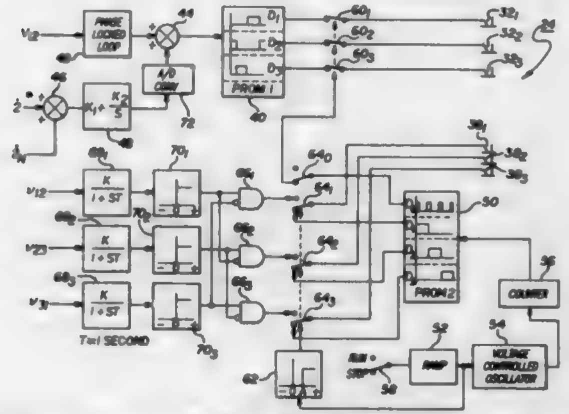
CONVERTER FOR SYNCHRONOUS MOTOR STARTING

Theodore M. Heinrich, and Colin D. Schauder, both of Murrysville, Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Sep. 30, 1991, Ser. No. 755,796

Int. Cl.^{5} H02P *1/46*

U.S. Cl. 318—712 **5 Claims**



1. A converter for starting a three phase synchronous motor from a three phase input power source wherein said motor has a first phase winding, a second phase winding and a third phase winding and further wherein said power source has a first mainline carrying a first phase of said power, a second mainline carrying a second phase of said power, a third mainline carrying a third phase of said power and a neutral line, said converter comprising:

a star point neutral termination coupling said first phase winding, said second phase winding, and said third phase winding to said neutral line;

means for rectifying said first phase, said second phase and said third phase of said input power and for summing each of said rectified phase to develop a starting current having a substantial DC component;

means for applying said starting current sequentially to each of said first phase winding, said second phase winding, and said third phase winding at a continuously increasing frequency so that an angular velocity of said motor synchronously increase with said increasing frequency, said starting current being removed when said angular velocity is synchronous with the constant frequency of said input power.

said applying means including a plurality of second thyristors, each of said second thyristors having a n anode, a cathode, and a gate, said anode of each of said second thyristors being electrically coupled in common to which said starting current is applied, said cathode of each of said second thyristors being coupled to a respective one of said first phase winding, said second phase winding and said third phase winding;

means for developing a plurality of second gate control signals, each of said second gate signals being applied to said gate of a respective one of said second thyristors to fire said respective one of said second thyristors, said second gate signals being developed sequentially at said continuously increasing frequency so that each of said second thyristors couples said starting current to said respective one of said first phase winding, said second phase winding, and said third phase winding to increase said angular velocity synchronously with said frequency; and

said developing means including a plurality of filters, each of said filters developing a filtered voltage in response to a respective voltage difference between said first phase windings, said second phase winding and said third phase winding, a plurality of first gates, said filtered voltage of each of said filters being applied to a respective one of said first gates, said first gates developing a gate voltage when said filtered voltage is positive, and a plurality of second gates, each of said second gates having a non-inverting input coupled to a respective one of said first gates for application of said gate voltage thereto and an inverting input coupled to a prior sequential one of said first gates for application of said gate voltage thereto, said second gates each developing one of said gate signals when said gate voltage of said respective one of said first gates is high and said gate voltage of said prior sequential one is low.

5,315,226

METHOD FOR CONTROLLING A SYNCHRONOUS MOTOR FOR IMPLEMENTATION OF AN EXACT START/STOP POSITIONING OPERATION IN A RECORDING APPARATUS

Ewald Fehlauer, Weiterstadt, and Klaus Hofmann, Langen, both of Fed. Rep. of Germany, assignors to Linotype-Hell AG, Fed. Rep. of Germany

Filed Jan. 13, 1993, Ser. No. 3,590

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1992, 4200607

Int. Cl.^{5} H02P *7/00*

U.S. Cl. 318—715 **19 Claims**

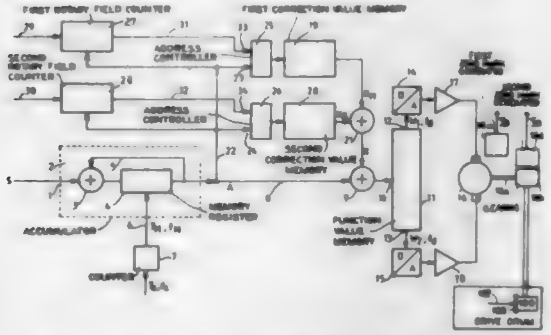
1. A method for controlling a synchronous motor with an AC voltage, comprising the steps of:

providing a rated value corresponding to a desired frequency of the AC voltage related to a rotational speed of the synchronous motor;

continuously adding the rated value in an accumulator by use of a micro-step clock sequence and providing added-up signal values;

employing the added-up signal values of the accumulator for

addressing stored function values in a function value memory, the function values representing at least one curve progression defining a wave shaped for said AC voltage;
reading out the addressed function values from the function value memory and converting them into said AC voltage said desired frequency corresponding to said rated value;
supplying said AC voltage to the synchronous motor for generating a rotary field wherein said frequency of said AC voltage defines said rotational speed of the synchronous motor;
for compensating speed errors due to errors of the synchronous motor
calculating motor correction values and storing them in a correction value memory,
addressing the stored motor correction values by said


FIRST ROTARY FIELD COUNTER
FIRST CORRECTION VALUE MEMORY
SECOND ROTARY FIELD COUNTER
ADDRESS CONTROLLER
ADDRESS CONTROLLER
SECOND CORRECTION VALUE MEMORY
ACCUMULATOR
MEMORY REGISTER
FUNCTION VALUE MEMORY
COUNTER
DRIVE DRUM

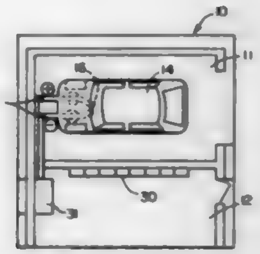
signal values of said accumulator and reading them out from the correction value memory, and
adding the motor correction values which have been read out with correct operational sign to said signal values of said accumulator before addressing said function value memory in order to correct addresses of the function value memory; and for calculating the motor correction values
identifying the motor errors by measuring a traverse rotational angle of the synchronous motor over at least one of a rotary field or an address range of the function value memory corresponding to said rotary field; and
identifying deviations of the measured rotational angle from a rated curve and acquiring from said deviations the motor correction values for the correction of the addresses of the function value memory.

5,315,227
SOLAR RECHARGE STATION FOR ELECTRIC VEHICLES

Mark V. Pierson, 65 Hospital Hill Rd., Binghamton, N.Y. 13901, and How T. Lin, 1200 Hartwick La., Binghamton, N.Y. 13903

Filed Jan. 29, 1993, Ser. No. 10,888
Int. Cl.⁵ H02J *7/00*

U.S. Cl. 320—2 **10 Claims**



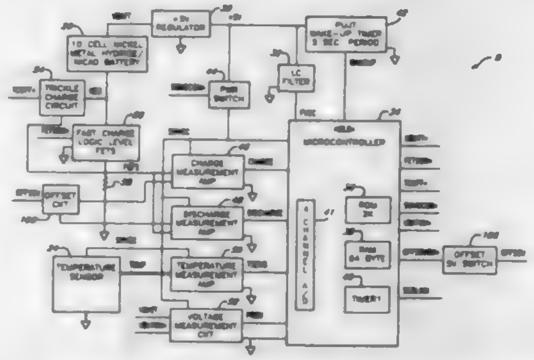
1. A solar recharge station for electric powered vehicles having electric contact means, comprising:
housing means including at least an inside, an outside, at least two areas including a contact room and a separate charge room, and roof means;
said contact room having space for enclosing at least one electric powered vehicle having vehicle electric contact means;
electric contact means affixed within said contact room including foxed position guide means for guiding said electric powered vehicle for said vehicle electric contact means to engage said fixed position guide means automatically;
means for wiping said vehicle electric contact means and said electric contact means within said contact room as said solar powered vehicle is guided by said fixed position guide means;
said separate charge room having space to retain battery means including connections with said electric contact means affixed within said contact room; and
solar panel array means supported by said roof means including connections for charging said battery means.

5,315,228
BATTERY CHARGE MONITOR AND FUEL GAUGE

Randall L. Hess, Cypress; Patrick R. Cooper; Armando Interiano, both of Houston, and Joseph F. Freiman, Cypress, all of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Filed Jan. 24, 1992, Ser. No. 825,638
Int. Cl.⁵ H02J *7/04*

U.S. Cl. 320—31 **23 Claims**


10 CELL NICKEL METAL HYDRIDE/ NICAD BATTERY
+5V REGULATOR
FAST WAKE-UP TIMER 3 SEC PERIOD
LC FILTER
TRICKLE CHARGE CIRCUIT
FAST CHARGE LOGIC LEVEL FETS
CHARGE MEASUREMENT AMP
DISCHARGE MEASUREMENT AMP
MICROCONTROLLER
OFFSET CKT
TEMPERATURE SENSOR
TEMPERATURE MEASUREMENT AMP
VOLTAGE MEASUREMENT CKT
TIMER1
OFFSET 5V SWITCH

1. An apparatus for determining an incremental battery charge value comprising:
a battery;
means for providing charging current to said battery;
means for measuring the charging current being provided to said battery at a predetermined interval;
means for measuring the temperature of said battery; and
means coupled to said means for measuring charging current and said means for measuring battery temperature for developing an incremental charge value of said battery during said predetermined interval, said incremental charge value being based on the measured current value times said predetermined interval less a fraction of said measured temperature.

5,315,229
MINIMUM TIME DELAY FILTERING METHOD FOR AUTOMATIC VOLTAGE REGULATORS

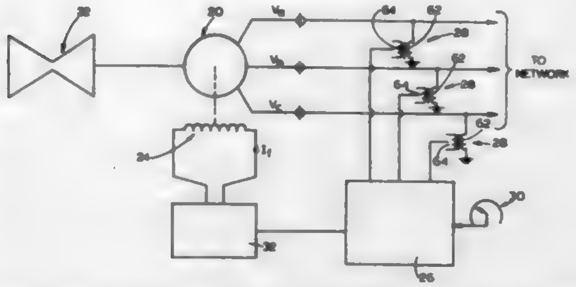
David R. Markus, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1991, Ser. No. 769,065
Int. Cl.⁵ H02P *9/00, 9/30*

U.S. Cl. 322—28 **15 Claims**

1. An automatic voltage regulator for controlling the terminal voltage of a polyphase electrical generator defining a plurality of phase voltages, comprising:
receiving means for receiving an signal representative of one of said phase voltages;

responsive means responsive to said receiving means for squaring said phase voltage signal;
generating means, responsive to said receiving means for generating a DC signal equal to $\cdot 3\sqrt{2A}$ representative of said phase voltages, where A is the amplitude of said phase voltage;
reference signal means for providing a reference signal;



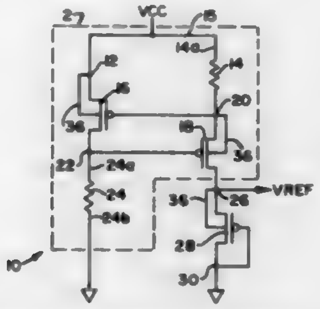
error signal generating means, responsive to said generating means and said reference signal means for comparing said DC signal with said reference signal and generating an error signal representative of the difference and;
controlling means, responsive to said error signal generating means, for controlling said terminal voltage.

5,315,230
TEMPERATURE COMPENSATED VOLTAGE REFERENCE FOR LOW AND WIDE VOLTAGE RANGES

Michael V. Cordoba; Kim C. Hardee, and Douglas B. Butler, all of Colorado Springs, Colo., assignors to United Memories, Inc., Colorado Springs, Colo. and Nippon Steel Semiconductor Corp., Japan

Filed Sep. 3, 1992, Ser. No. 940,084
Int. Cl.⁵ G05F *3/16*

U.S. Cl. 323—313 **19 Claims**



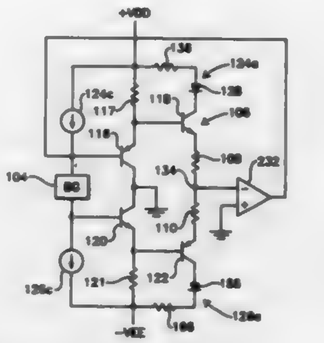
1. A reference voltage generator comprising:
a first node coupled to receive a first supply voltage;
a first resistance device having a first electrode coupled to receive said first supply voltage, and having a second electrode coupled to a second node;
a first transistor with a first electrode coupled to said first node, a second electrode coupled to a third node and a control electrode coupled to said second node;
a second transistor having a first electrode coupled to said second node, a second electrode coupled to a fourth node and a control electrode coupled to said third node;
a second resistance device having a first electrode coupled to said third node and a second electrode coupled to a second potential; and
a third transistor having a first electrode coupled to said fourth node, a second electrode, and a control electrode coupled to said second potential, wherein a reference voltage is available at said fourth node.

5,315,231
SYMMETRICAL BIPOLAR BIAS CURRENT SOURCE WITH HIGH POWER SUPPLY REJECTION RATIO (PSRR)

Lloyd F. Linder, Agora Hills; Dwight D. Birdsall, Norwalk, and Kelvin T. Tran, Carson, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 16, 1992, Ser. No. 976,760
Int. Cl.⁵ G05F *3/26*

U.S. Cl. 323—315 **14 Claims**



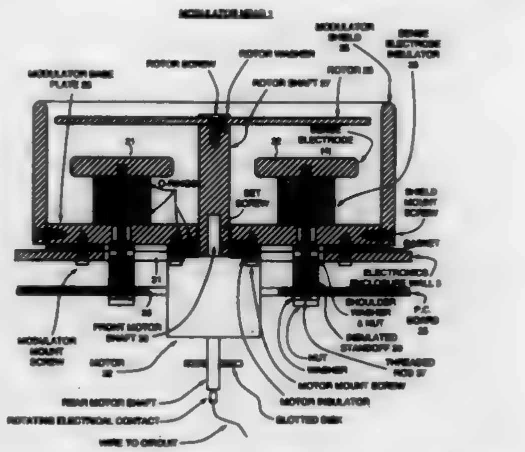
10. A bias current source, comprising:
positive and negative voltage supply nodes,
reference voltage source means for producing a predetermined reference voltage;
high impedance current source means having an impedance of at least about 10 kohms and connected in circuit with said positive and negative supply voltage nodes for causing a supply current to flow through the voltage source means;
voltage-to-current converter means responsive to said reference voltage for generating a corresponding reference current that is substantially independent of fluctuations in the voltages at said positive and negative voltage supply nodes; and
current mirror means responsive to said reference current for producing an output current corresponding thereto.

5,315,232
ELECTRIC FIELD MEASURING SYSTEM

Michael F. Stewart, 1617 W. Second Ave., Durango, Colo. 81301

Filed Jan. 3, 1991, Ser. No. 637,307
Int. Cl.⁵ G01R *29/12, 31/02*

U.S. Cl. 324—72 **43 Claims**



1. A sensor for measuring the polarity and amplitude of a low frequency electric field comprising:
sense electrode means exposable to the electric field to provide an electrical signal thereon responsive and related to the field, movable shutter electrode means for varying the

exposure of the sense electrode means to the electric field, additional electrode means, including at least shield electrode means, for affecting the path of the lines of force of the electric field at the sense electrode means,

motor means connected to the shutter electrode means to cyclically move the shutter electrode means to vary said exposure to provide a normal modulated signal from the sense electrode means,

means for demodulating said modulated signal to provide a quantitative output indication of the strength of the electric field and an indication of its polarity,

means for applying a precise voltage to one of said additional or shutter electrode means during operation of the sensor, without changing the position of said one electrode means from its position during operation of the sensor which provides said normal modulated signal, to induce a known shift in the voltage of said sense electrode means and a modified modulated signal, and means for comparing the output indications from the normal and modified modulated signals to provide a correction factor for calibrating the quantitative output indication for the normal modulated signal.

5,315,233

ELECTROMAGNETIC FIELD ANALYZER FOR DEVICES IN WHICH AN ELECTROMAGNETIC FIELD IS PRESENT NEAR A CONDUCTOR AND AN ELECTRIC CHARGE MOVES IN THE ELECTROMAGNETIC FIELD, AND METHOD OF ANALYZING AN ELECTROMAGNETIC FIELD

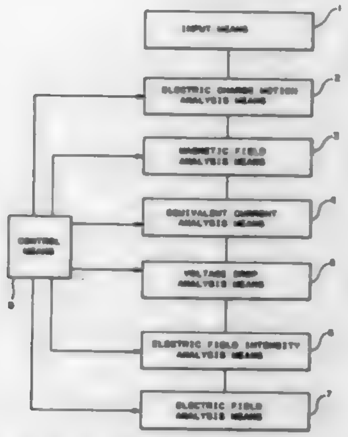
Kazuyuki Sakiyama, Moriguchi; Akira Ahagon, Neyagawa; Hidetoshi Kotera, Toyonaka, and Hiromi Kita, Kashihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1991, Ser. No. 699,513

Claims priority, application Japan, May 16, 1990, 2-127365

Int. Cl.⁵ G01R *29/08, 33/02;* **H01J** *25/00*

U.S. Cl. 324—72 **4 Claims**


INPUT MEANS
1
ELECTRIC CHARGE MOTION ANALYSIS MEANS
2
MAGNETIC FIELD ANALYSIS MEANS
3
EQUIVALENT CURRENT ANALYSIS MEANS
4
CONTROL MEANS
VOLTAGE DROP ANALYSIS MEANS
ELECTRIC FIELD INTENSITY ANALYSIS MEANS
ELECTRIC FIELD ANALYSIS MEANS
7

1. An electromagnetic field analyzer for devices in which an electromagnetic field is present near a conductor and an electric charge moves in the electromagnetic field, comprising:

resistance means located at a boundary of an analytical region for providing an equivalent to a load resistance at said boundary;

input means for inputting an initial condition for electric charge motion analysis and for inputting a boundary condition for electromagnetic field analysis;

electric charge motion analysis means for analyzing a position and velocity of an electric charge present within said analytical region at a specific time based on data input from said input means;

magnetic field analysis means for determining a distribution of a magnetic field present within said analytical region by utilizing results obtained by said electric charge motion analysis means;

equivalent current analysis means for determining an intensity of a magnetic field at said resistance means by utilizing results obtained by said magnetic field analysis means, said equivalent current analysis means further determining a current flowing through said resistance means from the boundary condition at the conductor surface;

voltage drop analysis means for determining a voltage drop across said resistance means based on the current flowing through said resistance means obtained from said equivalent current analysis means;

electric field intensity analysis means for analyzing an electric field intensity at said location of said resistance means based on results analyzed by said voltage drop analysis means;

electric field analysis means for determining an electric field based on information obtained by said electric field intensity analysis means; and

control means for driving said electric charge motion analysis means, said magnetic field analysis means, said equivalent current analysis means, said voltage drop analysis means, said electric field intensity analysis means, and said electric field analysis means, and for repeating the driving of all or part of said electric charge motion analysis means, said magnetic field analysis means, said equivalent current analysis means, said voltage drop analysis means, said electric field intensity analysis means, and said electric field analysis means following a time lapsing.

5,315,234

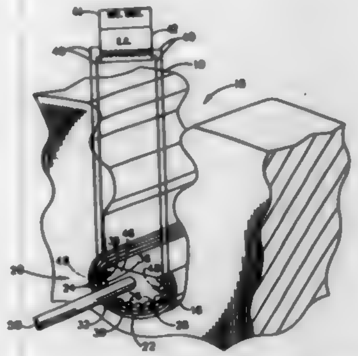
EDDY CURRENT DEVICE FOR INSPECTING A COMPONENT HAVING A FLEXIBLE SUPPORT WITH A PLURAL SENSOR ARRAY

George H. Sutton, Jr.; Francis H. Little, both of Cincinnati, Ohio; Kristina H. V. Hedengren; Richard J. Charles, both of Schenectady, N.Y.; William P. Kornrumpf, and Donna C. Hurley, both of Albany, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 3, 1992, Ser. No. 862,950

Int. Cl.⁵ G01N *27/82;* **G01R** *33/12;* **H01F** *21/02*

U.S. Cl. 324—242 **35 Claims**



1. A device for inspecting a component, comprising:

an eddy current array circuit having respective pluralities of drive and sense elements disposed on at least one flexible substrate and having an active face for positioning on a surface portion of the component during an inspection operation;

a flexible backing layer disposed on a face of said eddy current array circuit opposite to said active face for applying a uniform pressure behind said array circuit to maintain the array circuit against the surface portion during the inspection operation;

means for supporting and deploying said backing layer and said array circuit to conform to the surface portion of the component and to cause each of said respective pluralities of drive and sense elements to remain at a respective substantially constant distance from the component surface portion during the inspection operation; and

means for electrically connecting said eddy current array circuit to an eddy current instrument.

5,315,235

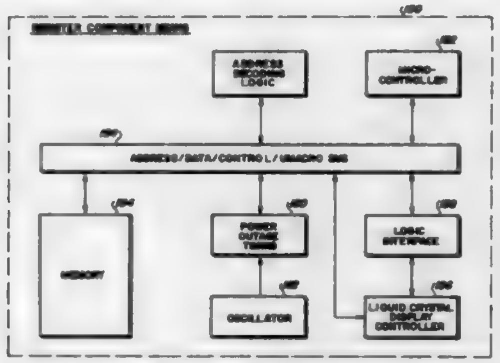
ELECTRICAL ENERGY METER WITH PROGRAMMABLE REGISTER COMPONENT

Kenneth W. Atherton, Saco, Me.; Susan D. Dastous, Milford, N.H.; Kevin P. Grogan, South Berwick, Me.; Gregory P. Lavoie, Newmarket, N.H.; Marjorie J. Mancuso, Exeter, N.H., and Mark J. Plis, Barrington, N.H., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 764,863, Sep. 24, 1991, abandoned. This application Jan. 21, 1993, Ser. No. 6,600

Int. Cl.⁵ G01R *19/16;* **G06F** *15/20*

U.S. Cl. 324—116 **9 Claims**



1. A programmable solid-state electronic register component for an electrical energy meter, comprising:

a mode table;

a plurality of task tables;

a plurality of modules;

wherein said mode table comprises an array of task pointers to respective ones of said plurality of task tables,

wherein each of said plurality of task tables comprises an array of module pointers to corresponding ones of said plurality of modules,

wherein each of said plurality of modules comprises a plurality of instructions to be executed during the performance of a corresponding task, which is included in at least one of predetermined groups of tasks, and

wherein each of said predetermined groups of tasks is defined by one of said task tables and corresponds to a predetermined mode of operation such as a time-of-use and demand mode of operation or a demand-only mode of operation; and

micro-controller means for operating said register component in said predetermined mode of operation by executing a corresponding predetermined group of tasks, said micro-controller means comprising

means for indexing to a task pointer in said mode table to thereby select one of said predetermined groups of tasks, said task pointer corresponding to a selected task table,

means for executing said one of said predetermined groups of tasks by repeatedly indexing said selected task table to respective module pointers, and

means for executing said plurality of modules corresponding to said respective module pointers.

5,315,236

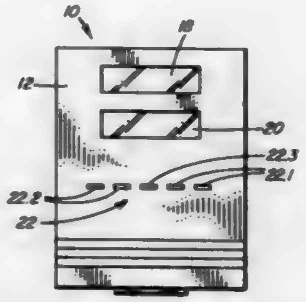
POWER CONSUMPTION METER FOR DISPLAYING ELECTRIC POWER CONSUMED BY APPLIANCE AND THE TIME PERIOD OF CONSUMPTION

Graham S. Lee, 760 Fairmile Rd., West Vancouver, British Columbia, Canada V7S 1R2

Filed Mar. 5, 1991, Ser. No. 664,888

Int. Cl.⁵ G01R *22/00, 21/06;* **G06F** *15/56;* **G07C** *1/00*

U.S. Cl. 324—157 **6 Claims**



1. An electric power consumption meter, comprising:

a body member;

prongs on the body member for insertion into an electric wall socket;

a socket on the body member for receiving the plug of an electric appliance, said socket being in electrical communication with the prongs for transferring electric power from the prongs to said socket;

a current meter in the body member for measuring electric current flow between said prongs and said socket on the body member;

a timer for measuring the duration of said electric current flow;

a data processor in the body member for receiving data from said current meter and said timer and for calculating a value for the quantity of electric power consumed from said data;

a display on said body member for simultaneously displaying said value of the quantity of said electric power consumed and the time period during which such power has been so consumed; and

colour coded lighting means on the body member for continuously indicating power consumption conditions throughout the range of power consumed by said appliance.

5,315,237

TOUCH SENSOR UNIT OF PROBER FOR TESTING ELECTRIC CIRCUIT AND ELECTRIC CIRCUIT TESTING APPARATUS USING THE TOUCH SENSOR UNIT

Kenichi Iwakura, and Tetsuo Ohtsuka, both of Kawasaki, Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Aug. 6, 1991, Ser. No. 741,071

Claims priority, application Japan, Aug. 6, 1990, 2-207947

Int. Cl.⁵ G01R *31/02, 1/073*

U.S. Cl. 324—158 F **16 Claims**

1. An electric circuit measuring apparatus comprising:

probe means having a plurality of test probe styluses including at least one stylus used as a monitor probe stylus;

placing means provided opposite to said probe means, in which a to-be-tested microelectronic device having a plurality of pads is placed;

moving means for relatively moving said probe means and said placing means in a first direction in which said probe means and said placing means approach each other, and a second direction in which they separate from each other;

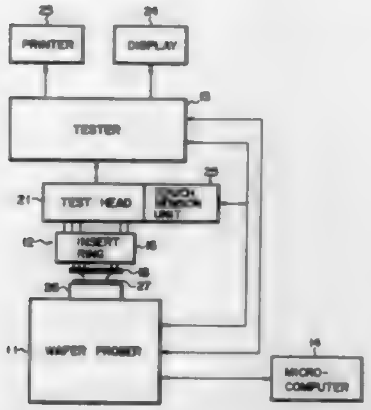
AC signal generating means for supplying an AC signal to at least one of said to-be-tested microelectronic device and said monitor probe stylus;

touch sensing means connected to the monitor probe stylus, for sensing the AC signal from said signal generating means which flows through said microelectronic device and the monitor probe stylus via capacitive coupling when said monitor probe stylus to which the AC signal is supplied comes into contact with oxide coating spontaneously formed on at least one of the pads of said to-be-tested microelectronic device thereby sensing the touching of the monitor probe stylus and the one of the pads;

over-drive means for moving at least one of said to-be-tested microelectronic device and said test probe styluses at a predetermined distance in said first direction to ensure electrical contact between said to-be-tested microelectronic device and said test probe styluses in response to the touch sensing by said touch sensing means;

tester means for measuring electrical characteristics of said to-be-tested microelectronic device through said probe means; and

switch means for disconnecting the monitor probe stylus from said touch sensing means and connecting said probe styluses including the monitor probe stylus to said tester means at the same time when said over-drive means moves at least one of the tested microelectronic device and the test probe styluses by means of said over-drive means.



5,315,238

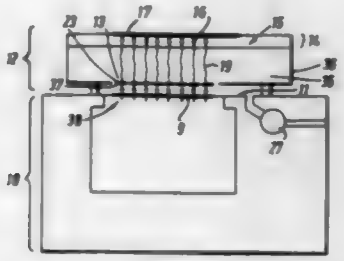
TESTING APPARATUS HAVING AN AIR PERMEABLE INTERFACE PANEL SPACED FROM A TEST HEAD

Colin G. Barker, Bollington, England, assignor to Innovate Limited, Northampton, England

Filed Sep. 26, 1991, Ser. No. 765,899

Int. Cl.^{5} G01R *31/02*

U.S. Cl. 324—158 F **15 Claims**



15. Test apparatus comprising:

an automatic test equipment for testing printed circuit boards and the like, said automatic test equipment having a receiver comprising

(A) a receiver platen, and

(B) receiver probes mounted on the platen;

a test fixture for connection to the receiver of the automatic test equipment, the test fixture including

(A) a test head having a platen and test probes mounted on the platen for contacting a unit under test, and

(B) an air permeable interface panel spaced from the test head and contacting the receiver probes of the automatic test equipment, the interface panel having contact pads positioned to make contact with the said receiver probes of the automatic test equipment, and the interface panel being made up of individual separable parts,

the test head probes and the interface panel being interconnected by minimum length electrical paths, and the separable parts of the interface panel being separable to give access to the minimum length wiring; and

a vacuum chamber extending between the test head platen of the test head and the receiver platen of the automatic test equipment for holding, the test fixture in contact with the automatic test equipment.

5,315,239

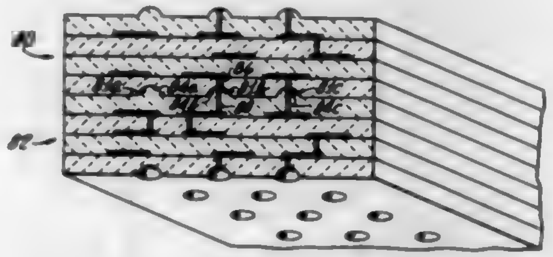
CIRCUIT MODULE CONNECTIONS

William A. Vitriol, West Lafayette, Ind., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 16, 1991, Ser. No. 807,311

Int. Cl.^{5} G01R *31/02;* **H05K** *1/03*

U.S. Cl. 324—158 F **14 Claims**



1. An electronic circuit package comprising:

first and second modules each having opposite connecting surfaces, at least a part of one of said connecting surfaces of one of said modules being contiguous to at least a part of one of said connecting surfaces of the other of said modules, said modules each being a low temperature co-fired ceramic (LTCC) monolithic structure comprising:

a plurality of cofired ceramic dielectric layers in a stacked assembly, and

a conductive pattern on one surface of some of said plurality of dielectric layers such that said conductive patterns are separated by said dielectric layers in said stacked assembly,

the other of said connecting surfaces of each module being on opposite sides of said stacked assembly, and said connecting surfaces having co-fired mating features therein,

wherein said first module has said mating features comprising a first pattern of protrusions projecting from one of its connecting surfaces,

said second module has said mating features comprising a second pattern of depressions in one of its connecting surfaces, said patterns having at least pattern portions in mating engagement with each other, with protrusions of said portions of said first pattern being received in depressions of said portions of said second pattern, and

wherein said opposite connecting surface of at least one module has the other of protrusion and depression mating features for making electronic circuit package connections.

5,315,240

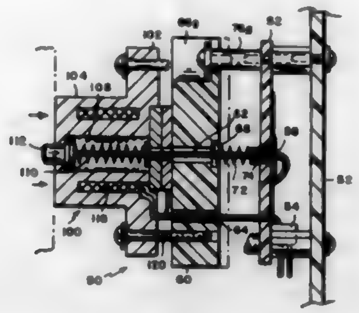
THERMAL CONTROL SYSTEM FOR A SEMI-CONDUCTOR BURN-IN

Elmer R. Jones, North Reading, Mass., assignor to EJ Systems, Inc., Lawrence, Mass.

Division of Ser. No. 708,353, May 31, 1991, Pat. No. 5,164,661. This application Oct. 27, 1992, Ser. No. 967,148

Int. Cl.^{5} G01R *31/02;* **H05B** *1/02*

U.S. Cl. 324—158 F **5 Claims**



1. A temperature controller adapted to releasably engage a burn-in tray to place the temperature controller in communication with a device under test (DUT), the temperature controller including:

a heat exchange device adapted to be placed in heat exchange relationship with the DUT;

a DUT temperature sensor received within the heat exchange device and thermally isolated from the heat exchange device to measure the temperature of the DUT;

a temperature sensor received within the heat exchange device to measure the temperature of the heat exchange device;

means to transfer thermal energy into the heat-exchange device; and

means to place the heat exchange device in heat transfer relationship with the DUT.

5,315,241

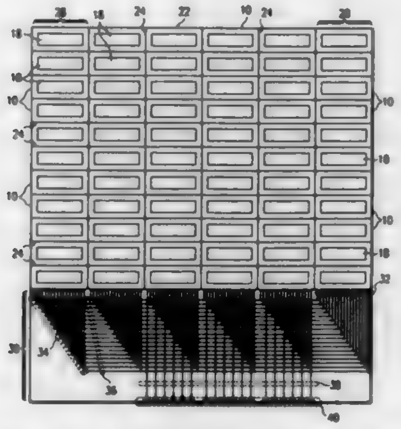
METHOD FOR TESTING INTEGRATED CIRCUITS

Charles R. Ewers, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Sep. 18, 1991, Ser. No. 761,728

Int. Cl.^{5} G01R *31/28*

U.S. Cl. 324—158 R **20 Claims**



1. A method for testing integrated circuit devices, comprising the steps of:

attaching a plurality of integrated circuit dice, containing a desired plurality of devices, to an insulating substrate having conductive traces on an upper surface and a lower surface thereof,

wherein said insulating substrate is divided into a plurality of regions defined by multiple lines of conductive through holes therethrough,

and wherein said conductive traces on said upper surface are electrically connected to said conductive traces on said lower surface through said through holes;

wire bonding to connect bonding wires from conductive bond pads on said integrated circuit dice to corresponding bonding locations on said traces on said upper surface;

providing electrical power and signals to said integrated circuit dice through said conductive traces on said lower surface, wherein the signals are connected to said integrated circuit dice through said through holes, said conductive traces on said upper surface, and said bonding wires, for at least a predetermined burn-in period;

physically breaking said conductive traces to at least partially isolate said integrated circuit dice; and

testing said integrated circuit dice.

5,315,242

METHOD FOR MEASURING AC SPECIFICATIONS OF MICROPROCESSOR

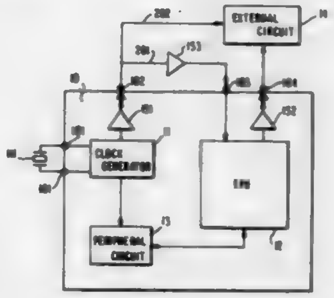
Tomokazu Enami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 18, 1992, Ser. No. 884,128

Claims priority, application Japan, May 16, 1991, 3-111367

Int. Cl.^{5} G01R *31/02, 31/28*

U.S. Cl. 324—158 R **2 Claims**



1. A method for measuring ac characteristics of a microprocessor which has, on a single semiconductor chip, a first terminal, a clock generator coupled to said first terminal, a second terminal, a first driver connected between said clock generator and said second terminal, a peripheral circuit coupled to said clock generator, a CPU, a third terminal coupled to said CPU, a fourth terminal, and a second driver connected between said CPU and said fourth terminal, said clock generator cooperating with a crystal oscillator, which is provided outside said semiconductor chip and connected to said first terminal, to generate a clock signal, said clock signal being supplied to said peripheral circuit and further to said CPU through said first driver, said second terminal, and an interconnection wiring which is provided outside said semiconductor chip between said second and third terminals, said CPU responding to said clock signal to control said peripheral circuit and to output a processed signal to said fourth terminal through said second driver, said method comprising the steps of:

applying a train of first test pulses to said first terminal in place of connecting said crystal oscillator to said first terminal to thereby cause said clock generator to output a train of pulses in response to said first test pulses at said second terminal;

measuring said train of pulses appearing at said second terminal to obtain ac characteristics of said clock generator;

applying a train of second test pulses to said third terminal in place of providing said interconnection wiring between said second and third terminals to thereby cause said CPU to output a processed signal to said fourth terminal in response to said second test pulses; and measuring the processed signal appearing at said fourth terminal to obtain ac characteristics of said CPU.

5,315,243

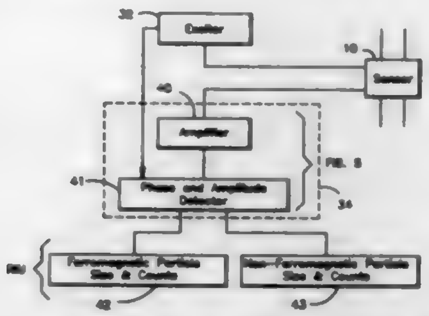
DETECTION AND DISCRIMINATION BETWEEN FERROMAGNETIC AND NON-FERROMAGNETIC CONDUCTIVE PARTICLES IN A FLUID

Robert W. Kempster, Ottawa, and Douglas B. George, Kanata, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Apr. 6, 1992, Ser. No. 866,885

Int. Cl.⁵ G01R *33/12;* **G01N** *27/74, 33/28;* **G08B** *21/00*

U.S. Cl. 324—204 **12 Claims**


32
Oscillator
10
Sensor
40
Amplifier
FIG. 8
41
Phase and Amplitude Detector
34
Ferromagnetic Particle Size & Counts
Non-Ferromagnetic Particle Size & Counts
42
43

1. Apparatus for detecting the presence of solid ferromagnetic particles or solid non-ferromagnetic conductive particles entrained in a stream of fluid comprising three coaxial coils arranged to encompass the stream, one of the coils being a sense coil and the other coils being field coils located respectively upstream and downstream with reference to the sense coil, one field coil being wound in a first direction and the other field coil being wound in the opposite direction, means for energizing the field coils to generate A.C. magnetic fields and establish opposing A.C. magnetic fields at the sense coil, means connected to the sense coil to detect a disturbance of the A.C. magnetic field present at the sense coil when a particle moves through the coils and to provide a signature electrical signal indicative of a disturbance, means for removing any residual electrical signal due to imbalance of the opposing A.C. magnetic fields from that signature electrical signal and provide an output signal and means to analyze the phase of the output signal so as to discriminate between ferromagnetic and non-ferromagnetic conductive particles, wherein the means for removing any residual electrical signal is a differential amplifier having one input supplied with an output from the sense coil, an output of the differential amplifier being connected to an input of an autobalance circuit whose output is connected to another input of the differential amplifier, the output of the differential amplifier being connected to a mixer whose other input is supplied with a signal of the same frequency as the A.C. magnetic fields, the mixer's output providing said output signal.

5,315,244

MAGNETIC SENSOR WITH LAMINATED FIELD CONCENTRATING FLUX BAR

Elmer L. Griebeler, Chesterland, Ohio, assignor to Visi-Trak Corporation, Cleveland, Ohio

Continuation of Ser. No. 653,685, Feb. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 437,657, Nov. 17, 1989, Pat. No. 4,992,733. This application Aug. 5, 1992, Ser. No. 925,298

Int. Cl.⁵ G01B *7/14;* **G01R** *33/02*

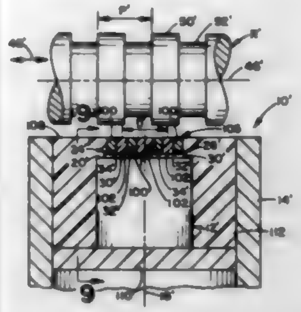
U.S. Cl. 324—207.21 **18 Claims**

1. A sensor for sensing movement relative thereto of an object in a direction of movement, the object having zones of different magnetic conductivity, the sensor comprising:

magnetic field producing means for producing a magnetic field near the object, the magnetic field producing means having a continuous planar pole face facing the object and a first thickness in said direction of movement;

transducer means, mounted directly on said pole face, for generating an electrical signal responsive to the movement of the object, the transducer means having a first width transverse the direction of movement and a first length in said direction of movement; and,

rectangular flux guide means, disposed between the object and the transducer means and having substantially said first width transverse the direction of movement and said first length in said direction of movement, for concentrating a portion of the magnetic field having passed through the transducer means to the object.



5,315,245

SENSOR ASSEMBLY HAVING EMBEDDED WIRES WITHIN A POWDER METAL CORE AND A METHOD THEREFOR

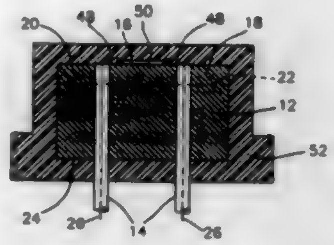
Thaddeus Schroeder; Chi H. Leung, both of Rochester Hills; Bruno P. B. Lequesne, Troy, all of Mich., and Robert W. Ward, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 842,938, Feb. 27, 1992, Pat. No. 5,210,493. This application Nov. 25, 1992, Ser. No. 983,064

The portion of the term of this patent subsequent to May 11, 2000, has been disclaimed.

Int. Cl.⁵ G01R *33/06, 3/00;* **G01B** *7/14;* **H01F** *1/06*

U.S. Cl. 324—207.21 **14 Claims**



1. A sensor comprising:

a magnetic body having a first portion and a second portion, said second portion defining a first surface of said magnetic body, said first portion of said magnetic body comprising compacted particles of a high coercivity magnetic material which are substantially individually coated with an electrically insulative coating, said second portion of said magnetic body comprising compacted particles of a ferromagnetic material which are substantially individually coated with an electrically insulative coating, said compacted particles of said ferromagnetic material being disposed adjacent said first surface of said magnetic body; and

at least one electrically conductive wire substantially embedded within said magnetic body, said at least one electrically conductive wire being coated with an electrically insulative material, said at least one electrically conductive wire having a terminal end which terminates substantially at said first surface of said magnetic body;

whereby the presence of said terminal and of said at least one electrically conductive wire at said first surface of said magnetic body facilitates the subsequent electrical connection of said at least one electrically conductive wire to a sensing element subsequently disposed on said first surface of said magnetic body.

5,315,246

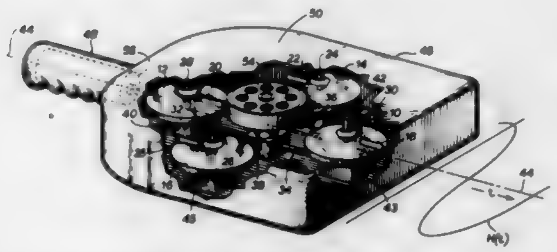
ROTATING SOURCE FOR GENERATING A MAGNETIC FIELD FOR USE WITH A CURRENCY DETECTOR

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1992, Ser. No. 932,114

Int. Cl.⁵ G01N *27/72;* **G01R** *33/12, 33/06;* **H01F** *7/02*

U.S. Cl. 324—228 **23 Claims**



1. An alternating magnetic field source comprising:

a) permanent magnet means for generating a magnetic field, said permanent magnet means further comprising at least one pair of coplanar dipole magnets, and

b) counter-rotational output parallel shafts driving means, said shafts mechanically coupled to said permanent magnet means for coplanarly counter-rotating at a predetermined angular rate each of said dipole magnets about an axis of rotation perpendicular to said dipole magnet, wherein said alternating magnetic field is the resultant vector sum of the magnetic fields of said pair of dipole magnets, and whereby said alternating magnetic field is substantially uniaxial in a longitudinal direction along a line copolanar with said dipoles and passing through said axis of rotation of said dipoles, and said field varies in a sinusoidal manner at said rotational angular rate.

5,315,247

METHOD AND APPARATUS FOR MEASURING A MAGNETIC FIELD USING A DEFLECTABLE ENERGIZED LOOP AND A TUNNELING TIP

William J. Kaiser, West Covina, Calif.; Steven B. Waltman, Boulder, Colo., and Thomas W. Kenny, Glendale, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 685,553, Apr. 15, 1991, which is a continuation-in-part of Ser. No. 118,733, Nov. 9, 1987, abandoned. This application Dec. 24, 1992, Ser. No. 996,613

Int. Cl.⁵ G01R *33/02*

U.S. Cl. 324—244 **12 Claims**

1. Apparatus for measuring a magnetic field, comprising in combination:

an electrically energizable loop;

means for rendering said electrically energizable loop deflectable by said magnetic field when electrically energized;

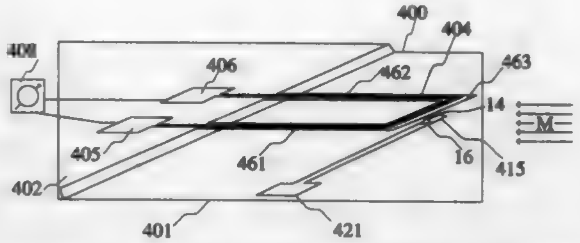
a tunneling gap between a tunneling tip and an electrode, one of said tunneling tip and said electrode connected to said loop;

means for electrically energizing said loop;

means for providing an electric tunneling current through said tunneling gap between said tunneling tip and said electrode;

means for varying an electrical property of said gap relating to said tunneling current in response to deflection of said electrically energized loop with said magnetic field; and

means for providing a measurement of said magnetic field in response to said variation in said electrical property.



5,315,248

METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE FOR MEASURING SPEED OF FLOWING TARGET OBJECT

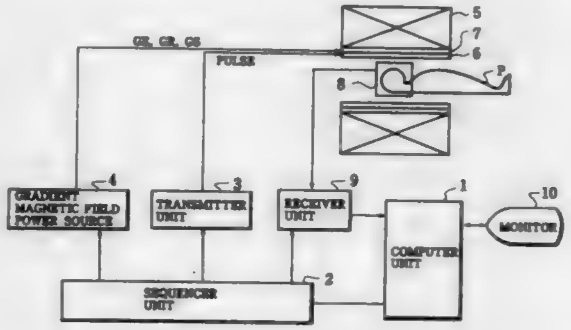
Kojiro Yamaguchi, Tochigiken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1993, Ser. No. 23,311

Claims priority, application Japan, Mar. 2, 1992, 4-044672

Int. Cl.⁵ G01V *3/00*

U.S. Cl. 324—306 **10 Claims**



1. An apparatus for nuclear magnetic resonance imaging for measuring a speed of a flowing target object, comprising:

pre-saturation means for applying a pre-saturation pulse to a desired saturation plane perpendicularly intersecting a flowing direction of the flowing target object, so as to produce a saturated portion within the flowing target object;

imaging means for executing a desired imaging pulse sequence to collect nuclear magnetic resonance signals from a desired imaging region containing the saturation plane and the saturated portion;

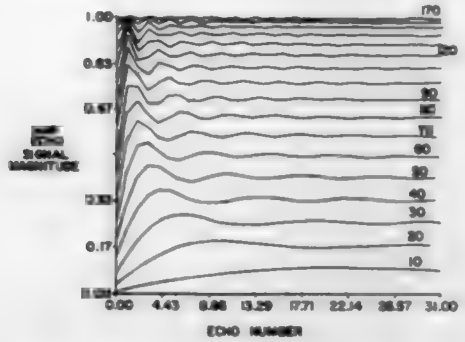
control means for controlling the pre-saturation means and the imaging means to realize a single slice multi-phase pulse sequence, at each phase of which an application of the pre-saturation pulse by the pre-saturation means is followed by an execution of the desired imaging pulse sequence by the imaging means; and

means for determining the speed of the flowing target object by reconstructing a nuclear magnetic resonance image of the desired imaging region from the nuclear magnetic resonance signals collected by the imaging means at each phase of the single slice multi-phase pulse sequence, measuring a distance between the saturated portion and the saturation plane in each reconstructed nuclear magnetic resonance image, and dividing the measured distance by a time interval between an application of the pre-saturation pulse and a reception of the nuclear magnetic resonance signals in the single slice multi-phase pulse sequence.

5,315,249
STABILIZED FAST SPIN ECHO NMR PULSE SEQUENCE

Patrick L. Le Roux, Gif/Yvette, France, and Richard S. Hinks, Waukesha, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jul. 28, 1992, Ser. No. 920,952
Int. Cl.⁵ G01R *33/20*
U.S. Cl. 324—309 **2 Claims**



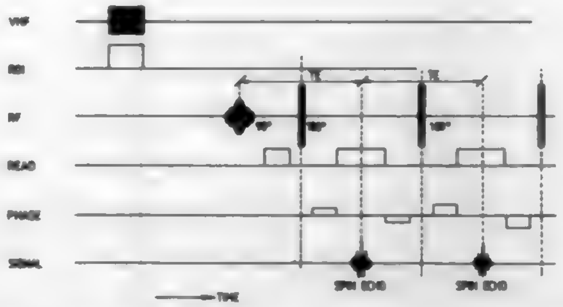
1. An NMR system, the combination comprising:
means for generating a polarizing magnetic field;
excitation means for generating an RF excitation magnetic field which produces transverse magnetization in spins subjected to the polarizing magnetic field;
receiving means for sensing an NMR signal produced by the transverse magnetization and producing digitized samples of the NMR signal;
first gradient means for generating a first magnetic field gradient to phase encode the NMR signal;
second gradient means for generating a second magnetic field gradient to frequency encode the NMR signal;
pulse control means coupled to the excitation means, first gradient means, second gradient means, receiver means, said pulse control means being operable to conduct a fast spin echo pulse sequence in which a series of NMR echo signals are produced in response to a single RF excitation pulse followed by a corresponding series of RF refocusing pulses produced by said excitation means, and in which said NMR echo signals are stabilized to a substantially smoothly decaying amplitude by altering the flip angle produced by one or more of the initial RF refocusing pulses in said series.

5,315,250
MAGNETIC RESONANCE IMAGING

Gosta J. Ehnholm, Helsinki, Finland, and John S. Petersson, Helsingborg, Sweden, assignors to Instrumentarium Corporation, Helsinki, Finland

Continuation of Ser. No. 891,296, May 29, 1992, abandoned. This application Aug. 18, 1992, Ser. No. 931,770
Claims priority, application United Kingdom, May 31, 1991, 9111738
Int. Cl.⁵ G01V *3/00*
U.S. Cl. 324—309 **16 Claims**

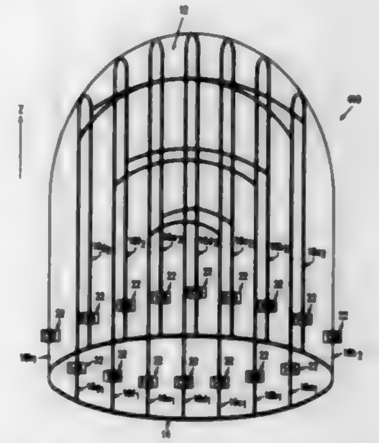
1. In a method of electron spin resonance enhanced magnetic resonance imaging wherein a subject is exposed to radiation of a frequency selected to stimulate an esr transition in a paramagnetic species in the subject to thereby effect dynamic nuclear polarization, the improvement comprising arranging said exposure to radiation such that within the region of the subject exposed to the esr stimulating radiation the capacity of said radiation to stimulate a said esr transition is relatively enhanced in at least one volume relative to the rest of the region of the subject so exposed whereby the esr stimulation within the said one volume is greater than elsewhere in the region exposed and the magnetic resonance signal enhancement for nuclei within that volume at the time of esr stimulation is also enhanced relative to the signal coming from other nuclei within the subject.



5,315,251
NMR RADIO-FREQUENCY COIL

Kevin A. Derby, San Bruno, Calif., assignor to Toshiba America MRI, Inc., Calif.

Continuation of Ser. No. 630,158, Dec. 19, 1990, abandoned. This application May 25, 1993, Ser. No. 67,341
Int. Cl.⁵ G01V *3/00*
U.S. Cl. 324—318 **21 Claims**



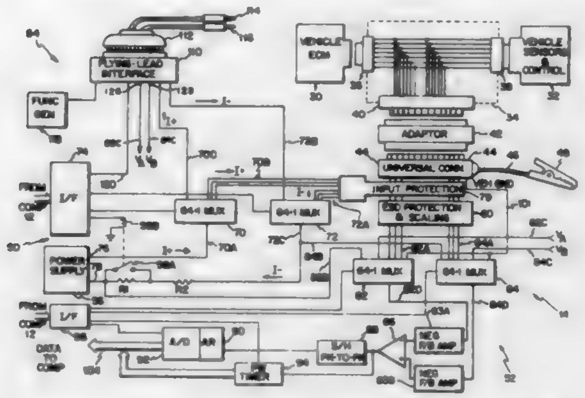
1. An NMR radio-frequency coil suitable for use in a coupled resonator system to generate a magnetic imaging field in a volume of space, comprising:
a first current path for the generation of the magnetic imaging field in the volume of space, said first current path lying in a first plane said first current path including a first end and a second end and an arcuate region therebetween; and
a single closed loop second current path for supplying current to said first current path, said second current path lying in a second plane, substantially perpendicular to said first plane said second current path conductively connected to said first end and to said second end at the intersection of said first plane and said second plane.

5,315,252
AUTOMOTIVE TEST SYSTEM WITH INPUT PROTECTION

Peter A. Puetz, Waukesha, and John Hintz, New Berlin, both of Wis., assignors to SPX Corporation, Muskegon, Mich.

Filed Aug. 26, 1992, Ser. No. 935,689
Int. Cl.⁵ F02P *17/00;* G01R *27/08*
U.S. Cl. 324—402 **17 Claims**

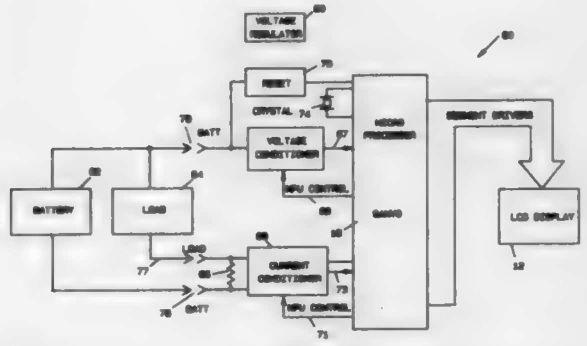
12. A test system for testing electrical components of an automotive vehicle, the test system capable of being electrically connected to an electronic control module of an automotive vehicle which is electrically connected to the electrical components of the vehicle, the test system comprising:
sensor means for measuring the electrical characteristics of an electrical component coupled to an input of the sensor means;
multiplexer means having an input for electrical connection to the electronic control module and having an output which is electrically connected to the input of the sensor means, the multiplexer means being capable of coupling a selected electrical component of the automotive vehicle to the input of the sensor means; and protection means, electrically connected to the multiplexer means, for limiting the voltage applied to the input of the multiplexer means, the protection means comprising a high impedance means for connection between the electronic control module and the input of the multiplexer means, and an amplifier means for electrical connection to the multiplexer means, the amplifier means providing a virtual ground at the multiplexer means output.



5,315,253
METHOD AND APPARATUS FOR MEASURING THE VOLTAGE AND CHARGE OF A BATTERY

Richard B. Alexandres, Clear Lake; Dennis P. Kindschuh, Mason City, both of Iowa; Larry Hall, Kansas City, Mo.; Perry B. Peden, Lenexa, Kans.; Larry Klusman, Lenexa, Kans., and Steve Potratz, Lenexa, Kans., assignors to Alexander Manufacturing Company, Mason City, Iowa

Continuation of Ser. No. 355,679, May 22, 1989, Pat. No. 5,144,248. This application Aug. 28, 1992, Ser. No. 937,223
Int. Cl.⁵ G01N *27/416;* H02J *7/04*
U.S. Cl. 324—429 **24 Claims**

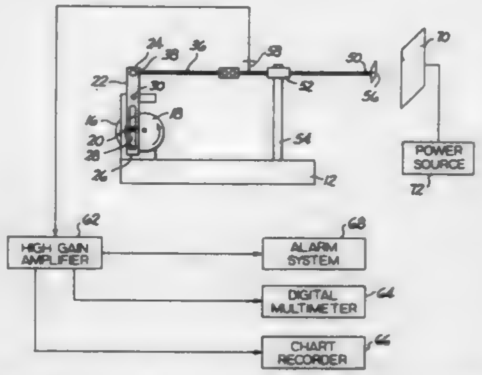


1. Apparatus for measuring the voltage on a battery comprising:
a. a battery for storing electrical power;
b. voltage regulator means connected to said battery having a constant reference output voltage;
c. integrating means including a capacitor connected to said constant reference output voltage of said voltage regulator means and said battery; and,
d. microprocessor means connected to said constant reference output voltage for initiating, charging and discharging of said capacitor, timing the charging and discharging of said capacitor, and computing battery voltage by comparing the ratios of charge time to discharge time and constant reference output voltage to battery voltage.

5,315,254
METHOD AND APPARATUS FOR NON-CONTACT CHARGE MEASUREMENT

Taylor G. Wang; Kuan-Chan Lin, both of Nashville, and James C. Hightower, Franklin, all of Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Jul. 11, 1991, Ser. No. 728,602
Int. Cl.⁵ G01N *27/60*
U.S. Cl. 324—452 **8 Claims**



1. An apparatus for the detection and measurement of static electric charge on the surface of a charged object comprising:
a sensing probe, said probe being positioned a specific distance from the surface of the object;
a motor means, connected to the sensing probe, for providing cyclic movement to the sensing probe so as to cyclically move the sensing probe relative to the surface of the object; the motor means includes a clock motor, said clock motor connected to a wheel so that the motor rotates the wheel; and
a monitoring means, connected to the sensing probe, for monitoring the potential of the charged object.

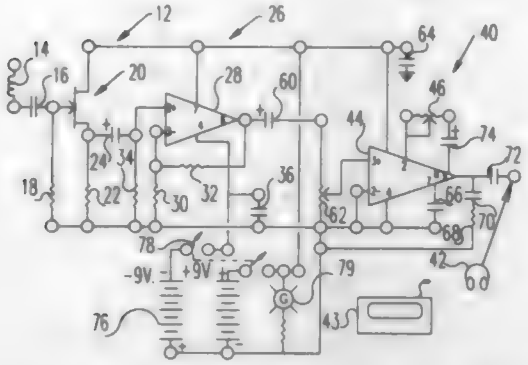
5,315,255
NON-CONTACT, ELECTROSTATIC, DISCHARGE DETECTOR

Michael J. Bettinger, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jul. 16, 1992, Ser. No. 914,784
Int. Cl.⁵ G01R *29/12, 31/12*
U.S. Cl. 324—457 **9 Claims**

1. A non-contact, electrostatic discharge event detector comprising:
a. a high impedance antenna input circuit to pass through a single-event signal and suppress a repeated background signal, said input circuit further comprising:
i. an antenna connecting to a blocking capacitor;
ii. a high impedance FET having an input in series with the blocking capacitor; and
iii. a first output coupling capacitor connecting to the FET;

b. amplification means to amplify said single-event signal; and



c. monitoring means to audit and record said single-event signal for detection and signature analysis.

5,315,256

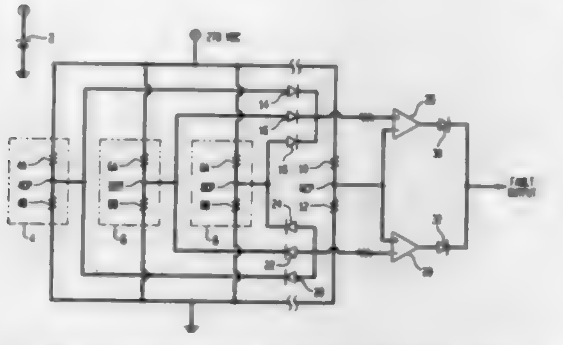
FAULT DETECTION CIRCUIT FOR USE IN DETERMINING THE EXISTENCE OF A FAULT IN ANY ONE OF A PLURALITY OF DC LOADS

Martin Schuyler, Hastings-On-Hudson, N.Y., assignor to Cox & Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 703,005, May 20, 1991, Pat. No. 5,168,236. This application Nov. 27, 1992, Ser. No. 982,398

Int. Cl.⁵ G01R *31/02*

U.S. Cl. 324—511 **13 Claims**



1. A fault detection circuit for determining the existence of a fault in any one of a plurality of center-tapped loads which are supplied by a DC source, comprising:
  a center-tapped reference load having two equal resistances connected to a floating reference centerpoint, each resistance being connected to a corresponding side of the source;
  means for monitoring the voltages at the centerpoints of all the center-tapped loads to be monitored; and
  means for comparing said monitored voltages with the voltage of said reference centerpoint.

5,315,257

SYSTEM FOR EVALUATING THE PERFORMANCE OF AN ELECTRICAL FILTER

Jacques Guillard, Le Chesnay; Christian Girard, Sartrouville, and Pierre Morin, Gif sur Yvette, all of France, assignors to Alcatel Cable, Clichy Cedex, France

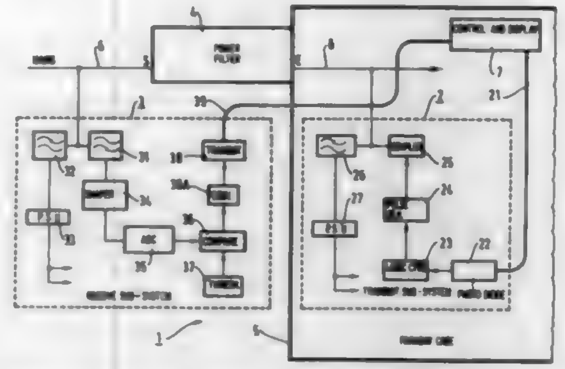
Filed Feb. 12, 1992, Ser. No. 834,591

Claims priority, application France, Feb. 13, 1991, 91 01667

Int. Cl.⁵ G01R *27/00*

U.S. Cl. 324—627 **10 Claims**

1. A system for evaluating the performance of an electrical filter installed on an electrical power supply network passing through the screening of a Faraday enclosure, the system comprising:
  transmit means for transmitting an inlet electrical pulse to the inlet of said filter;
  receive and processing means for receiving and processing a response electrical signal at the outlet of said filter corresponding to said pulse; and



  display means for displaying the results obtained by processing said signal;
  wherein said inlet electrical pulse is coupled to said power supply network and is conveyed thereby through said filter, said response being obtained from the outlet of said filter by decoupling.

5,315,258

METHOD AND APPARATUS FOR DETERMINING THE MOISTURE CONTENT OF A MATERIAL

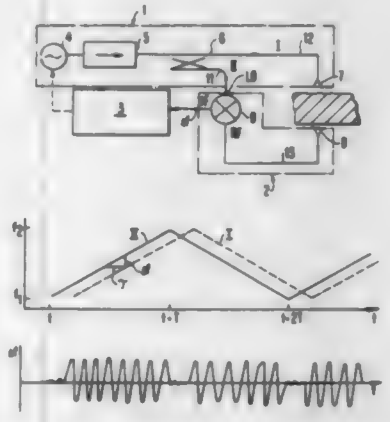
Pekka Jakkula, Oulu, and Esko Tahkola, Kiviniemi, both of Finland, assignors to Kajaani Elektroniikka Oy, Kajaani, Finland

Continuation-in-part of Ser. No. 464,281, Jan. 12, 1990, abandoned. This application Mar. 30, 1992, Ser. No. 859,893

Claims priority, application Finland, Jan. 13, 1989, 890201

Int. Cl.⁵ G01R *27/04, 25/04*

U.S. Cl. 324—640 **7 Claims**



1. Apparatus for determining the moisture content of a material, comprising a transmitting device which is arranged to transmit a microwave signal through the material to be measured, and a detecting device and a counting device which are arranged to measure the change of velocity of the signal transmitted through the material and to determine the moisture content of the material on the basis of said measured change and a predetermined known interdependence between the changes in the microwave signal velocity and the moisture content of the material, wherein the transmitting device comprises an oscillator designed to produce a signal of a frequency in the microwave range and to vary the signal frequency from a lower frequency f_1 to an upper frequency f_2 within a given period of time T in accordance with a mathematical function, an isolator designed to pass the signal in the oscillator circuit in only one direction, a directional coupler designed to divide the signal into a first component (I) and a second component (II), and a transmitter designed to transmit the first signal component obtained from the directional coupler through the material to be measured; that the detecting device comprises a receiver designed to receive the first signal component (I) after it has travelled through the material to be measured, a mixer provided with a first input gate (RF), a second input gate (LO) and an output gate (IF) and designed to receive the first component (I) from the receiver via its first input gate (RF) and the second component (II) directly from the directional coupler via its second input gate (LO) and to mix the signals applied to the input gates (LO) and (RF), to produce from the signal thus formed an intermediate frequency signal Δf corresponding to the delay and to output it through the output gate (IF); and the counting device is designed to control the oscillator and to measure the frequency of the intermediate frequency signal Δf obtained from the mixer output gate (IF) and to determine the moisture content value of the material under measurement from the intermediate frequency signal on the basis of a known interdependence of said signal Δf and the moisture content.

5,315,259

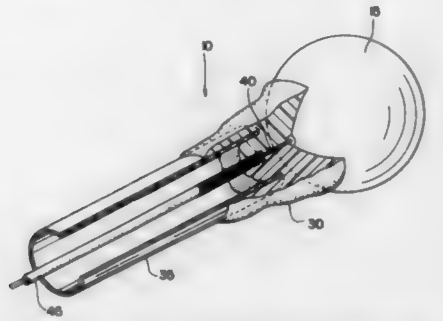
OMNIDIRECTIONAL CAPACITIVE PROBE FOR GAUGE OF HAVING A SENSING TIP FORMED AS A SUBSTANTIALLY COMPLETE SPHERE

Hans Jostlein, Naperville, Ill., assignor to Universities Research Association, Inc., Washington, D.C.

Filed May 26, 1992, Ser. No. 889,060

Int. Cl.⁵ G01R *27/26*

U.S. Cl. 324—690 **6 Claims**



1. An omnidirectional capacitive probe comprising:
  an electrically conductive hollow stalk;
  an electrically conductive spherical sensing tip disposed at one end of said hollow stalk, said spherical sensing tip formed as a substantially complete sphere;
  a wire coaxially disposed within said hollow stalk and electrically connected to said spherical sensing tip;
  a first voltage generating means for generating a first A.C. voltage between said spherical sensing tip and a workpiece; and
  a second voltage generating means for generating a second A.C. voltage between said hollow stalk and said workpiece, said first and second voltages being generally equal in phase and magnitude thereby to reduce the effect of stray capacitance on measurements made with said capacitive probe;
  said spherical sensing tip forming a capacitor with said workpiece when said spherical sensing tip is located in close proximity with the workpiece, the capacitor formed by said spherical sensing tip and the workpiece having a capacitance that is indicative of the distance between said spherical sensing tip and the workpiece, the capacitance of the capacitor formed by said spherical sensing tip and said workpiece being generally independent of the orientation of the spherical sensing tip with respect to the workpiece at distances less than the radius of said spherical tip.

5,315,260

APPARATUS FOR CONVERTING AN AC COMPONENT OF A SIGNAL TO A SQUARE WAVE

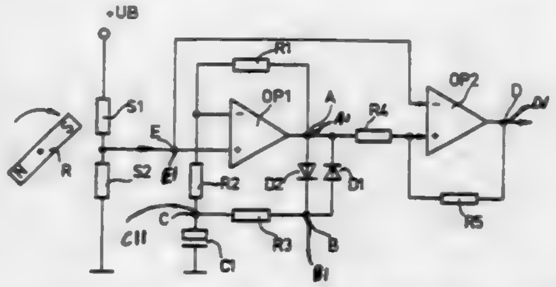
Hermann Link, Obereschach, and Walter Sturm, Ebersbach-/Fils, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jan. 18, 1991, Ser. No. 642,964

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824557

Int. Cl.⁵ H03K *5/00, 5/153, 5/08*

U.S. Cl. 328—28 **16 Claims**



1. An apparatus responsive to an input signal that is indicative of a rotation of a rotor of a motor for generating a square wave output signal that is indicative of said rotation of said rotor, comprising:
  a sensor coupled to said rotor for generating said input signal containing an AC component superimposed on an offset component;
  an operational amplifier responsive to said signal components of said input signal for generating an output signal of said amplifier;
  a resistor feedback network coupled to said amplifier for establishing a predetermined small signal closed-loop gain in said amplifier to control an amplitude of said output signal of said amplifier;
  a capacitor coupled to said feedback network for increasing said small signal closed-loop gain with respect to said AC component relative to said small signal closed-loop gain with respect to said offset component of said input signal;
  switching means for coupling in a feedback manner said output signal of said amplifier to said capacitor to develop in said capacitor a voltage that is coupled to a first input terminal of said amplifier at a magnitude that is determined in accordance with said offset component; and
  a comparator responsive to said output signal of said amplifier and to said input signal for generating said square wave signal in accordance with a difference therebetween.

5,315,261

COMPRESSING AND EXPANDING OPERATIONAL CIRCUIT WITH NO USE OF CLOCK SIGNAL

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 22, 1993, Ser. No. 7,791

Claims priority, application Japan, Jan. 22, 1992, 4-031523

Int. Cl.⁵ H03L *5/00;* **H03K** *5/01*

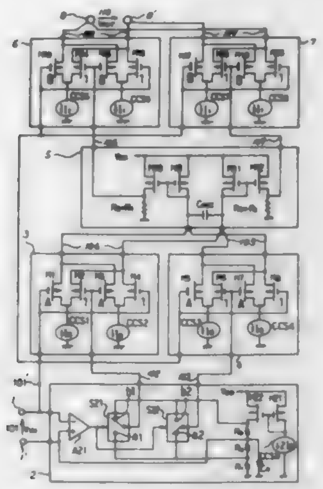
U.S. Cl. 328—168 **5 Claims**

1. An operational circuit to be used for a compressing or expanding circuit comprising:
  an input terminals pair;
  a polarity judging circuit which judges the polarity of an AC signal voltage to be applied to said input terminals pair thereby to generate and output a first DC signal and a second DC signal whose voltage difference is predetermined and different in polarity depending on the judgment of being positive and negative;
  a first differential amplifier circuit which differentially am-

plifies said AC signal and said first DC signal thereby to output a first differential output signal;

a second differential amplifier circuit which is equal in circuit structure to said first differential amplifier circuit and differentially amplifies said AC signal and said second DC signal thereby to output a second differential output signal;

an averaging circuit which obtains a rectified signal of said AC in response to said first and second differential output signals and averages said rectified signal thus obtained to generate an averaged rectified signal thereby to generate and output a first signal and a second signal in accordance with the averaged rectified signal, the difference of said first and second signals being dependent only on said averaged rectified signal and the sum of said first and second signals being independent of said averaged rectified signal;



a third differential amplifier circuit which differentially amplifies said AC signal and said first signal thereby to output a third differential output signal;

a fourth differential amplifier circuit which is equal in circuit structure to said third differential amplifier circuit and differentially amplifies said AC signal and said second signal thereby to output a fourth differential output signal; and

a differential output terminals pair which are applied with said third and fourth differential output signals so as to be opposite in polarity to each other thereby to output the product of said AC signal and said averaged rectified signal as its output signal.

5,315,262

DEMODULATOR ALIGNMENT METHOD AND APPARATUS

Gary Schulz, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1992, Ser. No. 941,286

Int. Cl.^{5} H03D *3/00*

U.S. Cl. 329—302 **25 Claims**

1. A demodulator alignment circuit comprising:

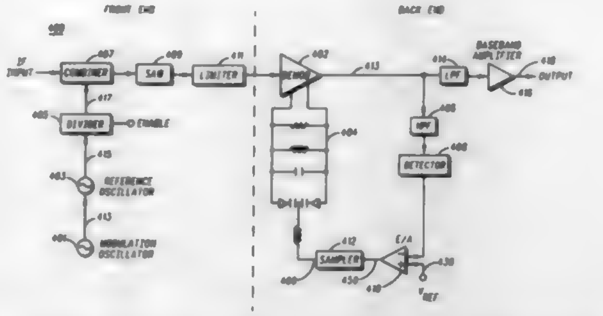
means, for generating an alignment signal in response to a modulation reference signal;

a demodulator, having voltage controlled delay element, coupled to the means for generating the alignment signal, for demodulating the alignment signal to produce a demodulated output signal having distortion components;

a base band amplifier, coupled to the demodulator, for amplifying the demodulated output signal;

a differential amplifier, coupled to the base band amplifier, for combining the amplified output signal with a delayed version of the modulation reference signal to form an error signal substantially representative of the distortion components; and

sampling means, coupled to the differential amplifier, for sampling the error signal and applying the sampled error signal to the voltage controlled delay element as a correction voltage in order to minimize the distortion components at the demodulator output.



5,315,263

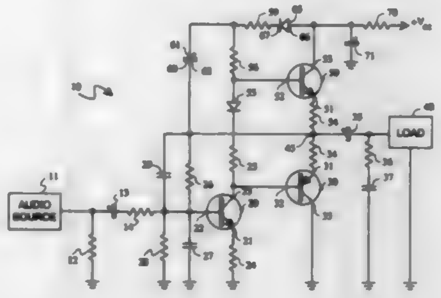
PUSH-PULL AMPLIFIER HAVING BOOTSTRAP CAPACITOR ISOLATION

Robert E. Mudra, Glenview, and Mark A. Scholten, Rolling Meadows, both of Ill., assignors to Zenith Electronics Corp., Glenview, Ill.

Filed Dec. 23, 1992, Ser. No. 998,280

Int. Cl.^{5} H03F *3/26*

U.S. Cl. 330—156 **6 Claims**



1. An amplifier operated from a source of supply voltage, said amplifier comprising:

a pair of complementary output transistors having emitter electrodes commonly coupled to form an output node and commonly coupled base electrodes;

a driver transistor having an input electrode, a common electrode and an output electrode coupled to said commonly coupled base electrodes;

means for coupling said input electrode of said driver transistor to a source of input signal;

a bootstrap capacitor having a first plate coupled to said output node and a second plate; and

an isolation switch coupled between said source of operating supply and said second plate of said bootstrap capacitor to decouple said bootstrap capacitor from said source of operating supply when the voltage upon said second plate of said bootstrap capacitor exceeds that of said source of operating supply.

5,315,264

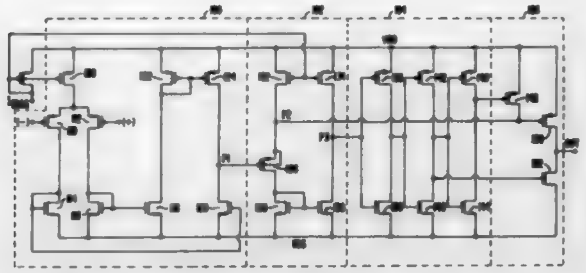
RAIL-TO-RAIL OPAMP WITH LARGE SOURCING CURRENT AND SMALL QUIESCENT CURRENT

James T. Sundby, Tracy, and Alexei N. Shkidt, Newark, both of Calif., assignors to Exar Corporation, San Jose, Calif.

Filed May 10, 1993, Ser. No. 60,148

Int. Cl.^{5} H03F *3/45*

U.S. Cl. 330—253 **11 Claims**



1. A CMOS operational amplifier coupled between a first and a second power supply rail, and having differential inputs and an output, comprising:

an input circuit having a differential pair input stage coupled to the operational amplifier differential inputs, and a folded rail-to-rail second stage with an output;

a negative slew detector having an input and an output, with said input coupled to said input circuit output;

a buffer circuit having an input coupled to said negative slew detector output; and

an output stage coupled to said buffer circuit and said negative slew detector, with an output coupled to the operational amplifier output.

5,315,265

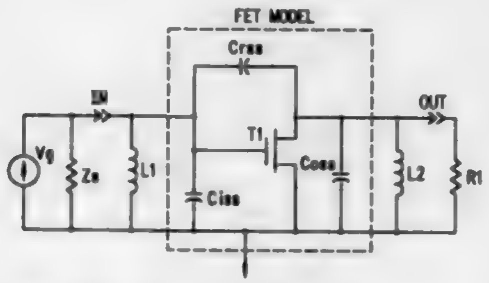
LOW INTERMODULATION DISTORTION FET AMPLIFIER USING PARASITIC RESONANT MATCHING

David S. Wisherd, and William H. McCalpin, both of Sunnyvale, Calif., assignors to Spectrian, Inc., Mountain View, Calif.

Filed Dec. 11, 1992, Ser. No. 989,449

Int. Cl.^{5} H03F *3/193*

U.S. Cl. 330—277 **2 Claims**



1. An RF power amplifier comprising:

a field effect transistor having a source, a drain, and a gate, a common-source input capacitance and a common-source output capacitance,

input circuit means for connecting an RF signal source having source resistance across said gate and said source, said input circuit means including an input inductor having a positive input reactance connected across said gate and said source, the reactance of said input inductor being equal in magnitude to the reactance of the common-source input capacitance,

output circuit means for connecting a load having a load resistance across said drain and said source, said output circuit means including an output inductor having a positive output reactance connected across said drain and said source, the reactance of said output inductor being equal in magnitude to the reactance of the common-source output capacitance, and

a negative feedback provided by a common-source capacitance between said gate and said drain, a feedback signal provided by said negative feedback being 180° with respect to forward gain of said amplifier.

5,315,266

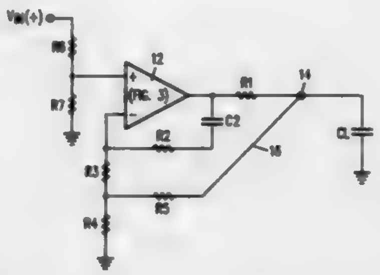
AMPLIFIER HAVING IMPROVED CAPACITIVE DRIVE CAPABILITY

Perry S. Lorenz, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 901,521, Jun. 19, 1992, abandoned. This application Jun. 4, 1993, Ser. No. 72,363

Int. Cl.^{5} H03F *1/34, 3/45*

U.S. Cl. 330—294 **3 Claims**



1. An amplifier having a low output impedance comprising:

a differential amplifier first stage having a first inverting input and a second noninverting input and an output;

a third stage having an input and a first output;

a second amplifier stage intermediate the first and third stages and coupling the output of the first stage to the input of the third stage, with the third stage and the second stage being implemented such that there is a negative voltage gain greater than unity between the output of the first stage and the first output;

a dominant pole capacitor which functions to establish a dominant pole in the frequency response to the amplifier, the dominant pole capacitor having one terminal connected to the output of the first stage and a second terminal connected to the first output and with the first stage, the second stage, the third stage and the dominant pole capacitor being implemented in a common monolithic integrated circuit; whereby the dominate pole capacitor provides a direct feedback path between the output of the first stage and the first output so as to reduce the open loop impedance of the amplifier stage at the first output;

a second output;

an isolation resistor coupled between the first and second outputs;

a second capacitor coupled between the first output and the first input; and

a feedback resistor coupled between the second output and the first input;

whereby the second capacitor creates a zero in the frequency response of the amplifier to compensate for a pole produced by any capacitive load coupled to the second output.

5,315,267

COMPOSITE DIFFERENTIAL DIRECT-COUPLED INSTRUMENTATION AMPLIFIER

William R. Chambers, Walnut, Calif., assignor to Neff Instrument Corporation, Monrovia, Calif.

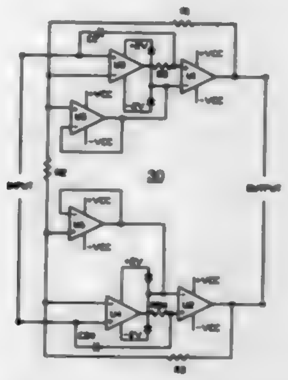
Filed Jan. 6, 1992, Ser. No. 817,863

Int. Cl.^{5} H03F *3/68*

U.S. Cl. 330—275 **11 Claims**

1. A differential instrumentation amplifier comprising a pair

of wideband operational amplifiers as output stages for two differential output signals, a pair of high performance DC operational amplifiers to buffer input signals to the output operational amplifiers and reduce offset voltage error by the amount of their DC gain, means for biasing the pair of high performance DC operational amplifiers to provide precision DC characteristics and eliminate common mode responses from the high performance DC operational amplifiers, and means for feeding forward high frequency AC input to the wideband operational amplifiers operating as output stages while eliminating common mode voltages in the high frequencies, in which the means for biasing the pair of high performance DC operational amplifiers to provide precision DC characteristics and eliminate common mode response from the high performance DC operational amplifiers comprises first and second floating voltage sources for applying voltage levels to each of the high performance DC operational amplifiers, means joining one terminal of each of the first and second floating voltage sources associated with each high performance DC operational amplifier to a biasing terminal of the high performance DC operational amplifier, and means for varying the voltage level at a second terminal of the first and second floating voltage sources to match a level at a non-inverting input to the associated amplifier.



5,315,268
AUDIO POWER AMPLIFIER

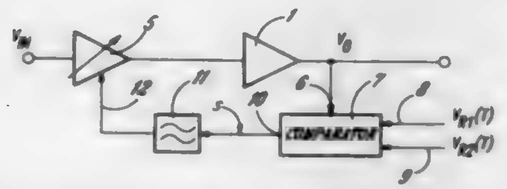
Edoardo Botti, Vigevano, and Claudio Tavazzani, Paiola, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

Filed Oct. 15, 1992, Ser. No. 962,488

Claims priority, application Italy, Oct. 18, 1991, TO91A000787

Int. Cl.⁵ H03F *1/52*

U.S. Cl. 330—298 **18 Claims**



16. A method of protecting a power amplifier from thermal overload damage, the method comprising the steps of:

(a) measuring a temperature value of the amplifier using a temperature sensor;
(b) generating a first reference voltage that varies in proportion to said temperature value;
(c) generating a second reference voltage that varies in proportion to said temperature value;
(d) comparing an output voltage from the amplifier to said first and second reference voltages, said first and second reference voltages defining a range of amplitudes of said output voltage; and
(e) varying the amplitude of said output voltage so that the amplitude of said output voltage is maintained within said range.

5,315,269
PHASE-LOCKED LOOP

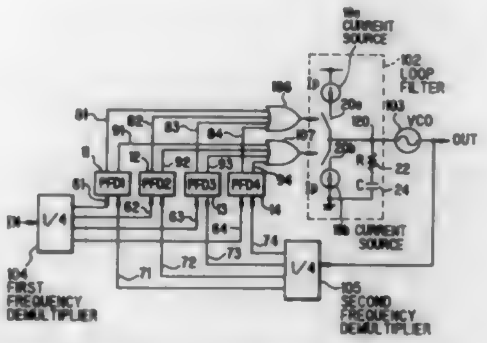
Takashi Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 31, 1992, Ser. No. 922,762

Claims priority, application Japan, Jul. 31, 1991, 3-215878

Int. Cl.⁵ H03L *7/00*

U.S. Cl. 331—1 A **5 Claims**



1. A phase-locked loop, comprising:

a first frequency demultiplier for dividing an input signal into first to N^{th} input divided signals, each of said first to N^{th} input divided signals having a predetermined phase difference relative to an input divided signal of an order subsequent thereto where N is an integer equal to or greater than two;

a second frequency demultiplier for dividing an output signal into first to N^{th} output divided signals, each of said first to N^{th} output divided signals having said predetermined phase difference relative to an output divided signal of an order subsequent thereto;

first to N^{th} phase comparators each comparing two phases between two corresponding first to N^{th} input and first to N^{th} output divided signals to provide a first or second phase difference signal dependent on a comparing result of said two phases;

a first gate circuit for passing said first phase difference supplied from each of said first to N^{th} phase comparators;

a second gate circuit for passing said second phase difference signal supplied from said each of said first to N^{th} phase comparators;

a loop filter for generating a voltage control signal which is increased in level by receiving said first phase difference signal passed through said first gate circuit, and decreased in level by receiving said second phase difference signal passed through said second gate circuit; and

a voltage controlled oscillator for generating a phase synchronous output signal by receiving said voltage control signal, said phase synchronous output signal being said output signal to be divided into said first to N^{th} output divided signals.

5,315,270
PHASE-LOCKED LOOP SYSTEM WITH COMPENSATION FOR DATA-TRANSITION-DEPENDENT VARIATIONS IN LOOP GAIN

Robert H. Leonowich, Muhlenberg Township, Berks County, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 28, 1992, Ser. No. 936,824

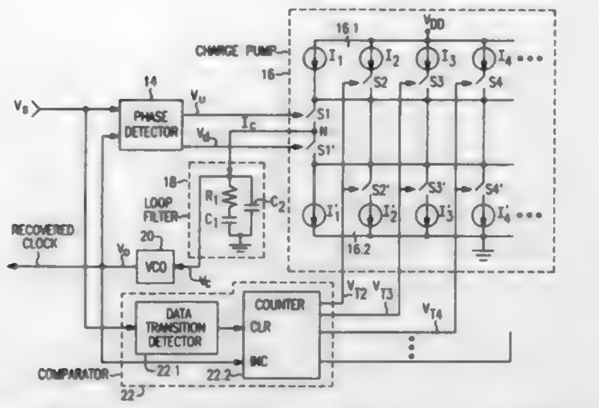
Int. Cl.⁵ H03L *7/089*

U.S. Cl. 331—1 A **18 Claims**

1. In a phase-locked loop system for locking a clock signal to an input data signal, a method characterized by the steps of:

(a) counting the number of clock signal transitions which occur between data signal transitions, and

(b) altering the loop gain of said system in response to said counting step (a) by injecting a current pulse into the loop only at said data transitions.



5,315,271
PROCESS AND DEVICE FOR SYNCHRONIZING TWO DIGITAL PULSE SEQUENCES S AND RF OF THE SAME HIGH FREQUENCY

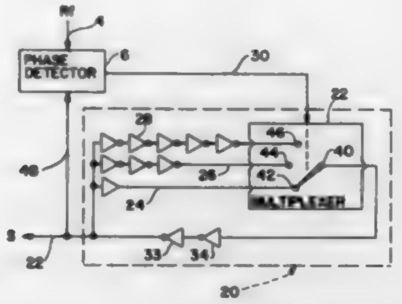
Nathalie Pascual, Prades le Lez; Christophe Fleury, Fontenilles; Georges Sagnes, Saint Gely du Fesc; Christian N'Guyen, Blagnac, and Jacques Lassale, Montpellier, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Continuation-in-part of Ser. No. 804,109, Dec. 6, 1991, abandoned. This application Jun. 8, 1992, Ser. No. 894,246

Claims priority, application France, Dec. 10, 1990, 90 15424

Int. Cl.⁵ H03L *7/085, 7/099*

U.S. Cl. 331—25 **6 Claims**



1. Synchronization process for maintaining in the vicinity of zero the average phase difference between two digital pulse sequences one of which is a selectable frequency sequence S and the other of which is a reference frequency sequence R_f, of the same high average fundamental frequency f consisting of:

using a first oscillator to provide the reference frequency sequence R_f of logic signals 0 and 1 at the constant fundamental frequency f;

using a second oscillator for supplying the selectable frequency sequence S of logic signals 0 and 1 on average at the constant theoretical fundamental frequency f and maintaining synchronism with the signals of the reference sequence R_f,

providing said second oscillator with means enabling it to supply the sequence of pulses S at a selected one of three fixed frequencies, namely;

a) the fundamental frequency f,

b) a second frequency f_1 slightly higher than the fundamental frequency f,

c) a third frequency f_2 slightly lower than the fundamental frequency f;

permanently comparing the phases of the selectable frequency sequence S and the reference sequence R_f using a phase detector in accordance with the following rules:

a) if the leading fronts of the reference sequence R_f pulses lead the leading fronts of the selectable frequency sequence S pulses by up to and including a first time T_{Rf} then the phase detector notes a synchronism state, and if the leading fronts of the selectable frequency sequence S pulses lag the leading fronts of the references sequence R_f pulses by more than the first time T_{Rf} then the phase detector notes a lag state;

b) if the leading fronts of the selectable frequency sequence S pulses lead the leading fronts of the reference sequence R_f pulses by up to and including a second time T_s then the phase detector notes the synchronism state, and if the leading fronts of the reference sequence R_f pulses lag the leading fronts of the selectable frequency sequence S pulses by more than the second time T_s then the phase detector notes a lead state;

controlling the second oscillator on the basis of information from the phase detector in such a way that it oscillates at:

the fundamental frequency f if the phase detector has noted a synchronism state,

the second frequency f_1 if the phase detector has noted the lag state, and

the third frequency f_2 if the phase detector has noted the lead state.

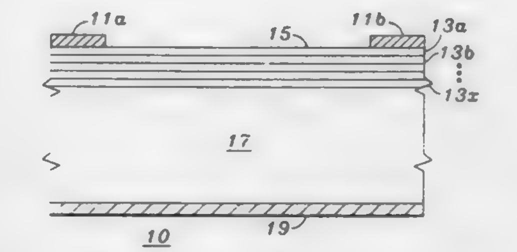
5,315,272
LIGHT EMITTING TUNNEL DIODE OSCILLATOR

William E. VonWicklen, Oxnard, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 26, 1993, Ser. No. 51,896

Int. Cl.⁵ H03B *7/00;* **H05B** *37/00*

U.S. Cl. 331—107 T **3 Claims**



1. A light emitting tunnel diode oscillator comprising a body of single crystalline material having a first portion n-doped and a second portion p-doped in such a way that the resulting p-n junction has the low voltage conductance characteristics of a tunnel diode as well as characteristics of light emission.

5,315,273
ATTENUATOR RELAY

Eddie L. Blair, Huntington Beach; John B. Brownwood, West Covina, and Delo K. K. Chun, Laguna Niguel, all of Calif., assignors to Teledyne Industries Inc., Los Angeles, Calif.

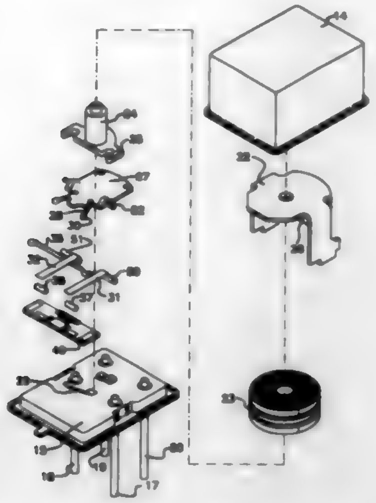
Filed Oct. 30, 1992, Ser. No. 969,435

Int. Cl.⁵ H03H *7/24*

U.S. Cl. 333—81 R **13 Claims**

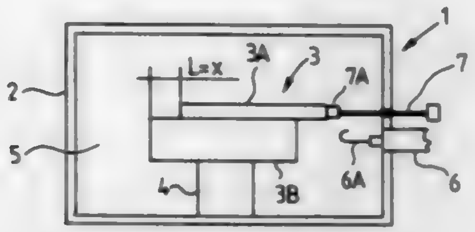
1. An attenuator relay comprising a standard enclosure for encapsulating a miniature electro-mechanical relay and circuitry; a miniature electro-mechanical relay having a number of contacts, the relay providing means for closing a first circuit

to allow current flow therethrough in a first condition; and means for closing a second circuit to allow current flow therethrough in a second condition; and an attenuator circuit connected in the first circuit and enclosed within the enclosure.



5,315,274
DIELECTRIC RESONATOR HAVING A DISPLACEABLE DISC

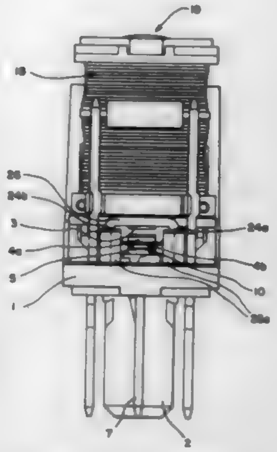
Veli-Matti Särkkä, Oulunsalo, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland
Filed Jan. 7, 1993, Ser. No. 960,403
Claims priority, application Finland, May 9, 1991, 912256
Int. Cl.⁵ H01P *7/10*
U.S. Cl. 333—219.1 **18 Claims**



1. A dielectric resonator comprising:
a first cylindrical dielectric disc having a first planar surface;
a second cylindrical dielectric disc having a second planar surface, said first surface and said second surface being in contact with each other;
means for displacing one of said first and second discs with respect to the other one of said first and second discs in a radial direction, parallel to said first surface and said second surface such that a resonance frequency of said resonator is adjusted.

5,315,275
ELECTROMAGNETIC RELAY AND METHOD OF ADJUSTING SAME

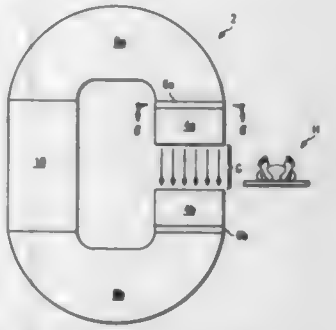
Wolfgang Hoffmann; André Körner, both of Lippstadt, and Maik Zimmer, Erwitte, all of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany
Filed Dec. 2, 1993, Ser. No. 160,198
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1992, 4243841
Int. Cl.⁵ H01H *51/22*
U.S. Cl. 335—86 **9 Claims**



1. An electromagnetic relay comprising:
a base plate;
a plurality of terminal tongues extending through said base plate, one of said terminal tongues being a normally-open contact tongue having a normally-open contact thereon, said normally-open contact tongue having a substantially L-shaped bend therein and including at least one finger extending laterally away from a main portion of said normally-open contact tongue;
a drawer-cavity-forming element positioned adjacent said main portion of said normally-open contact tongue for receiving said at least one finger and allowing sliding movement thereof during an adjustment stage of the position of said normally-open contact and including an affixing means for affixing said finger therein when said normally-open contact is in a desired position.

5,315,276
COMPACT SUPERCONDUCTING MAGNET FOR MAGNETIC RESONANCE IMAGING

F. Russell Huson; Sergio Pissanetzky, both of The Woodlands, Tex., and John D. Larson, III, Palo Alto, Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.
Filed Jan. 29, 1992, Ser. No. 827,378
Int. Cl.⁵ H01F *7/22*
U.S. Cl. 335—216 **18 Claims**

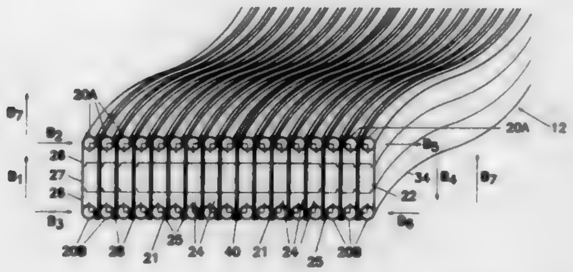


1. A superconducting magnet, comprising:

first and second superconducting coils, for generating a magnetic field across a gap therebetween;
first and second correction coils, disposed adjacent said first and second superconducting coils, respectively, on the opposing side thereof from said gap;
a magnetic return having first and second ends;
a first flux deflector, disposed between a first end of said magnetic return and said first correction coil, for guiding return magnetic flux between said magnetic return and said first correction coil; and
a second flux deflector, disposed between a second end of said magnetic return and said second correction coil, for guiding return magnetic flux between said magnetic return and said second correction coil.

5,315,277
VERTICALLY RIPPLED SUPERCONDUCTIVE MAGNETIC ENERGY STORAGE

Yehia M. Eyssa, Tallahassee, Fla.; Xianrui Huang, Lynchburg, Va., and Roger W. Boom, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed Aug. 21, 1992, Ser. No. 933,448
Int. Cl.⁵ H01F *1/00*
U.S. Cl. 335—216 **26 Claims**

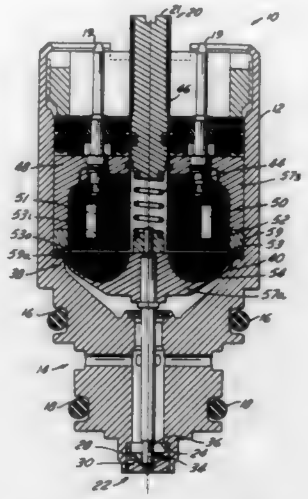


1. An electrical energy storage magnet, comprising:
(a) a coil of superconductive conductor arranged in turns in a layer about a central axis and having axially undulating ripples in the conductor;
(b) an inner support structure engaged with the turns of conductor to carry magnetically induced forces imposed on the conductor and axially undulating to match the conductor to which the support structure is engaged;
(c) a support wall formed of structural material which substantially surrounds the periphery of the coil layer and the inner support structure; and
(d) a plurality of support struts extending from the support wall to engage the inner support structure and oppose radial expansion of the inner support structure under magnetic forces imposed on the structure by the coil.

5,315,278
FILAMENT MAGNETIC FLUX CIRCUIT

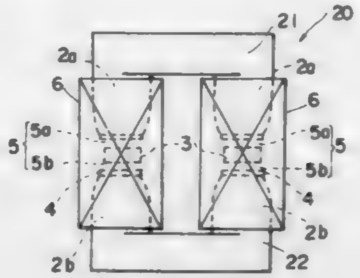
Sims B. Demere, Newport News; Benjamin F. Brinn, Jr., Williamsburg; John S. Bright, and Kenric J. Johnson, both of Newport News, all of Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.
Filed Jul. 30, 1992, Ser. No. 922,454
Int. Cl.⁵ H01F *5/00, 27/24;* **H02K** *33/00;* **F16K** *31/02*
U.S. Cl. 335—282 **17 Claims**

1. A solenoid comprising multiple convolutions of electrical conductor wire forming a tubular electromagnetic coil, a stator and an armature which are separated by a working gap and which, in cooperation with said working gap, form a closed path for magnetic flux issued by said electromagnetic coil when electric current flows through said conductor wire, said armature being arranged for linear motion along an axis toward and away from said stator so as to change the distance between them across said working gap as a function of current flow through said conductor wire, characterized in that one of said armature and said stator comprises a truncated toroidal winding composed of a multitude of individual magnetically permeable wires which are distributed collectively around said one of said armature and said stator and each of which individually has one end terminus disposed at a radially inner annular zone of said working gap and an opposite end terminus disposed at a radially outer annular zone of said working gap, and in that binding structure immovably binds said multitude of individual magnetically permeable wires together in said one of said armature and stator.



5,315,279
COIL DEVICE

Shinichiro Ito, and Yukiharu Kinoshita, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Feb. 22, 1991, Ser. No. 658,901
Claims priority, application Japan, Feb. 27, 1990, 2-48830; Oct. 2, 1990, 2-264251; Oct. 2, 1990, 2-264252
Int. Cl.⁵ H01F *17/04, 27/24*
U.S. Cl. 336—178 **4 Claims**



1. A coil device including magnetic cores of ferrite material having gap regions and a respective coil wound around each gap region, wherein a shape of at least one of the opposing magnetic cores defining a respective gap region has the same shape as seen from at least four side surfaces and is formed into a curve of a logarithmic function from a base end to an extreme end, said extreme end of said at least one magnetic core being providing with a gap adjusting flat surface and wherein a plurality of gaps are formed in at least one of said gap regions.

5,315,280

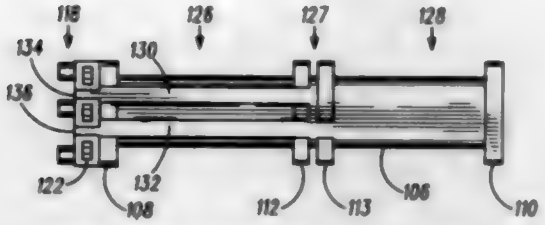
BOBBIN FOR ELECTRICAL WINDINGS

Rembert R. Stokes, Inverness, and Anand K. Upadhyay, Libertyville, both of Ill., assignors to Motorola Lighting, Inc., Buffalo Grove, Ill.

Filed Jun. 21, 1991, Ser. No. 719,224

Int. Cl.⁵ H01F *15/10*

U.S. Cl. 336—192 **23 Claims**



1. A bobbin for electrical windings, the bobbin comprising:
an inner portion for supporting a first electrical winding, the winding comprising an electrically conductive wire, therearound, the inner portion having a recess therein for receiving a magnetic core member; and
an outer portion for supporting a second electrical winding therearound and having a recess therein for receiving the inner portion;
wherein the inner portion further has:
an end for termination of the first winding;
a first annular recess therearound for receiving the first winding;
a first channel communicating between the end of the inner portion and an end of the first annular recess remote from the end of the inner portion, the channel being positioned radially inwardly of the first annular recess, the channel having a depth greater than the diameter of the wire; and
first winding maintaining means for maintaining the first winding proximate tot he bottom of the channel, such that an air gap is formed between a portion of the winding in the channel and the winding wound around the inner portion.

5,315,281

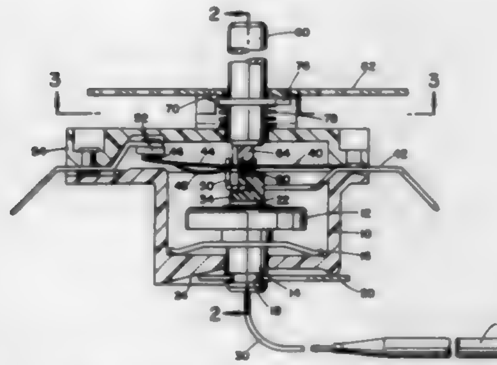
THERMOSTATICALLY CONTROLLED SWITCH

Mason B. Mount, Mansfield, Ohio, assignor to TPI Corporation, Gray, Tenn.

Continuation of Ser. No. 977,576, Nov. 17, 1992, which is a continuation-in-part of Ser. No. 841,592, Feb. 25, 1992, Pat. No. 5,173,679. This application Sep. 21, 1993, Ser. No. 124,888

Int. Cl.⁵ H01H *37/12, 37/36*

U.S. Cl. 337—319 **23 Claims**



1. A fluid controlled switch assembly comprising:
a first housing portion;
a diaphragm assembly including a diaphragm and diaphragm stud received in the first housing portion with the stud extending through an aperture in the first housing portion;
a calibration means for adjustably moving the diaphragm stud axially in the housing aperture, the calibration means being connected with the first housing portion and the diaphragm assembly;
an electrically conductive spring blade member having an elongated spring portion and a control spring portion, the spring blade member being mounted to the first housing portion adjacent one end of the spring member and including a control member connected with the control spring portion, the control member being operatively connected with the diaphragm such that the connecting spring portion is moved with movement of the diaphragm;
a stationary electrical contact supported by one of the housing portions, the spring portion supporting an electrical contact on a free end thereof for selectively at least breaking electrical contact with the stationary electrical contact in response to movement of the control member;
a reset means for selectively urging the contacts to close, the reset means being connected with the control member.

5,315,282

MAGNETORESISTANCE EFFECT ELEMENT

Teruya Shinjo, Uji; Hidefumi Yamamoto, Kobe, and Toshio Takada, Kyoto, all of Japan, assignors to Ube Industries, Ltd., Ube; Kanegafuchi Chemical Industry Co., Ltd., Osaka; Nippon Steel Corporation, Ohte; TDK Corporation, Tokyo; Tosoh Corporation, Shinnanyo; Toyo Boseki Kabushiki Kaisha, Osaka; Nippon Mining Co., Ltd.; NEC Corporation, both of Tokyo; Matsushita electgric Industrial Co., Ltd., Kadoma and Seisan Kaihatsu Kagaku Kenkyusho, Kyoto, all of Japan

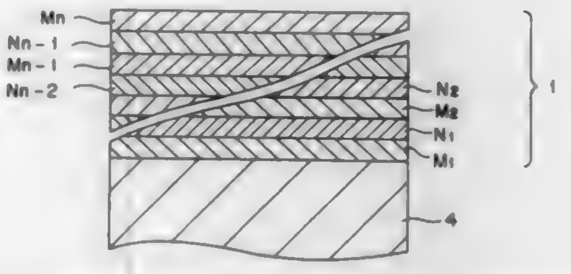
PCT No. PCT/JP91/00671, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO91/18424, PCT Pub. Date Nov. 28, 1991

PCT Filed May 20, 1991, Ser. No. 820,866

Claims priority, application Japan, May 21, 1990, 2-131602; Jun. 14, 1990, 2-155665; Sep. 12, 1990, 2-243076; Sep. 14, 1990, 2-244669; Apr. 11, 1991, 3-078824

Int. Cl.⁵ H01L *43/08*

U.S. Cl. 338—32 R **11 Claims**



1. A magnetoresistance effect element having a multilayer structure of the following layers:
[(a layer of an alloy comprising Ni and Fe)/(a layer of Cu or its alloy)/
(a layer of Co or its alloy)/(Cu or its alloy)]$_n$ wherein n is the number of the above multilayer structure and is an integer from 3 to 15, and a thickness of the layer of Cu or its alloy is from 30 to 55 Å.

5,315,283

STRUCTURE FOR VARIABLE ELECTRONIC COMPONENT

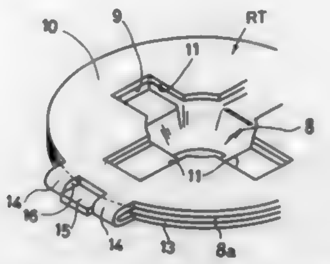
Tamotsu Yoshimura, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jun. 15, 1993, Ser. No. 76,747

Claims priority, application Japan, Jun. 24, 1992, 4-43826[U]

Int. Cl.⁵ H01C *10/30, 10/48*

U.S. Cl. 338—162 **5 Claims**



1. A variable electronic component comprising:
an insulating substrate; and
a rotor made of a metal plate and rotatably supported on the substrate for parameter adjustment of the electronic component, the rotor including a main rotor member and an upper plate member integral with the main rotor member via a connecting web which is bent so that the upper plate member overlaps on the main rotor member, the upper plate member having an engaging opening for engagement with a turning tool;
wherein the main rotor member is provided with a first engaging portion at a position spaced from the connecting web, the upper plate member being provided with a second engaging portion for engagement with the first engaging portion to prevent the upper plate member from angularly deviating relative to the main rotor member when the upper plate member is overlapped on the main rotor member.

5,315,284

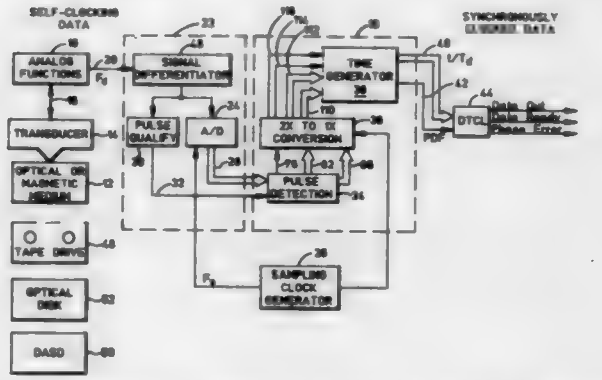
ASYNCHRONOUS DIGITAL THRESHOLD DETECTOR FOR A DIGITAL DATA STORAGE CHANNEL

Steven R. Bentley; Robert A. Hutchins, both of Tucson, Ariz.; Constantin M. Melas, Los Gatos, and Pantas Sutardja, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 995,849, Dec. 23, 1992, abandoned. This application Jun. 7, 1993, Ser. No. 73,921

Int. Cl.⁵ G05B *1/03;* **G06F** *7/02;* **H03K** *5/153*

U.S. Cl. 340—146.2 **35 Claims**



1. A method for asynchronous detection of the time t of a threshold transition in a signal waveform having a data clock rate F_d, said method comprising the steps of:
(a) sampling said signal waveform at a first clock rate $R_s=2F_d$ equal to the reciprocal of a first sampling interval T_s to create a plurality of digital sample signals {S} representing a series of instantaneous values of said signal waveform including an ith sample signal S_i and the preceding adjacent sample signal S_{i-1} where i is a nonzero positive integer;
(b) creating a detection signal responsive to a signal difference between said sample signal S_i and said sample signal S_{i-1};
(c) doubling said first sampling interval T_s to create a second sampling interval $T_d=2T_s$ equal to the reciprocal of said data clock rate F_d;
(d) creating a first digital signal corresponding to that half of said second sampling interval T_d in which said detection signal is located;
(e) creating a second digital signal by interpolating between said sample signal S_i and said sample signal S_{i-1}, wherein said second digital signal represents an estimate of the location t/T_s of said threshold transition within an ith said first sampling interval T_s; and
(f) combining said first and second digital signals to create a third digital signal representing the location t/T_d of said threshold transition within a contemporaneous said second sampling interval T_d.

5,315,285

ALARM SYSTEM FOR SENSING AND VOCALLY WARNING A PERSON APPROACHING A PROTECTED OBJECT

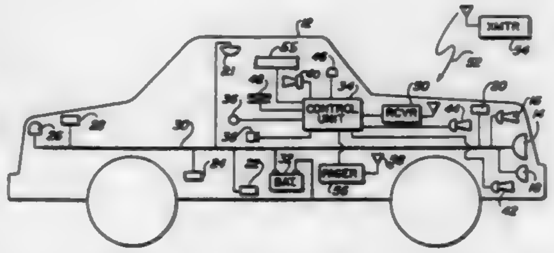
Michael Nykerk, Canoga Park, Calif., assignor to Electronic Security Products of California, Inc., Canoga Park, Calif.

Continuation of Ser. No. 610,402, Nov. 7, 1990, Pat. No. 5,117,217, which is a continuation of Ser. No. 423,987, Oct. 11, 1989, Pat. No. 4,987,402, which is a continuation-in-part of Ser. No. 260,933, Oct. 21, 1988, Pat. No. 4,897,630, which is a continuation-in-part of Ser. No. 5,873, Jan. 21, 1987, Pat. No. 4,794,368. This application Apr. 28, 1992, Ser. No. 875,061

The portion of the term of this patent subsequent to Nov. 7, 2007, has been disclaimed.

Int. Cl.⁵ B60R *25/10;* **B60Q** *1/00*

U.S. Cl. 340—426 **15 Claims**



1. A vocal alarm system for use with a vehicle comprising:
a first sensor that senses a person within a protected region around said vehicle;
a second sensor that senses a violation event made against said vehicle while said person remains within said protected region; and
an electronic voice generation circuit that generates a first vocal alarm message in response to sensing a person with said first sensor, and a second vocal alarm message in response to sensing a violation event with said second sensor.

5,315,286

VEHICLE SECURITY SYSTEM

Michael J. Nolan, 9135 Cherry La., La Plata, Md. 20646

Filed May 27, 1993, Ser. No. 67,597

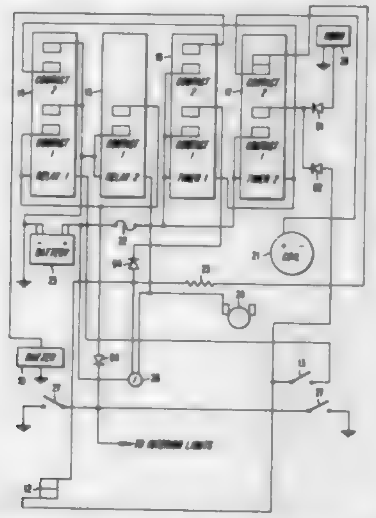
Int. Cl.⁵ B60R *25/10*

U.S. Cl. 340—426 **14 Claims**

1. A vehicle security system for a vehicle, said vehicle having an engine, a plurality of doors, a set of interior lights, a

starter, a coil, a starter solenoid coupled to the starter, and a battery having a positive terminal and a negative terminal, with the negative terminal coupled to a ground, a resistor, an ignition switch coupled to the starter solenoid and coupled to the positive terminal of the battery, and a horn having a first terminal coupled to the ground, the vehicle security system comprising:

- a first diode having a first terminal coupled to a second terminal of the horn;
- a second diode having a first terminal coupled to a second terminal of said first diode;
- a third diode having a first terminal coupled to the set of interior lights;
- a key switching having a first terminal coupled to a second terminal of said second diode;
- a push-button switch having a first terminal coupled to the first terminal of said key switch and a second terminal coupled to a first terminal of said resistor, said push-button switch having two contacts in a normally closed position, said push-button switch, responsive to being pushed, for initiating an engine standby mode by momentarily opening and returning to the closed position;
- a plurality of door switches, each of said plurality of door switches having a first terminal coupled to the ground, and each of said plurality of door switches having a second terminal coupled to the first terminal of said third diode;



- a buzzer having a first terminal coupled to the ground;
- a fuse having a first terminal coupled to the positive terminal of the battery;
- a fourth diode having a first terminal coupled to a primary terminal of the ignition switch;
- a first relay having a first terminal of a first set of contacts, said first set of contacts in a normally open position, and a first terminal of a second set of contacts, said second set of contacts in a normally open position, connected to the ground, the first set of contacts closing and the second set of contacts closing when activating said first relay;
- a second relay having a first terminal of a set of contacts, said set of contacts in a normally open position, connected to the ground and having a second terminal of the set of contacts connected to a second terminal of the first set of contacts of said first relay, the set of contacts of the second relay closing when activating said second relay;
- a first timer having a first terminal of a first set of contacts, said first set of contacts in a normally open position, and a first terminal of a second set of contacts, said second set of contacts in a normally open position, coupled to a second terminal of said fuse, having a second terminal of the first set of contacts coupled to a second terminal of said fourth diode, and having a second terminal of the second set of contacts coupled to a second terminal of said buzzer, with said first set of contacts closing and said set of contacts closing after a first predetermined-time delay after activating said first timer;
- a second timer having a first terminal of a first set of contacts, said first set of contacts in a normally opened position, coupled to the second terminal of said fuse, having a second terminal of the first set of contacts coupled to the second terminal of said first diode, having a first terminal of a second set of contacts, said second set of contacts in a normally closed position, coupled to a positive terminal of the coil, having a second terminal of the second set of contacts coupled to a second terminal of said resistor, said second timer having the first set of contacts closing and the second set of contacts opening after a second predetermined-time delay after activating said second timer;

wherein the second predetermined-time delay of said second timer is greater than the first predetermined-time delay of said first timer; and

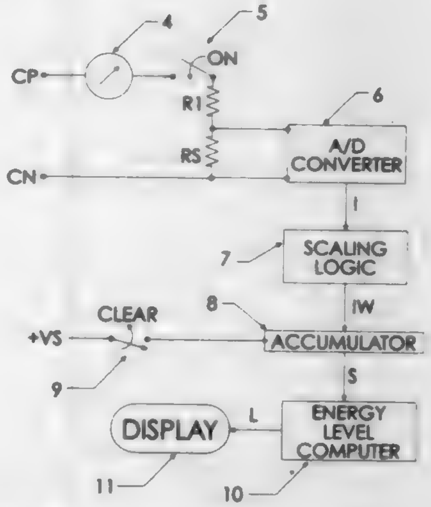
with said starter activating said second relay, at least one of said second relay or said plurality of door switches activating said first relay, and said relay activating said first timer and said second timer, said first timer initiating said buzzer, said push-button switch initiating the engine standby mode, and said second timer, responsive to an absence of the activation of said push-button switch, activating the horn and initiating engine cutoff.

5,315,287

ENERGY MONITORING SYSTEM FOR RECREATIONAL VEHICLES AND MARINE VESSELS

David Sol, 26500 W. Agoura Rd., Ste. 383, Calabasas, Calif. 91302

Filed Jan. 13, 1993, Ser. No. 3,576
Int. Cl.^{5} B60Q *1/00*
U.S. Cl. 340—455 9 Claims



1. An energy instrumentation and monitoring system for the on board cabin battery system of a recreational vehicle, marine vessel or a vehicle, the system comprising:

- a means coupled to said cabin battery system to generate a current flow signal responsive to the charge or discharge current of said cabin battery system;
- a means to generate an energy depletion signal responsive to integration over time of said current flow signal;
- a means to generate a stored energy signal responsive to the the differential of the total energy capacity of said cabin battery system and said energy depletion on signal;
- a means to generate an energy level signal responsive to the ratio of said stored energy signal to the total energy capacity of said battery system;

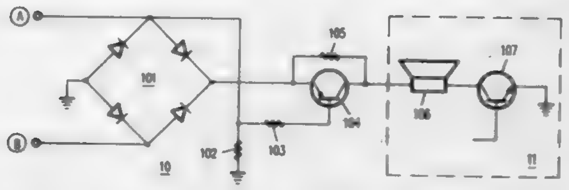
- a means to display said energy level signal responsive.

5,315,288

METHOD AND APPARATUS FOR CONTROLLING ELECTRIC CIRCUIT OUTPUT LEVEL IN BACKUP ALARMS LIGHTING FIXTURES, SENSORS AND THE LIKE

Mark T. Coward, Boise, Id., assignor to Electronic Controls Company, Boise, Id.

Filed May 24, 1991, Ser. No. 705,035
Int. Cl.^{5} B60Q *1/26*
U.S. Cl. 340—463 8 Claims



1. Apparatus for setting the power output level delivered to a load connected to an electrical circuit, when the polarity of applied power is reversed, said apparatus comprising:

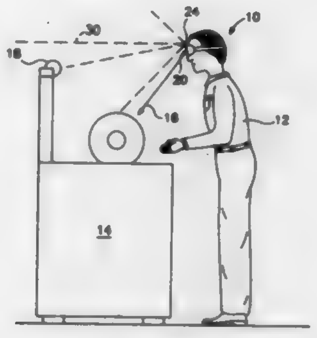
- power receiving means for receiving said applied power in a first or second polarity;
- conducting means, coupled to said power receiving means, for conducting power to the load connected thereto; and
- bias means, coupled to said power receiving means and to said conducting means, for setting the output power delivered to the load to a first power level when power is applied in said first polarity and for setting the power delivered to the load to a second power level when power is applied in said second polarity;
  - said first power level providing a first current flow to the load;
  - said second power level providing a second current flow to the load, said second current flow less than said first current flow;
  - wherein said apparatus provides said first power level and said second power level when the polarity of said applied power is reversed.

5,315,289

ANTICIPATORY INTERACTIVE PROTECTIVE SYSTEM

Terry A. Fuller, 944 Morgan Rd., Rydal, Pa. 19046, and Thomas Jennings, 5603 Benson Ter., Coloma, Mich. 49038

Continuation-in-part of Ser. No. 760,649, Sep. 16, 1991. This application Feb. 12, 1992, Ser. No. 834,445
Int. Cl.^{5} G08B *23/00*
U.S. Cl. 340—532 26 Claims



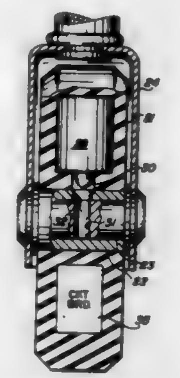
1. An interactive protective system to protect an individual from exposure to a dangerous condition, comprising a protective garment adapted to be worn by the individual, the protective garment including sensor means for sensing when the protective garment is being properly worn and signalling means responsive to the sensor means for actively generating a signal indicating that the protective garment is being properly worn, the system further comprising detector means responsive to the signal form the signalling means for detecting the signal, at least one sensor separate from the protective garment and responsive to positional change relative to the dangerous condition for arming an alarm, and control means responsive to the detector means for activating said armed alarm in the absence of detection of the signal.

5,315,290

CART THEFT PREVENTION SYSTEM

Raul G. Moreno, Phoenix, Ariz., and Paul J. Oster, Chino, Calif., assignors to Computron, Inc., Chino, Calif.

Filed Aug. 10, 1992, Ser. No. 926,304
Int. Cl.^{5} G08B *13/14;* B62D *39/00*
U.S. Cl. 340—568 12 Claims



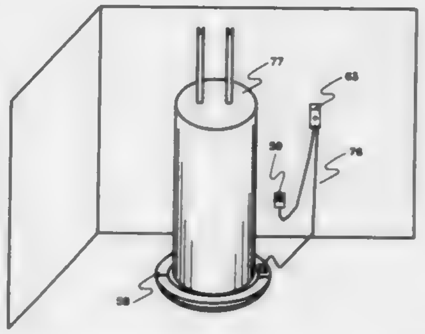
1. A wheeled cart immobilizing system comprising a cart, a wheel, a stationary axle supporting said wheel, said wheel being mounted so as to rotate on said axle whereby said cart is rendered mobile, said axle having an opening therein within the confines of said wheel, a solenoid device within the confines of said wheel, said solenoid device including an armature, said armature being positioned at one of first and second positions which are respectively outside and inside the opening in said axle for respectively allowing rotation of the wheel on the axle and locking the wheel against rotation on the axle, and means for activating the solenoid device to move said armature to said second position in response to movement of the cart out of a prescribed area.

5,315,291

LEAK DETECTION DEVICE

Mark A. Furr, P.O. Box 1393, Derry, N.H. 03038

Continuation-in-part of Ser. No. 830,937, Feb. 4, 1992. This application Dec. 23, 1992, Ser. No. 996,098
Int. Cl.^{5} G08B *21/00*
U.S. Cl. 340—605 6 Claims



1. A leak detection device for a liquid container comprising:

- a three layer sensor, having two detachable ring halves, dimensioned to encircle said liquid container, said sensor having a first layer, closest to said container, flexible and conductive, having a resistance ranging from 0 to 2 megohms, said sensor having a second layer, furthest from said container, flexible and conductive, having a resistance ranging from 0 to 2 megohms, and said sensor having a third layer, sandwiched between said first and second layers, said third layer nonconductive, wherein a leak in said container will cause the sensor to produce a signal corresponding to said leak by completing an electrical circuit through said first and second layers; and

wherein said sensor further comprises flexible and conductive strips with looped terminations, said looped terminations physically support said sensor and substantially conform to the contour of the surface said sensor rests on.

5,315,292

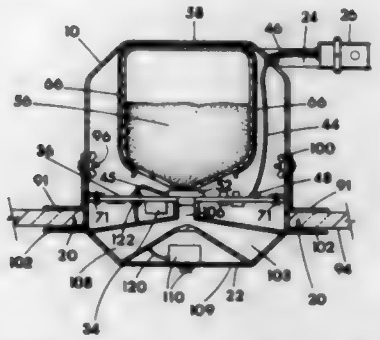
CEILING MOUNTABLE SMOKE DETECTOR AND FIRE EXTINGUISHER COMBINATION

Mitchell K. Prior, 13661 Blue Sky Rd., Bella Vista, Calif. 96008

Filed Jan. 11, 1993, Ser. No. 2,703

Int. Cl.⁵ G08B ***17/10***

U.S. Cl. 340—628 **1 Claim**



1. A combination smoke detector with an audible alarm and an automatic fire extinguisher for mounting in a ceiling of a room; comprising,

a housing having at least one open end, an outwardly extending flange attached to said housing adjacent said open end,

a junction box supported by said housing for making electrical connections therein, said junction box including means for accepting at least one electrical power cable from an external alternating current power source,

means for retaining at least one battery, an electric power supply means having means for electrical communication with a source of alternating current and with said battery, said electric power supply means being switchable between using alternating current and battery electrical power, said electric power supply means for properly conditioning and communicating electricity for operating a smoke detector means with audible alarm means,

said smoke detector means with audible alarm means attached to said housing, said smoke detector means with audible alarm means including means for sensing the presence of smoke, and sounding an audible alarm upon sensing smoke;

a pressurized canister containing fire retardant powder, said canister positioned within said housing and removably held therein by retention means, said canister having a dispensing opening aiming toward said open end of said housing,

a normally closed solenoid valve attached over said dispensing opening of said canister, said solenoid valve actuatable into an open position to release said fire retardant powder by way of electrical circuitry requiring both a condition of sensed smoke by said smoke detector means with audible alarm means and simultaneously a condition of abnormally high temperature,

a powder distributor positioned to receive fire retardant powder from said canister upon the opening of said solenoid, said powder distributor structured to distribute said fire retardant powder radially outward through a decorative trim plate attachable to said housing at said open end of said housing,

a first attachment means for attaching said housing to a building structure, said first attachment means including two sets of length adjustable attachment arms removably attached to said housing and having means in distal ends of said attachment arms to facilitate the fastening thereof with mechanical fasteners to structures of a building to support said housing,

a second attachment means for attaching said housing to a finished ceiling, said second attachment means including a plurality of cross-shaped apertures in said housing each positioned further from said opened end of said housing than said flange, each cross-shaped aperture sized cooperatively for receiving an L-shaped attachment clip inserted through said cross-shaped aperture from within an interior of said housing, each attachment clip having an affixed threaded stud extending therefrom in an oppositely disposed angle from a foot portion of said attachment clip, a nut on said threaded stud for securing said attachment clip stationary to said housing with said attachment clip positioned on the exterior of said housing and said foot of said attachment clip against a backside of a finished ceiling and said nut positioned within the interior of said housing.

5,315,293

OVERCURRENT DETECTING METHOD AND APPARATUS

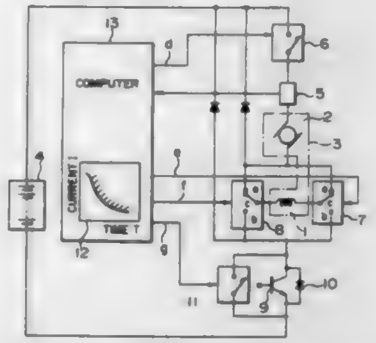
Toshikazu Kamiya, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed May 27, 1992, Ser. No. 889,142

Claims priority, application Japan, Jan. 11, 1991, 3-139222

Int. Cl.⁵ G08B ***21/00***

U.S. Cl. 340—664 **9 Claims**



1. A method of detecting occurrence of an overcurrent state in an electric circuit, comprising the steps of:

providing an overcurrent detection memory having an area therein capable of being defined along a time axis and a current axis, said area storing sets of data representing combinations of current values regarded as indicating overcurrent states in view of durations thereof and time values representing said durations;

periodically sampling an output of a current sensor adapted to detect the current flowing through said electric circuit at a selected time interval shorter than the duration represented by the time value paired with the maximum one of said current values stored in said memory area;

comparing the sampled value of said sensor output sequentially with said current values stored in said memory in descending order of magnitude, starting from the maximum one of said current values;

reading out from said memory the time value paired with the maximum one of the current values which are smaller than said sampled value; and

comparing the time value read out from said memory with the sum of said selected time intervals during which said sampled value has remained substantially constant, to thereby determine that said sampled value represents an overcurrent state, when said sum of said selected time intervals is equal to or greater than the duration represented by said read out time value.

5,315,294

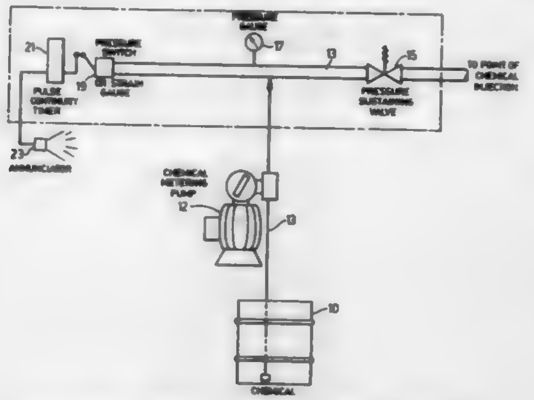
FLUID METERING VERIFICATION SYSTEM

Andrew S. Toth, Mississauga, Canada, assignor to Metex Corporation Limited, Weston, Canada

Filed Nov. 18, 1992, Ser. No. 978,417

Int. Cl.⁵ G08B ***21/00***

U.S. Cl. 340—679 **4 Claims**



1. A fluid metering verification system, comprising:

a fluid metering pump operable to meter a plurality of discrete quantities of a fluid from a fluid reservoir through a fluid conduit to a discharge site;

a pressure sustaining valve in the fluid conduit downstream of the fluid pump, the valve being adjustable to open at a desired threshold upstream fluid pressure and to close when the fluid pressure falls below the threshold level; and

pressure monitoring means in the fluid conduit downstream of the pump and upstream of the valve, the pressure monitoring means sensing periodic fluid pressure increases in the conduit corresponding to the periodic opening and closing of the valve and producing a signal if the periodic pressure increases stop for a specified time.

5,315,295

VEHICLE SPEED CONTROL SYSTEM

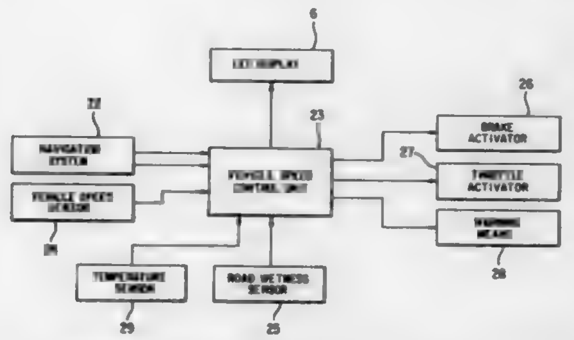
Yutaka Fujii, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 21, 1992, Ser. No. 822,285

Claims priority, application Japan, Jan. 18, 1991, 3-004590

Int. Cl.⁵ G08G ***1/01***

U.S. Cl. 340—936 **12 Claims**



1. A vehicle speed control system for a vehicle for use with a vehicle navigation system which indicates a location of the vehicle on a road map displayed on a screen as the vehicle travels and provides road information relating to curves, said vehicle speed control system comprising:

speed detecting means for detecting a speed of the vehicle;

vehicle speed control means for receiving information related to a curve in a road including at least the radius of curvature on which the vehicle is traveling when the vehicle navigation system indicates the vehicle is located at a predetermined location in front of said curve, calculating a limit vehicle speed, at which the vehicle can negotiate and pass safely through the curve, based on said speed of the vehicle detected by the speed detecting means and information related to said curve, comparing said speed of the vehicle with said limit vehicle speed, and responsive thereto causing at least one of a warning and deceleration of the vehicle to occur when said speed of the vehicle is higher than said limit vehicle speed.

5,315,296

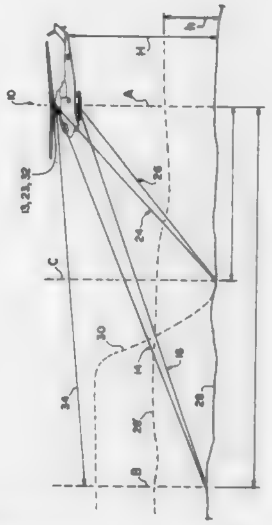
CUEING LIGHT CONFIGURATION FOR AIRCRAFT NAVIGATION

Mary K. Kaiser, Los Altos, and Walter J. Johnson, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 27, 1992, Ser. No. 935,939

Int. Cl.⁵ G08B ***21/00***

U.S. Cl. 340—946 **8 Claims**



1. A cueing light navigation system for an aircraft in substantially level flight, comprising:

a plurality of lower light sources projecting a plurality of light beams downwardly and forwardly from the aircraft at first and second angles relative to the aircraft; and

a plurality of upper light sources projecting a plurality of light beams downwardly and forwardly from the aircraft at third and fourth angles relative to the aircraft,

the plurality of light beams from the lower and upper light sources impinging on the ground in first and second clusters of light spots, each cluster having a predetermined pattern when the aircraft is at a nominal, predetermined altitude and flying over substantially featureless terrain,

each cluster pattern varying in accordance with one of the deviations from the nominal altitude and changes in terrain,

each of the plurality of lower light sources having a point of origin disposed below an eye point of a pilot of the aircraft, and

each of the plurality of upper light sources having a point of origin disposed above the eye point of the pilot of the aircraft.

5,315,297
LOW-LEVEL WIND-SHEAR ALERT SYSTEM

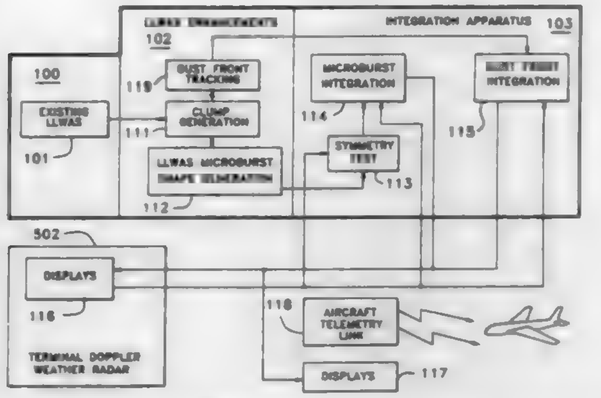
Lawrence B. Cornman, Boulder, Colo., assignor to University Corporation for Atmospheric Research, Boulder, Colo.

Division of Ser. No. 718,345, Jun. 19, 1991, Pat. No. 5,257,021. This application Feb. 25, 1992, Ser. No. 842,009

The portion of the term of this patent subsequent to May 4, 2000, has been disclaimed.

Int. Cl.⁵ G08B *23/00*

U.S. Cl. 340—968 **14 Claims**



1. A method of identifying the presence and locus of wind shear in close proximity to ground level in a predefined area based on wind measurements taken by an in-situ wind sensing system using a plurality of wind sensors, each of which is located at one of a plurality of wind sensing loci located in said predetermined area, each of said measurements being indicative of a wind magnitude and direction at a corresponding one of said loci, said method comprising the steps of:

collecting said wind measurements from said plurality of sensors;

producing wind shear shape data indicative of the bounds of wind shear events within said predetermined area based on said collected wind measurements to identify the presence and locus of wind shear in said predefined area, comprising:

mapping said collected wind measurements into a grid of data points, each of which is representative of said measured wind magnitude at a corresponding one of said loci and said predetermined area;

deleting all said mapped wind data points from said grid that whose wind magnitude does not exceed a predetermined threshold; and

bounding all contiguous ones of said mapped wind data points that remain in said grid following said step of deleting within a boundary of predetermined shape.

5,315,298
APPARATUS AND METHOD OF DISPLAYING CAR-NAVIGATING MAP

Kenji Morita, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1992, Ser. No. 964,449

Claims priority, application Japan, Oct. 29, 1991, 3-311671

Int. Cl.⁵ G08G *1/123*

U.S. Cl. 340—995 **4 Claims**

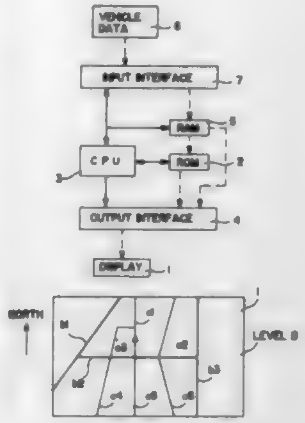
1. A method of displaying a map for a car-navigating map displaying apparatus, the car-navigating map displaying apparatus having a position detecting means for detecting a current position of a vehicle, a storage means for storing map data of at least two areas traveled by the vehicle represented at different levels of detailedness and a display means for displaying a map representing an area including the current position of the vehicle, the method of displaying a map comprising the steps of:

determining level of detailedness of map data of the area including the current position of the vehicle during travel of the vehicle;

causing said display means to display a map at the determined level of detailedness;

determining whether or not a screen of said display means currently displays maps having different levels of detailedness;

determining whether level of detailedness of a next area to be traveled by the vehicle is higher or lower than current level of detailedness;



displaying the maps at the lower level of detailedness when level of detailedness of said next area is determined to be lower than current level of detailedness; and

switching level of detailedness of a representation of a map in response to the magnitudes of areas present on the screen of said displaying means when level of detailedness of said next area is determined to be higher than current level of detailedness.

5,315,299
MULTIPLEX DATA COMMUNICATING APPARATUS APPLICABLE TO AUTOMOTIVE VEHICLE

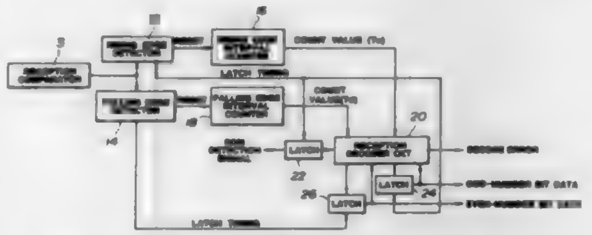
Takashi Matsumoto, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 8, 1993, Ser. No. 14,689

Claims priority, application Japan, Feb. 14, 1992, 4-059794

Int. Cl.⁵ H03M *5/08*

U.S. Cl. 341—53 **20 Claims**



1. A data communication apparatus, comprising:

a) signal transmitting means for coding a transmission data having a combination of bits "1" and/or "0" data into a communication signal based on an interval of time between a first rising edge and a subsequent rising edge, the rising edge being defined as the communication signal state changing from a relatively low potential level to a relatively high potential level and for outputting the communication signal to at least one signal transmission line;

b) first rising edge detecting means for detecting the rising edge of the communication signal inputted via the signal transmission line;

c) first rising edge interval of time measuring means for measuring the interval of time from a time at which the first rising edge detected by the first rising edge detecting means occurs to a time at which the subsequent rising edge occurs; and

d) decoding means for decoding the communication signal into either bit "1" or bit "0" according to the interval of time measured by the first rising edge interval of time measuring means.

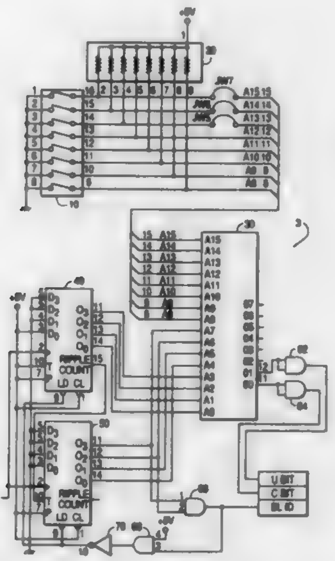
5,315,300
AES/EBU C BLOCK GENERATOR

David C. Schmidt, Jupiter, Fla., assignor to Sony Electronics Inc., Park Ridge, N.J.

Filed Sep. 29, 1992, Ser. No. 953,098

Int. Cl.⁵ H03M *7/00*

U.S. Cl. 341—55 **16 Claims**



1. An apparatus for selectively generating a data sequence, comprising:

means for generating a sequence signal for indicating a desired data sequence out of a plurality of possible data sequences;

means for counting a number of clock pulses and for generating a count signal corresponding to said number counted;

decoding means for selecting said desired data sequence out of said plurality of sequences based on said sequence signal; and

means, associated with said decoding means, for generating said bits of said desired data sequence in synchronism with said count signal;

wherein a bit of said desired data sequence is generated by said generating means when said number from said count signal corresponds to a position of said bit within said desired data sequence.

5,315,301
BINARY DATA GENERATING CIRCUIT AND A/D CONVERTER HAVING IMMUNITY TO NOISE

Shiro Hosotani; Takahiro Miki, and Masao Ito, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1992, Ser. No. 976,056

Claims priority, application Japan, Nov. 20, 1991, 3-304588

Int. Cl.⁵ H03M *1/06*

U.S. Cl. 341—94 **12 Claims**

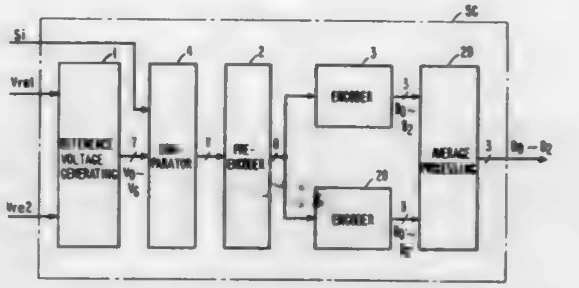
1. A n-bit analog to digital converter comprising:

voltage reference means for providing a plurality of voltage reference values;

comparator means for comparing said plurality of voltage reference values with an input voltage level and, in response, supplying thermometer code signals on a first plurality of output lines;

pre-encoder means receiving said thermometer code signals and, responsive to a signal level change from a first level to a second level on adjacent ones of said output lines, supplying decoded signals on a second plurality of output lines;

first binary encoder means receiving said decoded signals for supplying a first binary value representing a logical product of respective bits of binary representations of respective binary data corresponding to said decoded signals;



second binary encoder means receiving said decoded signals for supplying a second binary value representing the logical sum of respective bits of said binary representations of said respective binary data corresponding to said decoded signals; and

averaging means for adding said first and second binary values to form a sum of said first and second binary values and, in response to said sum, supplying a corrected binary output value.

5,315,302
RADAR DETECTOR

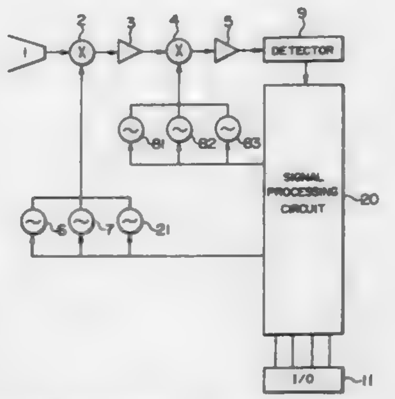
Shuichi Katsukura, Tokyo, and Mikio Iwakuni, Yachiyo, both of Japan, assignors to Uniden Corporation, Chiba, Japan

Filed Nov. 12, 1992, Ser. No. 974,466

Claims priority, application Japan, Apr. 16, 1992, 4-121051

Int. Cl.⁵ G01S *7/40*

U.S. Cl. 342—20 **26 Claims**



1. Apparatus suitable for use in a radar detector having an antenna horn for receiving radar waves including Ka-band radar waves, a heterodyne receiving system for selectively detecting at least ones of the Ka-band radar waves among the radar waves received by said antenna horn, and a signal processing circuit for activating a warning system to issue a predetermined warning based on a radar wave detection by said heterodyne receiving system, said apparatus comprising:

a Ka-band receiving means for selectively receiving the radar wave of said Ka-band;

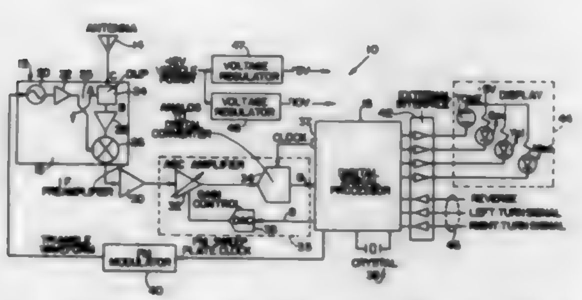
a leaked local oscillation wave receiving means for detecting leaked local oscillation waves radiated from other radar detectors which leaked local oscillation waves are of frequencies substantially corresponding to local oscillation signals used to receive X-band waves by a heterodyne method; and

wherein said signal processing circuit comprises means for inhibiting said warning system from issuing said predetermined warning when said leaked local oscillation wave receiving means has detected the leaked local oscillation waves after said Ka-band receiving means has detected the radar wave of said Ka-band.

5,315,303
COMPACT, FLEXIBLE AND INTEGRATED MILLIMETER WAVE RADAR SENSOR

Hai-Shen E. Tsou, Rancho Palos Verdes; Catherine L. Im, Torrance; Gregory A. Shreve, Torrance, and Martin M. LaCon, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 30, 1991, Ser. No. 767,953
Int. Cl.^{5} G01S *13/04*
U.S. Cl. 342—27 **17 Claims**



1. A compact highly integrated radar system for detecting objects within a desired field, said system comprising:

transceiver means including a monolithic millimeter wave integrated circuit (MMIC) transceiver having a transmitter for transmitting a frequency modulated (FM) carrier signal and a receiver for receiving reflected signals thereof, said MMIC transceiver having a circuit including oscillation, amplification and signal mixing means and integrated onto a single monolithic chip;

antenna means coupled to the transceiver means for transmitting said FM carrier signal and receiving said reflected signals within a desired field;

control means for controlling the dynamic range of said radar system; and

processor means including a digital signal processor coupled to the transceiver means for analyzing received signals so as to detect the presence of objects within the field.

5,315,304
DIGITAL MONOPULSE

Sam Ghaleb, and Michael Stokes, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1993, Ser. No. 86,424
Int. Cl.^{5} G01S *7/40*
U.S. Cl. 342—165 **4 Claims**

1. A digitally formed monopulse system having a transmission/calibration cycle and a receive cycle, said system comprising:

means for signal transmission to and return signal reception from an environment external to said system;

means for producing signals for external transmission and internal signal processing, said producing means connected to said means for signal transmission and reception, and to said means for internal signal processing;

means for diverting a portion of said signal produced for external transmission to said means for internal signal processing during said transmission/calibration cycle; and

means for internal signal processing comprising four signal processing channels for simultaneous processing of four-quadrant antenna transmit and receive signal information connected to said means for transmission and reception, said signal processing channels for calculating calibration factors reflecting system characteristics during the transmission/calibration cycle of said system, for calculating corrected signals received during the immediately following receive cycle, and for calculating the monopulse information derived therefrom and

wherein each of said channels provides in-phase and quadrature signals to a digital signal processor for production of calibration factors, where said in-phase and quadrature signals in one channel are used as the standard for correcting the other three channels to that standard in accordance with the following equations:

$$K(I2)=I(1)/I(2)$$

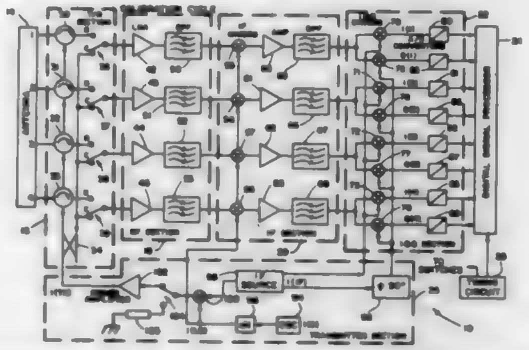
$$K(Q2)=Q(1)/Q(2)$$

$$K(I3)=I(1)/I(3)$$

$$K(Q3)=Q(1)/Q(3)$$

$$K(I4)=I(1)/I(4)$$

$$K(Q4)=Q(1)/Q(4)$$



where K(I2), K(Q2), K(I3), K(Q3), K(I4), K(Q4) are the calibration factors calculated as the ratio of the standard channel I(1) and Q(1) divided by each of the other channels I(2), Q(2), I(3), Q(3), I(4), and Q(4), and where during said receive cycle said means for digital signal processing uses the correction factors calculated during the calibration cycle to calculate the corrected signals received in accordance with the following equations:

$$I'(1)=I(1)$$

$$Q'(1)=Q(1)$$

$$I'(2)=I(2)\times K(I2)$$

$$Q'(2)=Q(2)\times K(Q2)$$

$$I'(3)=I(3)\times K(I3)$$

$$Q'(3)=Q(3)\times K(Q3)$$

$$I'(4)=I(4)\times K(I4)$$

$$Q'(4)=Q(4)\times K(Q4)$$

where the primes are the corrected values then used by said digital signal processing means to calculate the sum (Σ)

$$\Sigma=1+2+3+4$$

where 1, 2, 3, and 4 are the complex I and Q values for each channel, and where said digital signal processing means calculates

the delta pitch (Δp)

$$\Delta p=(1+2)-(3+4) \text{ and}$$

the delta yaw (Δy)

$$\Delta y=(1+3)-(2+4); \text{ and}$$

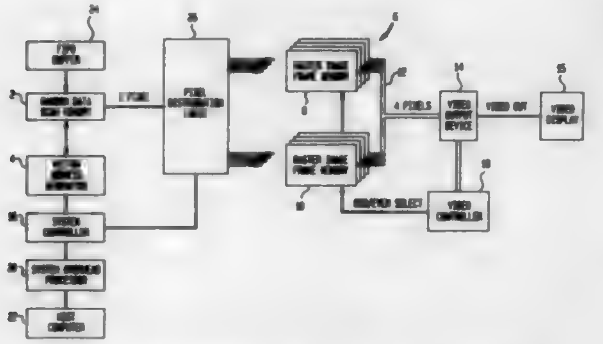
the delta diagonal (Δd)

$$\Delta d=(1+4)-(2+3).$$

5,315,305
SCAN CONVERTER FOR A RADAR DISPLAY

John M. Noll, Boca Raton, Fla., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Mar. 31, 1993, Ser. No. 41,014
Int. Cl.^{5} G01S *7/04;* **H04N** *7/01*
U.S. Cl. 342—185 **12 Claims**



1. A scan converter for a radar display comprising:

radar data scan memory means for storing radar data vectors;

vector address generator means using polar coordinate geometry for generating memory addresses of points along a defined radar data vector with the spacing of consecutive memory address points along said vector being variable, said vector address generator means providing a memory address output defining a pixel location in the radar data scan memory means using cartesian coordinate geometry, and said vector address generator means arranged to write radar scan data into the radar data scan memory means and to read raster image lines therefrom;

raster image frame memory means for storing raster image lines related to radar data vectors sampled from the radar data scan memory means;

controller means for synchronizing access of both the radar data scan memory means and the raster image frame memory means with the generation of memory addresses of points along the defined vector by the vector address generator means;

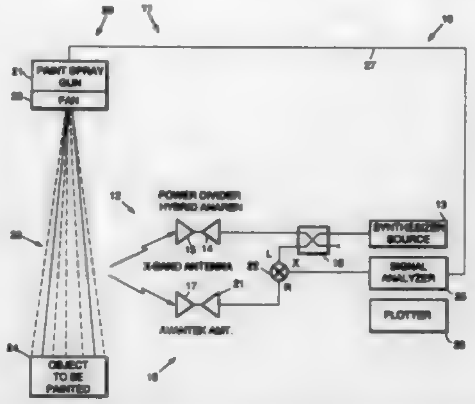
video controller means for controlling the raster image frame memory means for providing a pixel output and for synchronizing said pixel output with a video display means; and

processor means for interpreting commands and data from a host device, and for maintaining the generation of memory addresses of points along the defined radar data vector generated by the vector address generator by loading vector definitions parameters therein.

5,315,306
SPRAY PAINT MONITORING AND CONTROL USING DOPPLER RADAR TECHNIQUES

John K. Doughty, Redondo Beach; Gerald Brand, Los Angeles, both of Calif., and Jack Y. Josefowicz, Philadelphia, Pa., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 30, 1993, Ser. No. 100,511
Int. Cl.^{5} G01S *13/58, 7/40*
U.S. Cl. 342—192 **22 Claims**



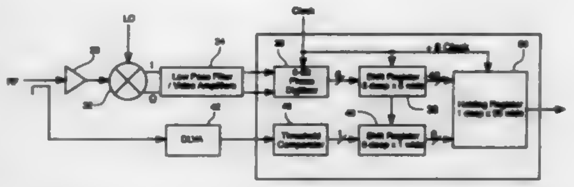
1. A spray paint monitoring system for optimizing the application of sprayed paint onto an object that is to be painted, said spray paint monitoring system comprising:

a Doppler radar comprising:
  a transmitter that includes a CW signal source coupled by way of a power divider to a power amplifier;
  a transmit antenna coupled to the power amplifier;
  a receiver comprising an RF preamplifier and a mixer, and wherein the mixer derives its local oscillator signal from the CW signal source of the transmitter; and
  a receive antenna coupled to the RF preamplifier; and
a signal analyzer coupled to an output of the mixer, for analyzing the Doppler return signals and displaying data indicative of the velocity of the paint particles.

5,315,307
DOPPLER FREQUENCY ANGLE MEASUREMENT TECHNIQUE

James B. Y. Tsui, Dayton; Rudy L. Shaw, Huber Heights, and Nicholas A. Pequignot, Kettering, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 18, 1993, Ser. No. 77,800
Int. Cl.^{5} G01S *7/36*
U.S. Cl. 342—444 **2 Claims**



1. A Doppler frequency angle measurement system using first and second antennas mounted on a vehicle, the antennas being coupled respectively to inputs of first and second receivers which measure phase angles, with digital outputs from the receivers coupled to digital processing means, to provide precise angle-of-arrival (AOA) and radio frequency measurements on radar signals from a non-cooperative transmitter;

wherein the antennas are separated by x meters, and the vehicle with the receivers is traveling at some velocity v at an angle θ relative to a line from the vehicle to the radar transmitter, the first and second antennas being designated as having positions 0 and 1 respectively, and the radar signals being measured at an initial time t_0 and a later time t_1;

wherein the receivers provide phase and quadrature phase channels;

wherein the measured phase angles are represented as

$$\theta_{0,0} = \omega\left(1 + \frac{v}{c}\cos\theta\right)t_0$$

$$\theta_{0,1} = \omega\left(1 + \frac{v}{c}\cos\theta\right)t_1$$

$$\theta_{1,0} = \omega\left(1 + \frac{v}{c}\cos\theta - \frac{x\cos\theta}{ct_0}\right)t_0$$

$$\theta_{1,1} = \omega\left(1 + \frac{v}{c}\cos\theta - \frac{x\cos\theta}{ct_1}\right)t_1$$

wherein for the angles the first subscript represents location and the second subscript represents time, ω is the angular velocity of the emitter, c is the speed of light; letting

$$b = \theta_{1,0} - \theta_{0,0} = -\frac{\omega x}{c}\cos\theta$$

and

$$a = \theta_{1,1} - \theta_{1,0} = \omega(t_1 - t_0)\left(1 + \frac{v}{c}\cos\theta\right)$$

with two unknowns ω and θ, solved to obtain results as

$$\cos\theta = \frac{-cb(t_1 - t_0)}{xa + vb(t_1 - t_0)}$$

$$\omega = \frac{1}{(t_1 - t_0)}\left[a + \frac{bv}{x}(t_1 - t_0)\right]$$

wherein $\omega = 2\pi f$ provides the radar signal frequency and θ is the angle of arrival (AOA).

5,315,308
METHOD FOR ELETROMAGNETIC SOURCE LOCALIZATION

Arye Nehorai, Branford, and Eytan Paldi, New Haven, both of Conn., assignors to Yale University, New Haven, Conn.

Filed Nov. 4, 1992, Ser. No. 971,304

Int. Cl.⁵ G01S *5/04*

U.S. Cl. 342—448 **14 Claims**

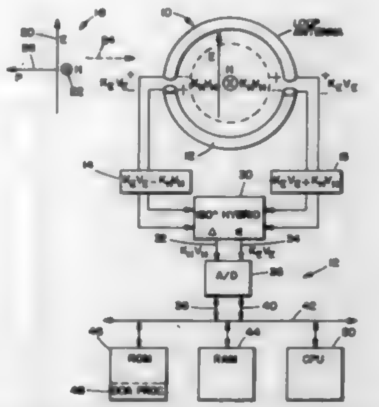
1. In a system including an antenna structure and a data processing system, a method for determining a direction of arrival (DOA) of an electromagnetic plane wave from a radiating source, said electromagnetic wave exhibiting a maximum wavelength much smaller than radiating source to antenna structure distance said method comprising the steps of:

(a) measuring and storing sets of electric and magnetic vector components from a received electromagnetic plane wave as sensed by said antenna structure, each set defining a plane in space;

(b) deriving direction vectors orthogonal to planes defined by said measured sets of electric and magnetic vector components;

(c) finding three dimensional components of each said direction vector;

(d) averaging like dimension components for a plurality of direction vectors; and



(e) determining said DOA by vectorially combining said averaged components.

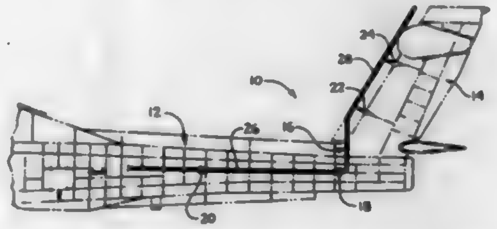
5,315,309
DUAL POLARIZATION ANTENNA

Richard W. Rudow, and Kenneth A. Wroblewski, both of Mesa, Ariz., assignors to McDonnell Douglas Helicopter Company, Mesa, Ariz.

Filed Sep. 6, 1991, Ser. No. 756,075

Int. Cl.⁵ H01Q *1/28*

U.S. Cl. 343—705 **12 Claims**



1. A passive dual polarization antenna for transmitting and receiving high frequency radio signals in the 2–30 MHz band comprising:

a horizontally polarized component; and

a vertically polarized component, said horizontally and vertically polarized components being formed of a single integral conductive element and being mounted on a structure, said integral element having a bend therein such that said horizontally and vertically polarized components have an angular orientation with respect to one another, said horizontally polarized component being oriented in a generally horizontal direction and said vertically polarized component being oriented in a generally vertical direction;

wherein said antenna is an open type electric field antenna, being electrically insulated from said structure, and is further capable of operating with both horizontally polarized and vertically polarized signals simultaneously.

5,315,310
CATHODE RAY TUBE DISPLAY APPARATUS

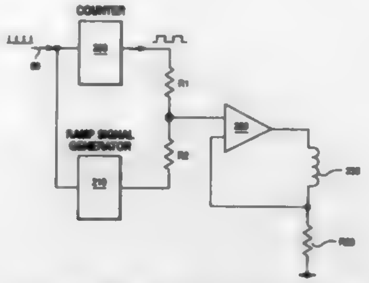
David J. Eagle, Chandlers Ford, England, and Andrew J. Morrish, West San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1992, Ser. No. 985,772

Claims priority, application United Kingdom, Dec. 19, 1991, 9126997

Int. Cl.⁵ G09G *1/06*

U.S. Cl. 345—14 **7 Claims**



1. Cathode ray tube display apparatus comprising:

a cathode ray tube display screen for displaying successive frames of a non-interlaced video image in response to excitation by a raster-scanned electron beam;

a line timebase circuit for sequentially addressing the electron beam to successive pixels on the screen in a line of a raster in response to a line timebase sync signal; and

a frame timebase circuit for sequentially addressing the electron beam to successive lines of the raster in response to a frame timebase sync signal;

characterized in that the frame timebase circuit comprises offset means for offsetting successive frames of the video image in a direction transverse of the lines of the raster by a distance less than the spacing of adjacent lines of the raster, wherein the offset means comprises a divide-by-two counter responsive to the line timebase sync signal for generating a square wave signal of half the frequency of the line timebase sync signal in such a manner that successive frames of the raster correspond to alternate levels of the square wave signal.

5,315,311
METHOD AND APPARATUS FOR REDUCING POWER CONSUMPTION IN AN AC-EXCITED ELECTROLUMINESCENT DISPLAY

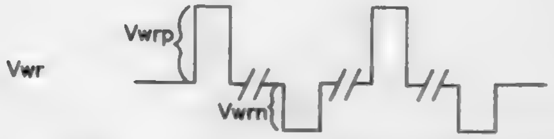
Jorma Honkala, Kauniainen, Finland, assignor to Planar International OY, Espoo, Finland

Filed Jun. 19, 1991, Ser. No. 717,396

Claims priority, application Finland, Jun. 20, 1990, 903103

Int. Cl.⁵ G09G *3/30*

U.S. Cl. 345—76 **8 Claims**



1. A method for driving an AC-excited thin-film electroluminescent display based on a display matrix of rows and columns wherein each row of the display matrix is alternately driven by pulses generated from positive and negative row drive voltages in which the magnitudes of successive pulses are different and wherein each column of the display matrix is driven individually by modulation voltage pulses synchronized to the row addressing sequence, the modulation voltage pulses having a variable amplitude and a polarity equal to that of the larger row drive pulse, the method comprising the steps of:

reducing the maximum amplitude of the modulation voltage during a limit-load situation of the display;

controlling the amplitude of the smaller magnitude row drive voltage pulse with feedback from the modulation voltage to increase the magnitude of the smaller row drive voltage pulse with a drop in the amplitude of the modulation voltage, the increase being essentially equal to the reduction in the modulation voltage; and

maintaining the higher amplitude row drive voltage pulse essentially constant to provide a constant luminescence to the display.

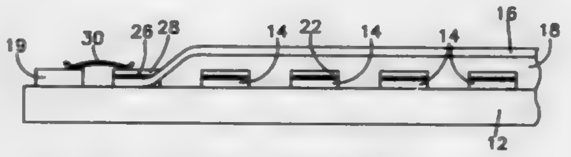
5,315,312
ELECTROPHORETIC DISPLAY PANEL WITH TAPERED GRID INSULATORS AND ASSOCIATED METHODS

Frank J. DiSanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Continuation of Ser. No. 999,570, Dec. 30, 1992, abandoned, which is a continuation of Ser. No. 696,169, May 6, 1991, abandoned. This application Aug. 18, 1993, Ser. No. 108,846

Int. Cl.⁵ G09G *3/34*

U.S. Cl. 345—107 **24 Claims**



1. An electrophoretic display comprising:

(a) a fluid tight envelope having a planar portion thereof which is at least partially transparent;

(b) an electrophoretic fluid contained within said envelope, said fluid having pigmented particles suspended therein;

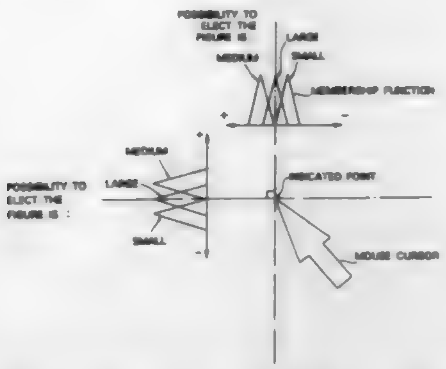
(c) a plurality of elongated substantially parallel cathode conductor members deposited upon said planar portion and contained within said envelope;

(d) a plurality of elongated substantially parallel grid conductor members contained within said envelope, said grid conductor members and said cathode conductor members defining a matrix with a plurality of intersections, and said grid and cathode conductor members being selectively electrically chargeable to induce movement of said particles within said fluid; and

(e) a plurality of elongated grid insulator strips interposed between and electrically insulating said cathode conductor members from said grid conductor members, each of said strips separating a respective grid conductor member from a corresponding cathode conductor member by a selected distance, each of said strips having a substantially planar top surface extending parallel to a base surface and an edge surface sloping downwardly from said top surface to said base surface, wherein said base surface is supported by said planar portion and a continuous surface portion of each grid conductor member is in contact with and supported by both said downwardly sloping edge surface and said planar portion.

5,315,313
DEVICE FOR ELECTING A FIGURE FROM AMONG FIGURES DEPICTED ON A DISPLAY DEVICE

Tomonori Shinagawa, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 6, 1992, Ser. No. 909,004
Claims priority, application Japan, Jul. 24, 1991, 3-184412
Int. Cl.⁵ G09G *3/02*
U.S. Cl. 345—145 **12 Claims**



1. A figure electing device for designating an elected figure which is elected by a pointer from among figures displayed in a figure display image plane, said pointer setting an indicating point in said figure display image plane and providing point information concerning said indicating point, said device comprising:

coordinates detecting means for receiving said point information and computing and providing coordinates of said indicating point;

figure detecting means for receiving said coordinates, detecting figures located in the vicinity of said indicating point, and providing figure information on individual detected figures;

figure determining means for receiving said figure information, determining said elected figure relying on said figure information, and providing election information concerning a figure that has been determined to be said elected figure; and

criteria providing means for holding and providing possibility information for election of a figure which is located at a relative position with respect to said indicating point, said possibility information being calculated by fuzzy inference based on fuzzy rules used in determining one figure among vicinal figures,

wherein, if said figure detecting means detects plural figures, said figure determining means receives possibility information for each of said plural figures and determines said elected figure from among said plural figures on the basis of which of said plural figures is located at a relative position having the most probable possibility of being elected.

5,315,314
VIDEO DISPLAY SYSTEM STORING UNPACKED VIDEO DATA IN PACKED FORMAT

Roy B. Harrison, East Wellow, and Roger T. Wood, Romsey, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 485,028, Feb. 26, 1990, abandoned.
This application Jan. 31, 1992, Ser. No. 830,538
Claims priority, application United Kingdom, Oct. 12, 1989, 892310457
Int. Cl.⁵ G09G *1/02*
U.S. Cl. 345—186 **2 Claims**

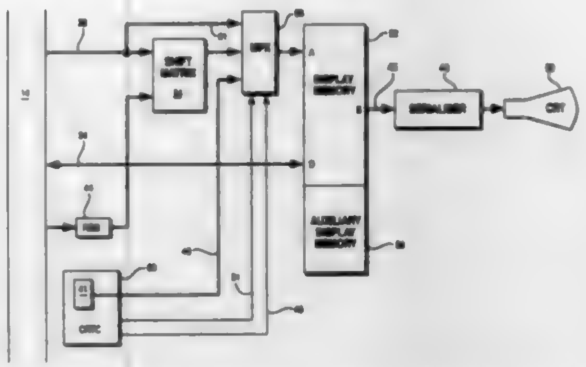
1. A video display system for processing unpacked input video information, said unpacked input video information comprising video data and corresponding non-sequential input video addresses, said display system comprising in combination:

a first memory having a data port and an address port, said data port receiving said video data;

memory mapping means for translating said non-sequential input video addresses to sequential write video addresses;

read address means for generating read addresses;

switch means for directing said write video addresses to said address port of said first memory when said switch means is in a first state, and for directing said read addresses to said address port of said first memory when said switch means is in a second state;



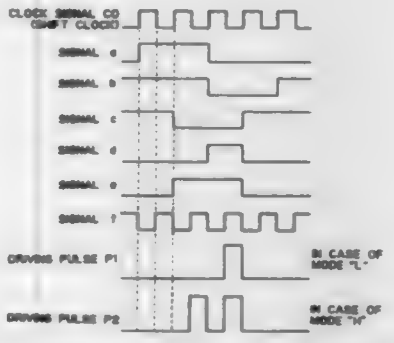
such that said video data is stored in said first memory in packed format when said switch means is in said first state, and said video data is read from said first memory when said switch means is in said second state;

a second memory having a data port and an address port, said data port of said second memory receiving said video data; and

wherein said switch means further comprises means for directing said non-sequential input video addresses to said address port of said second memory when said switch means is in a third state, such that said video data is stored in said second memory in unpacked format when said switch means is in said third state.

5,315,315
INTEGRATED CIRCUIT FOR DRIVING DISPLAY ELEMENT

Toshihiro Nakamura, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 21, 1992, Ser. No. 886,393
Claims priority, application Japan, May 29, 1991, 3-126044
Int. Cl.⁵ G09G *3/36*
U.S. Cl. 345—208 **17 Claims**



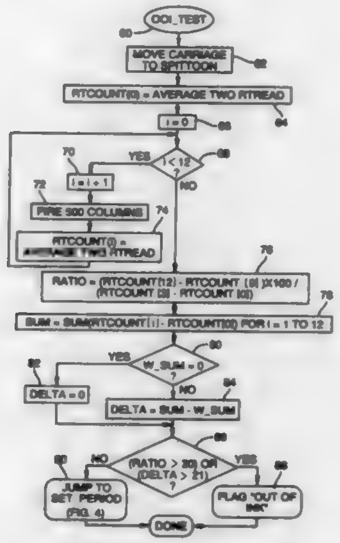
1. An integrated circuit for driving a plurality of scanning electrodes of a display element of matrix type, comprising:

driving pulse generating means, provided with a plurality of output terminals, each output terminal being connected to each scanning electrode of the display element, for outputting at least one driving pulse sequentially from each output terminal in response to a clock signal, so as to scan an entire display surface of the display element in one operation period; and

control means for controlling said driving pulse generating means to generate a plurality of driving pulses, having a same polarity during said one operation period, successively from each output terminal to prevent degradation of the control of the display element, said control means comprising a control gate for generating a clock signal and a control signal which is at a high level during the period corresponding to plural cycles of said clock signal and serves to determine the number of the plural driving pulses which are to be generated during said one operational period, successively from each output terminal, and a selector circuit for selecting either a first mode of the integrated circuit, in which said driving pulse generating means generates one driving pulse during one operational period for each output terminal, or a second mode of the integrated circuit, in which said driving pulse generating means generates a plurality of driving pulses successively during said one operation period for each output terminal.

5,315,316
METHOD AND APPARATUS FOR SUMMING TEMPERATURE CHANGES TO DETECT INK FLOW

Izadpour Khormaee, West Linn, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of Ser. No. 784,185, Oct. 29, 1991, Pat. No. 5,206,668. This application Jan. 4, 1993, Ser. No. 318
The portion of the term of this patent subsequent to Apr. 27, 2010, has been disclaimed.
Int. Cl.⁵ G01D *9/00, 15/18*
U.S. Cl. 346—1.1 **20 Claims**


DCI_TEST
MOVE CARRIAGE TO SPITTOON
RTCOUNT(0) = AVERAGE TWO RTREAD
I = 0
I < 12 ?
YES
NO
I = I + 1
FIRE 500 COLUMNS
RTCOUNT(I) = AVERAGE TWO RTREAD
RATIO = (RTCOUNT(12) - RTCOUNT (0))X100 / (RTCOUNT (2) - RTCOUNT (0))
SUM = SUM(RTCOUNT(I) - RTCOUNT(0)) FOR I = 1 TO 12
W_SUM = 0 ?
YES
NO
DELTA = 0
DELTA = SUM - W_SUM
(RATIO > 20) OR (DELTA > 21) ?
NO
YES
JUMP TO SET PERIOD (FIG. 4)
FLAG "OUT OF INK"
DONE

15. A method of detecting ink flow through a thermal inkjet printhead, comprising the steps of:

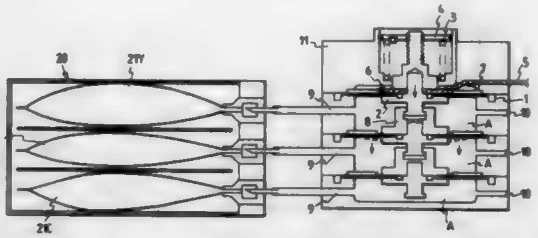
sensing a temperature of the printhead as the printhead prints;

summing the temperature of the printhead during the printing of a set of dots to determine a sum;

comparing the sum with a value to determine whether the ink flow through the printhead is sufficient for printing.

5,315,317
INK QUANTITY DETECTING DEVICE AND RECORDING APPARATUS WITH THE DEVICE

Koji Terasawa, Mitaka; Makoto Takemura; Takashi Nojima, both of Tokyo, and Akira Miyakawa, Tanashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 554,793, Jun. 28, 1990, abandoned.
This application Sep. 15, 1993, Ser. No. 121,251
Claims priority, application Japan, Jun. 29, 1989, 1-167614; Jun. 29, 1989, 1-167615
Int. Cl.⁵ G01D *9/00, 15/18;* **B41J** *2/01;* **G01F** *23/00*
U.S. Cl. 346—1.1 **28 Claims**



1. A device for detecting a decrease in ink amount, the device comprising:

a plurality of displacing members each provided on one of a plurality of corresponding ink chambers to be displaced in accordance with a decrease of ink in each said ink chamber;

a connecting member for connecting said plurality of displacing members to be displaced, when ink in at least one of said ink chambers decreases, in association with the displacement of said displacing member corresponding to said at least one ink chamber in accordance with the decrease of the ink, said connecting member including an integral conductive member;

an electrode fixed to a body of said device, said electrode being provided in a moving path of said conductive member; and

a biasing member for biasing said connecting member and said displacing members in a same direction and for biasing said conductive member to be in contact with said electrode,

wherein said conductive member remains in contact with said electrode when more than a predetermined amount of ink is contained in each of said ink chambers, and at least one of said displacing members is deformed in a direction against a direction of a biasing force of said biasing member and said connecting member is displaced in accordance with the movement of said at least one displacing member so that said conductive member is brought out of contact with said electrode when an ink amount in said ink chamber which corresponds to said at least one displacing member decreases and a pressure in said ink chamber becomes more negative than a predetermined pressure.

5,315,318
IMAGE FORMATION AND ERASURE ON AND FROM SCATTERING-MODE LIGHT-MODULATION DEVICE

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Miura; Tsutou Asakura, Yokohama; Yoshihisa Koyama, Yokosuka, and Hiroyuki Bonde, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Feb. 26, 1992, Ser. No. 842,032
Claims priority, application Japan, Feb. 28, 1991, 3-058265; Feb. 28, 1991, 3-058266
Int. Cl.⁵ B41M *5/26, 5/28*
U.S. Cl. 346—76 PH **11 Claims**

1. An image formation apparatus comprising:

a recording medium including a scattering-mode light-modulation member which takes an opaque state in response to heat and takes a transparent state in response to an electric field;

erasure-auxiliary means for heating said recording medium in accordance with a control signal from an external device so that the entire recording medium uniformly takes an opaque state;

erasure means for applying an electric field to said recording medium after heating of the recording medium by said erasure-auxiliary means; and

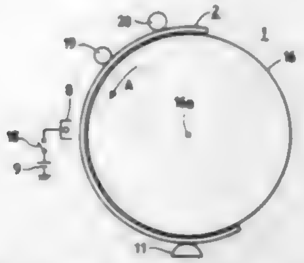


image-writing means for heating said recording medium in accordance with an information signal from the external device after application of the electric field to said recording medium by said erasure means.

5,315,319
THERMAL PLATE-MAKING APPARATUS AND THERMAL HEAD THEREFOR

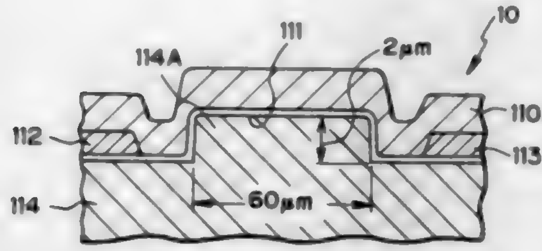
Mitsuo Sato, and Yusuke Tanno, both of Miyagi, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1992, Ser. No. 863,718

Claims priority, application Japan, Apr. 4, 1991, 3-071787; Jun. 19, 1991, 3-147572

Int. Cl.^{5} B41J *2/335*

U.S. Cl. 346—76 PH **6 Claims**



1. A thermal plate-making apparatus for forming dot perforations in a thermal screen original sheet composed of a thermoplastic resin film and a porous support, said apparatus comprising a line thermal head having a plurality of heat units in which the plurality of heat units are aligned at a predetermined pitch on a line in a primary scan direction, a pair of electrodes disposed at both opposed ends of each of said heat units in a secondary scan direction, means for contacting the line thermal head and the original sheet and means for relatively moving the original sheet past the line thermal head; wherein,

said line thermal head has a grace layer which has a protrusion at a portion thereof corresponding to a lower part of each of said heat units;

a length of said protrusion in the secondary scan direction is shorter than said predetermined pitch of two adjacent heat units of said heat units in the primary scan direction;

a width of said protrusion in the primary scan direction is not more than a width of each of said heat units in the primary scan direction; and

each of said heat units comprises a heating layer and a protection layer successively layered on the protrusion.

5,315,320
MIRROR IMAGE PRINTING PRINTHEAD

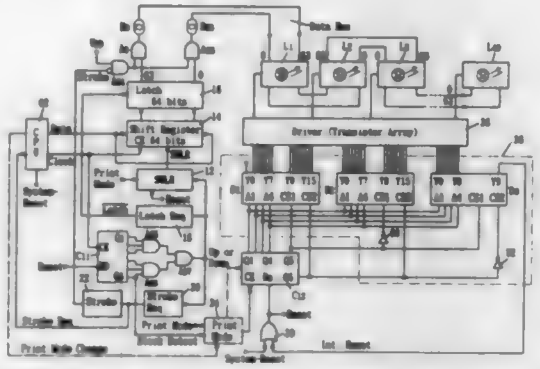
Shunji Murano, Aira, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Sep. 27, 1991, Ser. No. 766,838

Claims priority, application Japan, Sep. 29, 1990, 2-260767; Sep. 29, 1990, 2-260768; Sep. 29, 1990, 2-260769

Int. Cl.^{5} B41J *2/45*

U.S. Cl. 346—107 R **10 Claims**



2. A print head dividing one line printing into a plural number of printing line blocks for one line printing to achieve time sharing printing block by block, said print head being connected to signal supply means composed of a CPU for serially inputting prints data for each of the printing line blocks and clock pulses in synchronization with the print data, there being a selected number of clock pulses for the print data for each of the printing line blocks, and said print head comprising:

a print means for printing a pattern composed of successive parallel lines, each of said lines being composed of a plurality of dots in a row, in response to print data for each of said lines, said print means being divided into a plural number of print blocks, each associated with a respective one of the printing line blocks, one of said print blocks being a last print block and said print blocks being operated one at a time,

a storage means for storing print data inputted by serial transfer from said signal supply means,

a block detecting means for generating a block detect signal upon input of print data for one of said print blocks according to the selected number of clock pulses inputted in synchronization with the print data,

a block selecting means for selecting the print blocks of the print means individually and in sequence and driving the selected one of said print blocks according to the block detect signal for one line of printing so that said last print block is selected after selection of all of said print blocks other than said last print block,

a print data stop signal generating means for transmitting a print data stop signal to said signal supply means to stop transfer of print data from said signal supply means according to the block detect signal, a print data request signal generating means for outwardly transmitting a print data request signal after printing is performed by each of said print blocks of the print means to initiate transfer of print data from said signal supply means, and

a latch circuit for receiving print data for one of said print blocks which is being selected by said block selecting means, the print data being parallel-transferred from the storage means, and storing the print data therein, wherein the latch circuit receives print data for the selected one of said print blocks by parallel transfer when the block detecting means detects input of print data for the selected one of said print blocks, and the storage means receives print data for the one of said print blocks to be selected in sequence by said block selecting means upon completion of the parallel transfer of the print data for said selected one of said print blocks, wherein

after input of print data from the latch circuit to the last one of said print blocks selected by said block selecting means for performing printing on one line, the block detecting means receives a group of clock pulses containing the selected number of clock pulses from the signal supply means, and

the block selecting means is provided with a block number counting means for counting the block select signals from the block detecting means so that the block detecting means and the block selecting means will be reset to initial states whenever the block number counting means counts a number of blocks which is one greater than the number of print blocks for printing one line.

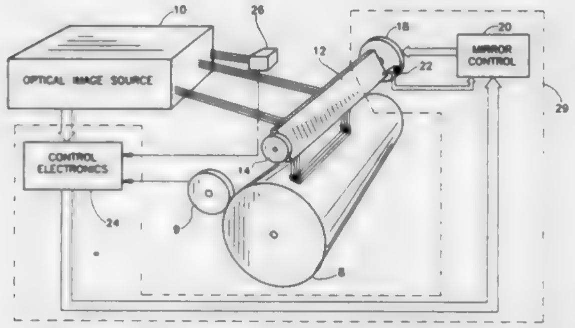
5,315,321
LASER SCANNING APPARATUS WITH A POSITIONABLE RELAY MIRROR

Shalom Peled, Rehovot; Abraham Greenberg, Rishon Le Zion, and Haim Livne, Kvar Saba, all of Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands

Continuation of Ser. No. 559,937, Jul. 30, 1990, Pat. No. 5,268,687. This application Jun. 8, 1993, Ser. No. 72,957

Int. Cl.^{5} H04N *1/21*

U.S. Cl. 346—108 **18 Claims**



1. Apparatus for optical imaging onto a moving surface comprising:

a movable surface for receiving an optical image;

means for measuring the movement of the surface and providing a surface movement reference signal;

optical image producing means operative to produce at least one scanning optical beam for scanning said surface and to provide a timing reference signal, wherein during a given time period at least a portion of the surface is scanned;

a positionable relay mirror located so as to reflect said at least one scanning optical beam onto the moving surface;

positioning means responsive to the relationship between the surface movement reference signal and the timing reference signal for positioning said mirror to ensure proper placement of the optical scanning beam on the movable surface; and

means for resetting the positionable relay mirror to a reference position at the end of the given period.

5,315,322
IMAGE FORMING APPARATUS WITH ANTI-BANDING IMPLEMENTATION

Kazunori Bannai, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 659,609, Feb. 21, 1991, abandoned. This application Jun. 16, 1993, Ser. No. 76,942

Claims priority, application Japan, Feb. 21, 1990, 2-38448; Feb. 28, 1990, 2-45824; Feb. 28, 1990, 2-45825; Oct. 24, 1990, 2-284141

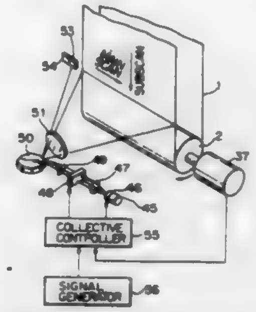
Int. Cl.^{5} G01D *9/42*

U.S. Cl. 346—108 **6 Claims**

1. An image forming apparatus for forming an image by deflecting a laser beam having been modulated by an image signal by a rotary polygonal mirror onto a photoconductive element to electrostatically form a latent image and then developing said latent image, said apparatus comprising:

position detecting means for detecting an incident position where the laser beam is incident to the photoconductive element in both a main scanning direction and a subscanning direction;

distance detecting means for detecting a distance which the photoconductive element moves in a period of time corresponding to a subscanning pitch interval; and



correcting means for correcting banding due to a variation in speed of the photoconductive element by comparing an output signal of said distance detecting means and a set signal stored beforehand and then deflecting the laser/-beam in a subscanning direction by a correction signal which is based on a sum of a difference between said output signal and said set signal, a sum of differences as measured from the beginning of writing and on said detected incident position, said correcting means updating said set signal every time a copy is produced.

5,315,323
COLOR IMAGE FORMING APPARATUS WITH MEANS FOR BIASING A RECORDING HEAD

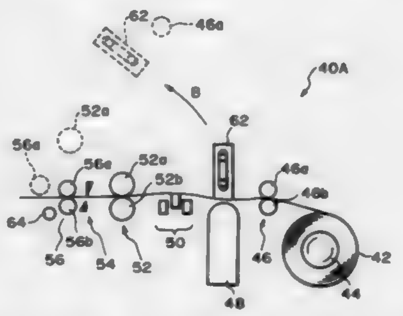
Kiyoshi Ohshima; Yoshiyumi Tamiya, both of Yokohama; Kenichi Shimizu; Tadahiro Suzuki, both of Kawasaki, and Kazuaki Iizuka, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 20, 1992, Ser. No. 854,905

Claims priority, application Japan, Mar. 22, 1991, 3-058800

Int. Cl.^{5} G01D *15/06*

U.S. Cl. 346—159 **11 Claims**



1. An image forming apparatus for forming an image on a recording medium being transported under tension, comprising:

a pair of rollers holding the recording medium under tension;

an ion-flow record head writing an image on the recording medium being transported by said pair of rollers;

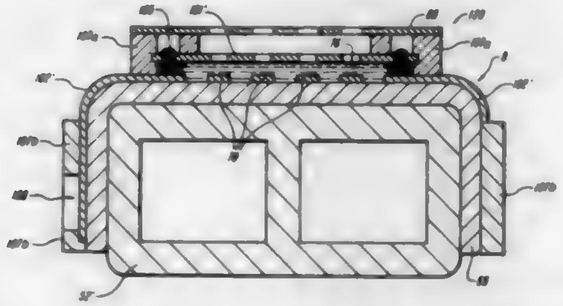
a guide member located to face said ion-flow head and guiding the recording medium while urging said recording medium; and

positioning means for maintaining said guide member at a predetermined position relative to said ion-flow record head said positioning means including means associated with said guide member for urging said guide member in a first direction and at least one positioning member disposed between said guide member and said record head for preventing movement of said guide member in said first direction beyond a predetermined spaced relationship between said guide member and said ion-flow record head.

5,315,324
HIGH PRECISION CHARGE IMAGING CARTRIDGE

Igor Kubelik, Mississauga, and Michael Simmonds, Caledon East, both of Canada, assignors to Delphax Systems, Canton, Mass.

Filed Dec. 9, 1992, Ser. No. 987,623
Int. Cl.^{5} G01D *15/06*
U.S. Cl. 346—159 **9 Claims**



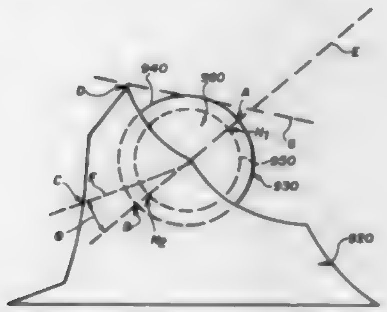
1. A charge deposition device for forming a latent charge image on a member spaced proximate thereto, by selective actuation of electrodes of the device to release charge at discrete charging sites thereof, the device being deformed during manufacture, characterized in having plural electrodes arranged in layers that are aligned with each other to define charging sites, and having a set of electrodes in one layer extending at least partially through a deformed region of the device wherein the electrodes of the set each include

a first electrode portion defining some of said charging sites,
a separate second electrode portion extending at least partially through the deformed region, and
conductive means interconnecting said first and second electride portions, said conductive means being attached thereto after deformation of the device such that strain of deformation does not misalign the first electrode portion.

5,315,325
LASER PRINTER CARTRIDGES

James W. Strouth, Simsbury, Conn., assignor to Recycling Technologies International Corporation, Springfield, Mass.

Filed Aug. 20, 1991, Ser. No. 747,552
Int. Cl.^{5} G03G *21/00*
U.S. Cl. 346—160.1 **28 Claims**

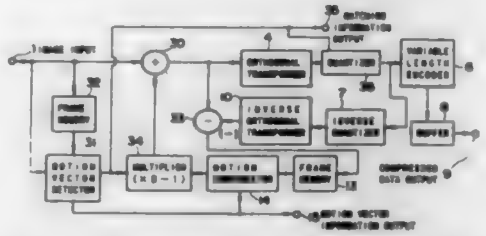


1. A laser printer cartridge comprising:
a housing;
a toner supply located in the housing;
a photosensitive drum rotatably mounted in the housing on a first axis of rotation;
a developer cylinder rotatably mounted in the housing on a second axis of rotation parallel to the first axis of rotation, the developer cylinder rotating relative to a toner pickup region located adjacent the toner supply, wherein toner is transferred to the developer cylinder from the toner supply, and a toner release region located adjacent the photosensitive drum, wherein toner is transferred from the developer cylinder to the photosensitive drum;
a metering structure located adjacent the developer cylinder between the toner pickup region and the toner release region, said structure removing from the developer cylinder excess toner thereon transferred from the pickup region, to provide a metered depth of toner on the developer cylinder;
a magnetic member located internal to and coaxial with the developer cylinder, establishing therein magnetic poles, the magnetic member being rotationally fixed on the second axis of rotation relative to the developer cylinder; and
a pair of end caps supporting each of the developer cylinder and the magnetic member, at opposite ends thereof, in the housing, at least one of the end caps and the magnetic member being constructed and arranged so that the magnetic member is freely rotatable on the second axis of rotation relative to the housing and is fixable in a desired rotational orientation relative to the housing whereby the magnetic poles are adjustably positionable to a desired rotational location relative to the pickup region and the release region, allowing control of a magnetic field at the pickup region and the release region.

5,315,326
EFFICIENT CODING/DECODING APPARATUSES FOR PROCESSING DIGITAL IMAGE SIGNAL

Kenji Sugiyama, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 24, 1992, Ser. No. 873,949
Claims priority, application Japan, Apr. 26, 1991, 3-125393
Int. Cl.^{5} H04N *7/12*
U.S. Cl. 348—415 **5 Claims**



1. An efficient coding apparatus for use in a coding processing utilizing correlation between frames or fields of an image signal, comprising:

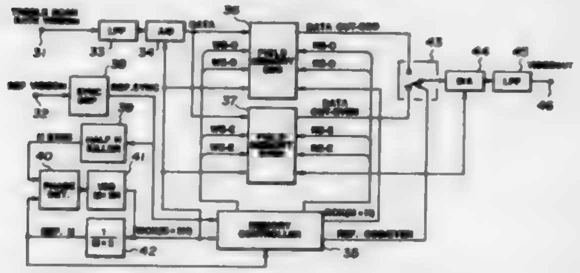
means for obtaining a signal component including a negative error signal provided by subtracting a reproduced image signal obtained by coding/decoding from an original image signal which has not undergone interframe/interfield coding processing, and
means for adding the signal component including the negative error signal to input image signals of other frames or fields; and further comprising:
means for coding said image signal to output a coded signal, said means for coding comprising an orthogonal transformer and a quantizer, wherein said orthogonal transformer orthogonally transforms a predictive residual every block consisting of a plurality of pixels to output a transformed signal, and said quantizer quantizes said transformed signal to output a quantized signal as said coded signal;

means for decoding said coded signal to output a decoded signal, said means for decoding comprising an inverse quantizer and an inverse orthogonal transformer, wherein said inverse quantizer performs an inverse-quantization on said coded signal to output an inverse-quantized signal, and said inverse orthogonal transformer performs an inverse-orthogonal-transformation on said inverse-quantized signal to output said decoded signal;
subtraction means for generating said negative error signal which occurs in an intraframe coding/decoding processing by subtracting said decoded signal from said image signal; and
a frame memory for storing said negative error signal for future use in compensating for a motion of said image signal.

5,315,327
HIGH SCANNING RATE TO STANDARD SCANNING RATE TELEVISION SIGNAL CONVERTER WITH SMOOTH MOVING EDGE CONVERSION

Yoshinori Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 18, 1992, Ser. No. 884,388
Claims priority, application Japan, May 21, 1991, 3-144075; May 21, 1991, 3-144076; May 21, 1991, 3-144077
Int. Cl.^{5} H04N *7/01*
U.S. Cl. 348—439 **6 Claims**



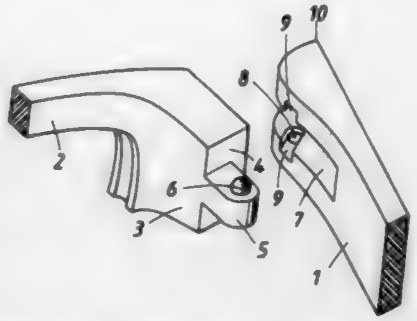
1. Apparatus for converting a high speed television signal to a reference scanning frequency, said reference scanning frequency defining reference odd and even field intervals, said high speed television signal including odd and even fields and having a scanning frequency N times greater than said reference scanning frequency, where N is an odd integer, comprising:

first memory means for storing a first plurality of consecutive odd fields of said high speed television signal in accordance with first write signals and for reading out the stored first plurality of odd fields in accordance with a first read signal;
second memory means for storing a second plurality of consecutive even fields of said high speed television signal in accordance with second write signals and for reading out the stored second plurality of even fields in accordance with a second read signal;
means for producing a mean odd field by obtaining an arithmetical mean of said stored first plurality of odd fields and for producing a mean even field by obtaining an arithmetical mean of said stored second plurality of even fields; and
control means for generating said first write signals and said second read signal during the reference even field interval to omit storage of even fields of said high speed television signal during said reference even field interval, and for generating said second write signals and said first read signal during the reference odd field interval to omit storage of odd fields of said high speed television signal during said reference odd field interval.

5,315,328
EYEGLASS FRAME

Herbert Hofmair, Linz, and Gerhard Fuchs, Pasching, both of Austria, assignors to Silouette International Gesellschaft m.b.H., Linz, Austria

Continuation of Ser. No. 821,355, Jan. 15, 1992, abandoned. This application May 20, 1993, Ser. No. 64,735
Claims priority, application Austria, Jan. 17, 1991, A97/91
Int. Cl.^{5} G02C *5/14*
U.S. Cl. 351—121 **2 Claims**



1. In an eyeglass frame comprising at each end a bow having an inside surface and an outside surface, said inside surface defining an open pocket formed with two coaxial bearing sockets and with grooves extending from said bearing sockets to said inside surface of said bow, the bearing socket being arranged intermediate the inside and outside surfaces to define a first side adjacent the inside surface and a second side opposite the first side with respect to the bearing sockets,

said frame also comprising a rim, which has in association with each of said bows a bow carrier having an abutment surface facing the associated bow, which bow carrier is provided with a hinge bracket protruding from said abutment surface and provided on opposite sides with two coaxial stub pins pivotally received in a snap-action fit in respective ones of said bearing sockets, and
wherein said outside surface of said bow has a terminal edge on the second side and said bow is pivotally movable to a stop-defined open position, in which said terminal edge bears on said abutment surface, and said bow is adapted to be opened beyond said stop-defined position about a fulcrum defined by said terminal edge bearing on said abutment surface,
the improvement residing in that
said grooves extend from said bearing sockets on the first side radially with respect to the fulcrum and at an acute angle with respect to said outside surface.

5,315,329
SIMULTANEOUS STEREO FUNDUS CAMERA

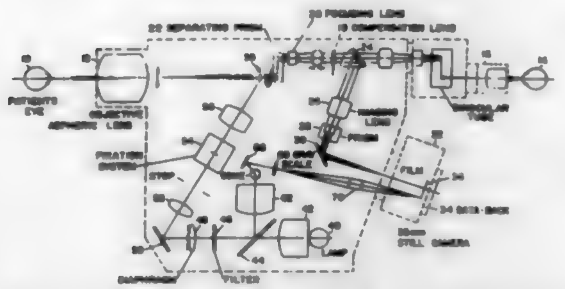
John B. McAdams, Santa Monica, Calif., assignor to Nishika Limited, Henderson, Nev.

Continuation of Ser. No. 490,305, Mar. 8, 1990, Pat. No. 5,120,122. This application Apr. 8, 1992, Ser. No. 865,079
Int. Cl.^{5} A61B *3/14, 3/10*
U.S. Cl. 351—206 **9 Claims**

1. A stereo eye fundus camera capable of simultaneously recording a stereo pair of images of the fundus of an eye of a patient onto color photographic film comprising:

light source means for illuminating the patient's eye fundus,
stereo optical means for projecting the stereo pair of images of the patient's eye fundus while it is illuminated onto the

film so that the images are recorded on the film, the optical means having a field of view that includes the optic nerve,



and means for projecting an image of a standardized gray color scale onto the film using light from the light source so that the gray color scale is recorded on the film.

5,315,330
PROJECTION TYPE DISPLAY APPARATUS

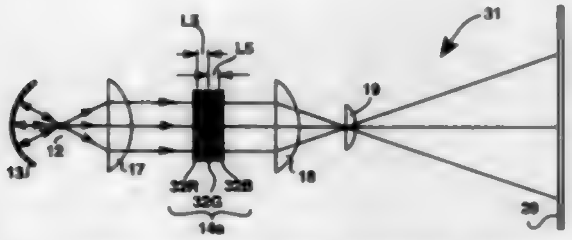
Hiroshi Hamada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 922,669, Aug. 5, 1992, abandoned, which is a continuation of Ser. No. 631,004, Dec. 19, 1990, abandoned. This application Sep. 22, 1993, Ser. No. 124,431

Claims priority, application Japan, Dec. 21, 1989, 1-333131

Int. Cl.⁵ G03B *21/00*

U.S. Cl. 353—31 **8 Claims**



2. A projection type image display apparatus which displays an image on a screen by projecting light rays, the display apparatus comprising:

a transmissive display device including three display cells multi-layered in a direction in which light rays are passed through the device;

a light source;

a first optical means situated along an optical axis between the light source and the transmissive display device so as to project the light rays from the light source and enable the principle light rays to enter the transmissive display device in parallel along the optical axis;

a second optical means disposed on an opposite side to the light source with respect to the transmissive display device so as to project the light rays from the transmissive display device; and

a third optical means so as to project a transmitted light image through the display device on a screen,

wherein a middle one of the three display cells contains magenta pigment for controlling a green light component, the image display apparatus being focussed in the middle display cell, thereby intensifying a visual resolving power of a human eye for image displayed on the screen.

5,315,331
OPTICAL APPARATUS CAPABLE OF PERFORMING A PANORAMIC PHOTOGRAPHING

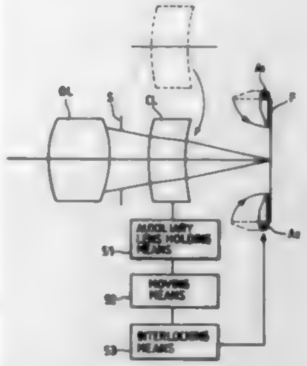
Koichi Ohshita, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 787,090, Nov. 4, 1991, abandoned. This application May 24, 1993, Ser. No. 65,035

Claims priority, application Japan, Nov. 9, 1990, 2-305820; Nov. 27, 1990, 2-323761

Int. Cl.⁵ G03B *37/00*

U.S. Cl. 354—94 **26 Claims**



1. An optical apparatus capable of performing a panoramic photographing, including the following:

a photographing lens for forming an image on an image plane;

an auxiliary lens having positive refractive power for converting its focal length synthesized with said photographing lens to be a focal length shorter than the individual focal length of the photographing lens; and

an auxiliary lens supporting means for supporting said auxiliary lens in such a manner that the auxiliary lens is installed in or removed from the optical path between said photographing lens and said image plane.

5,315,332
LENS-FITTED PHOTOGRAPHIC FILM PACKAGE AND FLASH UNIT

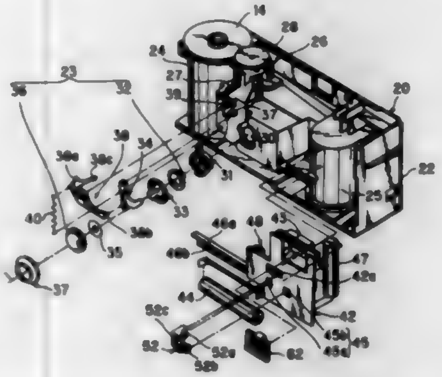
Norio Hirasaki, and Junichi Takagi, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1992, Ser. No. 867,526

Claims priority, application Japan, Apr. 11, 1991, 3-032833; Apr. 11, 1991, 3-032834; Apr. 11, 1991, 3-032835

Int. Cl.⁵ G03B *15/03*

U.S. Cl. 354—149.11 **23 Claims**



1. A lens-fitted photographic film package with a flash unit, which is pre-loaded with film and has a shutter mechanism, said lens-fitted photographic film package comprising:

a pair of gripping projections formed in a front wall of said lens-fitted photographic film package on both horizontal sides of a taking lens system, for defining holding positions of said lens-fitted photographic film package; and

a switch operating member for turning a charge switch of said flash unit on, said switch operating member being formed as at least a part of one of said gripping projections.

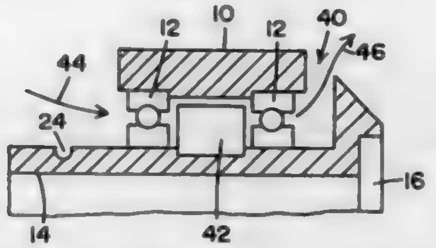
5,315,333
CAMERA LENS SHIELD

Michael Nash, 6621 Arozena La., Carpinteria, Calif. 93013

Filed Jun. 1, 1993, Ser. No. 69,733

Int. Cl.⁵ G03B *17/00*

U.S. Cl. 354—202 **8 Claims**



1. A camera lens shield comprising in combination:

a generally ring shaped bearing housing;

bearing means disposed within said bearing housing;

a generally cylindrical window support means mounted for rotation within said bearing means, said support means having a transparent window therein;

moving means on said housing adapted to spin said support means fast enough to centrifugally shed contamination from the surface of said window; and

impeller blade means on said support means at a location proximate said bearing means so as to flow air through the bearing means and prevent the entry of contamination into the bearing means.

5,315,334
LIQUID CRYSTAL FINDER/PROJECTOR FOR VIDEO CAMERA

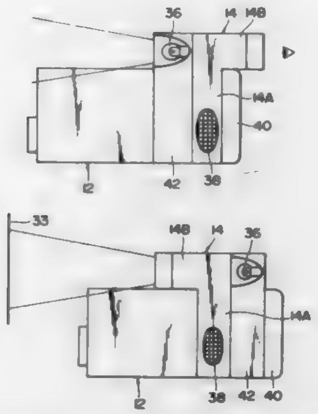
Katsuya Inana, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1992, Ser. No. 850,896

Claims priority, application Japan, Mar. 18, 1991, 3-052728

Int. Cl.⁵ G03B *13/02;* H04N *5/30, 5/04, 5/74*

U.S. Cl. 354—219 **4 Claims**



1. A liquid crystal finder attached video camera, comprising:

a video camera body having a first battery attachment face formed at the back thereof and a video output terminal for outputting a video signal, wherein on said first battery attachment face a battery may be detachably mounted;

a liquid crystal view finder unit having a front face which may be detachably mounted on said first battery attachment face and a back face formed with a second battery attachment face on which said battery may be detachably mounted, said liquid crystal view finder unit comprising a video input terminal for inputting the video signal from said video output terminal, transmission-type liquid crystal display means for displaying an image based on the video signal input through said video input terminal, an eyepiece for magnifying the image displayed by said transmission-type liquid crystal display means, and a turning mechanism for turning said eyepiece between a finder position behind said transmission-type liquid crystal display means and a projector position ahead of said transmission-type liquid crystal display means; and

a light unit having a front face which may be detachably mounted on said first or second battery attachment face, a back face formed with a third battery attachment face on which said front face of said liquid crystal view finder unit may detachably be mounted, and a light facing ahead in the upper portion thereof,

wherein said eyepiece is turned to said finder position and said light unit is mounted between said video camera body and said liquid crystal view finder unit so as to use said light unit as a video light, and said eyepiece is turned to said projector position and said liquid crystal view finder unit is mounted between said video camera body and said light unit so as to use said light unit as a projector light source.

5,315,335
BRAKE DEVICE FOR FOCAL PLANE SHUTTER

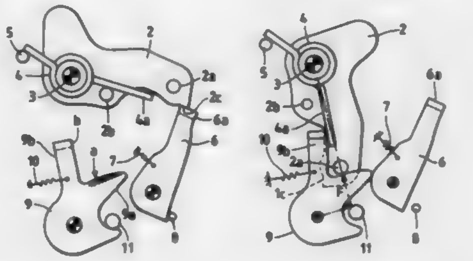
Ken-ichi Watabe, and Nobuyoshi Inoue, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Jul. 30, 1992, Ser. No. 922,131

Claims priority, application Japan, Aug. 2, 1991, 3-194330

Int. Cl.⁵ G03B *9/40*

U.S. Cl. 354—252 **3 Claims**



1. A focal plane shutter for cameras comprising:

a shutter base plate having an exposure aperture formed therein;

a front blade actuating member pivoted on said base plate and capable of rotating front blades, for exposure of a film, from cocked positions for opening said exposure aperture to uncocked positions for closing said exposure aperture;

a rear blade actuating member pivoted on said base plate and capable of rotating rear blades from cocked positions for opening said exposure aperture for exposure of the film to uncocked position for closing said exposure aperture;

a front blade actuating power source detachably connected to said front blade actuating member and functioning to urge said front blade actuating member to rotate said member from a cocked position to an uncocked position;

a rear blade actuating power source detachably connected to said rear blade actuating member and functioning to urge said rear blade actuating member to rotate said actuating member from a cocked position to an uncocked position;

a front blade braking member pivoted on said base plate, and having a first arm to be brought into contact with said front blade actuating member and pushed thereby when the front blade actuating member is rotated from the cocked position to the uncocked position, and a second arm to be engaged with said front blade actuating power source for disconnecting said front blade actuating power source from said front blade actuating member at a final stage of a rotational motion of said front blade braking member; and

a rear blade braking member pivoted on said base plate, and having a third arm to be brought into contact with said rear blade actuating member and pushed thereby, and a fourth arm to be engaged with said rear blade actuating power source for disconnecting said rear blade actuating power source from said rear blade actuating member at a final stage of a rotational motion of said rear blade braking member;

wherein a force produced by said front blade actuating power source is exerted toward a pivot of said front blade actuating member by way of said front blade braking member when said front blade actuating power source is disconnected from said front blade actuating member by said second arm, and a force produced by said rear blade actuating power source is exerted toward a pivot of said rear blade actuating member by way of said rear blade braking member when said rear blade actuating power source is disconnected from said rear blade actuating member by said fourth arm.

5,315,336
BATTERY HOUSING STRUCTURE

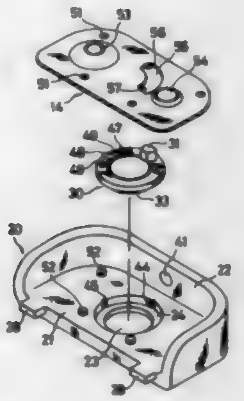
Shinya Suzuka, and Norimichi Takahashi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1991, Ser. No. 641,727

Claims priority, application Japan, Jan. 22, 1990, 2-4490[]; Feb. 28, 1990, 2-18783[U]; Aug. 30, 1990, 2-91062[U]

Int. Cl.⁵ G03B *17/02*

U.S. Cl. 354—288 **18 Claims**



1. A battery housing structure for a camera, said battery housing structure comprising:

a camera body including a battery chamber for housing a battery, said battery chamber including an engageable portion formed inside thereof and an opening through which said battery is inserted thereto;

a lid for opening and closing said opening of said battery chamber; and

an operating member movably supported by said lid, said operating member including an engaging boss which projects into a space formed around an electrode of a battery housed in said battery chamber and that is engageable with said engageable portion of said battery chamber, whereby, when said lid closes said opening, said engaging boss is engaged with said engageable portion, and said engageable portion is sandwiched between said engaging boss and said lid, to thereby fix said lid in a closed position over said opening of said battery chamber, and wherein said lid is provided with a hole, and said operating member is rotatably supported in said hole;

said camera body is provided with a guide boss and said lid is provided with a guide recess in which said guide boss is inserted, whereby said lid is guided by said camera body when opening and closing said opening of said battery chamber;

said guide boss comprising a screw, said screw comprising means for assembling said camera body, said guide boss comprising means for guiding said lid.

5,315,337
PHOTOGRAPHIC FILM PROCESSING

David A. Skye, Harpenden, Great Britain, assignor to Eastman Kodak Company, Rochester, N.Y.

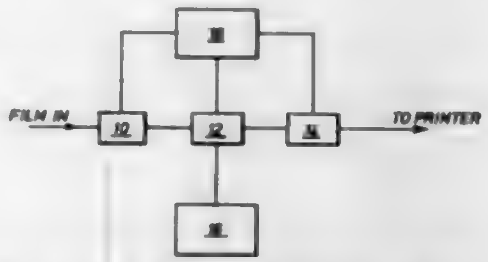
PCT No. PCT/EP90/02108, § 371 Date Jul. 2, 1992, § 102(e) Date Jul. 2, 1992, PCT Pub. No. WO91/10941, PCT Pub. Date Jul. 25, 1991

PCT Filed Dec. 14, 1990, Ser. No. 854,641

Claims priority, application United Kingdom, Jan. 11, 1990, 9000637

Int. Cl.⁵ G03D *13/00, 3/08*

U.S. Cl. 354—298 **13 Claims**



1. Film processing apparatus comprising a plurality of film processing stations, each station executing a step in the processing operation and monitoring means located at least two of said plurality of film processing stations, each monitoring means measuring the density of silver and/or silver halide present in the film and control means for detecting the density measured by each of said monitoring means and controlling the switching of the film from one station to another in response to the measured density.

5,315,338
APPARATUS FOR ENHANCING HEAT AND MASS TRANSFER IN A FLUID MEDIUM

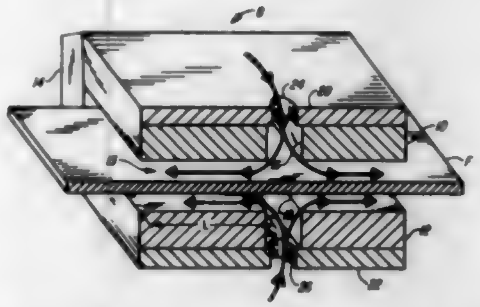
Lee F. Frank, Rochester; Jeffrey L. Helfer, Webster; Haribhajan S. Kocher, Penfield, and Paul W. Wagner, Holley, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 633,505, Dec. 28, 1990, Pat. No. 5,136,323. This application Jul. 24, 1992, Ser. No. 919,660

The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.

Int. Cl.⁵ G03D *3/08*

U.S. Cl. 354—320 **8 Claims**



1. Apparatus for subjecting a web to treatment fluid, said apparatus comprising:

means defining a fluid treatment channel for receiving the web, said means defining in said channel an elongated injection opening for injecting fluid into the channel and an elongated evacuation opening, said openings extending transversely of said channel;

means for supplying treatment fluid under pressure to said injection opening to inject treatment into said channel and establish fluid flow from said injection opening to said evacuation opening, said evacuation opening being spaced from said injection opening by a predetermined distance to effect evacuation of the fluid when the boundary layer of the fluid reaches a predetermined thickness to maintain an energy transfer rate in the fluid that exceeds the energy transfer rate within the web.

5,315,339
AUTO FOCUS CAMERA HAVING PLURAL FOCUSSING MODES

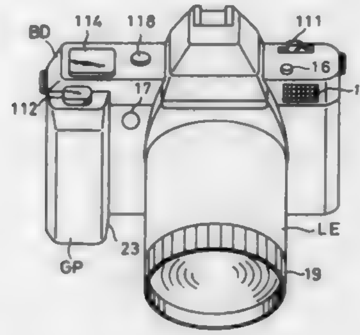
Masataka Hamada, Osakasayama; Kenji Ishibashi, Sakai; Hiroshi Ueda, Habikino; Hiroshi Otsuka, Sakai, and Yoshihiro Hara, Kishiwada, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1992, Ser. No. 885,615

Claims priority, application Japan, May 22, 1991, 3-147916; May 23, 1991, 3-149984; May 23, 1991, 3-149985; May 24, 1991, 3-149987; May 24, 1991, 3-149988; Jun. 27, 1991, 3-156675

Int. Cl.⁵ G03B *13/36*

U.S. Cl. 354—400 **18 Claims**



1. An auto focus camera comprising:

focus adjusting means for detecting a focus condition and driving a taking lens to an in-focus position based on a focus detection result, wherein said focus adjusting means has a continuous mode in which focus detection and lens driving are continuously repeated and a one-shot mode in which lens driving is stopped after an in-focus condition is once obtained;

starting signal producing means for producing a starting signal which starts a focus adjusting operation;

an operating member to be operated by a user after the starting signal is produced;

switching means for selectively switching between the continuous focusing mode and the one-shot focusing mode; and

controlling means for controlling said focus adjusting means to change a manner of lens driving in response to an operation of said operating member, wherein the changing of the lens driving manner is different from the focussing mode switching carried out by said switching means.

5,315,340
VIDEO CAMERA APPARATUS

Masahide Hirasawa, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1992, Ser. No. 927,855

Claims priority, application Japan, Aug. 14, 1991, 3-228803

Int. Cl.⁵ G03B *13/36*

U.S. Cl. 354—400 **16 Claims**

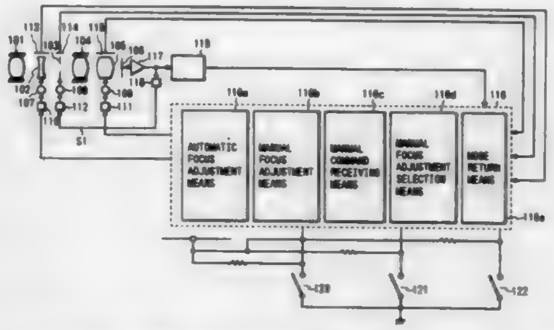
1. A lens control apparatus comprising:

a) lens drive means for driving a focus lens;

b) automatic focus adjustment means for controlling said lens drive means in an automatic focus adjustment mode;

c) manual focus adjustment means for controlling said lens drive means in a manual focus adjustment mode;

d) mode selecting means for selectively setting said automatic focus adjustment mode and said manual focus adjustment mode; and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116a
116b
116c
116d
116
AUTOMATIC FOCUS ADJUSTMENT MEANS
MANUAL FOCUS ADJUSTMENT MEANS
MANUAL COMMAND RECEIVING MEANS
MANUAL FOCUS ADJUSTMENT SELECTION MEANS
MODE RETURN MEANS
116e
120
121
122
S1

e) control means for, when a manual operation is performed, preferentially enabling said manual focus adjustment means to set the manual focus adjustment mode regardless of the state of said mode selecting means.

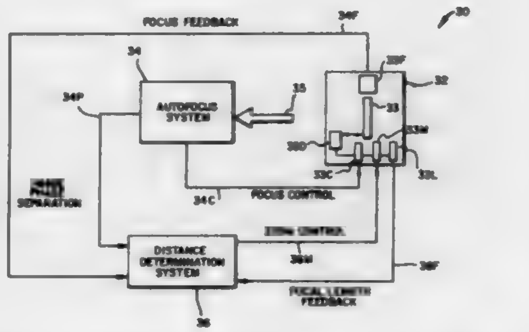
5,315,341
METHOD AND APPARATUS FOR THROUGH-THE-LENS DISTANCE DETERMINATION

Robert H. Hibbard, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1991, Ser. No. 809,999

Int. Cl.⁵ G03B *13/36*

U.S. Cl. 354—402 **17 Claims**



1. Distance determination apparatus for determining the absolute distances of a plurality of subjects from the apparatus, said plurality including principal and secondary subjects, comprising:

an optical assembly focusable according to the position of at least one positionable optical lens element therein;

autofocusing means for:

a) positioning the lens element to achieve an in-focus condition with respect to the principal subject, and

b) sensing the separation of a secondary subject relative to the principal subject, and for providing data indicative of the separation distance; means for sensing the optical element position

at the in-focus condition and for providing position data indicative of said position;

means for providing a predetermined function that relates the optical element position data to the absolute distance of the principal subject; and

computing means for:

a) computing the absolute distance of the principal subject according to the predetermined function and the lens element position data, and for providing corresponding principal subject distance data, and

b) determining the absolute distance to the secondary subject according to the separation distance data and the principal subject distance data, and for providing corresponding secondary subject distance data.

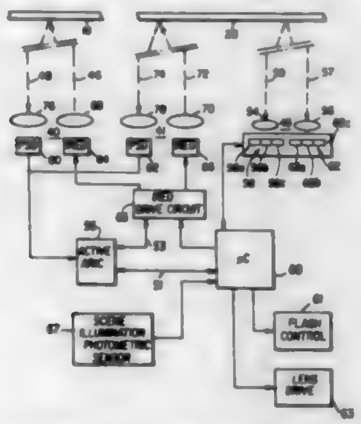
5,315,342
AUTOMATIC FOCUS AND INDIRECT ILLUMINATION CAMERA SYSTEM

J. David Cocca, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1992, Ser. No. 996,997

Int. Cl.⁵ G03B *13/36, 15/05*

U.S. Cl. 354—403 **13 Claims**



1. An automatic focus and indirect illumination control system for focusing a camera imaging lens on a scene and for selectively illuminating the scene with light from a camera associated light source comprising:

first range finder means, including first electromagnetic radiation emitting means for directing radiation at the scene, and first electromagnetic radiation detecting means for detecting electromagnetic radiation reflected from the scene, for providing a distance related first signal in response thereto;

second range finder means, including second electromagnetic radiation emitting means for directing radiation at a surface generally oblique to the plane of the scene onto which scene illuminating light may be directed, and second electromagnetic radiation detecting means for detecting electromagnetic radiation reflected from said generally oblique surface, for providing a distance related second signal in response thereto;

an auto range finding signal processor common to both said range finder means for selectively processing said first and second distance related signals for deriving first and second perspective range signals in response thereto; and

control means operatively coupled to said first and second range finder means and said auto range finding signal processor for selectively energizing said first and second electromagnetic radiation emitting means and selectively coupling said auto range finding signal processor to said first and second detecting means, respectively.

5,315,343

Patent Not Issued For This Number

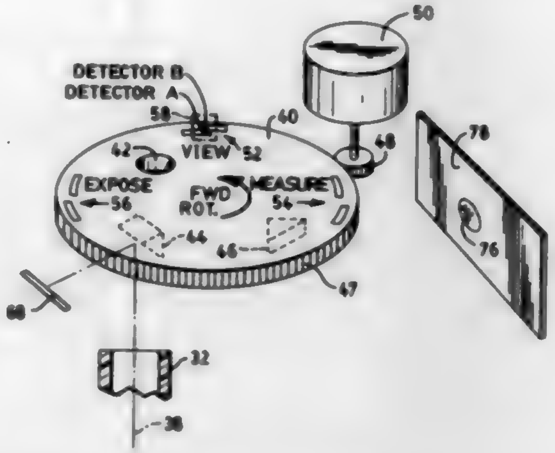
5,315,344
MICROSCOPE CAMERA

Peter P. Clark, Acton; Douglas E. Miller, W. Boylston; Deborah A. Mulford, Brookline, and John C. Ostrowski, Maynard, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 677,763, Mar. 29, 1991, abandoned. This application Nov. 4, 1991, Ser. No. 787,045

Int. Cl.⁵ G03B *7/08*

U.S. Cl. 354—456 **11 Claims**



1. Photographic apparatus comprising:

means for coupling said apparatus to an optical instrument;

a housing having a first opening therein through which image-bearing light rays emanating from the optical instrument may be directed to photosensitive material supported at a film plane within said housing to form a focused image thereat;

means for focusing said image bearing light rays at said film plane;

a viewfinder for viewing a scene in the optical instrument;

a photometer for measuring the brightness of the scene and for generating a signal representative thereof;

energizable exposure control means including a movably mounted member having a second opening therein situated for overlapping movement with respect to said first opening to collectively form an exposure aperture where it allows the passage of the image-bearing light rays from the optical instrument to said film plane during an exposure interval;

first means mounted on said movably mounted member, for movement therewith, for directing scene light to said viewfinder;

second means mounted on said movably mounted member, for movement therewith, for directing scene light to said photometer;

drive means coupled to said movably mounted member for moving 1) said second opening 2) said first means and 3) said second means, through the path of said image bearing light rays; and

control means for actuating said drive means to position one of said first and second means in the path of said image-bearing light rays and then the other of said first and second means into the path of said image-bearing light rays for scene viewing or for scene brightness measurement, and then move said second opening into the path of the image-bearing light rays, for a period of time that is dependent upon the magnitude of said image brightness signal, to produce the exposure interval with said exposure aperture and thereby cause the scene to be reproduced in the photosensitive material present at said film plane.

5,315,345
POWER ZOOM LENS AND CAMERA SYSTEM HAVING SAME

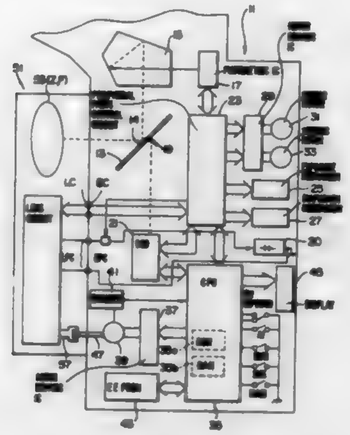
Masahiro Kawasaki; Hiroyuki Takahashi, and Yoshinari Tanimura, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1992, Ser. No. 886,402

Claims priority, application Japan, May 21, 1991, 3-218146; Nov. 29, 1991, 3-342123

Int. Cl.⁵ G03B *7/26*

U.S. Cl. 354—484 **14 Claims**



1. A camera system including a taking lens having a motor drive means and a control means for controlling the motor drive means, and a camera body to which the taking lens is detachably mounted, comprising:

a power supply provided in the camera body;

power supplying circuits provided in the camera body and the taking lens to independently supply the motor drive means and the control means with the electrical power of said power supply;

abnormal power supply detecting means in the taking lens for detecting an abnormality of the power supply to the motor drive means; and

power cutting means in the camera body for cutting the power supply to the motor drive means when said abnormal power supply detecting means detects an abnormality of said power supply.

5,315,346
SCANNERS

Christopher M. Graebe, Berkhamstead, and Paul C. Ward, Watford, both of Great Britain, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP91/00638, § 371 Date Oct. 9, 1992, § 102(e) Date Oct. 9, 1992, PCT Pub. No. WO91/16663, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 4, 1991, Ser. No. 941,079

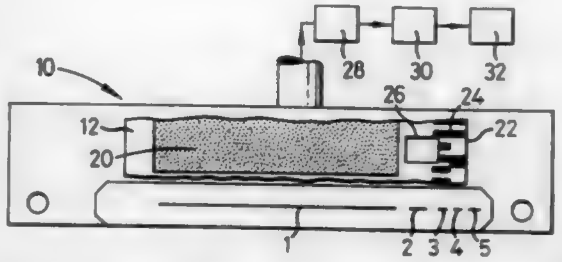
Claims priority, application United Kingdom, Apr. 12, 1990, 9008452

Int. Cl.⁵ G03B *27/00*

U.S. Cl. 355—1 **4 Claims**

1. A scanning device (10) for scanning 35 mm film (12) in a photofinishing operation, the device comprising:

a bundle of optical fibres (14) arranged linearly and divided into at least two sets (16, 18), a first set (16) of optical fibres being arranged to scan frames (20) of the film (12) to sense frame content information, and a second set (18) of optical fibres arranged to sense film reference information adjacent to at least one edge (22) of the film (12),



characterized in that the second set (18) of optical fibres comprises a portion arranged to sense illumination level information off the film.

5,315,347
DIFFUSION TRANSFER TYPE DUPLICATING CAMERA

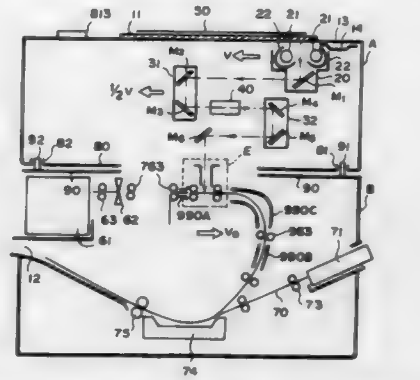
Hiroshi Shimizu; Jirou Ikeo; Katsutoshi Kabeta, and Yoshito Miyazaki, all of Gunma, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Ushio Denki Kabushiki Kaisha, Tokyo, both of Japan

Filed Apr. 27, 1993, Ser. No. 52,666

Claims priority, application Japan, Apr. 27, 1992, 34343[U]; Apr. 27, 1992, 34344[U]; Apr. 27, 1992, 34345[U]

Int. Cl.⁵ G03B *27/52, 27/70, 27/32*

U.S. Cl. 355—043 **13 Claims**

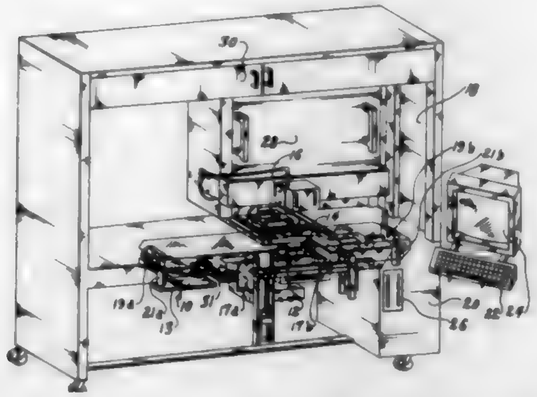


1. A diffusion transfer type duplicating camera including an exposure box, which incorporates a scanning unit causing a slit of light to be swept laterally over an original situated on an original exposure table, and a transfer box, in which a sheet of photosensitive material which is conveyed parallel with respect to the original exposure table at an exposure stage is exposed to light representing a slit image from the exposure box, and the exposed photosensitive material is superimposed on an image receiving material, and the image recorded on the photosensitive material is transferred to the image receiving material, wherein the duplicating camera is characterized in that

the exposure box is rotatably disposed on the transfer box, and the exposure box and the transfer box are fixed to each other after the scan axis of the scanning unit is matched with the transfer axis of the photosensitive material.

5,315,348
AUTOMATED PHOTOGRAPHIC NEGATIVE CARD HOLDER

Ray Hicks, 2605 Corunna Rd., Flint, Mich. 48503
Continuation of Ser. No. 815,710, Dec. 31, 1991, abandoned. This application Feb. 5, 1993, Ser. No. 17,414
Int. Cl.^{5} G03B *27/48, 27/50*
U.S. Cl. 355—50 **13 Claims**

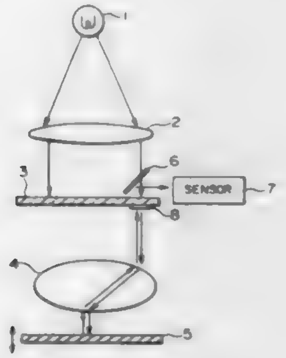


1. A method of transporting carrying cards having photographic negatives mounted thereon between a card supply location, a discharge location, and the optical stage of a photographic printer, characterized in that:

a shuttle is provided which is mounted for movement along a generally linear path extending from the optical stage to an intermediate location spaced from the card supply and discharge locations and each card is transported from the supply location to the intermediate location where it is received by the shuttle whereafter the shuttle moves the card to the optical stage for processing by the printer whereafter the card is moved by the shuttle back to the intermediate location whereafter the card is moved from the intermediate location to the discharge location.

5,315,349
PROJECTION ALIGNER

Kazuya Kamon, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1992, Ser. No. 974,077
Claims priority, application Japan, Jan. 21, 1992, 4-008311
Int. Cl.^{5} G03B *27/68*
U.S. Cl. 355—53 **4 Claims**



1. A projection aligner comprising:

a light source for emitting exposure light for exposing a photosensitive surface of a wafer;

a mask including a focusing pattern having light-blocking members and light-transmitting portions alternatingly arranged;

a condensing lens for condensing the exposure light onto said mask;

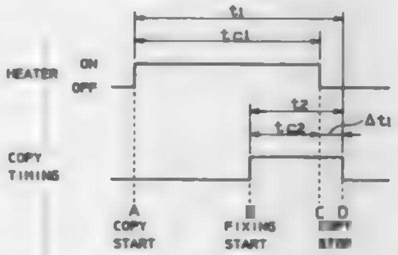
a converging lens for condensing the exposure light passing through the mask including the focusing pattern to illuminate the photosensitive surface of the wafer and for transmitting the exposure light reflected from the photosensitive surface of the wafer to the mask including the focusing pattern;

a half-mirror for reflecting exposure light transmitted through the light-transmitting portions of the focusing pattern of the mask after reflection from the photosensitive surface of the wafer, said half-mirror being disposed between said condensing lens and said mask; and

a sensor for measuring the amount of the exposure light reflected from said half-mirror.

5,315,350
IMAGE FORMING APPARATUS PROVIDED WITH A CONTROLLER FOR FIXING ROLLER HEATER

Junichi Hirobe, Kadoma; Masakatsu Akashi, Kakogawa; Masahiko Kobayashi, Ikoma, and Tsutomu Sugaya, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Mar. 9, 1992, Ser. No. 848,557
Claims priority, application Japan, Mar. 12, 1991, 3-46450
Int. Cl.^{5} G03G *21/00*
U.S. Cl. 355—208 **12 Claims**



1. An image forming apparatus comprising:

image forming means for forming and transferring an image of a document to a copy sheet, the copy sheet having a leading end and a trailing end;

feeding means for feeding the copy sheet to the image forming means;

fixing means including:

a fixing roller for fixing the transferred document image on the copy sheet while transporting it; and

heater means for heating the fixing roller, the heater means having an on-state for heating the fixing roller and an off-state in which the fixing roller is not heated; and

control means for setting the heater means in the on-state after an elapse of a predetermined time following a start of feeding of the copy sheet, until a predetermined time before the trailing end of the copy sheet passes off of the fixing roller.

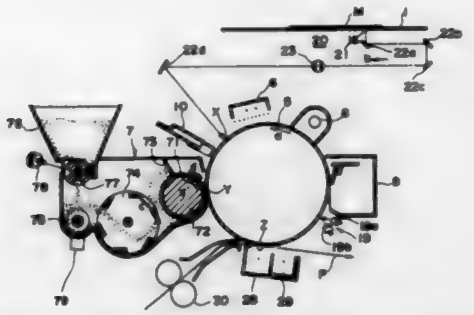
5,315,351
IMAGE FORMING APPARATUS

Moriyoshi Matsushiro, Nagoya; Naoki Toyoshi, and Tsugihito Yoshiyama, both of Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 7, 1992, Ser. No. 865,035
Claims priority, application Japan, Apr. 8, 1991, 03-075411; Apr. 8, 1991, 03-075412
Int. Cl.^{5} G03G *21/00*
U.S. Cl. 355—246 **26 Claims**

1. An image forming apparatus comprising:

discharging means for discharging an electric charge on a surface of a photosensitive member upon test image formation;

developing means for forming a toner image on the surface of the photosensitive member with a toner, said developing means includes a developing electrode to which at least two kinds of biases having different voltages and a same polarity as a toner charge polarity are applied upon test image formation, so that at least two test toner images having different densities are formed on the surface of the photosensitive member that has been discharged by said discharging means;

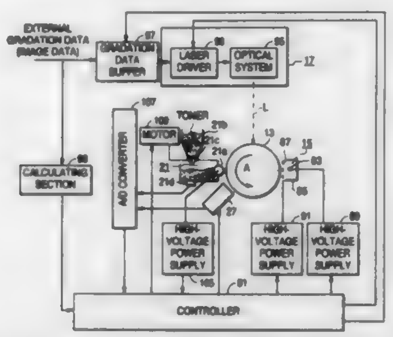


detecting means for detecting the density of each of the test toner images; and

control means for controlling the voltage value of a developing bias to be applied to the developing electrode during normal image formation based on the detected values of the test toner images.

5,315,352
IMAGE FORMING APPARATUS FOR FORMING AN IMAGE ON AN IMAGE BEARING MEMBER

Rintaro Nakane, and Jiro Egawa, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Jun. 18, 1992, Ser. No. 900,450
Int. Cl.^{5} G03G *21/00*
U.S. Cl. 355—246 **16 Claims**


EXTERNAL GRADATION DATA (IMAGE DATA)
GRADATION DATA BUFFER
LASER DRIVER
OPTICAL SYSTEM
17
L
TONER
MOTOR
A/D CONVERTER
CALCULATING SECTION
A
HIGH-VOLTAGE POWER SUPPLY
HIGH-VOLTAGE POWER SUPPLY
HIGH-VOLTAGE POWER SUPPLY
CONTROLLER

1. An apparatus for use in forming an image corresponding to digital image data supplied from a host computer on an image bearing member, said apparatus comprising:

means for receiving digital image data to be formed and supplied from said host computer;

means for estimating the amount of toner to be attached to said image bearing member in accordance with the digital image data received by said receiving means;

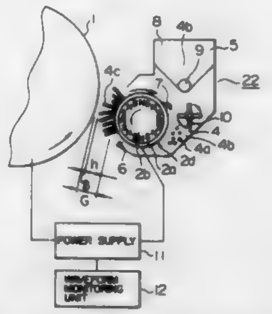
means for forming an image on said image bearing member, said image corresponding to digital image data to be formed and supplied from said host computer with a developing agent including toner under a predetermined image forming condition;

means for detecting the amount of toner attached to said image bearing member by said forming means; and

control means for setting said image forming condition in accordance with the amount of toner detected by said detecting means and the amount of toner estimated by said estimating means and performing the image forming operation of said forming means under said set image forming condition so as to stabilize image density changes of the image formed on said image bearing member.

5,315,353
IMAGE RECORDING METHOD INCLUDING DETERMINING A GAP BETWEEN A PHOTOSENSITIVE MEDIUM AND A DEVELOPING ROLLER AND APPARATUS THEREFOR

Yuzuru Simazaki; Takao Kumasaka; Kunio Satoh, all of Hitachi, and Youji Hirose, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan
Continuation-in-part of Ser. No. 545,576, Jun. 29, 1990. This application Sep. 25, 1992, Ser. No. 951,122
Claims priority, application Japan, Sep. 26, 1991, 3-247321
Int. Cl.^{5} G03G *15/09*
U.S. Cl. 355—251 **18 Claims**



1. An image recording method of forming a magnetic brush of a two-component developer on each of developing rollers provided in a plurality of developing units, respectively, forming a toner image of a first color on a recording area of photosensitive medium by a first one of said plural developing units and then forming a toner image of another color on the recording area of said photosensitive medium by a succeeding developing unit through contact of said magnetic brush with said photosensitive medium during a single rotation of said photosensitive medium, comprising the steps of:

a) applying a predetermined voltage between said photosensitive medium and a developing roller of at least one of said plural developing units;

b) measuring a current flowing between said photosensitive medium and said developing roller upon application of said predetermined voltage; and

c) determining the current flowing between said photosensitive medium and said developing roller in a range from a value representing an initial contact state in which only a tip end portion of said magnetic brush is brought into contact with said photosensitive medium to a value representing a wholly contact state in which said magnetic brush contacts substantially wholly with said photosensitive medium by changing a degree of the contact of said magnetic brush with said photosensitive medium, and selecting a gap between said photosensitive medium and said developing roller within said range.

5,315,354
CARRIER BEAD SEAL

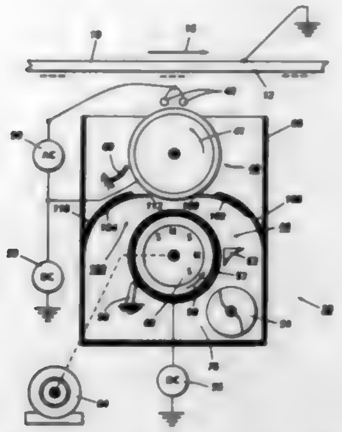
Samuel P. Mordenga, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 23, 1993, Ser. No. 51,718
Int. Cl.^{5} G03G *15/06*
U.S. Cl. 355—260 **16 Claims**

1. An apparatus for developing a latent image recorded on a surface with toner, including:

a magnetic member adapted to transport magnetic carrier and toner to a loading zone;

a donor member, positioned adjacent the magnetic member, to receive toner therefrom at the loading zone, said donor member being spaced from the surface for advancing toner to a developing zone adjacent the surface; and

a sealing member, interposed partially between said magnetic member and said donor member, to prevent carrier from being transported from said magnetic member to said donor member, said sealing member comprising a first sheet of magnitizable material having a free end thereof in a closely spaced relationship with said donor member on one side of the loading zone, and a second sheet having a free end thereof in a closely spaced relationship with said donor roll on the other side of the loading zone.



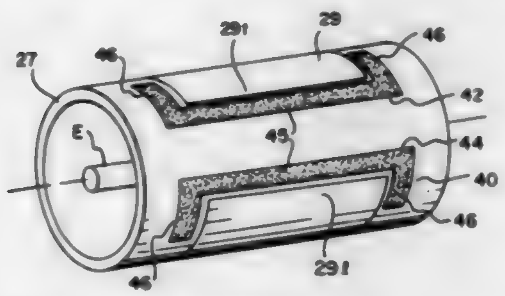
5,315,355
TRANSFER DRUM WITH SHIM MEMBER TO REDUCE SYSTEM VELOCITY FLUCTUATIONS

Kevin M. Johnson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1992, Ser. No. 956,129

Int. Cl.⁵ G03G *15/14*

U.S. Cl. 355—277 10 Claims



1. An imaging system, comprising:

an imaging member having an imaging surface on which transferable images are formed;

means for forming a transferable image on said imaging surface;

a rotatably driven drum having a peripheral surface adapted to receive and retain an image-receiver sheet having lead and trail edges;

means for urging said peripheral surface of said drum into engagement with said imaging surface to effect transfer of an image on said imaging surface to an image-receiver sheet retained on said peripheral surface, said urging means causing said image-receiver sheet to be compressed in thickness during such image transfer; and

a shim member positioned on and supported by said peripheral surface of said drum so as to be adjacent one of a lead or trail edge of a retained image-receiver sheet, said shim member being about the same thickness as said retained image-receiver sheet, at least a portion of said shim member being essentially parallel with said lead or trail edge and at least a portion of said shim member being perpendicular with said lead or trial edge.

5,315,356
FIXING APPARATUS

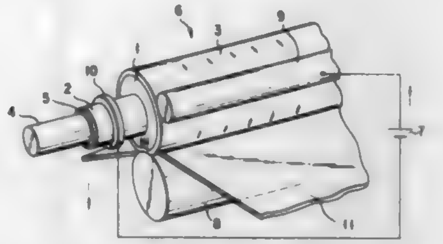
Hitoshi Nagato, Kawasaki, and Yuzo Koike, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 832,699, Feb. 7, 1992, abandoned. This application Jun. 11, 1993, Ser. No. 75,015

Claims priority, application Japan, Mar. 16, 1991, 3-075559

Int. Cl.⁵ G03G *15/20*

U.S. Cl. 355—289 7 Claims



1. A fixing apparatus comprising:

a heat roller having a first conductor, a pressure-sensitive conductive resin layer which is formed on said first conductor and in which a volume resistivity of a pressed area becomes lower than that of a non-pressed area, and a second conductive layer formed on said pressure-sensitive conductive resin layer; and

current supplying means for supplying a current to a low-resistance pressed area of said pressure-sensitive conductive resin layer by applying a voltage across said first and second conductive layers,

wherein a non-fixed toner image on a recording material partially pressed against said heat roller is fixed by using Joule heat generated by flowing of the current.

5,315,357
CLEANING UNIT PROVIDED IN XEROGRAPHIC IMAGE FORMING APPARATUS FOR REMOVING RESIDUAL TONER FROM AN IMAGE CARRIER

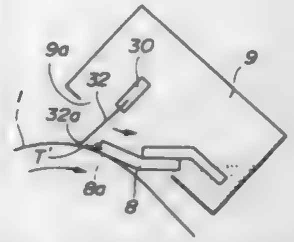
Masahiko Kamijo, Kawasaki; Yozo Matsuura, Machida, and Hiroshi Saitoh, Ayase, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 6, 1992, Ser. No. 908,064

Claims priority, application Japan, Jul. 15, 1991, 3-174036

Int. Cl.⁵ G03G *21/00*

U.S. Cl. 355—298 11 Claims



1. A cleaning unit, provided in a xerographic image forming apparatus, for removing residual developer from an image carrier medium after a transfer process for transferring a developed image from the image carrier medium to a recording sheet, said cleaning unit comprising:

a cleaning blade, in contact with a surface of said image carrier medium, for scraping the residual developer from said image carrier medium;

a housing for storing the residual developer scraped by said cleaning blade; and

a sweeping plate for feeding the residual developer, which has been scraped from said image carrier medium by said cleaning blade and has accumulated in front of an end surface of said cleaning blade, so as to lift the residual developer onto a top surface of said cleaning blade, the residual developer swept by said sweeping plate being fed into said housing via the top surface of said cleaning blade.

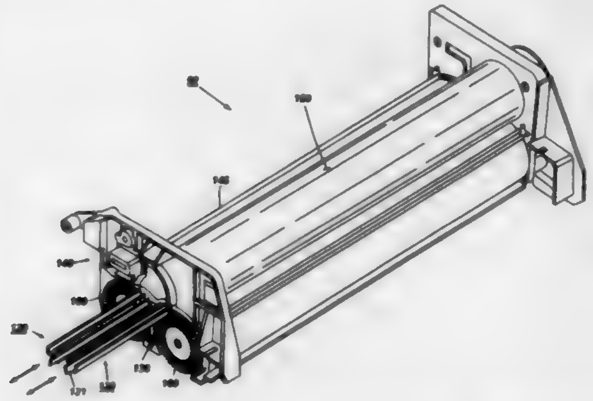
5,315,358
FLICKER BAR WITH AN INTEGRAL AIR CHANNEL

Bruce J. Parks, West Bloomfield, and John S. Vouros, Farmington, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 19, 1993, Ser. No. 47,513

Int. Cl.⁵ G03G *21/00*

U.S. Cl. 355—302 8 Claims



1. An apparatus for removing particles from a surface comprising:

a housing;

a rotatably mounted brush, at least partially enclosed in said housing, contacting the surface to remove particles therefrom; and

a bar in contact with said brush for removing particles therefrom, said bar, defining a channel therein adapted to have air with particles flow therethrough, said bar being mounted movably into said housing.

5,315,359
HEAT ROLL FIXING UNIT

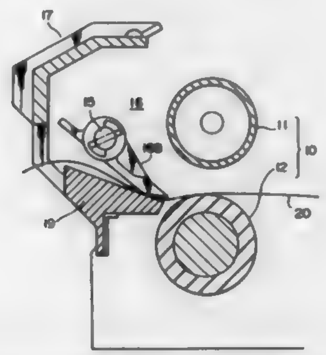
Tomoyuki Nishikawa, Matsudo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 664,672, Mar. 5, 1991, abandoned. This application Aug. 11, 1992, Ser. No. 927,727

Claims priority, application Japan, Mar. 6, 1990, 2-54164

Int. Cl.⁵ G03G *21/00*

U.S. Cl. 355—315 39 Claims



1. A heat roll fixing unit, adapted to be positioned in a printer employing an electrophotographic system for forming an image on a continuous-sheet to be fed in said printer, said heat roll fixing unit comprising:

a pair of rollers arranged to be brought into and out of contact with each other for pressurizing said continuous-sheet to fix the image formed thereon, one of said pair of rollers being a heat roller to be heated by a predetermined heating member; and

a sheet separation mechanism, located at the downstream side of said pair of rollers, for separating said continuous-sheet from said heat roller, said sheet separation mechanism comprising a separation member and means mounting said separation member for movement between a first position in which said separation member is in contact with said heat roller when said pair of rollers are in contact with each other and a second position in which said separation member is out of contact with said heat roller and in contact with said continuous-sheet when said pair of rollers are out of contact with each other.

5,315,360
COPYING MACHINE FOR COPYING A ONE-SIDE SUBJECT COPY ON BOTH SIDES OF A COPYING SHEET

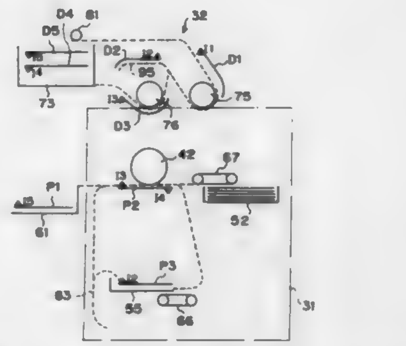
Yasuji Yamauchi, and Yuji Okamoto, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 20, 1991, Ser. No. 764,684

Claims priority, application Japan, Sep. 28, 1990, 2-264222

Int. Cl.⁵ G03G *15/00*

U.S. Cl. 355—319 16 Claims



16. A copying machine which is capable of continuously copying two or more simplex original documents on both sides of copying sheets, and copying machine having an exposure scanning means for scanning said simplex original documents, said copying machine further having a circulatory document delivering means for circulatory delivering a plurality of simplex original documents to said exposure scanning means in sequence, said copying machine furthermore having a copy processing means for copying an image of each of said simplex original documents scanned by said exposure scanning means, said copying machine comprising:

means for passing two or more copying sheets through a copy processing part of said copy processing means;

means disposed in said passing means for feeding said copying sheets to said copy processing means;

means coupled to said passing means for reversing said copying sheets having images formed by said copy processing means on said one side thereof;

means coupled to said passing means for refeeding said reversed copying sheets to said copy processing means;

means connected to said passing means for detecting a number of said copying sheets; and

means connected to said passing means for controlling said passing means in a manner that after a final page of said simplex original documents passes through an exposure scanning location of said exposure scanning means, a first group of said simplex original documents copies and pass through said exposure scanning location at a first circulation and a second group of said simplex original documents copies and pass through said exposure scanning location at second circulation sequentially in accordance with sand number detected by said detecting means,

said control means being adapted to control a passage of said simplex original documents so that all of said simplex original documents are copied on both sides of said copying sheets at one circulation in case that said numbers of said simplex original documents are three.

5,315,361

PRINTER USING ELECTROSTATIC PROCESS INCLUDING MULTIPLE SHEET DISCHARGE RECEIVERS WITH A PIVOTAL GUIDE AND A FULL TRAY DETECTOR

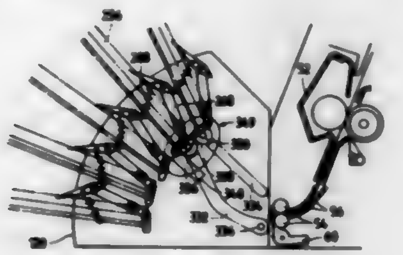
Shigeru Sawada; Shinichi Kasai; Jun Tsujimoto, and Masako Yokoyama, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 843,713, Feb. 28, 1992, abandoned, which is a division of Ser. No. 528,978, May 25, 1990, Pat. No. 5,141,222. This application Jun. 24, 1993, Ser. No. 80,595

Claims priority, application Japan, May 26, 1989, 1-133029; Nov. 30, 1989, 1-310892; Nov. 30, 1989, 1-310893; Nov. 30, 1989, 1-310894; Nov. 30, 1989, 1-310895; Nov. 30, 1989, 1-310896

Int. Cl.⁵ G03G *21/00*

U.S. Cl. 355—323 **1 Claim**



1. A printer comprising:

means for discharging a recording sheet that has been printed by an electrophotographic process, said discharge means having a recording sheet discharge outlet;

a plurality of sorter trays for receiving a plurality of recording sheets that have been printed;

means for guiding a recording sheet from said discharge means to said sorter trays and for discharging said recording sheet to said sorter trays; and

means for switching sorters by guiding said sorter guide means to a position of a desired one of said sorter trays;

wherein said sorter guide means is pivotably supported by said sorter switching means, and the center of rotation of said sorter guide means is arranged near said recording sheet discharge outlet of said discharge means;

wherein said sorter trays is provided with a first detection lever which rotates by the weight of said recording sheets accumulated on said sorter trays when a predetermined amount of recording sheets are accumulated on said sorter trays, said sorter trays are provided with a second detection lever which rotates in association with the first detection lever and said sorter guide means is provided with a lever detection means for detecting the movement of said second detection lever; and

wherein said sorter guide means is provided with a sheet detection lever which is pressed by said recording sheet to detect a jam of a recording sheet in said sorter guide means, said lever detection means detecting the movement of said sheet detection lever.

5,315,362

MULTICOLOR DEVELOPING DEVICE INCLUDING EXPANSION/CONTRACTION MEANS FOR PERMITTING A DEVELOPING MECHANISM TO MOVE RELATIVE TO ITS ASSOCIATED TONER CONTAINER

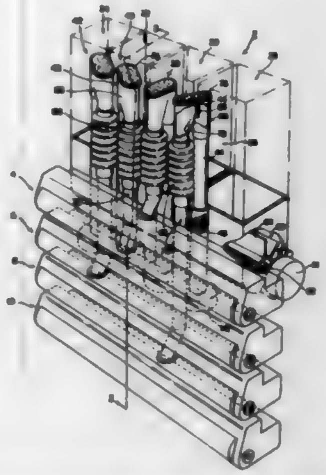
Kazuo Fuji, Osaka; Hideki Kita, Suita, and Toshimitsu Takeuchi, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Nov. 19, 1991, Ser. No. 794,588

Claims priority, application Japan, Nov. 27, 1990, 2-321401

Int. Cl.⁵ G03G *15/01*

U.S. Cl. 355—326 R **9 Claims**



1. A multicolor developing device comprising a stationary frame member, a movable frame member so mounted on the stationary frame member as to be moved reciprocatingly in a vertical direction by a moving means, and a number of developing mechanisms spaced in a predetermined direction and mounted on the movable frame member so as to be vertically movable therewith, each of the developing mechanisms being selectively positioned at a predetermined developing position when the movable frame member has been moved by the moving means, so that each developing mechanism performs developing in a different color,

wherein

a number of toner containers which is the same as the number of developing mechanisms are arranged in a fixed manner,

a toner feeding means for feeding a toner held within a toner container into a developing mechanism is provided between each of the toner containers and each of the developing mechanisms corresponding to the toner containers,

each of the toner feeding means includes a cylindrical member extending upwardly from a lower end portion of the toner container in the vertical direction, a toner conveying means which is disposed within the cylindrical member and extends therealong and which is adapted to convey toner that has been supplied to the cylindrical member from the lower end portion of the toner container, to an upper end portion of the cylindrical member, and a toner dropping passage means for connecting the upper end portion of the cylindrical member to the developing mechanism and feeding the toner conveyed to the upper end portion of the cylindrical member into the developing mechanism,

each toner conveying means is connected with a driving source which is actuated based on a toner feeding signal,

each toner dropping passage means includes an expansion/-contraction means adapted to extend substantially along the vertical moving direction of the developing mechanisms, and

each expansion/contraction means is so constructed as to be expansible and contractible in the vertical moving direction of the developing mechanisms in accordance with the reciprocating movement of the movable frame member.

5,315,363

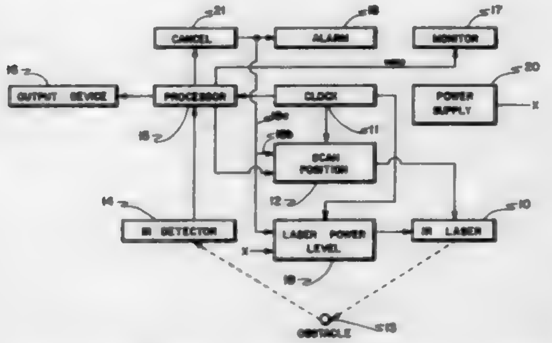
NIGHT VISION PROJECTED INFRARED CUEING SYSTEM

John E. Nettleton, Fairfax Station; Dallas N. Barr; James D. Habersat, both of Woodbridge, and Jonathan S. Lei, Springfield, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1993, Ser. No. 84,100

Int. Cl.⁵ G01S *13/00*

U.S. Cl. 356—4 **10 Claims**



1. An obstacle avoidance system for the pilot of a low flying aircraft; comprising:

a forward looking infrared laser ranging device, having normal and enhanced illuminating modes of operation;

an audio-visual alarm circuit means, coupled to said device, to alert said pilot when detection of an obstacle within a threshold distance from said aircraft by said ranging device initiates a warning pulse; and

a highlighting circuit means coupled with said device to switch it to said enhanced mode in response to said warning pulse and thereby increase the level of infrared light illuminating said obstacle by approximately an order of magnitude.

5,315,364

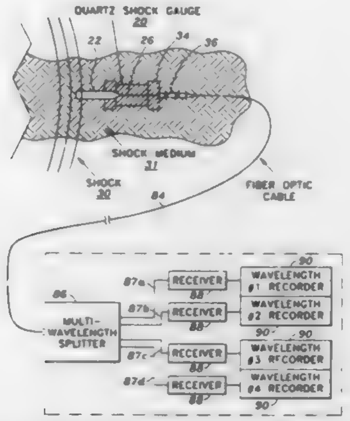
GAUGE FOR MEASURING STRONG SHOCK WAVES

Douglas N. Arion, Tijeras, and David E. Baird, Albuquerque, both of N. Mex., assignors to Science Applications International, Inc., San Diego, Calif.

Filed Nov. 4, 1991, Ser. No. 787,296

Int. Cl.⁵ G01B *11/16, 7/16*

U.S. Cl. 356—32 **1 Claim**



1. A system for measuring shock waves comprising;

a passive shock wave gauge assembly comprising a plurality of passive pressure sensing elements, each pressure sensing element emitting a pulse of light having a wavelength proportional to the pressure of a shock wave that impacts said pressure sensing element, each of said pressure sensing elements including;

a section of transparent mineral material (i) exhibiting a material Hugoniot whereby the temperature of the mineral material increases as the pressure of the shock wave impacting the mineral material increases and (ii) emitting a light pulse upon impact of the shock wave, said light pulse having a wavelength that varies as a function of the material's temperature, and

an output optical fiber drawn out from said section of transparent mineral material, said light pulse being transmitted over said output fiber;

the section of transparent mineral material of each of said sensing elements comprising a length of rod that extends out of a common mounting plate a distance that is different than the other sensing elements, whereby a tip of each rod will be exposed to the impact of a shock wave at a different time; and

processing means optically coupled to the output optical fiber from each of said pressure sensing elements for collecting and analyzing the emitted light pulse from each of said pressure sensing elements within said shock wave gauge assembly as a function of time.

5,315,365

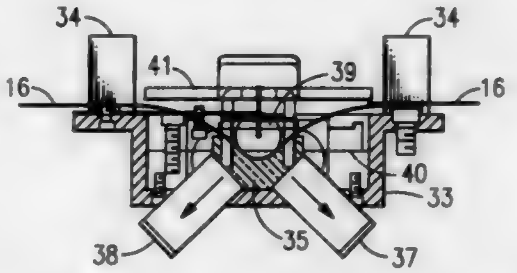
MACROBEND SPLICE LOSS TESTER FOR FIBER OPTIC SPLICES WITH SILICON GEL CUSHION ON OPTICAL COUPLING BLOCKS

Hosain Hakimi, Utica; Scott Bagetis, Cold Brook; Walter Williams, Newport; Howard Sins, West Leyden, and Dennis Marolf, Oriskany, all of N.Y., assignors to Laser Precision Corp., Utica, N.Y.

Filed Jun. 17, 1992, Ser. No. 899,880

Int. Cl.⁵ G01N *21/84, 21/59*

U.S. Cl. 356—73.1 **15 Claims**



1. Evanescent macrobend optic splice tester for testing the quality of a splice which joins first and second optical fibers which have a predetermined refractive index, comprising:

first and second macrobend light launch units for injecting light at a predetermined wavelength into said first and second fibers to travel in respective first and second directions towards said splice, each said macrobend light launch unit including an optical coupling block formed of a transparent material with a refractive index substantially the same as said fibers and having a launch portion with a substantially cylindrical surface, an anvil with a generally cylindrical surface biasing the respective fiber into an arc against the respective optical coupling block launch portion, and light emitting means in optical contact with said optical coupling block for injecting light at said predetermined wavelength in a direction to intersect the respective fiber in its arc thereon;

a macrobend light detection unit interposed between said first and second light launch units for detecting thereat the intensity of light from said first and second light launch units; including a detecting block formed of a transparent material with a refractive index substantially that of the optical fibers, and with a detecting portion having a cylindrical surface; an anvil member having a generally cylindrical surface which biases one of said first and second fibers into an arc against said detecting block cylindrical surface, and first and second light detecting elements in optical contact with said detecting block and having optical axes respectively oriented to intersect said arc to detect the level of light traveling through the fiber in said first and second directions and which emanates from the fiber biased therein; and

control circuit means for controlling the light injecting means and receiving detected light levels from said first and second light detecting elements, and for computing splice loss occurring at the splice, based on said detected light levels,

wherein said light launch units each contain a cushion layer of a clear silicon gel on said launch portion of said optical coupling block, and

said detection unit includes a cushion layer of a clear silicon gel on said detecting portion of said detecting block.

5,315,366

YARN PACKAGE INSPECTING APPARATUS

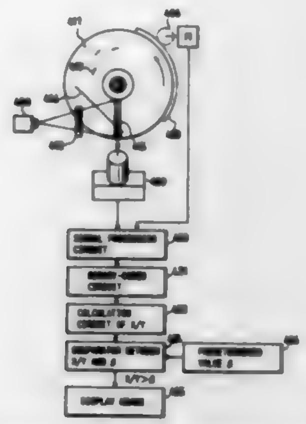
Kenichi Inada; Akihiko Takeshita, both of Ohtsu, and Tetsuji Masai, Kusatsu, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 2, 1992, Ser. No. 862,196

Claims priority, application Japan, Apr. 9, 1991, 3-031643[U]; Jun. 28, 1991, 3-058567[U]

Int. Cl.⁵ G01N *21/00*

U.S. Cl. 356—238 **3 Claims**



1. A yarn package inspecting apparatus, the yarn package defining an end and a longitudinal axis, the inspecting apparatus comprising:

support means for rotatably supporting the yarn package,

light means for irradiating light onto the end of the yarn package, the light extending radially from the longitudinal axis of the yarn package,

line sensor means for detecting light reflected by one of an off lease winding and a ribbon winding,

coding circuit means for binary-coding output information from the line sensor means,

calculation means for calculating a parabolic representation of the binary-coded line sensor information, and

comparator means for comparing a portion of the parabolic representation with a predetermined portion value.

5,315,367

METHOD TO DETECT MAN-MADE FIBERS AND/OR DEFECTIVE FIBERS AND/OR OTHER FOREIGN MATERIALS IN THE PROCESSING OF SILK WASTE, AND RELATIVE APPARATUS

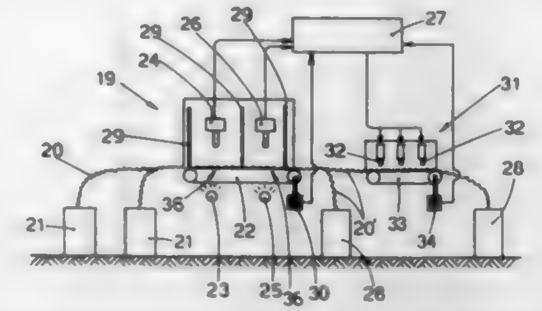
Pierantonio Salvador, Udine, and Paolo Viciguerra, Rivignano, both of Italy, assignors to Cascami Seta-Filature Seriche Riunite SpA, Vallemosso, Italy

Filed Nov. 25, 1992, Ser. No. 981,397

Claims priority, application Italy, Nov. 29, 1991, 91A000201

Int. Cl.⁵ G01N *21/00*

U.S. Cl. 356—238 **18 Claims**



1. Method to detect at least one of man-made fibers, defective fibers and other foreign materials in the processing of silk waste and to classify and count the faults detected in a lap of substantially parallel silk fibers comprising the steps of:

illuminating a substantially defined zone of the lap of silk fibers by transparency with white light while scanning the substantially defined zone of the lap of silk fibers by a telecamera associated with a data processing system; illuminating the substantially defined zone by transparency with polarized light while scanning the substantially defined zone of the lap of silk fibers with a telecamera associated with the data processing system; processing images taken by the telecamera(s); and comparing the images to predetermined characteristics of faults to determine at least one of the quantity, position, type and length of faults in the lap of silk fibers and of the man-made, foreign or defective fiber.

5,315,368

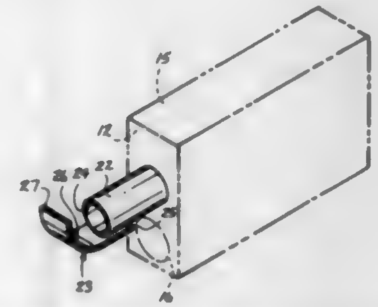
OPTICAL SIGHT ENHANCING BLADE ARRANGEMENT

Charles W. Winters, and Janice F. Winters, both of Rte. 1, Box 688, Bon Aqua, Tenn. 37025

Filed Apr. 12, 1993, Ser. No. 44,761

Int. Cl.⁵ G02B *27/34, 5/10*

U.S. Cl. 356—251 **1 Claim**



1. An optical sight enhancing blade arrangement in combination with a sight housing, having a housing front wall spaced from a housing rear wall, and a housing bottom wall spaced from a housing top wall, with the housing including an objective tube directed into the housing through the housing front wall, and an eyepiece tube longitudinally aligned with the

objective tube, with the eyepiece tube directed into the housing through the housing rear wall, and

a light tube directed into the housing through the housing front wall oriented between the objective tube and the housing top wall, with the light tube including a mirror plate fixedly mounted to the light tube, with the mirror plate adapted to direct available light into the light tube, and

the light tube includes an entrance opening, and the mirror plate includes a first end secured to the light tube, and includes a second end spaced beyond the entrance opening, with the mirror plate having a mirror plate concave interior reflective surface extending in a facing relationship relative to the entrance opening, and

the mirror plate includes mirror plate spaced parallel sides and a plurality of parallel slots directed into the mirror plate concave interior surface coextensively therewith, with the slots oriented orthogonally relative to the sides, and

the light tube includes a first tube mounted to the housing, the first tube having an annular ring groove spaced from the housing, and a second tube, the second tube having a second tube ring flange rotatably mounted within the annular ring groove, with the second tube and the first tube coaxially aligned relative to one another, and the second tube including the mirror plate first end fixedly mounted to the second tube.

5,315,369

METHOD OF AND APPARATUS FOR FEEDING A SAMPLE TO A PLASMA OF AN INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPECTROMETER

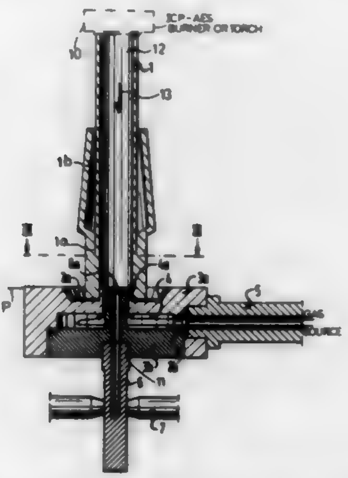
Zdravka Zadgorska, and Hubertus Nickel, both of Jülich, Fed. Rep. of Germany, assignors to Forschungszentrum Julich GmbH, Julich, Fed. Rep. of Germany

Filed Oct. 19, 1992, Ser. No. 963,579

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1991, 4134512

Int. Cl.⁵ G01N *21/73*

U.S. Cl. 356—316 **20 Claims**



1. A method of feeding sample material to a plasma of an inductively coupled plasma atomic emission spectrometer, comprising the steps of:

(a) connecting a sample-containing vessel to an upright central capillary tube of an inductively coupled plasma atomic emission spectrometer plasma torch so that an upwardly open mouth of said vessel communicates directly and extends into said tube while defining an all-around clearance around said mouth with said tube;

(b) feeding a gas stream from below into said clearance to generate a rising flow of the gas around said mouth and along said tube in a sheath around an axis of the tube;

(c) generating with said gas stream in said vessel by passage of said flow past said mouth, a suction inducing a sample contained in said vessel to flow upwardly along said axis within said sheath in said tube; and

(d) entraining said sample with said gas into said plasma to meter said sample into said plasma.

5,315,370

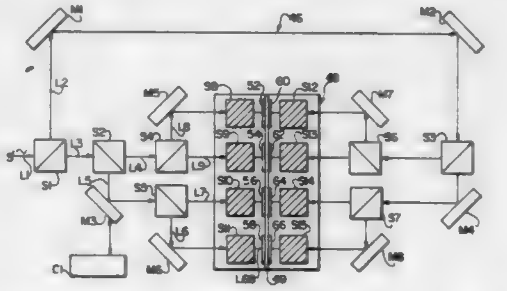
INTERFEROMETRIC MODULATOR FOR OPTICAL SIGNAL PROCESSING

Jeffrey A. Bulow, 209 Granger Rd., West, Syracuse, N.Y. 13219

Filed Oct. 23, 1991, Ser. No. 780,786

Int. Cl.⁵ G01B *9/02*

U.S. Cl. 356—345 **39 Claims**



1. An interferometric modulator for electromagnetic signals comprising:

means for providing an electromagnetic input signal having a first fundamental frequency;

beamsplitter means for receiving said electromagnetic input signal and separating said input signal into a reflected signal and a transmitted signal having a respective phase relationship;

first means for providing a first modulating signal;

a first reflecting means positioned a first distance from said beamsplitter means for receiving said reflected signal and returning said reflected signal to said beamsplitter means, said reflected signal having an optical path length determined by said first distance;

a second reflecting means positioned a second distance from said beamsplitter means for receiving said transmitted signal and returning said transmitted signal to said beamsplitter means, said transmitted signal having an optical path length determined by said second distance;

said first reflecting means including a modulating means responsive to said first modulating signal for varying said first distance and said reflected signal optical path length, wherein said respective phase relationship between said reflected and transmitted signals varies as said first distance is varied; and wherein

said beamsplitter means combines said returned reflected and transmitted signals into a modulated output signal having a second fundamental frequency determined by said varying phase relationship; and wherein

said first reflecting means includes a first piezoelectric crystal that has a distance of movement of 50 to 500 times lambda, where lambda is the wavelength of said electromagnetic input signal.

5,315,371
DEVICE FOR MEASURING THE POSITION OF A FILAMENT BUNDLE

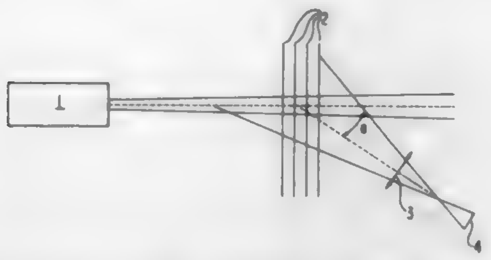
Matthias Hartrumpf, Karlsruhe, Fed. Rep. of Germany, assignor to Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.V., Fed. Rep. of Germany

Continuation of Ser. No. 648,852, Jan. 31, 1991, abandoned. This application Nov. 2, 1992, Ser. No. 970,469

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1990, 4002743

Int. Cl.^{5} G01B *9/02*

U.S. Cl. 356—355 **19 Claims**



1. Device for measuring position of a bundle of filaments as it is withdrawn in a first direction from a spinnerette of a spinning machine, comprising:

a source of light disposed adjacent to said filament bundle in an illumination plane which is approximately normal to said first direction, whereby light from said light source impinges on said filament bundle in said illumination plane;

a light measuring detector disposed adjacent said filament bundle at and angle relative to said illumination plane, said angle being chosen such that light from said source of light does not impinge directly on the detector, and

analyzer means responsive to a signal from said light measuring detector for the calculating of the position of said filament bundle.

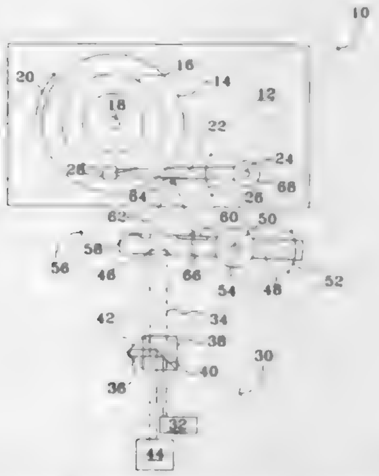
5,315,372
NON-CONTACT SERVO TRACK WRITING APPARATUS HAVING READ/HEAD ARM AND REFERENCE ARM

John C. Tsai, Saratoga, Calif., assignor to Excel Precision, Inc., Santa Clara, Calif.

Filed Jan. 4, 1993, Ser. No. 262

Int. Cl.^{5} G01B *9/02*

U.S. Cl. 356—358 **19 Claims**



1. A servo track writing apparatus for positioning a read/write head and an associated head positioning arm over a media disk, comprising:

a first movable arm;

a laser interferometer for determining the position of said first movable arm;

a head positioning arm affixed to the read/write head for holding and positioning the read/write head;

a relationship determining apparatus for determining a the position of said head positioning arm relative to said first movable arm;

first motive means for moving said first movable arm; and

second motive means for moving the read/write head to maintain a fixed relationship between the read/write head and said first movable arm.

5,315,373
METHOD OF MEASURING A MINUTE DISPLACEMENT

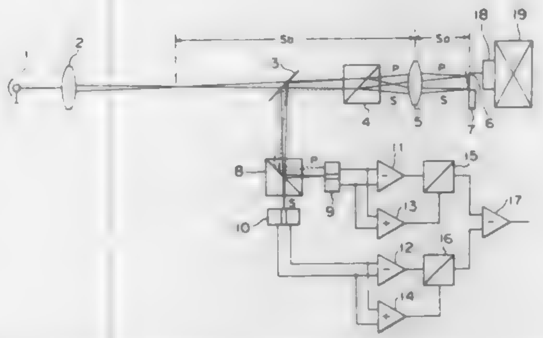
Keishi Kubo, Moriguchi; Yoshihiro Ikemoto, Katano, and Tatsuo Itou, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 26, 1992, Ser. No. 904,730

Claims priority, application Japan, Jun. 28, 1991, 3-157268

Int. Cl.^{5} G01B *7/34, 11/30*

U.S. Cl. 356—373 **2 Claims**



1. A method of detecting a minute displacement of a probe which comprises:

emitting from a laser source two laser beams having different polarizing directions;

passing the laser beams through a first lens so as to cause the laser beams to diverge;

passing the diverged laser beams through a beam splitter and then through a first prism having an angle of separation which varies depending on the direction of polarization of light, the beams passing through the first prism forming first and second measuring beams;

passing the first and second measuring beams through a second lens so as to be focused on and subsequently reflected from a first reflecting surface provided in the vicinity of a tip of the probe and a second reflecting surface provided in the vicinity of a probe holder;

passing the reflected first and second measuring beams through the second lens and the first prism towards the beam splitter;

deflecting by means of the beam splitter the reflected first and second measuring beams in a direction diverging from a direction towards the laser source so as to enter a polarizing beam splitter operable to pass or reflect the rays of light depending on the direction of polarization of the light, said reflected first measuring beam being deflected by said polarizing beam splitter so as to enter a first photodetector and said reflected second measuring beam being passed through said polarizing beam splitter so as to enter a second photodetector;

causing the first photodetector to detect a position of focus of the reflected first measuring beam and causing the second photodetector to detect a position of focus of the reflected second measuring beam; and

processing respective output signals from the first and second photodetectors by the use of a signal processing circuit to measure the displacement of the probe.

5,315,374
THREE-DIMENSIONAL MEASURING APPARATUS

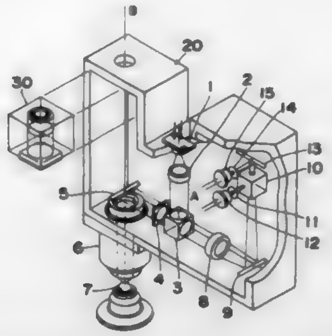
Keiichi Yoshizumi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 23, 1992, Ser. No. 948,592

Claims priority, application Japan, Sep. 27, 1991, 3-248830

Int. Cl.^{5} G01B *11/24*

U.S. Cl. 356—376 **5 Claims**



1. A three-dimensional measuring apparatus having an optical probe built therein, the optical probe comprising:

a laser source;

an objective lens for condensing a light from the laser source onto a surface to be measured;

a first beam splitter for separating from an incident optical path a laser light reflected from the surface to be measured;

a non-polarizing beam splitter for separating the separated light, separated by said first beam splitter, into two separated lights by a fixed separating ratio, independent of a direction of polarization;

a first pin hole provided in front of a condensing point of one of the two separated lights separated by the non-polarizing beam splitter;

a first photodetector for receiving the light passing through the first pin hole;

a second pin hole provided behind a condensing point of the other of the two separated lights separated by the non-polarizing beam splitter;

a second photodetector for receiving the light passing through the second pin hole;

a driving means for driving the objective lens in accordance with a difference of outputs between the first and second photodetectors as an error signal for automatic focus control;

a z-axis guide for guiding the optical probe in a z-axis direction; and

wherein the driving means includes a linear driving means having coils mounted on both sides of the optical probe and generating a linear driving force in the z-axis direction when a current is fed to the coils so as to linearly move the optical probe guided by the z-axis guide in the z-axis direction, and a control means for feeding to the coils a control current corresponding to the error signal.

5,315,375
SENSITIVE LIGHT DETECTION SYSTEM

Fritz S. Allen, Corrales, N. Mex., assignor to Acrogen, Inc., Oakland, Calif.

Filed Feb. 11, 1992, Ser. No. 833,926

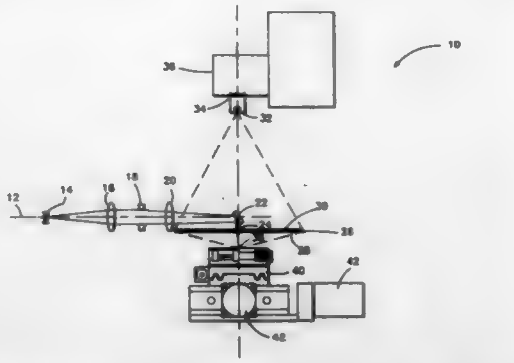
Int. Cl.^{5} G01N *21/64*

U.S. Cl. 356—417 **21 Claims**

1. An improved sensitivity light collection system capable of detecting luminescence from emitters in biological assay media comprising a sample resulting in a very low signal level, said light detection system comprising:

means for collecting emitted light from said assay media comprising a discrete element collector system, said system having a first discrete element collector catadioptric lens proximal to said sample having a small focal length and a low f number in the range of about 0.05-2 for collecting and collimating emitted light; and a second lens in light receiving relationship when said first discrete element collector separated by from about 0.1 to 50 cm from said first discrete element collector and distal from said sample having a greater focal length and a larger f number in the range of about 1-10 for focusing said collimated emitted light collected by said first discrete element collector; and

photodetecting means for detecting light transmitted by said discrete element collector system.



5,315,376
METHOD AND APPARATUS FOR CORRECTING CONCENTRATION

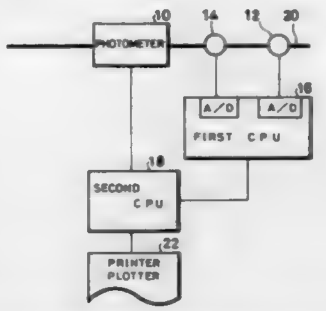
Akio Wada, Hachioji; Mitsuo Watanabe, Aichi; Yoshikazu Yuki; Kazunori Ebisawa, both of Tokyo; Masashi Nishimoto, Kanagawa; Kazuhisa Hayashi, Aichi; Kiyoharu Kutsuna, Anjo, and Takehito Mizutani, Oobu, all of Japan, assignors to JASCO Corporation, Tokyo and Nippondenso Co., Ltd., Aichi, both of Japan

Filed Oct. 11, 1991, Ser. No. 774,816

Claims priority, application Japan, Oct. 13, 1990, 2-274039

Int. Cl.^{5} G01N *21/01*

U.S. Cl. 356—432 **7 Claims**



1. A concentration measurement correcting apparatus comprising:

a material measuring means for measuring the material which is an object of measurement in a medium as a density per unit volume;

a temperature measuring means disposed in the vicinity of said measuring means so as to measure the temperature of said medium;

a pressure measuring means disposed in the vicinity of said measuring means so as to measure the pressure of said medium;

a correction coefficient calculating means for calculating correction coefficient a_0, a_1 in the following equation (1) for correcting the density measurement of said material when the actual density of said medium at the measurement of the material is calculated in terms of the density of said medium at a reference temperature and pressure from the results of said temperature measuring means and said pressure measuring means on the basis of the following equations (2) and (3):

$$C=a_0+a_1\cdot A \tag{1}$$

wherein C represents a concentration, A the measured density of said material,

$$a_0 = \alpha_0 \cdot \left(\frac{T}{P}\right) + \beta_0 \cdot \left(\frac{1}{P}\right) + \gamma_0 \cdot (T) + \delta_0 \tag{2}$$

$$a_1 = \alpha_1 \cdot \left(\frac{T}{P}\right) + \beta_1 \cdot \left(\frac{1}{P}\right) + \gamma_1 \cdot (T) + \delta_1 \tag{3}$$

wherein P represents a measured pressure, T a measured temperature and α_i, β_i, γ_i and δ_i constants and

correcting means for correcting the result of said material measuring means to a density measurement at said reference temperature and pressure by said correction coefficient.

5,315,377

THREE-DIMENSIONAL IMAGE DISPLAY USING ELECTRICALLY GENERATED PARALLAX BARRIER STRIPES

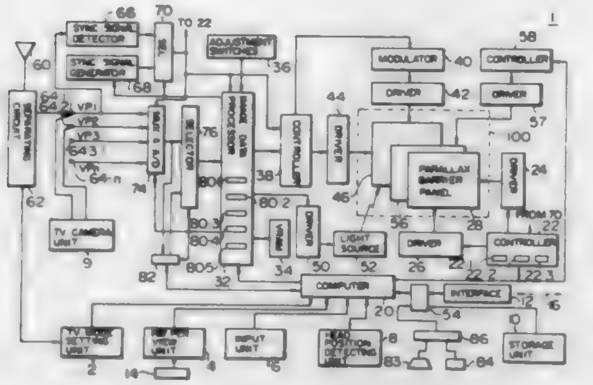
Haruo Isono, and Minoru Yasuda, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 15, 1992, Ser. No. 883,465

Claims priority, application Japan, Oct. 28, 1991, 3-281496

Int. Cl.^{5} H04N *13/04, 15/00*

U.S. Cl. 348—51 **39 Claims**



1. A display apparatus to display a three-dimensional (3D) image, comprising:

image display means for displaying a two-dimensional (2D) image in response to an input 2D image signal and for displaying a 3D image in response to an input 3D image signal, said 3D image signal being a signal representing spatially multiplexed 2D images; and

barrier display means having a barrier display panel of a transmitting type, for displaying a parallax barrier onto a portion of said barrier display panel corresponding to said 3D image such that said 3D image displayed by said image display means can be observed by use of gaps of said parallax barrier in a 3D image display mode, said barrier display means displaying no parallax barrier when said 2D image is displayed.

5,315,378

GAMMA CORRECTION AND WHITE BALANCE ADJUSTMENT METHOD AND APPARATUS FOR PROJECTION DISPLAY

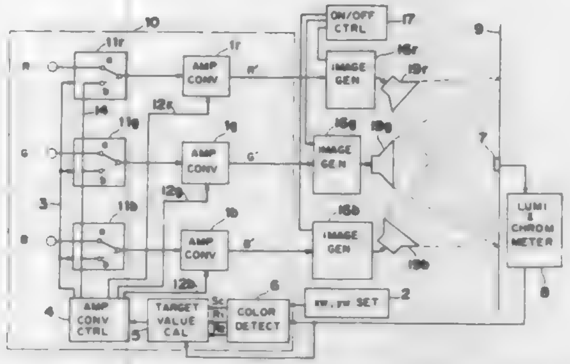
Hiroaki Satou, Minoo, and Tsutomu Muraji, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Nov. 3, 1992, Ser. No. 970,777

Claims priority, application Japan, Nov. 6, 1991, 3-289706

Int. Cl.^{5} H04N *9/73, 9/31, 5/74, 5/66*

U.S. Cl. 348—655 **13 Claims**



1. A method for white balance adjustment in a color projection display device having first, second and third color light emitting means which are used to form an image on a screen, said method comprising the steps of:

(a) setting desired white balance values (xw, yw);

(b) applying a predetermined luminance signal to each of said first, second and third color light emitting means in separate time slots to form first color, second color and third color raster images on the screen;

(c) measuring chromaticity values (xr, yr; xg, yg; xb, yb) for each of the first color, second color and third color raster images on the screen;

(d) obtaining a target mixture ratio for controlling the first color, second color and third color light emitting means from the measured chromaticity values of the first, second and third color raster images and the set desired white balance values; and

(e) processing received red, green and blue signals as a function of the obtained target mixture ratio, when producing an image on the screen.

5,315,379

APPARATUS FOR THE DEMODULATION OF A CARRIER CHROMINANCE SIGNAL INTO COLOR DIFFERENCE SIGNALS

Tsutomu Fukatsu, Kanagawa; Tadayoshi Nakayama, Tokyo; Yoshihiro Nakatani, Kanagawa; Hisataka Hirose, Kanagawa, and Chikara Sato, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 518,780, May 4, 1990, abandoned. This application Jul. 2, 1992, Ser. No. 907,711

Claims priority, application Japan, May 15, 1989, 1-122615; May 15, 1989, 1-122617; May 15, 1989, 1-122619; May 15, 1989, 1-122621

Int. Cl.^{5} H04N *9/64, 9/66*

U.S. Cl. 348—713 **4 Claims**

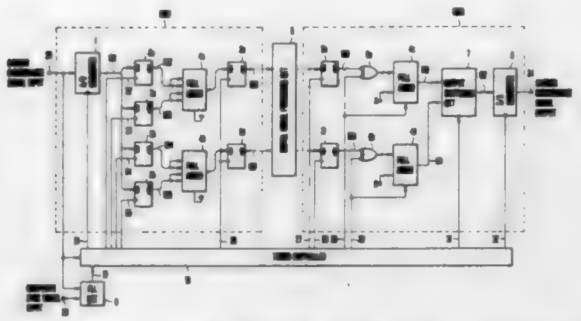
1. A digital color signal processing device for digital-processing a carrier chrominance signal, comprising:

(A) sampling clock signal producing means for producing first, second, third and fourth sampling clock signals, which have a frequency equal to that of the color burst signals of the carrier chrominance signal and have phases which differ by 90 degrees from each other, respectively,

on the basis of the color burst signal contained in the received carrier chrominance signal;

(B) sampling means for sampling the received carrier chrominance signal in accordance with the first, second, third and fourth sampling clock signals produced by said sampling clock signal producing means, thereby forming sampling data; and

(C) subtracting means for effecting subtraction of the sampling data formed in accordance with said first sampling clock signal and the sampling data formed in accordance with the second sampling clock signal, thereby outputting a first baseband signal conforming to a first color-difference signal and effecting subtraction of the sampling data formed in accordance with the third sampling clock signal and the sampling data formed in accordance with the fourth sampling clock signal, thereby outputting a second baseband signal conforming to a second color-difference signal.



5,315,380

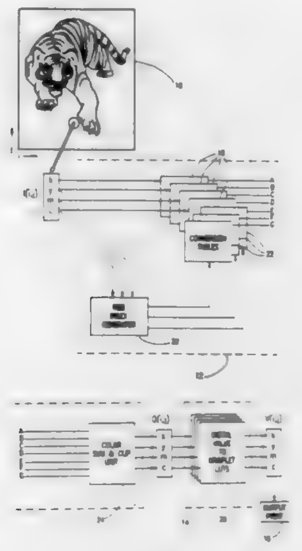
APPARATUS AND METHOD FOR TRANSFORMING THE DIGITAL REPRESENTATION OF A COLOR INPUT IMAGE

John Ingraham, North Chelmsford; Brad Winslow, Nashua, and Foster Fargo, Lincoln, all of Mass., assignors to Iris Graphics Inc., Bedford, Mass.

Filed Aug. 23, 1991, Ser. No. 749,299

Int. Cl.^{5} H04N *1/46*

U.S. Cl. 358—500 **20 Claims**



1. A system for converting a first representation of a color input image to a second representation, the system comprising:

means for mapping primary axes and overprint axes of a selected color coordinate system to primary axes and overprint axes of a printer color coordinate system of said second representation, thereby to produce primary conversion tables and overprint conversion tables; and

means for converting said first representation to said second representation utilizing said primary and overnight conversion tables,

said means for mapping comprising means for matching color of a plurality of reference step wedges in said printer color coordinate system to color of a small number of step wedges in said selected color coordinate system wherein said step wedges in said selected color coordinate system have color values along said primary and overprint axes of said selected color coordinate system.

5,315,381

COLOR IMAGE FORMING APPARATUS

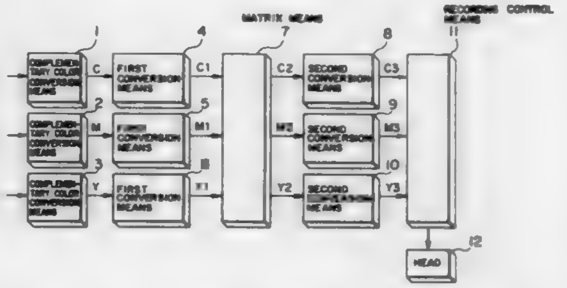
Haruo Yamashita, Osaka; Hideshi Ishihara, Takatsuki, and Yasuki Matsumoto, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 549,938, Jul. 9, 1990, abandoned. This application May 4, 1992, Ser. No. 879,455

Claims priority, application Japan, Jul. 17, 1989, 1-184092; Sep. 18, 1989, 1-241253

Int. Cl.^{5} H04N *1/46;* **G03F** *3/08*

U.S. Cl. 358—500 **16 Claims**



1. A color image forming apparatus comprising:

means for recording a color image on a print medium by employing a plurality of colored inks;

first conversion means including is first look-up table containing a monotonously incremental non-linear function with a monotonously incremental derivative, for converting color density information for C, M, YU (cyan, magenta, yellow), obtained by complementary color conversion of R, G, B (red, green, blue) luminance information, by said monotonously non-linear function with said monotonously incremental derivative to provide converted outputs C1, M1, Y1;

matrix means receiving said converted outputs C1, M1, Y1 or the first conversion means for performing a matrix operation with at least one matrix diagonal element to produce outputs C2, M2, Y2;

second conversion means including a second look-up table containing an inverse function of said non-linear function, said inverse function being a monotonously incremental non-linear function with a monotonously decremental derivative, for converting the outputs C2, M2, Y2 to produce ink control outputs C3, M3, Y3 by said monotonously incremental non-linear function with said monotonously excremental derivative; and

means or controlling ink densities of said colored inks applied to said print medium in accordance with the outputs of the second conversion means or color recording.

5,315,382

IMAGE PROCESSING APPARATUS

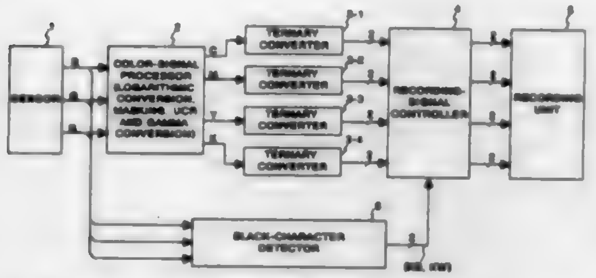
Hiroshi Tanioka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,641

Claims priority, application Japan, Jun. 20, 1990, 2-163605

Int. Cl.^{5} H04N *1/46*

U.S. Cl. 358—523 **33 Claims**



1. An image processing apparatus comprising:

input means for inputting image data consisting of a plurality of color components expressed by n-levels ($n>2$) of values;

converting means for converting the color components of n-level of values to m-level ($2<m<n$) of values;

discriminating means for determining whether an object pixel is on part of a line of a predetermined color based upon the image data inputted by said input means; and

correcting means for correcting color components of m-level of values of the object pixel based upon the determination made by said discriminating means.

5,315,383

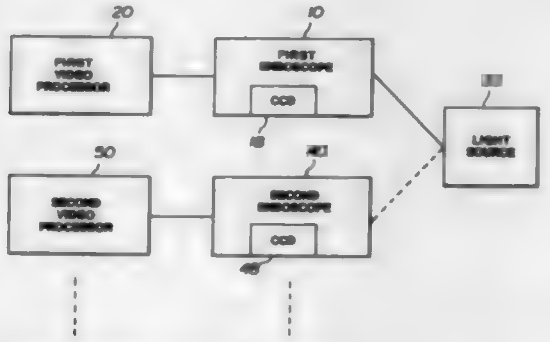
ENDOSCOPE SYSTEM

Hisao Yabe; Hiroyuki Sasa; Shigeru Nakajima; Kazunari Nakamura; Yoshihiro Okada; Katsuyuki Saito, and Seiji Yamaguchi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1992, Ser. No. 842,704

Int. Cl.^{5} A61B *1/04, 1/06*

U.S. Cl. 348—68 **8 Claims**



1. An endoscope system, comprising:

a plurality of different endoscopes each of which has an illumination optical system for emitting light outward and an observation optical system for forming an optical image of a subject at a distal end of an insertion tube that can be inserted into said subject, and includes a different type of solid-state imaging device for converting the optical image of said subject formed by said observation optical system into an electric signal;

a plurality of different signal processors each of which is compatible with one of said plurality of different endoscopes according to the type of said solid-state imaging device, for driving said solid-state imaging device in simultaneous mode, and for processing the output signal of said solid-state imaging device to provide a video signal; and

a light source which is compatible with any one of said plurality of different endoscopes for supplying light to said illumination optical system,

wherein one of said plurality of different endoscopes is connected to a compatible one of said plurality of different signal processors and to said light source, thus forming an endoscope apparatus.

5,315,384

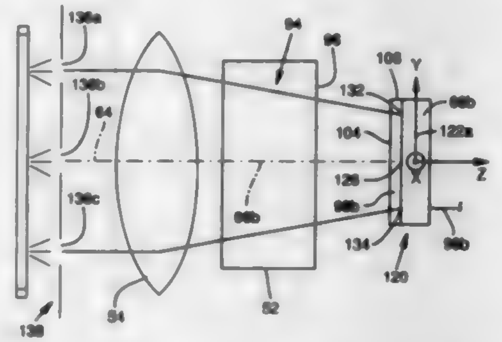
COLOR LINE SCAN VIDEO CAMERA FOR INSPECTION SYSTEM

Jack C. Heffington, Central Point, and H. Parks Squyres, Medford, both of Oreg., assignors to Simco/Ramic Corporation, Medford, Oreg.

Continuation of Ser. No. 606,758, Oct. 30, 1990, abandoned. This application Nov. 25, 1992, Ser. No. 982,148

Int. Cl.^{5} H04N *7/18*

U.S. Cl. 348—93 **7 Claims**



1. A method for positioning and aligning a first photodetector array relative to a first exit surface of a prismatic beam splitter of a color inspection camera, comprising the steps of:

directing light from an alignment target through the prismatic beam splitter to the first exit surface;

positioning with a micrometric manipulator the first photodetector array adjacent to the first exit surface of the prismatic beam splitter;

aligning the first photodetector array with an electromechanical manipulator coupled to the micrometric manipulator such that the alignment target is received by predetermined photodetectors in the first photodetector array, the electromechanical manipulator providing a finer degree of manipulation than the micrometric manipulator; and

bonding the first photodetector array to the first exit surface of the prismatic beam splitter.

5,315,385

INVERTING THE PHASE OF THE CARRIER OF A FIRST SIGNAL ON A LINE-BY-LINE BASIS TO PREVENT CO-CHANNEL INTERFERENCE WITH A SECOND INDEPENDENTLY TRANSMITTED SIGNAL

Gerd Reime, Schömberg, Fed. Rep. of Germany, assignor to Nokia (Deutschland) GmbH, Pforzheim, Fed. Rep. of Germany

Filed Mar. 13, 1992, Ser. No. 850,876

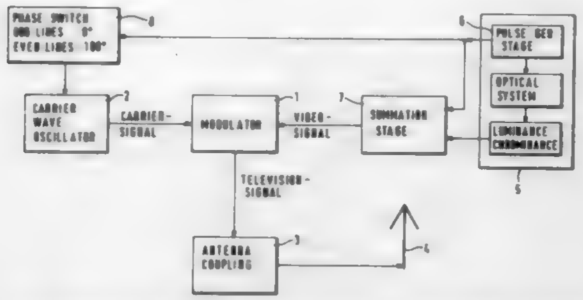
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1991, 4108558

Int. Cl.^{5} H04N *7/04, 7/08, 5/38*

U.S. Cl. 348—441 **4 Claims**

1. A method of transmitting first and second independent television signals for broadcasting by independent transmitters at different places using a same channel frequency range for unmodulated luminance carrier waves of the first and second independent television signals wherein the luminance carrier waves of the first and second independent television signals are modulated with different first and second video signals, respectively, comprising the steps of:

inverting the phase of oscillations of the second unmodulated luminance carrier wave each line of the corresponding video signal by a duration of one line and



modulating the phase inverted second unmodulated luminance carrier wave with the second video signal for transmitting the second independent television signal for broadcast.

5,315,386

TELEVISION RECEIVER AND DECODER FOR CLOSED-CAPTION BROADCAST PROVIDING SIMPLE CHARACTER DISPLAY SHOWING EXISTENCE OF A CLOSED-CAPTION SIGNAL IRRESPECTIVE OF USER SELECTION OF CLOSED CAPTION DEMODULATION

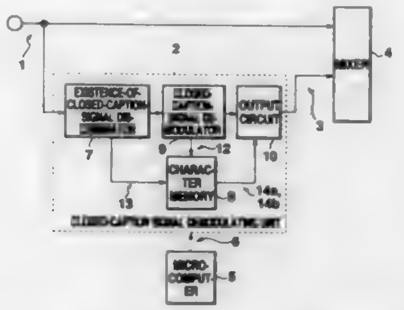
Yoshifumi Muramoto, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1993, Ser. No. 25,245

Claims priority, application Japan, Mar. 4, 1992, 4-046537

Int. Cl.^{5} H04N *7/087, 5/50, 7/08, 5/445*

U.S. Cl. 348—569 **12 Claims**


1
2
3
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6
7
8
9
10
12
13
14a, 14b
MIXER
EXISTENCE-OF-CLOSED-CAPTION-SIGNAL DISCRIMINATOR
CLOSED-CAPTION SIGNAL DEMODULATOR
OUTPUT CIRCUIT
CHARACTER MEMORY
CLOSED-CAPTION SIGNAL DEMODULATING UNIT
MICRO-COMPUTER

1. A television receiver for closed-caption broadcast in which an image signal and a closed-caption signal are to be displayed on a viewable screen of the receiver, comprising:

(a) a closed-caption signal demodulating unit for demodulating a closed-caption signal in an image signal of television broadcast and for outputting the demodulated closed-caption signal for closed-caption display, said closed-caption signal demodulating unit including

  (i) an existence-of-closed-caption-signal discriminator for discriminating whether or not a closed-caption signal exists, for closed-caption broadcast, in an image signal of television broadcast,

  (ii) a first memory for outputting a predetermined simple existence of closed-caption character in response to said existence-of-closed-caption-signal discriminator judging that the closed-caption signal exists, and

  (iii) an output circuit for receiving the simple existence of closed-caption character output from said first memory and for converting the simple existence of closed-caption character into a closed-caption signal;

(b) a mixer for mixing the closed-caption signal, which is output from said output circuit, with the image signal and for outputting the composite signal as a screen display signal

for displaying an image on a viewable screen of the receiver, whereby a viewer may recognize, from the simple existence of closed-caption character displayed on the viewable screen, if closed-caption broadcast is available or not.

5,315,387

HORIZONTAL SYNCHRONIZATION CIRCUIT

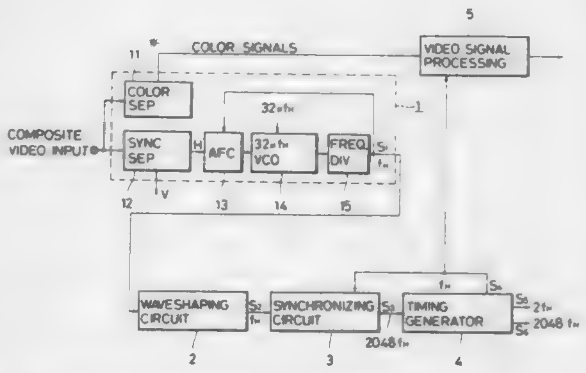
Miyuki Tachibana, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1993, Ser. No. 6,493

Claims priority, application Japan, Jan. 27, 1992, 4-034036

Int. Cl.^{5} H04N *5/06, 5/12*

U.S. Cl. 348—521 **12 Claims**



1. A horizontal synchronization circuit, comprising:

a decoder having an automatic frequency control circuit for receiving a composite video signal, separating therefrom horizontal synchronizing pulses having a certain horizontal frequency, generating a first signal also having said horizontal frequency, and locking said first signal in phase with said horizontal synchronizing pulses;

a waveshaping circuit coupled to said decoder, for reshaping said first signal by reducing the duty cycle of said first signal to generate a second signal also having said horizontal frequency;

a synchronizing circuit coupled to said waveshaping circuit, for receiving said second signal, generating a third signal with a frequency higher than said horizontal frequency, receiving a fourth signal, and controlling the frequency of said third signal according to a phase difference between said fourth signal and said second signal; and

a timing generator coupled to said synchronizing circuit, for receiving said third signal and dividing the frequency thereof, thereby generating said fourth signal and a fifth signal, said fourth signal having said horizontal frequency and said fifth signal having a higher frequency.

5,315,388

MULTIPLE SERIAL ACCESS MEMORY FOR USE IN FEEDBACK SYSTEMS SUCH AS MOTION COMPENSATED TELEVISION

Paul Shen, San Diego; Woo H. Paik, Encinitas, and Edward A. Krause, San Diego, all of Calif., assignors to General Instrument Corporation, Hatboro, Pa.

Filed Nov. 19, 1991, Ser. No. 791,369

Int. Cl.^{5} H04N *5/907*

U.S. Cl. 348—718 **20 Claims**

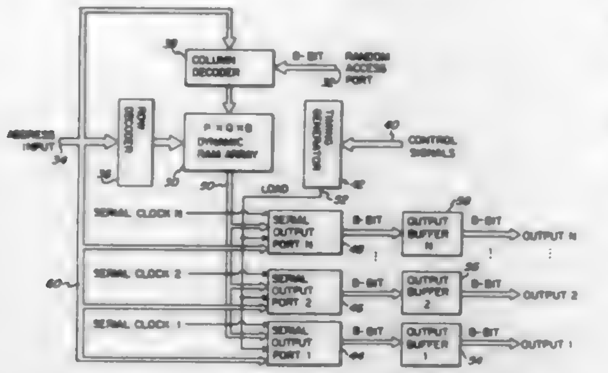
1. A multiple serial access memory comprising:

a dynamic random access memory array P rows high by Q columns wide by B bits deep;

means for addressing said array to randomly input N row high by M column wide blocks of B bit data bytes thereto, where $N<P$ and $M<Q$;

means for outputting rows of data of length L from said array in response to address signals provided by said addressing means, where $M<L<Q$;

a plurality of serial output ports coupled to said outputting



means for selectively latching rows of data output by said outputting means; and

means for clocking said serial output ports to output latched data therefrom.

5,315,389

INTENSITY CORRECTION DEVICE FOR PROVIDING A CORRECTION SIGNAL FOR AUTOMATICALLY CORRECTING AN INTENSITY OF A VIDEO SIGNAL

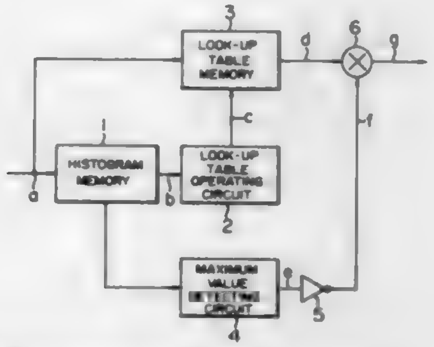
Yosuke Izawa, Ibaraki, and Naoji Okumura, Minoo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 25, 1992, Ser. No. 904,214

Claims priority, application Japan, Jun. 28, 1991, 3-158193

Int. Cl.^{5} H04N *5/208*

U.S. Cl. 348—672 **4 Claims**


3
LOOK-UP TABLE MEMORY
d
6
g
c
f
1
HISTOGRAM MEMORY
a
b
LOOK-UP TABLE OPERATING CIRCUIT
2
MAXIMUM VALUE DETECTING CIRCUIT
e
4
5

1. An intensity correction device comprising:

a histogram memory for forming a histogram of an input luminance signal;

a look-up table operating circuit for accumulating the histogram and normalizing the accumulated histogram so that a maximum cumulative frequency of occurrence of the input luminance signal becomes a maximum value of an output luminance signal;

a look-up table memory for storing the normalized data and outputting a correction signal in response to the input luminance signal;

a maximum value detecting circuit for detecting a maximum value of the histogram; and

a multiplier for multiplying an inverse value of the maximum value detected by said maximum value detecting circuit and the correction signal.

5,315,390

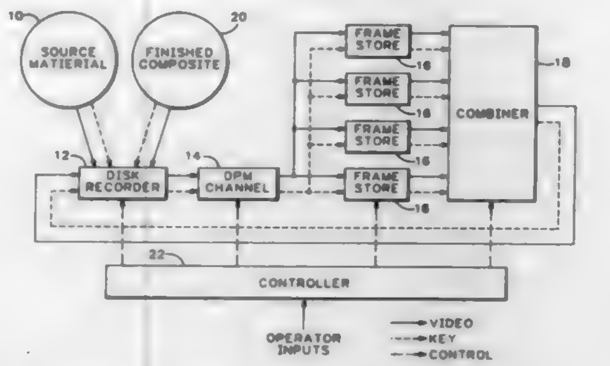
SIMPLE COMPOSITING SYSTEM WHICH PROCESSES ONE FRAME OF EACH SEQUENCE OF FRAMES IN TURN AND COMBINES THEM IN PARALLEL TO CREATE THE FINAL COMPOSITE SEQUENCE

Kevin D. Windrem, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Apr. 2, 1993, Ser. No. 42,223

Int. Cl.^{5} H04N *5/262, 5/265, 5/272, 9/74*

U.S. Cl. 348—584 **5 Claims**



1. A simple compositing system comprising:

means for storing sequences of images from a plurality of sources;

means for processing the sequences of images from the storing means, the processing means processing one frame from each image sequence in turn;

a plurality of frame stores, coupled to receive the processed frames from the processing means, store the processed frames, one frame store for each image sequence being composited; and

means for combining simultaneously the processed frame from each of the frame stores after one frame for each image to be composited is loaded into the frame stores to produce a composite frame, which composite frame is stored in the storing means together with other composite frames, the totality of composite frames forming a final composite image sequence.

5,315,391

PIP MAIN AND SUBSCREEN SELECTION FROM AMONG TV, BS, AND VCR PLAYBACK SIGNALS

Jun H. Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Corporation, Kyungki-do, Rep. of Korea

Filed Dec. 11, 1992, Ser. No. 989,591

Claims priority, application Rep. of Korea, Dec. 11, 1991, 91-22626

Int. Cl.^{5} H04N *5/44, 5/272, 5/268, 9/74*

U.S. Cl. 348—553 **2 Claims**

1. A TV receiver with built-in multiple functions comprising:

a TV tuner for tuning conventional TV signals;

a TV signal processing means for processing signals from said TV tuner;

a PIP signal processing means for processing PIP signals, said PIP signal processing means having a clock generator for generating clock pulses;

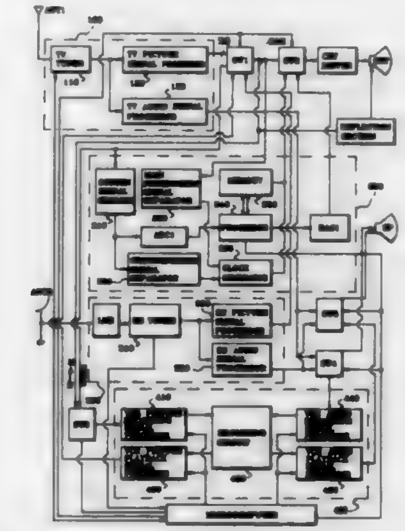
a Bs signal processing means for processing BS signals;

a VCR signal processing means for processing VCR signals and including a VCR;

a microcomputer (MICOM) for controlling each said signal processing means;

TV main screen selection means responsive to control of said MICOM and connected to said TV signal processing means, BS picture signal processing means and VCR signal processing means and said MICOM, for selecting and displaying as the main screen display a signal from among a TV picture signal, a BS picture signal, and a VCR playback signal generated by said TV, BS and VCR signal processing sections, respectively, and for selecting a subscreen signal from among a TV picture signal, a BS picture signal, and a VCR playback signal generated by said TV, BS and VCR signal processing sections, respectively;

TV subscreen selection means responsive to control of said MICOM and connected to said TV main screen selection means, said PIP signal processing means and said MICOM, for displaying said selected sunscreen signal as a PIP or subscreen display within said TV main screen display, said PIP screen being output to said TV subscreen selection means and read out at a clock rate provided by the clock pulses from said clock generator;



audio output and recording signal selection means responsive to control of said MICOM and connected to said TV signal processing means, BS signal processing means and said MICOM, for selecting an audio signal to be recorded on said VCR and for providing said audio signal to said VCR signal processing means, said audio signal to be recorded being selected from among the audio signals associated with said TV signal and said BS signal; and

audio output means responsive to control of said MICOM and connected to said TV signal processing means, said BS signal processing means, said VCR signal processing means, and said MICOM, for providing an audio signal output selected from audio signals associated with said TV signal, said Bs signal, and the audio recorded on said VCR.

5,315,392

APPARATUS FOR DISPLAY AND SELECTION OF AVAILABLE TELEVISION CHANNELS

Yoji Ishikawa, and Takashi Otani, both of Saitama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1992, Ser. No. 852,726

Claims priority, application Japan, Mar. 29, 1991, 3-066108

Int. Cl.^{5} H04N *5/445*

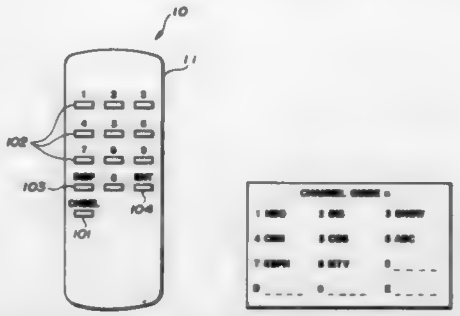
U.S. Cl. 348—570 **3 Claims**

1. A television channel selection apparatus for use with a television receiver having a display and receiving a number of available television channels, comprising:

a first pushbutton provided on a pushbutton pad and means for producing a first command signal upon said first pushbutton being depressed;

information processing means responsive to the first command signal for displaying a television channel list on the display of the television receiver, the television channel list including channel numbers corresponding to the respective available television channels;

a plurality of second pushbuttons provided on the pushbutton pad and means for selectively producing one of a plurality of second command signals, said plurality of second command signals corresponding respectively to the listed channel numbers displayed following depression of said first pushbutton;



wherein said information processing means responds to the selectively produced second command signal and selects a television channel corresponding to the channel number selected by the second command signal.

5,315,393

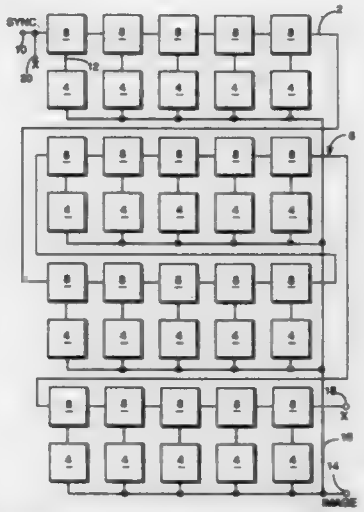
ROBUST PIXEL ARRAY SCANNING WITH IMAGE SIGNAL ISOLATION

Stephen G. Mican, Munster, Ind., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 1, 1992, Ser. No. 861,929

Int. Cl.^{5} H04N *5/335, 9/07*

U.S. Cl. 348—268 **6 Claims**



1. For an optoelectronic image transducer that comprises a plurality of discrete picture elements arranged in rows and columns, and into spectral groups of picture elements, with each said group of elements having a different characteristic optical spectrum and said picture elements from each of said spectral groups arranged in a predetermined spectral order of spectral picture element sets, and said plurality of picture elements are individually addressed over a predetermined image frame scanning period that corresponds to the addressing of said plurality of picture elements that comprises a complete image frame, a method of sequentially addressing each of said picture elements, comprising the steps of:

sensitizing said picture elements to a scanning signal that comprises a singular pulse having a period of duration less than or substantially equal to the reciprocal of a picture element scanning rate to activate said picture elements upon receipt of said scanning signal propagated through a scanning signal path;

simultaneously coupling an image signal through an image signal path separate from said scanning signal path to all of said picture elements that has a signal level parameter that is proportional to a brightness level parameter of those of said picture elements that are activated; and

propagating said pulse scanning signal through said scanning signal path in a predetermined special order of said rows and columns at said predetermined picture element scanning rate from one to another of said picture elements in each said spectral picture element set until all of said picture elements that comprise said complete image frame have been activated.

5,315,394
AUTO-IRIS METHOD AND APPARATUS FOR IMAGING DEVICE

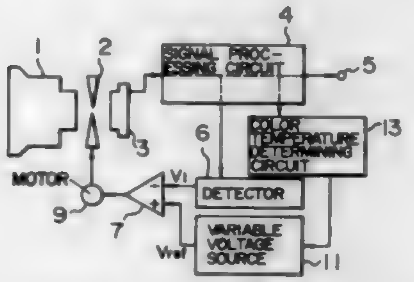
Tomoyuki Kurashige; Takuya Imaide, both of Yokohama, and Hiroyuki Tarumizu, Fujisawa, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Video & Information System, Inc., Kanagawa, both of Japan

Filed Sep. 3, 1991, Ser. No. 754,398

Claims priority, application Japan, Sep. 4, 1990, 2-232348

Int. Cl.⁵ H04N *5/225*

U.S. Cl. 348—229 **40 Claims**


1
2
4
SIGNAL PROC-ESSING CIRCUIT
5
3
6
COLOR TEMPERATURE DETERMINING CIRCUIT
13
MOTOR
V1
DETECTOR
9
7
Vref
VARIABLE VOLTAGE SOURCE
11

1. An auto-iris method for an imaging device comprising the steps of:

(a) obtaining a first signal indicating brightness of an object to be imaged from an output signal of an imaging element;

(b) comparing a level of said first signal with a level of a reference signal; and

(c) controlling an iris to pass a larger quantity of light to said imaging element as said object becomes brighter.

5,315,395
PROJECTOR WITH SEPARABLE PROJECTION UNIT AND DISPLAY BODY

Mitsuya Nakao, 25-5, Fujigaoka-3-chome, Fujisawa-shi; Keiichiro Tanaka, 1-3-304, Ryoke-4-chome, Izumi-ku, Yokohama-shi; Kousyu Ichikawa, 9-3, Nagatadai, Minami-ku, Yokohama-shi; Akio Yamamoto, 467-8, Nakatacho, Izumi-ku, Yokohama-shi, and Tadakazu Matsubara, 8-11, Honfujisawa-2-chome, Fujisawa-shi, all of Japan

Filed Nov. 6, 1992, Ser. No. 972,837

Claims priority, application Japan, May 8, 1991, 3-102468; Dec. 13, 1991, 3-330344

Int. Cl.⁵ H04N *5/74*

U.S. Cl. 348—789 **6 Claims**

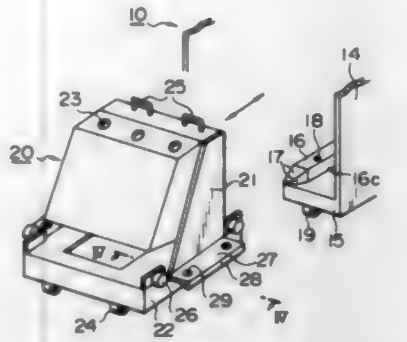
1. A projection-type display device comprising:

a display body including an upper cabinet having a screen at a front portion thereof and a lower cabinet having a pair of side frames for supporting said upper cabinet;

a projector unit including projectors and a mounting device on which said projectors are mounted movable in the forward/backward directions with respect to said lower cabinet;

means for guiding said projector unit to a predetermined position in said display body when said projector unit is separated from or received into said display body;

means for locating said projector unit at a predetermined position and securing together said projector unit and said display body to separate one of them from a floor surface; and



means for supporting the other of said projector unit and said display body which is grounded on the floor surface, at three positions.

5,315,396
DROPOUT COMPENSATION DEVICE

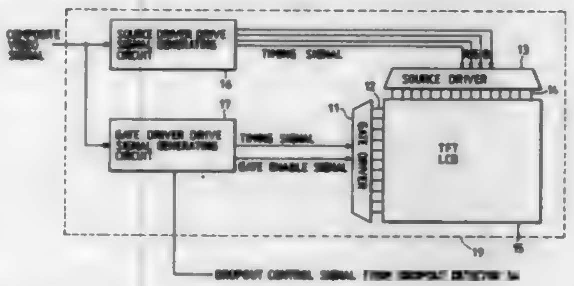
Shunichi Miyadera, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 656,324

Claims priority, application Japan, Feb. 22, 1990, 2-42189

Int. Cl.⁵ H04N *5/70, 5/76*

U.S. Cl. 348—792 **5 Claims**


COMPOSITE VIDEO SIGNAL
SOURCE DRIVER DRIVE SIGNAL GENERATING CIRCUIT
TIMING SIGNAL
13
SOURCE DRIVER
16
17
12
11
GATE DRIVER DRIVE SIGNAL GENERATING CIRCUIT
TIMING SIGNAL
GATE ENABLE SIGNAL
GATE DRIVER
TFT LCD
19
15
DROPOUT CONTROL SIGNAL FROM DROPOUT DETECTOR

1. A dropout compensation device, comprising:

display means having a plurality of capacitors for storing video signals, a plurality of display elements for displaying respective image portions in accordance with the video signals stored in said capacitors, and a plurality of switching elements for supplying to said capacitors video signals representing an image to be displayed;

a first driver for supplying said video signals to said switching elements to be supplied to said capacitors;

a second driver for generating scanning pulses for turning said switching elements on and off; and

dropout detection means for detecting a dropout of said video signal;

said second driver being responsive to detection of a dropout by said dropout detection means for controlling said switching elements to interrupt the supplying of said video signals to said capacitors so that during a dropout said capacitors continue to store video signals provided to said capacitors prior to said dropout, and said display elements continue to display image portions in accordance with the previously stored video signals.

5,315,397
APPARATUS AND METHOD FOR RECEIVING AND TRANSMITTED RECORDING DATA

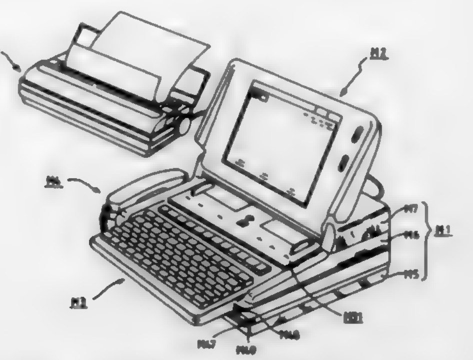
Naoshi Inoue, Tokyo; Shigeo Yoshida, Yokohama, and Toshio Sugino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1990, Ser. No. 621,065

Claims priority, application Japan, Feb. 13, 1990, 2-031712

Int. Cl.⁵ H04N *1/21, 1/32;* **G01D** *15/18*

U.S. Cl. 358—296 **30 Claims**



1. An image communication apparatus for receiving and recording transmitted recording data, the apparatus comprising:

reception means for receiving the transmitted recording data;

storage means for storing the recording data received by said reception means in a nonvolatile manner such that said recording data can remain stored in said storage means after being read therefrom;

recording means for recording an image in accordance with the recording data without regard to to a possible occurrence of an irregularity in said recording means;

reading means for automatically reading out the recording data stored in said storage means and for outputting the recording data to said recording means without regard to the possible occurrence of an irregularity in said recording means; and

deletion means for deleting the recording data stored in said storage means by a manual operation after the recording data is recorded by said recording means.

5,315,398
AUTOMATICALLY ADJUSTABLE SHEET MEMBER CUTTING DEVICE

Shinnichiro Otsuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 781,573, Oct. 23, 1991, abandoned. This application Jul. 6, 1993, Ser. No. 86,372

Claims priority, application Japan, Oct. 24, 1990, 2-287562

Int. Cl.⁵ H04N *1/23;* **B41J** *11/66;* **B41F** *13/56;* **B26D** *5/00*

U.S. Cl. 358—304 **7 Claims**

1. A sheet member cutting device comprising:

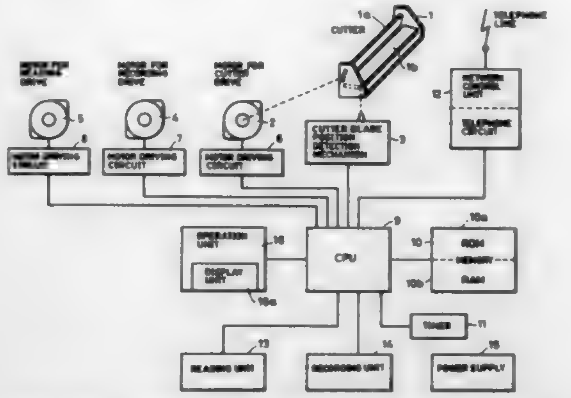
a cutter having blades at least one of which is movable between a first position for receiving a sheet member and a second position for cutting a sheet member;

a stepping motor for moving said blade from one of the first position and the second position, said stepping motor moving said blade at a plurality of rotation speeds;

a timer for measuring a time after the blade movement caused by said stepping motor has started;

a memory for storing a plurality of times, each corresponding to a time necessary for normally completing a cutting operation by said cutter at one of said plurality of rotation speeds for said stepping motor; and

control means for starting a drive of said stepping motor at one of said plurality of rotation speeds, for comparing a time stored in the memory corresponding to the one of said plurality of rotation speeds with a time measured by a timer, and for setting the rotation speed of said stepping motor to another one of said plurality of rotation speeds wherein the time measured by the timer will be greater than the time stored in memory corresponding to the one of said plurality of rotation speeds, and said control means comprises a malfunction detection means for detecting a malfunction in the cutting of the sheets member and for correcting the malfunction by setting the rotation speed to another one of the plurality of rotation speeds whereby a driving torque of the stepping motor is increased or by setting the driving torque at a higher driving torque.



5,315,399
CAPACITIVE CIRCUIT

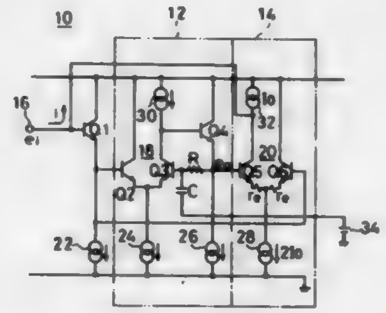
Fumiaki Honda, Takatsuki, and Nobukazu Hosoya, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 26, 1992, Ser. No. 904,066

Claims priority, application Japan, Jun. 28, 1991, 3-158980; Jun. 28, 1991, 3-158981; Jun. 28, 1991, 3-158982; Feb. 28, 1992, 4-043866

Int. Cl.⁵ H04N *5/60, 5/00*

U.S. Cl. 358—335 **12 Claims**



1. A capacitive circuit, comprising:

an input terminal for inputting an input signal;

a high-pass type amplifier for receiving said input signal;

a differential amplifier for detecting a differential component between an output signal of said high-pass type amplifier and said input signal; and

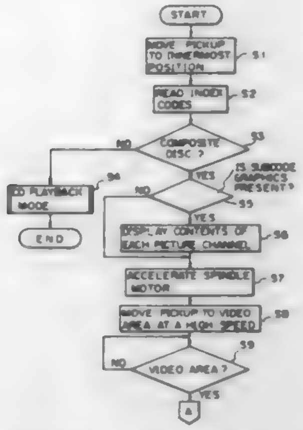
feed-back means for feeding-back said differential component to said input terminal, whereby said input signal is phase-shifted by 90 degrees.

5,315,400

METHOD OF RECORDING AND REPRODUCING PICTURE INFORMATION, RECORDING MEDIUM, AND RECORDING MEDIUM PLAYING APPARATUS

Junichi Kurata, and Satoru Nomura, both of Yamanashi, Japan, assignors to Pioneer Electronic Corp. and Pioneer Video Corp., both of Japan

Continuation of Ser. No. 860,250, Mar. 27, 1992, abandoned, which is a continuation of Ser. No. 247,351, Sep. 21, 1988, abandoned. This application May 24, 1993, Ser. No. 65,036
Claims priority, application Japan, Mar. 11, 1988, 63-57401
Int. Cl.^{5} H04N *5/76*
U.S. Cl. 358—335 **10 Claims**


START
MOVE PICKUP TO INNERMOST POSITION
S1
READ INDEX CODES
S2
COMPOSITE DISC ?
S3
NO
YES
IS SUBCODE GRAPHICS PRESENT?
S5
NO
CD PLAYBACK MODE
S4
END
YES
DISPLAY CONTENTS OF EACH PICTURE CHANNEL
S6
ACCELERATE SPINDLE MOTOR
S7
MOVE PICKUP TO VIDEO AREA AT A HIGH SPEED
S8
NO
VIDEO AREA ?
S9
YES
A

1. A method of recording and reproducing picture information on a recording medium having a lead-in area and a program area to be played after the lead-in area, the method comprising the steps of:

inserting a plurality of graphic subcodes including picture information in a coded information signal, wherein said graphic subcodes occupy at least one signal source channel in a signal source channel group of N channels where N is a natural number greater than 1;

recording said information signal including said graphic subcodes occupying at least one signal source channel in said program area of said recording medium;

recording in said lead-in area identification code information representing a content of said graphic subcodes occupying said at least one signal source channel in said program area of said recording medium;

displaying said identification code information when said recording medium is to be played; and

mixing with a video format signal a picture signal corresponding to graphic subcodes occupying one signal source channel in said signal source channel group of N channels designated by a picture channel command.

5,315,401

APPARATUS FOR RECORDING AND/OR REPRODUCING DIGITAL VIDEO AND AUDIO SIGNALS OPERABLE IN AN AFTER-RECORDING MODE

Hiroshi Okada, Tokyo; Keiji Kanota, and Yukio Kubota, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

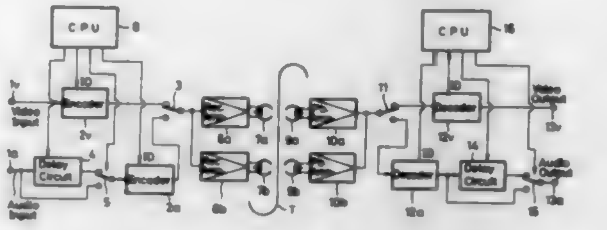
Filed Sep. 4, 1992, Ser. No. 941,244
Claims priority, application Japan, Sep. 12, 1991, 3-233332
Int. Cl.^{5} H04N *5/95*
U.S. Cl. 358—337 **22 Claims**

1. Digital video tape recording apparatus for recording digital video and digital audio signals in separate portions of a record track, comprising:

digital video processing means including video record processing means and video reproduce processing means for processing the digital video signal supplied thereto for recording and for reproduction, respectively, each of said video record processing means and said video reproduce processing means exhibiting an inherent time delay t_1;

digital audio processing means including audio recording processing means and audio reproduce processing means for processing the digital audio signal associated with said digital video signal and supplied thereto for recording and reproducing, respectively, each of said audio record processing means and said audio reproduce processing means exhibiting an inherent time delay t_{11}, where $t_1 > t_{11}$;

delay means including record delay means and reproduce delay mean for delaying the digital audio signal that is recorded and reproduced, respectively, each of said record delay means and reproduce delay mans exhibiting a delay substantially equal to $(t_1 - t_{11})$ so that during a reproduction operation, the reproduced digital video and digital audio signals are recovered in synchronism;



supplying means operable in an after-recording mode for supplying the digital audio signal to said audio record processing means for recording the same in said after-recording mode substantially immediately after the digital video signal with which the supplied digital audio signal is associated is recovered, the recording of the digital audio signal in said after-recording mode being carried out without re-recording the digital video signal; and

record delay adjustment means and reproduce delay adjustment means for adjusting the delay of said record delay means and said reproduce delay means, respectively, to zero during said after-recording mode; each of said record and reproduce delay adjustment means comprising bypass means operable during said after-recording mode to bypass said record delay means and said reproduce delay means, respectively.

5,315,402

VIDEO SIGNAL RECORDING/REPRODUCING SYSTEM FOR INCREASING RECORDING DENSITY OF A FREQUENCY MODULATED SIGNAL

Yasuyuki Ito, Tokyo; Takeshi Kawabe, Asaka; Yukio Tojo, and Takeo Takase, both of Kashiwa, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 561,682, Aug. 2, 1990, abandoned. This application Aug. 25, 1992, Ser. No. 932,748
Claims priority, application Japan, Aug. 2, 1989, 1-200840; Dec. 21, 1989, 1-333810; Mar. 15, 1990, 2-67588; Jul. 5, 1990, 2-178793
Int. Cl.^{5} H04N *5/85;* G11B *11/18*
U.S. Cl. 358—342 **7 Claims**

2. A video signal recording/reproducing device comprising:

a laser light source, for projecting a laser light on an optical disk memory, to record/reproduce video signals;

frequency modulating means for generating frequency modulated signals representative of said video signals for recording on said optical disk memory;

laser driving pulse generating means, coupled to said frequency modulating means, for generating laser driving pulses derived from said frequency-modulated signals, a duty factor of said laser driving pulses being modified in accordance with a linear velocity signal indicative of a linear velocity of a part of said optical disk memory where recording is performed;

recording means, coupled to said laser light source, for recording said frequency-modulated signals by converging said laser light, emitted from said laser light source in accordance with said laser driving pulses, on said optical disk memory;

driving means for driving said optical disk memory during recording/reproducing;

linear velocity detecting means, coupled to said recording means and said laser driving pulse generating means, for detecting said linear velocity to generate said linear velocity signal;

reproduction means for reproducing said frequency-modulated signals recorded on said optical disk memory by said recording means to output a reproduction pulse signal; and

FM demodulating means, coupled to said reproduction means, for demodulating said reproduction pulse signal,

said recording means including

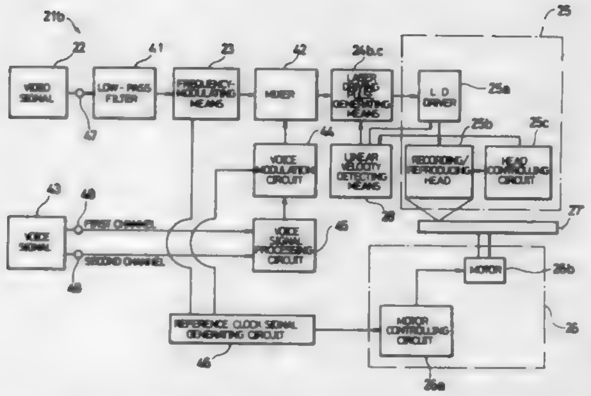
laser light source driving means, coupled to said laser driving pulse generating means and said laser light source, for driving said laser light source in response to said laser driving pulses and for controlling output power of said laser light source to be an optimum value during recording according to said linear velocity signal and the duty factor of said laser driving pulses,

recording head means equipped with converging means for converging said laser light emitted by said laser light source onto said optical disk memory and a magnetic field applying section for emitting an auxiliary magnetic field, and

head control means, coupled to said recording head means, for controlling the converging position of said laser light,

said laser driving pulse generating means and said laser light source driving means respectively controlling the duty factor of said laser driving pulses and the output power of said laser light source to be optimum values so that said reproduction pulse signal has a duty factor substantially equal to 50%,

said laser driving pulse generating means including pulse width adjusting means for increasing the duty factor of said laser driving pulses so that the duty factor approaches 50%, as said linear velocity of said optical disk memory detected by said linear velocity detecting means increases.

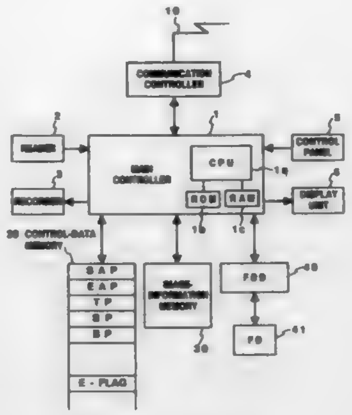

21b
22
VIDEO SIGNAL
47
41
LOW-PASS FILTER
23
FREQUENCY-MODULATING MEANS
42
MIXER
24b,c
LASER DRIVING PULSE GENERATING MEANS
L D DRIVER
25
25a
25b
25c
44
VOICE MODULATION CIRCUIT
LINEAR VELOCITY DETECTING MEANS
28
RECORDING/REPRODUCING HEAD
HEAD CONTROLLING CIRCUIT
27
43
VOICE SIGNAL
48
FIRST CHANNEL
SECOND CHANNEL
49
VOICE SIGNAL PROCESSING CIRCUIT
45
MOTOR
26b
REFERENCE CLOCK SIGNAL GENERATING CIRCUIT
46
MOTOR CONTROLLING CIRCUIT
26
26a

5,315,403

FACSIMILE APPARATUS IN WHICH INPUT TO MEMORY IS CONTROLLED BASED UPON CAPACITY OF EXTERNAL STORAGE DEVICE

Nobuyuki Hirai, and Masato Hara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1992, Ser. No. 853,445
Claims priority, application Japan, Mar. 22, 1991, 3-058459
Int. Cl.^{5} H04N *1/00*
U.S. Cl. 358—404 **15 Claims**



1. A facsimile apparatus comprising:

receiving means for receiving data;

first storage means for storing the received data;

second storage means for storing data;

transfer means for reading out data from said first storage means, and transferring the read out data to said second storage means;

detecting means for detecting a storage capacity of said second storage means; and

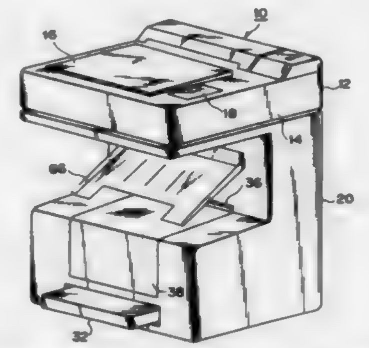
control means for controlling data storage to said first storage means by using the detected storage capacity of said second storage means as a storage capacity of said first storage means.

5,315,404

IMAGE PROCESSING METHOD AND APPARATUS FOR PROCESSING AN IMAGE SIGNAL IN EACH OF A PLURALITY OF PROCESSING MODES

Keiju Kuboki, Kawasaki; Kiyohisa Sugishima, Yokohama; Yutaka Udagawa, Machida; Toshihiko Otsubo, Yokohama, and Masahiro Nishio, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1991, Ser. No. 775,088
Claims priority, application Japan, Oct. 17, 1990, 2-279702
Int. Cl.^{5} H04N *1/415*
U.S. Cl. 358—433 **39 Claims**



1. An image processing apparatus which receives an image signal transmitted in one of a plurality of different modes to process an image of one picture, comprising:

analysis means for analyzing the contents of the modes;

first processing means for sequentially processing the image signal for one picture while receiving the same, part by part, in accordance with the result of analysis effected by said analysis means;

second processing means for receiving the whole image signal for one picture and for processing the same, as a block, in accordance with the result of analysis effected by said analysis means; and

output means for outputting the image processed by one of either said first or second processing means.

5,315,405

BINARY CIRCUIT OF SCANNER READ IMAGE DATA

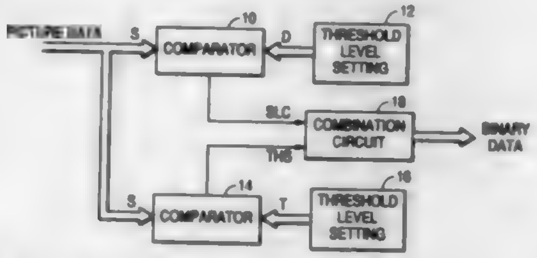
Hirotaka Okuwaki, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 540,628, Jun. 19, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 833,922

Claims priority, application Japan, Aug. 29, 1989, 1-222621

Int. Cl.^{5} H04N *1/40*

U.S. Cl. 358—445 **3 Claims**



3. An apparatus comprising:

an image scanner for scanning an image and including a plurality of sensor elements which generate an analog image signal having a signal magnitude which varies in accordance with a density of a scanned image, said image scanner generating a serial analog output image signal made up of a succession of the analog image signals generated by the respective sensor elements;

digitizing means for converting the serial analog output image signal generated by said image scanner to a serial digital output image signal made up of a succession of multi-bit data denoting the signal magnitude of a respective analog image signal of the serial analog output image signal;

binarizing means for converting the serial digital output image signal generated by said image scanner into a serial binary signal representative of the image scanned by said image scanner means, said binarizing means including (a) a first comparator for comparing the signal magnitude of each multi-bit data of the serial digital output image signal with a first threshold denoting a first image density, (b) a second comparator for comparing the signal magnitude of each multi-bit data of the serial digital output image signal with a second threshold denoting a second image density which is greater than the first image density, and (c) an output circuit, operatively coupled to said first and second comparators, for generating the serial binary signal;

wherein the binary signal is made up of a succession of first and second values respectively denoting a presence of the scanned image and an absence of the scanned image, and wherein said output circuit includes means for generating for each multi-bit data of the serial digital output image signal the first value when the signal magnitude thereof is between the first and second thresholds, and for generating the second value when the signal magnitude thereof is not between the first and second thresholds, and wherein, for each multi-bit data, the first value denoting the presence of the scanned image is generated by said output circuit if the density of the scanned image is between the first and second densities, and the second value denoting the absence of the scanned image is generated by said output circuit if the density of the scanned image is either one of less than the first density or greater than the second density.

5,315,406

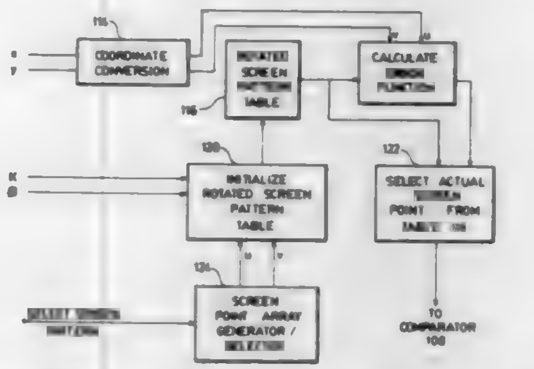
SCREEN GENERATION FOR HALFTONE SCREENING OF IMAGES USING ARBITRARY DISTRIBUTION OF TRANSFORMED SCREEN COORDINATES

Raphael L. Levien, P.O. Box 31, McDowell, Va. 24458

Continuation-in-part of Ser. No. 768,135, Sep. 27, 1991, which is a continuation-in-part of Ser. No. 753,893, Sep. 3, 1991. This application Dec. 10, 1991, Ser. No. 805,278

Int. Cl.^{5} H04N *1/40*

U.S. Cl. 358—456 **44 Claims**



1. In a method for generating a halftone screened image from an original image at a desired screen angle, said method including storing a screen pattern as an array of elements representing a desired spot function, transforming a point from said original image to an ideal screen point, selecting an actual screen point in said stored screen pattern array of elements to form a generated screen pattern, and screening said original image with said generated screen pattern to form said halftone screened image, the improvement comprising:

computing an error function based on the error between said ideal screen point and actual points in said stored screen pattern array, wherein said step of computing an error function comprises computing an error vector between an actual screen point and said ideal screen point; and

selecting said actual screen point in said stored screen pattern which produces the least said computed error function.

5,315,407

METHOD OF AND APPARATUS FOR GENERATING HALFTONE DOTS

Takashi Sakamoto, Kyoto, and Nobuaki Usui, Tokyo, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1993, Ser. No. 76,048

Claims priority, application Japan, Jul. 10, 1992, 4-207234

Int. Cl.^{5} H04N *1/40*

U.S. Cl. 358—456 **16 Claims**

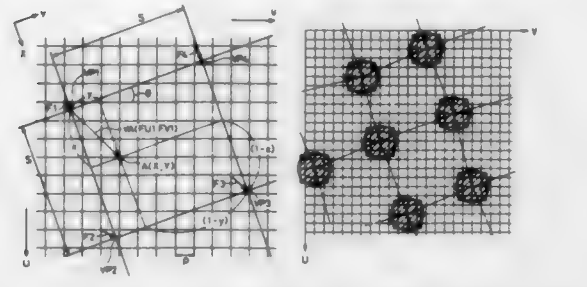
1. A method of generating halftone dots each consisting of a plurality of pixels as a function of given image signals, comprising the steps of:

(a) preparing a screen pattern memory for storing a plurality of threshold values arranged in each of matrices laid out in Cartesian X-Y coordinate systems, each of said matrices including at least one reference point which has an extreme of said plurality of threshold values;

(b) arranging said pixels at lattice points in Cartesian U-V coordinate systems, said U and V denoting a primary scanning direction and a secondary scanning direction, respectively, said U-v coordinate systems being set in predetermined relation to said X-Y coordinate systems;

(c) obtaining displacement of said reference point in each of said matrices from an lattice point of said U-V coordinate systems adjacent to said reference point;

(d) obtaining X-Y coordinates of a target lattice point in said U-V coordinate systems while correcting said X-Y coordinates of said target lattice point with displacement of said target lattice point interpolated from said displacement of a plurality of said reference points, said plurality of said reference points existing in the vicinity of said target lattice point;



(e) addressing said screen pattern memory by said corrected X-Y coordinates to thereby read out said threshold value for said target lattice point; and

(f) comparing said threshold value for said target lattice point and said given image signal to determine whether or not to expose a pixel at said target lattice point.

5,315,408

IMAGE SIGNAL GENERATING APPARATUS

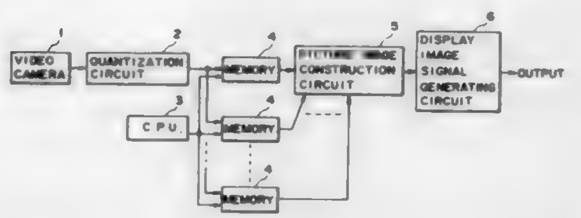
Norihiro Kawahara, Tokyo, and Yoshihiro Nakatani, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 797,962

Claims priority, application Japan, Nov. 30, 1990, 2-329743

Int. Cl.^{5} H04N *1/40*

U.S. Cl. 358—458 **19 Claims**



1. An image signal generating apparatus for generating an image signal, comprising:

(A) quantized data forming means for receiving an image signal, for quantizing the input image signal, and for forming quantized data;

(B) a plurality of quantized data holding means each of which can hold the quantized data of one picture image;

(C) quantized data input/output control means for sequentially distributing and supplying the quantized data formed by the quantized data forming means into said plurality of quantized data holding means and for selectively sequentially generating the quantized data held in said plurality of quantized data holding means; and

(D) quantized image signal forming means for forming a quantized image signal on the basis of the quantized data which are generated from said plurality of quantized data-holding means.

5,315,409

METHOD OF AND APPARATUS FOR OBTAINING BINARY IMAGE

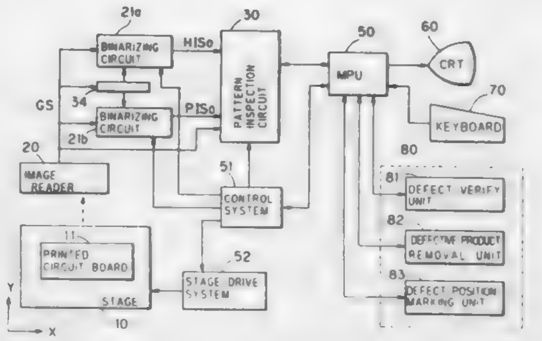
Akira Matsumura, and Ryuji Kitakado, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Feb. 19, 1992, Ser. No. 838,496

Claims priority, application Japan, Feb. 19, 1991, 3-47522

Int. Cl.^{5} H01N *1/40;* G06K *9/38*

U.S. Cl. 358—458 **16 Claims**



1. A method of obtaining a binary image from an original image in which respective density levels of pixels are represented in the form of gradation levels, comprising the steps of:

(a) obtaining pairs of gradation levels representing respective pairs of adjacent pixels in said original image;

(b) counting the number of said pairs of gradation levels which are equal to one another, each count produced by said counting corresponding to a unique pair of values;

(c) determining a tentative threshold level;

(d) obtaining the number of pairs of adjacent pixels each of which is comprised of such two gradation levels that said tentative threshold level is included in a range defined by said two gradation levels, to obtain an index value;

(e) repeating the steps (c) and (d) while updating said tentative threshold value among a plurality of tentative threshold values, to obtain a plurality of index values;

(f) comparing said plurality of index values with each other to determine a threshold value; and

(g) comparing said respective gradation levels of pixels in said original image with said threshold value to obtain a binarized image.

5,315,410

METHOD AND APPARATUS FOR RECORDING OPTICAL INFORMATION BY USING A PHOTOELECTRIC TRANSDUCER

Itsuo Takanshi, Kamakura; Shintaro Nakagaki, Miura; Tsutou Asakura; Masato Furuya, both of Yokomaha; Yoshihisa Koyama, Yokosuka, and Yuji Uchiyama, Chigasaki, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 8, 1991, Ser. No. 653,538

Claims priority, application Japan, Feb. 12, 1990, 2-29938; Feb. 22, 1990, 2-41529; Feb. 23, 1990, 2-43838; Feb. 28, 1990, 2-48111; Mar. 23, 1990, 2-74390; Jan. 29, 1991, 3-028108

Int. Cl.^{5} H04N *1/028, 3/15;* G02F *1/135*

U.S. Cl. 358—471 **13 Claims**

1. In a system having a first electrode, a second electrode, a photosensitive member located between the first and second electrodes, a recording member located between the first and second electrodes, and an optical shutter, a method comprising the steps of:

applying light to the photosensitive member, the light having information to be recorded;

recording the light information on the recording member;

setting an exposure amount of the light with respect to the photosensitive member by setting a time during which the optical shutter remains open;

applying a drive voltage of a predetermined variation manner between the first and second electrodes during recording of the light information on the recording member; and

enabling an open period of the optical shutter and a period of the application of the drive voltage between the first and second electrodes to be different from each other in at least one of time length and time position.

6. In a system having a first electrode, a second electrode, a photosensitive member located between the first and second electrodes, a recording member located between the first and second electrodes, and an optical shutter, a method comprising the steps of:

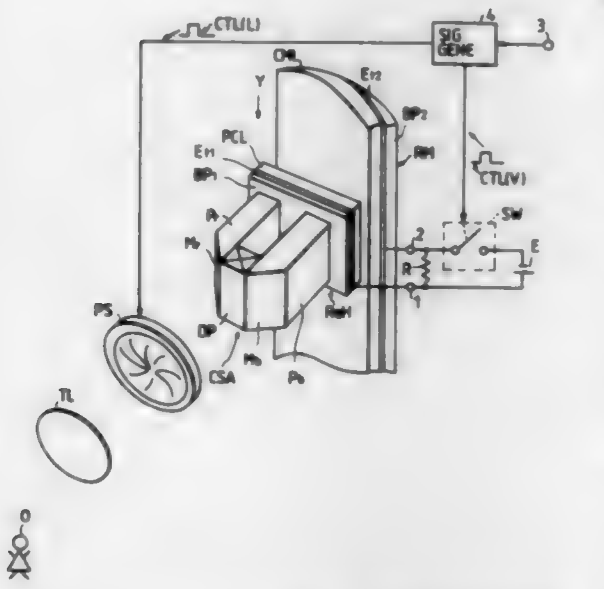
applying a predetermined voltage between the first and second electrodes during a predetermined period;

applying light to the photosensitive member, the light having information to be recorded;

recording the light information on the recording member;

setting an exposure amount of the light with respect to the photosensitive member by setting a time during which the optical shutter remains open;

during a period different from the predetermined period of application of the predetermined voltage, setting a drive voltage between the first and second electrodes in a condition where the recording member remains unchanged; and



enabling an open period of the optical shutter and a period of the application of the drive voltage between the first and second electrodes to be different from each other in at least one of time length and time position.

9. An apparatus comprising:

an optical shutter for setting an exposure light amount;

a photosensitive member exposed to an optical image of an object when the optical shutter is open;

a recording member recording information corresponding to the optical image when the optical shutter is open;

first and second electrodes for applying an electric field to the photosensitive member and the recording member when a potential is applied between the first and second electrodes;

means for applying a voltage between the first and second electrodes; and

means for changing the voltage applied between the first and second electrodes

wherein an open period of the optical shutter and a period of the application of the drive voltage between the first and second electrodes are different from each other in at least one of time length and time position.

5,315,411

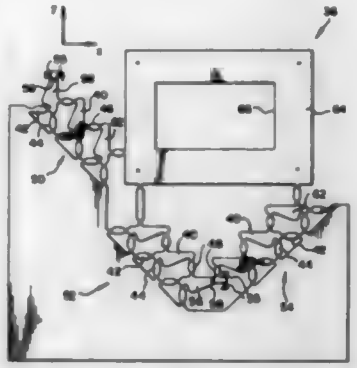
DITHERING MECHANISM FOR A HIGH RESOLUTION IMAGING SYSTEM

Douglass L. Blanding, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 4, 1993, Ser. No. 325

Int. Cl.^{5} H04N *1/04, 3/14, 5/335*

U.S. Cl. 358—482 **8 Claims**



1. Apparatus for generating a high resolution image output from an image sensor having a plurality of pixels with a preselected pitch, comprising:

means for dithering said image sensor with respect to an input image and producing arrays of data representing positions generated by step offsets of said image sensor with respect to the input image in at least one of a horizontal and a vertical direction so that said step movements causes said pixels to map a new area of an image,

said dithering means comprising an arrangement of at least one set of cascaded levers which comprises a plurality of interconnected levers connected to a movable platform carrying one of the input image and the image sensor, said levers being arranged so that the output displacement of each lever is but a fraction of its input displacement, with the output of each lever being connected to the input of the succeeding lever and the output of the final lever being connected to said movable platform,

means for applying an input force to a first lever, and

stop means arranged to engage said first lever at a first and a second limit of its input displacement so that said input force applied to said first lever will produce a precise, repeatable, shift of the position of said movable platform, and the magnitude of said shift is not dependent upon the magnitude of the input force but is dependent only upon the geometry of the arrangement of levers and upon the position of the fixed stops which limit the motion of the first lever.

5,315,412

MULTI-CHIP COLOR IMAGE SENSOR WITH LIGHT-RECEIVING WINDOWS ARRANGED TO PROVIDE SENSOR OUTPUT SIGNALS CORRESPONDING TO THE GAP BETWEEN ADJACENT SENSORS

Akio Mihara, Isehara, and Seiji Hashimoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,692

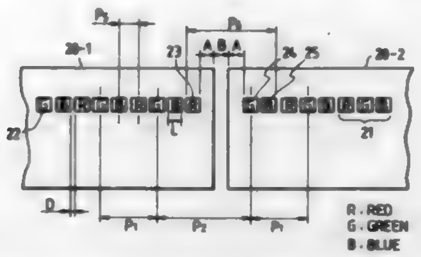
Claims priority, application Japan, Apr. 6, 1990, 2-90447; Apr. 9, 1990, 2-92050; Apr. 9, 1990, 2-92051; Apr. 9, 1990, 2-92052

Int. Cl.^{5} H04N *9/09*

U.S. Cl. 358—512 **20 Claims**

1. A multi-chip color image sensor in which a plurality of semiconductor image sensors each having a plurality of light-receiving windows are arrayed, and in which one color light-receiving element corresponds to a plurality of light-receiving windows in a main scanning direction,

wherein some or all of the plurality of light-receiving windows which correspond to the one color light-receiving element on an end portion of each of said semiconductor image sensors are juxtaposed in a subscanning direction.



5,315,413

COLOR IMAGE CORRECTION DEVICE FOR CORRECTING PHASE AND RESOLUTION CHARACTERISTICS OF A COPY IMAGE USING DIFFERENT COLOR SIGNAL COMPONENTS

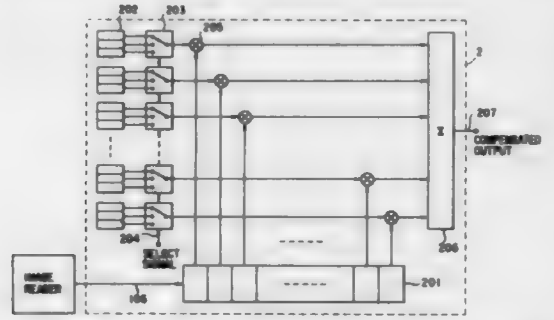
Naofumi Yamamoto, Tokyo, and Hidekazu Sekizawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 2, 1992, Ser. No. 907,597

Claims priority, application Japan, Jul. 4, 1991, 3-164701

Int. Cl.^{5} H04N *1/46*

U.S. Cl. 358—512 **11 Claims**



1. A color image reading and compensating device comprising:

image reading means including a color image sensor for forming a number of dots arranged in a line, each of the dots being composed of a plurality of pixels corresponding to a plurality of colors, respectively, for outputting a color image signal having a plurality of color signal components for each dot; and

compensating means for compensating phase and resolution characteristics of the color image signal, by use of not only one color signal component selected from the color signal components of the color image signal but also the other color signal components indicating at least one color different from that of the one color signal component, said one color signal component corresponding to a dot of interest and the other signal components corresponding to dots in close proximity to the dot of interest.

5,315,414

SYSTEM FOR CONTROLLING MULTIPLE FILTERS IN A COLOR RASTER INPUT SCANER

Thomas R. Beikirch, Webster; Richard A. Beck, Fairport; Jack K. Fullerton, Webster, and Joseph P. Taillie, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1992, Ser. No. 947,585

Int. Cl.^{5} H04N *1/46, 1/04*

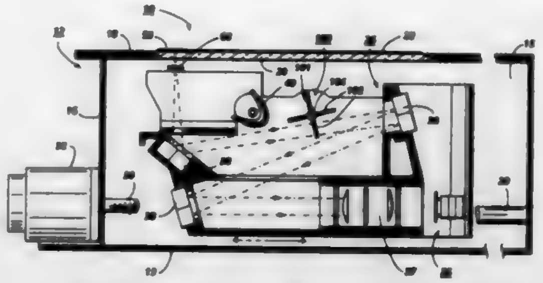
U.S. Cl. 358—512 **7 Claims**

1. In an apparatus for scanning a color document, an image scanner converts a light image of the color document into a series of scan lines, wherein the improvement comprises:

a target of a preselected color;

a plurality of different color optical filters; and

means for indexing a selected one of said optical filters from a not-filtering position to a filtering position, said selected one of said optical filters filtering the light image of the color document and a light image of the target, and the image scanner responding to the optically filtered light image of the target to confirm that said selected one of the optical filters is in the filtering position.



5,315,415

COLOR IMAGE PROCESSING APPARATUS

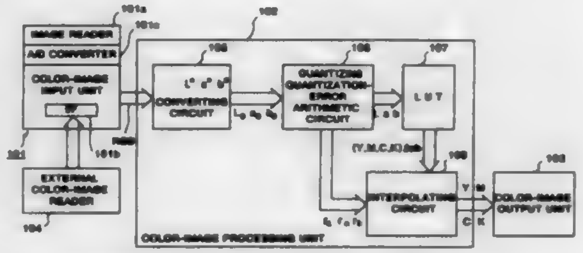
Takashi Kawai; Akihiro Usami, both of Yokohama; Ken-ichi Ohta, Kawasaki; Yoshiko Horie, Tokyo; Seita Shono, Warabi, and Eiji Ohta, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1991, Ser. No. 793,011

Claims priority, application Japan, Nov. 20, 1990, 2-312639

Int. Cl.^{5} H04N *1/46;* G03F *3/08*

U.S. Cl. 358—515 **10 Claims**



1. A color image processing apparatus which comprises:

input means for inputting color component signals which include a luminance component and a chrominance component;

quantization means for quantizing the input color component signals and outputting quantitized color component signals;

a look-up table for storing a correlation between the quantized color component signals and density signals suitable for respective ones of the quanitized color component signals;

interpolation means for interpolating the density signals output from said look-up table in accordance with the levels of the density signals,

wherein said interpolation means computes a quantization error which arises when input color component signals are quantized by said quantization means, and executes the interpolation processing with regard to an output from said look-up table by using the quantization error as an interpolation coefficient.

5,315,416

MONO-COLOR EDITING METHOD FOR COLOR PICTURE IMAGE RECORDING

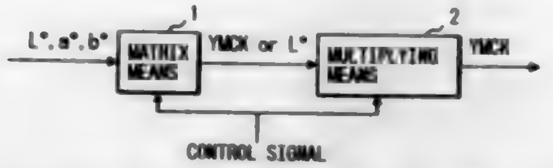
Kazuman Taniuchi; Katuyuki Kouno, and Hiroshi Sekine, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 13, 1992, Ser. No. 882,011

Claims priority, application Japan, May 14, 1991, 3-109243

Int. Cl.^{5} G03F *3/00, 15/00*

U.S. Cl. 358—537 **9 Claims**



1. A mono-color editing method for a color picture image recording apparatus, comprising the steps of:

inputting picture image data composed of a luminance signal, a first color difference signal and a second color difference signal to a matrix means, said matrix means outputting said luminance signal when said matrix means is notified of a control signal giving instructions for a mono-color editing operation for converting an achromatic picture image into a prescribed chromatic picture image while maintaining tonal gradation intact, said matrix means also generating and outputting four toner color signals for yellow, cyan, magenta, and black from said picture image data when said matrix means is not notified of said control signal; and

multiplying output picture image data from said matrix means with a prescribed coefficient in a multiplying means.

5,315,417

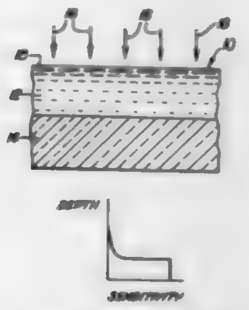
LOW NOISE TRANSMISSION HOLOGRAPHIC OPTICAL ELEMENT

Gaylord E. Moss, Marina Del Rey, and John E. Wreede, Monrovia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 607,384, Oct. 31, 1990, abandoned. This application Oct. 28, 1992, Ser. No. 967,941

Int. Cl.^{5} G03H *1/02, 1/04;* **G02B** *5/32*

U.S. Cl. 359—3 **26 Claims**



1. A method for reducing extraneous diffraction due to surface effects in volume transmission holograms, comprising:

applying a layer of light sensitive holographic recording medium to a substrate;

treating said layer to reduce light sensitivity at and adjacent surface regions thereof; and

exposing said recording medium to coherent light so as to strike said light sensitive holographic material symmetrically to record a volume transmission hologram therein with fringes perpendicular to said surface regions.

5,315,418

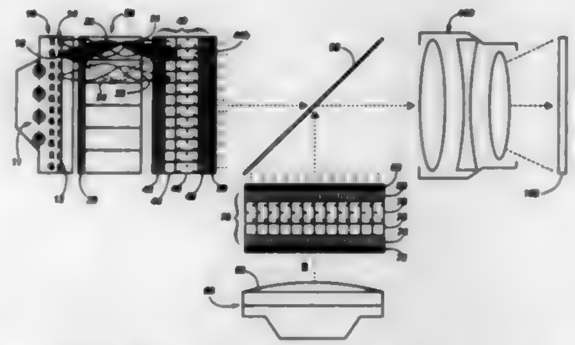
TWO PATH LIQUID CRYSTAL LIGHT VALVE COLOR DISPLAY WITH LIGHT COUPLING LENS ARRAY DISPOSED ALONG THE RED-GREEN LIGHT PATH

Robert A. Sprague, Saratoga, Calif.; Louis D. Silverstein, Scottsdale, Ariz., and Richard H. D. Bruce, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 17, 1992, Ser. No. 900,812

Int. Cl.^{5} G02F *1/1347;* **H04N** *9/31*

U.S. Cl. 359—41 **19 Claims**



1. A liquid crystal color display for displaying a full color image comprising

light source means for providing a red light component and a green light component along a first optical path, and for providing a substantially collimated blue light component along a second optical path;

first liquid crystal image forming means for receiving the red and green light from the light source means along the first optical path and for forming a red and green color image therefrom; the first liquid crystal image forming means having a plurality of individually addressable, light modulating display pixels; the plurality of light modulating display pixels having modulation means associated therewith for modulating the red and green light components according to the red and green image to be formed;

light coupling lens array means disposed only along said first optical path for optically coupling the red and green light components received along the first optical path to respective ones of the plurality of light modulating display pixels; the light coupling lens array means having optical properties to collect the red and green light components and to focus a real image thereof in the respective ones of the plurality of light modulating display pixels;

second liquid crystal image forming means for forming a blue color image; the second image forming means receiving the collimated blue light component from the light source means along the second optical path;

image combination means for receiving the red and green color image and the blue color image from the respective first and second optical paths for combining by additive spatial superposition into a composite full color image; and

image display means, disposed to receive the full color image from the image combination means, for displaying the composite full color image in a manner so as to be visible to a human observer.

5,315,419

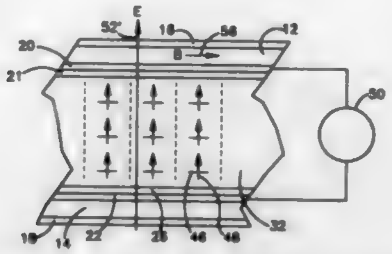
METHOD OF PRODUCING A HOMOGENEOUSLY ALIGNED CHIRAL SMECTIC C LIQUID CRYSTAL HAVING HOMEOTROPIC ALIGNMENT LAYERS

Alfred Saupe, and Antal Jakli, both of Kent, Ohio, assignors to Kent State University, Kent, Ohio

Continuation-in-part of Ser. No. 885,180, May 19, 1992, abandoned. This application Jul. 23, 1992, Ser. No. 918,918

Int. Cl.^{5} G02F *1/13, 1/137, 1/1337*

U.S. Cl. 359—46 **8 Claims**



1. A method for producing a ferroelectric liquid crystal film comprising the steps of:

a) confining smectic C* phase liquid crystal between parallel substrates having inner surfaces treated to promote homeotropic alignment of the liquid crystal near the inner surfaces;

b) generating an electric field in the liquid crystal normal to the inner surfaces of the substrates; and

c) biasing the liquid crystal in a direction parallel to the inner surfaces of the substrates to induce a realignment of the liquid crystal molecules into homogeneously aligned layers with boundaries perpendicular to the inner surfaces of the substrates.

5,315,420

OPTICAL WRITING TYPE LIQUID CRYSTAL DISPLAY DEVICE

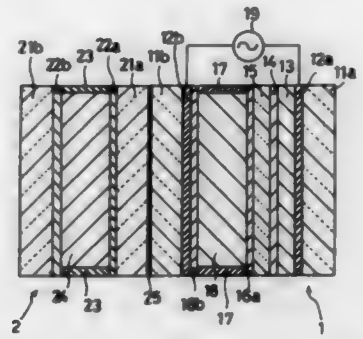
Yozo Narutaki, Nara, and Hisakazu Nakamura, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1992, Ser. No. 885,540

Claims priority, application Japan, May 20, 1991, 3-114846

Int. Cl.^{5} G02F *1/133*

U.S. Cl. 359—53 **6 Claims**



1. An optical writing type liquid-crystal display device, comprising:

two twisted nematic liquid crystal cells, each of which has a twist direction different from the other, each cell being formed by two glass substrates;

a first twisted nematic liquid crystal cell formed by a first glass substrate and a second glass substrate, the first and second glass substrates having a first twisted nematic liquid crystal composition disposed therebetween;

a second twisted nematic liquid crystal cell formed by a third glass substrate and a fourth glass substrate, the third and fourth glass substrates having a second twisted nematic liquid crystal composition disposed therebetween;

a first cell being laminated to the second cell by laminating the second glass substrate to the third glass substrate;

a photoconductive layer disposed on the first glass substrate between the substrate and the liquid crystal composition for changing an impedance according to light applied on said photoconductive layer;

a first transparent electrode disposed on said second substrate on the side of said second substrate nearest said first substrate,

a second transparent electrode disposed on the first substrate on the same side of said first glass substrate as said photoconductive layer;

said two twisted nematic liquid crystal cells being arranged such that a polarized axis of a light incident onto the two twisted nematic liquid crystal cells is not coincident with molecular axes of liquid crystal composition of the second twisted nematic liquid crystal cell in order to increase a change of a transmittance of the incident light onto the two twisted nematic liquid crystal cells in response to a change of a voltage applied to the first twisted nematic liquid crystal cell.

5,315,421

RUBBING APPARATUS INCLUDING DOUBLE REFRACTION PHASE DIFFERENCE MEASURING MEANS AND MANUFACTURING METHOD FOR LIQUID CRYSTAL DISPLAY DEVICE

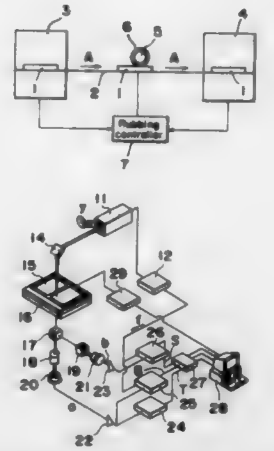
Hisako Kurai, Amagasaki; Hideaki Mochizuki, Osaka, and Shinya Kosako, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 28, 1993, Ser. No. 53,200

Claims priority, application Japan, Apr. 28, 1992, 4-109462; Sep. 21, 1992, 4-251020

Int. Cl.^{5} G02F *1/1335, 1/1337*

U.S. Cl. 359—76 **6 Claims**



1. A rubbing apparatus for liquid crystal display devices which is provided with a rubbing means for rubbing an orientation film formed on a transparent electrode substrate of a liquid crystal display device, a double refraction phase difference measuring means for measuring at least the double refraction phase difference of said orientation film after rubbing, and a rubbing controlling means for controlling said rubbing means on the basis of the measured result of the double refraction phase difference, wherein said double refraction phase difference measuring means consists of a light source which generates a first linearly polarized laser light with f1 frequency propagating in the z-axis direction with the optical electric field directed in the x-axis direction and a second linearly polarized laser light with f2 frequency propagating in the z-axis direction with the optical electric field directed in the y-axis direction, a difference frequency generating means for generat-

ing an alternating current signal f of a difference frequency f=f1–f2, a light splitting means for splitting the laser light passing through said substrate with the orientation film at an approximately constant ratio irrespective of the direction of polarization, a multiplicator which obtains products q and s of said difference frequency alternating current signal f with a signal a detected when one of the split lights is received by a photodetector through an analyzer which allows only a component substantially 45° to the x and y axes to pass through and a signal b detected when the other split light is received by a photodetector through an analyzer which allows only a component substantially in the x-axis or y-axis direction to pass through, respectively and a calculation means for calculating the amount of the double refraction d of said substrate with the orientation film and the direction of a delayed phase axis (or an advanced phase axis) based on the output of said multiplicator.

3. A manufacturing method of a liquid crystal display device having two electrode substrates, each with a transparent electrode layer and a rubbed orientation film sequentially formed in this order on a base, disposed in confronting relation to each other,

comprising steps of

rubbing said orientation film formed on said electrode substrate,

irradiating said electrode substrate with the rubbed orientation film with first and second linearly polarized laser beams having optical electric fields perpendicular to each other and to the direction of their propagation,

splitting light transmitted through said electrode substrate with the rubbed orientation film into two,

detecting a component substantially 45° to the x and y axes included in one of the split lights and a component in the x-axis or y-axis direction included in the other split light,

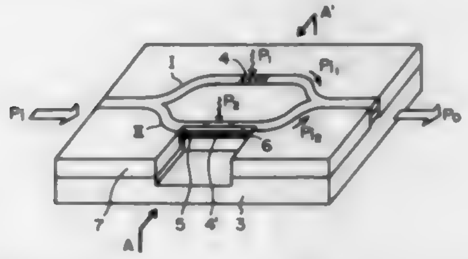
calculating the double refraction phase difference of said rubbed thin film, based on the detected values, and

controlling the next rubbing operation by setting rubbing conditions based on the double refraction phase difference calculated.

5,315,422
OPTICAL MACH-ZEHNDER TYPE LOGIC ELEMENT WHICH PERFORMS AN XOR OPERATION

Katsuyuki Utaka; Yasuyuki Nagao, both of Tokyo; Yuichi Matsushima, Tokorozawa, and Kazuo Sakai, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1993, Ser. No. 22,016
Claims priority, application Japan, Feb. 28, 1992, 4-075749
Int. Cl.^{5} G02B *6/10, 26/00*
U.S. Cl. 359—107 **4 Claims**



1. An optical logic element comprising:

a Mach-Zehnder interference type optical path for branching an input optical path into a plurality of optical paths which are joined together to form a light output optical path, and

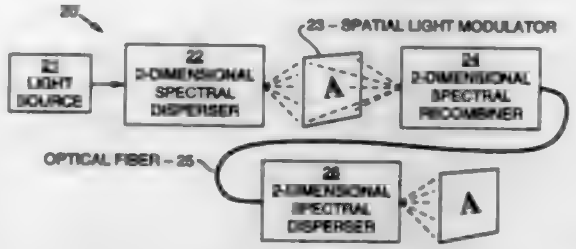
a plurality of phase modulating elements disposed in at least one of said branched optical paths, the refractive index of each of said phase modulating elements being controlled by the intensity of light applied thereto, and

the intensity of output light obtained from said light output optical path being controlled in accordance with a combination of the intensities of light applied to said plurality of phase modulating elements.

5,315,423
WAVELENGTH MULTIPLEXED TWO DIMENSIONAL IMAGE TRANSMISSION THROUGH SINGLE MODE OPTICAL FIBER

John H. Hong, Moorpark, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Feb. 18, 1992, Ser. No. 837,019
Int. Cl.^{5} H04J *14/00, 14/02*
U.S. Cl. 359—124 **5 Claims**


20
21 LIGHT SOURCE
22 2-DIMENSIONAL SPECTRAL DISPERSER
23 – SPATIAL LIGHT MODULATOR
A
24 2-DIMENSIONAL SPECTRAL RECOMBINER
OPTICAL FIBER – 25
26 2-DIMENSIONAL SPECTRAL DISPERSER
A

1. A system for parallel transmission of a two-dimensional image through a single mode optical fiber, comprising:

a broadband light source;

a first thin film channel waveguide for dispersing said broadband light into a two-dimensional array of spectral components;

a two-dimensional spatial light modulator for modulating the intensity of said spectral components of said two-dimensional array to correspond to the two-dimensional image;

a second thin film channel waveguide for collecting and recombining said modulated spectral components into a broadband light beam;

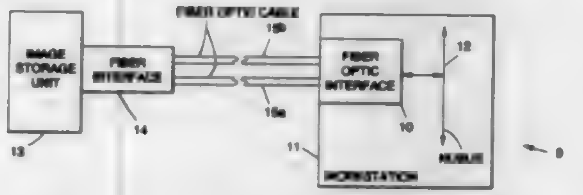
a single mode optical fiber connected to said recombining means for transmitting said broadband light beam; and

a third thin film channel waveguide connected to said single mode fiber for receiving and dispersing said transmitted broadband light beam into said intensity modulated two-dimensional array of spectral components to reproduce the two-dimensional image.

5,315,424
COMPUTER FIBER OPTIC INTERFACE

David E. Boden; Mandy M. H. Fong, and John M. McReynolds, all of San Jose, Calif., assignors to Loral Aerospace Corp., New York, N.Y.

Filed Jun. 30, 1992, Ser. No. 906,891
Int. Cl.^{5} H04B *10/00*
U.S. Cl. 359—152 **9 Claims**



1. A fiber optic interface circuit that is adapted to couple data between an image storage system and a computer that are interconnected by way of first and second fiber optic cables, and wherein the image storage system comprises a bidirectional input/output fiber interface that interfaces the first and second fiber optic cables to the image storage system, said fiber optic interface circuit comprising:

an optical receiver coupled to one of the fiber optic cables for receiving optical signals transmitted from the image storage system and converting them into corresponding electrical signals;

an optical transmitter coupled to the other of the fiber optic cables for converting electrical signals derived from the computer into corresponding optical signals and for transmitting them to the image storage system;

a plurality of data buffers coupled to the optical receiver and optical transmitter for buffering the electrical signals received from the optical receiver and to be transmitted by the optical transmitter;

a sum generator checker coupled to the plurality of data buffers;

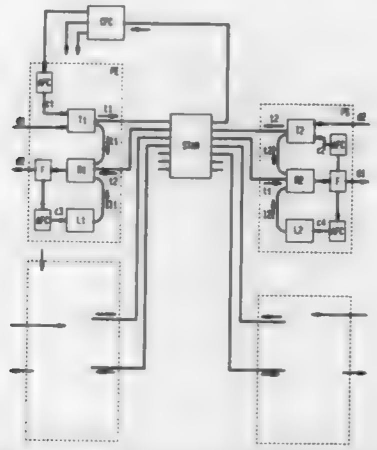
a rate data buffer coupled to the sum generator checker for buffering data signals received thereby; and

an interface circuit coupled to the rate data buffer that is adapted to interface between the sum generator checker and a computer backplane of the computer.

5,315,425
OPTICAL TRANSMISSION NETWORK WITH FREQUENCY LOCKING MEANS

Mattijs O. van Deventer, Leidschendam, and Johan P. Bekooij, Zoeterwoude-Rijndijk, both of Netherlands, assignors to Koninklijke PTT Nederland N.V., Groningen, Netherlands

Filed Sep. 4, 1991, Ser. No. 754,746
Claims priority, application European Pat. Off., Sep. 11, 1990, 90202410.8
Int. Cl.^{5} H04B *10/24;* **H04J** *14/02*
U.S. Cl. 359—153 **9 Claims**



1. Optical transmission network, comprising an optical transmission medium with one or more optical fibers, to which, at one side, one or more first optical transceivers are connected and to which, at the other side, one or more second transceivers are connected, said first transceivers each having a first transmitter and a first receiver and said second transceivers each having a second transmitter and a second receiver, a first transmission signal being transmitted by the first transmitter of a first transceiver and being received by the second receiver of a second transceiver, and a second transmission signal being transmitted by the second transmitter of that second transceiver and being received by the first receiver of that first transceiver,

said first transceivers being located together in a network center and the frequencies of the first transmission signals as transmitted by the various first transmitters, each being kept at a fixed frequency relationship to one frequency of a common reference frequency source, the frequency of said second transmission signal, transmitted by the second transmitter, being kept at a fixed frequency relationship to the frequency of the first transmission signal as received by that second receiver from the first transmitter, characterized in that,

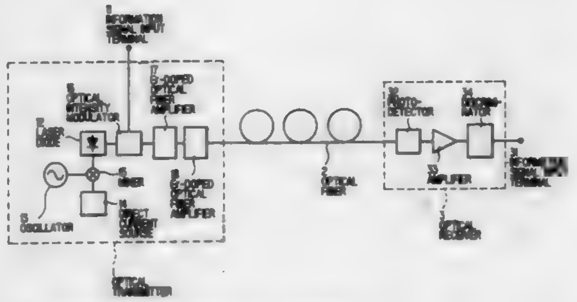
in the second receiver, the received first transmission signal is mixed with a second local oscillator signal (l2), the frequency (f4) of which being tuned so that the reception of the first transmission signal has its optimum, and that, in the second transmitter, the frequency of the second transmission signal is kept at a fixed frequency relationship to the frequency of that tuned second local oscillator signal, and in that,

in the first receiver, the received second transmission signal is mixed with a first local oscillator signal (l1), the frequency (f3) of which is kept at a fixed frequency relationship to the frequency of the first transmission signal as transmitted by the first transmitter.

5,315,426
OPTICAL TRANSMITTER

Yasubiro Aoki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 16, 1992, Ser. No. 852,407
Claims priority, application Japan, Mar. 20, 1991, 3-81838
Int. Cl.^{5} H04B *10/04*
U.S. Cl. 359—180 **3 Claims**


INFORMATION SIGNAL INPUT TERMINAL
OPTICAL INTENSITY MODULATOR
LASER DIODE
Er-DOPED OPTICAL FIBER AMPLIFIER
OSCILLATOR
MIXER
DIRECT CURRENT SOURCE
Er-DOPED OPTICAL FIBER AMPLIFIER
OPTICAL TRANSMITTER
2 OPTICAL FIBER
PHOTO-DETECTOR
DEMODULATOR
AMPLIFIER
OPTICAL RECEIVER
INFORMATION SIGNAL OUTPUT TERMINAL

1. An optical transmitter, comprising:

means for emitting a light:

means for supplying a current modulated in frequency to said emitting means to be thereby driven;

means for modulating said light in intensity in accordance with an information signal to generate a signal light pulse; and

means for supplying said signal light pulse to an optical fiber;

wherein a spectral width $\Delta\nu_m$ and a power P_s of said signal light pulse meet the following formulas:

$$P_s > P_{th} \text{ and}$$

$$\frac{\Delta\nu_m + \Delta\nu_B}{\Delta\nu_s + \Delta\nu_B} \geq \frac{P_s}{P_{th}}$$

where P_{th} is a threshold input light power when the stimulated Brillouin scattering begins to occur in said optical fiber in case of no frequency modulation of said light, $\Delta\nu_B$ is the Brillouin gain bandwidth of said optical fiber, and $\Delta\nu_s$ is the spectral width of said signal light in case of no frequency modulation of said light.

5,315,427

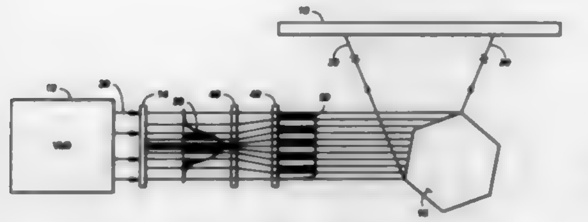
PAIR OF BINARY DIFFRACTION OPTICS FOR USE IN OVERFILLED RASTER OUTPUT SCANNING SYSTEMS

Russell B. Rauch, Pasadena, and Ellis D. Harris, Claremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1992, Ser. No. 990,491

Int. Cl.⁵ G02B *26/08*

U.S. Cl. 359—216 **3 Claims**



1. An overfilled raster scanning system comprising:
a light source emitting a light beam;
a binary diffraction optic lens system comprising a first binary diffraction optic lens element and a second binary diffraction optic lens element spaced along said light beam path from said first binary diffraction optic lens element;
said binary diffraction optic lens system being arranged to receive said light beam from said light source and reprofile the intensity of said light beam;
a photo sensitive medium; and
a rotating scanning means arranged to receive said reprofiled light beam from said binary diffraction optic lens system and scan said reprofiled light beam across said photo sensitive medium.

5,315,428

OPTICAL SCANNING SYSTEM COMPRISING OPTICAL CHOPPER

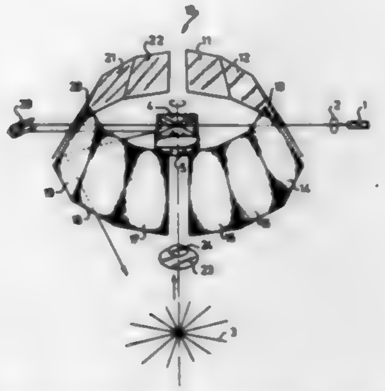
Ke- Ou Peng, Delft, Netherlands, assignor to Opticon Sensors Europe B.V., Hoofddorp, Netherlands

Filed Jan. 27, 1993, Ser. No. 9,810

Claims priority, application European Pat. Off., Jan. 28, 1992, 92200241.5

Int. Cl.⁵ G02B *26/08*

U.S. Cl. 359—216 **11 Claims**



1. An optical scanning system to scan a code on an object comprising:
a laser source,
a laser beam shaper receiving a laser beam from said laser source and focussing the laser beam on the object,
a polygon means having at least two facets, at least one of which is reflective,
motor means for rotating said polygon means,
a mirror array substantially entirely surrounding said polygon means and having a first and second set of mirrors,
said mirror array being arranged in such a way that during operation the laser beam after being reflected by said rotating polygon means and by the mirror array will generate a scanning pattern on the code to be detected, and
a detector receiving the light scattered by the object,
said polygon means being designed to direct the laser beam to said first set of mirrors in said mirror array during a first part of each rotation cycle and to direct the laser beam to said second set of mirrors of said mirror array during a second part of each rotation cycle.

5,315,429

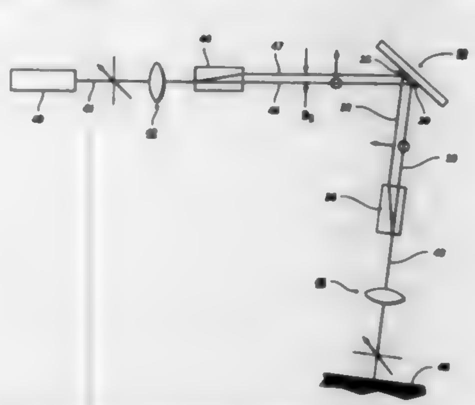
MICROMECHANICAL LIGHT MODULATOR WITH OPTICALLY INTERLACED OUTPUT

Igor Abramov, Redondo Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 4, 1993, Ser. No. 305

Int. Cl.⁵ G02B *26/08*

U.S. Cl. 359—224 **16 Claims**



1. A light pattern generating system comprising:
a) illumination source means for generating a light,
b) light modulator means for receiving said light from said illumination source means and emitting at least two beams,
c) the path of one of said at least two beams being offset from the path of the other of said at least two beams in a sagittal direction,
d) said beams having optical properties,
e) said one beam having optical properties which are different from the optical properties of said other beam, and
f) means for optically converging in the sagittal direction the paths of said one beam with said other beam to combine the beams into a single line pattern in a tangential direction.

5,315,430

STRAINED LAYER FABRY-PEROT DEVICE

Thomas M. Brennan; Ian J. Fritz, both of Albuquerque, and Burrell E. Hammons, Tijeras, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

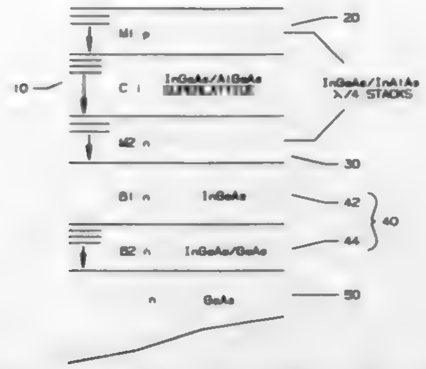
Filed Apr. 15, 1992, Ser. No. 869,269

Int. Cl.⁵ G02F *1/03;* G02B *27/00, 5/28*

U.S. Cl. 359—248 **15 Claims**

1. An asymmetric Fabry-Perot reflectance modulator (AFPM) consisting of an active region in an optical cavity between top and bottom mirrors, said bottom mirror being affixed to a substrate by a buffer layer, said modulator being formed only from layers of ternary materials resulting from the combination of pairs of three binary materials (A, B, C),
at least two of said materials, (A, B) having different bandgaps,
the third material (C) and at least one of said at least two materials (A and B) having different lattice constants, and

the active region comprising a thermodynamically stable combination of quantum well and barrier layers of alternating strain having a free-standing lattice constant a_0 matched to the lattice constant of the mirrors.



5,315,431

OPTICAL ISOLATOR

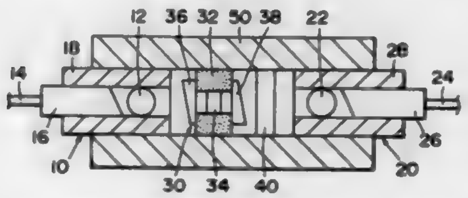
Akihiro Masuda; Ikuo Maeda; Hideaki Yuri, and Yoichi Suzuki, all of Shizuoka, Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1992, Ser. No. 997,745

Claims priority, application Japan, Apr. 20, 1992, 4-126763

Int. Cl.⁵ G02B *5/30;* G02F *1/09*

U.S. Cl. 359—281 **5 Claims**



1. A non-polarization-mode-dispersing optical isolator comprising:
a cylindrical casing,
a non-reciprocal unit, in said casing, having a 45° Faraday rotator and two tapered birefringent plates on opposite sides of said Faraday rotator,
fiber collimators on opposite sides of said non-reciprocal unit,
said fiber collimators including a first fiber collimator connected to a first optical fiber and a second fiber collimator connected to a second optical fiber, and
a parallel-surfaced flat birefringent plate between said non-reciprocal unit and one of said fiber collimators,
wherein said parallel-surfaced flat birefringent plate is fixed within said casing with an optical axis of said parallel-surfaced flat birefringent plate is staggered at 90° from an axis of an adjacent one of said tapered birefringent plate.

5,315,432

THIN FILM OF LITHIUM NIOBATE SINGLE CRYSTAL

Satoshi Ohno, Ibigawa, Japan, assignor to Ibiden Co., Ltd., Ogaki, Japan

PCT No. PCT/JP91/00126, § 371 Date Dec. 2, 1991, § 102(e) Date Dec. 2, 1991, PCT Pub. No. WO92/09917, PCT Pub. Date Jun. 11, 1992

PCT Filed Feb. 1, 1991, Ser. No. 777,312

Claims priority, application Japan, Nov. 30, 1990, 2-330262

The portion of the term of this patent subsequent to May 17, 2010, has been disclaimed.

Int. Cl.⁵ H03F *7/00*

U.S. Cl. 359—326 **16 Claims**

1. A thin film of lithium niobate single crystal formed on a (0001) surface of a lithium tantalate substrate wherein the thin film has an a-axis lattice constant in the range of 99.92 to 100.03% of the a-axis lattice constant of the lithium tantalate substrate, and the thin film is lattice matched with the substrate to thereby improve the optical properties of the thin film.

5,315,433

OPTICAL WAVELENGTH CONVERTING APPARATUS

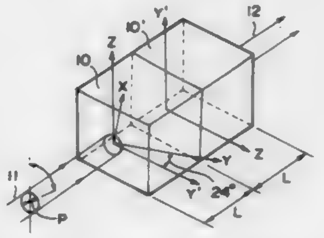
Yoji Okazaki; Chiaki Goto; Hiroaki Hyuga, and Akinori Harada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 28, 1992, Ser. No. 843,719

Claims priority, application Japan, Feb. 28, 1991, 3-33954; Mar. 1, 1991, 3-36098; Apr. 12, 1991, 3-79849; Apr. 15, 1991, 3-82333; Apr. 17, 1991, 3-85322; Apr. 17, 1991, 3-85595; Apr. 18, 1991, 3-86404; Apr. 18, 1991, 3-86617

Int. Cl.⁵ G02F *1/37*

U.S. Cl. 359—328 **9 Claims**



1. An optical wavelength converting apparatus in which a crystal structure formed of nonlinear optical material is provided to receive a fundamental wave and to emit a second harmonic of the fundamental wave, said structure being formed and oriented for type II phase matching between the fundamental wave and the second harmonic,
said structure comprising two crystals, each formed of said optical material, and together forming said crystal structure, wherein said two crystals have substantially equal lengths and are oriented with respect to each other such that corresponding optic axes of said crystals are shifted substantially 90° from each other.

5,315,434

INFRARED-TRANSMISSIVE LENS AND HUMAN BODY DETECTING SENSOR USING THE SAME

Yasuo Mizuno, Hirakata; Masakatsu Sugai, Osaka; Masaki Ikeda, and Akihiko Yoshida, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1992, Ser. No. 882,906

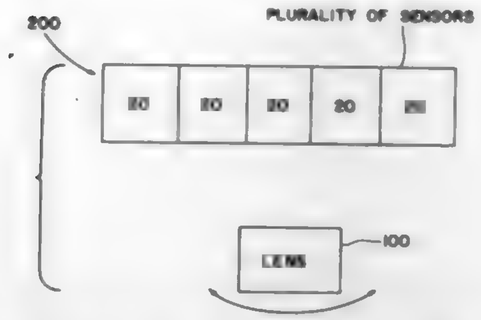
Claims priority, application Japan, May 21, 1991, 3-115997; Jul. 24, 1991, 3-184462

Int. Cl.⁵ G02B *1/02, 13/14;* G01J *5/00*

U.S. Cl. 359—355 **8 Claims**

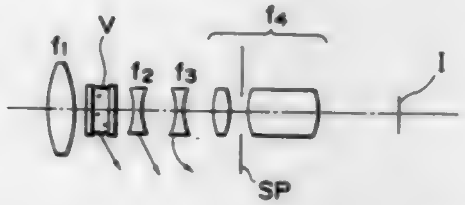
1. A human body detecting sensor device wherein infrared rays are directed towards sensors, said device comprising:
a movable infrared-transmissive lens comprising non-oxide glass formed of a compressed mixture of a non-oxide as a starting material and germanium and sulfur as main components; and

a plurality of pyroelectric infrared sensors arranged side-by-side with one another;



said lens being movable relative to said sensors such that said lens directs said infrared rays toward each of said infrared sensors as said lens is moved.

5,315,435
IMAGE STABILIZING OPTICAL SYSTEM
Akihisa Horiuchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 15, 1991, Ser. No. 700,609
Claims priority, application Japan, May 16, 1990, 2-127807
Int. Cl.⁵ G02B *27/64, 5/06*
U.S. Cl. 359—554 **10 Claims**



1. An optical apparatus for stabilizing an image, comprising:

an objective lens having a plurality of lens units, the spacing of at least one of said lens units being changed to effect zooming; and

an optical unit whose vertical angle can be changed to refract light from said objective lens, a transparent and flexible material being sealed in said optical unit, said optical unit being disposed immediately following a predetermined lens surface which satisfies a condition $|Fa| < 10$ Ft, where Fa is the combined effective focal length from the front lens surface of said objective lens to said predetermined lens surface, and Ft is the focal length of said objective lens at the telephoto end thereof.

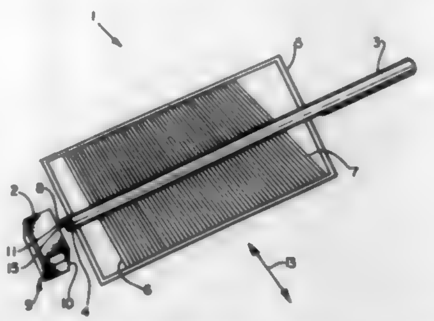
5,315,436
FIBER OPTICS SYSTEM
Herman L. Lowenhar, 21 Lakeview Dr., West Orange, N.J. 07052, and Burton L. Hulland, 648 E. Broadway, Long Beach, N.Y. 11561
Continuation of Ser. No. 534,710, Jun. 6, 1990, abandoned. This application Jun. 16, 1992, Ser. No. 899,825
Int. Cl.⁵ G02B *5/18, 6/34*
U.S. Cl. 359—569 **42 Claims**

12. A tuneable substantially single-line spectrum optical wavelength generator comprising:

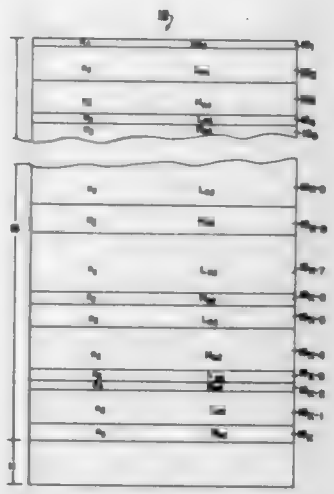
a laser with only one reflective surface embedded in an optical cavity;

a grating coupled to the optical axis by controllable coupling means whose lines form the second relective end of said cavity to effect laser oscillation over its operating band; and

means for simultaneously and in direct proportion altering both the perioidicity of the intersections of the grating with the optical axis and the laser effective cavity length at all grating periodicities to cause the laser to produce a substantially single-line spectral output at any desired point in the laser's operating band.

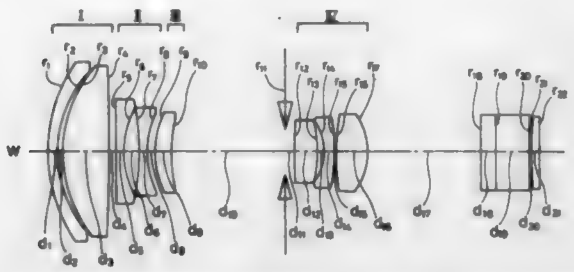


5,315,437
PROTECTIVE DEVICE FOR SELECTIVELY REFLECTING HIGH-INTENSITY LIGHT OVER A BROAD SPECTRAL BANDWIDTH
Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463, and Kwong M. Yoo, 412 W. 148th St., Apt. 2G, New York, N.Y. 10031
Continuation-in-part of Ser. No. 685,964, Apr. 12, 1991, which is a continuation of Ser. No. 322,439, Mar. 13, 1989, abandoned. This application May 21, 1992, Ser. No. 884,038
Int. Cl.⁵ G02B *5/28*
U.S. Cl. 359—588 **17 Claims**



1. A protective device designed to selectively reflect an incident beam of high-intensity light over a broad spectral bandwidth, the protective device comprising a stack of nonlinear materials, each of said nonlinear materials possessing a linear index of refraction, a nonlinear index of refraction, and an optical thickness, the respective linear indices of refraction of said nonlinear materials being the same, the respective nonlinear indices of refraction of said nonlinear materials alternating between a relatively high nonlinear index of refraction and a relatively low nonlinear index of refraction, and the respective optical thicknesses of said nonlinear materials being unordered.

5,315,438
ZOOM LENS SYSTEM
Hironori Shibata, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 12, 1991, Ser. No. 806,127
Claims priority, application Japan, Dec. 12, 1990, 2-401563; Dec. 26, 1990, 2-406529
Int. Cl.⁵ G02B *15/14*
U.S. Cl. 359—687 **22 Claims**



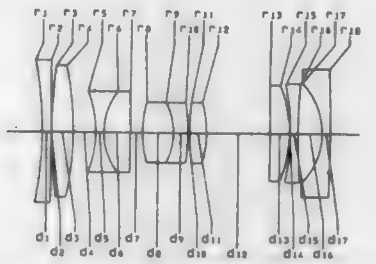
1. A zoom lens system consisting of, in order from the object side, a first lens group having a positive refractive power, a second lens group having a negative refractive power, a third lens group having a positive refractive power and a fourth lens group consisting of three lens elements and having a positive refractive power as a whole, said second and third lens groups being moved in zooming, thereby effecting variable power and said zoom lens system satisfying the following condition (1):

$$0.1 < (r_{4IF} + r_{4IR})/(r_{4IF} - r_{4IR}) < 3.0 \qquad (1)$$

wherein r_{4IF} is the radius of curvature of a front surface of the lens in the fourth lens group that is proximate to the object side and r_{4IR} is the radius of curvature of a rear surface of the lens in the fourth lens group that is proximate to the object side;

wherein said first lens group is fixed for zooming.

5,315,439
ZOOM LENS SYSTEM
Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 11, 1992, Ser. No. 943,521
Claims priority, application Japan, Sep. 13, 1991, 3-310288
Int. Cl.⁵ G02B *15/14, 13/18, 9/12*
U.S. Cl. 359—689 **5 Claims**



1. A zoom lens system comprising at least three lens groups which are arranged, in order from the object side, as a first lens group having a positive focal length, a second lens group having a positive focal length and a third lens group having a negative focal length, wherein, when zooming is carried out from a wide-angle to a telephoto end, said first, second and third lens groups are all moved towards the object so that the distance between said first and second lens groups increases whereas the distance between said second and third lens groups decreases, said first lens group having a first lens element on a side of said first lens group closest to the object, said first lens element having a concave lens surface on the side the closest to the object and satisfying the condition

$$-3 < (r11 + r12)/(r11 - r12) < 0$$

where r11 is the radius of curvature of the surface on the object side of the first lens element in the first lens group, and r12 is the radius of curvature of the surface on the image plane side of the first lens element in the first lens group; and

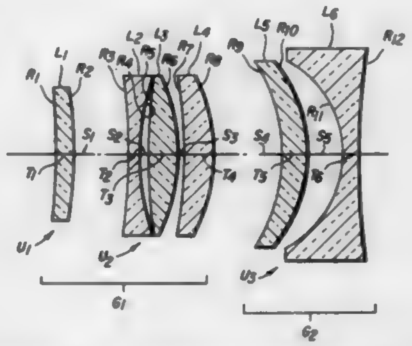
wherein said second lens group comprises, in order from the object side, a sub-group *2a* having a negative focal length and a sub-group *2b* having a positive focal length, said sub-group *2b* having a divergent aspheric surface that satisfies the condition

$$-30 < \Delta I2b < 0$$

where

ΔI2b is the amount of variation in the coefficient of a spherical aberration due to the aspheric surface in the sub-group *2b* (the aberration coefficient being such as is calculated with the focal length of the overall system at the wide-angle end being taken as 1.0).

5,315,440
ZOOM LENS HAVING WEAK FRONT LENS GROUP
Ellis I. Betensky, W. Redding, Conn., and Melvyn H. Kreitzer, Cincinnati, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 4, 1991, Ser. No. 792,504
Int. Cl.⁵ G02B *15/14, 9/08*
U.S. Cl. 359—612 **21 Claims**



1. A zoom lens comprising two groups of lens components including, from the object side, a first positive group and a second negative group and which zoom lens achieves zooming between a wide angle position and a narrow angle position by changing distance between the first and the second groups,

said first group including two lens units, a first, weak unit having no strong lens component, said weak first unit positioned on the object side of said first group and a second positive unit following said first unit,

said second group having negative power and providing most of the magnification change during zooming,

wherein none of said lens components are made of a gradient index material,

said zoom lens satisfying the following condition

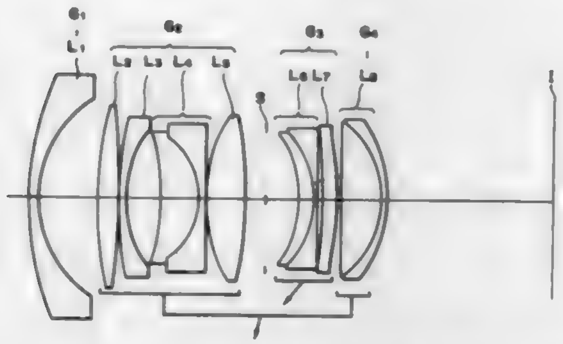
$$\frac{|K_1|}{K_w} < 0.4$$

where K_1 is the power of the first unit and K_w is the power of the zoom lens at its wide angle position, and

wherein said weak unit is a single negative lens component.

5,315,441
INVERSE TELEPHOTO LARGE APERTURE WIDE ANGLE LENS

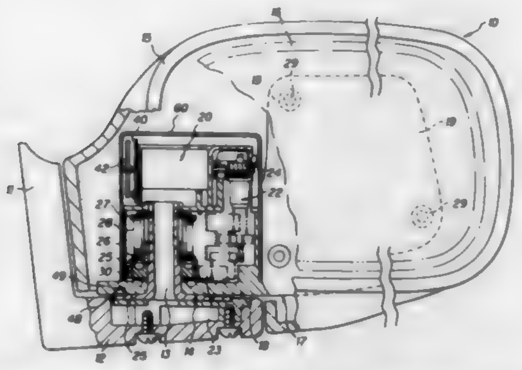
Kenji Hori, Tokyo, and Wataru Tatsuno, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 998,621, Dec. 30, 1992, abandoned. This application Sep. 13, 1993, Ser. No. 120,189
Claims priority, application Japan, Jan. 16, 1992, 4-005862
Int. Cl.^{5} G02B *13/04*
U.S. Cl. 359—753 **6 Claims**



1. An inverse telephoto large aperture wide angle lens comprising a first lens group with a negative refractive power, a second lens group with a positive refractive power, a stop, a third lens group with a negative refractive power, and a fourth lens group with a positive refractive power arranged in the order from an object side, wherein for focusing on a near object from infinity said first lens group is fixed with respect to an image surface, and said second, third, and fourth lens groups are moved along an optical axis thereof toward said object such that a space between said first lens group and said second lens group and a space between said second lens group and said third lens group decrease, but a space between said third lens group and said fourth lens group increases.

5,315,442
ELECTRICALLY FOLDABLE REARVIEW MIRRORS

Hidenori Sato, and Naoto Iwanabe, both of Fujieda, Japan, assignors to Murakami Kaimeido Co., Ltd., Shizuoka, Japan
Filed Dec. 28, 1992, Ser. No. 997,245
Claims priority, application Japan, Dec. 26, 1991, 3-112134[U]
Int. Cl.^{5} G02B *7/182*
U.S. Cl. 359—877 **6 Claims**



1. An electrical control system for an electrically powered foldable rearview mirror having a mirror body movable between a folded state and an erected state, said electrical control system comprising:

a reversible motor contained in a mirror body movable between a folded state and an erected state;

motor drive circuit means connected to the reversible motor to drive the motor body between the folded state and the erected state;

mechanical stop means to stop rotation of said mirror body when said mirror body reaches the erected state and also when said mirror body reaches the folded state;

noncontacting sensor means for detecting a halt to motor rotation as a result of a halt of mirror body rotation;

control circuit means for interruption of said motor drive circuit means when said noncontacting sensor means detects the halt of motor rotation, said control circuit means including power circuit means;

switching means for switching the motor drive circuit means on and off, said switching means including a switching transistor having a base;

sensor circuit means connected to said noncontacting sensor means to generate a plurality of pulses according to a rotation frequency of said motor; and

sensor pulse processing means including a differentiation circuit having a capacitor and resistor, and wherein said differentiation circuit is connected electrically to the sensor circuit mean, the capacitor of the differentiation circuit is charged and discharged by said pulses and is connected to the base of the switching transistor to turn said switching transistor off and on.

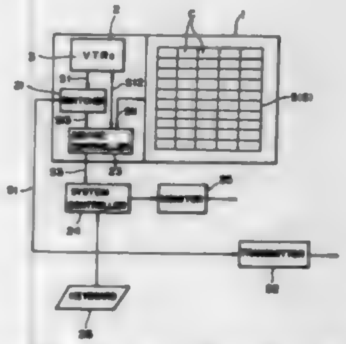
5,315,443
ORGANIC OPTICAL MATERIAL

Tetsusaburo Taira, and Makoto Ikari, both of Tokorozawa, Japan, assignors to Tokyo Seihinkaihatsu Kenkyusho, Japan
Filed Jun. 15, 1993, Ser. No. 76,882
Claims priority, application Japan, Jun. 22, 1992, 4-202849
Int. Cl.^{5} G02B *5/22*
U.S. Cl. 359—885 **4 Claims**

1. Organic optical material having excellent transmittancy in visible range, less than 40% in infra red range from 700 nm to 800 nm and improved water resistivity which comprises 0.05–40% by weight (calculated as the radical content) of a compound for supplying at least one radical selected from the group consisting of carboxyl radical, phosphoric radical and sulfonic radical, 0.05–40% by weight (calculated as ion content) of metal compound for supplying metal ions containing 80% or more of Cu^{++} ion therein and the balance of high molecular organic matrix resin.

5,315,444
CASSETTE AUTOCHANGER SYSTEMS

Mamoru Ishiguro, Kanagawa; Masato Yokota, Tokyo, and Shingo Yamauchi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 25, 1991, Ser. No. 674,469
Claims priority, application Japan, Mar. 28, 1990, 2-079923
Int. Cl.^{5} G11B *5/86, 15/68*
U.S. Cl. 360—15 **7 Claims**



1. A cassette autochanger for automatically supplying and selectively reproducing a plurality of cassettes having programs recorded on recording media thereof, the cassette autochanger comprising:

a plurality of reproducing/recording means;

a cassette housing means having a plurality of cassette storage locations;

cassette transporting means for selectively transporting said cassettes between said cassette storage locations and said reproducing/recording means; and

control means for controlling the operation of said reproducing/recording means and said cassette transporting means, said control means comprising:

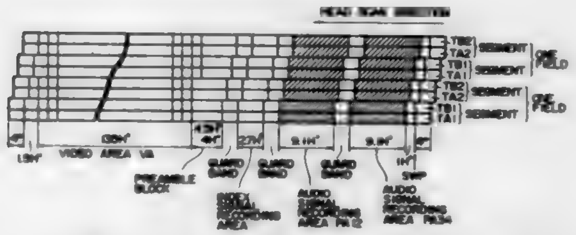
first detecting means for determining whether any one of said programs is recorded only in one of said cassettes but not in a plurality of said cassettes;

second detecting means for determining whether any two of said reproducing/recording means are available for use; and

dubbing control means for controlling said two of said reproducing/recording means to automatically dub said one of said programs onto another one of said cassettes when said one of said programs recorded in only one of said cassettes is determined by said first detecting means, thereby making available both of said cassettes for reproduction of said one of said programs.

5,315,445
AUDIO SIGNAL RECORDING APPARATUS AND METHOD FOR USE WITH VTR

Kenji Fukumoto, Chiba; Ichiro Okamoto, Saitama, and Keitaro Yamashita, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Sep. 5, 1991, Ser. No. 757,653
Claims priority, application Japan, Sep. 14, 1990, 2-245111
Int. Cl.^{5} G11B *5/02*
U.S. Cl. 360—19.1 **7 Claims**



1. A method for recording audio signals onto a tape by a recording apparatus which also records video signals onto said tape, in which said apparatus has a plurality of rotating heads which simultaneously scan said tape, said method comprising the steps of:

forming an oblique recording track on said tape for each of said rotating heads which simultaneously scan said tape without any guard bands being inserted between the oblique recording tracks, the formed oblique recording tracks constituting one segment;

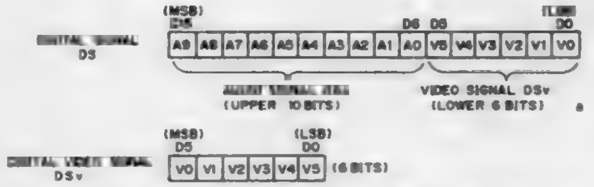
recording said video signals in a longitudinal direction in a video signal recording area in each of said oblique recording tracks for each said segment;

arranging at least four channels of audio signals into a plurality of groups, in which each of said groups includes said audio signals from a plurality of said channels and is assigned a predetermined priority rating; and

recording in a longitudinal direction, for each said segment, said audio signals in each of said groups which correspond to the video signals recorded for the respective segment in a number of audio signal recording areas in each of said oblique recording tracks, the number of said recording areas being equal to the number of said groups, in which each of said audio signal recording areas is separated from the corresponding video signal recording areas and is located at a respective distance in the longitudinal direction from an end of the respective oblique recording tracks, and in which the audio signals from each of said groups are recorded in said audio signal recording areas in accordance with the respective predetermined priority rating such that the audio signals from the group having the highest priority rating are recorded in the audio signal recording area located at the farthest distance from the end of the respective oblique recording track.

5,315,446
RECORDING AND REPRODUCING METHOD AND APPARATUS FOR A DIGITAL AUDIO SIGNAL AND A REVERSED BIT ORDER DIGITAL VIDEO

Mamoru Niki, Koshigaya; Yoshiaki Hosaka, Tokyo; Takao Mogi, Utsunomiya, and Haruo Saito, Kuki, all of Japan, assignors to AIWA Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 533,583, Jun. 5, 1990, abandoned. This application Jan. 13, 1993, Ser. No. 4,195
Claims priority, application Japan, Jun. 13, 1989, 1-151217; Jun. 13, 1989, 1-151220; Jun. 13, 1989, 1-151221; Jun. 13, 1989, 1-151222; Jun. 13, 1989, 1-151223
Int. Cl.^{5} G11B *5/09, 5/02*
U.S. Cl. 360—48 **20 Claims**



1. A method of recording a digital audio signal and a digital video signal, comprising the steps of:

forming a composite digital signal having bits 1 . . . (N+M) (N,M: positive integers) from a digital audio signal component having bits 1 . . . N, where bit 1 is the LSB and bit N is the MSB, and a digital video signal component having bits 1 . . . M, where bit 1 is the LSB and bit M is the MSB, wherein bits 1 . . . M of the composite digital signal are bits M . . . 1 respectively of the digital video signal component and bits (M+1) . . . (M+N) of the composite digital signal are bits 1 . . . N respectively of the digital audio signal component; and

recording the composite digital signal in a recording medium.

5,315,447
DISK CONTROL METHOD OF FORMAT WRITE OPERATION USING DATA DISTANCE ON A TRACK

Masahiro Nakayama; Hisaharu Takeuchi; Mamoru Tohchi, and Satoshi Numakura, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 407,421, Sep. 14, 1989, abandoned. This application Apr. 6, 1992, Ser. No. 864,381
Claims priority, application Japan, Sep. 16, 1988, 63-231866
Int. Cl.^{5} G11B *5/09, 15/04*
U.S. Cl. 360—49 **2 Claims**

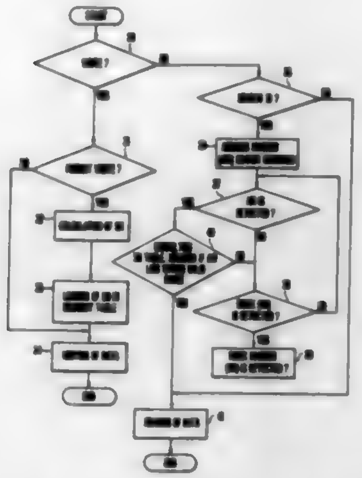
1. A method of controlling an access to data performed in response to a read command, wherein the data is recorded as a data record on a track of a recording medium of an external storage system, on the basis of a control information recorded on said track through a format writing operation, said track storing a plurality of data records, an address marker being associated with each data record, comprising the steps of:

at a time of recording data, storing in a semiconductor memory a length data indicating a position of the last control information recorded on the track of said recording medium in a format writing operation;

completing said format writing operation without erasing data of a succeeding area of said track;

at a time of reading data in response to the read command, detecting an address marker indicating each data record on a track of said recording medium;

detecting whether the read command for reading data on said track of said recording medium includes an access to data at a position exceeding the position represented by the length data based on information of a position associated with one of said detected address markers indicating a predetermined one of said plurality of data records on said track which corresponds to said position of the last control information;



executing an access to data when the detected address marker does not indicate that the position of the data to be accessed exceeds the position represented by the length data; and

inhibiting executing the access to data on said track when the detected address marker indicates that the position of the data to be accessed exceeds the position represented by the length data.

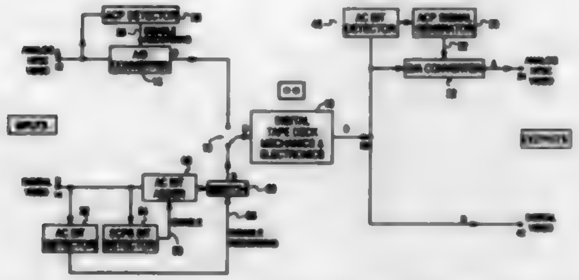
5,315,448
COPY PROTECTION FOR HYBRID DIGITAL VIDEO TAPE RECORDING AND UNPROTECTED SOURCE MATERIAL

John O. Ryan, Cupertino, Calif., assignor to Macrovision Corporation, Mountain View, Calif.

Filed Mar. 18, 1993, Ser. No. 32,894

Int. Cl.⁵ H04N *5/78;* C11B *15/04;* H04L *9/00*

U.S. Cl. 360—60 **49 Claims**



45. An apparatus for playing back video material recorded on a recording medium, comprising:

a mechanism for playing the recording medium and providing an analog video playback signal;

a detector for detecting a copy protection flag in the played back signal; and

a signal generator for generating an anti-copy signal in response to the detected copy protection flag and modifying the analog video playback signal with the generated signal.

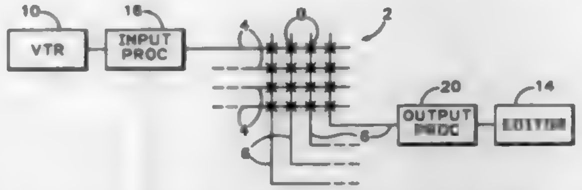
5,315,449
TIME CODE SIGNAL PROCESSING CIRCUIT FOR REMOVING AND RESTORING VARIATION IN SLEW RATE

Birney D. Dayton, Nevada City, and Thomas B. Crabb, Grass Valley, both of Calif., assignors to NVision, Inc., Nevada City, Calif.

Filed Sep. 14, 1992, Ser. No. 945,113

Int. Cl.⁵ G11B *27/02, 15/12, 5/03*

U.S. Cl. 360—61 **4 Claims**



1. Switching apparatus for switching a binary input signal composed of pulses of which the slew rate depends on the pulse frequency of the binary signal, said switching apparatus comprising:

an input processor for receiving the binary input signal and generating a corresponding binary output signal composed of pulses having a predetermined amplitude and having transitions of which the slew rate is within a predetermined range,

a switcher having n input terminals, one of which is connected to the input processor, m output terminals, and a plurality of digital crosspoint elements for selectively connecting any one input terminal to any set of one or more output terminals, the crosspoint elements being adapted to propagate a signal composed of pulses having said predetermined amplitude and having transitions of which the slew rate is within said predetermined range,

an output processor connected to one of the output terminals of the switcher, said output processor generating an output pulse signal of which the transitions have a slew rate that is dependent on the frequency of such transitions.

5,315,450
DUAL HEAD TYPE MAGNETIC DISK RECORDING/REPRODUCING APPARATUS

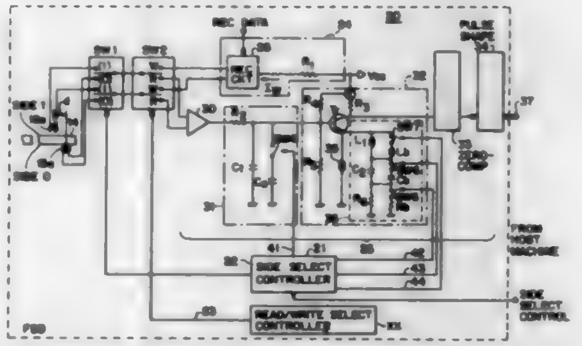
Fumio Nagase, and Toru Tanabe, both of Tokyo, Japan, assignors to TEAC Corporation, Tokyo, Japan

Continuation of Ser. No. 729,216, Jul. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 388,566, Aug. 1, 1989, abandoned. This application Jul. 16, 1993, Ser. No. 93,330

Claims priority, application Japan, Aug. 2, 1988, 63-193288

Int. Cl.⁵ G11B *5/09*

U.S. Cl. 360—65 **6 Claims**



1. A dual head type magnetic disk recording/reproducing apparatus, in which a magnetic disk is inserted and/or from which said magnetic disk is ejected, said magnetic disk having a first surface and a second surface each of which is segmented into a plurality of tracks, each track having a corresponding track number, said dual head type magnetic disk recording/reproducing apparatus comprising:

a first magnetic head which reproduces a first information signal from a first track on said first surface by establishing a physical contact with said first surface;

a second magnetic head which reproduces a second information signal from a second track on said second surface by establishing physical contact with said second surface, said second magnetic head being offset in a radially outward direction with respect to said first magnetic head by a predetermined number of tracks that exist between said first track and said second track;

a low pass filter, coupled to said first and second magnetic heads, to which said information signals are supplied, said low pass filter having a cut-off frequency that can be changed between a first predetermined cut-off frequency and a second predetermined cut-off frequency;

control means, coupled to said low pass filter, said control means being supplied with a control signal indicative of which one of said first magnetic head and said second magnetic head is to be used, for controlling said low pass filter such that said cut-off frequency is set to said first predetermined cut-off frequency when said control signal indicates use of said first magnetic head and such that said cut-off frequency is set to said second predetermined cut-off frequency when said control signal indicates use of said second magnetic head;

said first predetermined cut-off frequency being set higher with respect to said second predetermined cut-off frequency to form a constant frequency offset upon switching from one side of said magnetic disk to the opposite side thereof independent of track position with said constant frequency offset selected such that said first information signal and said second information signal have substantially an identical output lever; and

selection means, coupled to said first and second magnetic heads and said control means, for selecting either said first or second magnetic head under control of said control means and in response to said control signal, such that said first magnetic head is selected when said control signal indicates use of said first magnetic head, and such that said second magnetic head is selected when said control signal indicates use of said second magnetic head.

5,315,451
ROTATING STORAGE TRACK FORMAT EMULATION

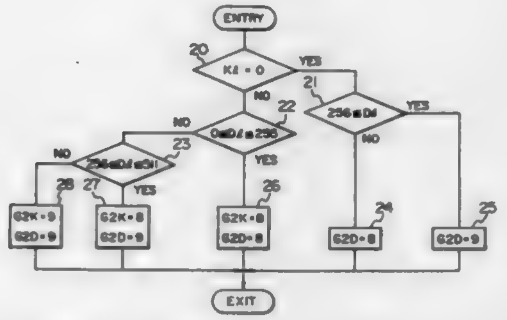
Masahiro Nakayama; Hisaharu Takeuchi; Hisashi Takamatsu; Mamoru Tobchi, and Akira Kurano, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,189

Claims priority, application Japan, Sep. 6, 1990, 2-236705

Int. Cl.⁵ G11B *15/18;* H04N *5/78*

U.S. Cl. 360—72.2 **14 Claims**



1. A method of emulating for a rotating storage device having a plurality of tracks divided into a plurality of segments, comprising the steps of:

determining an original angular position (α) of a record according to a first recording format;

determining a desirable angular position (β) for recording according to a second recording format having a higher recording density than that of said first recording format;

determining a first value representing a difference between said desirable angular position and said original angular position; and

incrementing a first gap length within said record when said first value exceeds a second value corresponding to one segment length.

5,315,452
APPARATUS AND METHOD FOR AUTOMATICALLY ADJUSTING RECORDING SPEED OF A RECORDER

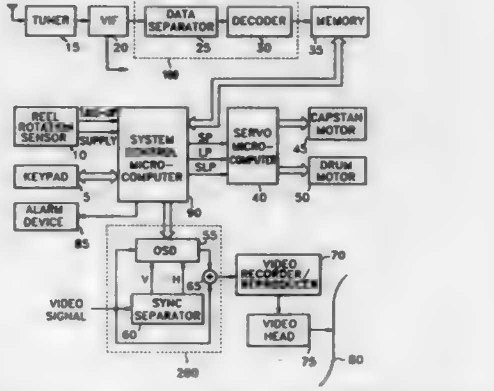
Kwon-pyo Hong, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Mar. 10, 1992, Ser. No. 847,290

Claims priority, application Rep. of Korea, Apr. 29, 1991, 91-7068

Int. Cl.⁵ G11B *15/46*

U.S. Cl. 360—73.07 **11 Claims**



1. An apparatus for automatically adjusting the recording speed of a recorder, the apparatus comprising:

reel rotation sensing means for sensing the states of a take-up reel and a supply reel of a recording medium in the recorder;

data input means for inputting data and setting a mode;

a broadcast schedule data processor for receiving and decoding broadcast schedule data so as to provide beginning and ending time data;

a memory for storing said data input from said data input means and for storing the beginning and ending time data;

a system-control microcomputer for calculating a remaining length of the recording medium in accordance with an output signal from said reel-rotation sensing means, and outputting a signal for controlling a recording mode of the recorder by comparing the remaining length with said beginning and ending time data stored in said memory; and

a servo microcomputer for driving motors which automatically control at least one of the take-up and supply reels in accordance with said control signal from said system-control microcomputer.

5,315,453
ROTATING-HEAD VIDEO SIGNAL RECORDING APPARATUS

Keiji Sato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1991, Ser. No. 783,215

Claims priority, application Japan, Oct. 31, 1990, 2-295975

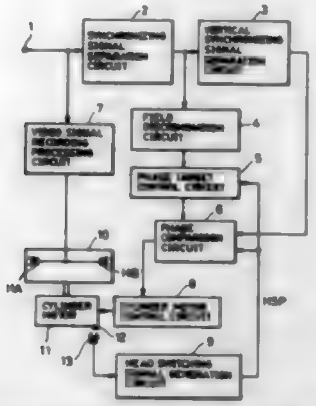
Int. Cl.⁵ G11B *21/02*

U.S. Cl. 360—75 **14 Claims**

1. A video signal recording apparatus, comprising:

(a) a rotating cylinder provided with a plurality of rotating heads having different rotational phases;

(b) recording means for sequentially supplying said plurality of rotating heads with a video signal having interlaced video information; and



(c) control means for controlling a phase difference between said rotating cylinder and a vertical synchronizing signal of said video signal on the basis of a relationship between said plurality of rotating heads and said video signal.

5,315,454

LOADING METHOD OF MAGNETIC HEAD AND MAGNETIC DISC APPARATUS

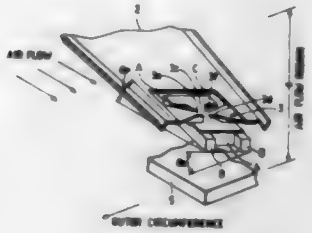
Masaharu Fukakusa, Kumamoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

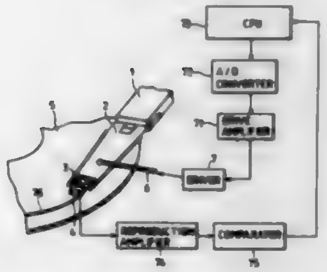
Filed Feb. 26, 1992, Ser. No. 842,302

Claims priority, application Japan, Feb. 27, 1991, 3-032687

Int. Cl.^{5} G11B *21/02*

U.S. Cl. 360—75 **24 Claims**





1. A method of loading a negative pressure type magnetic head with respect to a magnetic recording medium which head is equipped with an air-inlet portion for introduction of air and an air-outlet portion for discharge of air which are disposed along a longitudinal axis of said head, comprising the step of causing said magnetic head being brought close to said magnetic recording medium to float above a surface of said magnetic recording medium and satisfy the following conditions when reaching a region of air flow occurring due to rotation of said magnetic recording medium:

$$+0.1^\circ \leq \theta_P \leq +1.8^\circ$$

$$-1.2^\circ \leq \theta_R \leq +1.2^\circ$$

$$VL \leq 100 [mm/sec]$$

where θ_P represents a pitching angle of said magnetic head which is an angle made between said longitudinal axis of said magnetic head and said surface of said magnetic recording medium, said pitching angle taking a positive (+) angle when said air-inlet portion is more separated from said surface of said magnetic recording medium as compared with said air-outlet portion, θ_R designates a rolling angle of said magnetic head which is an angle made between said surface of said magnetic recording medium and a traversal axis perpendicular to said longitudinal axis of said magnetic head, said rolling angle taking a positive (+) angle when a portion of said magnetic head which is on said traversal axis and far away from a center of said magnetic recording medium is more separated from said surface of said magnetic recording medium as compared with a portion thereof which is on said traversal axis and near the center of said magnetic recording medium; and VL denotes a speed of said magnetic head taken when being brought close to said magnetic recording medium.

3. A magnetic disc apparatus comprising a magnetic disc, an arm movable in directions substantially parallel to a surface of said magnetic disc, a flexible member, one end portion of which is attached to said arm, a negative pressure type magnetic head attached through a gimbal to the other end portion of said flexible member, wherein said magnetic head is equipped with an air-inlet portion for introduction of air and an air-outlet portion for discharge of air which are disposed along a longitudinal axis of said head, and means for pressing said flexible member toward said magnetic disc to load said magnetic head above said magnetic disc and for causing said magnetic head being brought close to said magnetic disc to float above a surface of said magnetic disc so as to satisfy the following conditions when reading a region of air flow occurring due to rotation of said magnetic disc:

$$+0.1^\circ \leq \theta_P \leq +1.8^\circ$$

$$-1.2^\circ \leq \theta_R \leq +1.2^\circ$$

$$VL \leq 100 [mm/sec]$$

where θ_P represents a pitching angle of said magnetic head which is an angle made between said longitudinal axis of said magnetic head and said surface of said magnetic disc, and pitching angle taking a positive (+) angle when said air-inlet portion is more separated from said surface of said magnetic disc as compared with said air-outlet portion; θ_R designates a rolling angle of said magnetic head which is an angle made between said surface of said magnetic disc and a traversal axis perpendicular to said longitudinal axis of said magnetic head, said rolling angle taking a positive (+) angle when a portion of said magnetic head which is on said traversal axis and far away from a center of said magnetic disc is more separated from said surface of said magnetic disc as compared with a portion thereof which is on said traversal axis and near the center of said magnetic disc, and VL denotes a speed of said magnetic head taken when being brought close to said magnetic disc.

5,315,455

DATA RECORDING/REPRODUCING APPARATUS

Hiroshi Ito, Iruma, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 9, 1992, Ser. No. 848,283

Claims priority, application Japan, Mar. 29, 1991, 3-066713

Int. Cl.^{5} G11B *21/02*

U.S. Cl. 360—75 **7 Claims**

1. A data recording or reproducing apparatus comprising:

a recording medium having a data zone prestoring servo data and a contact start and stop zone;

head means for reading or writing data from or in the recording medium;

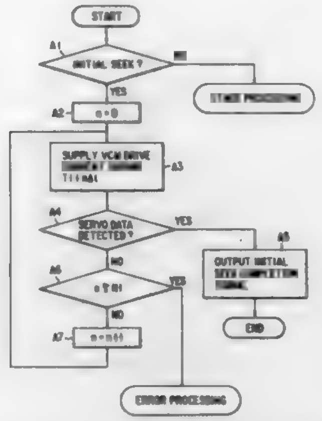
supporting means for supporting the head means;

moving means for moving the supporting means;

supplying means for supplying a driving current to the moving means;

locking means for locking the supporting means when the head means is placed on the contact start and stop zone;

detecting means for detecting the servo data from data read from the data zone by the head means; and



controlling means for controlling the supplying means so that the driving current is supplied to the moving means at predetermined time intervals when the head means is moved to the data zone from the contact tart and stop zone, the driving current being increased at a predetermined rate until the servo data is detected by the detecting means.

5,315,456

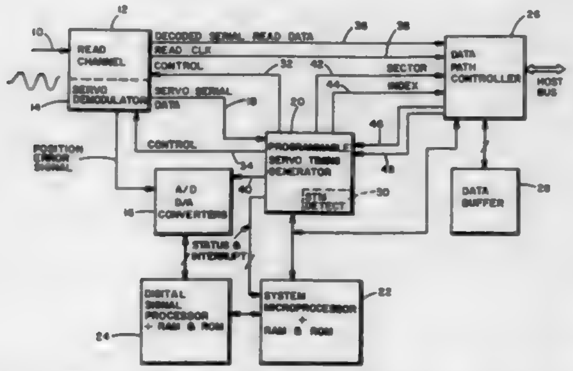
PROGRAMMABLE SERVO TIMING GENERATOR

Charles E. Hessing; Boyd N. Shelton, and Robert K. Barnes, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 16, 1992, Ser. No. 869,603

Int. Cl.^{5} G11B *5/596*

U.S. Cl. 360—77.08 **6 Claims**



1. A disk drive system having prerecorded track format signal patterns including servo bursts with servo timing marks and interspersed data fields, said disk drive having data read/-write circuits and timing generation means for generating timing signals, said disk drive comprising:

writable program storage means for storing a plurality of alterable timing signal commands;

disk drive processor means for loading said writable program storage means with a series of commands for generating timing signals in response to signals sensed from said prerecorded servo format signal patterns, said processor means causing read-out of said commands from said writable program storage means in response to said prerecorded track format signal patterns; and

execution register means for receiving said read-out commands and for generating timing signals in response to said commands, said timing signals controlling synchronization and operation of said data read/write circuits.

5,315,457

MAGNETIC RECORDING APPARATUS WITH PILOT SIGNAL RECORDED IN SUCCESSIVE TRACKS WITH CHANGING PILOT FREQUENCY

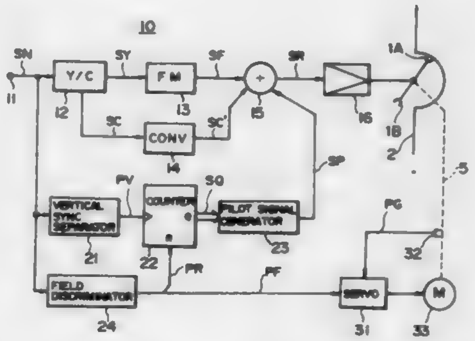
Koichi Ono; Tsunekazu Okada, and Seiichi Hataoka, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 3, 1992, Ser. No. 829,313

Claims priority, application Japan, Feb. 8, 1991, 3-039495

Int. Cl.^{5} G11B *5/584, 5/58;* **H04N** *5/78*

U.S. Cl. 360—77.14 **14 Claims**



1. Apparatus for recording a video signal in successive tracks on a record medium together with a pilot signal, wherein the video signal has successive frames, each formed of plural fields, and wherein the pilot signal is cyclically recorded with a different one of at least four frequencies in successive tracks for tracking control during reproduction, said apparatus comprising:

plural transducer means rotatable for recording said video and pilot signals in successive tracks on a record medium;

pulse generating means for generating a pulse signal indicative of a rotational phase of the transducer means;

field detecting means supplied with said video signal for detecting sequential fields in the frames of said video signal;

phase control means coupled to said pulse generating means and said field detecting means for controlling the rotation of said transducer means in response to said pulse signal and the detected sequence of fields; and

pilot signal generating means for generating said pilot signal with an initial frequency determined by an initial field in said detected sequence of fields, said frequency changing as a function of the detected sequential fields.

5,315,458

METHOD AND APPARATUS FOR POSITIONING HEAD ON REFERENCE TRACK OF DISK MEDIUM

Atsushi Sato, and Konichi Kusakari, both of Higashine, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 30, 1992, Ser. No. 876,419

Claims priority, application Japan, Apr. 30, 1991, 3-098507

Int. Cl.^{5} G11B *21/08*

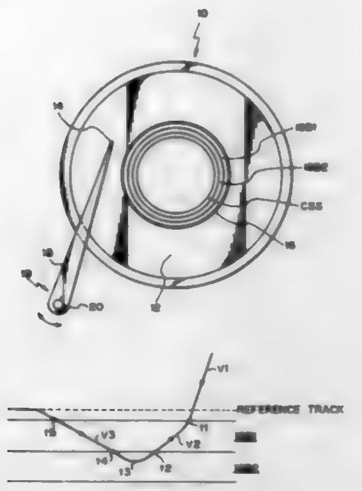
U.S. Cl. 360—78.08 **8 Claims**

1. A method of positioning a head on a reference track of a disk medium having a first guard band behind the reference track and having a second guard band behind the first guard band, the head being movable by feeding a drive current to a driving motor for the head, comprising the steps of:

i) moving the head toward the first guard band at a first speed until the first guard band is detected;

ii) moving the head toward the second guard band at a second speed lower than the first speed until the second guard band is detected;

iii) feeding an inverted drive current to the driving motor until an inversion of a direction of movement of the head is detected;



iv) moving the head toward the reference track at a third speed, until the first guard band is not detected; and

v) positioning the head on the reference track.

5,315,459

VIDEO CASSETTE RECORDER DEVICE

Takashi Kimura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

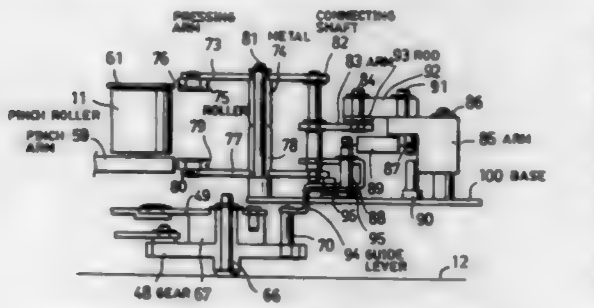
Continuation of Ser. No. 628,176, Dec. 17, 1990, abandoned.

This application Feb. 10, 1993, Ser. No. 15,899

Claims priority, application Japan, Dec. 18, 1989, 1-326120; Dec. 18, 1989, 1-326121

Int. Cl.^{5} G11B *15/665*

U.S. Cl. 360—85 **17 Claims**



1. A control device for controlling a pinch roller, in a recording or reproducing device, comprising:

a capstan;

a pinch roller rotatable about its axis by engaging with said capstan;

a first member for supporting said pinch roller at one end of said first member, said first member comprising means for permitting rotation of said pinch roller about said axis, and said first member being movable to an engaging position where said pinch roller engages said capstan and to a non-engaging position where said pinch roller does not engage said capstan;

a supporting member pivotally connected to an other end of said first member;

a movable second member pivotally connected to said supporting member, so that said first member and said second member are each independently pivotable relative to said supporting member;

a positioning member for positioning said supporting member and said second member at a predetermined position against said positioning member where said first member is movable to said engaging position; and

a moving mechanism for moving said second member and said supporting member to said predetermined position against said positioning member;

wherein said positioning member engages with a plurality of portions of said supporting member to position said supporting member.

5,315,460

MAGNETIC RECORDING AND REPRODUCING APPARATUS INCLUDING S FIXED CHASSIS FOR SUPPORTING A HEAD DRUM AND A MOVABLE CHASSIS FOR MOUNTING A TAPE CASSETTE

Hidekazu Takeda; Masao Iwakura; Nobuo Masuoka; Tetsuo Itou, all of Kanagawa; Ikuo Nishida, Ibaraki; Yoshiharu Yamashita, Ibaraki; Motonori Ohmori, Ibaraki, and Koji Iyota, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering, Inc., Yokohama, both of Japan

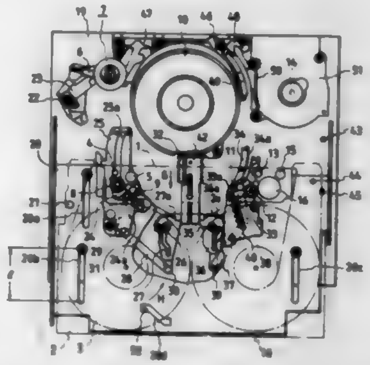
Continuation of Ser. No. 654,799, Feb. 13, 1991, abandoned.

This application Jul. 12, 1993, Ser. No. 89,597

Claims priority, application Japan, Feb. 16, 1990, 2-33778

Int. Cl.^{5} G11B *5/027, 15/60*

U.S. Cl. 360—85 **7 Claims**



1. A magnetic recording and reproducing apparatus comprising a cylindrical drum having a portion receivable in an open space of a magnetic tape cassette when said cassette is in the loaded state in said apparatus, the magnetic tape cassette including a magnetic tape supply reel, a magnetic tape take-up reel and a magnetic tape, said magnetic tape having first and second surfaces on opposite sides of said tape and being helically wound over a predetermined angle on said cylindrical drum in said loaded state of the cassette and scanned by at least a magnetic head upon rotation of said cylindrical drum to record or reproduce an information signal on said magnetic tape;

a fixed chassis supporting said cylindrical drum so that said cylindrical drum is inclined in a direction perpendicular to a segment line connecting centers of the supply and take-up reels of said cassette when said cassette is in said loaded state in said apparatus;

a movable chassis movable with respect to said fixed chassis for mounting said magnetic tape cassette while receiving a portion of said cylindrical drum in said open space of said magnetic tape cassette;

first movable means provided on said movable chassis in an area thereof corresponding to said open space of said tape cassette in a loaded state of the magnetic tape cassette and movable between a first position in a cassette unloading state and a second position in a cassette loading completion state to contact said first surface of the magnetic tape and move the magnetic tape from said tape supply reel toward said cylindrical drum by a length sufficient to smoothly shift a level of the tape upwardly toward said cylindrical drum;

second movable means provided on said fixed chassis so as to be displaceable between first and second positions and adapted to contact said second surface of said magnetic tape to cooperate with said first movable means to form a supply side tape running system for transporting said magnetic tape from said supply reel to said cylindrical drum;

third movable means adapted to cooperate with said second movable means to form the supply side tape running system from said tape supply reel to said cylindrical drum;

fourth movable means provided on said movable chassis in an area thereof corresponding to said open space of said magnetic tape cassette in the loaded state of the magnetic tape cassette and movable between a first position in a cassette unloading state and a second position in a cassette loading completion state to move the magnetic tape from said take-up reel toward said cylindrical drum by a length sufficient to smoothly shift a level of the tape downwardly from said cylindrical drum to said take-up reel, said first and fourth movable means being adapted to cooperate to helically wrap the magnetic tape around said cylindrical drum over a predetermined angle; and

fifth movable means adapted to cooperate with said fourth movable means to form a take-up side tape running system from said cylindrical drum to said take-up reel.

5,315,461

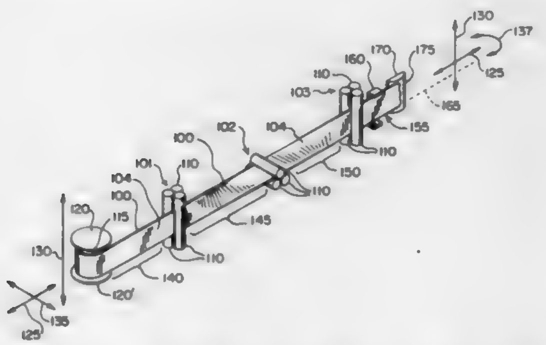
METHOD AND APPARATUS FOR ELIMINATING THE EFFECT OF STAGGERWRAP ON TAPE GUIDANCE

Christian A. Todd, Thornton, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 26, 1992, Ser. No. 904,978

Int. Cl.^{5} G11B *15/61*

U.S. Cl. 360—90 **7 Claims**



4. Apparatus for aligning one edge of a media being unwound form a tape spool to a desired path of travel of said media, wherein said media has a planar surface, said apparatus comprising:

(a) first means fo: guiding said media from said tape spool on which said media is wound;

(b) second means for guiding said media so that said planar surface of said media is twisted a first substantial angle in a first direction about a longitudinal axis of said path of travel;

(c) third means for guiding said media so that said planar surface of said media is twisted a second substantial angle about said axis in a second direction opposite to said first direction to align said media with respect to said desired path of travel; and

(d) fourth means for guiding said media so that said one edge of said media is coincident with a reference edge of a tape transport read/write head.

5,315,462

CARTRIDGE LOADING DEVICE HAVING SIDE-LOCKING MECHANISM

Hiroshi Ohkubo, and Takashi Miyamoto, both of Tokyo, Japan, assignors to TEAC Corporation, Tokyo, Japan

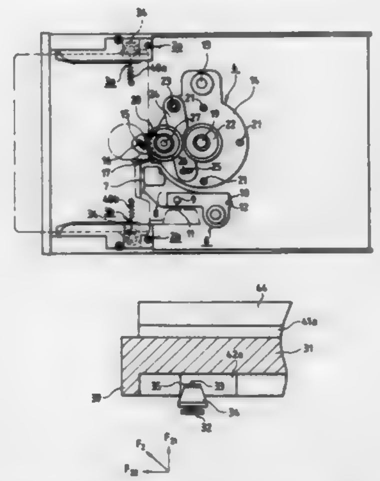
Continuation of Ser. No. 703,819, May 21, 1991, abandoned.

This application Jun. 22, 1993, Ser. No. 79,857

Claims priority, application Japan, Jun. 4, 1990, 2-59012[U]

Int. Cl.^{5} G11B *5/008, 15/675*

U.S. Cl. 360—96.5 **4 Claims**



1. A cartridge loading device for loading a cartridge into a recording/reproducing apparatus, said cartridge including a case containing a recording tape, and having two lateral side faces, each of said side faces having a locking notch disposed therein, and said recording/reproducing apparatus having a loading port and a drive unit for transfer-driving said recording tape, said cartridge loading device comprising;

means for guiding said cartridge to a loaded position within said loading port;

means for locking said cartridge in said loaded position, said locking means including means for engaging said locking notches disposed in said lateral side faces,

said engaging means including at least two rollers,

each of said rollers being associated with a respective locking notch and having a conical surface contacting a bottom edge of the associated locking notch to urge the cartridge upward and forward when the case is guided to the loaded position,

means for urging said rollers inwardly of the locking notches to nip the cartridge in the transverse direction perpendicular to the direction in which said cartridge is guided to the loaded position by said guiding means;

each of said rollers being mounted on a roller supporting arm, said roller supporting arm being slidably connected to said guiding means enabling said roller supporting arm and said roller to slide in said transverse direction.

5,315,463

DISK FILE HAVING THERMAL EXPANSION RING FOR ENSURING DISK/HUB CONCENTRICITY

Graham N. Dew, Winchester; Anthony R. Hearn, South Wonston; David J. Sebborn, Eastleigh, and Julian T. Young, Medstead, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/GB90/00020, § 371 Date Oct. 1, 1992, § 102(e) Date Oct. 1, 1992, PCT Pub. No. WO91/11004, PCT Pub. Date Jul. 25, 1991

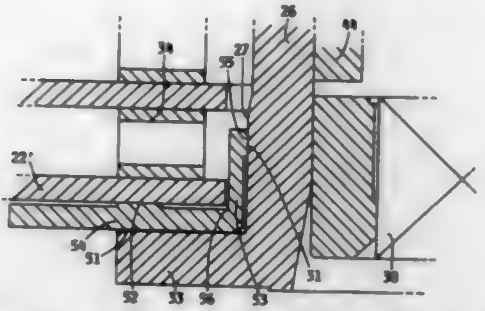
PCT Filed Jan. 8, 1990, Ser. No. 761,864

Int. Cl.^{5} G11B *17/08*

U.S. Cl. 360—98.08 **17 Claims**

1. A disk file including a disk assembly (20) comprising:

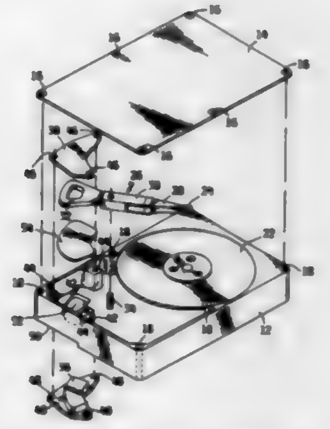
a hub (26), rotatable about a central axis, having a wall (31) and a peripheral flange (33);
at least one data storage disk (22) supported by the flange, the disk and flange being made from materials having dissimilar coefficients of thermal expansion;
clamping means for clamping said disk to said flange, said clamping means applying a clamping force against said flange in an axial direction; and
compensation means (50, 51) located between a surface of the flange and an opposed surface of the disk, for ensuring



that the disk remains concentric with the hub during temperature changes, said compensation means further including:
expansion means having a coefficient of thermal expansion different to that of the hub, the expansion means being attached to the hub wall and having raised portions (52) concentric with the hub and in non-slipping contact with the surface of the disk (22'), and
means (51) interposed between the expansion means and flange for allowing the expansion means to move radially relative to the flange during temperature changes.

5,315,464
DISK APPARATUS AND MANUFACTURING METHOD THEREOF

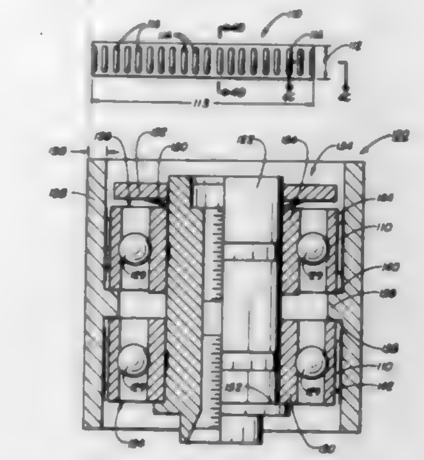
Hitoshi Tsujino, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 17, 1991, Ser. No. 731,587
Claims priority, application Japan, Jul. 20, 1990, 2-190878
Int. Cl.^{5} G11B *21/08*
U.S. Cl. 360—99.08 **11 Claims**



1. A disk apparatus for storing information comprising:
a disk;
a head to read or write on said disk;
a carriage to support said head;
a coil connected to said carriage;
an enclosure which envelops said disk, said head, said carriage and said coil; and
a magnet positioned outside of said enclosure for supplying magnetic flux to said coil,
wherein a portion of said enclosure located between said coil and said magnet is a thin film, said film being thin in relation to the thickness of said enclosure.

5,315,465
COMPLIANT PIVOT MECHANISM FOR A ROTARY ACTUATOR

John B. Blanks, Edmond, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.
Filed Jul. 12, 1991, Ser. No. 729,453
Int. Cl.^{5} G11B *5/55*
U.S. Cl. 360—106 **8 Claims**

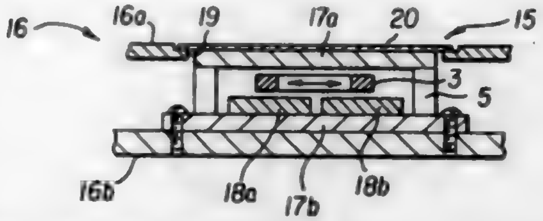


1. A pivot mechanism for a rotary actuator in a disc drive data storage device having a base member and a plurality of discs mounted for rotation on the base member for the storage of data, the rotary actuator having a motor for moving a plurality of read/write heads for storing and retrieving data, the pivot mechanism comprising:
a pivot shaft fixedly mounted to the base casting closely adjacent the outer periphery of the plurality of discs and extending in parallel with the axis of the rotation of the discs;
lower and upper ball bearings having inner and outer races and a plurality of balls constrained therebetween, the inner races of the lower and upper ball bearings engaged to the pivot shaft;
an actuator body having a central bore, the actuator body comprising:
first coupling means for coupling the actuator body to the motor; and
second coupling means for coupling the actuator body to the plurality of read/write heads;
first and second tolerance rings disposed between the outer races of the lower and upper ball bearings and the inner surface of the central bore of the actuator body; and
preload means for biasing the inner races toward each other along the length of the pivot shaft and for biasing the outer races away from each other within the central bore of the actuator body.

5,315,466
MAGNETIC DISK UNIT HAVING REDUCED PROFILE AND/OR FASTER SEEK SPEED

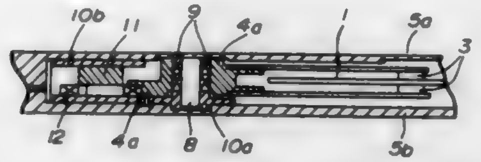
Hideki Nishimoto, and Wataru Niibe, both of Matumoto, Japan, assignors to Fuji Electric Co., Ltd., Japan
Filed Mar. 5, 1992, Ser. No. 846,343
Claims priority, application Japan, Mar. 6, 1991, 3-38821; Dec. 10, 1991, 3-324887
Int. Cl.^{5} G11B *5/55*
U.S. Cl. 360—106 **14 Claims**

1. A magnetic disk unit comprising: an access arm; a voice coil motor for rotating the access arm; and a pair of case bodies for housing and enclosing the access arm and voice coil motor; wherein the voice coil motor comprises a coil disposed on the side of the access arm substantially parallel with the case bodies, an upper yoke and a lower yoke, with the coil located therebetween, mounted substantially parallel with the case bodies, and magnets disposed on at least one of the upper and lower yokes and having a cross flux to the coil; and wherein at least one of the upper and lower yokes extends through a through-hole provided in at least one of the case bodies.



5,315,467
HEAD ACTUATOR PIVOTING AROUND STATIONARY SHAFT AND DISH HAVING SUCH HEAD ACTUATOR

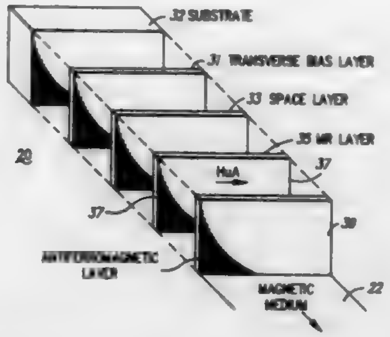
Kobun Yoshida, Sayama, Japan, assignor to Teac Corporation, Tokyo, Japan
Continuation of Ser. No. 610,807, Nov. 8, 1990, abandoned. This application Jun. 25, 1992, Ser. No. 904,885
Claims priority, application Japan, Nov. 13, 1989, 1-131818[U]
Int. Cl.^{5} G11B *21/02*
U.S. Cl. 360—106 **16 Claims**



11. A head actuator adapted to be fixed in a housing, comprising:
said housing has a first surface and a second surface opposite to said first surface,
a single fixed plate via which said head actuator is fixed in said housing, said fixed plate being a member different from said housing;
a stationary shaft having first and second ends;
a head supporting member pivotably supported around said stationary shaft, said head supporting member having substantially the same height as said stationary shaft; and
a head attached to said head supporting member,
said stationary shaft of said head supporting member being positionally fixed in a longitudinal direction of said stationary shaft by said fixed plate which supports only said first end of said stationary shaft, said stationary shaft being held between said first and second surfaces of said housing, said second end of said stationary shaft directly engaging but not secured to said second surface of said housing, said second end of said stationary shaft directly engaging said second surface of said housing without an intervening fixed plate.

5,315,468
MAGNETORESISTIVE SENSOR HAVING ANTIFERROMAGNETIC LAYER FOR EXCHANGE BIAS

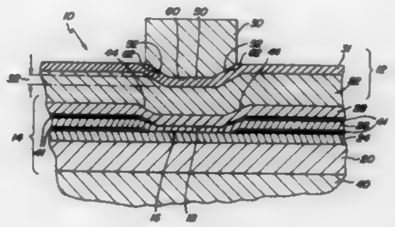
Tsann Lin, Campbell; James K. Howard, Morgan Hill; Cherngye Hwang, San Jose; Daniele Mauri, San Jose, and Norbert Staud, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 28, 1992, Ser. No. 920,943
Int. Cl.^{5} G11B *5/127, 5/33*
U.S. Cl. 360—113 **11 Claims**

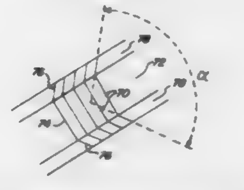


1. A magnetoresistive read sensor of the type having a layer of antiferromagnetic material in direct contact with a layer of magnetoresistive ferromagnetic material for inducing a longitudinal bias field in the ferromagnetic layer wherein said antiferromagnetic layer comprises an alloy of manganese (Mn), at least a portion of said Mn alloy layer having a face-centered-tetragonal (fct) structure.

5,315,469
MAGNETIC RECORDING HEAD WHICH PRODUCES VARIABLE ERASE BANDS

Michael McNeil, Santa Ynez, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.
Filed Jul. 25, 1991, Ser. No. 736,449
Int. Cl.^{5} G11B *5/39, 5/23, 5/147*
U.S. Cl. 360—119 **15 Claims**





1. A magnetic recording system for recording data onto a track of a magnetic medium, said magnetic recording system comprising:
a magnetic recording head, comprising:
a leading pole defining a first portion, a second portion and a third portion, said second portion being positioned between said first portion and said third portion, wherein said first portion, said second portion and said third portion form a single continuous magnetic layer;
a trailing pole defining a fourth portion, a fifth portion and a sixth portion, wherein said fourth portion, said fifth portion and said sixth portion form a single continuous magnetic layer and wherein further said fourth portion

opposes and is parallel to said first portion, said fifth portion writing data in said desired orientation opposes and is parallel to said second portion and said sixth portion opposes and is parallel to said third portion and wherein further said fifth portion and said second portion cooperate to write transitions on said magnetic medium, said fourth portion and said first portion cooperate to write transitions on said magnetic medium which are non-parallel to said transitions written by said fifth portion and said second portion and said sixth portion and said third portion cooperate to write transitions on said magnetic medium which are non-parallel to said transitions written by said fifth portion and said second portion; and

a non-magnetic layer between said trailing pole and said leading pole;

a conducting coil enclosing one of said poles; and

a signal source connected to said coil to energize said coil to simultaneously cause said fifth portion to cooperate with said second portion to write data, and said fourth portion to cooperate with said first portion and said sixth portion to cooperate with said third portion to write transitions which are non-parallel to said transitions written by said fifth portion and said second portion.

5,315,470
DISK CARTRIDGE WITH CENTERED MAGNETIC PLATE

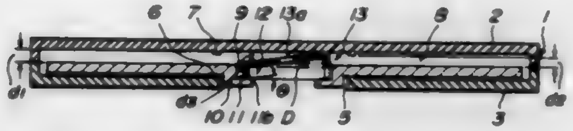
Toyomi Fujino, and Hajime Yano, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1992, Ser. No. 871,822

Claims priority, application Japan, Apr. 25, 1991, 3-095061

Int. Cl.^{5} G11B *23/03*

U.S. Cl. 360—133 **22 Claims**



1. A disk cartridge comprising:

a casing formed of first and second halves, said first half having an access opening for allowing driving means to be communicated with an internal space of said disk cartridge;

a disk having an axial opening formed substantially in a center portion thereof and having a recess surrounding a periphery of said axial opening, said recess being formed to depend from one planar surface of the disk toward a second planar surface of the disk which is parallel to the first planar surface and having an annular bottom flange which surrounds the axial opening, said annular bottom flange having a chucking surface facing the exterior of said disk cartridge through said access opening and a counter chucking surface facing the internal space of said disk cartridge;

a magnetic plate provided in said recess, a height of said magnetic plate being greater than a shortest axial distance between said disk and an inner surface of said second half of said casing which opposes the recess.

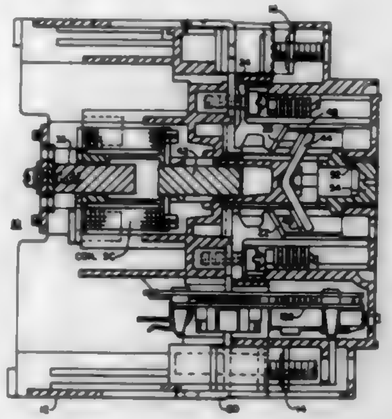
5,315,471
COIL CURRENT REGULATOR WITH INDUCED FLUX COMPENSATION IN AN ELECTROMAGNETIC CONTACTOR SYSTEM

Rick A. Hurley, Fletcher, and Mark E. Innes, Asheville, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 1, 1992, Ser. No. 891,877

Int. Cl.^{5} H01H *67/02*

U.S. Cl. 361—160 **18 Claims**



1. An electrical contactor having separable contacts, an electromagnet coil controlling opening and closing of said separable contacts to control a flow of load current therethrough, coil energizing means gating pulses of full wave rectified ac voltage to said electromagnet coil to close said separable contacts, and regulating means delaying gating of said pulses of full wave rectified ac voltage to said electromagnet coil to regulate coil holding current maintaining said separable contacts closed, and including means adjusting regulation of said coil holding current to compensate for flux induced in said coil by said load current.

5,315,472
GROUND RING/SPARK GAP ESD PROTECTION OF TAB CIRCUITS

Jon J. Fong, San Diego, and William B. Reid, Solana Beach, both of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Jul. 23, 1991, Ser. No. 734,725

Int. Cl.^{5} H05F *3/02*

U.S. Cl. 361—212 **5 Claims**

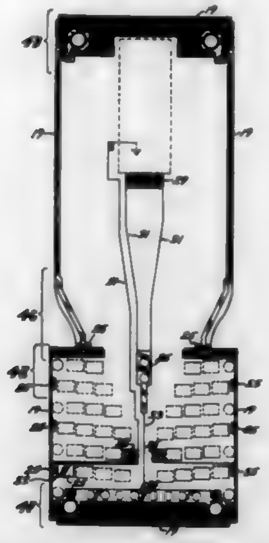
1. An electrostatic discharge protection structure formed on an interconnect circuit structure that includes a dielectric substrate having a printed side and a non-printed side and a pattern of openings formed therein, and elongated interconnect lines and interconnect contact pads formed on the printed side of the dielectric substrate, wherein the interconnect contact pads are formed over corresponding openings in the dielectric substrate so that the interconnect contact pads are contacted from the non-printed side through the corresponding openings, the electrostatic discharge protection structure comprising:

perimeter conductive grounding means formed on the printed side of the dielectric substrate adjacent selected edges of the perimeter of the substrate and surrounding the area occupied by the elongated interconnect lines and interconnect contact pads, said conductive grounding means being conductively connected to a ground reference;

interior conductive grounding means formed on the printed side of the dielectric substrate adjacent selected edges of openings in the substrate and conductively connected to said perimeter conductive grounding means;

conductive grounding pads formed on the printed side of the dielectric substrate over openings in the substrate so as to be subject to contact by a person from the non-printed side of the dielectric substrate and located adjacent selected interconnect pads and electrically connected to said perimeter conductive grounding means;

spark gaps formed on the printed side of the dielectric substrate between said perimeter conductive grounding means and selected ones of said interconnect contact pads which are adjacent said perimeter conductive grounding means;



spark gaps formed on the printed side of the dielectric substrate between said conductive grounding pads and said adjacent selected interconnect pads; and

spark gaps formed on the printed side of the dielectric substrate between adjacent interconnect contact pads such that discharge paths to the perimeter conductive grounding means are provided for each of the interconnect contact pads.

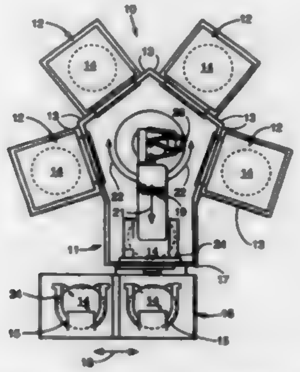
5,315,473
ISOLATED ELECTROSTATIC CHUCK AND EXCITATION METHOD

Kenneth S. Collins, San Jose, and Edward A. Gritters, Felton, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 21, 1992, Ser. No. 823,280

Int. Cl.^{5} H02N *13/00*

U.S. Cl. 361—234 **37 Claims**



1. A method of electrostatically clamping a workpiece to a support having at least a pair of dielectrically isolated electrodes comprising:

applying to the paired electrodes an alternating current square-wave voltage of a frequency greater than 0.1 Hz and of a magnitude sufficient to clamp the workpiece flat against the support.

5,315,474
SOLID ELECTROLYTIC CAPACITOR

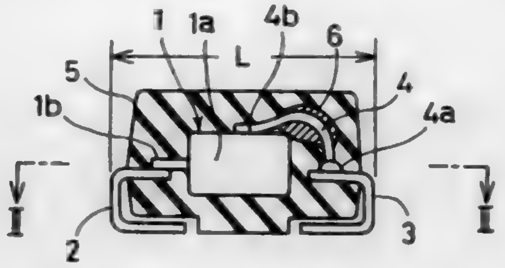
Chojiro Kuriyama, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 2, 1993, Ser. No. 41,971

Claims priority, application Japan, Apr. 7, 1992, 4-85353

Int. Cl.^{5} H01G *9/00*

U.S. Cl. 361—534 **9 Claims**



1. A solid electrolytic capacitor comprising:

at least one capacitor element including a chip body and an anode wire projecting from the chip body;

an anode lead electrically connected to the anode wire;

a cathode lead paired with the anode lead;

a fuse wire having a first end electrically connected to the cathode lead and a second end electrically connected to the chip body, the fuse wire being made of solder; and

a resin package enclosing the capacitor element, part of the anode lead, part of the cathode lead, and the fuse wire;

wherein the first end of the fuse wire has a nail head form for bonding to the cathode lead.

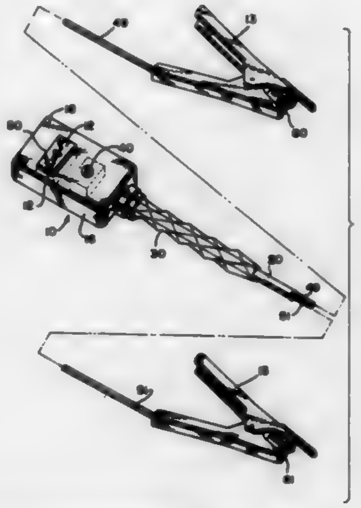
5,315,475
ELECTRICIAN'S FREE POWER CORD

Allen T. Scheidel, 31 Briarwood Rd., North Canton, Conn. 06059, and Glenn C. Fuller, 37 Jackson St., Torrington, Conn. 06790

Filed Jul. 26, 1993, Ser. No. 53,676

Int. Cl.^{5} H02B *1/10*

U.S. Cl. 361—643 **2 Claims**



1. An electricians power cord, comprising:

(a) a molded insulating body having a bottom wall and a continuous side wall and defining an open top;

(b) means for supplying electrical power being attached to said body, said means including live, ground and/or neutral conductors attached to said body at one end of the respective conductors: and

(c) a circuit breaker mechanism and a ground fault current interrupter mechanism having multiple electrical outlets mounted side-by-side one another in said body and connected in series with one another and with said power supplying means for respectively protecting external circuits when plugged into said multiple electrical outlets;

(d) said body also including a cover separate from said base so as to cover said open top thereof, said cover having apertures formed therein to accept the reset button of said circuit breaker mechanism and the multiple electrical outlets of the said ground fault interrupter mechanism;

(e) connecting means attached to the other end of the live conductor of the said power supplying means and similar connecting means attached to the other end of the ground and neutral conductors of the said power supplying means;

(f) each of said connecting means including a battery clamp mechanism with jaws and having a non-conducting contact holding block attached to a clamp portion thereof, the said contact holding block having a through drilled hole in alignment with the centerline of the jaws of the said battery clamp to accept a conducting contact plunger, said contact plunger having a spherical contact surface and a cylindrical body portion extending through the said contact holding block and being biased forward by a helical spring, said contact holding block having a kerf perpendicular to and intersecting the said through drilled hole exposing a portion of the cylindrical body of the said contact plunger, the cylindrical end of the said contact plunger of one of the said connecting means being electrically connected to the live conductor of the said power supplying means and the cylindrical end of the said contact plunger of the other of said connecting means being electrically connected to the ground or neutral conductor of the said power supplying means.

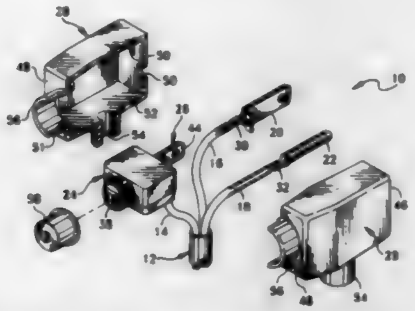
5,315,476
MALE CONDUCTOR PLUG FOR A CORD SET

Hedrick, Paul A., West Greenwich, R.I., assignor to General Cable Industries, Inc., Highland Heights, Ky.

Filed Feb. 23, 1993, Ser. No. 21,320

Int. Cl.⁵ H02B *1/20*

U.S. Cl. 361—652 **5 Claims**



1. A right angle male conductor plug and cord set, said cord set having a positive lead wire, a neutral lead wire and a ground lead wire, said conductor plug comprising:

a neutral blade connected to said neutral lead wire;

a ground blade connected to said ground lead wire;

a circuit breaking device having an input terminal, an output terminal, and a reset switch, said positive lead wire being connected to said output terminal, said circuit breaker further including an integral positive blade having a head portion for insertion into an electrical outlet and an elongated body which is fixedly mounted to said input terminal of said circuit breaking device,

a molded housing having opposite first and second walls, said housing encapsulating said circuit breaker and blade combination, and said cord set wherein said head portion of said positive blade, said neutral blade, and said ground blade extend outwardly from the first wall of said housing and said reset switch extends outwardly from the opposite second wall of said housing,

said cord set extending outwardly and downwardly from said housing through a bottom wall thereof.

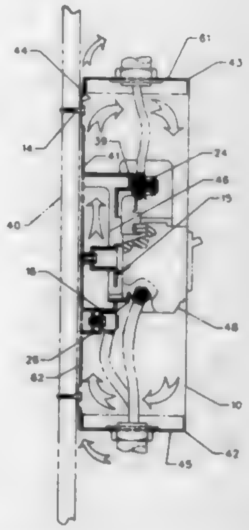
5,315,477
THERMALLY EFFICIENT COMPACT CIRCUIT BREAKER SUPPORT AND ENCLOSURE

Richard W. Schumacher, Newington; Denis A. Perzan, Plainville; Peter F. Cavanaugh, West Simsbury, and George J. Boucher, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 8, 1993, Ser. No. 43,696

Int. Cl.⁵ H02B *1/04;* **H05K** *7/20*

U.S. Cl. 361—678 **12 Claims**



1. A compact molded case circuit breaker load center comprising:

an enclosure having top, bottom and back walls defining a front part that is covered by a front plate, said enclosure being accessible by means of a front slot through said front plate;

a circuit breaker support assembly within said enclosure attached to said back wall, said support assembly comprising a plastic unitary piece having circuit breaker engaging hooks at one end and means receiving neutral connectors at an opposite end, said support assembly including platform means supporting circuit breaker stab connectors, said platform means being slotted under said stab connectors for passing cooling air up through said platform and;

perforations through said top and bottom walls for allowing passage of cooling air into and out of said enclosure.

5,315,478
MEMORY CARD TRAY FOR PORTABLE COMPUTER

Peter F. Cadwell, Sunnyvale, and Noah L. Anglin, San Jose, both of Calif., assignors to Fujitsu Personal Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 374,409, Jun. 30, 1989, abandoned. This application Oct. 16, 1991, Ser. No. 777,454

Int. Cl.⁵ H05K *5/00*

U.S. Cl. 361—684 **4 Claims**

1. A structure comprising:

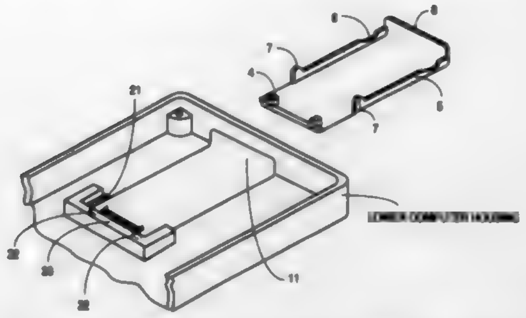
a memory card having a socket comprising a plurality of socket connectors;

means for inserting and holding said memory card in a computer housing,

a computer housing comprising a plug from which extend a plurality of plug pins;

a computer having circuitry connected to said plug pins; and

means for enabling said computer to access said memory card after said plurality of plug pins are connected to respective ones of said socket connectors, wherein said



means for enabling said computer comprises a conductive stop at a back end of said means for inserting and holding and a conductive guide member on said plug, arranged such that said plurality of plug pins are connected to respective socket connectors before said conductive stop contacts said conductive guide member.

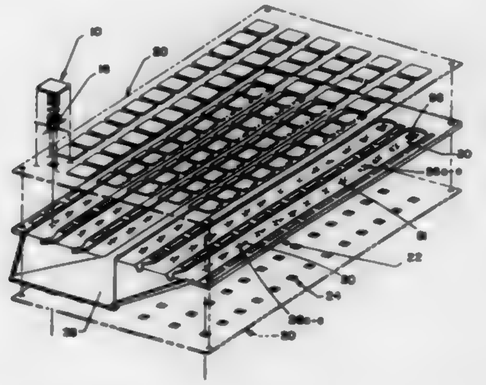
5,315,479
AIR MANIFOLD FOR COOLING ELECTRONIC COMPONENTS

Bradley W. Bartilson, Chippewa Falls, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Filed Jan. 21, 1993, Ser. No. 7,100

Int. Cl.⁵ H05K *7/20*

U.S. Cl. 361—690 **4 Claims**



1. An air manifold, having a top planar surface and a bottom planar surface, adapted for mounting a top and bottom boards adjacent thereto, comprising:

air flow channels defined between the top planar surface of the air manifold and the top board, and between the bottom planar surface of the air manifold and the bottom board, each of said channels having an air inlet end and a tapered end;

a plurality of nozzles positioned along said air flow channels for expelling air therefrom to cool said top and bottom boards; and

a plurality of members positioned with respect to said plurality of nozzles, said members changing in size as the distance between the air inlet end and said members increases, said members being positioned adjacent to at least five of said plurality of nozzles, wherein said plurality of members includes a first member, having a blunt end facing toward said air inlet end of said air flow channels, positioned between said air inlet end an said plurality of nozzels, a second member, having a blunt end facing away from said air inlet end, positioned between said plurality of nozzles and said tapered end.

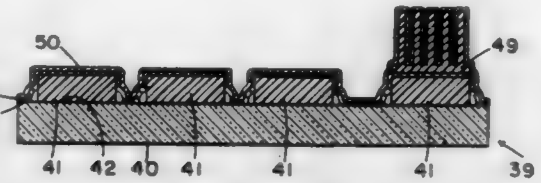
5,315,480
CONFORMAL HEAT SINK FOR ELECTRONIC MODULE

Victor M. Samarov, Carlisle; Ralph I. Larson, Jr., Bolton, and George A. Doumani, No. Andover, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 792,127, Nov. 14, 1991, abandoned. This application Apr. 28, 1993, Ser. No. 54,458

Int. Cl.⁵ H05K *7/20*

U.S. Cl. 361—705 **3 Claims**



2. An electronic assembly comprising:

an electronic module permanently coated at least in part by an electrically insulating first layer of a thickness sufficient to reliably cover protruding features of electrical components carried on the module;

a surface-expanding element mounted on said first layer; and a substantial continuous thermally conductive and solid second layer permanently formed on said first layer and said surface-expanding element to cool said electrical components during operation.

5,315,481
PACKAGING CONSTRUCTION FOR SEMICONDUCTOR WAFERS

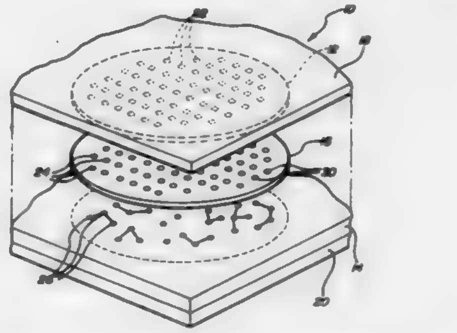
Robert Smolley, Porteuguese Bend, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 835,818, Mar. 3, 1986, Pat. No. 5,007,841, which is a continuation-in-part of Ser. No. 499,137, May 31, 1983, abandoned, and a continuation-in-part of Ser. No. 499,136, May 31, 1983, Pat. No. 4,574,331. This application Mar. 12, 1990, Ser. No. 492,008

Claims priority, application European Pat. Off., May 15, 1984, 84303285.5; Rep. of Korea, May 29, 1984, 2954/84; Japan, May 31, 1984, 59-112169

Int. Cl.⁵ H05K *7/20, 1/14*

U.S. Cl. 361—707 **12 Claims**



1. A semiconductor wafer packaging construction, comprising:

at least one semiconductor wafer, wherein each semiconductor wafer has a plurality of integrated circuits therein covering substantially the entire wafer and a plurality of contact areas;

at least one insulating board, wherein each insulating board has a plurality of openings therethrough, with at least

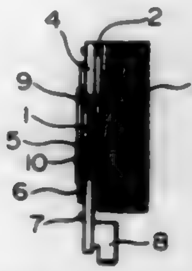
some of the openings at positions corresponding to the wafer contact areas;
a circuit board having contact areas at positions corresponding to some of the insulating board openings;
a plurality of conductive connector elements disposed in selected ones of the openings in each insulating board, each of said connector elements including a wadded strand of conductive wire that is deformed when compressed; and
means for compressing each wafer toward the circuit board, thereby compressing the wadded strand of each of the connector, each strand elements making multiple electrical contact between a corresponding wafer contact area and a circuit board contact area;
wherein the packaging construction is a wafer scale integrated circuit packaging construction.

5,315,482

SEMICONDUCTOR APPARATUS OF MODULE INSTALLING TYPE

Akira Tanaka; Hiroichi Shinohara; Kazuji Yamada, all of Hitachi; Takao Ohba, Hadano; Akira Yamagiwa, Hadano; Hitoshi Yoshidome, Hadano; Yuji Shirai, Kodaira; Toshio Hatada, Tsuchiura; Munehisa Kishimoto, Kamakura, and Michiharu Honda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1992, Ser. No. 961,394
Claims priority, application Japan, Oct. 21, 1991, 3-272330
Int. Cl.^{5} H05K *7/20*
U.S. Cl. 361—707 10 Claims



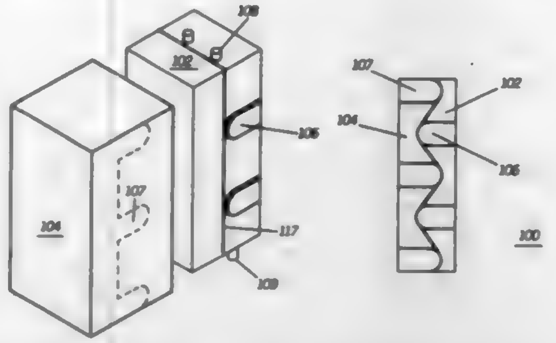
1. A semiconductor apparatus of a module installing type having a plurality of semiconductor integrated circuit devices mounted thereon and having different heat generation amounts, comprising:
a printed circuit board made of resin and having at least one through hole;
a plurality of first semiconductor integrated circuit devices mounted on said printed circuit board and having a maximum heat generation amount of less than 5 W, each of said plurality of first semiconductor integrated circuit devices having input terminals and output terminals;
a heat diffusing plate made of metal or ceramics; and
at least one second semiconductor integrated circuit device arranged in the through hole of said printed circuit board and also mounted on said heat diffusing plate, each of said at least one second semiconductor integrated circuit device having signal input terminals and output terminals and having a heat generation amount of 5 W or more,
wherein signal input terminals and output terminals of said second semiconductor integrated circuit device are electrically connected to signal input terminals and output terminals of at least one of said first semiconductor integrated circuit devices,
wherein said heat diffusion plate has radiating fins provided thereon, which extend externally of said printed circuit board, and
wherein said printed circuit board is provided with external input and output terminals.

5,315,483

HOUSING HAVING NON-PLANAR RADIAL SEAL

James L. Tracy, Margate, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 5, 1992, Ser. No. 956,219
Int. Cl.^{5} H05K *5/06*
U.S. Cl. 361—752 16 Claims



1. A housing having a non-planar radial seal, comprising:
a first housing member having a first perimeter;
a second housing member for mating with the first housing member, said second housing member having a second perimeter that is larger than the first perimeter so that when the first housing member is mated with the second housing member a gap is formed between the first housing member and the second housing member, said gap having a width;
a perimeter seal formed in the gap between the first housing member and the second housing member, said perimeter seal comprising a compliant material having a cross sectional diameter that is larger than the width of the gap; and
complementary means formed on the first housing member and the second housing members for guiding the perimeter seal into a non-planar orientation.

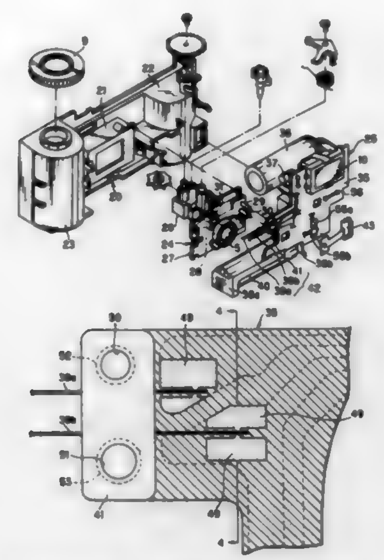
5,315,484

PRINTED CIRCUIT BOARD AND METHOD FOR ATTACHING MOVABLE SWITCH THERETO

Seiji Asano, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 6, 1992, Ser. No. 972,922
Claims priority, application Japan, Nov. 6, 1991, 3-290248
Int. Cl.^{5} H05K *1/16*
U.S. Cl. 361—765 17 Claims

1. A method for attaching a pair of switch contacts to a printed circuit board having at least two lead lines, comprising the steps of:
providing a soldering land portion on each of said lead lines by coating a surface of said lead lines with a solder-proof layer while leaving uncoated said soldering land portions, each of said soldering land portions having two sub-soldering land portions and a narrow connecting portion interconnecting middle portions of said sub-soldering land portions;
coating each of said soldering land portions with solder;
attaching a holder with said switch contacts to said printed circuit board such that one end of each of said switch contacts is positioned on a respective one of said narrow connecting portions; and



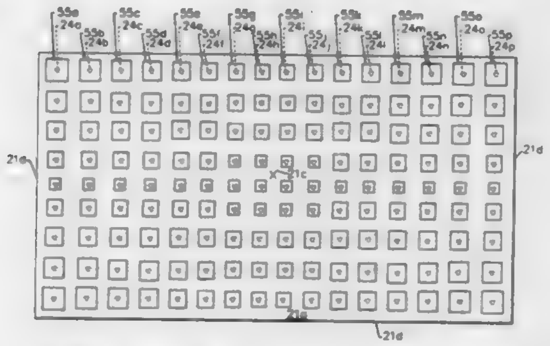
soldering said switch contacts to said lead lines by melting the solder on said soldering land portions.

5,315,485

VARIABLE SIZE CAPTURE PADS FOR MULTILAYER CERAMIC SUBSTRATES AND CONNECTORS THEREFOR

Paul A. Magill, Chapel Hill; Nicholas G. Koopman, Raleigh, and Glenn A. Rinne, Cary, all of N.C., assignors to MCNC, Research Triangle Park, N.C. and Northern Telecom Limited, Montreal, Canada

Filed Sep. 29, 1992, Ser. No. 953,564
Int. Cl.^{5} H05K *1/11*
U.S. Cl. 361—767 36 Claims



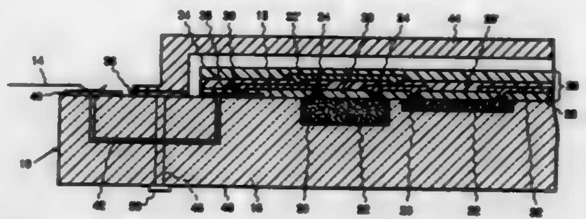
1. A multilayer ceramic substrate comprising:
a substrate of ceramic material having an internal conductor system including a plurality of conductor filled vias extending to a face thereof; and
a plurality of capture pads of predetermined size and of predetermined center-to-center spacing on said substrate face, a respective one of which is electrically connected to a respective one of said conductor filed vias, said predetermined capture pad size and said predetermined center-to-center spacing being relatively large relatively far from an imaginary reference point on said substrate face and being relatively small relatively near the imaginary reference point on said substrate face such that said predetermined capture pad size and said predetermined center-to-center spacing of at least some of said capture pads progressively increase as the distance from the imaginary reference point increases to ensure electrical connection to the respective conductor filled via notwithstanding variability in location of the respective via due to shrinkage of said substrate during fabrication thereof.

5,315,486

HERMETICALLY PACKAGED HDI ELECTRONIC SYSTEM

Raymond A. Fillion, Niskayuna; William P. Kornrumpf, Albany, and Edward S. Bernard, Manlius, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 807,325, Dec. 16, 1991. This application Jun. 7, 1993, Ser. No. 73,250
Int. Cl.^{5} H01L *23/053, 23/055, 23/10;* **H05K** *1/16*
U.S. Cl. 361—795 21 Claims



1. A packaged electronic system comprising:
a ceramic substrate having a component-supporting surface, and at least one electronic component disposed on said component-supporting surface, said component having contact pads thereon;
a seal ring disposed on said component-supporting surface encircling said at least one electronic component;
a set of inner contact points on said component-supporting surface located inside said seal ring, and a corresponding set of outer contact points on said component-supporting surface located outside said seal ring;
a set of electrical conductors at least in part buried in said ceramic substrate and extending between said inner and outer sets of contact points;
electrical connections between at least some of said components contact pads and said inner contact points, comprising a multilayer interconnect structure including interleaved layers of dielectric material and conductive material disposed over portions of said substrate, over said at least one electronic component and over said inner set of contact points; and
a package lid attached to said seal ring and enclosing said at least one electronic component and said electrical connections.

5,315,487

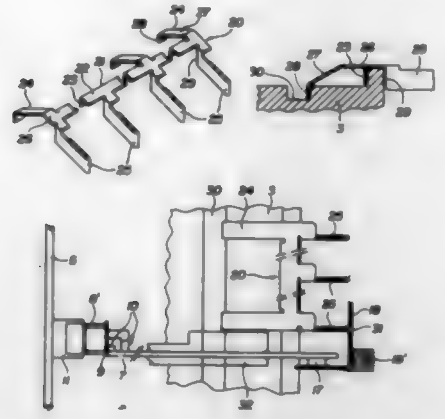
METHOD AND DEVICE FOR CODING PRINTED CIRCUIT BOARDS

Gérard Le Goe, La Ville du Bois, and Jacques Roger, Guyancourt, both of France, assignors to Alcatel CIT, Paris, France

Filed Jul. 29, 1992, Ser. No. 921,082
Claims priority, application France, Jul. 30, 1991, 91 09659
Int. Cl.^{5} H05K *7/14;* H01R *13/64*
U.S. Cl. 361—796 9 Claims

1. Device for implementing a method of associative coding printed circuit boards adapted to be connected into a subrack adapted to be fitted with a plurality of boards each of which is guided by at least one slideway which is part of a plurality of parallel spaced slideways respective to said boards each of which has a front panel in the form of a wall perpendicular to its plane adapted to close part of an open front side of said subrack when said board is inserted in said subrack, in which method, before inserting the first board, at least one elongate coding member is fitted to said subrack and comprises a series of projecting portions disposed along the length of said member at intervals in corresponding relationship to respective intervals between two consecutive slideways, each projecting portion being adapted to collaborate plug-and-socket fashion

with an opening formed in the front panel of each board to enable said board to be connected only if it is part of the same family as the first board mounted and connected into the subrack, said coding member being disposed parallel to the plane of the open front side of the subrack and adapted to be movable longitudinally for fitting the first board of the family, the coding of the boards of the same family being defined by the location of said opening in the plane of the front panel of each board, which device comprises at least one elongate coding member provided with means for mounting said member inside said subrack and comprising a plurality of parallel projecting ports perpendicular to the length of said coding member at intervals in corresponding relationship to respective intervals between two consecutive guide slideways.



5,315,488
HOST STRUCTURE FOR TERMINAL ADAPTERS

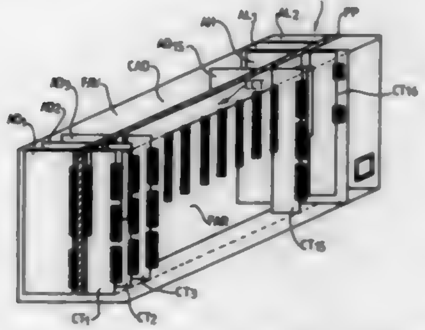
Rémy Le Galle, Le Chesnay; Gérard Lyvet, Les Clayes Sous Bois, and Bernard Maigogne, Dreux, all of France, assignors to Bull S.A., Paris, France

Filed Apr. 12, 1993, Ser. No. 46,036

Claims priority, application France, Apr. 14, 1992, 92 04580

Int. Cl.⁵ H05K *7/14*

U.S. Cl. 361—796 **17 Claims**



1. A host structure for terminal adapters AD to AD15, to H that are part of a distributed computer architecture composed of a plurality of computer systems each connected via communication servers to at least one network, with each computer system connected to a plurality of terminals T1, T2, T3, T4, T5 via the network and terminal adapters, each of said terminal adapters being connected to the network and to at least one corresponding terminal via a transmission connection, said host structure containing a plurality of adapter cards, each with the electronic circuit of an adapter, physically independent from one another, wherein said host structure includes:

a front side permitting removal of the adapter cards and a back side permitting connection of each adapter card to the network and to the at least one corresponding terminal;

a front compartment including the front side with adapter cards parallel to one another;

a back compartment including the back side and connection cards, each one corresponding to an adapter card, and the number of connection cards is equal to the number of adapter cards; and

wherein the two compartments are separated by a backplane assembly, with each adapter card having means of removal located on the side of the front and first means of connection connecting said adapter card to second means of connection for the connection card via the backplane assembly for connecting each card to the network; each connection card is equipped with third means of connection located on the side of the front for connecting the corresponding adapter card to the at least one corresponding terminal.

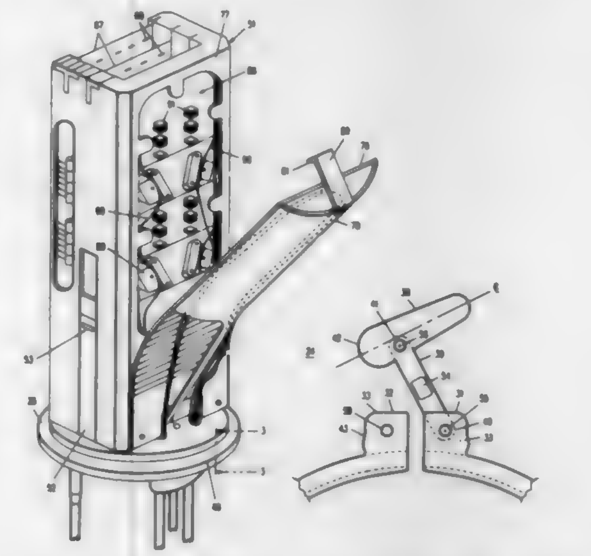
5,315,489
PRESSURE CLAMP FOR TELECOMMUNICATIONS CLOSURE

Mark McCall, San Jose; Donald Del Fava, San Carlos; Thomas Wong, Menlo Park, and Lowell I. Koht, Foster City, all of Calif., assignors to Raynet Corporation, Menlo Park, Calif.

Filed Dec. 10, 1992, Ser. No. 988,619

Int. Cl.⁵ H05K *7/18*

U.S. Cl. 361—801 **12 Claims**



1. A pressure clamp (21) for a telecommunications closure (1), comprising:

a circumferential clamp member (22, 23) which encircles a sealing ring (25) disposed within a circumferential cavity (26) formed between mating parts (47, 48) of the telecommunications closure, the clamp member having first and second confronting ends (31, 32) which are separated in an unclamped state from one another, the clamp member having first and second legs (27, 28) extending radially inwardly around its circumference, an interior surface (29, 30) of the legs being shaped so as to be slideable over radially extending mating engagement surfaces (49, 50) of the closure parts;

means (24) for urging and latching the first and second confronting ends together so as to urge the clamp member legs over the engagement surfaces to maintain compression on the sealing ring to provide a pressure seal between the closure mating parts;

the urging and latching means including an over-center rotatable latch (38) rotatably moveable between a first open unlatched position and a second latched position, an attractive force exerted between the first and second clamp member confronting ends increasing to a maximum as the rotatable latch is moved from its first position to an intermediate position between the first and second positions and then decreasing from the maximum as the latch is moved from the intermediate position to the second position.

5,315,490
LIGHT FITTINGS

Rodney C. Bastable, The Old Court, Newmarket Road, Newmarket Suffolk CB8 8HH, England

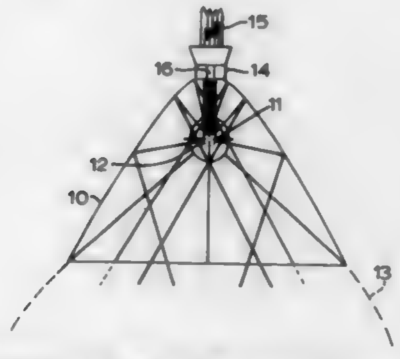
PCT No. PCT/GB90/01579, § 371 Date Apr. 9, 1992, § 102(e) Date Apr. 9, 1992, PCT Pub. No. WO91/05972, PCT Pub. Date May 2, 1991

PCT Filed Oct. 12, 1990, Ser. No. 847,101

Claims priority, application United Kingdom, Oct. 13, 1989, 8923122

Int. Cl.⁵ F21V *8/00*

U.S. Cl. 362—32 **7 Claims**



1. A light fitting for display illumination to provide a primary light source and at least one secondary light source, comprising a holder for a high intensity light source and a reflector specifically adapted for use with a held source and juxtaposed with respect to the holder whereby a held source will provide a beam of a predetermined configuration, there being an orifice formed through the reflector and the light fitting includes a fibre optic loom having a plurality of optic fibres and having an end coupler which is mounted to cooperate with the orifice so that light from a held source will be incident on the end face of the coupler to enter the optical fibers of the loom. characterized in that the orifice is formed through the reflector at a site where a majority of the light from a held source and impinging on that site does not contribute significantly to the resultant beam produced by the reflector, and wherein distal ends of some of the optical fibres of the loom are provided with lenses, small translucent globes or the like.

5,315,491
REFLECTING AND LUMINOUS LAYERED MATERIAL

Andrew B. Spencer, Manchester; Richard J. Guastamachio, Broad Brook, and Bryan D. Marsh, South Windsor, all of Conn., assignors to American Ingenuity, Inc., Bloomfield, Conn.

Continuation-in-part of Ser. No. 954,387, Sep. 30, 1992. This application Feb. 17, 1993, Ser. No. 19,152

Int. Cl.⁵ F21V *9/16*

U.S. Cl. 362—84 **17 Claims**

1. Reflecting and luminous layered material comprising:

a first layer of prismatic light reflective material having an underlying surface formed with a plurality of minute prism-like formations projecting therefrom at regular spaced intervals and an overlying substantially smooth light transmissive surface, said first layer having a first peripheral edge; and

a second layer of phosphorescent material attached to said underlying surface of prism-like formations and generally coextensive therewith, said second layer having a second peripheral edge;

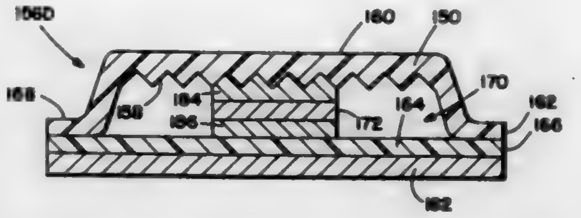
said first and second peripheral edges being proximately disposed, said first layer and said second layer being joined together into a unitary structure along a border of finite width extending continuously along said first and second peripheral edges, said prism-like formations coextensive with said border being thereby substantially destroyed, said border encompassing and defining a central region whereat said first layer and said second layer are physically distinct;

an electroluminescent lamp within the central region having a luminous surface proximate said underlying surface of said first layer; and

operative means for selectively energizing said electroluminescent lamp;

whereby, when said lamp is energized, light therefrom radiates through said underlying surface of prism-like formations and through said smooth light transmissive surface and, simultaneously, reflected light from said prism-like formations partially energizes said second layer of phosphorescent material; and

whereby, when said lamp is deenergized, phosphorescent light radiates from said second layer through said underlying surface of prism-like formations and through said smooth light transmissive surface.



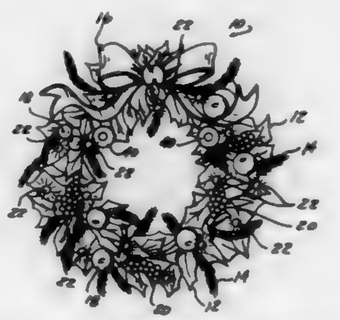
5,315,492
ILLUMINATED WINDOW DISPLAY ORNAMENT

Donald J. Davenport, P.O. Box 278, Troy, Mich. 48099

Filed Apr. 23, 1993, Ser. No. 52,471

Int. Cl.⁵ F21P *1/02*

U.S. Cl. 362—122 **8 Claims**



1. An illuminated holiday window display ornament comprising:

a generally planar rigid frame defining the outline of said ornament;

ornamentation attached to one side of said frame including a series of LED lights connected to an electrical lead extending about said frame;

at least one support stanchion attached to said one side of said frame and projecting normally therefrom;

glass attachment means carried by said support stanchion adapted to attach said frame to a glass pane;

a housing attached to said frame, said housing including a battery compartment containing batteries for powering said LED lights.

5,315,493

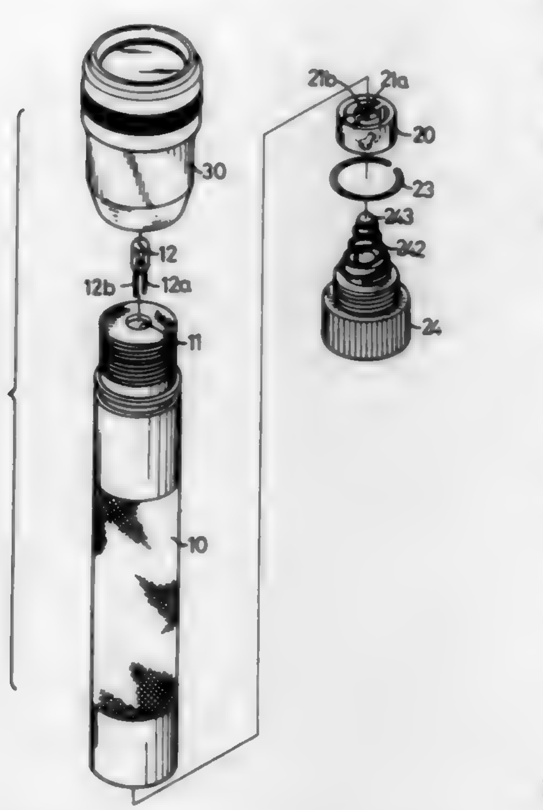
FLASHLIGHT

Juei-Nuan Huang, No. 42, Rei Feng Rd., Wu Feng Hsiang, Taichung Hsien, Taiwan

Filed Apr. 28, 1993, Ser. No. 53,445

Int. Cl.^{5} F21L *7/00*

U.S. Cl. 362—202 **1 Claim**



1. A flashlight comprising:

a) a tubular conductive body including a first externally threaded end and a second internally threaded end, and an annular portion formed on the first end and having a hole therethrough;

b) an isolating seat having first and second slots formed therethrough, a C-ring frictionally engaged within the conductive body and the isolating seat being disposed between the annular portion and the C-ring;

c) a first conductive receiver including a first section received in the first slot of the isolating seat and a second section positioned exteriorly of the isolating seat;

d) a second conductive receiver including a first section received in the second slot of the isolating seat and a second section disposed between the annular portion and the isolating seat;

e) a bulb including a first leg received in the first section of the first conductive receiver and a second leg received in the first section of the second conductive receiver;

f) a tubular head threadedly engaged on the threaded first end of the conductive body and a lens mounted within the tubular head, whereby rotation of the head relative to the body permits adjusting the distance between the lens and the bulb to change the focus of the flashlight; and

g) a threaded plug engaged within the internally threaded second end of the conductive body and a spring secured to the plug for engaging a power supply disposed within the body and completing an electric circuit, whereby rotation of the plug closes and opens the circuit to turn the flashlight on and off.

5,315,494

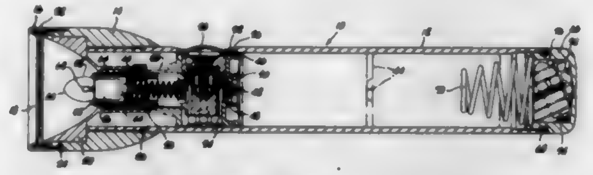
FLASHLIGHT AND BULB HOLDER THEREFOR

Anthony Maglica, Anaheim, Calif., assignor to Mag Instrument Inc., Ontario, Calif.

Continuation-in-part of Ser. No. 866,714, Apr. 10, 1992, Pat. No. 5,226,722, which is a continuation-in-part of Ser. No. 832,857, Feb. 7, 1992, Pat. No. 5,260,858, which is a continuation-in-part of Ser. No. 719,156, Jun. 21, 1991, Pat. No. 5,113,326, which is a continuation-in-part of Ser. No. 553,977, Jul. 16, 1990, abandoned, which is a continuation of Ser. No. 356,361, May 23, 1989, Pat. No. 4,942,505, which is a continuation of Ser. No. 222,378, Jul. 19, 1988, Pat. No. 4,899,265, which is a continuation of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Jul. 13, 1993, Ser. No. 91,071

Int. Cl.^{5} F21L *7/00*

U.S. Cl. 362—207 **6 Claims**



1. A holder for a flashlight bulb, comprising

a cylindrical resilient body including a peripheral wall, a slot to receive the flashlight bulb, said slot extending across said resilient body, being sized to receive the flashlight bulb in interference fit and being defined by a wall substantially U-shape in cross section, said body having ribs extending in substantially parallel planes outwardly of said U-shape wall to and within said peripheral wall.

5,315,495

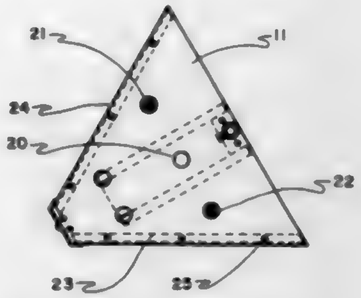
ILLUMINATED SIGN DEVICE

Rudolph G. Buser, Wall, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1993, Ser. No. 119,297

Int. Cl.^{5} F21V *29/00*

U.S. Cl. 362—373 **2 Claims**



1. An illuminated sign device comprising:

a triangular housing with upper and lower surfaces between which is coupled a back surface, a front left surface, and front right surface;

illumination means positioned within the housing;

ventilation means integral with the upper and lower surfaces for allowing heat transfer from the illumination means by convection to occur through the lower surface, within the housing, and out through the upper surface;

sign display means within the front left and front right surface both which is opaque to the illumination source, whereby the sign display means protects both sides of an at least semi-opaque sign and positions the sign within the front left and front right surfaces such that the sign is at least partially viewable from any approach angle;

access means removably attached to the front left and front right surfaces whereby access is obtained for the interchanging of the signs, such that upon selective activation of the illumination source the sign are at least partially illuminated.

5,315,496

CURRENT RESONANCE CONVERTER HAVING OVERLOAD DETECTING FUNCTION

Sadao Okochi, Fussa, and Terutaka Takoda, Ome, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

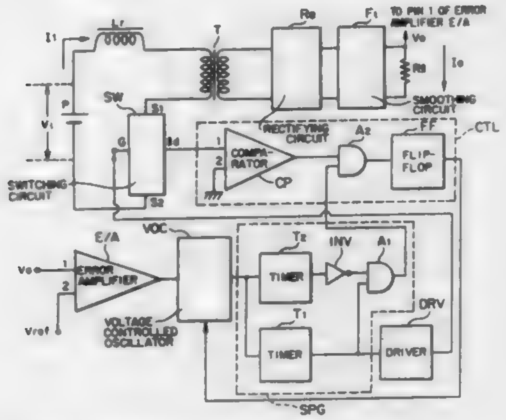
PCT No. PCT/JP91/00093, § 371 Date Jul. 24, 1991, § 102(e) Date Jul. 24, 1991

Continuation of Ser. No. 721,544, Jul. 24, 1991, abandoned. This PCT application Jan. 29, 1991, Ser. No. 40,574

Claims priority, application Japan, Jan. 29, 1990, 2-18544

Int. Cl.^{5} H02M *3/335*

U.S. Cl. 363—21 **17 Claims**



17. A current resonance converter comprising:

a transformer;

a series resonant circuit having an inductor and a capacitor connected therein in series, said capacitor connected to one of a primary and secondary coil of said transformer in parallel;

a switch means connected to said series resonant circuit to turn on and off said series resonant circuit;

an oscillating circuit means for driving said switch means so as to turn said switch means on and off;

electric current detecting means for detecting an electric current which flows through said series resonant circuit;

a strobe pulse generating means for generating a strobe pulse after a predetermined period of time elapses from a time when said switching element is turned on; and

a controlling means for controlling said oscillating circuit means so as to avoid an overload of said current resonance converter by reducing an oscillation frequency of said oscillating circuit when said electric current detecting means detects a forward current which flows through said series resonance circuit when said strobe pulse is generated.

5,315,497

SYMMETRICAL UNIVERSAL AC-AC POWER CONDITIONER

Alex J. Severinsky, Silver Spring, Md., assignor to Premier Power, Inc., McLean, Va.

Filed Nov. 7, 1991, Ser. No. 788,946

Int. Cl.^{5} H02J *3/01*

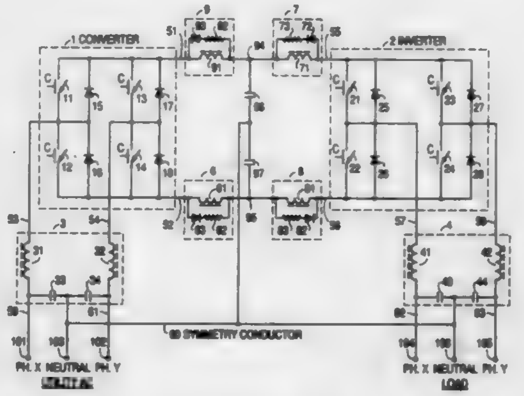
U.S. Cl. 363—34 **19 Claims**

1. An electrical power conditioning apparatus for receiving an unregulated input AC voltage and providing a regulated AC output voltage, said apparatus comprising:

input terminal means for connecting said apparatus to two power carrying conductors;

input voltage divider means connected in series between said power carrying conductors for dividing the voltage across said two power carrying conductors and providing a divided voltage, said input voltage divider means being formed of two equal impedances having a common connection point;

voltage converter means having an input coupled to said input terminal means for receiving and converting the voltage across said two power carrying conductors to a regulated DC voltage across electrical charge storage means connected to the output of said voltage converter means, said DC voltage having a value larger than the peak voltage across said two power carrying conductors, said electrical charge storage means being formed of two electrically equal and serially connected storage elements having a common connection point;



voltage inverter means having an input coupled to said electrical charge storage means for receiving and inverting said DC voltage to a regulated AC output voltage at an output of said voltage inverter means;

output voltage divider means connected in series across said output of said voltage inverter means for dividing said regulated AC output voltage, said output voltage divider means being formed of two equal impedances and having a common connection point;

output terminal means coupled to said output of said voltage inverter means for providing said regulated AC output voltage to a load; and

connection means for connecting together said common connection point of said input voltage divider means, said electrical charge storage means and said output voltage divider means wherein this connection means can be connected to a third power carrying conductor identified as a neutral conductor on input means and output means if this conductor is provided from said electrical service.

5,315,498

APPARATUS PROVIDING LEADING LEG CURRENT SENSING FOR CONTROL OF FULL BRIDGE POWER SUPPLY

Miguel A. Berrios, Kingston, and Kevin R. Covi, Glenford, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1992, Ser. No. 996,230

Int. Cl.^{5} H02M *7/5387*

U.S. Cl. 363—98 **13 Claims**

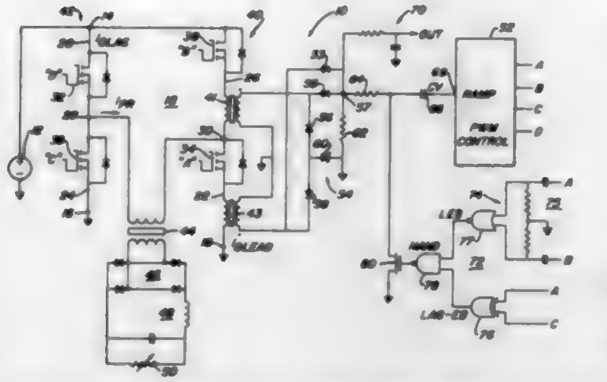
1. A voltage and power regulator comprising:

a full bridge switching network having a switching element in each of four arms, input terminals for connection to an unregulated power supply and output terminals;

current mode controller means responsive to a feedback control wave for supplying phase staggered control signals to the switching elements wherein the arms in a leading leg of the full bridge switching network conduct substantially unidirectional current having a duty cycle component and a freewheeling component;

a power output transformer having a primary winding connected to the output terminals of the full bridge network;

current sensing means in each arm of the leading leg connected in series with the switching element in the arm for generating a sensed signal on a sensed signal output terminal;



logic means connected to the current mode controller means for generating logic pulses having duration equal to the duration of the freewheeling components of the unidirectional current in the leading leg; and

means for producing the feedback control wave by summing the sensed signals and, responsive to the logic pulses, blanking portions of the sensed signals corresponding to the freewheeling components of current conducted in the leading leg.

5,315,499

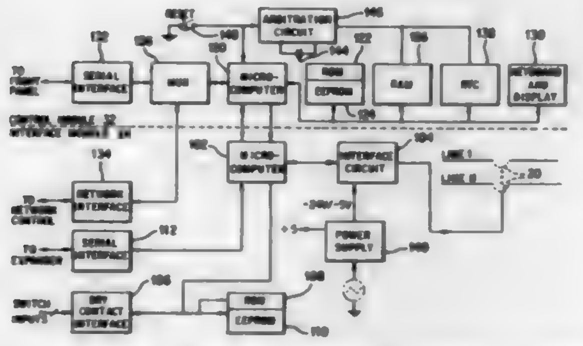
COMPUTER-CONTROLLED CIRCUIT BREAKER ENERGY MANAGEMENT ARRANGEMENT HAVING RELIABLE MEMORY AND CLOCK

Ron J. Bilas; Drew A. Reid, both of Cedar Rapids, and Martin J. Wittrock, Belle Plaine, all of Iowa, assignors to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 723,370, Jun. 28, 1991, Pat. No. 5,231,565. This application Jun. 19, 1992, Ser. No. 901,058

Int. Cl.^{5} G06F *15/56*; G05B *9/02*

U.S. Cl. 364—140 **19 Claims**



1. An energy management load panel arrangement, comprising:

a load panel enclosure;

a plurality of circuit breakers secured in the enclosure, each of said circuit breakers capable of opening and closing in response to a control signal so as to interrupt an associated current path;

at least one microcomputer for generating said control signals to control said circuit breakers and their associated current paths;

a real-time-clock circuit, coupled with said at least one microcomputer, for automatically providing the time of day;

a volatile memory circuit for storing time-event data which is used to indicate when at least one of said control signals should be generated; and

an electronic multi-layered capacitor coupled to said volatile memory for providing operating power thereto for a significant period of time during a power outage;

wherein the time-event data is retained during the power outage so that the circuit breakers are timely controlled, after the power outage, in response to said control signals, and the microcomputer automatically reads the time of day in the real time clock and, based thereon, corrects the time-event data in the volatile memory.

5,315,500

DIAGNOSTIC SYSTEM AND METHOD FOR DETECTING RETARDATION OF AN OBJECT CONTROLLED BY A PROGRAMMABLE CONTROLLER

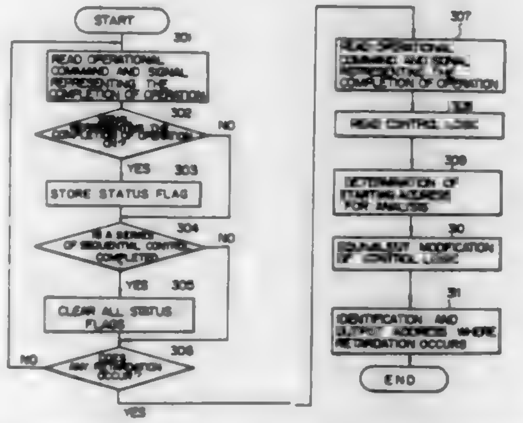
Izumi Uchishiba; Kathuhito Kawai, and Shinji Kogure, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 30, 1992, Ser. No. 828,177

Claims priority, application Japan, Mar. 14, 1991, 3-49374

Int. Cl.^{5} G05B *11/01*

U.S. Cl. 364—183 **10 Claims**


START
301
READ OPERATIONAL COMMAND AND SIGNAL REPRESENTING THE COMPLETION OF OPERATION
302
NO
YES
303
STORE STATUS FLAG
304
IS A SERIES OF SEQUENTIAL CONTROL COMPLETED
NO
YES
305
CLEAR ALL STATUS FLAGS
306
DOES ANY RETARDATION OCCUR?
NO
YES
307
READ CONTROL LOGIC
DETERMINATION OF STARTING ADDRESS FOR ANALYSIS
EQUIVALENT MODIFICATION OF CONTROL LOGIC
IDENTIFICATION AND OUTPUT ADDRESS WHERE RETARDATION OCCURS
END

1. A method of diagnosing a programmable controller with a diagnostic system having a telecommunication line for connecting to said programmable controller, input means for commanding operations, output means for outputting diagnostic results, and memory means for storing information sent from said programmable controller through said telecommunication line, comprising the steps of:

storing one set of output addresses assigned to output ports of said programmable controller from which one series of operational commands for sequentially controlling at least one controlled object is applied to said at least one controlled object, one set of input addresses assigned to input ports of said programmable controller to which one set of feedback signals corresponding to said one series of operational commands is fed back from said at least one controlled object, and status flags each of which is set, respectively, when each signal of said one set of feedback signals is received by said programmable controller;

determining whether or not retardations occur in said at least one controlled object by checking whether or not all of said status flags are set;

transferring said status flags and control logic programmed in said programmable controller from said programmable controller when it is determined that retardation occurs at said determining step; and

identifying an address where a status flag is not set as an address where retardation occurs.

5,315,501

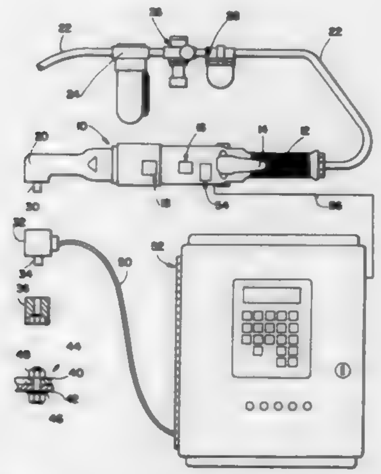
POWER TOOL COMPENSATOR FOR TORQUE OVERSHOOT

Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britain, Conn.

Filed Apr. 3, 1992, Ser. No. 863,054

Int. Cl.^{5} G05B *13/02*

U.S. Cl. 364—152 **23 Claims**



18. A method for compensating for torque overshoot in a rotary power tool wherein the tool is to be shut off at a target torque and is actually shut off at a torque set point equal to or less than the target torque depending upon the amount of torque overshoot, said method comprising the steps of:

(a) operating the tool to perform a fastening job;

(b) determining a relationship between torque rate in the fastening job to overshoot in the tool while the tool is performing the job;

(c) monitoring the torque rate in the job while the tool is setting the job;

(d) measuring deceleration time and torque overshoot during the job, said deceleration time being measured between selected fractional values of the target torque;

(e) adjusting the torque set point while the tool is setting the job to compensate for overshoot related to the torque rate according to said relationship between torque rate and overshoot;

(f) said relationship between torque rate in the fastening job to overshoot in the tool following the mathematical expression $Y=K/X$ where Y is overshoot, X is deceleration time required to tighten the fastener and K is a constant which is determined by using the measured deceleration time and torque overshoot during a previous fastening job in said expression; and

(g) during a subsequent fastening job, measuring deceleration time between the same selected fractional values of target torque of a previous high torque-rate job, calculating overshoot from the foregoing mathematical expression using the previously determined value of K, and adjusting the torque set point to compensate for the calculated value of overshoot.

5,315,502

PLANT OPERATION SUPPORT APPARATUS AND METHOD USING EXPERT SYSTEMS

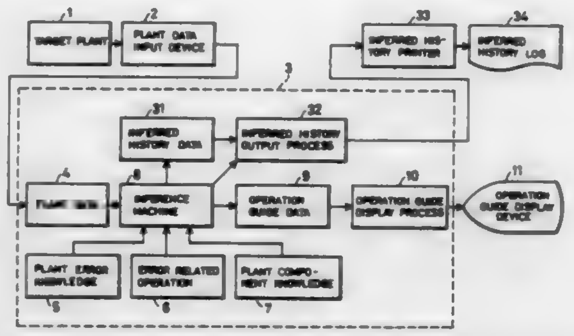
Kenji Koyama, and Shoichi Uchihara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1990, Ser. No. 534,089

Claims priority, application Japan, Jun. 9, 1989, 1-148086; Jun. 15, 1989, 1-154903; Jun. 21, 1989, 1-158778; Jul. 14, 1989, 1-183229; Jul. 14, 1989, 1-183230; Apr. 27, 1990, 2-113551

Int. Cl.^{5} G06F *15/46*

U.S. Cl. 364—184 **3 Claims**



1. A plant operation support apparatus for monitoring input process data from a plant to detect errors in the plant, and for providing a countermeasure process guide relating to the cause of error for the use of a plant operator or maintenance personnel, said apparatus comprising:

error detecting means for detecting error in the plant based upon process data from the plant;

error cause inference means for determining the cause of the error;

countermeasure determining means for outputting a countermeasure against the cause of the error determined by said error cause inference determining means;

emergency operation determining means for outputting an emergency operation against said cause of error; and

emergency priority determining means for judging the priority level of the detected error, and for signaling said emergency operation determining means when the detected error is of a selected high priority level;

wherein said error detecting means includes a first knowledge base storing knowledge concerning the normal range of each process data and the priority level of each error event, and error detecting means for detecting errors in the plant by comparing process data which is inputted from the plant with stored data on normal ranges of values stored in said first knowledge base, means for determining priority level by using knowledge stored in said first knowledge base and outputting said priority level and an error event name;

said error cause inference means including a second knowledge base storing knowledge on the characteristics of components of the plant in its normal condition and each cause and effect inter-relating each error and the cause of the error, and error cause inference means for inferring the cause of error by using knowledge stored in said second knowledge base;

said countermeasure determining means including a third knowledge base storing knowledge on each relationship between each cause of error and countermeasures against such error, and an emergency operation finding means for obtaining countermeasures for addressing the determined error by using knowledge stored in said third knowledge base; and

said emergency operation finding means including a fourth knowledge base storing knowledge as to each relationship between each cause of error and the emergency operation pertaining thereto, and an emergency operation finding means for obtaining an emergency operation for addressing the determined error by using the knowledge stored in said fourth knowledge base.

5,315,503

NUMERICAL CONTROL APPARATUS HAVING A TEACHING FUNCTION AND A METHOD OF TEACHING A MACHINING PROGRAM THEREBY

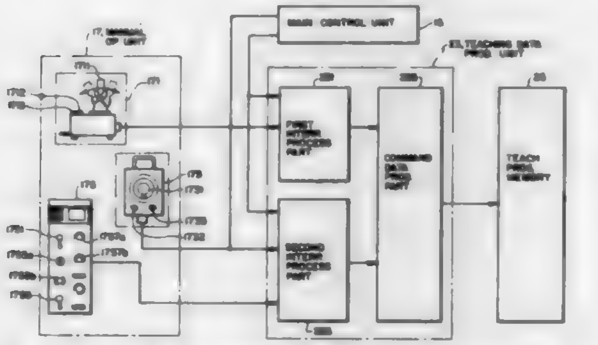
Kenji Kato, and Takeshi Momochi, both of Shizuoka, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 510,238, Apr. 18, 1990, abandoned. This application Sep. 25, 1992, Ser. No. 951,316

Claims priority, application Japan, Apr. 18, 1989, 1-98177

Int. Cl.^{5} G05B *19/42;* G06F *15/46*

U.S. Cl. 364—192 **17 Claims**



MAIN CONTROL UNIT
17, MANUAL OP UNIT
21, TEACHING DATA PROD. UNIT
FIRST INTERN. PROCESS PART
COMMAND DATA PROD. PART
TEACH PROG. MEMORY
SECOND INTERN. PROCESS PART

11. A method for generating a machining program for a numerical control apparatus and operating the numerical control apparatus, the numerical control apparatus having a plurality of operating modes to control a machine tool, the method comprising the steps of:

selecting in a teaching mode between at least a first sub-teaching mode and a manual teaching mode;

inputting a machining program in the first sub-teaching mode, the machining program providing instructions as to positioning of the machine tool within the reference space and a machining operation of the machine tool;

manually controlling, via manual controls, the position and machining operation of the machine tool in the manual teaching mode;

controlling the machine tool according to the selected one of the input machining program in the first sub-teaching mode and the manual control of the machine tool in the manual teaching mode;

generating a teaching machining program from the manual control of the position and machining operation of the machine tool in the manual teaching mode;

combining the input machining program and the teaching machining program to form a resulting machining program in the teaching mode; and

storing the resulting machining program.

5,315,504

ELECTRONIC DOCUMENT APPROVAL SYSTEM

Philippe Lemble, Saint-Laurent du Var, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1990, Ser. No. 494,261

Claims priority, application European Pat. Off., Mar. 14, 1989, 89480045.7

Int. Cl.^{5} G06F *15/16, 15/46*

U.S. Cl. 364—400 **12 Claims**

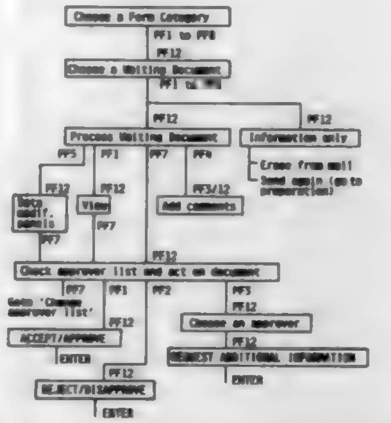
1. An approval system for controlling the processing of a user originated document requiring signature by electronic approval by system selected users, in an electronic mailing system including terminals attached to a digital network, virtual machines (VM) including computer means, memory and software facilities assigned to individual users, each user being assigned at least one job or function within the population of system attached users, and means for generating processing and monitoring electronic documents to be mailed from any terminal to any user, said approval system comprising:

means for storing and updating function tables wherein each system user's function and address are identified;

means for storing document forms;

means for storing predefined approval rules, said predefined approval rules being based upon user function and the meaning of fields within said document forms;

terminal controllable means for selecting, accessing and filling-in a selected document form, thereby creating a filled-in form, said filled-in form requiring approval;



means for mailing and processing said filled-in form;

means sensitive to said mailing for accessing said function tables and said predefined approval rules and thereby generating an approval table

means for determining an approval path based upon said approval table; and

means sensitive to said approval path determination for monitoring the mailing and processing of said filled-in form.

5,315,505

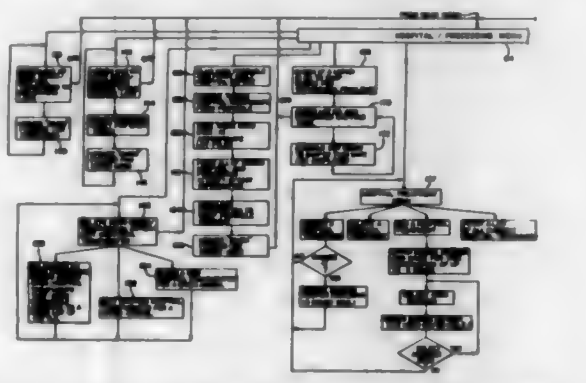
METHOD AND SYSTEM FOR PROVIDING ANIMAL HEALTH HISTORIES AND TRACKING INVENTORY OF DRUGS

William C. Pratt, Canyon, and William D. McKillip, Amarillo, both of Tex., assignors to Micro Chemical, Inc., Amarillo, Tex.

Continuation of Ser. No. 457,338, Dec. 27, 1989, abandoned, which is a continuation of Ser. No. 85,073, Aug. 12, 1987, abandoned. This application Jan. 29, 1992, Ser. No. 827,843

Int. Cl.^{5} G06F *15/42*

U.S. Cl. 364—413.01 **70 Claims**



38. A method of providing drug treatment to selected individual animals which are removed from a group of retained animals to a drug treatment location for specific treatments by an operator, the method comprising:

moving a selected individual animal to be treated to the drug treatment location;

entering into a computer the animal's identity;

in response to entry of the animal's identity, providing the animal's health and drug treatment history, if any, to assist the operator in making a diagnosis;

diagnosing the condition of the animal to be treated;

entering into the computer the diagnosed condition as an addition to the animal's health history, if any;

following entry of the diagnosed condition, providing a list at the drug treatment location of available drug treatments;

evaluating the animal's health and drug treatment history and the animal's diagnosed condition and, based on such information, the operator's judgment and the list of available drug treatments, selecting a drug treatment for the animal; and

in response to selection of a drug treatment requiring a withdrawal period, calculating in the computer system, for the selected drug treatment, when the animal may be released.

5,315,506

CORRECTION FOR COMPTON SCATTERING BY ANALYSIS OF SPATIALLY DEPENDENT ENERGY SPECTRA EMPLOYING REGULARIZATION

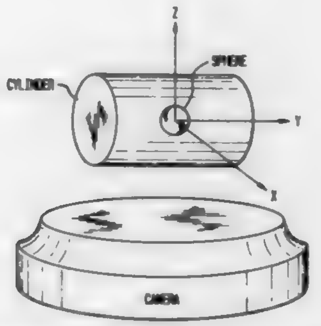
Xiaohan Wang; Kenneth F. Koral; Neal H. Clinthorne; W. Leslie Rogers, and Jeffrey M. Slosar, all of Ann Arbor, Mich., assignors to University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 53,242, May 22, 1987, Pat. No. 4,839,808, and a continuation-in-part of Ser. No. 331,993, Mar. 31, 1989, Pat. No. 5,081,581. This application Dec. 20, 1991, Ser. No. 812,589

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.^{5} G06F *15/42*

U.S. Cl. 364—413.19 **15 Claims**



1. A method of producing an image having reduced effects of Compton scattered photons detected in a gamma ray detection arrangement, the method comprising the steps of:

receiving data responsive to energy states of the detected photons and storing said data in memory locations corresponding to predetermined image grid points;

calibrating the gamma ray detection arrangement of by utilizing a spectral shape corresponding to a calibration function which is expected to correspond to a first data set corresponding to unscattered ones of the detected photons and by utilizing spectral shapes for mono-energetic gamma rays the energies of which are higher than the energy of the gamma ray of primary interest and by utilizing spectral shapes for mono-energetic gamma rays whose energies are lower than the energy of the gamma ray of primary interest;

processing said stored data for at least selected ones of said predetermined grid points using as a model of the unscattered spectrum a set of parameters, one for each energy channel, and employing minimization of a function which includes a product of an energy regulation term times an energy regularization parameter, for separating said stored data into said first data set corresponding to unscattered ones of the detected photons and a second data set corresponding to scattered ones of the detected photons;

summing said first data set for each of said selected ones of said predetermined grid points for determining a number of said unscattered ones of said detected photons; and

forming the image utilizing said number of said unscattered ones of said detected photons.

5,315,507

ENERGY SUBTRACTION PROCESSING METHOD AND APPARATUS, SUPERPOSITION PROCESSING METHOD AND APPARATUS, AND RADIATION IMAGE READ-OUT APPARATUS

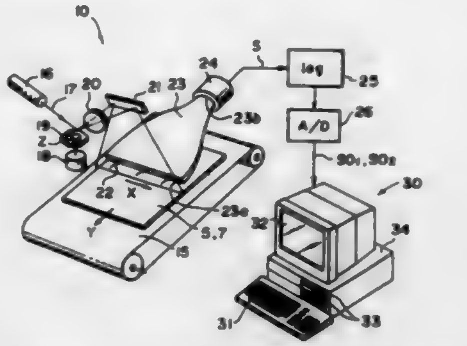
Nobuyoshi Nakajima, and Toshitaka Agano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1990, Ser. No. 586,350

Claims priority, application Japan, Sep. 22, 1989, 1-246944; Sep. 22, 1989, 1-246945; Oct. 3, 1989, 1-258539; Oct. 18, 1989, 1-270736

Int. Cl.^{5} G06F *15/68*

U.S. Cl. 364—413.23 **40 Claims**



1. An energy subtraction processing method for radiation images, which comprises the steps of:

i) irradiating radiation, which has been produced by a radiation source and which comprises radiation components having energy levels covering a predetermined energy range, to an object,

ii) irradiating the radiation, which has passed through said object, to a recording medium capable of recording a plurality of radiation images during its exposure to radiation with different energy distributions, whereby a plurality of radiation images of said object are recorded on said recording medium,

iii) from said recording medium on which the plurality of said radiation images have been recorded, obtaining a plurality of image signals representing the plurality of said radiation images of said object,

(iv) carrying out a modulated transfer function (MTF) correcting process on the plurality of said image signals representing the plurality of said radiation images of said object, thereby substantially eliminating differences between MTF's of said radiation images of said object represented by the plurality of said image signals, and

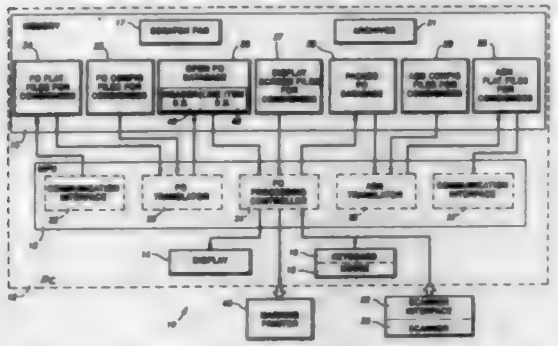
v) carrying out subtracting operations on image signals, which are obtained from said MTF correcting process.

5,315,508

LABEL GENERATING AND DATA TRACKING SYSTEM FOR PROCESSING PURCHASE ORDERS

James M. Bain, Beavercreek; David J. Best, Miamisburg; James G. Markham, Spring Valley; Mark S. Morrow; Debra A. Stellwag, both of Dayton, and Raymond D. Tavener, Kettering, all of Ohio, assignors to Monarch Marking System, Dayton, Ohio

Filed Sep. 3, 1992, Ser. No. 940,383
Int. Cl.⁵ G06F *15/22*
U.S. Cl. 364—401 **27 Claims**



1. A container packing verification and labeling system for use on a computer having a processor, a memory, at least one input device operable by a user to enter data and commands to said computer, a display and a communication interface for electronically receiving data for a plurality of purchase orders from a plurality of consignees to store data for each purchase order in a data file associated with the consignee issuing the purchase order, said computer being coupled to a printer for printing on a web of record members, each record member being affixable to a container, said container packing and verification system comprising:

a plurality of consignee specific configuration files accessible by said processor, said configuration files including information indicating how purchase order data stored in a data file for said specific consignee is to be interpreted;

a nonconsignee specific purchase order translator for controlling, in accordance with a consignee specific configuration file, said processor to store purchase order data from a data file in a predetermined manner in a purchase order database to allow said purchase order database to be accessed by said processor when operating in accordance with a nonconsignee specific purchase order processing controller;

a plurality of consignee specific display screen files accessible by said processor and associated with a plurality of consignees each requiring a different set of input data from a user to process a purchase order issued thereby, each display screen file being associated with a consignee and including data representing information to be depicted on said display to prompt a user to enter only that data required by said associated consignee to process a purchase order issued thereby and said display screen files including data associating particular user entered commands with a consignee specific purchase order processing operation; and

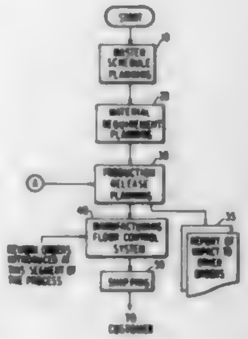
a nonconsignee specific purchase order processing controller for controlling said processor to couple to the display prompt information for a specific consignee from an associated display screen file in response to user entered data including data representing the selection of said consignee, said controller controlling said processor in accordance with said display screen file to collect in said memory data entered by a user in association with a purchase order and to compare selected user entered data to said associated purchase order data from said database to validate said use entered data; and said controller controlling said processor to couple selected user entered data from said purchase order database to said printer for printing said information on a record member.

5,315,509

ARTIFICIAL INTELLIGENCE SYSTEM FOR ITEM ANALYSIS FOR REWORK SHOP ORDERS

Bharath Natarajan, Marietta, Ga., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 822,248, Jan. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 425,612, Oct. 23, 1989, abandoned. This application Jul. 30, 1993, Ser. No. 100,067
Int. Cl.⁵ G06F *15/22, 15/24;* **G06G** *7/52*
U.S. Cl. 364—401 **13 Claims**


START
MASTER SCHEDULE PLANNING
MATERIAL REQUIREMENT PLANNING
PRODUCTION RELEASE PLANNING
A
MANUFACTURING FLOOR CONTROL SYSTEM
REPORT OF IMPACT TO OTHER ORDERS
35
TO CUSTOMER

6. A method for item analysis, said method providing for the automatic identification of a replacement item for a defective item identified in a re-work order created by a re-work order scheduling process, said method comprising the computer implement steps of:

monitoring a re-work order scheduling process for re-work orders generated by said re-work order scheduling process;

identifying a replacement item for said defective item in response to an occurrence of a re-work order by

designating an item as replacement item if said item identical to said defective item is available,

determining if a new item has superseded said item utilizing an engineering change in response to an unavailability of said item,

determining if said new item is available if said new item has superseded said item,

designating said new item as said replacement item if said new item is available,

selecting an alternate item having the same function as the defective item in response to an unavailability of said new item, and

designating said alternate item as said replacement item if said alternate item is available; and

allocating said replacement item for delivery and establishing a delivery schedule for said replacement item in response to an identification of said replacement item, wherein uniform identification of replacement items may be provided.

5,315,510

ELECTRONIC CASH REGISTER INDICATING WHEN CASH IS REQUIRED TO BE COLLECTED FROM THE CASH DRAWER

Yoshiharu Kimura, and Akihiro Kikuchi, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

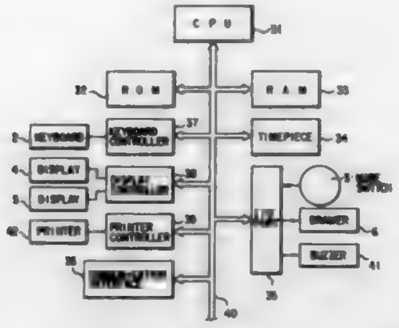
Filed Apr. 29, 1992, Ser. No. 875,347
Claims priority, application Japan, May 13, 1991, 3-107284
Int. Cl.⁵ G06F *15/21*
U.S. Cl. 364—405 **16 Claims**

1. An electronic cash register comprising:

a drawer for storing cash therein;

generating means for generating total amount data indicating a total amount of cash stored in said drawer;

storing means for storing different upper limits of a total cash amount to be received in said drawer for respective periods of time, said periods of time comprising at least one daytime time period and at least one nighttime time period, said upper limit for said at least one daytime time period differing from said upper limit for said at least one nighttime time period;



reading means for reading out from said storing means, an upper limit of the total cash amount for the current time which is included in a given time period, from the stored upper limits for the respective periods of time;

comparing means for comparing the upper limit of the total cash amount read out by said reading means with the total amount data generated by said generating means; and

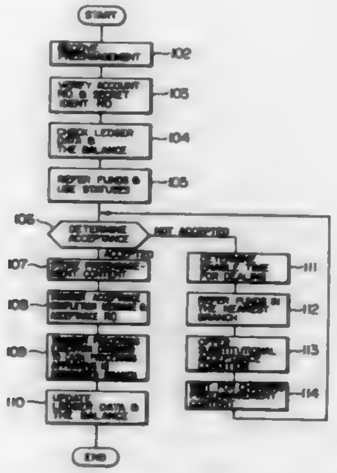
warning means for automatically producing a warning to request a collection of cash when said comparing means detects that the total amount data is not less than the read out upper limit of the total cash amount.

5,315,511

METHOD OF DETERMINING THE ACCEPTABILITY OF A REQUEST TO PREENGAGE RECEIPT AND/OR PAYMENT OF MONEY IN AN ATM SYSTEM USING THE SAME

Kunihisa Matsuura, Aichi, and Yoshio Horiba, Owariasahi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,841
Claims priority, application Japan, Apr. 21, 1989, 1-102782
Int. Cl.⁵ G06F *15/30*
U.S. Cl. 364—408 **22 Claims**


START
102
VERIFY ACCOUNT NO & SECRET IDENT NO
103
CHECK LEDGER DATA & THE BALANCE
104
REFER FUNDS & USE STATUSES
105
106
DETERMINE ACCEPTANCE
NOT ACCEPTED
ACCEPTED
107
108
109
110
UPDATE LEDGER DATA & THE BALANCE
111
REFER FUNDS IN THE NEAREST BRANCH
112
113
114
END

1. A method of preengaging a receipt and/or payment of money, carried out in a system for carrying out a receipt and/or payment of money installed in monetary facilities, the method comprising the steps of:

inputting dealing data from a user as preengagement data, to request carrying out a dealing for the receipt and/or payment of money at a cash processing apparatus at a branch of the system requested by the user;

determining acceptability of said input preengagement data with reference to use data regarding present and/or predicted funds in the cash processing apparatus installed at the requested branch;

transmitting said preengagement data to said requested branch to input said preengagement data thereto as a processing execution command when said preengagement data is determined to be acceptable to thereby permit the receipt and/or payment of money at the requested branch;

determining acceptability of substitutional preengagement data different from said preengagement data when said preengagement data is determined not to be acceptable for receipt and/or payment of money at the requested branch; and

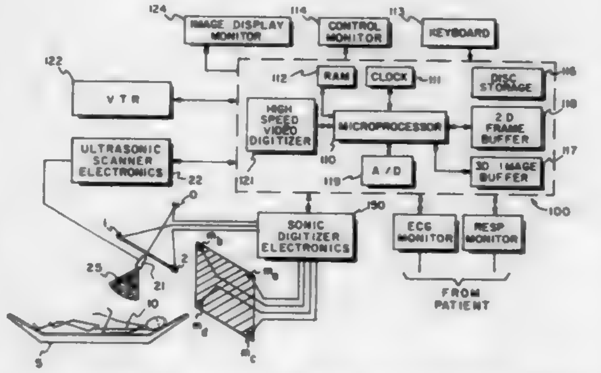
announcing said substitutional preengagement data to the user when said substitutional preengagement data is determined to be acceptable.

5,315,512

APPARATUS AND METHOD FOR GENERATING IMAGE REPRESENTATIONS OF A BODY UTILIZING AN ULTRASONIC IMAGING SUBSYSTEM AND A THREE-DIMENSIONAL DIGITIZER SUBSYSTEM

James A. Roth, Dobbs Ferry, N.Y., assignor to Montefiore Medical Center, Bronx, N.Y.

Filed Sep. 1, 1989, Ser. No. 402,904
Int. Cl.⁵ G06F *15/42*
U.S. Cl. 364—413.25 **16 Claims**



1. Apparatus for producing a three-dimensional image representation of a body, comprising:

an ultrasonic imaging subsystem for producing signals representative of two-dimensional images of sections of the body, said subsystem including a scanning transducer that is moveable in three dimensions, without constraint of position or orientation within a three-dimensional space, to select the section of the body to be imaged;

means for storing said image representative signals as arrays of digital pixel values, said digital pixel values representing one of a multiplicity of gray scale values;

means, including a three-dimensional digitizer subsystem, for deriving information representative of the three-dimensional position and orientation of the transducer during the scanning of an associated section of the body;

means for storing said information;

means for projecting the arrays of digital pixel values into a three dimensional voxel space, the voxel locations which correspond to projected pixel locations of a given pixel array being determined as a function of the stored position and orientation information associated with the section of the body from which the given pixel array was obtained, said projection means including means for determining if an existing non-zero gray scale value is already present at a given voxel location to which a current pixel value with said existing voxel value and storing the resulting average value as a new voxel value at said given voxel location; and

voxel space storage means for storing the voxel values projected into the voxel space.

5,315,513

SYSTEM FOR MODELLING MODERATE RESOLUTION ATMOSPHERIC PROPAGATION

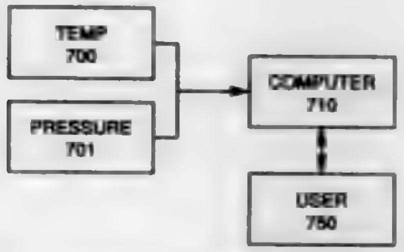
Leonard W. Abreu, Chelmsford; Francis X. Kneizys, Burlington; Gail P. Anderson, Concord; James H. Chetwynd, Stoneham; Lex Berk, Medford; Larry Bernstein, Lexington, and David Robertson, Bedford, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 29, 1991, Ser. No. 784,487

The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.

Int. Cl.^{5} G01V *1/00;* **G01W** *1/10;* **G06F** *15/54;* **G06G** *7/48*

U.S. Cl. 364—420 **6 Claims**



1. A moderate resolution atmospheric propagation model comprising:

a host system which transmits signals through an atmosphere along selected slant angles and receives a first data stream in return, said host system outputting said first data stream along with a second data stream, said second data stream defining said slant angles; and

a first means for calculating atmospheric transmittance and atmospheric background radiance which is electrically connected to said host system, said first calculating means receiving said first and second data streams from said host system and determining therefrom an estimate of atmospheric transmittance and atmospheric background radiance for said slant angles with a 2 cm^{-1} spectral resolution that can range between 0 and 50,000 cm^{-1} in steps of 1 cm^{-1}.

5,315,514

UNEXPECTED N LOGIC FOR VEHICULAR SEMI-AUTOMATED MECHANICAL TRANSMISSIONS

Jon A. Steeby, Schoolcraft; Stephen A. Edelen, Battle Creek, and Alan R. Davis, Plainwell, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 568,790, Aug. 17, 1990, Pat. No. 5,089,962. This application Sep. 16, 1991, Ser. No. 760,671

Int. Cl.^{5} B60K *41/08*

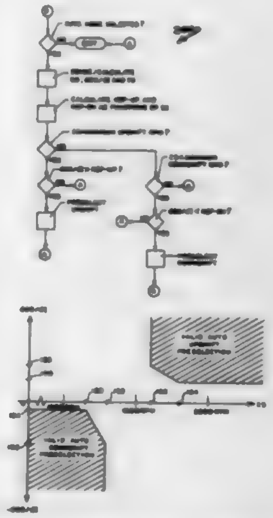
U.S. Cl. 364—424.1 **16 Claims**

1. A control method (**200**) for controlling a vehicle semi-automatic mechanical change gear transmission system comprising a fuel throttle controlled engine (E) having known characteristics, a multi-speed change gear mechanical transmission (**10**), a manually controlled master friction clutch (C) drivingly interposed between the engine and the transmission, a first sensor (**98**) for providing a first input signal indicative of transmission input shaft (**16**) rotational speed, a second sensor (**100**) for providing a second input signal (OS) indicative of the rotational speed of the transmission output shaft (**90**) under at least certain transmission operating conditions, a nonmanually controllable transmission actuator (**112, 70, 96**) for controlling shifting of the transmission, a mode selector (**108**) for manual selection of at least an automatic preselection mode of operation and for providing a mode input signal indicative of said selected mode, and a central processing unit (**106**) for receiving said input signals and for processing same in accordance with predetermined logic rules to issue command output signals, said central processing unit including means responsive to said automatic preselection of a transmission shift from a currently engaged ratio for automatically issuing command output signals to said actuator to cause the transmission to be shifted into neutral;

said method including:

predetermining as a function of said known characteristics of said engine a minimum upshift input shaft speed value (**150**), a rated maximum input shaft speed value (**154**), a maximum downshift input shaft speed value (**152**) and a rated minimum input shaft speed value (**160**);

if said central processing unit is operating in said automatic preselection mode of operation, sensing the rotational speed of said input shaft (IS) and of said output shaft (OS) and the rotational acceleration (dOS/dt) of said output shaft;



calculating a first reference value (REF-UP) and a second reference value (REF-DN), said first reference value (REF-UP) decreasing in a range of input shaft speeds from said minimum upshift input shaft speed value (**150**) to said rated maximum input shaft speed value (**154**) and said second reference value (REF-DN) increasing in a range of input shaft speeds from said maximum downshift input shaft speed value (**152**) to said rated minimum input shaft speed value (**160**); and

preselecting upshifts only if sensed input shift speed exceeds said minimum upshift input shift speed value (**150**) and the rotational acceleration of said output shaft (dOS/dt) exceeds said first reference value (REF-UP) and preselecting downshifts only if sensed input shaft speed is less than said maximum downshift input shaft speed value (**152**) and the rotational acceleration of said output shaft (dOS/dt) is less than said second reference value (REF-DN).

5,315,515

REMOTE VEHICLE CONTROLLER

John J. Schmitz, Macomb County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

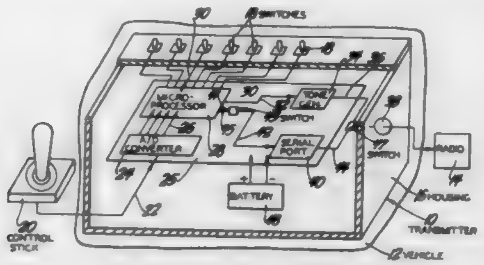
Filed Jun. 22, 1992, Ser. No. 902,264

Int. Cl.^{5} H04Q *7/02;* **G05D** *3/10*

U.S. Cl. 364—424.01 **1 Claim**

1. An apparatus for remotely controlling the movement of a first remote military vehicle, having a military radio, from a second command vehicle having a military radio compatible

with the transmission characteristics of the military radio on the remote vehicle, comprising a transmitter connected to the military radio of the control vehicle, the transmitter including a housing, a plurality of switches mounted on the housing there being one switch for each switched function to be controlled in the remote vehicle, at least one control means mounted on the transmitter housing, the control means being adapted to mimic the control of the remote vehicle, an analog-digital converter connected to the control means, a programmable microprocessor electrically connected to the switches and the analog-digital converter the microprocessor receiving the inputs from the switches and the analog-digital converter and processing the inputs to a corresponding series of digitized instructions describing the actions to be performed by the remote vehicle and sending the corresponding instructions to a two position switch having a first analog position and a second digital position, the two position switch routing the digitized instructions to a tone generator when placed in the analog position and routing the digitized instructions to a digital bus when in the digital position, the resulting instructions from the tone generator or digital bus are sent to the control vehicle military radio, a source of electrical power to provide power to the transmitter circuitry; and a receiver connected to the military radio of the remote vehicle, the receiver being adapted to receive the transmissions from the control vehicle via the radio linkage with the instructions, the receiver having a housing, a source of electrical power to provide power to the receiver circuitry, a reception converter which receives the radio format transmission from the control vehicle military radio and processes the transmitted signal into a digital format, the reception converter being electrically connected to a programmable actuator microprocessor to receive the processed digitized instructions and convert the digitized instructions into the proper format for use by the remote vehicle, a digital-analog converter which receives the digitized instructions related to the corresponding controller functions generated by the actuator programmable microprocessor and converts them into analog signals corresponding to the desired control signatures which are them fed to the actuator cards of the remote vehicle to effect the desired maneuvers and an output which sends the desired digital signals to the relays of the remote vehicle to activate the desired switches.



5,315,516

PROCESS AND SYSTEM FOR GENERATING A SIGNAL REPRESENTATIVE OF THE TRANSVERSE MOVEMENT OF A VEHICLE

Bernhard Miller, Stuttgart; Stefan Gorny, Schwieberdingen; Rainer Kallenbach, Waiblingen-Neustadt, and Andreas Klug, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart-Feuerbach, Fed. Rep. of Germany

Filed Oct. 29, 1992, Ser. No. 968,294

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1991, 4140239

Int. Cl.^{5} B60T *8/32*

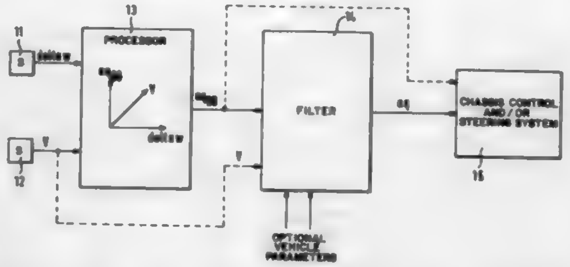
U.S. Cl. 364—424.01 **8 Claims**

1. A method of generating a signal representative of transverse movement of a vehicle, comprising the steps of:

determining respective speeds of rotating of a plurality of wheels, at least two of said wheels associated with an axle of the vehicle;

generating a first signal representing a difference between said speeds of rotation of said at least two wheels;

generating a second signal representing a speed of the vehicle;


11
12
13
PROCESSOR
FILTER
14
15
CHASSIS CONTROL AND/OR STEERING SYSTEM
OPTIONAL VEHICLE PARAMETERS

generating a third signal representing a static transverse acceleration of the vehicle, utilizing mapped data, dependent on said first and second signals; and

processing said third signal in a second order filter having an output comprising a fourth signal representing a dynamic transverse acceleration of the vehicle, said fourth signal corresponding to said signal representative of said transverse movement.

5,315,517

MACHINE WITH AN ACTIVE SENSOR

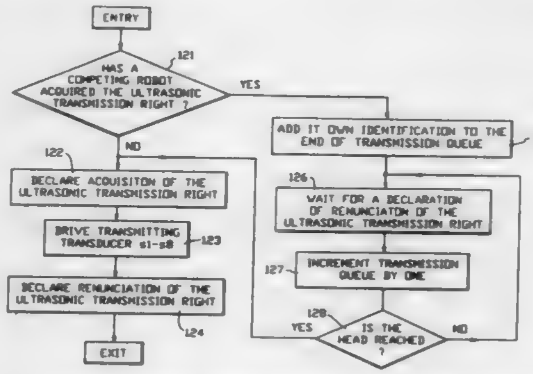
Kei Kawase, Komae; Shigeki Ishikawa, Tokyo, and Shunichi Asaka, Chofu, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1992, Ser. No. 968,096

Claims priority, application Japan, Nov. 26, 1991, 3-335556

Int. Cl.^{5} H02J *7/00;* **G06F** *15/50*

U.S. Cl. 364—424.02 **10 Claims**


ENTRY
121
HAS A COMPETING ROBOT ACQUIRED THE ULTRASONIC TRANSMISSION RIGHT ?
YES
NO
122
DECLARE ACQUISITION OF THE ULTRASONIC TRANSMISSION RIGHT
DRIVE TRANSMITTING TRANSDUCER s1-s8
123
DECLARE RENUNCIATION OF THE ULTRASONIC TRANSMISSION RIGHT
124
EXIT
ADD IT OWN IDENTIFICATION TO THE END OF TRANSMISSION QUEUE
125
126
WAIT FOR A DECLARATION OF RENUNCIATION OF THE ULTRASONIC TRANSMISSION RIGHT
127
INCREMENT TRANSMISSION QUEUE BY ONE
128
YES
IS THE HEAD REACHED ?
NO

1. A mobile machine with an active sensor that transmits energy waves and receives reflections from objects, comprising:

(a) means for generating data on its own position,

(b) means for transmitting and receiving positional data to and from other mobile machines,

(c) means for determining whether there is a possibility of interference between its own active sensor and the active sensor of another mobile machine by using said positional data,

(d) means for switching its own mode of energy wave transmission in accordance with the result of said determination,

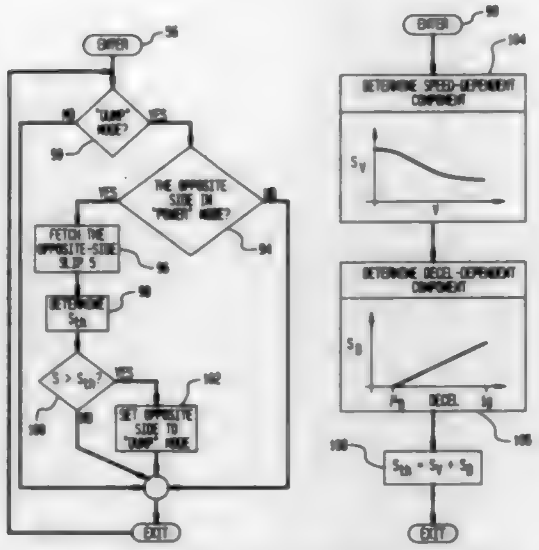
said mobile machine determining whether it is allowed to transmit energy waves by referring to the status of energy wave transmissions from other mobile machines, if it is determined that there is a possibility of interference between its own active sensor and the active sensor of another machine.

5,315,518

METHOD AND APPARATUS FOR INITIALIZING ANTILOCK BRAKE CONTROL ON SPLIT COEFFICIENT SURFACE

William C. Lin, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 10, 1991, Ser. No. 712,291
Int. Cl.^{5} B60T *8/58*
U.S. Cl. 364—426.02 **2 Claims**


ENTER
56
"DUMP" MODE?
NO
YES
58
THE OPPOSITE SIDE IN "POWER" MODE?
YES
NO
94
FETCH THE OPPOSITE-SIDE SLIP S
96
DETERMINE S_th
98
S > S_th?
YES
NO
100
SET OPPOSITE SIDE TO "DUMP" MODE
102
EXIT
ENTER
98
104
DETERMINE SPEED-DEPENDENT COMPONENT
S_V
V
DETERMINE DECEL-DEPENDENT COMPONENT
S_D
DECEL
106
108
S_th = S_V + S_D
EXIT

1. A method for controlling brake pressure applied to respective brakes of left and right wheels of an axle of a vehicle traveling over a road surface, the method comprising the steps of:

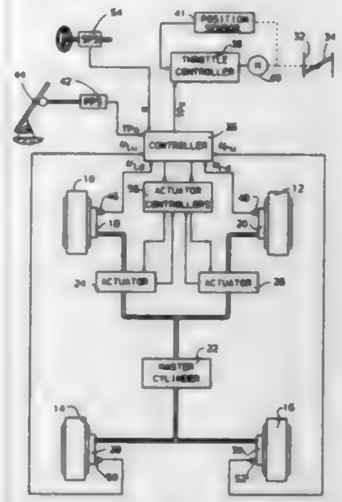
sensing vehicle speed;
sensing vehicle deceleration;
controlling the brake pressure applied to each of the left and right wheel brakes in accord with a power mode for full brake application;
calculating a value or slip between each of the left and right wheels and the road surface;
for each one of the left and right wheels, terminating the power mode and initiating a brake pressure dump mode for releasing brake pressure when the calculated value of slip of said one of the left and right wheels exceeds a respective slip threshold, sensing a wheel recovery condition in response to the release of brake pressure in the brake pressure dump mode, and initiating a brake regulation mode for increasing the brake pressure in response to the sensed wheel recovery condition;
sensing a split coefficient road surface condition by determining when the power mode has been terminated and the brake pressure dump mode initiated for one of the left and right wheels while the brake pressure is being applied in accord with the power mode to the brake of the other one of the left and right wheels;
computing a yaw slip threshold having a value that is a predetermined function of the sensed vehicle speed and vehicle deceleration, the yaw slip threshold having an inverse proportional relationship to vehicle speed and a direct proportional relationship to vehicle deceleration; and
when a split coefficient road surface condition is sensed, terminating the power mode and initiating the brake pressure dump mode for said other one of the left and right wheels when the calculated value of slip of said other one of the left and right wheels becomes greater than the computer yaw slip threshold.

5,315,519

METHOD OF SENSING EXCESSIVE SLIP IN A WHEEL SLIP CONTROL SYSTEM

Yuen-Kwok Chin, Troy, and Youssef A. Ghoneim, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1991, Ser. No. 770,269
Int. Cl.^{5} B60K *17/34;* **B60T** *8/04*
U.S. Cl. 364—426.02 **6 Claims**



1. A method of controlling slip between a wheel of a vehicle and a road surface, the method comprising the steps of:

sensing wheel speed;
sensing vehicle speed;
sensing vehicle turn radius;
determining a wheel speed index value that is a predetermined function of the difference between the sensed wheel speed and the sensed vehicle speed;
determining a wheel slip index value that is a predetermined function of the ratio of the sensed vehicle speed and the sensed wheel speed;
determining a speed enable threshold that is a predetermined function of the sensed vehicle turn radius;
determining a slip enable threshold that is a predetermined function of the sensed vehicle turn radius; and
controlling wheel slip (A) when the sensed vehicle speed is less than a vehicle speed threshold and the wheel speed index value is greater than the speed enable threshold and (B) when the sensed vehicle speed is greater than the vehicle speed threshold and the wheel slip index is greater than the slip enable threshold.

5,315,520

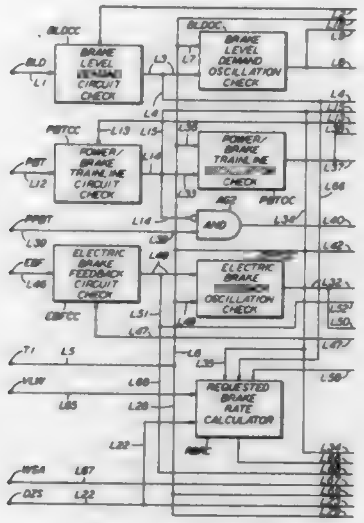
FRICTION BRAKE INTERFACE HEALTH CHECK SYSTEM FOR MULTIPLE-AXLE RAILWAY VEHICLES

John B. Drake, Cincinnati, Ohio; James A. Wood, Spartanburg, S.C.; Carl J. Slavick, Jr., Greenville, S.C., and Richard J. Mazur, Greer, S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 6, 1991, Ser. No. 756,021
Int. Cl.^{5} B60L *3/00*
U.S. Cl. 364—426.05 **18 Claims**

18. A system for dynamically diagnosing the existence of a signal fault condition in friction brake equipment comprising, a brake level demand circuit check module being connected to a brake level demand oscillation check circuit and to a brake level demand range determination circuit, said brake level demand range determination circuit being connected to a brake level demand timer circuit, said brake level demand oscillation check circuit, said brake level demand range determination circuit, and said brake level demand timer circuit being connected to a brake level interface health check circuit

which is connected to an interface health determination fault monitor circuit, a power/brake trainline circuit check module being connected to a power/brake trainline oscillation check circuit and to a power/brake trainline timer circuit, said power/brake trainline oscillation check circuit and said power/-brake trainline timer circuit being connected to a power/brake interface health check circuit which is connected to said interface health determination fault monitor circuit, an electric brake feedback circuit check module being connected to an electric brake feedback oscillation check circuit and to an electric brake feedback rate check circuit, said electric brake feedback oscillation check circuit and said electric brake feedback rate check circuit being connected to an electric brake interface health check circuit which is connected to said interface health determination fault monitor circuit, a requested brake rate calculator circuit being connected to an electric brake rate request comparator circuit which is connected to said interface health determination fault monitor circuit which monitors and dynamically diagnoses the specific failure characteristics of each of a plurality of friction brake interface input signals of the system.

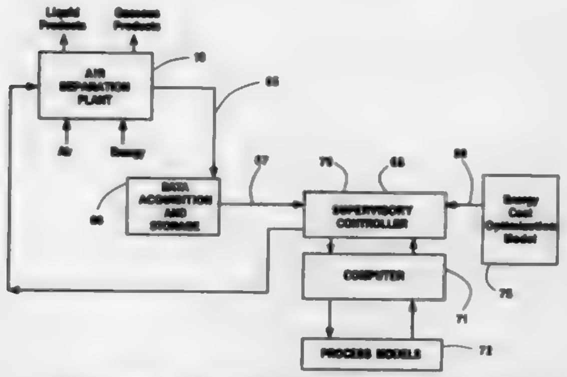

BLDCC
BLD
BRAKE LEVEL DEMAND CIRCUIT CHECK
BRAKE LEVEL DEMAND OSCILLATION CHECK
PBTCC
PBT
POWER/BRAKE TRAINLINE CIRCUIT CHECK
POWER/BRAKE TRAINLINE CHECK
AND
PBTOC
EBF
ELECTRIC BRAKE FEEDBACK CIRCUIT CHECK
ELECTRIC BRAKE OSCILLATION CHECK
EBFCC
T1
MUR
REQUESTED BRAKE RATE CALCULATOR
WSA
DZS
L22
L67

5,315,521

CHEMICAL PROCESS OPTIMIZATION METHOD

Thomas C. Hanson, Buffalo; Dante P. Bonaquist, Grand Island, and Michael D. Jordan, Williamsville, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jul. 29, 1992, Ser. No. 921,144
Int. Cl.^{5} G06F *15/46;* **G05B** *13/04*
U.S. Cl. 364—468 **6 Claims**



1. A method for producing at least two products from a production site to satisfy a given product demand for each of said products within a fixed time horizon in which the rate of product production required to satisfy such demand is correlated to energy consumption and varied in accordance with a predetermined schedule of production to minimize the cost of electrical energy consumed at said site, with the cost of such energy dependent upon a cost structure having multiple costs levels and wherein said predetermine schedule of production is formulated to correspond to a number of energy cost levels; comprising the steps of:

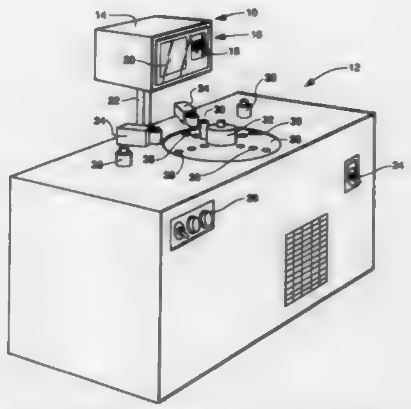
formulating a process model for said production site which characterizes the operating characteristics of the production site as a functional relationship between the rate of production of each of said products from said site, including any hiatus in the production of such products, and the amount of energy consumed in the manufacture of each of said products over said time horizon with said functional relationship defining a linear or convex relationship;
identifying the process constraints in the operating characteristics of the production site which determine the limitations and boundaries in the production of said products;
selecting operating points which satisfy the process model without violating said process constraints;
limiting the selection of said operating points to a matrix of discrete operating points which identify the feasible operating space of the process;
computing any feasible operating point within the operating space as a convex combination of fractions of the operating points in the matrix of discrete operating points with each fraction representing a numerical value from zero to one inclusive;
establishing an objective function which will minimize the cost of energy for the production of said products for all feasible operating points within the defined operating space;
formulating a linear programming model based upon said objective function the solution of which will determine the minimum rate of energy use required to produce said products for any given process output level within said fixed time horizon;
solving said linear programming model; and operating the said production site to produce the said products based on the solution of said linear programming model.

5,315,522

TABLE BENDER CONTROLLER

Kenneth A. Kauffman, R.D. #12, Pisgah Rd., York, Pa. 17406; Stephen C. Davis, Wrightsville, and Frederick W. Wise, Windsor, both of Pa., assignors to Kenneth A. Kauffman, York, Pa.

Filed Nov. 6, 1992, Ser. No. 972,942
Int. Cl.^{5} G06F *15/46;* **B21D** *7/12*
U.S. Cl. 364—474.07 **5 Claims**



1. A table bender controller operationally interfaced through a cable conduit means in electronically connected combination with a manually cycled table bending machine for bending a bar stool piece into a specified workpiece shape, said

controller further comprising in combination an enclosure cabinet adapted to support a computer and a screen in electronically integrated connection through a control console having a data input means, a first computer program within said computer adapted to receive an input of workpiece bend profile specification data and be accessed by means of said data input means, a second computer program means adapted to calibrate an integration of bend execution commands from said controller to bend execution functions of said machine and the machining characteristics of a sample of said bar stock piece to be bent, a third computer program means adapted to process said input of bend profile specification data and project a sequential digitally annotated bend profile graphical image for each of a successively separate bend sequence instruction projection upon said screen whereby a table bending machine operator is visually instructed sequentially at the workstation location through the bending of said workpiece shape in a graphically screen projected digitally annotated visual image step-by-step process, and a fourth computer program means adapted to download bend profile specification data entered as an alternate access from a remote interfaced bend profile specification data input terminal location.

5,315,523
NUMERICAL CONTROL APPARATUS HAVING A WORK SIMULATION FUNCTION

Naoki Fujita; Terayuki Matsumura, and Koichi Murata, all of Oshino, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

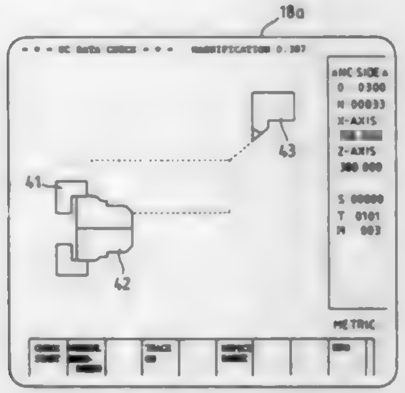
PCT No. PCT/JP91/01536, § 371 Date Jun. 30, 1992, § 102(e) Date Jun. 30, 1992, PCT Pub. No. WO92/08574, PCT Pub. Date May 29, 1992

PCT Filed Nov. 8, 1991, Ser. No. 866,184

Claims priority, application Japan, Nov. 8, 1990, 2-303102

Int. Cl.^{5} G06F *15/46*

U.S. Cl. 364—474.22 **5 Claims**



1. A numerical control apparatus having a work simulation function capable of displaying both a workpiece configuration change and a tool shift movement on the same display screen in accordance with an execution of a numerical control program, said numerical control apparatus comprising:

a scaling means for presetting a first display scale for displaying a workpiece configuration change;

an arithmetic means for calculating a second display scale for displaying both the workpiece configuration change and a corresponding tool shift movement at its present shifted position on the same display screen, based on the present shifted position of the tool according to an execution of a numerical control program; and

a magnification determining means for comparing the first display scale and the second display scale and for determining a display magnification, for displaying both the workpiece configuration change and the corresponding tool shift movement on the same display screen, based on a result of the comparison so that a work simulation can be executed.

5,315,524
INTERACTIVE TYPE AUTOMATIC PROGRAMMING METHOD INCLUDING AUTOMATIC RE-EXECUTION OF PROGRAM STATEMENTS

Masaki Seki, Tokyo; Takashi Takegahara, Hachioji, and Masatoshi Nakajima, Oshino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

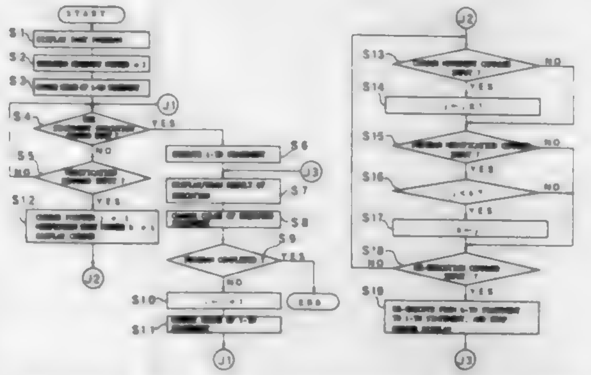
PCT No. PCT/JP91/00301, § 371 Date Nov. 8, 1991, § 102(e) Date Nov. 8, 1991, PCT Pub. No. WO91/14215, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 8, 1991, Ser. No. 773,557

Claims priority, application Japan, Mar. 8, 1990, 2-54915

Int. Cl.^{5} G06F *15/46*

U.S. Cl. 364—474.25 **15 Claims**



1. An interactive automatic programming method, comprising the steps of:

(a) automatically displaying a part program to be executed, the part program including a plurality of part program statements;

(b) automatically executing a corresponding one of the plurality of part program statements each time an execution command is manually input;

(c) automatically displaying a result of the execution of the corresponding part program statement in step (b);

(d) manually modifying at least one of the part program statements;

(e) automatically determining a re-execution portion of the part program to be re-executed in dependence upon said modifying in step (d); and

(f) automatically re-executing only the re-execution portion of the part program determined in step (e) when a re-execution command is manually input.

5,315,525
METHOD FOR SIMULATING THE MACHINING OF WORKPIECES

Reiner Blüthgen, Isernhagen, and Klaus Deichmann, Hanover, both of Fed. Rep. of Germany, assignors to Grundig AG, Furth, Fed. Rep. of Germany

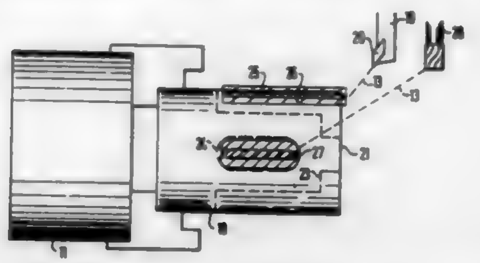
Continuation of Ser. No. 761,266, Sep. 17, 1991, abandoned. This application Oct. 29, 1993, Ser. No. 146,828

Claims priority, application European Pat. Off., Sep. 18, 1990, 90117969.7

Int. Cl.^{5} G06F *15/46*

U.S. Cl. 364—474.26 **11 Claims**

1. A method for simulating the machining of a workpiece on a lathe, comprising the steps of showing in two dimensions a contour of an unmachined workpiece, a contour of a finished workpiece and a contour of a tool on a screen of a numerical control or programming device and also showing on said screen of said numerical control or programming device a path of movement of a defined tool reference point according to a machining program by defining a part of at least one cutting edge of the tool intended to do the cutting and outlining and filling a respective area that is traversed by the cutting edge part of the tool during a machining feed with a pattern that covers the area only in part so that already existing lines and patterns remain visible and the degree of overlap or utilization of the tool is highlighted by a denser pattern.



5,315,526
NUMERICALLY CONTROLLED LATHE

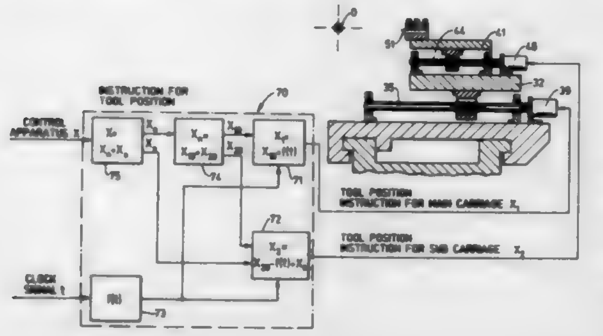
Yutaka Maeda; Yoshimaro Hanaki, and Seiichi Iwasaka, all of Niwa, Japan, assignors to Okuma Corporation, Nagoya, Japan

Continuation-in-part of Ser. No. 619,298, Nov. 28, 1990, abandoned. This application Oct. 7, 1991, Ser. No. 772,392

Claims priority, application Japan, Dec. 7, 1989, 1-319114

Int. Cl.^{5} G06F *15/46;* **B23B** *21/00*

U.S. Cl. 364—474.28 **4 Claims**


INSTRUCTION FOR TOOL POSITION
CONTROL APPARATUS
CLOCK SIGNAL t
f(t)
TOOL POSITION INSTRUCTION FOR MAIN CARRIAGE X_1
TOOL POSITION INSTRUCTION FOR SUB CARRIAGE X_2
70
71
72
73
74
75

1. A method for operating a main carriage and a sub carriage of a numerically controlled lathe in which the main carriage is displaceable along an axis, and the sub carriage is movable relative to the main carriage along the axis, the sub carriage being arranged to carry a tool which is positioned on the axis, said method comprising:

providing a position instruction, X, representing the desired position, relative to a reference position of the tool, along the axis;

deriving from position instruction X, a main carriage reference position instruction X_{10} and a sub carriage reference position instruction X_{20}, in which

$$X=X_{10}+X_{20};$$

generating a time varying position correction instruction f(t) from a clock signal;

generating a first carriage position instruction by adding together one of the reference position instructions and the time varying position correction instruction;

generating a second carriage position instruction by subtracting from the other reference position instruction the time varying position correction instruction; and

supplying one of the carriage position instructions to the main carriage and the other carriage position instruction to the sub carriage so as to position the machine tool so that, at all times, the position represented by X is equal to the sum of the positions represented by the first and second carriage position instructions.

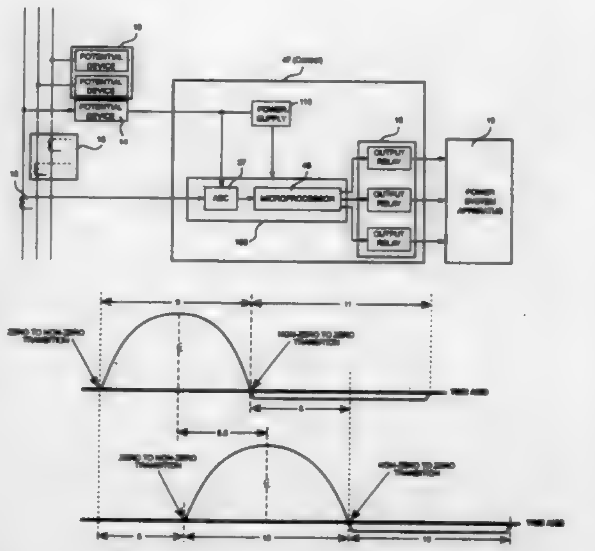
5,315,527
METHOD AND APPARATUS PROVIDING HALF-CYCLE DIGITIZATION OF AC SIGNALS BY AN ANALOG-TO-DIGITAL CONVERTER

Robert W. Beckwith, 2794 Camden Rd., Clearwater, Fla. 34619

Filed Jan. 3, 1992, Ser. No. 816,242

Int. Cl.^{5} G06F *15/20;* **G01R** *21/00*

U.S. Cl. 364—483 **13 Claims**



1. Apparatus for receiving and digitizing alternating current (AC) signals of the same frequency and for determining the phase angle between two received signals, each signal coming from a pair of terminals with the potential of one terminal being the ground reference for said signal and with the signal potential of the second terminal alternating about said reference potential, comprising in combination,

a) analog-to-digital converter means (ADC) having at least two analog inputs, having a low and a high reference input and having a range of operation starting with zero for an analog input equal to said low reference input voltage,

b) a high ADC reference voltage connected to said high reference input,

c) at least two of said second signal terminals being connected to said ADC analog inputs,

d) said ADC having said low reference input connected to each said AC signal ground terminal to set the change of signal polarity to said ADC zero,

e) said ADC providing periodic non-zero digital samples proportional to said AC signals whenever the polarity of said AC signal is the same as said high reference voltage and providing digital samples which are zeros whenever the polarity of said AC signal is not the same as said high reference voltage,

f) means for receiving and processing said digital samples and sensing transitions in said digital samples from zero to non-zero (znz) and non-zero to zero (nzz),

g) means for determining the phase angle between any two received AC signals after sensing (1) at least one pair of said znz transitions, the first from a first AC signal and the second sequentially from the second AC signal, and (2) at least one pair of said nzz transitions, the first from said first AC signal and the second sequentially from said second AC signal, and

h) means for averaging the phase angle result from said first pair of transitions with the results from said second pair of transitions to obtain the phase angle between the centers of the two signals.

5,315,528

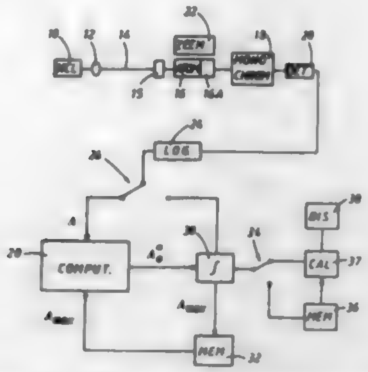
METHOD OF, AND APPARATUS FOR, ABSORBANCE CORRECTION IN ATOMIC ABSORPTION SPECTROSCOPY

Boris V. L'vov, Leningrad, U.S.S.R., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 3, 1991, Ser. No. 801,990

Int. Cl.^{5} G01J *3/00*

U.S. Cl. 364—498 **23 Claims**



1. A method of determining by atomic absorption the amount of an analyte contained in a sample, comprising the steps of:

electrothermally atomizing a predetermined number of samples containing known amounts of an analyte and integrating with respect to time the respectively obtained transient atomic absorption signals and thereby determining a maximum absorbance value;

electrothermally atomizing the sample containing an unknown amount of said analyte and thereby obtaining a transient atomic absorption signal composed of individual absorbance values as a function of time;

evaluating said individual absorbance values as a function of said maximum absorbance value and thereby obtaining corrected individual absorbance values;

integrating said corrected individual absorbance values with respect to time and thereby producing a corrected time-integrated absorbance value which is proportional to said unknown amount of said analyte contained in said sample, said step of integrating said corrected individual absorbance values and thereby producing said corrected time-integrated absorbance value including producing a time-integrated absorbance value which is substantially corrected for stray light effects;

determining a calibration factor; and

determining said unknown amount of said analyte contained in said sample from said corrected time-integrated absorbance value and said calibration factor.

5,315,529

FLUID VESSEL LEAK EXISTENCE SYSTEM, METHOD AND APPARATUS

Edward J. Farmer, 1611 20th St., Sacramento, Calif. 95814

Filed Oct. 11, 1991, Ser. No. 774,805

Int. Cl.^{5} G01F *23/22*

U.S. Cl. 364—509 **26 Claims**

1. Means for detecting a change in the presence of a substance in a mixture having other matter present by measuring a proportionate presence of a characteristic of the substance with respect to the other matter present within a sensed environment, comprising in combination:

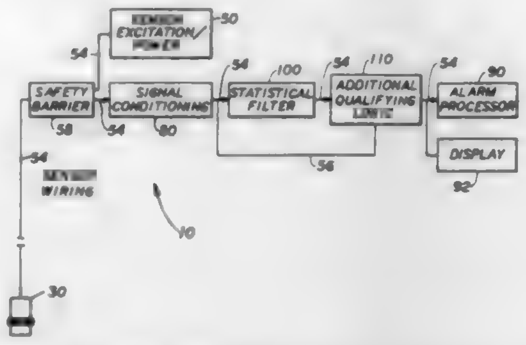
a plurality of sensors detecting and making concentration readings of the proportionate presence of said characteristic as a proportion of the other matter present, the concentration readings defining a concentration of the substance within the matter present,

a signal conditioner operatively coupled to said sensors by communication means having means for compiling said concentration readings taken by said sensors in chronological sequence according to a time corresponding to when each said concentration reading was taken, relative to other said concentration readings, to establish a signal representing magnitudes of changes in the concentration of the substance as a function of time,

a processor taking as input said signal and means for statistically filtering out anomalous said concentration readings, such that the processor will determine the probability that changes in said signal represent occurrence of an event relating to conditions in the sensed environment rather than an anomaly due to normal fluctuations in said concentration readings by ignoring any single said concentration reading alone, and

means for outputting the result of analysis by said statistical filter means;

whereby said event can be accurately distinguished from said anomaly.



5,315,530

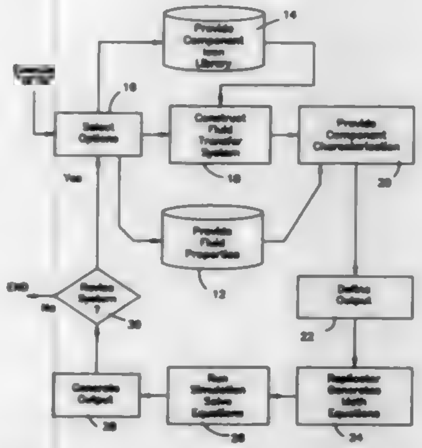
REAL-TIME CONTROL OF COMPLEX FLUID SYSTEMS USING GENERIC FLUID TRANSFER MODEL

David L. Gerhardt, Redondo Beach; Paul J. Su, Hacienda Heights; Tibor I. Lak, Huntington Beach, and Donna M. Brakeville, Brea, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Continuation-in-part of Ser. No. 560,415, Jul. 30, 1990, abandoned. This application Aug. 14, 1992, Ser. No. 930,489

Int. Cl.^{5} G05D *9/00;* **G06F** *15/46*

U.S. Cl. 364—510 **4 Claims**



1. A method for controlling a complex fluid system in real-time by modeling and reconfiguring a fluid transfer system of said complex fluid system, comprising the steps of:

a. providing a first database including a first plurality of electronic documents, each of said first plurality of electronic documents containing a set of thermophysical properties of fluids and materials to be used in a required fluid transfer system;

b. providing a second database including a second plurality of electronic documents, each of said second plurality of electronic documents containing a set of icons representing components of said fluid transfer system in a pictorial system representation;

c. providing a third database including a third plurality of electronic documents, each of said third plurality of electronic documents containing a set of component definition panels which completely specify the necessary component characteristics of said required fluid transfer system components;

d. generating and displaying a plurality of first command options on a computer controlled display system (CCDS) associated with said first database, each of said first command options representing operations utilized to create and manipulate said set of thermophysical properties;

e. generating and displaying a plurality of second command options on a CCDS associated with said second database, each of said second command options representing operations utilized to create said pictorial representation and associated connectivity of a desired fluid system;

f. generating and displaying a plurality of third command options on a CCDS associated with said third database, each of said third command options associated with the specification of said necessary component characteristics for the component definition panels;

g. generating and solving a plurality of simultaneous mathematical equations representing said connectivity and functional operation of the fluid system created in step e, above, utilizing said connectivity and functional operation of the fluid system created in step e, above, utilizing said fluid and material properties of steps a and d, above, and the component characteristics of step f, above, said step of generating and solving said plurality of simultaneous mathematical equations including the steps of:

  i) generating and storing information from said pictorial system representation in a linkage table which represents the connectivity between system components and provides numerical representations for identifying components in said fluid transfer system;

  ii) utilizing the information of step i, above, in a fluid system replicator means, for creating coefficients and associated set of simultaneous mathematical equations representing said fluid transfer system being analyzed, at each time step in said system specification; and,

  iii) solving said simultaneous mathematical equations utilizing matrix inversion techniques in an iterative process, with provisions for possible flow reversals between either iterations or time steps altering the form of said equations, said step of generating and solving said plurality of simultaneous mathematical equations thereby obviating any requirement for user intervention or coding; and,

h. controlling said complex fluid system in real-time by providing the results from step g, above, to said complex fluid system.

5,315,531

ENERGY MONITORING SYSTEM FOR A PLURALITY OF LOCAL STATIONS WITH SNAPSHOT POLLING FROM A CENTRAL STATION

David M. Oravetz, Gibsonia; Robert T. Elms; Joseph C. Engel, both of Monroeville Boro; Frank Klancher, Pittsburgh, and Thomas J. Kenny, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 746,019, Aug. 15, 1991. This application Jul. 15, 1992, Ser. No. 915,171

Int. Cl.^{5} G01R *21/00, 22/00;* **G08C** *25/00;* **H05K** *11/00*

U.S. Cl. 364—550 **21 Claims**

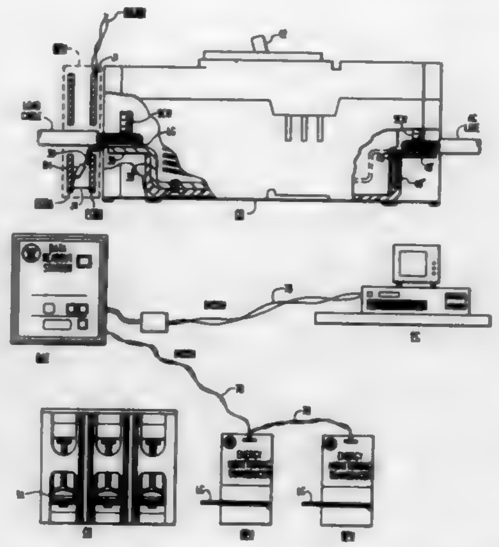
1. An electrical monitoring system for use on an AC line, comprising:

a circuit breaker installed on said AC line;

a backpack unit mounted on said circuit breaker and having an opening through which said AC line is passed and wherein said backpack unit further has mounted therein transducer means cooperating with said AC line for deriving analog signals representative of AC line current and voltage, analog to digital means for converting said analog signals to digital signals, and processing means for computing electrical measurements from said digital signals;

a remote monitoring device for retrieving said computed electrical measurements; and

bi-directional digital communication means linking said backpack unit and said remote monitoring device for establishing a data highway therebetween.



5,315,532

METHOD AND DEVICE FOR REAL-TIME SIGNAL SEPARATION

Pierre Comon, Nice, France, assignor to Thomson-CSF, Puteaux, France

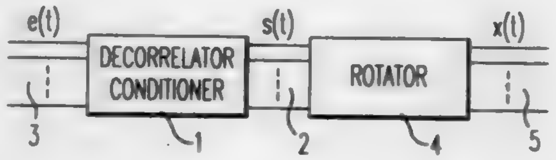
PCT No. PCT/FR90/00932, § 371 Date Jul. 8, 1992, § 102(e) Date Jul. 8, 1992, PCT Pub. No. WO91/11037, PCT Pub. Date Jul. 25, 1991

PCT Filed Dec. 20, 1990, Ser. No. 854,648

Claims priority, application France, Jan. 16, 1990, 90 00436

Int. Cl.^{5} G06F *15/20*

U.S. Cl. 364—553 **4 Claims**



1. A method for separating signals in real-time, said signals being received by a predetermined number of sensors and which are separated from a linear mixture having an unknown transfer function into a plurality of source-signals less than or equal to said predetermined number of sensors, said source-signals being produced from independent and, except for one of them, non-Gaussian sources, said method comprising the steps of:

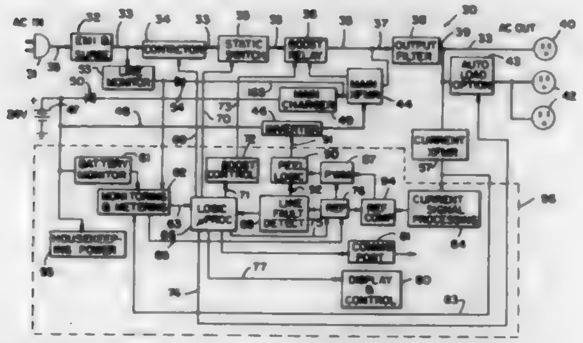
obtaining a plurality of decorrelated signals equal to number to said predetermined number of sensors from said signals to be separated; and

calculating an orthogonal matrix using a rotator element which comprises a plurality of cascade connected elementary rotators which together produce said orthogonal matrix, said orthogonal matrix being equal to the required source signals divided by said plurality of decorrelated signals, wherein said orthogonal matrix effects a linear transformation from successive polynomial transformations of said decorrelated signals and is determined using a stochastic algorithm which stores average statistics and which uses said average statistics to effect the real-time determination of said orthogonal matrix.

5,315,533
BACK-UP UNINTERRUPTIBLE POWER SYSTEM

Frederick A. Stich, Wisconsin Rapids; Donald K. Zahrte, Sr., Necedah; Richard V. Baxter, Jr., Appleton; Douglas C. Folts, Mauston; Thomas G. Hubert, Necedah; Juan M. Medina; William J. Hazen, both of Wisconsin Rapids, and Edward G. Beistle, Appleton, all of Wis., assignors to Best Power Technology, Inc., Necedah, Wis.

Filed May 17, 1991, Ser. No. 702,733
Int. Cl.^{5} G06F ***15/20***
U.S. Cl. 364—480 **48 Claims**



1. AC line fault detection apparatus comprising:

(a) means for sampling an AC power line input voltage at periodic times and providing digital output data corresponding to the sampled input voltage;

(b) means receiving the digital data corresponding to the sampled AC power line voltage and for producing a reference waveform at selected sample times during the period of the AC line voltage, wherein each reference value at each sample time comprises a selectively weighted average of sample values of the cycle of the AC waveform presently being sampled and prior cycles of the AC power voltage signal;

(c) means for providing digital data corresponding to the reference waveform data synchronized in frequency and phase to the AC power voltage signal;

(d) digital to analog conversion means receiving the digital reference waveform data for providing an analog reference waveform signal corresponding thereto;

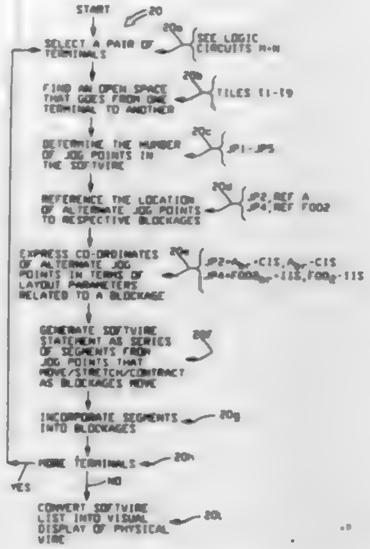
(e) means for providing a selected relative scaling of the magnitudes of the AC power line voltage and the analog reference waveform signal to provide a selected magnitude tolerance band between the reference signal and the AC power line voltage;

(f) a comparator receiving the scaled AC power line voltage and the analog reference waveform signal at its inputs and providing an output signal indicating a line fault if the difference in magnitude between the two input signals is greater than the selected tolerance band.

5,315,534
COMPUTER PROCESS FOR INTERCONNECTING LOGIC CIRCUITS UTILIZING SOFTWIRE STATEMENTS

Eli S. Schlachet, San Diego, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 25, 1991, Ser. No. 720,356
Int. Cl.^{5} G06F ***15/60***
U.S. Cl. 364—490 **12 Claims**


START
20
SELECT A PAIR OF TERMINALS
20a
SEE LOGIC CIRCUITS N-N
FIND AN OPEN SPACE THAT GOES FROM ONE TERMINAL TO ANOTHER
20b
TILES 11-19
DETERMINE THE NUMBER OF JOG POINTS IN THE SOFTWIRE
20c
JP1-JP5
REFERENCE THE LOCATION OF ALTERNATE JOG POINTS TO RESPECTIVE BLOCKAGES
20d
JP2,REF A
JP4,REF F002
EXPRESS CO-ORDINATES OF ALTERNATE JOG POINTS IN TERMS OF LAYOUT PARAMETERS RELATED TO A BLOCKAGE
20e
GENERATE SOFTWIRE STATEMENT AS SERIES OF SEGMENTS FROM JOG POINTS THAT MOVE/STRETCH/CONTRACT AS BLOCKAGES MOVE
20f
INCORPORATE SEGMENTS INTO BLOCKAGES
20g
MORE TERMINALS
20h
YES
NO
CONVERT SOFTWIRE LIST INTO VISUAL DISPLAY OF PHYSICAL WIRE
20i

1. A computer process for interconnecting logic circuits on an integrated circuit substrate; said process including the steps of:

providing a set of files for said computer which identify—a) blockages, including said logic circuits and pre-existing interconnections on said substrate, b) terminals on said logic circuits that are to be interconnected, and c) a set of layout parameters;

finding, via said computer, an open space on said substrate which goes from one of said terminals to another;

locating, via said computer, relative jog points in said open space with the location of each jog point being established in terms of said layout parameters relative to a respective blockage such that said jog points move as their respective blockage move and/or layout parameters change; and,

generating, via said computer, a softwire statement that specifies an interconnection from said one terminal to said another terminal as a series of conductor segments which extend in certain directions from said jog points and which stretch/contract as said blockages and jog points move.

5,315,535
AUTOMATIC ROUTER CAPABLE OF SEARCHING FOR A NEW WIRING WITH REFERENCE TO CONNECTION FAILURES

Hideo Kikuchi, and Yasushi Utsumi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 618,741, Nov. 27, 1990, abandoned. This application Jun. 25, 1993, Ser. No. 83,199
Claims priority, application Japan, Nov. 28, 1989, 1-306500
Int. Cl.^{5} G06F ***15/60***
U.S. Cl. 364—490 **6 Claims**

1. An automatic router comprising:

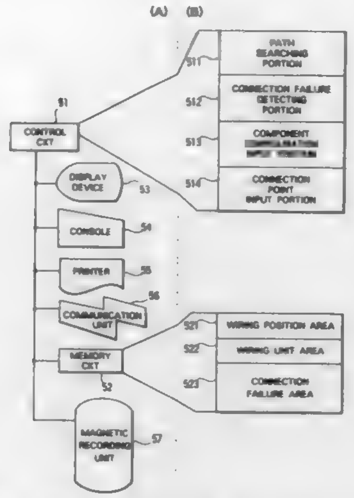
means for designating a pair of terminals to be connected to each other;

means responsive to said designating means for memorizing a line segment data signal representative of a line segment connected to both of the terminals;

means responsive to the memorizing means for calculating a bundle width of a connection conductor intersecting said line segment;

means for further calculating an acceptable minimum length of said line segment that is equal to said bundle width in order to obtain a modification with said acceptable minimum length kept unchanged and to judge whether or not said line segment can be expanded to the extent that a conductor connection can be inserted by said modification;

means responsive to said calculating means for memorizing a connection failure when said line segment can not be expanded to the extent that said conductor connection can be inserted;



means responsive to said connection failure for searching for candidate paths between said terminal pair on the condition that said candidate paths neither intersect a provisional path nor intersect the line segment which accompanies the connection failure; and

means responsive to said search for determining a wiring location data signal from said candidate paths by determining the location of said candidate path.

5,315,536
METER DRIVING SYSTEM

Hiroshi Murase, and Kazuyuki Fukuda, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 3, 1992, Ser. No. 863,716
Claims priority, application Japan, Apr. 9, 1991, 3-076362; Sep. 10, 1991, 3-230511
Int. Cl.^{5} G01P ***3/48;*** **G01R** ***11/36***
U.S. Cl. 364—569 **26 Claims**

1. A meter driving system for driving at least one meter means with meter indication signals, the system comprising:

input means for inputting data signals representing time periods;

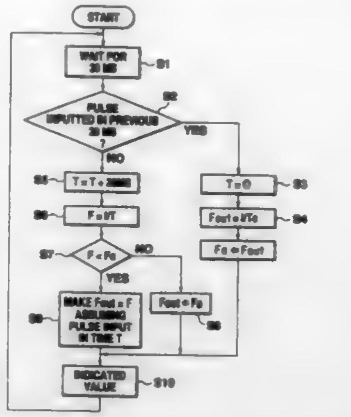
processing means for updating the meter indication signals according to the inputted data signals;

comparing means for comparing a first elapsed time from receipt of a previous one of the data signals from said input means until a present moment to a time period represented by the previous data signal; and

control means for determining if a second elapsed time exceeds a preset time, said control means operating the comparing means only when the preset time is exceeded;

wherein, when said comparing means determines that said first elapsed time is longer than the previous time period represented by the previous data signal, said first elapsed time is treated as a current time period, the processing means updating said meter indication signals based on the current time period, and

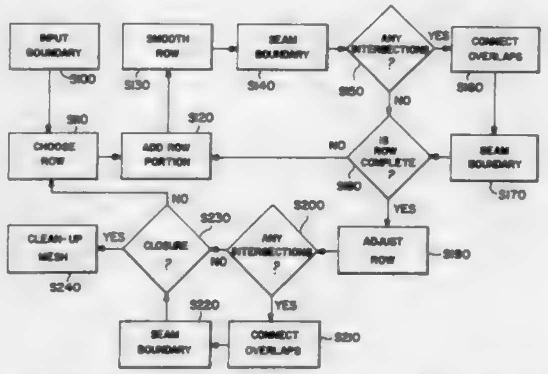
when said comparing means determines that the previous time period represented by the previous data signal is longer than said first elapsed time, the previous time period is treated as the current time period, the processing means updating said meter indication signals based on the current time period.



5,315,537
AUTOMATED QUADRILATERAL SURFACE DISCRETIZATION METHOD AND APPARATUS USABLE TO GENERATE MESH IN A FINITE ELEMENT ANALYSIS SYSTEM

Teddy D. Blacker, 12205 Kashmir, N.E., Albuquerque, N. Mex. 87111

Filed Apr. 8, 1991, Ser. No. 682,838
Int. Cl.^{5} G06F ***15/20***
U.S. Cl. 364—570 **62 Claims**



1. An automated system for quadrilateral surface discretization of a geometric region, comprising:

means for inputting a permanent boundary on the exterior of the geometric region; and

processing means for iteratively layering rows of quadrilateral elements inward from said permanent boundary to the interior of the geometric region to form a mesh of the quadrilateral elements defining the geometric region;

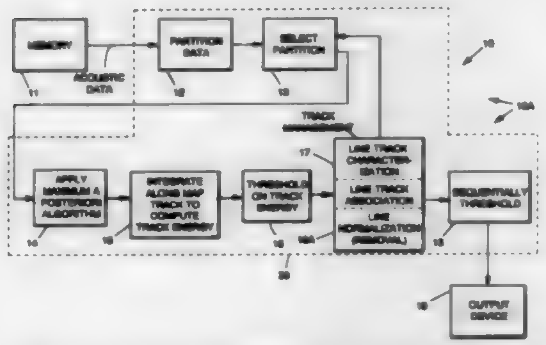
wherein said processing means defines a plurality of fixed nodes along said permanent boundary, generates a paving row including the layered rows of quadrilateral elements around the inside of said boundary, smooths said paving row of said boundary, seams said paving row of said boundary, detects when said paving row intersects itself or when said paving row intersects an existing portion of said mesh and connects the intersection portions, determines whether said paving row includes contracting or expanding quadrilateral elements and adjusts said paving row by inserting wedges or forming tucks, determines when six or less nodes remain in said paving row and completes said paving row by forming a seam or adding additional quadrilateral elements when six or less nodes remain, and inserts or deletes elements to improve local aspect ratios, reduce the number of irregular nodes and eliminate elements having interior angles less than a predetermined value to complete said paving row.

5,315,538

SIGNAL PROCESSING INCORPORATING SIGNAL, TRACKING, ESTIMATION, AND REMOVAL PROCESSES USING A MAXIMUM *A POSTERIORI* ALGORITHM, AND SEQUENTIAL SIGNAL DETECTION

Ronald A. Borrell, Fullerton, Calif.; Ben R. Breed, Austin, Tex.; Allen K. Lo, Diamond Bar, Calif.; Mark D. Skinas, deceased, late of Huntington Beach, both of Calif. by Kimberly A. Skinas, administratrix , and Kenneth A. Witzke, Santa Clara, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 23, 1992, Ser. No. 860,732
Int. Cl.^{5} G06K *9/34, 9/36;* H04N *7/12*
U.S. Cl. 364—574 11 Claims


MEMORY
ACOUSTIC DATA
PARTITION DATA
SELECT PARTITION
TRACK
APPLY MAXIMUM A POSTERIORI ALGORITHM
INTEGRATE ALONG MAP TRACK TO COMPUTE TRACK ENERGY
THRESHOLD ON TRACK ENERGY
LINE TRACK CHARACTERIZATION
LINE TRACK ASSOCIATION
LINE NORMALIZATION (REMOVAL)
SEQUENTIALLY THRESHOLD
OUTPUT DEVICE
11
12
13
14
15
16
17
18
19
10
10A

1. A signal processing method for passively tracking moving targets comprising the steps of:

storing received data signals indicative the frequency and time of arrival of moving targets to provide stored data signals;

processing the stored data signals using a processing window comprising a first time frame having a predetermined frequency extent and time extent to process a predetermined subset of the stored data signals;

partitioning the processing window into a plurality of subwindows;

selecting a subwindow and detecting a strongest line of signals within the subwindow using a maximum a posteriori procedure;

integrating and removing the strongest line of signals detected in the subwindow;

repeating the last two steps until all lines have been detected and removed from the selected subwindow; and

repeating the last three steps until all subwindows have been processed;

associating based on line characteristics the detected lines of the current time segment to line tracks that have already been either detected as targets or maintained as potential targets;

comparing lines that have not been declared as targets with continuously adjusted thresholds to determine whether they should be maintained as potential targets or be purged as noise tracks;

signalling an operator of the presence of a target having predetermined operator-defined characteristics,

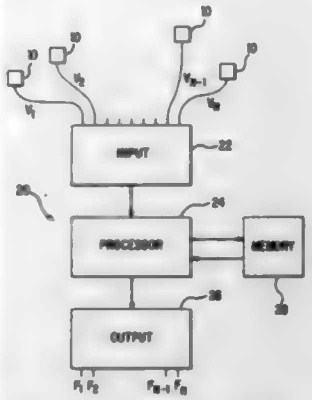
whereupon the moving targets are passively tracked and the operator is notified of potential targets.

5,315,539

METHOD AND APPARATUS FOR DEBOUNCING SIGNALS

M. Kerrigan Hawes, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 24, 1992, Ser. No. 949,933
Int. Cl.^{5} H04L *15/06*
U.S. Cl. 364—224.01 7 Claims



1. A lockout filter for processing a plurality of binary signals into a plurality of filtered signals, the filter comprising:

boolean means for simultaneously processing each binary signal through a corresponding one of a plurality of signal filters to produce a corresponding current filtered signal, each signal filter processing the corresponding current binary signal and a predetermined number of previous corresponding filtered signals to produce a corresponding current filtered signal; and

repeating means for successively operating the boolean means to produce the corresponding current filtered signal for each signal filter, a successive current filtered signal being produced by each signal filter each time the boolean means is operated.

5,315,540

METHOD AND HARDWARE FOR DIVIDING BINARY SIGNAL BY NON-BINARY INTEGER NUMBER

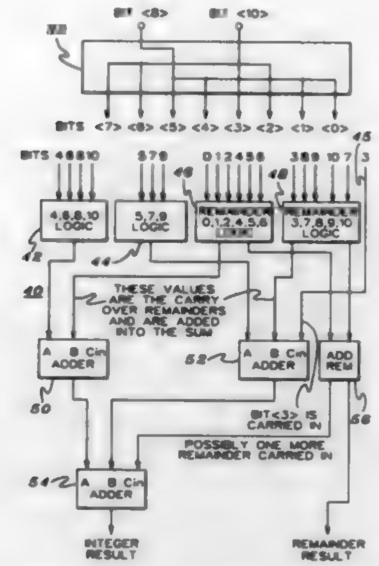
William F. Lawless, Red Hook, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1992, Ser. No. 931,623
Int. Cl.^{5} G06F *7/52*
U.S. Cl. 364—764 8 Claims

1. A hardware divider for a raster engine of a graphics display system, said raster engine having a given binary signal of a plurality of bits, said hardware divider for dividing said given binary signal by a predetermined integer number of a non-binary power, each of said plurality of bits having a binary power of known weight, said hardware divider comprising:

means for converting each '1' bit of said given binary signal into a binary weight signal, each binary weight signal comprising a binary representation of the binary power of known weight for said '1' bit divided by said integer number, and each binary weight signal having an integer portion and a remainder portion; and

means for summing each of said binary weight signals corresponding to said '1' bit of said given binary signal to derive a resultant binary signal having both an integer portion and a remainder portion, said resultant binary signal being a binary representation of said given binary signal divided by said predetermined integer number.

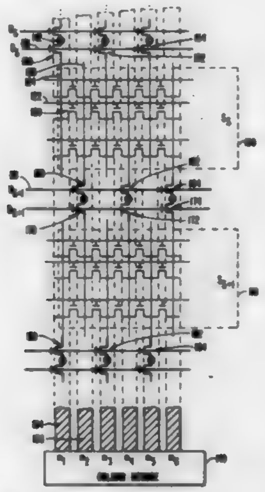

BIT <8>
BIT <10>
BITS <7> <6> <5> <4> <3> <2> <1> <0>
BITS 4 6 8 10
5 7 9
0 1 2 4 5 6
3 8 9 10 7
3
4,6,8,10 LOGIC
5,7,9 LOGIC
REMAINDER 0,1,2,4,5,6 LOGIC
REMAINDER 3,7,8,9,10 LOGIC
THESE VALUES ARE THE CARRY OVER REMAINDERS AND ARE ADDED INTO THE SUM
A B Cin ADDER
A B Cin ADDER
ADD REM
BIT<3> IS CARRIED IN
POSSIBLY ONE MORE REMAINDER CARRIED IN
A B Cin ADDER
INTEGER RESULT
REMAINDER RESULT
10
42
44
45
46
48
50
52
54
56

5,315,541

SEGMENTED COLUMN MEMORY ARRAY

Eliyahou Harari, Los Gatos, and Sanjay Mehrotra, Milpitas, both of Calif., assignors to SunDisk Corporation, Del.

Filed Jul. 24, 1992, Ser. No. 919,715
Int. Cl.^{5} G11C *5/06*
U.S. Cl. 365—63 11 Claims



1. In an EPROM or EEPROM of Flash EEPROM integrated circuit memory device, including a two-dimensional array of memory cells organized in rows and columns, each memory cell having a gate, a source and a drain, said two-dimensional array having a word line connected to all the gates in each row, said integrated circuit memory device comprising:

a plurality of segmented arrays formed by partitioning the two-dimensional array along the column direction, each segmented array being formed by a bank of segmented columns and each segmented column having a pair of independent segmented bit lines connected respectively to all the sources and drains therein, such that each segmented array is addressable column-by-column by an array of segmented bit lines;

cell accessing means connectable to an addressed cell in a segmented array by the word line and the pair of segmented bit lines connected thereto, said cell accessing means further comprising:

a plurality of electrically isolated conductive rails parallel to and overlaying the columns of the two-dimensional array, such that for each segmented column therein, the pair of segmented bit lines thereof is associated with a corresponding pair of conductive rails for access therethrough;

first and second switching transistors for exclusively and switchably connecting the pair of segmented bit lines to the pair of corresponding conductive rails;

each first switching transistor located at a top end of each segmented column for switchably connecting first of the pair of segmented bit lines to first of the pair of corresponding conductive rails; and

said second switching transistor located at a bottom end of each segmented column for switchably connecting second of the pair of segmented bit lines to second of the pair of corresponding conductive rails;

thereby forming in each segmented array, a row of first switching transistors at a top end thereof one-to-one connected to one set of alternate segmented bit lines therein and a row of second switching transistors at a bottom end thereof one-to-one connected to a complement set of alternate segmented bit lines therein, each said row of first or second switching transistors having a pitch double that of the array of segmented bit lines.

5,315,542

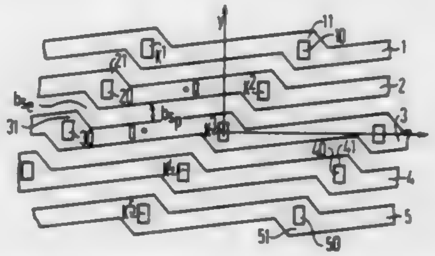
BIT LINE ARRANGEMENT FOR INTEGRATED CIRCUITS

Hanno Melzner, Feldkirchen-Westerham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 2, 1992, Ser. No. 984,376

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1991, 4139719

Int. Cl.^{5} G11C *5/06*
U.S. Cl. 365—72 15 Claims



10. A bit line arrangement for integrated circuits, comprising:

a plurality of bit lines and a plurality of cells;

each bit line of the plurality of bit lines having a row of contacts in a first direction, each contact thereof contacting a conductive region of a respective cell and being widened to form a contact surface only in an area of said contacts;

contacts of adjacent bit lines being offset relative to one another thereby forming at least a 3-fold stagger;

a distance between bit line edges of two adjacent bit lines having everywhere a substantially constant value within a range of manufacturing tolerances; and

given a prescribed geometrical arrangement and size of the contacts, the bit line edges represent, in segments, straight lines which have at least three different gradients.

5,315,543

SEMICONDUCTOR MEMORY DEVICE AND A MANUFACTURING METHOD THEREOF

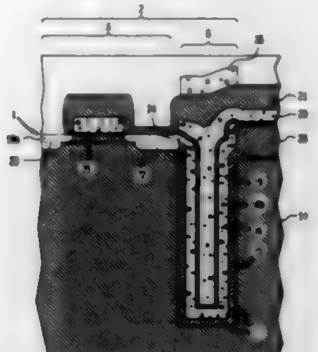
Naoto Matsuo, Ibaraki; Hisashi Ogawa, Katano; Yoshiro Nakata, Ikoma, and Shozo Okada, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 12, 1992, Ser. No. 882,064

Claims priority, application Japan, May 13, 1991, 3-107621

Int. Cl.⁵ G11C *13/00*

U.S. Cl. 365—149 5 Claims



1. A semiconductor memory device including a single crystalline semiconductor substrate having a main surface, a plurality of active regions formed at the main surface, and an isolation region which is formed at the main surface and isolates the active regions from one another, wherein:

each of the active regions has a transistor region and a capacitor region;

the capacitor region has a trench formed in the single crystalline semiconductor substrate, an inner wall of the trench being covered with an insulating layer;

at least a portion of the transistor region and the insulating layer are both covered with a single continuous semiconductor layer;

a portion of the semiconductor layer, the portion covering at least the portion of the transistor region is an epitaxial layer; and

a portion of the semiconductor layer, the portion covering the insulating layer, is a polycrystalline layer, which functions as a storage node of a capacitor.

5,315,544

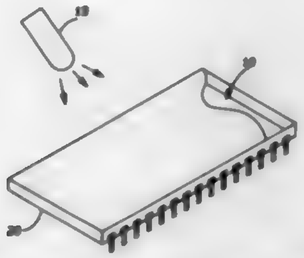
RADIATION-HARDENED MEMORY STORAGE DEVICE FOR SPACE APPLICATIONS

Timothy A. Yokote, and Thomas J. Gritzmacher, both of Torrance, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 29, 1991, Ser. No. 799,813

Int. Cl.⁵ H01L *27/12*

U.S. Cl. 365—154 11 Claims



1. A radiation-hard dynamic random access memory (DRAM) device having reduced sensitivity to single event upset and latchup, comprising:

a high-density configuration of transistors that have been exposed to neutron bombardment substantially higher rate than the rate of naturally occurring neutron bombardment.

5,315,545

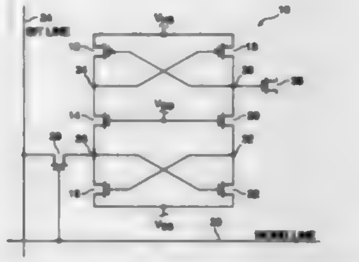
HIGH-VOLTAGE FIVE-TRANSISTOR STATIC RANDOM ACCESS MEMORY CELL

Ta-Pan Guo, Cupertino, and Adi Srinivasan, Fremont, both of Calif., assignors to Aptix Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 900,241, Jun. 17, 1992, Pat. No. 5,239,503, and a continuation-in-part of Ser. No. 2,776, Jan. 8, 1993. This application Jun. 15, 1993, Ser. No. 77,299

Int. Cl.⁵ G11C *11/40*

U.S. Cl. 365—156 6 Claims



1. A level-shifting static random access memory cell which may be coupled to a bit line and a word line operating at a first set of high and low logic-state voltages substantially equal to a first power-supply rail potential and a second power-supply rail potential, respectively, said level-shifting static random access memory cell having at least one output node operating at a second set of high and low logic-state voltages substantially equal to a third high-voltage power-supply rail potential and said second power-supply rail potential, respectively, said cell comprising:

a first P-Channel MOS transistor having a source connected to said third high-voltage power-supply rail potential, and further having a drain and a gate;

a first N-Channel MOS transistor having a drain connected to said drain of said first P-Channel MOS transistor, and further having a gate connected to said first power-supply rail potential, and a source;

a second N-Channel MOS transistor having a drain connected to said source of said first N-Channel MOS transistor, and further having a source connected to said second power-supply rail potential, and a gate;

a second P-Channel MOS transistor having a source connected to said third high-voltage power-supply rail potential, and further having a drain connected to said gate of said first P-Channel MOS transistor and a gate connected to said drain of said first P-Channel MOS transistor;

a third N-Channel MOS transistor having a drain connected to said drain of said second P-Channel MOS transistor, and further having a gate connected to said first power-supply rail potential, and a source connected to said gate of said second N-Channel MOS transistor;

a fourth N-Channel MOS transistor having a drain connected to said source of said third N-Channel MOS transistor, and further having a source connected to said second power-supply rail potential, and a gate connected to said source of said first N-Channel MOS transistor; and

switching means connected to said drain of said second P-Channel MOS transistor for switching a component.

5,315,546

NON-VOLATILE SEMICONDUCTOR MEMORY USING A THIN FILM TRANSISTOR

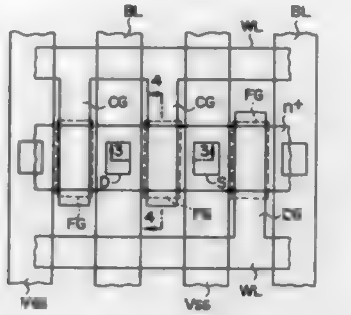
Kiyofumi Ochii, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1991, Ser. No. 707,064

Claims priority, application Japan, May 30, 1990, 2-138529

Int. Cl.⁵ G11C *11/34;* H01L *29/68*

U.S. Cl. 365—185 8 Claims



1. A semiconductor memory device, comprising:

a semiconductor substrate;

a diffusion layer formed in said semiconductor substrate and serving as a source and drain region;

a floating gate formed on said semiconductor substrate to be insulated from said semiconductor substrate;

a control gate made of a thin film and formed on said floating gate to be insulated from said floating gate; and

a transistor including said control gate and said floating gate wherein one end of a current path of said insulating gate transistor is connected to a bit line and the other end is connected to a power source and said control gate is connected to a word line, and a portion of said control gate corresponding to said floating gate is a channel region having an impurity concentration, which is lower than that of other portions of the control gate, and said floating gate is a gate electrode controlling said channel region.

5,315,547

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH SELECTIVE TOW ERASURE

Kazuyoshi Shoji, Tokyo; Tadashi Muto, Iruma; Yasurou Kubota, Tokyo; Koichi Seki, Tokyo; Kazuto Izawa, Tokyo, and Shinji Nabetani, deceased, Tokyo, Japan by Yuko Nabetani, administratrix, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

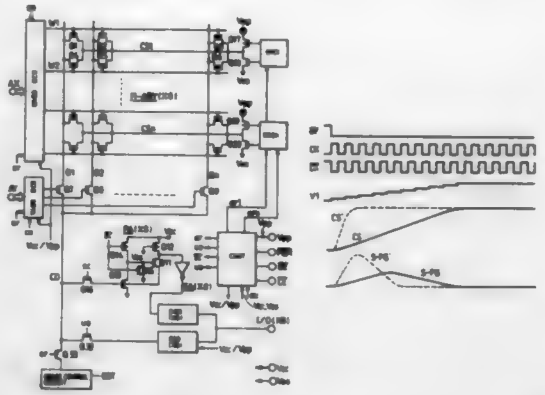
Continuation of Ser. No. 713,026, Jun. 7, 1991, abandoned, which is a continuation of Ser. No. 376,667, Jul. 7, 1989, abandoned. This application Oct. 13, 1992, Ser. No. 960,280

Claims priority, application Japan, Jul. 11, 1988, 63-172230

Int. Cl.⁵ G11C *7/00*

U.S. Cl. 365—185 7 Claims

1. A nonvolatile semiconductor memory device including a memory array having a plurality of memory cells, each of which includes one nonvolatile semiconductor memory transistor having a control gate, a source and a floating gate, said device comprising an erase operation mode in which charges stored in said floating gate are extracted through source line coupled to said sources of said memory transistors in such a way that word lines to which the control gates of the nonvolatile memory transistors to be erased are coupled are set at a ground potential, such that a potential of the source lines to which source of said nonvolatile semiconductor memory transistors are coupled is provided with a ramp rate for gradually raising the potential applied to said sources from a low voltage to a high voltage in accordance with said ramp rate, wherein the high voltage with the ramp rate to be supplied to said source lines is formed on the basis of a control voltage which rises gradually in such a way that charges are transferred between at least two capacitors having a comparatively great capacitance ratio, through a switch element that is switch-controlled by a cyclic pulse signal.



5,315,548

COLUMN SELECTING CIRCUIT IN SEMICONDUCTOR MEMORY DEVICE

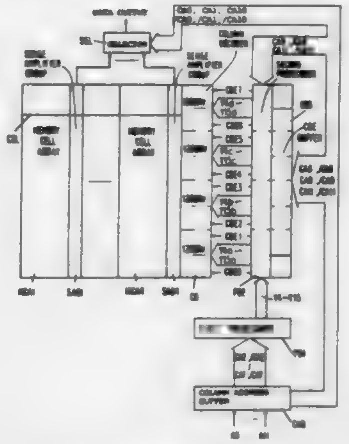
Tsukasa Ooishi; Kazutami Arimoto; Hideto Hidaka; Masanori Hayashikoshi; Shinji Kawai; Mikio Asakura; Masaki Tsukude; Katsuhiro Suma; Shigeki Tomishima, and Kazuyasu Fujishima, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1992, Ser. No. 900,368

Claims priority, application Japan, Jun. 20, 1991, 3-148968

Int. Cl.⁵ G11C *8/00, 7/00*

U.S. Cl. 365—189.01 12 Claims



1. A column selecting circuit for selecting a bit line in a semiconductor memory device comprising a memory cell array divided into a plurality of blocks, each of said blocks of said memory cell array including a plurality of word lines, a plurality of bit lines arranged crossing said word lines, and a plurality of memory cells arranged at respective crossings of said word lines and said bit lines, said column selecting circuit comprising:

a plurality of column selecting lines for applying a selecting signal in common to corresponding bit lines of said memory cell array;

predecode means for predecoding an applied column address signal to provide a plurality of predecoded signals;

column decode means for decoding said predecoded signals to select one of said plurality of column selecting lines; and

wiring means for transmitting said predecoded signals to said column decode means;

said column decode means including a plurality of selecting signal providing means provided respectively for said plurality of column selecting lines for providing selecting signals to corresponding column selecting lines, respectively;

said plurality of selecting signal providing means being divided into a plurality of adjacent groups each including an equal number, greater than one, of said plurality of selecting signal providing means;

said predecode means providing independent predecoded signals for said respective groups of said plurality of selecting signal providing means; and

said wiring means having a wiring structure divided between said groups of said plurality of selecting signal providing means.

5,315,549

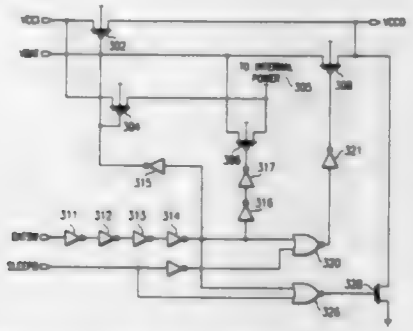
MEMORY CONTROLLER FOR NONVOLATILE RAM OPERATION, SYSTEMS AND METHODS

Francis A. Scherpenberg, Carrollton; Eric W. Mumper; John W. Rea, both of Dallas, and Robert D. Lee, Denton, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Jun. 11, 1991, Ser. No. 714,545

Int. Cl.^{5} G11C *7/00*

U.S. Cl. 365—189.09 **13 Claims**



8. An integrated circuit, comprising:

(a) a first input node;

(b) a second input node;

(c) a switch selectively coupling one of said first and second nodes to a third node;

(d) a first p-channel FET with source coupled to said first input node and gate coupled to said third node;

(e) a second p-channel FET with source coupled to said second input node and gate coupled to said third node; and

(f) circuitry connected to the drains of said first and second FETs to activate said switch if either of said FETs is turned on.

5,315,550

DYNAMIC RANDOM ACCESS MEMORY HAVING SENSE AMPLIFIER ACTIVATION DELAYED BASED ON OPERATION SUPPLY VOLTAGE AND OPERATING METHOD THEREOF

Youichi Tobita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 437,425, Nov. 16, 1989, Pat. No. 5,132,932. This application Jan. 31, 1992, Ser. No. 829,144

Claims priority, application Japan, May 19, 1989, 1-127114

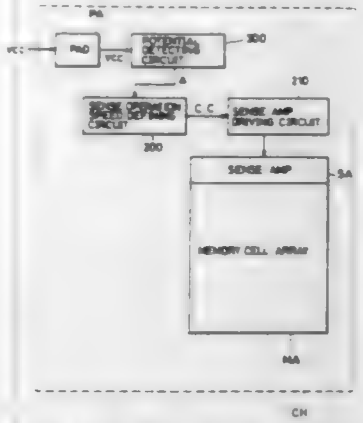
Int. Cl.^{5} G11C *7/00, 8/00*

U.S. Cl. 365—194 **23 Claims**

1. A dynamic random access memory having a plurality of memory cells arranged in a matrix of rows and columns, a plurality of bit lines each connected to a row of said plurality of memory cells, and a power supply voltage serving as an operation supply voltage, comprising:

sensing means provided for each of said plurality of bit lines for sensing and amplifying a potential on a corresponding bit line;

operation timing defining means responsive to an externally applied operation timing defining signal and to a sense amplifier activating signal for producing an operation characteristic instruction signal when the supply voltage is at a first magnitude, said operation characteristic instruction signal being delayed with respect to a memory access signal by a prescribed delay period when the supply voltage is at a second magnitude, less than the first magnitude; and


PAD
VCC
POTENTIAL DETECTING CIRCUIT
300
210
SENSE OPERATION TIMING DEFINING CIRCUIT
SENSE AMP DRIVING CIRCUIT
200
SENSE AMP
SA
MEMORY CELL ARRAY
MA
CH

activating means responsive to said operation characteristic instruction signal for activating said sensing means at a timing depending on the magnitude of the operation supply voltage.

5,315,551

SEMICONDUCTOR MEMORY DEVICE WITH PRECHARGING VOLTAGE LEVEL UNCHANGED BY DEFECTIVE MEMORY CELL

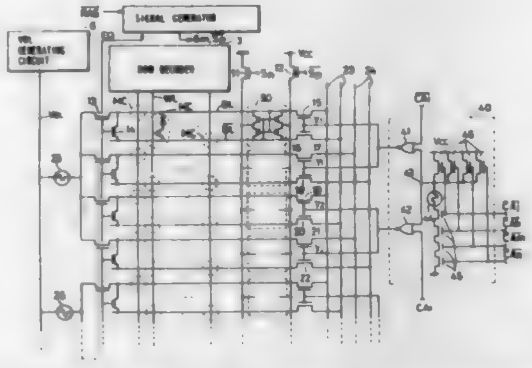
Kazutoshi Hirayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 651,855

Claims priority, application Japan, Feb. 21, 1990, 2-41563

Int. Cl.^{5} G11C *29/00*

U.S. Cl. 365—200 **8 Claims**



1. A dynamic random access memory device comprising:

a memory cell array having a plurality of memory cells arranged in row and column directions, each memory cell being of a one transistor-one capacitor type,

a plurality of spare memory cell columns, each spare memory cell column having a redundant circuit function for electrically replacing a defective memory cell column in said memory cell array with the spare memory cell column,

a plurality of bit lines connected to said plurality of memory cells, respectively,

means for generating a precharging voltage;

means for precharging said plurality of bit lines to said precharging voltage, and

cutting-off means connected between said precharging voltage generating means and said precharging means for selectively cutting off a connection between said precharging voltage generating means and said bit lines connected to said detective memory cell column so as to prevent said defective memory cell column from changing said precharging voltage on said plurality of bit lines of said dynamic random access memory device.

5,315,552

MEMORY MODULE, METHOD FOR CONTROL THEREOF AND METHOD FOR SETTING FAULT BIT TABLE FOR USE THEREWITH

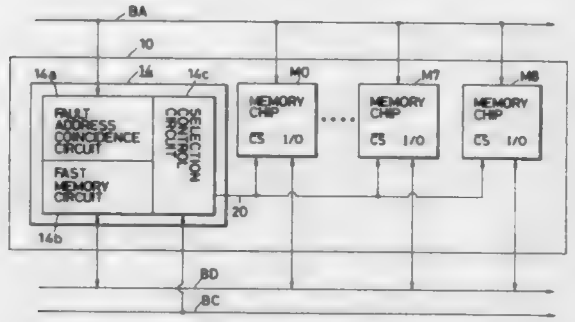
Hideki Yoneda, Yachiyo, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

Filed Aug. 25, 1992, Ser. No. 934,235

Claims priority, application Japan, Aug. 29, 1991, 3-244639

Int. Cl.^{5} G11C *13/00*

U.S. Cl. 365—200 **9 Claims**



1. A memory module providing a required memory capacity using a plurality of memory chips, said memory module having fault bit substituting means for detecting access to a fault bit and selecting a substitute bit to replace the fault bit, wherein said fault bit substituting means comprises:

a fault address coincidence circuit for detecting access to the fault bit using a fault bit table;

a fault bit substitute memory; and

a selection control circuit for selecting, if said fault address coincidence circuit detects access to the fault bit, a substitute address within said fault bit substitute memory without asserting a selection signal to said plurality of memory chips, the selection control circuit asserting said selection signal to said plurality of memory chips if said fault address coincidence circuit fails to detect access to the fault bit.

5,315,553

MEMORY CIRCUIT TEST SYSTEM USING SEPARATE ROM HAVING TEST VALUES STORED THEREIN

John O. Morris, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 10, 1991, Ser. No. 712,793

Int. Cl.^{5} G11C *7/00*

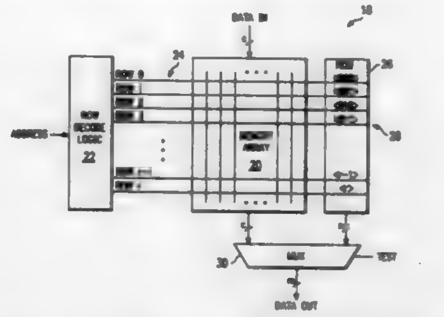
U.S. Cl. 365—201 **14 Claims**

4. A memory circuit, comprising:

a first memory array comprising a plurality of first memory storage locations for storing data, said first memory array coupled to a plurality of row address lines;

a row decode address circuit coupled to said plurality of row address lines to receive an address and activate one of said plurality of row address lines in response to the address; and

a read only memory array coupled to said plurality of row address lines and comprising a plurality of second memory storage locations associated with and coupled, respectively, to each of said plurality of row address lines, each of said second memory storage locations storing a different predetermined value such that access to each of said second memory storage locations through said row address lines can be verified by successful retrieval of said predetermined values.



5,315,554

DYNAMIC RANDOM ACCESS MEMORY DEVICE WITH INTERMEDIATE VOLTAGE GENERATOR INTERRUPTING POWER SUPPLY IN TEST OPERATION

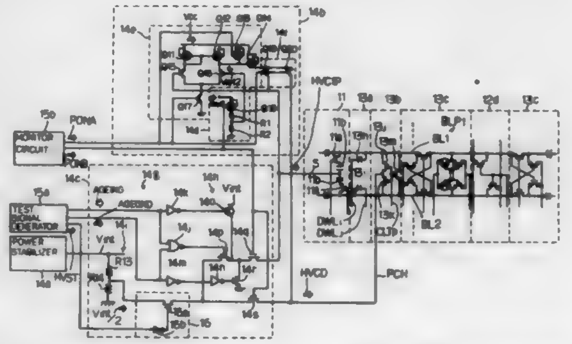
Yasuhiro Nanba, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Apr. 27, 1993, Ser. No. 52,675

Claims priority, application Japan, Apr. 28, 1992, 4-109409

Int. Cl.^{5} G11C *29/00*

U.S. Cl. 365—201 **5 Claims**



1. A semiconductor dynamic random access memory device having standard modes and a diagnostic mode of operation, comprising:

a) a memory cell array having a plurality of memory cells each addressable with a row address and a column address, each of said plurality of memory cells being implemented by a series combination of a switching transistor and a storage capacitor having an accumulated electrode and a counter electrode;

b) an addressing means responsive to row and column address bits for selecting one of said plurality of memory cells;

c) a plurality of bit lines selectively coupled with said plurality of memory cells, and conducted with the accumulating electrodes of the storage capacitors when said addressing means selects the memory cells;

d) a precharge unit coupled with said plurality of bit lines for charging said plurality of bit lines to a first intermediate voltage level;

e) a data input and output means selectively coupled with said plurality of bit lines for propagating a data bit between said one of said plurality of memory cells and a data port;

f) an intermediate voltage producing means operative to supply said first intermediate voltage to said precharge unit and a second intermediate voltage to the counter electrodes of the storage capacitors in said standard modes;

g) a diagnostic unit activated in said diagnostic mode, and producing a test control signal for carrying out at least a test operation on said bit lines to see whether or not leakage current flows therefrom; and

h) a block means responsive to said test control signal for blocking said counter electrodes and said precharge unit from said first and second intermediate voltages during said test operation.

5,315,555

SENSE AMPLIFIER FOR PERFORMING A HIGH-SPEED SENSING OPERATION

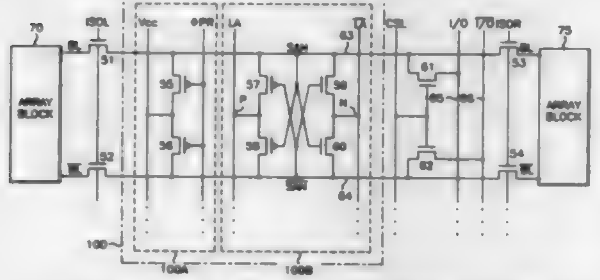
Yun-Ho Choi, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Oct. 30, 1991, Ser. No. 785,091

Claims priority, application Rep. of Korea, Jun. 19, 1991, 1991-10195

Int. Cl.^{5} G11C *5/02, 11/34*

U.S. Cl. 365—207 **18 Claims**



1. A sense amplifier for a semiconductor memory device, comprising:

first and second memory array blocks each having a plurality of memory cells;

a pair of sensing lines each commonly connected to said first and second memory array blocks;

a pair of first and second isolation transistors for isolating said first and second memory array blocks from said sensing lines when a given memory cell is selected;

a pair of common input/output lines for transferring input-/output data to an exterior of said semiconductor memory device;

data input/output transistors connected between said sensing lines and said common input/output lines, for enabling access operation of said semiconductor memory device;

precharge means connected to said sensing lines and coupled to receive a control signal, for precharging a voltage of said sensing lines to a power voltage amplitude in dependence upon said control signal; and

sensing means connected to said sensing lines, for amplifying a potential difference between said sensing lines in dependence on reception of a first latching signal exhibiting said power voltage amplitude before a sensing operation and reception of a second latching signal exhibiting said power voltage amplitude before said sensing operation and exhibiting a reference voltage different from said power voltage amplitude during said sensing operation.

5,315,556

SEMICONDUCTOR MEMORY HAVING IMPROVED SENSE AMPLIFIER

Isao Fukushi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

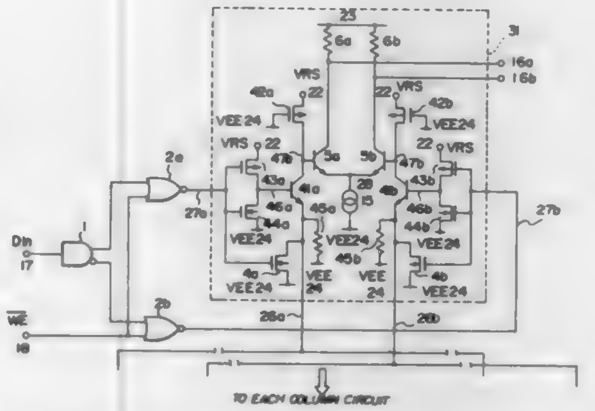
PCT No. PCT/JP92/00327, § 371 Date Nov. 6, 1992, § 102(e) Date Nov. 6, 1992, PCT Pub. No. WO92/16945, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 18, 1992, Ser. No. 946,420

Claims priority, application Japan, Mar. 20, 1991, 3-057475

Int. Cl.^{5} G11C *11/413*

U.S. Cl. 365—208 **8 Claims**



1. A semiconductor memory comprising:

a plurality of memory cells disposed in rows and at least one column;

a bit line pair disposed in each column of said memory cells and selectively coupled to each of said memory cells in the column, the memory cell being selected by a row address;

a pair of write means, each of said write means being coupled to a corresponding one of the bit lines forming said bit line pair, the pair of write means being operable in response to a write signal which instructs a write operation, the pair of write means putting one bit line of said bit line pair to a low potential in response to the write signal, which bit line is put to a low potential depending on the state of said write signal; and

read means operable in response to a read signal which instructs a read operation, said read means detecting data stored in one of said memory cells via said bit line pair, said read means comprising:

a pair of bipolar transistors having collectors thereof coupled to a high potential power supply via load means, emitters thereof each coupled to a corresponding one of the bit lines forming said bit line pair, and bases;

a pair of gate circuits for respectively coupling the bases of said pair of bipolar transistors to the high potential power supply to turn said pair of bipolar transistors ON in response to the read signal during the read operation, and for coupling the base of only one of said pair of bipolar transistors to the high potential power supply in response to the write signal during the write operation, which base is coupled to the high potential power supply depending on the state of the write signal; and

differential amplifier means having two inputs thereof, each coupled to a collector of a corresponding bipolar transistor of said pair of bipolar transistors, for detecting a potential difference between said inputs.

5,315,557

SEMICONDUCTOR MEMORY DEVICE HAVING SELF-REFRESH AND BACK-BIAS CIRCUITRY

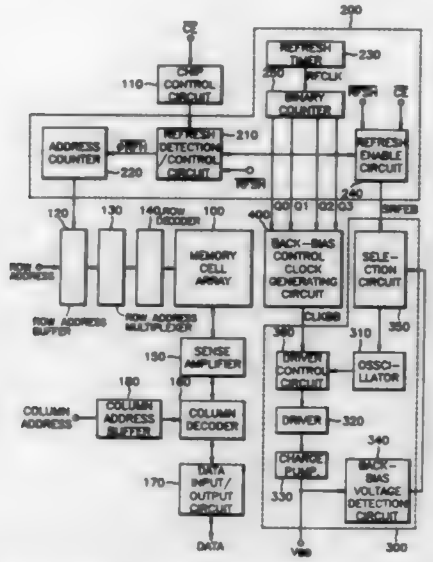
Moon-Gone Kim, Kyungi, and Sei-Seung Yoon, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Nov. 25, 1992, Ser. No. 980,951

Claims priority, application Rep. of Korea, Nov. 25, 1991, 21143

Int. Cl.^{5} G11C *11/402, 7/02*

U.S. Cl. 365—222 **7 Claims**



6. A semiconductor memory device comprising:

means for generating a refresh clock pulse;

counter means for generating a predetermined number of signals of different frequency in response to said refresh clock pulse;

means for generating a self-refresh enable signal in response to said predetermined number of signals from said counter means;

means for generating a back-bias control clock pulse comprising first, second and third selector circuits, said third selector circuit selecting one of said predetermined number of signals transmitted from said counter means in response to an output from each of said first and second selector circuits;

means for generating a back-bias voltage including an oscillator circuit and a back-bias voltage detection circuit;

selection means for receiving an output from said back-bias voltage detection circuit and selectively transmitting a signal to said oscillator circuit in response to said self-refresh enable signal; and

driver control means for receiving an output from said oscillator circuit and said back-bias control clock pulse.

5,315,558

INTEGRATED CIRCUIT MEMORY WITH NON-BINARY ARRAY CONFIGURATION

Ejaz U. Hag, Sunnyvale, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Division of Ser. No. 783,040, Oct. 25, 1991, Pat. No. 5,220,518. This application Apr. 21, 1993, Ser. No. 52,143

Int. Cl.^{5} G11C *11/40*

U.S. Cl. 365—230.01 **9 Claims**

1. A memory device comprising:

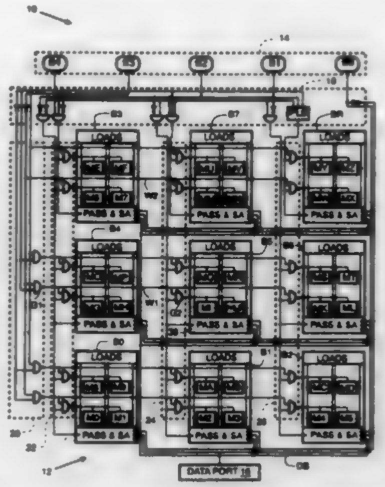
an array of memory cells arranged in blocks, said blocks being arranged in P physical block rows and Q physical block columns, where $2^M<P<2^{M+1}$ and $2^N<Q<2^{N+1}$, where M, N, P and Q are integers, said memory cells being arranged in array cell rows and array cell columns, the cells in each of said blocks being arranged in block cell rows and block cell columns, each of said block cell rows being the intersection of a respective array cell row and a respective block, each of said block cell columns being the intersection of a respective physical array cell column and a respective block;

data port means for communication between said memory cells and a host system;

address input means for receiving address codes; and

address decoding means for decoding said address codes so as to select at least one of said cells for communication with said host system for each of said address codes, said address decoding means including word line decoding means for selecting at least one of said array cell rows, said address decoding means including block decoding means for selecting at least one block so as to select the block cell row at the intersection of said array cell row and said block, said address decoding means including column decoding means selecting block cell columns of said at least one block;

whereby the at least one cell at the intersection of said selected block cell row and said selected block cell column is selected for communication with said host system.



5,315,559

ASYNCHRONOUS ACCESS TYPE SEMICONDUCTOR MEMORY DEVICE EQUIPPED WITH DATA LATCHING UNIT FOR PREVENTING OUTPUT DATA INFORMATION FROM NOISES

Michinori Kamaya, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,422

Claims priority, application Japan, Oct. 15, 1990, 2-276058

Int. Cl.^{5} G11C *7/00, 11/34*

U.S. Cl. 365—233.5 **9 Claims**

1. An asynchronous access type semiconductor memory device comprising:

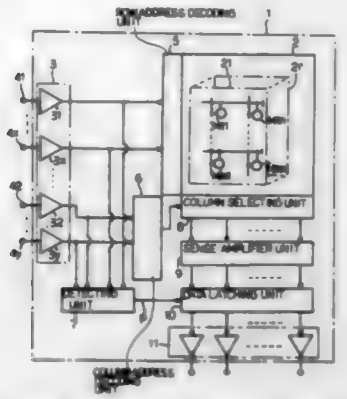
a) a memory cell array having a plurality of memory cells respectively assigned address locations and storing data bits, respectively,

b) an address buffer unit responsive to an external address signal indicative of an address transition from one of said address locations to another of said address locations, and operative to produce an internal address signal indicative of said another of said address locations on the basis of said external address signal,

c) a detecting unit measuring a predetermined time period from said address transition to said another of said address locations, and changing a detecting signal from a first level to a second level when said predetermined time period is expired, said detecting unit recovering said detecting signal to said first level when said internal address signal is changed to indicate said another of said address locations,

d) an addressing means responsive to said internal address signal, and allowing at least one of said data bits and another of said data bits to be sequentially read out from one of said plurality of memory cells assigned said one of said address locations and another of said plurality of memory cells assigned said another of said address locations, and

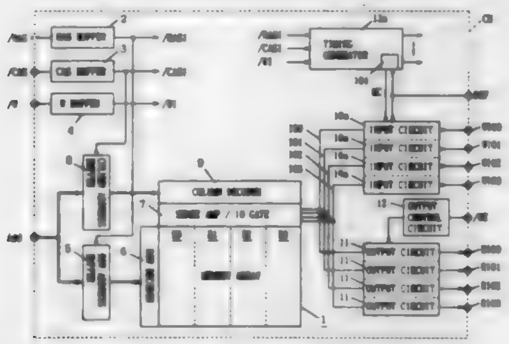
e) a data latching unit transferring said at least one of said data bits to an output data buffer unit while said detecting signal is in said second level, said data latching unit being responsive to said detecting signal of said first level for temporarily storing said at least one of said data bits.



5,315,560
SEMICONDUCTOR MEMORY DEVICE HAVING A WRITE PER BIT FUNCTION IN PAGE MODE

Masaki Nishimoto, and Junko Matsumoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1992, Ser. No. 961,577
Claims priority, application Japan, May 25, 1992, 4-131190
Int. Cl.^{5} G11C *8/00, 7/00*
U.S. Cl. 365—238.5 **14 Claims**



1. A semiconductor memory device, comprising:

a plurality of memory arrays, each including a plurality of memory cells disposed in a plurality of rows and a plurality of columns;

a row selecting means for selecting any one row in each of said plurality of memory arrays;

a column selecting means for selecting any one column in each of said plurality of memory arrays;

a control signal buffer for receiving control signals for controlling said column selecting means to repetitively carry out a column selecting operation in which said memory cells in a selected one row are sequentially selected while maintaining a state in which said row selecting means has selected one row in each of said plurality of memory arrays;

a plurality of input means disposed corresponding to said plurality of memory arrays, and each providing externally applied data to a memory cell selected by said row selecting means and said column selecting means in a corresponding memory array;

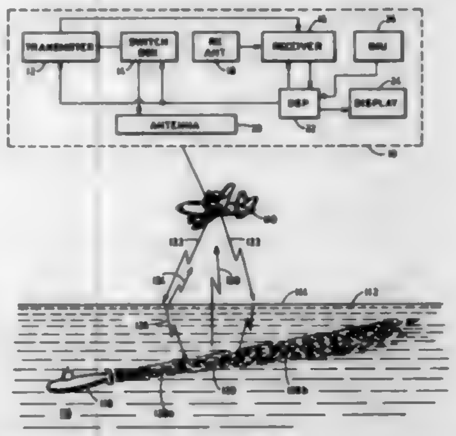
inhibiting means for inhibiting the input of data by an arbitrary one of said plurality of input means; and

activating means for activating or deactivating said inhibiting means in each column selecting operation.

5,315,561
RADAR SYSTEM AND COMPONENTS THEREFORE FOR TRANSMITTING AN ELECTROMAGNETIC SIGNAL UNDERWATER

Mario D. Grossi, Cambridge, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 21, 1993, Ser. No. 80,252
Int. Cl.^{5} G01S *13/04*
U.S. Cl. 367—1 **8 Claims**



1. A radar system for transmitting an electromagnetic signal into water having a surface from above the surface of the water to below the surface of the water comprising:

(a) means for transmitting a pulsed electromagnetic signal having a frequency less than 500 Hz;

(b) means for receiving a reflected signal provided from the pulsed electromagnetic signal reflected from an anomaly below the surface of the water;

(c) means for inhibiting the receiving means from receiving a reflected signal provided from the pulsed electromagnetic signal reflected from the surface of the water; and

(d) means for controlling the transmitting means, the receiving means and the inhibiting means.

5,315,562
CORRELATION SONAR SYSTEM

Steven E. Bradley, and Francis D. Rowe, both of San Diego, Calif., assignors to Rowe, Deines Instruments Inc., San Diego, Calif.

Filed Oct. 23, 1992, Ser. No. 966,092
Int. Cl.^{5} G01S *15/58*
U.S. Cl. 367—89 **28 Claims**

1. A correlation sonar system, comprising:

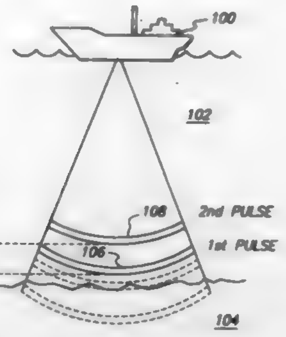
a transmitting transducer for emitting acoustic energy onto a reflecting surface;

pulse generation means for generating a single pulse of electrical energy to the transmitting transducer;

a plurality of receiving transducers for receiving a pulse echo from the reflecting surface;

a plurality of demodulators, each demodulator connected to one of the receiving transducers and generating a set of values;

means for cross-correlating the values for each receiving transducer at a predetermined time delay less than the pulse width; and

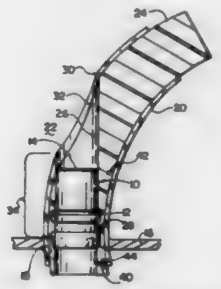


maximum likelihood means for estimating velocity using correlated values.

5,315,563
EXTERNAL SEALED INTRUSIVE MOUNTING ARRANGEMENT FOR A FUEL LEVEL SENSOR

Frederick L. Lichtenfels, II, Vergennes; Robert E. Birkett, Shelburne; Ward J. Nial, So. Burlington, and Frederick G. Hoff, Bristol, all of Vt., assignors to Simmonds Precision Products, Inc., Akron, Ohio

Filed Nov. 17, 1992, Ser. No. 977,360
Int. Cl.^{5} G01S *15/08*
U.S. Cl. 367—99 **25 Claims**



1. An intrusive fluid level sensor mounting arrangement for a fluid container, said mounting arrangement comprising first and second tubes, said first tube being attachable to a wall of the container such that a first end of said first tube is open to the container exterior through the container wall and a second end of said first tube extends into the container; said second tube being sized to slide axially within said first tube between first and second positions; said second tube having a first end accessible from outside the container such that a sensor can be installed in and removed from said second tube; said second tube providing fluid communication between the sensor and fluid in the container when said second tube is in said first position, and substantially preventing fluid loss from the container when said second tube is in said second position.

5,315,564
SENSING APPARATUS

Charles F. Upton, Juarez, Mexico, assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 6, 1992, Ser. No. 832,146
Int. Cl.^{5} H04R *17/00*
U.S. Cl. 367—140 **16 Claims**

1. An ultrasonic sensing apparatus connected to a power source with a positive terminal and a negative terminal and signaling source, comprising:

a housing comprising a shell surrounding a central cavity;

a first circuit electrically connected to the power source and the signaling source, wherein the first circuit is in the cavity, comprising:

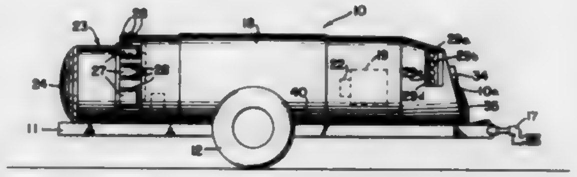
a positive terminal electrically connected to the positive terminal of the power source;

a return terminal electrically connected to the negative terminal of the power source;

means for suppressing noise from the power source, wherein the means for suppressing noise from the power source comprises:

a first diode with a first end and a second end, wherein the first end of the first diode is electrically connected to the positive terminal, and wherein the first diode allows current to flow from the first end to the second end, but resists current from flowing from the second end to the first end; and

a second diode with a first end and a second end, wherein the first end of the second diode is electrically connected to the return terminal, and wherein the second diode allows current to flow from the second end to the first end, but resists current from flowing from the first end to the second end; and



means for suppressing noise from the signaling source;

a second circuit electrically connected to the first circuit wherein the second circuit is in the cavity, comprising;

means for generating a digital signal from a signal from the signaling source and electrically connected to the first circuit;

means for receiving an analog echo signal electrically connected to the first circuit; and

means for amplifying the analog echo signal electrically connected to the first circuit; and

an ultrasonic transducer electrically connected to the second circuit, wherein the ultrasonic transducer is able to transform the digital signal to an ultrasonic acoustical wave and transform an ultrasonic acoustical wave to the analog echo signal.

5,315,565
RESONANCE OSCILLATOR

Jörgen Brosow, Plainfeld 156, A-5322 Hof, Austria

PCT No. PCT/EP90/01882, § 371 Date Jun. 1, 1992, § 102(e) Date Jun. 1, 1992, PCT Pub. No. WO91/07741, PCT Pub. Date May 30, 1991

PCT Filed Nov. 9, 1990, Ser. No. 853,760
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937365; Jun. 29, 1990, 4020881
Int. Cl.^{5} H04R *17/00*
U.S. Cl. 367—140 **16 Claims**

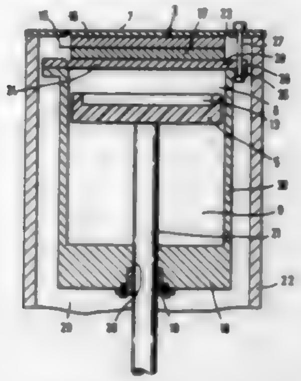
1. A resonance oscillator, comprising:

an active oscillator part;

a passive oscillator part for basically determining a resonant frequency, said passive oscillator part being connected to said active oscillator part and having a resonance container receiving a liquid column of a variable length greater than a length of said active oscillator part;

an equalizing container connected to said resonance container for receiving liquid from and returning liquid to said resonance container;

a piston sliding axially in said resonance container for displacing liquid from said resonance container into said equalizing container and for drawing liquid from said equalizing container into said resonance container, thereby varying the length of the liquid column in said resonance container and setting the resonant frequency; and a counterpressure diaphragm sealing said equalizing chamber with respect to the surroundings of said resonance oscillator and enabling a change in volume within said equalizing chamber corresponding to axial displacement of said piston.



5,315,566

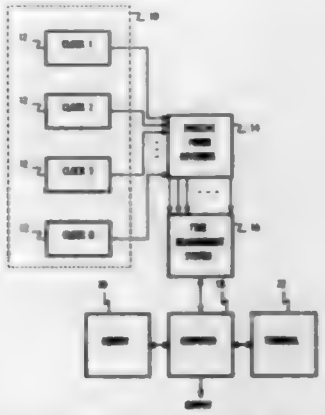
TIME SCALE COMPUTATION SYSTEM

Samuel R. Stein, Boulder, Colo., assignor to Timing Solutions Corporation, Boulder, Colo.

Filed Jun. 22, 1993, Ser. No. 80,970

Int. Cl.^{5} G04C *11/00*; **G04F** *5/00*

U.S. Cl. 368—46 **8 Claims**



1. A system for providing an ensemble time comprising:

a plurality of clocks, each of said plurality of clocks providing a clock signal;

first means for measuring differences between clock signal related parameters for pairs of clocks of said plurality of clocks; and

second means, which uses said differences, for providing a first ensemble time, said second means including means for implementing an ensemble time definition that has a plurality of solutions which are representative of an ensemble time and means for constraining said plurality of solutions to a number of solutions that is less than said first plurality of solutions.

5,315,567

OPTICAL DISK FORMATTING SYSTEM USING INDEX MARK DETECTING CIRCUIT

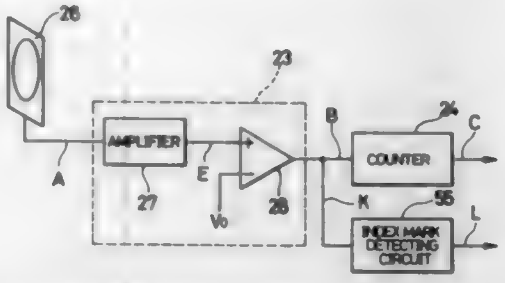
Hiroshi Fuji, Nara, and Hirotsugu Matoba, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1991, Ser. No. 794,490

Claims priority, application Japan, Nov. 20, 1990, 2-316365

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—32 **9 Claims**



1. An optical disk drive comprising:

optical head means for projecting a light beam as a spot onto an optical disk;

photodetector means for detecting a variation in intensity of reflected light from the spot of the light beam and for transmitting a detection signal;

index mark detecting means for detecting an index mark and for generating an index mark detection signal, one index mark being formed on each track line on the optical disk, the index mark being optically readable, one track line representing one complete turn of a circular track on the optical disk;

optical head control mean for moving the spot of the light beam to a desired track line in accordance with the photodetection signal;

formatting means for generating formatting data of address information of track and sectors in accordance with the index mark detection signal, the address information being necessary for recording, reproduction and erasing of desired information;

recording means for recording the address information on the desired track line in accordance with the formatting data;

hysteresis comparator means for generating a binary signal by comparing the detection signal with a first slice level and with a second slice level when the spot of the light beam crosses the track line, the second slice level being higher than the first slice level; and

counting means for receiving the binary signal from the hysteresis comparator means and for counting the number of track lines crossed by the spot of the light beam,

wherein a level of the binary signal turns from high to low in accordance with the comparison between the detection signal and the first slice level, while it turns from low to high in accordance with the comparison between the detection signal and the second slice level.

5,315,568

APPARATUS AND METHOD FOR ACCESSING SECTORS OF A ROTATING DISK

James J. Dente; Glen A. Jaquette, and William C. Williams, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1992, Ser. No. 974,639

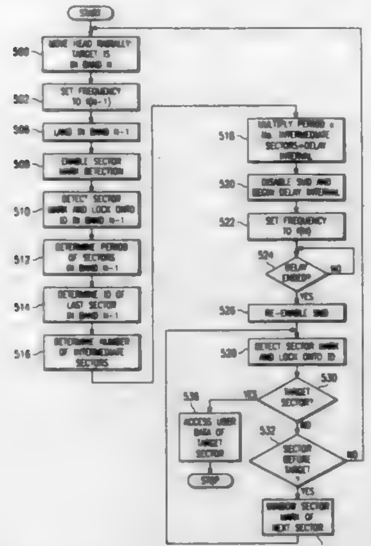
Int. Cl.^{5} G11B *17/22*

U.S. Cl. 369—32 **32 Claims**

1. A controller for positioning an optical read head opposite a target sector of a spiral track rotating optical disk having a plurality of bands, each band having a plurality of logical tracks, each track having a plurality of sectors, each sector having a sector mark area, an identification area and a user data area, the controller comprising:

a data transfer clock for regulating the rate at which data is transferred from an optical disk;

means for setting a frequency of said clock to a first frequency when an optical head is positioned opposite a sector P in a first band of the disk, the first clock frequency being a function of the radial distance from an inner disk area to the first band;



means for enabling detection of a sector mark and reading an identification in the sector P and causing said frequency setting means to set the frequency of said clock to a second frequency, the second clock frequency being a function of the radial distance from the inner disk area to a second band of which a target sector is a first sector; and

means for disabling said sector mark detection means until the optical head is opposite the user data area of a last sector Q in the first band and for re-enabling said sector mark detection means whereby the sector mark of the target sector is detected.

5,315,569

APPARATUS FOR RECORDING AND/OR REPRODUCING INFORMATION ON/FROM OPTICAL CARD-LIKE INFORMATION RECORDING MEDIUM

Akito Saito, and Tsuyoshi Togawa, both of Hino, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1991, Ser. No. 804,326

Claims priority, application Japan, Dec. 10, 1990, 2-407223; Dec. 18, 1990, 2-411284; Feb. 13, 1991, 3-020189

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—44.32 **11 Claims**

1. An apparatus for recording/reproducing optical information on and/or from an optical card in which the optical card and an optical head are relatively moved with respect to each other in a track direction and a tracking direction to record and/or reproduce optical information on and/or from said optical card, said apparatus comprising:

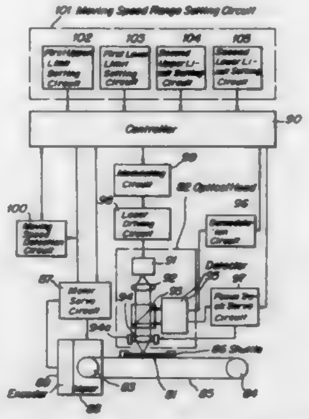
driving means for causing a relative movement of said optical head and said optical card with respect to each other;

anomalous condition detection means for detecting a condition of said relative movement between the optical card and the optical head and for deriving from said condition of said relative movement an output indicating whether said condition of said relative movement is anomalous;

control signal production means, responsive to said output from said anomalous condition detection means, for producing at least one control signal; and

control means, responsive to said at least one control signal from said control signal production means, for controlling said apparatus in accordance with the control signal produced in said control signal production means, wherein:

said anomalous condition detection means comprises a relative moving speed detection means for detecting the relative moving speed of the optical card and the optical head and a relative moving speed range setting means for setting a first moving speed range of the relative moving speed of the optical card and the optical head when optical information is recorded on the optical card and a second moving speed range of the relative moving speed of the optical card and the optical head when optical information is reproduced from the optical card;



said control signal production means produces a control signal when said relative moving speed for recording optical information is outside the first moving speed range or when said relative moving speed for reproducing optical information is outside the second moving speed range;

said control means controls the apparatus so as to inhibit to record and/or reproduce optical information on/from the optical card in response to the control signal; and

said first moving speed range is smaller than said second moving speed range.

5,315,570

OPTICAL DISK REPRODUCING APPARATUS WHICH AUTOMATICALLY DETERMINES THE FORMAT TYPE OF THE OPTICAL DISK

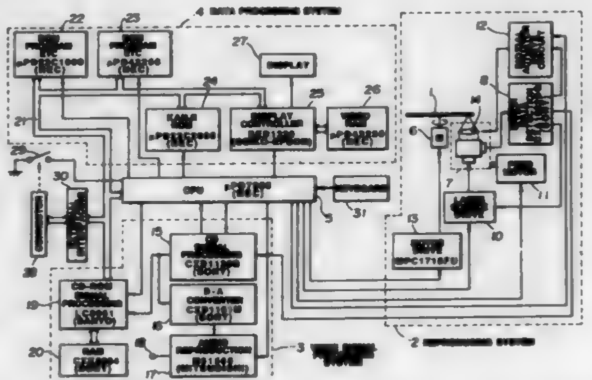
Yoshihiro Miura, Tokyo, and Koji Takagi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 638,848, Jan. 8, 1991, abandoned. This application Mar. 18, 1993, Ser. No. 33,412

Claims priority, application Japan, Jan. 9, 1990, 2-002151

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—48 **10 Claims**



1. A reproducing apparatus for reproducing optical discs having at least two different kinds of recording format types

for recording either non-audio, information data or audio data, respectively, the discs further having recorded thereon format type discriminating data, wherein the reproducing apparatus comprises:

optical reading means for optically reproducing recorded data from an optical disc;

a first signal processing means for processing reproduced audio data;

a second signal processing means for processing reproduced information data;

a main body section;

discriminating means connected to the optical reading means and supplied with recorded data reproduced from the optical disc for detecting, at the time of star ting the disc reproducing operation, the format type discriminating the format type of the optical disc on the basis of the format type discriminating data, and causing the reproduced recorded data from the optical reading means to be supplied either to the first signal processing means or the second signal processing means depending upon the format type of the optical disc;

display means having its display contents switched by the discriminating means;

pointing means for allowing a user of the apparatus to manually position a cursor on the display means;

central processing means connected to the first signal processing means, the second signal processing means, and the discriminating means for causing, under the control of the discriminating means, either reproduced audio data or information data to be accessible to a user of the reproducing apparatus, and wherein the central processing means further generates display control signals indicating the type of the optical disc on the basis of the format type discrimination data;

wherein the optical reading means includes an optical pickup and the central processing means causes the optical reading means to shift the optical pickup towards the innermost periphery of the disc at the time of starting a data reproducing operation to read out the format type discrimination data recorded towards an innermost periphery of the disc;

wherein, when the format type discrimination data indicate that the disc is an information data disc, the central processing means transmits the display control signal before moving the optical pickup to a record start portion of the disc; and

wherein, when the type discriminating data indicate that the disc is an optical disc on which audio data are recorded, the central processing means outputs a record time signal, in addition to the display control signals, indicating a total record time of audio data programs on the disc.

5,315,571

INFORMATION RECORDING AND REPRODUCING DEVICE PROVIDING FASTER ACCESS TIME TO A RECORDING MEDIUM

Shigemi Maeda, Yamatokoriyama; Kunio Kojima, Nara; Jun Akiyama, Kashihara; Shigeo Terashima, and Tomiyuki Numata, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 788,999, Nov. 7, 1991, abandoned. This application Jul. 29, 1993, Ser. No. 100,077

Claims priority, application Japan, Nov. 9, 1990, 2-305486; Dec. 14, 1990, 2-402487

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—50 **14 Claims**

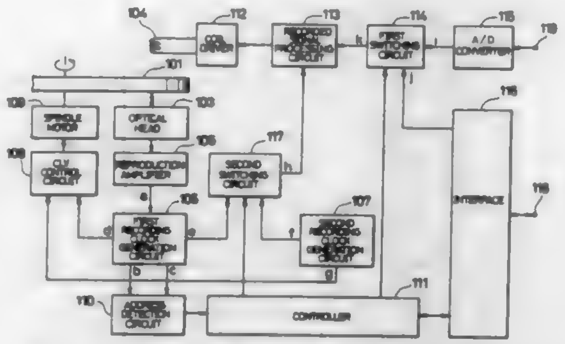
1. An information recording and reproducing device employing a recording medium having pre-recorded information formed thereon, said pre-recorded information including rotation control information for controlling a rotation of said recording medium at a predetermined constant linear velocity, said device comprising:

optical head means for recording and reproducing information on and from said recording medium,

rotation control means for controlling by CLV control the linear velocity of the recording medium relative to the optical head means;

first recording clock generation means for generating a first recording clock for signal processing in a recording mode based on the pre-recorded information of reproduced signal on said recording medium and on the actual linear velocity of the recording medium when said optical head means reaches a target recording portion on said recording medium, said first recording clock having a frequency which is proportional to said actual linear velocity which said recording medium acquires when said optical head means reaches a target recording portion on said recording medium,

wherein the recording mode is carried out in accordance with said first recording clock just after said optical head means reaches the target recording portion.



5,315,572

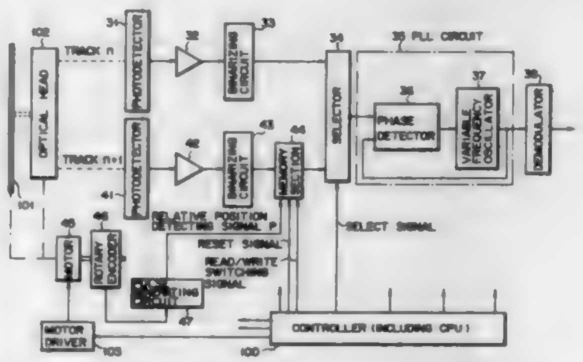
INFORMATION REPRODUCING APPARATUS CAPABLE OF ELIMINATING JITTERS

Yuichiro Akatsuka, Tama, and Yoshio Nakajima, Higashimurayama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 644,615, Jan. 23, 1991, abandoned. This application Jan. 29, 1993, Ser. No. 11,114

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—54 **12 Claims**



1. An information reproducing apparatus for reproducing data in which jitter resulting from differences in relative movement between a read head and a recording medium driven by a drive means is eliminated, as data is read by said read head simultaneously from at least two of a plurality of recording areas of said recording medium, said recording areas having data recorded therein, the apparatus comprising:

memory means for storing data read by said read head from at least one of said two recording areas, said memory means including a memory address;

relative position detecting means included in said drive

means for detecting a relative position between said recording medium and said read head;

control means for controlling a storing operation of the data into said memory means, based upon an output signal output by said relative position detecting means, said control means controlling said memory address and a writing operation for writing said data read by said read head in said memory means based on said output signal output by said relative position detecting means as said drive means drives said recording medium to thereby eliminate jitter from the data being stored in said memory; and

read-out means for reading out data stored in said memory means sequentially and in synchronism with clock signals from a clock signal source having a specified period, and for demodulating the data read out by said read-out means without adding jitter.

5,315,573

NON-LINEAR OPTICAL SATURABLE ABSORBER LAYER IN AN OPTICAL DISK TO DISCRIMINATE WAVELENGTH ABOVE OR BELOW A THRESHOLD LEVEL OF INTENSITY

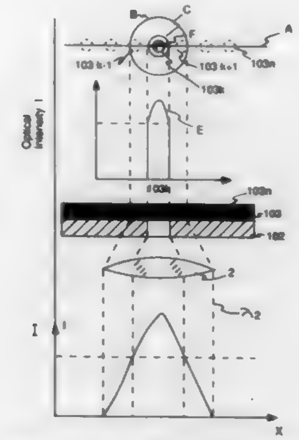
Takeshi Nakao, Sagamihara; Akira Arimoto, Kodaira; Kensuke Ogawa, Hachiouji; Hirofumi Sukeda, and Hisataka Sugiyama, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1992, Ser. No. 922,375

Claims priority, application Japan, Aug. 8, 1991, 3-199084; Nov. 5, 1991, 3-288496

Int. Cl.^{5} G11B *7/12, 7/24*

U.S. Cl. 369—100 **16 Claims**



10. An optical information device, comprising:

an information recording layer having a stored information correlated pattern for one of transmitting or reflecting an incident beam of light in a corresponding information related beam of light;

a non-linear optical saturable absorber that is effectively transparent to light of a wavelength above a threshold level of intensity, and that is opaque to light of the wavelength below the threshold level of intensity;

laser means for producing a first beam of light at the wavelength;

optical means for shaping the first beam of light and directing it along a path intersecting the saturable absorber and the information recording layer; and

optical means for receiving light reflected by or transmitted through the information recording layer for reading information.

5,315,574

OPTICAL HEAD WITH POLARIZED BEAM HOLOGRAM

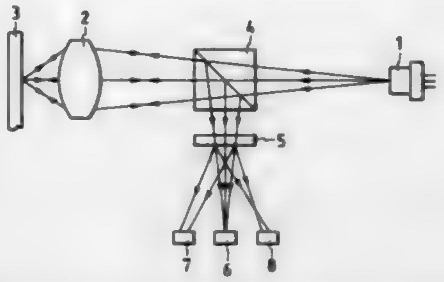
Tetsuo Saimi; Kazuo Momoo, both of Osaka, and Makoto Kato, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 871,618, Apr. 21, 1992, abandoned, which is a continuation of Ser. No. 427,531, Oct. 27, 1989, abandoned. This application Sep. 15, 1993, Ser. No. 120,869

Claims priority, application Japan, Oct. 28, 1988, 63-273545

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—109 **15 Claims**



1. An optical head for optically recording and reproducing information on and from a recording medium, comprising:

light source means;

optical means for converging a light beam emitted from said light source means on said recording medium;

beam splitter means provided between said light source means and said optical means for branching a light beam reflected from said recording medium;

hologram means for causing transmission or reflection of the light beam branched by said beam splitter means as a zero-order light and ± first-order diffracted lights and for polarizing the light beam so that the zero-order light of P-polarization and the + first-order diffracted light of S-polarization produced due to the polarization are cross-polarized with respect to each other and the zero-order light of P-polarization and the − first-order diffracted light of S-polarization produced due to the polarization are cross polarized with respect to each other;

a plurality of photodetector means for respectively receiving the zero-order light, the + first-order diffracted light and the − first-order diffracted light from said hologram means, and

difference means for obtaining a differential output signal representing a difference between the diffracted light and the zero-order light,

wherein said information is retrieved in accordance with said differential output signal,

whereby polarization information in said information is detected.

5,315,575

OPTICAL INFORMATION RECORDING APPARATUS

Yuichiro Akatsuka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1992, Ser. No. 826,469

Claims priority, application Japan, Jan. 28, 1991, 3-025248

Int. Cl.^{5} G11B *7/125, 21/10*

U.S. Cl. 369—112 **13 Claims**

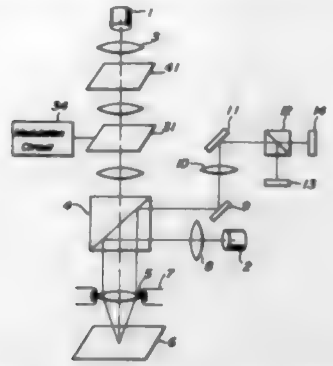
1. An optical information recording apparatus comprising:

a light source for emitting a main light beam for recording information on an optical information recording medium;

a light beam dividing means for dividing said main light beam into a plurality of sub-light beam in a first direction and a second direction, said first direction corresponding to a tracking direction which is perpendicular to a track extended direction on the optical information recording medium, said second direction coinciding with said track extended direction, so that information can be recorded on a plurality of data tracks formed on said optical information recording medium and in a plurality of data pits on each of said plurality of data tracks at the same time;

a modulation means for selectively modulating light intensities of said plurality of sub-light beams in accordance with information to be recorded on the optical information recording medium; and

a light incident means for making said plurality of sub-light beams incident upon said optical information recording medium in a focus condition.



5,315,576
OPTICAL PICK-UP DEVICE FOR OPTICAL DISC PLAYER

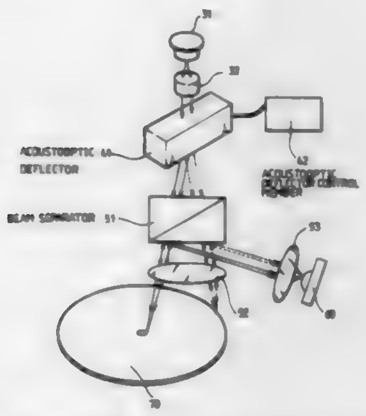
Young S. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Aug. 18, 1992, Ser. No. 931,683

Claims priority, application Rep. of Korea, Aug. 20, 1991, 14349/1991

Int. Cl.⁵ G11B *7/09*

U.S. Cl. 369—112 **5 Claims**



1. An optical pick-up device of an optical disc player comprising:

a laser source part for generating a laser beam and for scanning said laser beam as a beam spot having a predetermined size, said laser source part being disposed above a disc turntable, said turntable being rotatably mounted on a deck of said optical disc player, so as to be spaced apart from the turntable by a predetermined distance;

a beam deflecting part for receiving said laser beam scanned by the laser source part and for deflecting the laser beam so as to cause the laser beam to be scanned to a desired access position of an optical disc;

a beam scanning part for causing the laser beam scanned by said beam deflecting part to become a concentrated beam spot which is in turn scanned over said optical disc on the turntable, said beam scanning part also functioning to separate a retrace laser beam reflected by the optical disc by reflecting said retrace laser beam; and

an optical detector for receiving the retrace laser beam and for detecting the retrace laser beam so as to output electric signals corresponding to the detected retrace laser beam;

said beam deflecting part comprising:

an acoustooptic deflector for deflecting the laser beam of the laser source part in accordance with the change of the ultrasonic frequency thereof, said deflector being disposed below the laser source part; and

an acoustooptic deflector control member for controlling the ultrasonic frequency of said acoustooptic deflector in response to an inputted feedback signal, said feedback signal corresponding to the desired access position of the optical disc and being outputted from said optical detector, in order to cause the laser beam to be disposed on the desired access position of the optical disc which is intended to be accessed, said control member being disposed at a side of the acoustooptic deflector and electrically connected thereto by means of a signal cable.

5,315,577
OPTICAL RECORDING/REPRODUCING BY CHANGING PERPENDICULAR MAGNETIC ANISOTROPY TO NON-PERPENDICULAR MAGNETIC ANISOTROPY

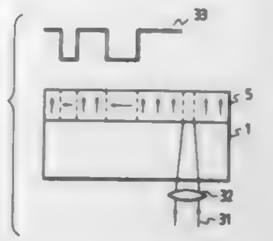
Fumiyoshi Kirino, Suginami; Junko Nakamura, Kokubunji; Ryo Suzuki, Hachiouji; Masafumi Yoshihiro, Yuuki; Yukinori Yamada, Tsukuba, and Norio Ohta, Kitasouma, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Maxell, Ltd., Osaka, both of Japan

Filed Mar. 6, 1992, Ser. No. 846,883

Claims priority, application Japan, Mar. 7, 1991, 3-41807

Int. Cl.⁵ G11B *7/125*

U.S. Cl. 369—116 **10 Claims**



1. An optical recording material characterized by forming over a non-magnetic substrate an information recording layer, in which there are alternately laminated: a noble metal element layer having a thickness of 5 to 30 Å and made of at least one kind of element selected from the group consisting of Pd, Pt, Rh and Au; and an iron group element layer having a thickness of 2 to 15 Å and made of either at least one kind of element selected from the group consisting of element selected from the group consisting of Fe and Co and at least one kind of element selected from the group consisting of Pd, Pt, Rh and Au, said information recording layer including at least one portion having a perpendicular anisotropy and at least parts of the one portion being changeable to a non-perpendicular anisotropy.

5,315,578
DISC RECORDING MEDIUM AND DATA RECORDING METHOD

Masamichi Furukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

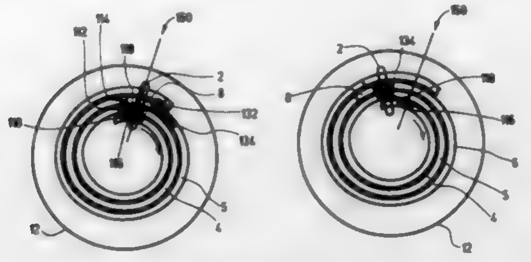
Filed May 6, 1992, Ser. No. 879,771

Claims priority, application Japan, May 7, 1991, 3-131782

Int. Cl.⁵ G11B *7/00*

U.S. Cl. 369—275.3 **21 Claims**

1. A disc recording medium having first data recorded thereon and having second data, consisting substantially of the same data as the first data, recorded at least a second time thereon for preventing data reproduction of an error, at least a portion of said second data having a possibility of appearing at a position ahead of at least a corresponding portion of said first data, the disc recording medium including at least one adjusting section inserted in an interval between said first and second data, wherein the length of the adjusting section is set in accordance with a value such that a portion of the second data is not located in parallel to the corresponding portion of the first data relative to a radial direction of the disc recording medium.



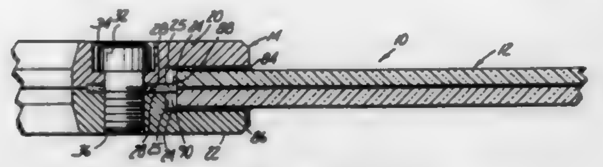
5,315,579
RECORDING DISK HUB BOND

Wayne M. Hector, Shoreview, and Cathleen M. Arsenault, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1991, Ser. No. 804,681

Int. Cl.⁵ G11B *3/70*

U.S. Cl. 369—290 **10 Claims**



1. An information carrying disk comprising

a substrate with a recording medium thereon;

first and second hub halves, each hub half having an annular outer surface area facing the substrate and an inner annular surface area facing the other hub half;

a bond layer having a thickness of less than one millimeter bonding the outer annular surface area of a hub half to the substrate, the bond layer including a cross-linked adhesive and a monolayer of spheroids dispersed within the adhesive, the spheroids made of a material selected from the group consisting of aluminum, glass and other ceramics, the bond layer thickness being no less than the maximum diameter of the spheroids; and

a cross-linked adhesive disposed between the inner annular surface areas of the hub halves, wherein an air space is positioned between the cross-linked adhesive and the cross-linked adhesive with spheroids and the substrate.

5,315,580
NETWORK MONITORING DEVICE AND SYSTEM

Peter Phaal, Bristol, United Kingdom, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 26, 1991, Ser. No. 749,580

Claims priority, application European Pat. Off., Sep. 28, 1990, 90310699.5

Int. Cl.⁵ H04B *17/00*

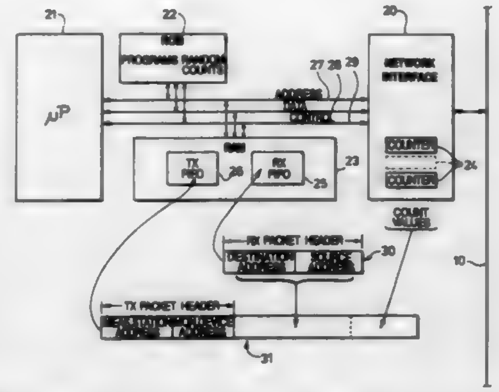
U.S. Cl. 370—13 **22 Claims**

1. A network monitoring device for monitoring the activity on a network carrying message packets of a predetermined type, the monitoring device comprising:

a receive means for detecting substantially all message packets carried on the network,

a sampling means operatively interfaced with the receive means for selecting only some of the message packets received by the receive means, selection being based on the number of message packets detected by the receive means; and

a processing means interfaced with the receive means and the sampling means for collecting data related to only the message packets so selected by the sampling means.



5,315,581
HIT-LESS PROTECTION SWITCHING METHOD AND APPARATUS FOR ATM TRANSMISSION LINES

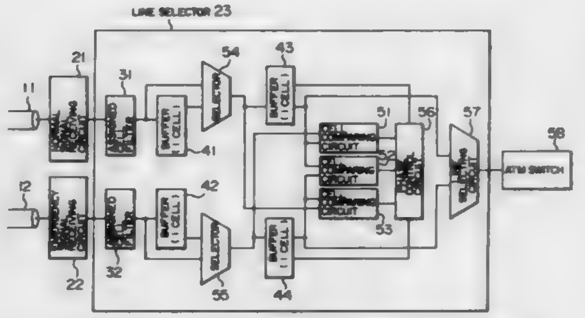
Yukio Nakano, Hachioji; Akihiko Takase, Tokyo; Masahiro Takatori, Kokubunji, and Junichirou Yanagi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 14, 1991, Ser. No. 744,717

Claims priority, application Japan, Aug. 17, 1990, 2-215708

Int. Cl.⁵ H04B *1/74;* **H04L** *1/02*

U.S. Cl. 370—16 **2 Claims**



1. A hit-less protection switching method for ATM transmission lines comprising the steps-of:

selecting assigned cells from signals received through a normal transmission line and writing the selected assigned cells into a normal cell buffer;

selecting assigned cells from signals received through an emergency transmission line and writing the assigned cells into an emergency cell buffer;

reading a first assigned cell from said normal cell buffer with a first delay of a predetermined time and reading a second assigned cell from said emergency cell buffer with a second delay of a predetermined time simultaneously;

comparing contents of said first assigned cell with contents of said second assigned cell and detecting discrepancy between said contents;

changing a difference between said first delay of a predetermined time and said second delay of a predetermined time, when a state of the discrepancy between said contents is continuously detected for a predetermined time, so as to dissolve said state of the discrepancy; and

selecting one of said assigned cells read from said normal cell buffer and from said emergency cell buffer as communication information based on operation commands,

wherein said changing step includes a step of once stopping read-out from the cell buffer out of said normal cell buffer or said emergency cell buffer wherefrom assigned cells are previously read, and reading an assigned cell from the other cell buffer in the meantime when an idle cell is received as a received signal by a transmission line from which said assigned cells are previously read.

5,315,582

COMMUNICATIONS SYSTEM BETWEEN LAN'S OF DIFFERENT TYPES

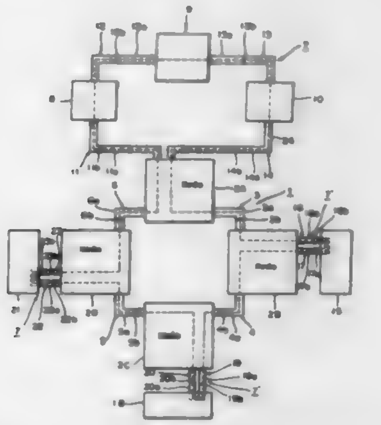
Toshiaki Morizono, and Takaaki Suga, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 25, 1991, Ser. No. 752,549

Claims priority, application Japan, Jan. 26, 1990, 2-14786

Int. Cl.^{5} H04J *3/14*

U.S. Cl. 370—16 **9 Claims**



1. A communication system for communicating between LANs of different types constituted of a backbone LAN having a plurality of nodes connected to form a ring through a pair of backbone LAN transmission lines and a plurality of branch LANs each having a plurality of terminals connected thereto, one of the branch LANs being connected to the backbone LAN at each node, said communications system being adapted such that a branch LAN frame containing the addresses of terminals communicating with each other is transmitted through the branch LANs and a backbone LAN frame containing the address of a destination is circulated through the backbone LAN, said communication system comprising:

means provided in each of said nodes for incorporating a branch LAN frame outputted from one of the terminals of one of the branch LANs into a backbone LAN frame;

means provided in each of the nodes for writing an address of an adjoining node on the downstream side of the ring into the backbone LAN frame in response to the incorporation of the branch LAN frame into the backbone LAN frame;

means provided in each of the nodes for reading the address in the backbone LAN frame; and

means provided in each of the nodes for separating the branch LAN frame from the backbone LAN frame when the address in the backbone LAN frame read by the address reading means coincides with an address of each of the nodes, said branch LAN frame separating means in cooperation with said address writing means and said address reading means allowing the branch LAN frame to be transmitted through the terminals in a predetermined sequence.

5,315,583

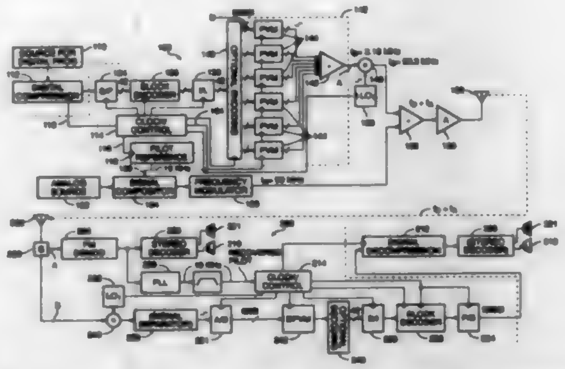
METHOD AND APPARATUS FOR DIGITAL AUDIO BROADCASTING AND RECEPTION

John L. Murphy, San Francisco, and Mark J. Rich, Menlo Park, both of Calif., assignors to USA Digital Radio, Los Angeles, Calif.

Filed Apr. 11, 1991, Ser. No. 684,529

Int. Cl.^{5} H04J *13/00*

U.S. Cl. 370—18 **25 Claims**



19. A method for transmitting, in a broadcast transmission and reception system, an analog signal and digitized program material, including an analog frequency modulated (fm) signal from a composite baseband signal, wherein said composite baseband signal includes a single unmodulated pilot tone, said method comprising the steps of:

encoding, in first signal processing means coupled to accept digitized program material from a source of digitized program material, said digitized program material according to an error-correcting block code of predetermined length and predetermined error correcting capability to produce a digital representation of a block encoded signal;

generating in second signal processing means an equivalent of a plurality of equivalent tones which are spaced equally at a baseband between 0 Hz and a selected maximum frequency, each of said equivalent tones being at a frequency which is an integer multiple of a base frequency tone and each one of said equivalent tones being constrained to be phase coherent with said unmodulated pilot tone by means of a master clock, and quadrature phase shift key (QPSK) modulating each one of said equivalent tones with said digital representation of said block-encoded signal thereby to distribute said digital representation of said block-encoded signal over substantially all of said equivalent tones in order to produce a multitone QPSK modulated signal at a selected intermediate frequency carrier signal;

linearly combining said analog fm signal and said multitone QPSK modulated signal, said multitone QPSK modulated signal having a magnitude when combined with said analog fm signal of at least 100 times less than the magnitude of said analog fm signal, to produce a combined information signal; and,

broadcasting said combined information through atmospheric free-space.

5,315,584

SYSTEM OF DATA TRANSMISSION BY SHARING IN THE TIME-FREQUENCY SPACE WITH CHANNEL ORGANIZATION

Jean-Yves Savary, Cesson Sevigne, and Floriane Blusseau, Thorigne Fouillard, both of France, assignors to France Telecom and Telediffusion de France, France

Filed Dec. 17, 1991, Ser. No. 808,676

Claims priority, application France, Dec. 19, 1990, 90 16383

Int. Cl.^{5} H04J *11/00*

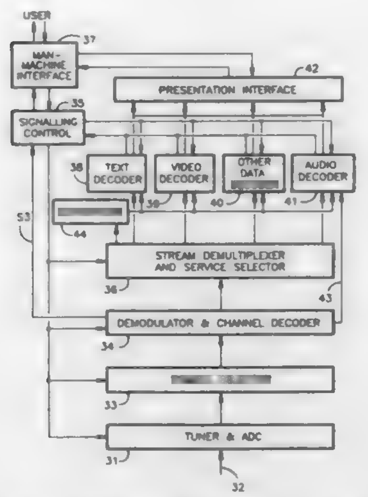
U.S. Cl. 370—18 **20 Claims**

1. A method of broadcasting a plurality of programs, each

program comprising at least one stream of digital information, each stream of digital information having a throughput rate which can vary with time, the method comprising the steps of

organizing the streams of digital information into a succession of frames composed of a predetermined number of symbols,

arranging each frame as a plurality of data conveying channels, each channel comprising at least one symbol and containing digital elements from only one of said streams of digital information,



modifying the number of symbols in each channel in response to variations in said throughput rate of each stream of digital information,

periodically encoding in at least one selected symbol in at least some of the frames at least one information element descriptive of the organization of the channels, and

simultaneously transmitting the digital elements of each symbol on a multiplex of orthogonal carrier frequencies.

5,315,585

ECHO CANCELLER USING TWO RESIDUAL ECHOES

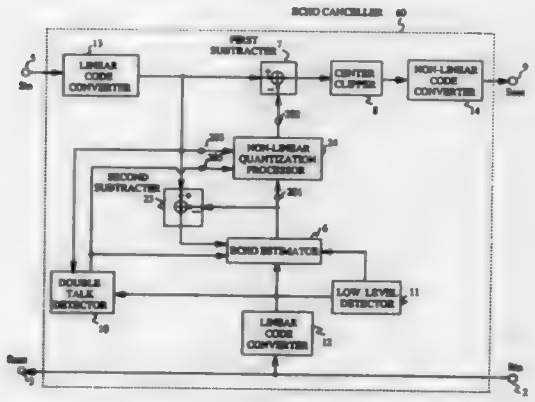
Shigeru Iizuka, Saitama, and Youtaro Yatsuzuka, Kanagawa, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd, Tokyo, Japan

Filed Apr. 29, 1993, Ser. No. 53,658

Claims priority, application Japan, May 15, 1992, 4-147963

Int. Cl.^{5} H04L *5/14*

U.S. Cl. 370—32.1 **6 Claims**



1. An echo canceller inserted in a four-wire circuit for cancelling an echo component in a transmit path comprising:

a first substracter inserted in said transmit path for substracting an optimum echo estimate at a first input of said first substracter from a linear transmit input signal at a second input of said first substracter so as to provide a first residual echo at an output of said first substracter which is a linear transmit output signal;

an echo estimator coupled with a receive path for synthesizing an echo estimate as an output from a linear receive input signal in said receive path by using an adaptive digital filter in said echo estimator;

a quantization processor, coupled with said echo estimator, for providing said optimum echo estimate based on said echo estimate of said echo estimator to said first substracter;

a second substracter, inserted for substracting either said echo estimate of the echo estimator or a quantized value of said echo estimate at a first input of said second substracter from said linear transmit input signal at a second input of said second substracter so as to provide a second residual echo at an output of said second substracter to said echo estimator; and

a double talk detector coupled with said receive path to detect a double talk situation between near-end and far-end talkers,

wherein

filter coefficients of said adaptive digital filter in said echo estimator are updated according to said second residual echo at said output of said second substracter and said linear receive input signal in said receive path,

said quantization processor includes a multi-output quantizer, which outputs a plurality of quantized echo estimates as candidates based on said echo estimate from said echo estimator, and an optimum echo estimate selector which chooses said optimum echo estimate minimizing a level of said first residual echo from said candidates supplied by said multi-output quantizer by comparing each of them with said linear transmit input signal,

said double talk detector informs said quantization processor so as to output one of a) said echo estimate and b) a quantized value corresponding to said echo estimate from said echo estimator as said optimum echo estimate during double talking and informs said echo estimator so as to make an adaptation speed of said filter coefficients either very slow or zero during double talking.

5,315,586

RESOURCE REALLOCATION FOR FLOW-ENFORCED USER TRAFFIC

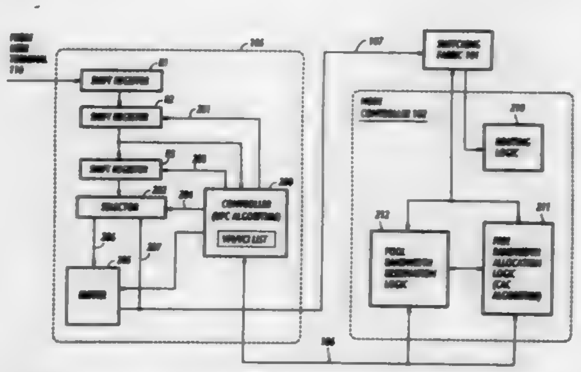
Eric Charvillat, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 29, 1992, Ser. No. 905,794

Claims priority, application Japan, Jun. 28, 1991, 3-157240

Int. Cl.^{5} H04J *3/26*

U.S. Cl. 370—60 **15 Claims**



1. A network node for a packet network comprising:

call admission control means responsive to a connection request from a user terminal for accepting or rejecting the connection request depending on the amount of resource requested by the user terminal, establishing a contract parameter value, and allocating a resource to said user terminal according to the established contract parameter value;

flow enforcement means including a buffer for allowing cells from said user terminal to be transmitted toward a destination terminal when said contract parameter value is not violated and storing the cells in said buffer when said contract parameter value is violated; and

resource reallocation means responsive to receipt of a reallocation request from said user terminal when occupancy of said buffer is higher than a predefined value and allocating an additional resource to said user terminal.

5,315,587
DATA FLOW CONTROL

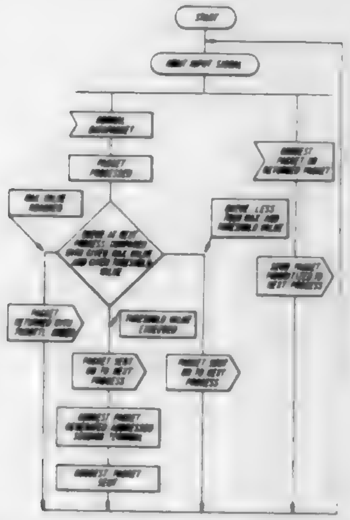
Jan Kullander, Göthenburg, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 2, 1992, Ser. No. 955,412

Claims priority, application Sweden, Oct. 4, 1991, 9102893-6

Int. Cl.⁵ H04L *12/56;* **H04J** *3/16*

U.S. Cl. 370—60 **17 Claims**



1. A method for monitoring and controlling dataflow in a packet data network or a datagram network comprising a plurality of lines and a plurality of nodes, the lines connecting a plurality of terminals with each other via the nodes, the lines and nodes forming paths through the network, between which terminals flow data packets/datagrams, every line and every node respectively comprising a line process and a routing process respectively preceded by a queue of data packets/datagrams and loading terminals among the plurality of terminals sending in data packet/datagrams into the network with a respective frequency during a respective time interval, comprising the steps of sending data packets/datagrams directly into the network without preceding control-packets with frequencies which successively increase at a predetermined rate for successive elapsed time intervals during which not throttling order was received from the line processes and routing processes, and sending data packets/datagrams with frequencies which successively decrease at a second predetermined rate for elapsed time intervals during which at least one throttling order has been received from the line processes and the routing processes.

5,315,588
METHOD OF CONTROLLING FRAME-RELAY MODULE, AND HIGH-SPEED SWITCHING SYSTEM

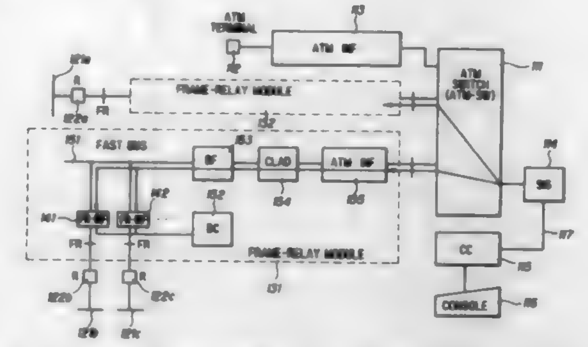
Yasuhiro Kajiwara, and Shigehiko Yazawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 7, 1993, Ser. No. 117,448

Claims priority, application Japan, Mar. 19, 1993, 5-059992

Int. Cl.⁵ H04J *3/26*

U.S. Cl. 370—60.1 **10 Claims**



1. A method of controlling a frame-relay module having a plurality of frame-relay interface circuits, each of which is equipped with a logical-path setting table, for adding logical-path information to a frame, which has entered from a local fast bus, upon referring to said logical-path setting table, and for accepting a frame sent from another party and then sending the frame to the local fast bus, a cell assembly/disassembly circuit for assembling a frame into an ATM cell and disassembling an ATM cell into a frame, and an ATM interface circuit for sending an ATM cell that has entered from the cell assembly/disassembly circuit to an ATM switch and inputting an ATM cell, which has entered from the ATM switch, to the cell assembly/disassembly circuit, said method comprising the steps of:

outputting a control-information frame from a control unit connected to the ATM switch, said control-information frame containing data specifying a frame-relay interface circuit as well as a processing command;

assembling said control-information frame into an ATM cell and sending said ATM cell, via the ATM switch, to a frame-relay module in which the specified frame-relay interface circuit is present;

restoring the ATM cell to a control-information frame by the ATM interface circuit and cell assembly/disassembly circuit in the frame-relay module;

causing the specified frame-relay interface circuit to accept said control-information frame; and

executing processing, which conforms to the command contained in the control-information frame, in the frame-relay interface circuit.

5,315,589
TDMA SYNCHRONIZATION USING VISIBILITY DESIGNATION

W. Robert Kepley, Gaithersburg; Stanley E. Kay, Rockville; Ashim Roy, North Potomac; Steven M. Kee, Rockville; Carle C. Henson, III, Damascus; Adrian J. Morris, and Randy Drago, both of Gaithersburg, all of Md., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 3, 1991, Ser. No. 770,206

Int. Cl.⁵ H04Q *11/04*

U.S. Cl. 370—62 **23 Claims**

1. A method of collecting and distributing data useful for control of a TDMA conference of stations comprising the steps of:

a) determining, a given station, which of the other stations in the conference have transmitted a signal which is received at the given station,

b) receiving reports, at the given station, respecting the visibility of stations in the conference to stations other than the given station,

c) combining the information collected in steps a) and b),

d) processing said combined information and transmitting said processed information from the given station to others of the stations in the conference.

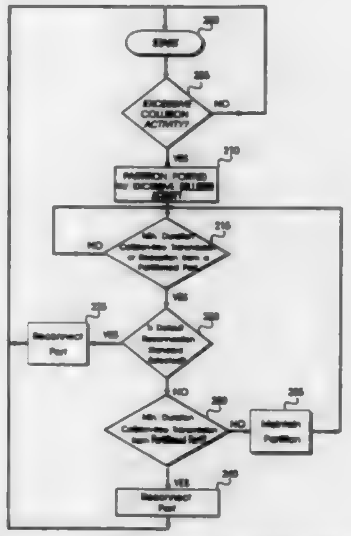
5,315,590
SELECTABLE REPEATER PORT RECONNECTION METHOD AND APPARATUS

Nader Vijeh, Cupertino, and David Staab, San Jose, both of Calif., assignors to Advanced Micro Devices Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 556,046, Jul. 20, 1990, Pat. No. 5,265,123, and a continuation-in-part of Ser. No. 480,426, Feb. 15, 1990, Pat. No. 5,164,960. This application Oct. 10, 1990, Ser. No. 594,929

Int. Cl.⁵ H04B *3/36*

U.S. Cl. 370—79 **9 Claims**



1. A method for reconnecting a partitioned port in a repeater having a plurality of ports, comprising the steps of:

detecting excessive collision activity for a particular one port of the plurality of ports;

partitioning said particular one port;

checking for lack of data collisions only during transmissions from said particular one port; and

reconnecting said particular one port only when said particular one port transmits collision-free for a predetermined time period.

5,315,591
METHOD AND APPARATUS FOR CONTROLLING CONGESTION IN PACKET SWITCHING NETWORKS

Jason B. Brent; Edward Hatala, both of Wiltshire, and John Timms, Berkshire, all of Great Britain, assignors to Cray Communications Limited, Berkshire, Great Britain

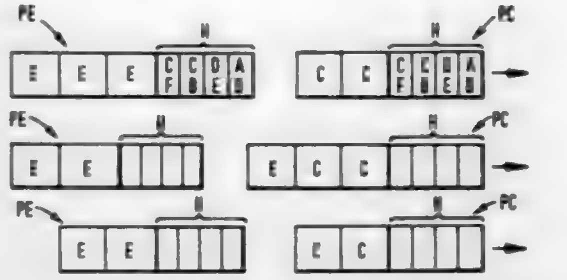
Filed Nov. 23, 1992, Ser. No. 981,937

Claims priority, application United Kingdom, Nov. 23, 1991, 9124913

Int. Cl.⁵ H04L *12/56*

U.S. Cl. 370—85.6 **12 Claims**

1. A method of controlling congestion in a packet transmission system comprising formatting information to be transmitted into blocks according to whether it is core information or enhancement information, transmitting the blocks of core information in core packets and transmitting at least some of the blocks of enhancement information in enhancement packets which are separate from the core packets and which are each marked with a discard marker, and discarding said enhancement packets under congestion conditions by reference to said discard marker only, so as to relieve congestion.



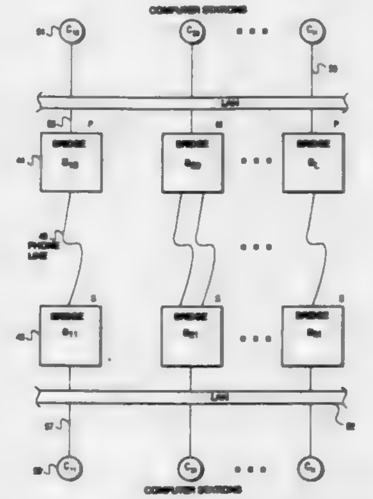
5,315,592
PARALLEL BRIDGING

George E. Conant, Acton; Steven H. Sherry, Lynnfield, and Scott G. Wasson, Shrewsbury, all of Mass., assignors to Xyplex Inc., Boxborough, Mass.

Filed Apr. 23, 1992, Ser. No. 872,516

Int. Cl.⁵ H04J *3/02*

U.S. Cl. 370—85.13 **5 Claims**



1. Apparatus for transmitting information packets over parallel paths between first and second terminals in a network having other terminals while maintaining conformity with a protocol that precludes establishing loops formed by links between terminals that allow information packets to recirculate indefinitely comprising,

first and second terminals,

a first pair of bridges interconnected by a first link with each bridge connected to a respective one of said first and second terminals,

a second pair of bridges interconnected by a second link with each bridge connected to a respective one of said first and second terminals,

a bridge in each of said first pair of bridges and said second pair of bridges being designatable as a master bridge and having a forwarding/filtering module for forwarding and filtering information packet transfer between said first and second terminals, a topology recognition/traffic assignment module for sensing the existence of said first and second links between said first and second terminals and assigning information packets to respective ones of said first and second links for transferring between said first and second terminals, and a spanning tree module for providing a spanning tree bridge identifier signal,

and a spanning tree bridge identifier signal sensor for sensing said spanning tree bridge identifier signal and designating as a master that bridge having the spanning tree bridge identifier signal meeting a predetermined condition,

wherein said spanning tree bridge identifier signal is characterized by a quantizable value and said spanning tree bridge identifier signal sensor designates as the master that bridge having the spanning tree bridge identifier signal with a value that is one of lower and higher than the values of all other spanning tree bridge identifier signals for other bridges in parallel paths between said first and second terminals.

5,315,593
COMMUNICATION CONTROL UNIT

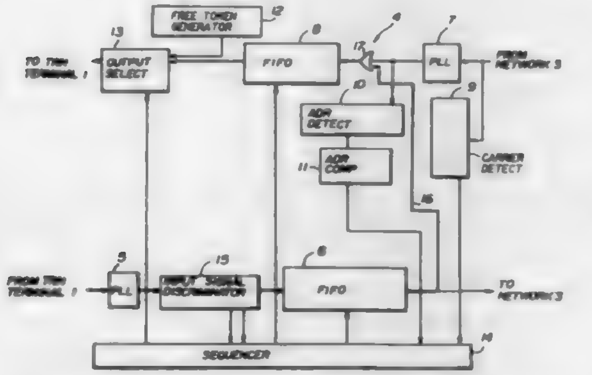
Osamu Adachi, Hiratsuka, and Kazunori Hoshi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 3, 1992, Ser. No. 816,581

Claims priority, application Japan, Jan. 8, 1991, 3-11484; Jan. 8, 1991, 3-11485; Jan. 8, 1991, 3-11486; Jan. 8, 1991, 3-11487; Jan. 8, 1991, 3-11489; Mar. 20, 1991, 3-56394

Int. Cl.^{5} H04L *12/28*

U.S. Cl. 370—94.3 **21 Claims**



1. A communication control unit for providing an interface between a node apparatus of a lattice communication network and a terminal in conformance with a token ring network standard, said communication control unit comprising:

- first memory means for temporarily storing an input frame from the terminal;
- second memory means for temporarily storing an input frame from the lattice communication network;
- input signal discriminator means, coupled to said first memory means, for detecting a MAC frame which is used for ring management from the input frame from the terminal;
- control means, coupled to said first and second memory means and said input signal discriminator means for controlling operation timings of at least said first and second memory means; and
- a return path for returning the MAC frame to the terminal with a priority over other frame when said input signal discriminator means detects the MAC frame.

5,315,594
INTER-NETWORK TRANSPORT ELEMENT OF SONET OVERHEAD

Francis G. Noser, Raleigh, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

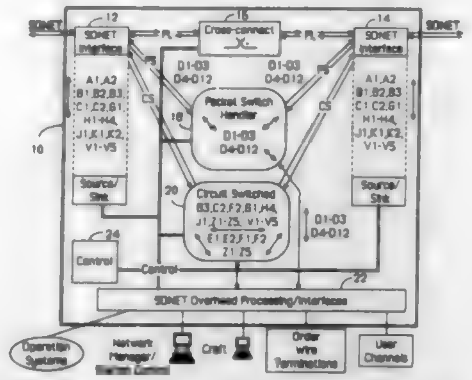
Filed Mar. 2, 1992, Ser. No. 844,245

Int. Cl.^{5} H04J *3/12*

U.S. Cl. 370—110.1 **8 Claims**

4. A method, comprising the steps of:

- receiving, in a cross-connect, a plurality of SONET signals having overhead and payload signal information therein;
- grouping selected overhead signal information from the plurality of SONET signals as pseudo-payload signal information; and



- transporting the pseudo-payload signal information as a payload signal.

5,315,595
PACKET MODE METHOD AND CONCENTRATOR ARRANGEMENT FOR DATA TERMINALS SERVED BY AN ISDN

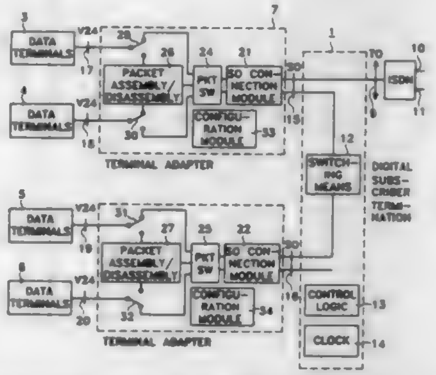
Jacques Allouis, Ostwald, and Jean-Claude Fuhrer, Fegersheim, both of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 6, 1992, Ser. No. 848,419

Claims priority, application France, Mar. 8, 1991, 91 02819

Int. Cl.^{5} H04J *3/12;* **H04L** *12/56*

U.S. Cl. 370—110.1 **11 Claims**



1. Concentration method adapted to enable a plurality of synchronous or asynchronous data terminals to be served by a common ISDN data B channel to which said terminals are connected via a digital subscriber termination and terminal adapters for transmission of data in packet mode, said data terminals being connected to said terminal adapters via digital interfaces and said terminal adapters being connected to said digital subscriber termination at a basic access level providing access to first and second ISDN data B channels and to an ISDN signalling D channel, comprising the steps for providing B channel communication between a first data terminal served by a first terminal adapter and a packet mode ISDN port to which a second data terminal already has access via a second terminal adapter and the first B channel:

- establishing a transit connection between said first and second terminal adapters via said digital subscriber termination and the second B channel,
- passing data packets to be transmitted between the first data terminal and said packet mode ISDN port via said transit connection, the second terminal adapter and the first B channel, and
- passing data packets to be transmitted between the second data terminal and said packet mode ISDN port also via the second terminal adapter and the first B channel.

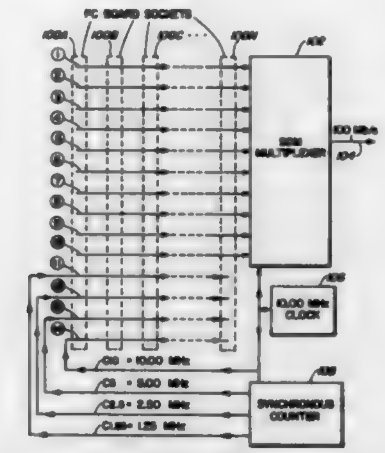
5,315,596
DIGITAL MULTIPLEXER WITH LOGICALLY ALLOCATABLE CHANNELS AND BIT RATES

Townes T. H. Lee, Regina, Canada, assignor to Canadian Institute for Broadband & Information Network Technologies, Inc. (CIBINT), Regina, Canada

Filed Apr. 17, 1992, Ser. No. 870,456

Int. Cl.^{5} H04J *3/04*

U.S. Cl. 370—112 **21 Claims**



1. A data multiplexer-demultiplexer system comprising:

- (a) a space division multiplexer for receiving a first clock signal at a first clock rate and having a first number of space divided SDM (Space Division Multiplex) data channels, each of said data channels being adapted to carry at said first clock rate a second number of time divided TDM (time Division Multiplex) sub-channels received from one or more external data signal sources;
- (b) means for receiving said first clock signal and generating a group of second clock rate signals defining second clock rates derived from said first clock rate;
- (c) means in communication with said data channels for selecting at least one of said TDM sub-channels by using at least one of said second clock rates, combinations and multiples thereof;
- (d) means for selecting and sampling in said multiplexer (multiplex sampling) at least one data signal received or derived from external signal sources, at said at least one of the second clock rates, combinations and multiples thereof, and placing said selected at least one multiplex sampled data signal into said selected at least one TDM sub-channel;
- (e) means in communication with said data channels for selecting an SDM data channel to which said selected at least one multiplex sampled data signal is applied;
- (f) means in communication with said data channels for applying said selected at least one multiplex sampled data signal to said selected SDM data channel; and
- (g) means for providing when required, at least one of said second clock rates, combinations and multiples thereof to said one or more external data signal sources.

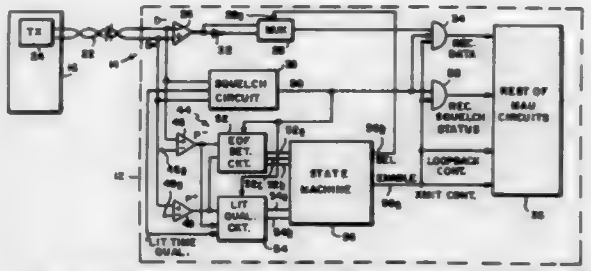
5,315,597
METHOD AND MEANS FOR AUTOMATICALLY DETECTING AND CORRECTING A POLARLITY ERROR IN TWISTED-PAIR MEDIA

Henry S. Yang, Andover, Mass., and William C. Mallard, Jr., Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 8, 1992, Ser. No. 880,455

Int. Cl.^{5} H04L *12/40*

U.S. Cl. 371—20.1 **56 Claims**



1. A circuit for testing the link integrity and correcting the polarity of LAN link transmission media coupled to the MAU circuit of a LAN device that receives the transmission of data which includes link integrity test (LIT) pulses and frames including end of frame delimiter (EOF) waveforms, said circuit comprising

- sensing means receiving said transmission and sensing the polarity of a first EOF waveform and succeeding EOF waveforms and producing signals indicative of same;
- counter means responsive to said signals for counting consecutive EOF waveforms having the same polarity as the first EOF waveform and providing an enabling signal when the count equals or exceeds a selected number;
- means for producing a selection signal when an EOF waveform of the opposite polarity to said first EOF waveform is received by said sensing means and clearing said counter means in response thereto;
- polarity switching means receiving said transmission and being responsive to said selection signal for inverting said transmission, and
- logic means receiving said transmission from said polarity switching means and being responsive to said enabling signal for passing said transmission.

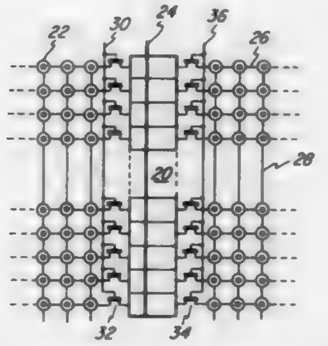
5,315,598
METHOD TO REDUCE BURN-IN TIME AND INDUCING INFANT FAILURE

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1991, Ser. No. 680,662

Int. Cl.^{5} G01R *31/28*

U.S. Cl. 371—21.1 **20 Claims**



1. A method of testing any portion of a plurality of memory

cells and the pass gates of transistors connecting said memory cells to datalines of a memory device, said method comprising:

- a. accessing every memory cell of said portion of said plurality of memory cells;
- b. supplying a positive voltage to a first electrode of said every memory cell of said portion concurrently with supplying a lower voltage to another electrode of said every memory cell;
- c. supplying a positive voltage to every said pass gate of transistors connecting said each memory cell of said portion to said datalines; and
- d. evaluating the condition of said memory cells and pass gates to determine the acceptance or rejection of the memory cells or pass gates.

5,315,599

MICROPROCESSOR-BASED MONITORING OR PROTECTION DEVICE COMPRISING AN ANALOG DATA ACQUISITION SYSTEM

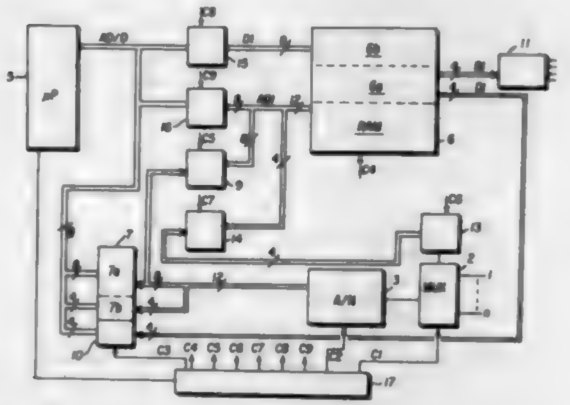
Gilbert Chaboud, Seyssinet, and Yvan Kalenine, St. Ismier, both of France, assignors to Merlin Gerin, France

Filed Oct. 8, 1991, Ser. No. 772,858

Claims priority, application France, Oct. 23, 1990, 90 13217

Int. Cl.^{5} G01R *31/28;* G06F *11/00*

U.S. Cl. 371—25.1 **12 Claims**



10. An apparatus comprising;

an analog-to-digital converter for converting analog input signals into digital samples representative of the analog input signals, wherein the digital samples includes a plurality of high bits and low bits;

a random access memory unit including a comparison zone and a storage zone, wherein the comparison zone contains a plurality of storage locations containing comparison result data corresponding to a comparison of the digital samples with a plurality of predetermined thresholds;

first bus means for applying the high bits of the digital samples to the random access memory unit to address the storage locations in the comparison zone, wherein the comparison data is then supplied to a data output of the random access memory unit;

a first buffer memory coupled to an output of the analog-to-digital converter, wherein the first buffer memory includes a first storage part that receives the high bits of the digital samples and a second storage part that receives the low bits of the digital samples;

a second buffer memory coupled to the data output of the random access memory unit to receive the comparison results data;

second bus means for addressing the storage zone of the random access memory and transferring the high bits of the digital samples from the first part of the first buffer memory to the storage zone during a first read cycle, and for transferring the low bits of the digital samples from the second part of the first buffer memory and the comparison result data from the second buffer memory to the storage zone during a second read cycle;

a microprocessor coupled to an output of the first buffer memory and the second buffer memory, wherein the microprocessor reads the high bits of the digital samples from the first part of the first buffer memory during the first read cycle, and the low bits of the digital samples from the second part of the first buffer memory and the comparison result data from the second buffer memory during the second read cycle; and

a monitoring circuit for synchronizing the operation of the analog-to-digital converter, the random access memory unit, the first and second bus means, the first and second buffer memories and the microprocessor.

5,315,600

ERROR CORRECTION SYSTEM INCLUDING A PLURALITY OF PROCESSOR ELEMENTS WHICH ARE CAPABLE OF PERFORMING SEVERAL KINDS OF PROCESSING FOR ERROR CORRECTION IN PARALLEL

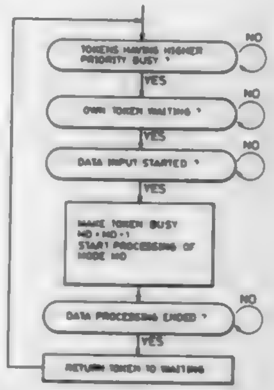
Keiichi Iwamura, Kawasaki; Takayuki Aizawa, Yokohama; Izumi Narita, Koganei, and Takatoshi Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 711,990

Claims priority, application Japan, Jun. 28, 1990, 2-168331

Int. Cl.^{5} G06F *11/00*

U.S. Cl. 371—37.6 **8 Claims**



1. An error correction system comprising:

a plurality of processing elements capable of parallel operation while being connected to one another, each of which comprises:

detection means for detecting a condition of a respective element and conditions of elements having a higher priority than the respective element;

processing means capable of executing each step in a series of processing steps for error correction;

recognition means for recognizing a processing step to be performed for data serving as an object of processing among said series of processing steps; and

control means for controlling said processing means to execute the processing recognized by said recognition means when said detection means detects that all the elements having a higher priority are incapable of performing processing and the respective element is capable of performing processing.

5,315,601

ERROR CORRECTION METHOD AND APPARATUS THEREOF

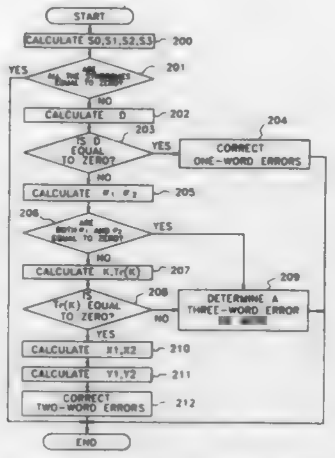
Man-young Lee; Hak-song Park, both of Seoul; Young-cheol Kim; Tae-yong Kim, both of Incheon; Yong-jin Choi, and Jae-moon Kim, both of Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea

Filed May 30, 1991, Ser. No. 707,811

Claims priority, application Rep. of Korea, Jan. 31, 1991, 91-1859

Int. Cl.^{5} G06F *11/10*

U.S. Cl. 371—39.1 **3 Claims**



1. An error correction method for correcting errors in received digital data signals, comprising the steps of:

obtaining four syndromes S_0, S_1, S_2 and S_3 by operating on a block of data V^T composed of n received digital data words with a parity check matrix H such that

$$H \cdot V^T = \begin{bmatrix} S_0 \\ S_1 \\ S_2 \\ S_3 \end{bmatrix};$$

determining no errors when said syndromes S_0, S_1, S_2 and S_3 satisfy $S_0=S_1=S_2=S_3=0$;

calculating $D=S_0\,S_2+S_1^2$ from said syndromes S_0, S_1, S_2 and S_3 and determining whether D is equal to zero;

calculating the following coefficients σ_1 and σ_2, if D is not equal to zero:

$$\sigma_1 = \frac{S_0\,S_3 + S_1\,S_2}{D}$$

$$\sigma_2 = \frac{S_1\,S_3 + S_2^2}{D}$$

obtaining the following coefficient K and the value Tr(K), when said coefficients σ_1 and σ_2 are not equal to zero:

$$\begin{aligned} K &= \frac{\sigma^2}{\sigma_1^2} \\ &= k_0 + k_1\,\alpha + k_2\,\alpha^2 + k_3\,\alpha^3 + k_4\,\alpha^4 + k_5\,\alpha^5 + \\ &\quad k_6\,\alpha^6 + k_7\,\alpha^7 \end{aligned}$$

$$Tr(K) = k_0\,TR(1) + k_1\,Tr(\alpha) + k_2\,TR(\alpha^2) + k_3\,Tr(\alpha^3) + k_4\,Tr(\alpha^4) + k_5\,Tr(\alpha^5) + k_6\,Tr(\alpha^6) + k_7\,Tr(\alpha^7)$$

obtaining the following error locations X_1 and X_2 from said coefficient K:

$$X_1 = X_1\sigma_1$$

$$X_2 = (1+X_1)\sigma_1$$

where, from Tr $(\alpha^5)=1$, the following is derived:

$$\begin{aligned} x_1 &= [k_0, k_1, k_2, k_3, k_4, k_5, k_6, k_7] \\ &\quad \begin{bmatrix} 01101011 \\ 00010111 \\ 01010111 \\ 10110100 \\ 01110111 \\ 10000000 \\ 10100100 \\ 00001010 \end{bmatrix} \\ &= (X_0, X_1, X_2, X_3, X_4, X_5, X_6, X_7) \end{aligned}$$

obtaining the following error values Y_1 and Y_2 from said error locations X_1 and X_2:

$$Y_1 = \frac{S_0\,X_2 + S_1}{X_1 + X_2}$$

$$Y_2 = \frac{S_0\,X_1 + S_1}{X_1 + X_2}$$

and correcting two-word errors where $K \in GF(2^8)$ by adding said error values Y_1 and Y_2 to said received digital data word signals.

5,315,602

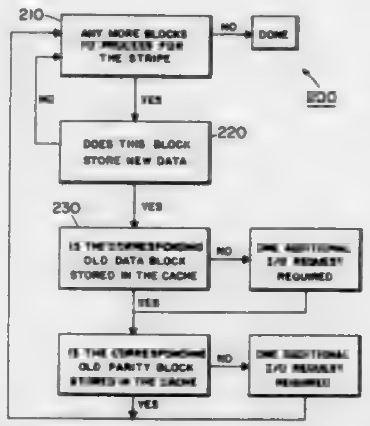
OPTIMIZED STRIPE DETECTION FOR REDUNDANT ARRAYS OF DISK DRIVES

Eric S. Noya, Groton; Randy M. Arnott, Clinton, and Mitchell N. Rosich, Groton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 12, 1992, Ser. No. 929,076

Int. Cl.^{5} G06F *11/10*

U.S. Cl. 371—40.4 **10 Claims**


210
ANY MORE BLOCKS TO PROCESS FOR THE STRIPE
NO
DONE
200
NO
YES
220
DOES THIS BLOCK STORE NEW DATA
230
YES
IS THE CORRESPONDING OLD DATA BLOCK STORED IN THE CACHE
NO
ONE ADDITIONAL I/O REQUEST REQUIRED
YES
IS THE CORRESPONDING OLD PARITY BLOCK STORED IN THE CACHE
NO
ONE ADDITIONAL I/O REQUEST REQUIRED
YES

1. An apparatus for generating parity data for a plurality of disk drives, each of the plurality of disk drives divided into a plurality of blocks, the plurality of blocks further organized into a plurality of stripes, each of the plurality of stripes including one block from each of the plurality of disk drives, one of the blocks of each stripe storing parity data generated from the data stored in the other blocks of the stripe, the apparatus comprising;

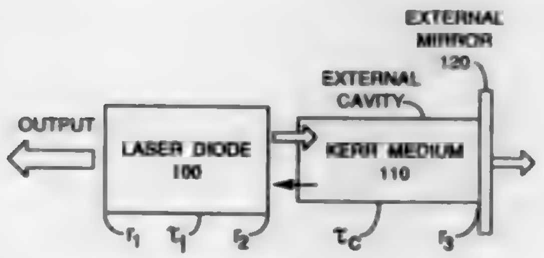
memory means for storing data, said memory means parti-

tioned into blocks compatible with the block structure of the plurality of disk drives;
means for identifying an updated memory block storing data to be written to one of the plurality of disk drives;
means for identifying a predetermined stripe, said predetermined stripe including a disk block to be overwritten by said updated memory block;
first means for determining the number of I/O requests required to aggregate in said memory means all of the data, except the parity data, of said predetermined stripe;
second means for determining the number of I/O requests required to aggregate in said memory means said block to be overwritten and the parity block of said predetermined stripe; and
means for choosing said first means OR said second means to perform said I/O requests by choosing the means which requires the fewest number of I/O requests to aggregate in said memory means the blocks of said identified stripe necessary to generate the parity data of said predetermined stripe.

5,315,603
BACKSCATTER ABSORPTION FOR LASER DIODES

Phillip R. Peterson, and Athanasios Gavrielides, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 11, 1993, Ser. No. 3,065
Int. Cl.⁵ H01S *3/10*
U.S. Cl. 372—21 **4 Claims**



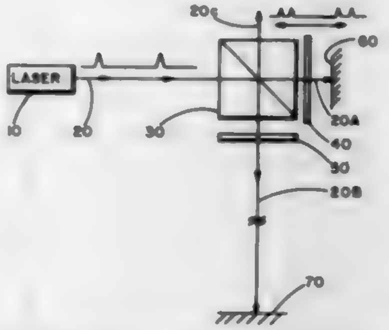
1. A laser system comprising:
a laser which emits a coherent emission when driven with a driving signal, wherein said laser comprises a laser diode; and
a means for driving said laser with said driving signal, said driving means being coupled with said laser to supply said driving signal along with backscattered light thereto, said driving means being filled with a medium material which absorbs said backscattered light, wherein said driving means comprises an external laser cavity containing nonlinear Kerr material which absorbs said backscattered light, wherein said medium material consists of polydiacetylene.

5,315,604
OPTICAL STRUCTURE FOR ADJUSTING THE PEAK POWER OF A LASER BEAM

George Chiu, Cross River, N.Y.; Rama N. Singh, Bethel, Conn., and Janusz S. Wilczynski, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1993, Ser. No. 10,207
Int. Cl.⁵ G01B *9/02*
U.S. Cl. 372—25 **8 Claims**

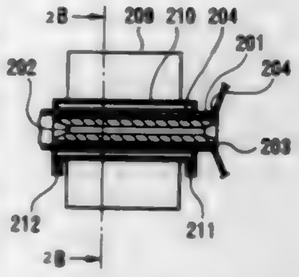
1. An optical structure for adjusting the peak power of a pulsed laser beam from a laser comprising:
at least one beam splitting means disposed in the path of a pulsed laser beam consisting of a sequence of pulses occurring at the same fixed time intervals for splitting said pulsed, laser beam into first and second component pulsed laser beams, wherein said second component pulsed laser beam is directed in a path different from the path of said first component pulsed laser beam,
first reflective means in the path of said first component pulsed laser beam for reflecting said first component pulsed laser beam back to said beam splitting means with a first amount of pulse time delay applied to said pulses occurring at said fixed time intervals,
second reflective means in the path of said second component pulsed laser beam for reflecting said second component pulsed laser beam back to said beam splitting means with a second amount of pulse time delay applied to said pulses occurring at said fixed time intervals,
said first and second reflected component pulsed laser beams containing said timed delayed pulses having said first and second amount of time delay being combined at said beam splitter to form a third pulsed laser beam wherein said third pulsed laser beam that includes said combined time delayed pulses from said first and second reflected component pulsed laser beams and has a peak power less than the peak power of said pulsed laser beam from said laser.



5,315,605
ION LASER APPARATUS

Yoshio Nakazawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 12, 1993, Ser. No. 3,272
Claims priority, application Japan, Jan. 24, 1992, 4-034286
Int. Cl.⁵ H01S *3/04*
U.S. Cl. 372—34 **4 Claims**

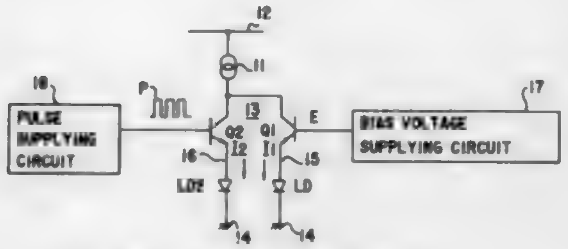


1. An ion laser apparatus comprising:
a laser tube including a laser capillary having a discharge path between an anode and a hot cathode and a feedback path for ian internal gas inside of:
a pipe member constituting a cooling liquid channel for enabling a cooling liquid to flow between an outer peripheral surface of said laser capillary and an inner peripheral surface thereof in order to cool a said laser tube, the inner peripheral surface of said pipe member being in partial contact with the outer peripheral portion of said laser capillary; and
air cooling heat radiation fins, fixed on an outer peripheral surface of said pipe member in correspondence with a contact portion between the inner peripheral surface of said pipe member and the outer peripheral surface of said laser capillary, or directly radiating heat, which is generated by said laser capillary, without requiring a heat transfer through the cooling liquid.

5,315,606
LASER DIODE DRIVING CIRCUIT

Haruo Tanaka, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jan. 5, 1993, Ser. No. 997,707
Claims priority, application Japan, Jan. 13, 1992, 4-003798
Int. Cl.⁵ H01S *3/00*
U.S. Cl. 372—38 **7 Claims**



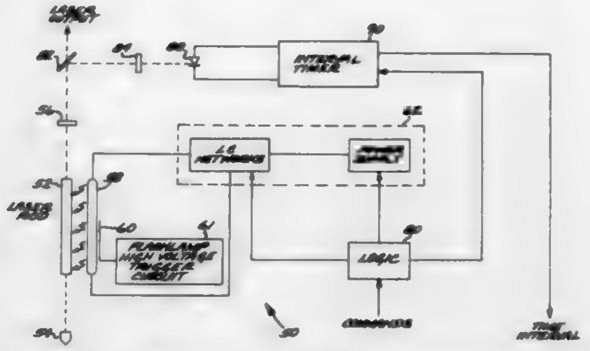
1. A laser diode driving circuit comprising:
a constant current source;
a first series circuit connected to said constant current source, said first series circuit comprising a first switching device and a laser diode connected thereto, said first switching device providing current to said laser diode, and
a second series circuit connected to said constant current source and said first series circuit, thereby forming a differential circuit; said second series circuit comprising a second switching device in series with an impedance device, wherein a switching of said first and second switching devices is controlled based upon a differential between a pulse voltage applied to said second switching device and a bias voltage applied to said first switching device, such that a high level of said pulse voltage is higher than said bias voltage, and a low level of said pulse voltage is lower than said bias voltage,
wherein said impedance device has an impedance which corresponds to an impedance of said laser diode such that an impedance of said first series circuit when said first switching device is ON is substantially the same as an impedance of said second series circuit when said second switching device is ON and wherein said laser diode is turned ON and OFF by the switching of said second switching device, such that when said second switching device is ON said laser diode is OFF, and when said second switching device is OFF, said laser diode is ON, such that uniform and precise laser light is irradiated from said laser diode.

5,315,607
DUAL USE POWER SUPPLY CONFIGURATION FOR THE DOUBLE PULSED FLASHLAMP PUMPED DYE LASER

Keith E. Nielsen, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 9, 1993, Ser. No. 28,496
Int. Cl.⁵ H01S *3/00*
U.S. Cl. 372—38 **12 Claims**

1. A dual pulse flashlamp-pumped laser system, comprising:
laser cavity-defining means with laser material disposed therein;
a flashlamp means for providing pump light to excite said laser material, said flashlamp means comprising a gas-filled lamp chamber;
means for ionizing said gas in said flashlamp;
means for discharging a first current pulse through said flashlamp to cause a first high intensity light flash and thereby pumping said laser material to emit a first laser pulse;
means for maintaining said gas in said ionized state for a predetermined time interval after said first current pulse until a second current pulse is discharged through said flashlamp; and

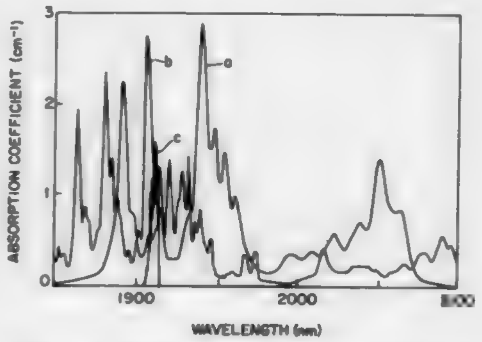


means for discharging a second current pulse through said flashlamp a delay time interval after said first current pulse, thereby pumping said laser material to emit a second laser pulse.

5,315,608
HOLMIUM-DOPED SOLID STATE OPTICALLY PUMPED LASER

Hong K. Choi; Stephen J. Eglash, both of Concord; Tso Y. Fan, Cambridge, and C. David Nabors, Bedford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 880,622, May 8, 1992, Pat. No. 5,251,225. This application Jul. 17, 1992, Ser. No. 916,467
Int. Cl.⁵ H01S *3/16*
U.S. Cl. 372—41 **18 Claims**



1. An optically pumped solid state laser system comprising:
a) a solid state host medium doped with a holmium activator and enclosed in an optical cavity; and
b) a pump source means external to said medium for generating optical radiation within a wavelength band of from 1.8 to 210 microns for direct absorption by said holmium activator to stimulate emission of light at a wavelength of from 2.0 to 2.2 microns.

5,315,609
SEMICONDUCTOR LASER MODULE WITH LENS HOLDER COMPENSATING FOR THERMAL STRESS

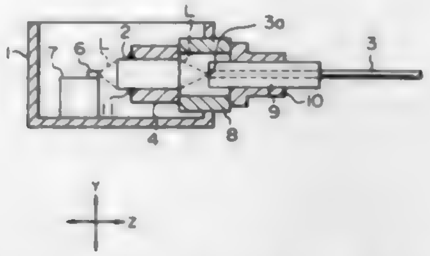
Tsuyoshi Tanaka, Yokohama; Satoshi Aoki, Chigasaki, and Kazuyuki Fukuda, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1992, Ser. No. 968,668

Claims priority, application Japan, Oct. 30, 1991, 3-310195

Int. Cl.^{5} H01S *3/18;* **G02B** *6/26*

U.S. Cl. 372—43 **5 Claims**



1. A semiconductor laser module formed by fixing to a package a holding member for holding a rod lens for converging a laser light from a semiconductor laser, and coupling said laser light to an optical fiber, wherein said holding member is formed in a two-piece structure including a holder part formed as a first material and fixedly soldered to said package and a lens holder part formed of a second material different from said first material, said lens holder part being fixedly soldered to one inner end face of said holder part within said package, an opposite other end face of said holder part having said optical fiber passing therethrough, wherein said second material of said lens holder part has a thermal expansion coefficient near a thermal expansion coefficient of said lens, and wherein said lens holder part is fixedly soldered to said rod lens with a high-melting-point solder.

5,315,610
SYSTEM FOR CONTROLLING THE FLOW OF GAS INTO AND OUT OF A GAS LASER

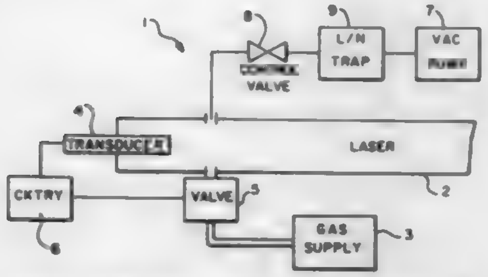
Terry Alger, Tracy; Dennis M. Uhlich; William J. Benett, both of Livermore, and Earl R. Ault, Dublin, all of Calif., assignors to The United States of America as represented the the Unites States Department of Energy, Washington, D.C.

Filed Sep. 22, 1986, Ser. No. 911,189

The portion of the term of this patent subsequent to Aug. 24, 2010, has been disclaimed.

Int. Cl.^{5} H01S *3/00*

U.S. Cl. 372—55 **11 Claims**



1. An assembly for controlling the flow of gas out of a gas laser, comprising: a vacuum pump; conduit means extending between said laser and vacuum pump and cooperating with the latter for drawing gas out of said laser; and a capillary tube arrangement forming part of and located within a flow line of said conduit means between said laser and vacuum pump, said capillary tube arrangement being configured to function as a flow constriction within said line for dropping the pressure between said laser and pump sufficiently low to cause the pump to operate in the molecular flow region while the pressure within the laser is sufficiently high to operate in the viscous flow region, said capillary tube arrangement being sufficiently long so as to define an upstream section, flow wise, which operates within the viscous flow region and a downstream section, flow wise, which operates within the molecular flow region.

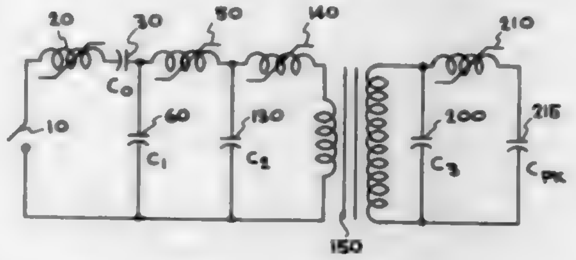
5,315,611
HIGH AVERAGE POWER MAGNETIC MODULATOR FOR METAL VAPOR LASERS

Don G. Ball, Livermore; Daniel L. Birx, Oakley; Edward G. Cook, and John L. Miller, both of Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 915,197, Sep. 29, 1986, Pat. No. 5,189,628, and a continuation-in-part of Ser. No. 336,451, Mar. 15, 1989, Pat. No. 5,177,754, which is a continuation of Ser. No. 915,163, Sep. 25, 1986, abandoned. This application Jun. 12, 1992, Ser. No. 898,105

Int. Cl.^{5} H01S *3/22*

U.S. Cl. 372—56 **23 Claims**



1. A magnetic modulator comprising:

pulse compression apparatus having as an input a first series of electrical pulses having a first pulse width and a first voltage amplitude and as an output a second series of electrical pulses having a second pulse width and said first voltage amplitude, wherein said first pulse width is of longer duration than said second pulse width,

a transformer having as an input said second series of electrical pulses having said first voltage amplitude and as an output a third series of electrical pulses having a second voltage amplitude, wherein said second voltage amplitude is greater than said first voltage amplitude,

said transformer having a step-up ratio of greater than 1:1.

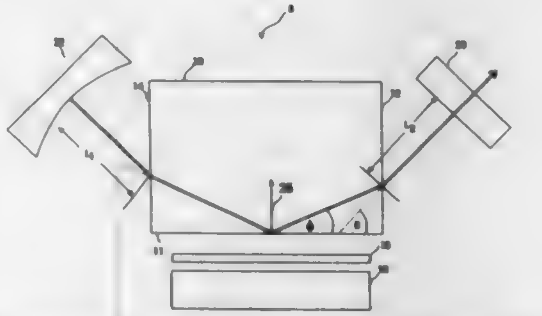
5,315,612
HIGH EFFICIENCY TRANSVERSELY PUMPED SOLID-STATE SLAB LASER

Alfred J. Alcock, Gloucester, and John E. Bernard, Ottawa, both of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Mar. 11, 1993, Ser. No. 29,585

Int. Cl.^{5} H01S *3/09*

U.S. Cl. 372—69 **13 Claims**



1. A method of generating an optical signal within a laser material having at least one flat pumping surface and having an absorption length at a pumping wavelength approximately equal to the radius of a laser mode of the optical signal comprising the steps of;

pumping the laser material with a light source directed towards the flat surface to produce gain within the laser material; and,

forming a laser resonator by providing reflecting surfaces positioned so that a beam path of a resonant mode reflects at a grazing angle from the flat pumping surface, the grazing angle being the angle between the reflecting beam and flat pumping surface and being approximately 10 degrees or less with respect to the flat pumping surface so that the beam travels through the region of highest gain as it travels through the laser material, the fold angle being 160 degrees or more.

5,315,613
LASER DIODE PUMPED SOLID LASER

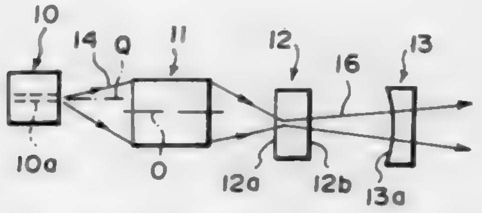
Nobuharu Nozaki; Shinji Mitsumoto; Yoji Okazaki, and Takashi Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 4, 1993, Ser. No. 70,922

Claims priority, application Japan, Jun. 10, 1992, 4-149773

Int. Cl.^{5} H01S *3/09*

U.S. Cl. 372—69 **4 Claims**



1. A laser diode pumped solid laser comprising:

i) a solid laser medium, to which a rare earth metal has been added,

ii) a semiconductor laser, which produces a laser beam for pumping the solid laser medium, and

iii) a condensing lens, which causes the laser beam to converge in the solid laser medium,

wherein the condensing lens is located such that an optical axis of the condensing lens may deviate in the width direction of a semiconductor laser active layer from a center of irradiation area of the semiconductor laser.

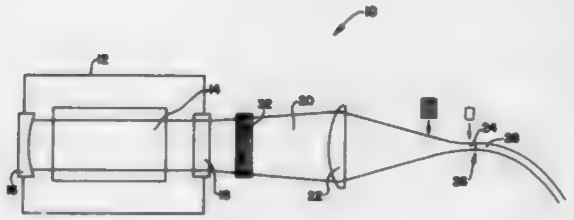
5,315,614
APPARATUS AND METHOD FOR SOFT FOCUSING ENERGY INTO AN OPTICAL FIBER ARRAY

Kenneth P. Grace, Woodland Park; Michael B. Donnelly, and Dean J. Geraci, both of Colorado Springs, all of Colo., assignors to The Spectranetics Corporation, Colorado Springs, Colo.

Filed May 3, 1993, Ser. No. 55,348

Int. Cl.^{5} H01S *3/08*

U.S. Cl. 372—101 **41 Claims**



1. A soft focusing laser apparatus comprising:

a laser cavity;

a concave reflector positioned at a first end of the laser cavity;

a planar reflector positioned at a second end of the laser cavity;

a lens focusing a laser beam that emanates from the laser cavity to a beam waist; and

an optical fiber array having a proximal end positioned substantially at the beam waist.

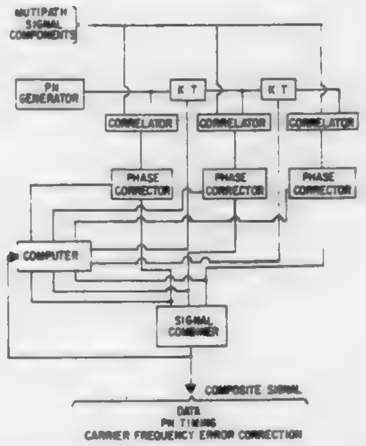
5,315,615
DSSS COMMUNICATIONS CORRELATION

William E. DeLisle, Milford, and John W. Lovell, Sherborn, both of Mass., assignors to GTE Government Systems Corporation, Waltham, Mass.

Filed Dec. 31, 1992, Ser. No. 999,040

Int. Cl.^{5} H04L *27/30*

U.S. Cl. 375—1 **1 Claim**



1. Method of processing a direct sequence spread spectrum communication system signal wherein digital data comprised of data bits at a data bit rate is modulated by a first pseudo-noise code comprised of a sequence of chips having a pseudo-noise chip rate greater than said date bit rate, each chip having a chip period, said sequence repeating at a code period, and the pseudo-noise modulated data modualates a carrier frequency resulting in said signal, said method comprising the steps:

generating digital samples of said signal;

generating a second pseudo-noise code replicating said first pseudo-noise code;

generating a first correlation of the sampled signal and the second pseudo-noise code;

generating a second correlation of the sampled signal and the second pseudo-noise code delayed by one chip period;

generating a first correlated signal energy value representing the signal energy of said first correlation;

generating a second correlated signal energy value representing the signal energy of said second correlation;

combining said first and second correlated signal energy values to obtain the combined value of correlated signal energy and

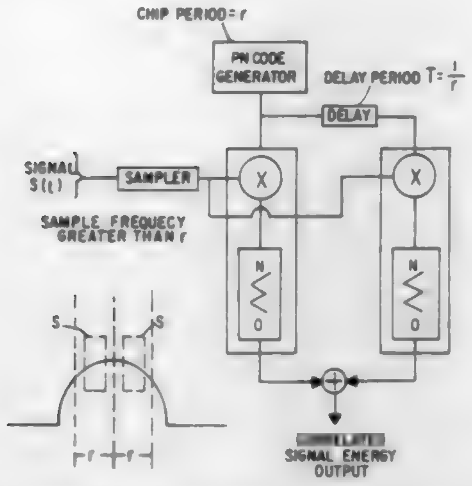
time syncronizing the second pseudo-noise code to maximize the combined value of correlated signal energy, thereby time locking said first pseudo-noise code and said second pseudo-noise code.

5,315,616

CORRELATOR FOR DSSS COMMUNICATIONS

William E. DeLisle, Milford, and John W. Lovell, Sherborn, both of Mass., assignors to GTE Government Systems Corporation, Waltham, Mass.

Filed Dec. 31, 1992, Ser. No. 999,505
Int. Cl.^{5} H04L *27/30*
U.S. Cl. 375—1 **1 Claim**



1. A correlator for processing a direct sequence spread spectrum communication system signal, wherein digital data comprised of data bits at a data bit rate is modulated by a first pseudo-noise code comprised of a sequence of chips having a pseudo-noise chip rate greater than said data bit rate, each chip having a chip period, said sequence repeating at a code period, and the pseudo-noise modulated data modulates a carrier resulting in said signal, said correlator comprising:

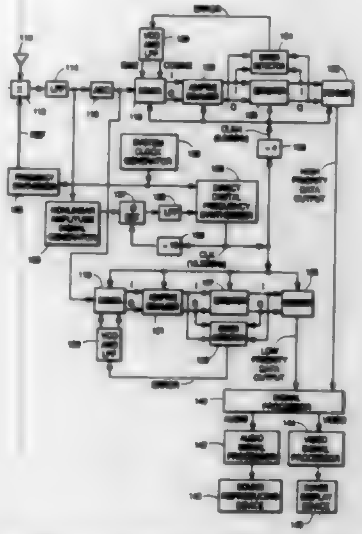
a sampler for producing digital samples of said signal;
a pseudo-noise code generator producing a second pseudo-noise code replicating said first pseudo-noise code;
a first multiplier coupled to said pseudo-noise generator producing a first correlation of the sampled signal and the second pseudo-noise code;
a delay device a time delay equivalent to one chip period coupled to said pseudo-noise generator;
a second multiplier coupled to said pseudo-noise generator through said delay device having a time delay equivalent to one chip period, and coupled to said sampler to produce a second output corresponding to a second correlation of the sampled signal and the second pseudo-noise code delayed by one chip period;
a first integrator coupled to the output of said first multiplier for intergrating the output of the first multiplier to produce at an output a first correlated signal energy value corresponding to the signal energy of said first correlation;
a second integrator coupled to the output of said second multiplier for intergrating the output from the second multiplier to produce at an output a second correlated signal energy value corresponding to the signal energy of said second correlation;
a combiner coupled to the outputs of said first and second intergrator for combining said first and second correlated signal energy values to obtain the combined value of correlated signal energy from said first and second intergrators; and
a synchronizer coupled to said combiner for time syncronizing the second pseudo-noise code to maximize the combined value of correlated signal energy, thereby time locking said first pseudo-noise code and said second pseudo-noise code.

5,315,617

QAM ENCODING FOR HIGH-DEFINITION TELEVISION SYSTEM

Allan A. Guida, East Windsor, and Krishnamurthy Jonnalagadda, Plainsboro, both of N.J., assignors to General Electric Company, Princeton, N.J.

Filed May 29, 1992, Ser. No. 889,805
Int. Cl.^{5} H03D *1/00;* H04L *27/06*
U.S. Cl. 375—39 **17 Claims**



1. In a video signal processing system comprising an encoder apparatus; wherein said encoder apparatus includes means for providing a bitstream of symbols representing video data, each of said symbols representing plural bits, and modulation means responsive to said symbol bitstream for producing a carrier quadrature amplitude modulated (QAM) with said symbols, said symbols being assigned to respective points at prescribed locations of a grid-like constellation in a plane defined by orthogonal I,Q axes; wherein said constellation is divided into first and second separate partitions arranged so that (a) points that are closest in distance to a point of said first partition belong to said second partition, and (b) points that are closest in distance to a point of said second partition belong to said first partition; the improvement wherein

an n-bit segment having a unique binary value is assigned to each individual point of said constellation; said n-bit segment comprising (1) phase bits for distinguishing each of four rotationally symmetrical sets of constellation points situated respectively in each of four quadrants of said plane, and (2) invariant bits for distinguishing each of said constellation points in a rotationally symmetrical set; and
said first and second partitions are distinguishable from each other by the lowest significant phase bit of all n-bit segments belonging to said first partition having a certain binary value, and all n-bit segments belonging to said second partition having a binary value opposite to said certain binary value.

5,315,618

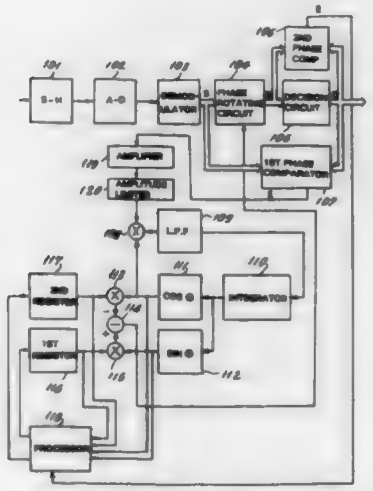
APPARATUS AND METHOD OF CANCELING PERIODIC CARRIER PHASE JITTER

Atsushi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 11, 1991, Ser. No. 775,274
Claims priority, application Japan, Oct. 11, 1990, 2-272799
Int. Cl.^{5} H03D *1/00;* H04L *27/06, 7/00*
U.S. Cl. 375—94 **14 Claims**

1. An apparatus for canceling periodic carrier phase jitter produced over a transmission line in a data modem receiver which receives QAM data from an analog line, said apparatus comprising:

a sample-hold circuit means for sampling and holding a received signal in each cycle of a sampling cycle;
an analog-digital converting means for converting an analog output signal from said sample-hold circuit means into a digital signal;
demodulating means for demodulating said digital signal from said analog-digital converting means into a complex baseband signal;
phase rotating means for imparting phase rotation corresponding to a separately applied predictive signal to said complex baseband signal from said demodulating means, thereby generating a complex baseband signal that is compensated for phase deviation;
decision means for determining a data point of a two-dimensional data point matrix of modulated signals which is closest to said compensated complex baseband signal from said phase rotating means, in order to output a phase signal point vector corresponding to said determined data point;
phase rotation angle predicting means for calculating a phase rotation angle predictive value to compensation for the phase deviation of said complex baseband signal based on a phase error between the complex baseband signal from said demodulating means and the phase signal point vector from said decision means, in order to output said predictive signal, which is representative of said phase rotation angle predictive value, to said phase rotating means; and
predictive value correcting means for controlling said phase rotation angle predicting means to correct calculation of said predictive signal in the next sampling cycle based on the phase error between the complex baseband signal from said phase rotating means and the phase signal point vector from said decision means.



5,315,619

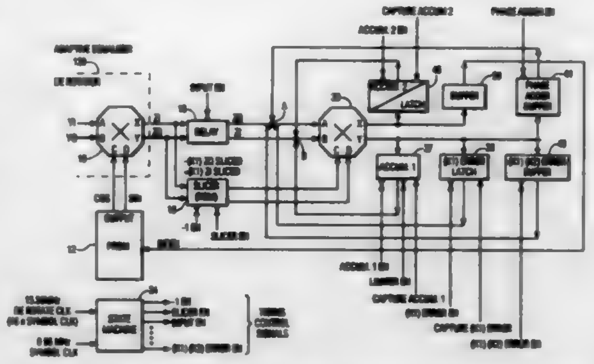
CARRIER RECOVERY PROCESSOR FOR A QAM TELEVISION SIGNAL

Bhavesh B. Bhatt, Franklin Park, N.J., assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed May 15, 1992, Ser. No. 883,735
Int. Cl.^{5} H04L *5/12, 23/02*
U.S. Cl. 375—94 **14 Claims**

3. In a television signal receiver including a signal processing path for processing a television signal containing a carrier quadrature amplitude modulated (QAM) with symbols exhibiting a given symbol period and mapped into prescribed locations of a grid-like constellation, apparatus comprising:

means for generating a reference signal nominally at the frequency of said carrier;
input means responsive to said modulated carrier and to said reference signal for producing a processed modulated carrier;
means for generating a control signal as a function of an offset exhibited by a constellation associated with said processed carrier relative to a constellation associated with said television signal; and
means for coupling said control signal to said signal processing path for reducing said offset; wherein
said means for generating said control signal is a time multiplexed processor with plural operating modes providing a product-type output signal in at least one of said plural operating modes representative of said offset, said multiplexed processor being responsive to a first signal containing a constellation of symbols at received locations, and to a second signal containing a constellation of symbols at expected locations, said output signal of said multiplexed means representing a difference between said received and expected locations.

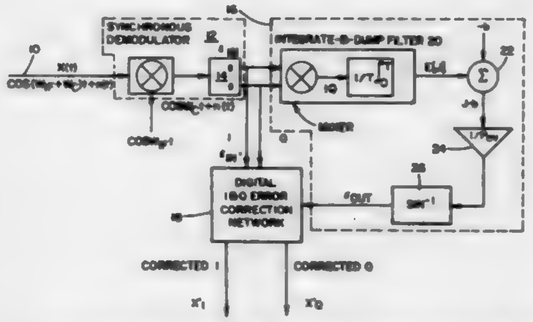


5,315,620

ARRANGEMENT FOR CORRECTION OF SYNCHRONOUS DEMODULATOR QUADRATURE PHASE ERRORS

Natalie Halawani, Brooklyn; Theodore Koutsoudis, Farmingdale, and John M. Kowalski, Greenlawn, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 1, 1992, Ser. No. 877,427
Int. Cl.^{5} H04B *1/10*
U.S. Cl. 375—102 **7 Claims**


SYNCHRONOUS DEMODULATOR 12
INTEGRATE-&-DUMP FILTER 20
10
x(t)
22
Σ
DIGITAL I&Q ERROR CORRECTION NETWORK
CORRECTED I
CORRECTED Q
x'_I
x'_Q
e_{OUT}
I
Q
1/T

1. A method for detecting quadrature phase errors introduced by a synchronous demodulator between the two quadrature channels (I and Q) of the synchronous demodulator and for correcting detected quadrature phase errors, without the need for high data sampling rates, comprising:

a. during normal operation of the synchronous demodulator, directly and simultaneously generating in-phase (I) and quadrature-phase (Q) channel signals;
b. testing the operation of the synchronous demodulator by introducing a periodic symmetrical test signal of known frequency into the synchronous demodulator;
c. during said introducing step, integrating the output of the synchronous demodulator over an integer multiple of periods to detect the quadrature phase error introduced by the synchronous demodulator, and generating a signal representative of the detected quadrature phase error and

d. during normal operation of the synchronous demodulator, applying the in-phase (I) and quadrature-phase (Q) signals produced by the synchronous demodulator to a quadrature phase error correction network, along with the generated quadrature phase error signal, and said quadrature phase error correction network applying the quadrature phase error signal at least one of the in-phase and quadrature-phase signals to minimize or eliminate the detected quadrature phase error between the in-phase and quadrature-phase signals.

5,315,621
ADAPTIVE NONRECURSIVE DIGITAL FILTER AND METHOD FOR FORMING FILTER COEFFICIENTS THEREFOR

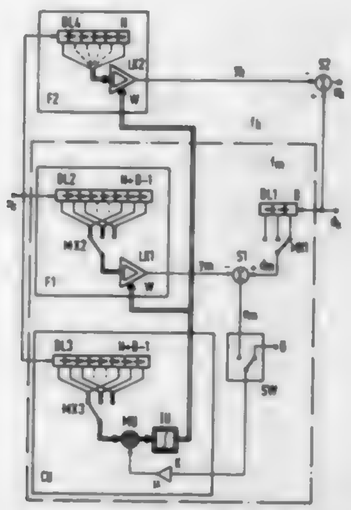
Gonzalo Lucioni, Bochum, and Lajos Gazsi, Düsseldorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 8, 1993, Ser. No. 14,839

Claims priority, application European Pat. Off., Feb. 7, 1992, 92102094.7

Int. Cl.⁵ H04B *1/10*

U.S. Cl. 375—103 **9 Claims**



1. An adaptive nonrecursive digital filter, comprising:

a first filter unit having N controllable filter coefficients, N being a positive integer;

a control unit with means for forming a difference, said control unit controlling the filter coefficients as a function of an input signal applied to said first filter unit at a given sampling rate and as a function of a difference formed by said difference forming means between a reference signal and an output signal output by said first filter unit, in accordance with the least mean error square in each case;

said first filter unit and said control unit sampling the input signal and the reference signal continuously, with a cyclically varying delay, at a correspondingly increased sampling rate; and

a second filter unit being operated at the given sampling rate and having N controllable filter coefficients, said second filter unit receiving the input signal, outputing a further output signal, and having filter coefficients also being controlled by said control unit.

5,315,622
DATA CIRCUIT TERMINATING EQUIPMENT (DCE) INCLUDING TIMING ARRANGEMENTS CIRCUITS CONTROLLED BY PROCESSING MEANS

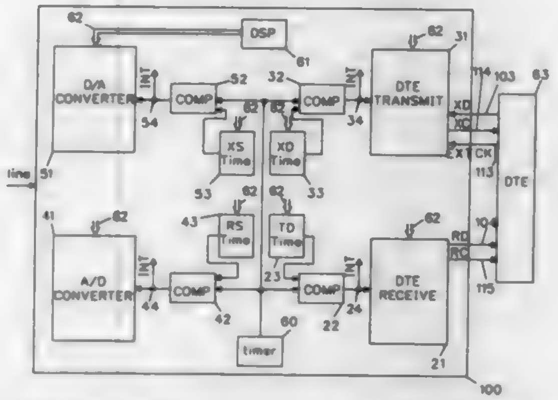
Jean-Claude Abbiate, La Gaude; Alain Blanc, Vence, both of France, and Gottfried Ungerboeck, Langnaud a. Albis, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 3, 1991, Ser. No. 754,104

Claims priority, application European Pat. Off., Sep. 28, 1990, 90480150.3

Int. Cl.⁵ H04L *7/00*

U.S. Cl. 375—106 **14 Claims**



1. A Data Circuit Terminating Equipment (DCE) for allowing connection of a Data Terminal Equipment (DTE) to a telecommunication line, including timing circuits for providing said DTE with the required transmit signal element timing and receive signal element timing at a nominal rate, characterized in that said DCE further includes:

processor means for computing a sequence of digital values A(n) corresponding to required timing instants determined according to the mode of operation of said DCE;

means for deriving from said sequence of digital values A(n) a corresponding sequence of processor interrupt signals T(n) at said required timing instants; and

generating means in said timing circuits receiving said interrupt signals T(n) for generating a set of N signal element timing pulses at said nominal rate upon the occurrence of each said interrupt signal T(n),

whereby said required signal element timings are provided by said signal element timing pulses generated by said generating means in said timing circuits controlled by said processor means.

5,315,623
DUAL MODE PHASE-LOCKED LOOP

Yao H. Kuo, Brentwood, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1992, Ser. No. 924,808

Int. Cl.⁵ H04L *7/06*

U.S. Cl. 375—120 **6 Claims**

1. A phase-locked loop for generating an output signal having a selectable frequency, comprising:

reference means for generating a reference signal:

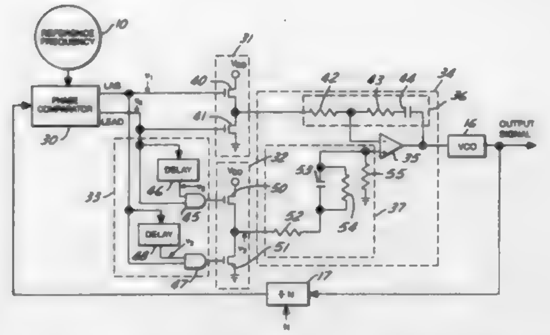
phase comparator means responsive to said output signal and said reference signal for generating a lead signal and a lag signal;

a lowpass filter including a lag circuit for providing a relatively low cutoff frequency and a lead circuit for providing a relatively high cutoff frequency;

a voltage-controlled oscillator coupled to the output of said lowpass filter, the output of said voltage-controlled oscillator providing said phase-locked loop output signal;

transient means for comparing a phase error detected by said phase comparator to a predetermined phase error; and

driver means coupled to said phase comparator means, said transient means, and said lowpass filter for charging said lag circuit in response to said lag signal and for discharging said lag circuit in response to said lead signal, and if a transient condition is sensed by said transient means then for charging said lead circuit in response to said lead signal and for discharging said lead circuit in response to said lag signal.



5,315,624
PRODUCTION OF NUCLEAR FUEL

Kevin W. Hesketh, Preston, and Brian C. Hexter, Fylde, both of United Kingdom, assignors to British Nuclear Fuels PLC, Cheshire, England

Filed Feb. 11, 1993, Ser. No. 16,545

Claims priority, application United Kingdom, Feb. 13, 1992, 9203090.7

Int. Cl.⁵ G21C *21/00*

U.S. Cl. 376—261 **4 Claims**

1. A process for the production of plutonium-containing mixed oxide nuclear fuel, the process comprising selecting a plutonium-containing solution, determining the plutonium isotopic composition of the solution, precipitating particulate plutonium oxide from the solution, forming a mixture comprising the plutonium oxide and a particulate uranium oxide, and forming nuclear fuel compacts from the mixture, the amount of plutonium in the mixture being controlled in accordance with the equation:

$$\Delta C_{Pu}/C_{Pu}=\alpha_8 \alpha f_{238}-\alpha_9 \alpha f_{239}+\alpha_0\Delta f_{240}-\alpha_1\Delta f_{241}+\alpha_2\Delta f_{242}-[(1-C_{Pu})/c_{Pu}]\,\alpha_5\Delta f_{235}+\alpha_{Am}\Delta f_{Am}$$

f_{238}, f_{239}, f_{240}, f_{241} and f_{242} representing the absolute perturbations in the Pu^{238}, Pu^{239}, Pu^{240}, Pu^{241} and Pu^{242} isotopic fractions, respectively, f_{235} being the absolute perturbation for U^{235}, and f_{Am} that for Am^{241}, the α's, all being positive in value and being factors related to the partial derivatives of lifetime averaged reactivity to variations in the individual isotopes.

5,315,625
METHOD FOR PROTECTING THE BASE OF THE REACTOR CONTAINER IN NUCLEAR POWER PLANTS, AND A DEVICE FOR IMPLEMENTING THE METHOD

Arnaldo Turricchia, Rome, Italy, assignor to Enel S.p.A., Rome, Italy

Filed Nov. 2, 1992, Ser. No. 969,986

Claims priority, application Italy, Nov. 5, 1991, MI.91-A/002930

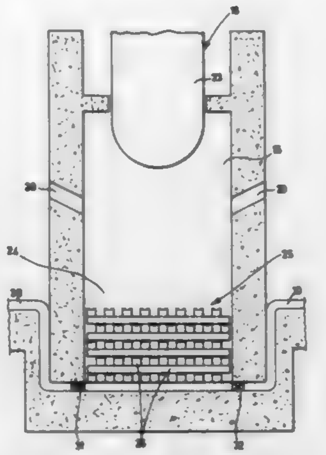
Int. Cl.⁵ G21C *9/00*

U.S. Cl. 376—280 **13 Claims**

1. A method for protecting the integrity of the reactor container base in nuclear power plants in the case of an accident involving melt-down of the reactor core and the consequent escape from the pressure vessel of molten material which falls into the container cavity positioned below the reactor pressure vessel, said method comprising:

intercepting the molten material falling from the reactor on interceptor elements and redistributing said molten material regularly and three-dimensionally in layers of small thickness on the surface of said interceptor elements to prevent the molten material from coming into contact with the container base,

and to cool and resolidify said molten material in a dry environment in the container cavity below the reactor, said interceptor elements being constructed of a material which provides rapid initial cooling and resolidification of the molten material by virtue of the having a high heat capacity and thermal conductivity said container cavity containing said interceptor elements being flooded with a cooling fluid only after the molten material has resolidified bit before the mass of said interceptor elements has overheated, in order to achieve final cooling of the solidified material distributed on the surface of said interceptor elements.



5,315,626
METHOD FOR TREATING THE PRIMARY COOLING MEDIUM OF A PRESSURIZED WATER NUCLEAR REACTOR

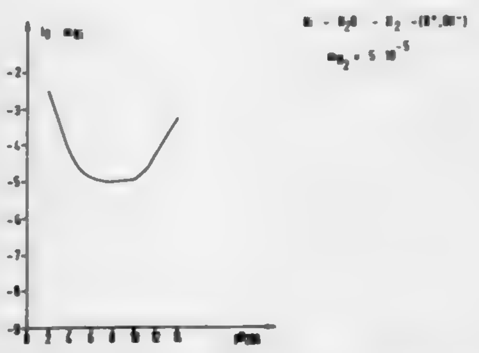
Vladimir I. Pasevic, and Dmitrii V. Pasevic, both of Mytisci, U.S.S.R., assignors to Techno-Invest Entwicklung Von Technologien GmbH, Bundesrepublik, Fed. Rep. of Germany

Filed Aug. 6, 1992, Ser. No. 926,579

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1991, 4126467

Int. Cl.⁵ G21C *9/00*

U.S. Cl. 376—306 **3 Claims**



1. Method for treating a primary cooling medium of a pressurized water nuclear reactor by controlling its efficiency through the H_3BO_3 content in the cooling medium, which comprises; continuously feeding hydrazine hydrate to the cooling medium of the reactor, which is charged for energy generation, in an amount of 5.10^{-6} to 5.10^{-2} g/kg coolant medium, as well as KOH and/or LiOH which corresponds to

the alkaline properties of KOH at an amount of 80 to 5.6 mg/kg cooling medium with respect to the amount of H_3BO_3 in a range of 20 to 0 g/kg cooling medium and which removes excess hydrogen from the system leaving a maximum amount of hydrogen in the coolant medium of 100 n-ml/kg.

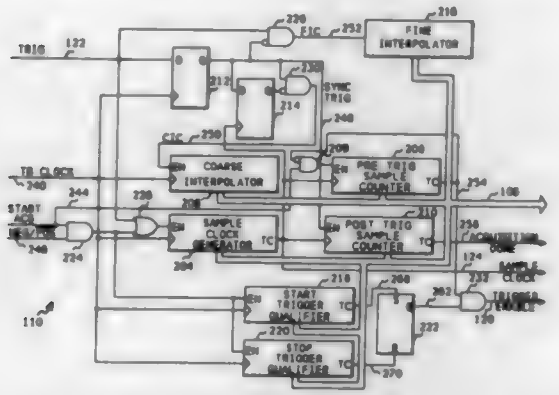
5,315,627
PSEUDO-RANDOM REPETITIVE SAMPLING OF A SIGNAL

Steven D. Draving, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 22, 1993, Ser. No. 20,474

Int. Cl.^{5} H03K *17/26;* **G01R** *29/02*

U.S. Cl. 377—20 **10 Claims**



1. A circuit for sending a sample signal, said sample signal being used to cause analog to digital conversion of an input signal, said circuit comprising:

means for creating a negative time signal, said negative time signal being set to a value of one when sending sample signals before an occurrence of a trigger signal, and said negative time signal being set to a value of zero when sending sample signals after an occurrence of said trigger signal;

means for sending a sample signal at least once after an occurrence of said trigger signal when said negative time signal is zero;

trigger qualifying circuit means for creating a trigger qualifying signal that starts a first predefined amount of time after each sample signal is sent, and ends a second predefined amount of time after each sample signal is sent; and

means for sending a sample signal at a random time before an occurrence of said trigger signal, and for retaining data obtained by digital conversion caused by said sample signal, when said negative time signal is one, and further when said trigger signal occurs coincident with said trigger qualifying signal.

5,315,628
COMPUTER TOMOGRAPH HAVING MEANS FOR DISPLAYING SHADOWGRAPHS

Lutz Guendel, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 9, 1993, Ser. No. 73,515

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1992, 4220709; Jul. 16, 1992, 4223430

Int. Cl.^{5} A61B *6/03*

U.S. Cl. 378—20 **4 Claims**

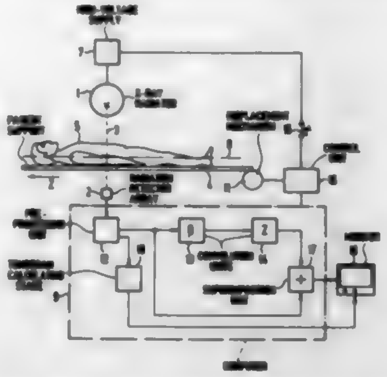
1. A medical imaging apparatus comprising:

measurement means for conducting a scan of an examination subject, said measurement means including an x-ray source and a radiation detector rotatable around said examination subject for irradiating said examination subject with an x-ray beam from said x-ray source at at least one projection angle, said radiation detector generating electrical output signals corresponding to radiation incident thereon at each projection angle;

means for effecting relative longitudinal displacement between said measurement means and said examination subject;

means for calculating a shadowgraph of said examination subject in real time as said relative longitudinal displacement takes place, from output signals with said measurement means disposed at a selected projection angle a plurality of times during said scan; and

means for displaying said shadowgraph, as said shadowgraph is calculated, to an extent correlated with the amount of relative longitudinal displacement between said examination subject and said measurement means.



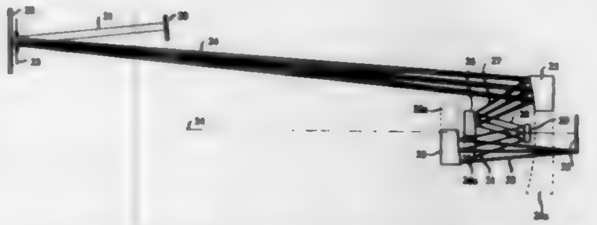
5,315,629
RINGFIELD LITHOGRAPHY

Tanya E. Jewell, Bridgewater, N.J., and Kevin Thompson, La Canada, Calif., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 595,341, Oct. 10, 1990. This application Jul. 19, 1991, Ser. No. 732,559

Int. Cl.^{5} G21K *5/00*

U.S. Cl. 378—34 **2 Claims**



1. Scanning ringfield reduction projection apparatus for lithographic patterning with x-ray radiation in the wavelength range of from 300 Å to 40 Å, the optics of the apparatus being all-reflective and comprising Distributed Bragg Reflectors, characterized in that

the apparatus includes a scanning arcuate slit of constant radius from the optic axis along its length and of width in the scanning direction of at least 0.5 mm, the focusing optics consisting of four coaxial, spherical elements, which as viewed from object to image are, in succession, concave, convex, concave and concave, the third element providing an accessible stop, at least two elements having aspheric departures, and all elements being coaxial.

5,315,630
POSITIONING DEVICE IN MEDICAL APPARATUS

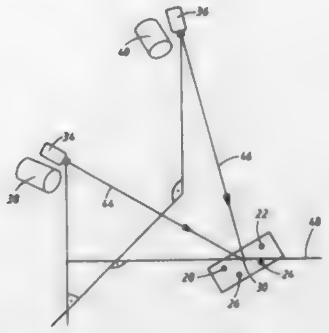
Volker Sturm, Wiesloch-Schatthausen; Otto Pastyr, Leimen-St. Ilgen; Wolgang Schlegel, Heidelberg; Christoph Uihlein, Üerlingen, and Thomas Mack, Altheim, all of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen/Bodensee, United Kingdom

Filed Mar. 10, 1993, Ser. No. 29,015

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1992, 4207632

Int. Cl.^{5} G21K *5/10*

U.S. Cl. 378—65 **14 Claims**



1. A device for positioning a body part of the human body for treatment with a medical apparatus, wherein marks are affixed to said body part at well-defined positions, the positioning of said body part causing an exactly defined treatment point to be maintained at a desired position, characterized by

(a) at least two picture signal generating sensors (34,36), which are aligned to monitor said marks (22,24,26,28.30),

(b) picture processing means (74,76), to which said picture signals from said sensors (34,36) are applied for processing pictures (54A to 62A;54B to 62B) of said marks to fix marker points (80), which are determined by said marks and define the actual position of said body part,

(c) signal processing and controller means (86,88,90;92,94)
  for computing the actual position of the body part from the observed position of said marker points,
  for comparing said actual position with a desired position, and
  for generating actuating signals, which depend on the error between said actual position and said desired position of said body part, and

(d) means for preventing treatment with misalignment between said apparatus and said body part, said actuating signals being applied to said preventing means.

5,315,631
METHOD OF GENERATING X-RAY IMAGES, AND X-RAY APPARATUS FOR CARRYING OUT THE METHOD

Walter Hillen, Aachen, Fed. Rep. of Germany, and Rudolph M. Snoeren, Veldhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1993, Ser. No. 21,923

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1992, 4205522

Int. Cl.^{5} H05G *1/64*

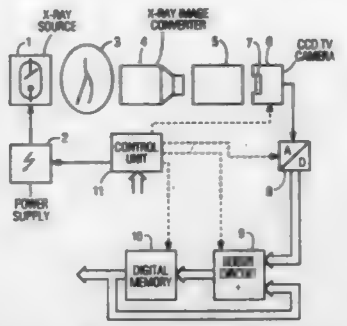
U.S. Cl. 378—98.8 **8 Claims**

1. A method of generating X-ray images by means of an X-ray image converter and a CCD image sensor having an image section and at least one storage section, comprising the following steps:

a) performing a first X-ray exposure during a first time interval (T_1) which is shorter than a read-out period (T_r) of an image stored in the storage section of the CCD image sensor to generate during the first exposure a first image in the image section of the CCD image sensor,

b) transferring the first image from the image section to the storage section of the CCD image sensor after expiration of the first time interval (T_1),

c) performing a second X-ray exposure after the first X-ray exposure during a second time interval (T_2) which is shorter than the read-out period (T_r) to generate during the second exposure a second image in the image section of the CCD image sensor,



d) reading out the first image from the storage section and writing the first image in a further memory,

e) transferring the second image from the image section to the storage section of the CCD image sensor after said reading out the first image, and

f) reading out the second image from the storage section and summing it with the first image written in the further memory so as to produce the X-ray image.

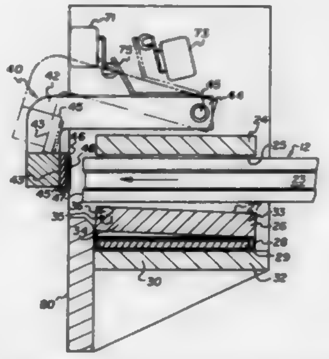
5,315,632
CASSETTE CLAMPING MECHANISM

Michael R. Flynn; Wayne J. Arseneault; John C. Boutet, all of Rochester; Jeffrey J. Yaskow, Williamson, and Thomas D. Baker, Livonia, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1992, Ser. No. 981,680

Int. Cl.^{5} G03G *5/16*

U.S. Cl. 378—167 **18 Claims**



1. In an apparatus for clamping a cassette containing a photosensitive element comprising:

a frame;

a stop bar pivotably mounted to said frame for movement between an operative position and a non-operative position, said stop bar having a registration surface for registering the forward end of a cassette wherein said non-operating position allows extraction of a photosensitive element from said cassette;

a first jaw member secured to said frame, said first jaw member having a second registration surface for engagement with a first side of said cassette;

a second movable jaw member movable between a clamping position and a non-clamping position, said second jaw member having a clamping surface for engaging a second side of said cassette opposite said first side of said cassette so as to clamp said cassette between said first and second jaw members when said second jaw member is in the clamping position; and

pneumatic means for moving said second jaw member between said clamping and non-clamping positions.

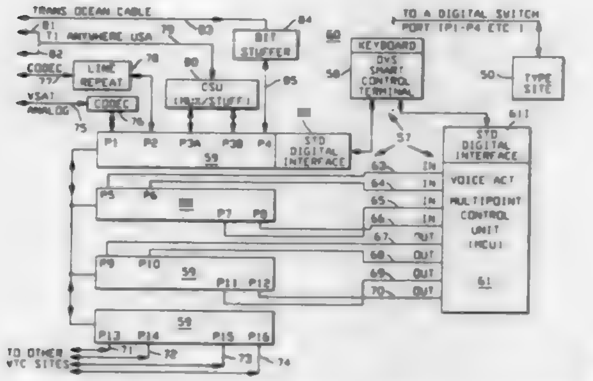
5,315,633
DIGITAL VIDEO SWITCH FOR VIDEO TELECONFERENCING

John J. Champa, Dearborn, Mich., assignor to UNISYS Corporation, Blue Bell, Pa.

Filed Dec. 20, 1991, Ser. No. 811,131

Int. Cl.⁵ H04N *1/42, 7/14;* **H04M** *3/42*

U.S. Cl. 348—16 **9 Claims**



1. A programmable digital video switch for controlling video teleconferencing comprising;

a plurality of conferencing sites,

each of said sites having a plurality of video monitors, at lest one monitor for active on-site monitoring and at least one monitor for displaying a video signal generated at a remote side,

each of said conferencing sites having at least one video camera for generating on-site video and audio camera signals,

Compression/Decompression (CODEC) means coupled to said at least one video camera for converting said on-site video and audio camera signals to a predetermined compressed digital format for transmission to a central control site and for decompressing the digital format video and audio camera signals received at said central control site,

digital transmission/receiving means coupled to said CODEC means for transmitting and receiving the predetermined compressed digital format audio and video camera signals to and from said central control site, and

digital video switch means located at said control central site comprising:

digital port interconnection means having a plurality of duplex input/output ports for connecting to said transmission/receiving means coupled to said CODEC means from each of said conferencing sites,

said digital port interconnection means further having a plurality of output only ports and a plurality of input only ports,

multiport control means for connecting the input only ports to a plurality of said output only ports, and

smart terminal control means coupled to said multiport control means for automatically selecting one of said plurality of input only ports and for connecting the selected port to a plurality of said output only ports in response to a predetermined condition remotely programmable at said smart terminal, whereby a combined digital video and audio signal generated at the remote site is selected as an input to said multiport control means and is further selected as a digital output to said plurality of conferencing sites.

5,315,634
AUTOMATIC TRADING METHOD AND APPARATUS

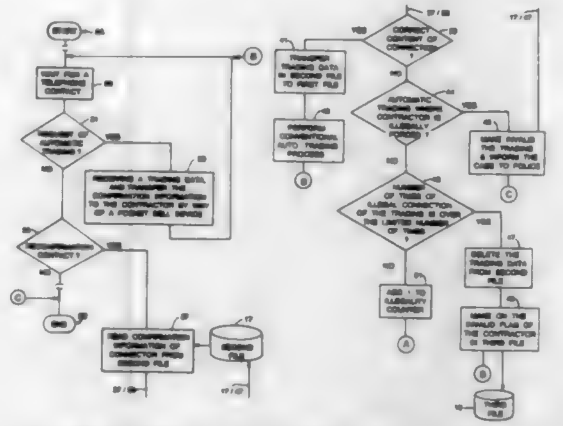
Kazuaki Tanaka, Sagamihara; Takeshi Matsuki, Musashino, and Kazuo Takaragi, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 576,690

Claims priority, application Japan, Sep. 4, 1989, 1-227366; Jul. 23, 1990, 2-193012

Int. Cl.⁵ H04M *11/08*

U.S. Cl. 379—57 **41 Claims**


START
WAIT FOR A TELEPHONE CONTACT
REQUEST OF AUTOMATIC TRADING ?
YES
NO
RECEIVING A TRADING DATA, AND TRANSFER THE CONFIRMATION INFORMATION TO THE CONTRACTOR BY WAY OF A POCKET BELL DEVICE
CONFIRMATION CORRECT ?
YES
NO
END
SEND CONFIRMATION INFORMATION OF CONNECTOR FROM SECOND FILE
SECOND FILE
CORRECT CONTENT OF CONNECTION ?
YES
NO
TRANSFER TRADING DATA IN SECOND FILE TO FIRST FILE
PERFORM CONVENTIONAL AUTO TRADING PROCESS
AUTOMATIC TRADING WHERE CONTRACTOR IS ILLEGALLY FORCED ?
YES
NO
MAKE INVALID THE TRADING & INFORM THE CASE TO POLICE
NUMBER OF TIMES OF ILLEGAL CONNECTION OF THE TRADING IS OVER THE LIMITED NUMBER OF TIMES ?
YES
NO
DELETE THE TRADING DATA FROM SECOND FILE
ADD 1 TO ILLEGALITY COUNTER
MAKE ON THE INVALID FLAG OF THE CONTRACTOR IN THIRD FILE
THIRD FILE
A
B
C

2. A trading method for communicating a trade of selected items between a trader and a contractor and for verifying with the contractor that the trade is authorized, comprising the steps of:

identifying a first specified code representative of the contractor after a request for trading to the trader from a user through a first communication device by a first communication route;

selecting a second communication device indicated by the first specified code for contacting the contractor comprising determining a preselected calling number of a one of a pocket bell device and a handheld telephone;

communicating to the contractor confidential reconfirmation information through the second communication device by a second communication route different from the first communication route;

verifying that the user is the contractor by the trader receiving back from the contractor the reconfirmation information; and,

executing the request for trading.

5,315,635
RELIABLE MESSAGE COMMUNICATION SYSTEM

John R. Kane, Wellington; Robert J. Schwendeman, Pompano Beach, and James A. Wright, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1992, Ser. No. 954,106

Int. Cl.⁵ H04M *11/00*

U.S. Cl. 379—57 **15 Claims**

1. A method in communication system for reliably delivering messages from a terminal to a selective call receiver, the method comprising the steps of:

(a) the terminal storing messages for transmission to a selective call receiver, each message comprising address information, a message sequence identifier, and message data;

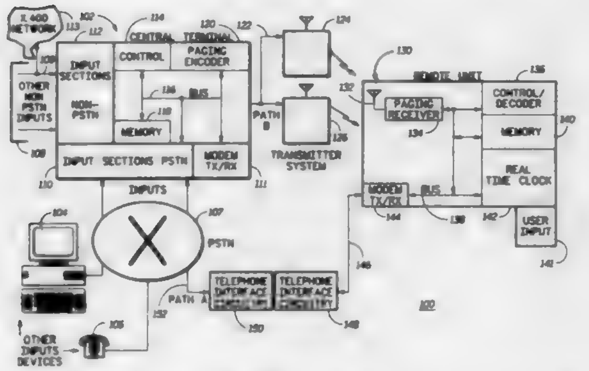
(b) the terminal sequentially transmitting the messages over a first communication medium for reception by the selective call receiver, the message sequence identifiers transmitted with the messages identifying the sequence of transmitted messages that include the same address information;

(c) the selective call receiver receiving at least some of the transmitted messages, including the message sequence identifiers associated with the received messages;

(d) the selective call receiver monitoring a time associated with a last received message to determine when a predetermined amount of time has expired;

(e) the selective call receiver determining, after expiration of the predetermined amount of time, that a transmitted message has been missed when the last received message is out of sequence with other messages received by the selective call receiver;

(f) the selective call receiver generating, in response to determining that a transmitted message has been missed, a over a second communication medium, the second communication medium being different from the first communication medium, the message reconciliation request identifying a predetermined address for the selective call receiver and any message sequence identifiers included with the received messages;



(g) the terminal determining whether any messages that were sequentially transmitted in step (b) were not received by the selective call receiver by comparing the message sequence identifiers of the stored messages to the message sequence identifiers identified in the message reconciliation request as being received, wherein a stored message is determined to have not been received when the message sequence identifier of a stored message is not identified as received in the message reconciliation request;

(h) retrieving each stored message that was determined not to have been received by the selective call receiver in step (g); and

(i) transmitting over the second communication medium at least the message data of each of the retrieved messages in step (h) for reception by the selective call receiver for reliably delivering messages to the selective call receiver.

5,315,636
PERSONAL TELECOMMUNICATIONS SYSTEM

Rajendra Patel, Plano, Tex., assignor to Network Access Corporation, Richardson, Tex.

Filed Jun. 28, 1991, Ser. No. 723,169

Int. Cl.⁵ H04M *11/00*

U.S. Cl. 379—58 **27 Claims**

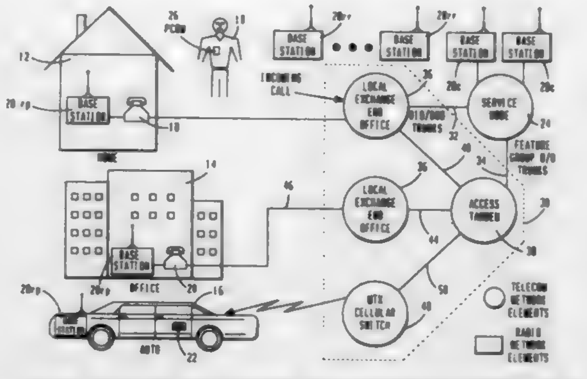
1. A personal telecommunications system, comprising:

telephone switching means connected to a plurality of telephones at locations designated by system subscribers;

means for determining the presence of a subscriber at one of the designated locations proximate to a telephone connected to the telephone switching means and for outputting a subscriber location signal indicating that the subscriber is present at a certain one of the designated locations to receive an incoming call dialed to a personal telephone number assigned to the subscriber and forwarded to the telephone at the certain designated location indicated by the location signal;

personal transceiver means assigned to the subscribers including means for transmitting at any time in response to a subscriber input a subscriber instruction signal specifying an alternative manner of handling the incoming call dialed to the personal telephone number of the subscriber; and

control means for receiving the subscriber location signal, the subscriber instruction signal and the incoming call placed by the caller to the personal phone number assigned to the subscriber, said control means including



means for either forwarding the received incoming call to the subscriber by routing the incoming call through the telephone switching means to the telephone at the certain designated location indicated by the received subscriber location signal, or for alternatively handling the incoming call in the manner specified by the subscriber in response to the received subscriber instruction signal transmitted by means of the personal transceiver means.

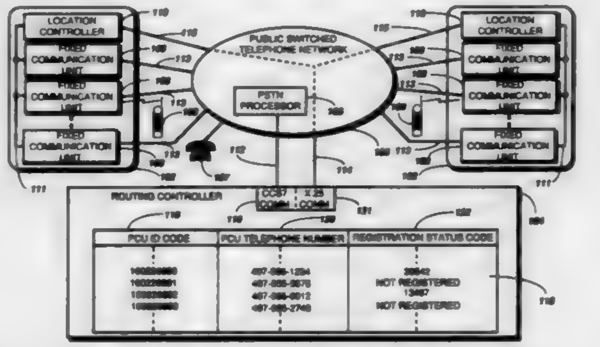
5,315,637
APPARATUS AND METHOD FOR CONTROLLING THE ROUTING OF INCOMING CALLS IN A WIRELESS COMMUNICATION SYSTEM

Robert L. Breeden, Boca Raton, and Prabhakar Muppidi, Lake Worth, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1992, Ser. No. 877,293

Int. Cl.⁵ H04M *11/00*

U.S. Cl. 379—58 **14 Claims**



6. In a wireless communication system having a plurality of portable communication units (PCUs) each PCU having a PCU identification code and each PCU assigned a PCU telephone number for receiving incoming calls, the wireless communication system coupled to a public switched telephone network (PSTN) for transporting calls to and from the PCUs, and having a plurality of locations, each location having a plurality of fixed communication units (FCUs), each location having a location controller (LC) for controlling the plurality of FCUs, each FCU being coupled to the PSTN, each FCU having at least one transceiver channel, and each transceiver channel having a telephone access number, a method of using the LC for establishing communications with a routing controller (RC) and controlling each of the plurality of FCUs at a

location in response to an access request message generated by the RC, wherein the LC has an LC identification code, the method comprising in the RC the steps of:

(a) registering the location of a PCU in a location database in response to a registration communication from one of the LCs, comprising the steps of:
(b) receiving an LC registration request message from the LC for requesting registration of the PCU at the location of the LC, comprising the steps of:
(c) receiving the PCU identification code of the PCU; and
(d) receiving therewith an LC identification code that identifies the LC sending the LC registration request message for the PCU;
(e) accessing the location database in response to step (b) to find a pre-programmed entry for the PCU identification code;
(f) storing the LC identification code in a manner that couples the LC identification code to the pre-programmed entry for the PCU identification code in response to finding the pre-programmed entry for the PCU identification code;
(g) sending an LC registration acknowledge message to the LC to acknowledge the successful completion of the registration in response to completing step (f); and
(h) sending an LC registration failure message to the LC to indicate failure of the registration in response to being unable to find a pre-programmed entry for the PCU identification code;
(i) receiving a call routing request from the PSTN in response to an incoming call for a PCU, the call routing request comprising the PCU telephone number assigned to the PCU having received the incoming call;
(j) accessing the location database in response to step (i) to determine registration status of the PCU;
(k) providing call routing information in response to determining in step (j) that the PCU is registered with an LC, step (k) comprising the steps of:
(l) sending an access request message to the LC;
(m) receiving a telephone access number of a selected available FCU from the LC in response to step (l); and
(n) sending the telephone access number of the selected FCU received in step (m) to the PSTN in further response to the call routing request received in step (i); and
(o) providing a call routing failure message to the PSTN in response to determining in step (j) that the PCU is not registered; and in the LC the steps of:
(p) handling communications for registrations of the locations of PCUs in response to registration requests from the PCUs, comprising the steps of:
(q) receiving a PCU registration request message from a PCU requesting registration of the PCU, the PCU registration request message comprising the PCU identification code of the PCU;
(r) sending an LC registration request message to the RC in response to step (q) comprising the steps of:
(s) sending the PCU identification code of the PCU; and
(t) sending therewith the LC identification code that identifies the LC;
(u) receiving the LC registration acknowledge message from the RC in response to a successful completion of the registration by the RC;
(v) receiving the LC registration failure message from the RC in response to an unsuccessful completion of the registration by the RC;
(w) sending a PCU registration acknowledge message to the PCU in response to step (u); and
(x) sending a PCU registration failure message to the PCU in response to step (v);
(y) receiving at the LC the access request message from the RC, the access request message being generated in response to an incoming call for a PCU determined to be registered with the LC, comprising receiving the PCU identification code of the PCU being called;
(z) selecting an available FCU at the location of the LC for receiving the incoming call in response to step (y);
(aa) sending the telephone access number of the selected FCU to the RC in response to step (z);
(bb) controlling activities of the FCU during a period between the selection of the FCU in step (z) and an expected delivery of the incoming call to the FCU by the PSTN, comprising the steps of:
(cc) temporarily preventing the selected FCU from being used for outgoing calls; and
(dd) controlling answer supervision of the selected FCU in response to delivery of the incoming call; and
(ee) controlling establishment of a wireless communication link between the selected FCU and the PCU being called in response to completion of the delivery of the incoming call, comprising sending the PCU identification code of the PCU being called over the wireless communication link in response to the completion of the delivery of the incoming call.

5,315,638

METHOD FOR PROGRAMMING OF INSTALLATION DATA IN A MOBILE TELEPHONE

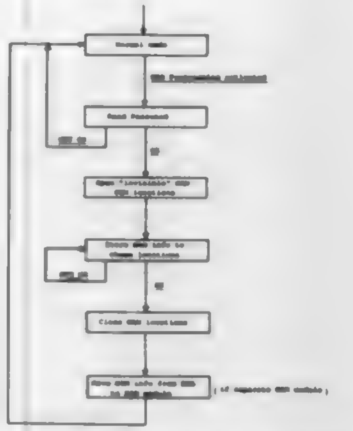
Timo Mukari, Oulu, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed May 12, 1992, Ser. No. 882,453

Claims priority, application Finland, May 31, 1991, 912640

Int. Cl.^{5} H04M *11/00*

U.S. Cl. 379—58 **8 Claims**



2. A method for the programming of installation data in a mobile telephone, the mobile telephone having an operation-controlling logic, a nonvolatile memory for the installation data, and an operating memory in which operating programs and rapid dialing numbers can be recorded, the logic being capable, on the basis of the recorded programs, of reading and executing any dialing and other orders contained in them, characterized in that the method comprising the steps of:

a1) arranging a program for the processing of installation data,
a2) booting up the program for the processing of installation data, releasing in a first routine of the predetermined memory addresses of the rapid dialing memory for programming and for display on the screen of the mobile telephone,
b) recording the installation data of the mobile telephone at said released memory addresses of the rapid dialing memory by a known method, for the programming of rapid dialing numbers,
c) booting up a routine second of the program for the recording of installation data, whereupon
d) transferring the program for the recording of installation data which is recorded at the predetermined memory addresses of the rapid dialing memory to the nonvolatile memory of the mobile telephone, and

e) preventing, by means of the program for the recording of installation data, the programming of said predetermined memory addresses and their display on the screen before a shift is made to the normal operating mode of the mobile telephone.

5,315,639

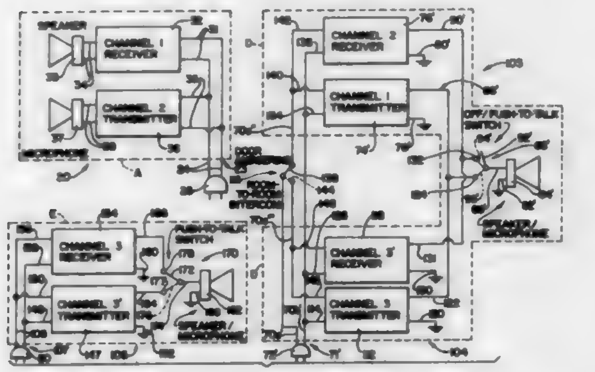
HANDS-FREE INTERCOM SYSTEM

Arthur H. Lassers, 343 Lamon Ave., Wilmette, Ill. 60091

Filed Jan. 6, 1992, Ser. No. 817,136

Int. Cl.^{5} H04M *11/00, 9/00, 1/60;* **H04H** *1/00*

U.S. Cl. 379—66 **12 Claims**



1. A wireless intercommunication system that permits a person at a calling station at a predetermined location to use the system without operating a push-to-talk switch, which system is utilized with a conventional electrical power line that provides electrical power at a standard frequency at a plurality of outlets, one of which outlets is located in the vicinity of the predetermined calling station and one in the vicinity of an answering station, which wireless intercommunication system comprises:

(a) a predetermined calling station, which includes:
(i) means for delivering alternating electrical current at a standard frequency to said predetermined calling station from said outlet in the vicinity of the calling station;
(ii) a radio frequency receiver whose input leads are connected across said means for delivering alternating electrical current, said receiver operating on a first predetermined carrier frequency or frequency band as a part of a first sound transmitting channel;
(iii) a loudspeaker operatively connected to the output of said radio frequency receiver for said first channel;
(iv) a radio frequency transmitter whose output leads are connected across said means for delivering alternating electrical current, said transmitter operating on a second, separate, predetermined carrier frequency or frequency band as a part of a second sound transmitting channel; and
(v) a microphone operatively connected to the input leads of said radio frequency transmitter for said second channel; and
(b) an answering station, which includes:
(i) means for delivering alternating electrical current at a standard frequency to said answering station from said outlet in the vicinity of the answering station;
(ii) a radio frequency transmitter whose output leads are connected across said last mentioned means for delivering alternating electrical current, said transmitter operating on said first predetermined carrier frequency or frequency band as a part of said first sound transmitting channel, said transmitter having one input lead connected to ground;
(iii) a radio frequency receiver whose input leads are connected across said last mentioned means for delivering alternating electrical current, said receiver operating on said second, separate, predetermined carrier frequency or frequency band as a part of said second sound transmitting channel, said receiver having one output lead connected to ground;
(iv) a speaker/microphone adapted to operate as a microphone when operatively connected to said transmitter for said first channel and as a speaker when operatively connected to said receiver for said second channel, said speaker/microphone having one lead connected to ground; and
(v) talk/listen selection means which:
  has at least one talk position and at least one listen position,
  is normally biased from a talk position to a listen position to connect the second output lead of said receiver for the second channel to the second lead of said speaker/-microphone, and
  when moved into a talk position by the person at said answering station, is adapted to connect the second input lead of the transmitter for the first channel to the second lead of said speaker/microphone,

whereby the person at the predetermined calling station can communicate "hands-free" with the person at the answering station, since;
  the receiver for the first channel and the transmitter for the second channel, both located at the predetermined calling station, are operative at all times,
  one or the other of the transmitter for the first channel and the receiver for the second channel, both located at the answering station, is selectively operative depending upon the position of the talk/listen selection means at the latter station,
  said talk/listen selection means, when in a normally biased listen condition, connects the speaker/microphone at said answering station to the output of the receiver for said second channel, so that any sound picked up by the microphone at the predetermined calling station will be converted by it into an electrical signal in the audio frequency range, which is then converted by the transmitter for the second channel into a radio frequency electrical signal that is carried by said conventional electrical power line to the answering station and converted there by the receiver for the second channel and the speaker/microphone into an audible sound, and
  the reverse is true when the talk/listen selection means is actuated by the person at the answering station to connect the speaker/microphone to the second input lead of the transmitter for the first channel.

5,315,640

DATA TRANSFER DEVICE

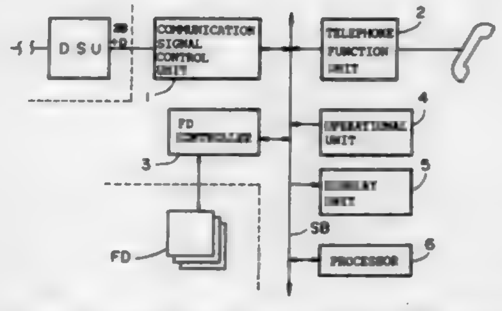
Akira Takayama, Hamamatsu; Mitsuo Yoshida, Tokyo, and Shinichi Matsui, Gifu, all of Japan, assignors to Yamaha Corporation and Nippon Telegraph and Telephone Corporation, Japan

Filed Apr. 30, 1991, Ser. No. 693,625

Claims priority, application Japan, Oct. 31, 1990, 2-293804

Int. Cl.^{5} H04M *11/00, 1/00*

U.S. Cl. 379—93 **2 Claims**



1. A data transfer device for transmitting and receiving

speech and data over digital communication lines, said data transfer device comprising:

a) first telephone number memory means for storing a telephone number of a remote communication node with which said data transfer device originates a communication session;

b) second telephone number memory means for storing a telephone number of a remote communication node which originates a communication session with said data transfer device;

c) start command generating means for generating a start command; and

d) data transfer means for transferring data, such that:

i) when said start command generating means generates a start command and a time interval of no greater than a predetermined time interval has a elapsed since completion of a communication session which was originated by said data transfer device, said data transfer means initiates a connection over a channel for transmission of digital data between said data transfer device and the remote communication node corresponding to the telephone number stored in said first telephone number memory means, and

ii) when said start command generating means generates a start command and a time interval of no greater than a predetermined time interval has elapsed since completion of a communication session which was originated by a remote communication node, said data transfer means initiates a connection over a channel for transmission of digital data between said data transfer device and the remote communication node corresponding to the telephone number stored in said second telephone number memory means.

5,315,641

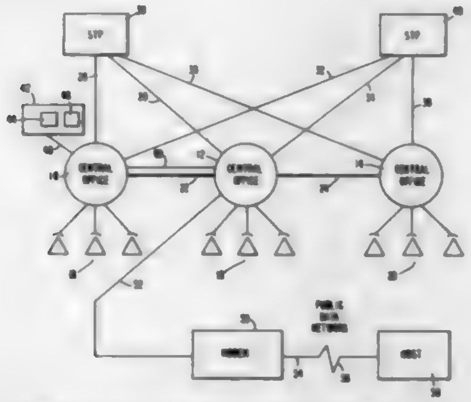
PUBLIC SWITCHED TELEPHONE NETWORK ACCESS TO PUBLIC DATA NETWORK

Robert H. Montgomery, Herndon, Va., and Lawrence A. Delss, Baltimore, Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Oct. 14, 1992, Ser. No. 959,920

Int. Cl.^{5} H04M *11/00*

U.S. Cl. 379—94 **23 Claims**



10. A system for connecting selected calling stations to a predetermined destination over the public switched telephone network, said network including Stored Program Control (SPC) switching means connected by trunks and trunk switching means, said SPC switching means being connected to stations by station lines, said predetermined destination comprising a station connected to one of said SPC switching means by station lines, said destination station comprising line side modem means connected to said station lines, said modem means being connected by digital communication link means to host computer means, said one SPC switching means being connected to Feature Group trunk means in said telephone network, said Feature Group trunk means being connected through said network to said selected calling stations by said selected stations dialing a customer identification code (CIC) number, said one SPC switching means being programmed to connect said CIC number received over said Feature Group trunk means to a line side number for said destination station, and means at said one SPC switching means for initiating a quick start signal to said modem means immediately upon said one SPC switching means seizing a circuit in said Feature Group trunk means on which said CIC call is incoming.

5,315,642

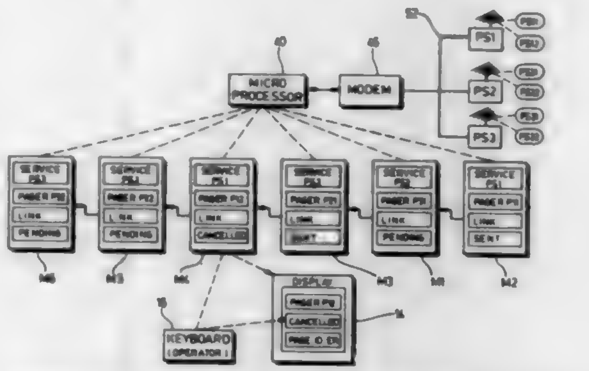
CONCURRENT CREATION AND TRANSMISSION OF TEXT MESSAGES TO MULTIPLE PAGING SERVICES

Jorge D. Fernandez, Willowdale, Canada, assignor to Canamex Corporation, Markham, Canada

Filed Apr. 16, 1992, Ser. No. 869,190

Int. Cl.^{5} H04M *11/00*

U.S. Cl. 379—96 **16 Claims**



1. For a remotely-located device that transmits text messages with a programmable modem over telephone lines to a paging service that serves pagers and observes a particular communication protocol, the device using communication data stored in storage means associated with the device to communicate with the paging service and being programmed to permit entry and editing of the communication data, the communication data comprising at least paging service data identifying the communication protocol of the paging service, a method of reconfiguring the communication data of the remotely-located device to correct transmission problems associated with faulty communication data or to meet operator communication requirements, the method comprising:

telephonically connecting the remotely-located device via its modem with a device at the service center;

operating the remotely-located device to retrieve from its associated storage means the communication data and to transmit the retrieved communication data according to a predetermined communication protocol via its modem over telephone lines to the telephonically-connected service center device;

storing the received communication data in storage means associated with the service center device;

reconfiguring the received communication data with the service center device;

telephonically connecting the service centre device with the remotely-located device after reconfiguring the received communication data;

transmitting the reconfigured communication data from the service centre device over telephone lines to the telephonically-connected remotely-located device; and,

operating the remotely-located device to store the reconfigured transmitted communication data in the storage means associated with the remotely-located device for later use by the remotely-located device for communication with the paging service.

5,315,643

COMMUNICATION SYSTEM AND DATA COMMUNICATION METHOD

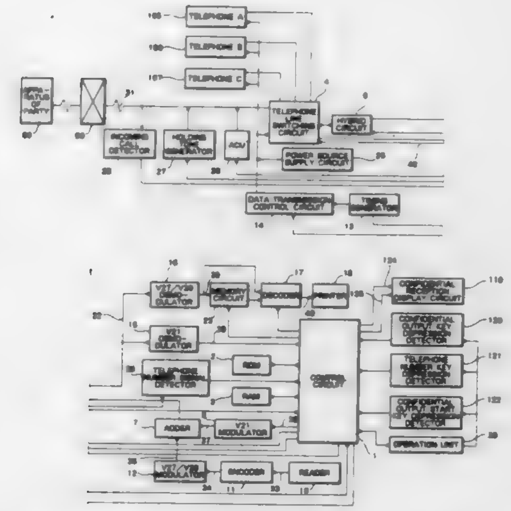
Takehiro Yoshida, Tokyo, and Kenzo Sakakibara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 774,649, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 278,260, Nov. 29, 1988, abandoned. This application Mar. 22, 1993, Ser. No. 34,658

Claims priority, application Japan, Nov. 30, 1987, 62-299806; Nov. 30, 1987, 62-299807; Dec. 8, 1987, 62-308678; Dec. 8, 1987, 62-308679; Dec. 10, 1987, 62-310906; Dec. 10, 1987, 62-310907; Dec. 10, 1987, 62-310908; Dec. 18, 1987, 62-319012; Dec. 19, 1987, 62-319013; Jan. 11, 1988, 63-002405; Jan. 28, 1988, 63-015734

Int. Cl.^{5} H04M *11/00, 1/32*

U.S. Cl. 379—100 **27 Claims**



1. A communication system which has telephone terminals having display means, facsimile communication means for receiving image data and telephone selection information, and storing the received image data into a memory, and connecting means for connecting a telephone line with one of said telephone terminals or said facsimile communication means selectively, comprising:

display control means for controlling said display means of said telephone terminals in accordance with the telephone selection information received by said facsimile communication means; and

output means for visibly outputting the image data in the memory in accordance with whether predetermined data corresponding to the telephone selection information is manually inputted.

5,315,644

TELEPHONE INTERFACE CIRCUIT

James W. Lester, Ventura; Randall M. Wagner, Thousand Oaks, and Randy A. Callaway, Simi Valley, all of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 21, 1991, Ser. No. 795,373

Int. Cl.^{5} H04M *11/00*

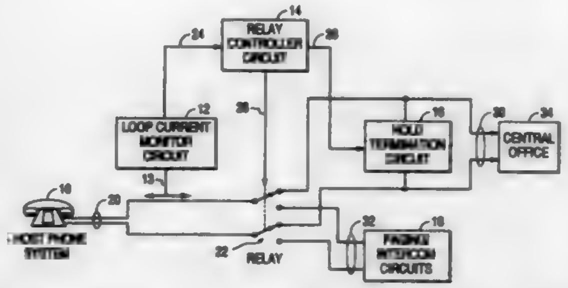
U.S. Cl. 379—103 **5 Claims**

1. A circuit for interfacing a host telephone system having a trunk line pair with a central office line pair and an additional circuit line pair, comprising;

a loop current monitor circuit for monitoring the host telephone system trunk line pair normally connected to the central office line pair and providing a status signal output in response to a monitored condition;

a relay controller capable of receiving said status signal and providing a relay control signal and a hold signal;

a relay for selectively connecting the host telephone system trunk line pair to the additional circuit line pair in response to receiving the relay control signal;



a hold termination circuit which receives said hold signal and, in response, said hold termination circuit trapping any loop current signals detectable over the central office line pair; and

wherein said relay controller circuit is active to generate said relay control signal for an initial time period after the host telephone system goes off-hook.

5,315,645

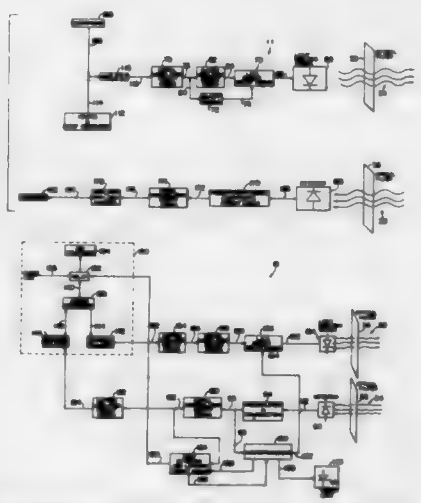
COMMUNICATION APPARATUS UTILIZING DIGITAL OPTICAL SIGNALS

Mark Matheny, Manchester, Conn., assignor to Tek Electronics Manufacturing Corporation, Manchester, Conn.

Filed Dec. 10, 1990, Ser. No. 624,983

Int. Cl.^{5} H04B *9/00;* **H04M** *17/00*

U.S. Cl. 379—144 **27 Claims**



21. Communication apparatus utilizing digital optical signals, said apparatus comprising:

first input circuit means for receiving an input analog electrical signal;

first digital circuit means coupled to said input circuit means for converting said analog electrical signal to a digital electrical signal;

first optical transmission circuit means coupled to said first digital circuit means for generating and transmitting a first baseband digitally formatted optical signal;

enabling circuit means coupled to said first optical transmission circuit means for enabling said first optical transmission circuit means to transmit a connection command signal;

first optical receiving circuit means located remotely from and in line-of-sight alignment with said first optical transmission circuit means for sensing and receiving said baseband digitally formatted optical signal and for converting said baseband digital formatted optical signal to a digital electrical signal, and

second digital circuit means coupled to said first optical receiving circuit means for converting said digital electrical signal to an output analog electrical signal, said output analog electrical signal replicating said input analog electrical signal;

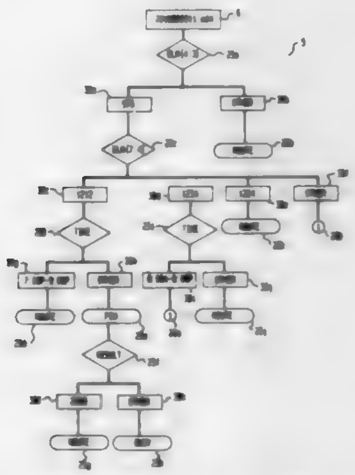
5,315,646
SYSTEMS AND PROCESSES FOR PROVIDING MULTIPLE INTERFACES FOR TELEPHONE SERVICES

David L. Babson, III, Somerset; James A. Bajzath, Jr., Roebling, and Thomas C. Ely, Bridgewater, all of N.J., assignors to Bell Communications Research, Livingston, N.J.

Filed Dec. 18, 1990, Ser. No. 629,447

Int. Cl.^{5} H04M *3/42, 11/00*

U.S. Cl. 379—201 **6 Claims**



1. A data processing system for designing a procedure to direct a telephone network having a customized call processor to provide requested services to a customer of the network, the data processing system including

- a display terminal for displaying a visual representation of the procedure;
- control means, coupled to the display terminal, for causing the display terminal to display the visual representation based upon multilevel data the multilevel data including
  - a graphical representation level containing display information for the visual representation including an object level containing information about screen objects used in the visual representation, and a screen level containing information about relationships between the screen objects in the visual representation;
  - a data structure level containing data, organized in data structures, which correspond to the display information; and
  - a code level containing machine independent binary code executable in real time by the customized call processor to implement the requested services, the machine independent binary code corresponding to the data in the data structure;
- a plurality of graphical representation level modules for operating on the display information;
- a plurality of data structure level modules for operating on the data organized in the data structures; and
- a plurality of code level modules for operating on the executable code.

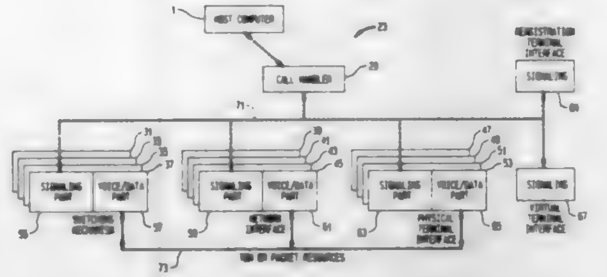
5,315,647
PRIVATE BRANCH EXCHANGE ADAPTED FOR TELEMARKETING

Kenneth S. Araujo, Long Branch, N.J., assignor to Teleos Communications, Inc., Eatontown, N.J.

Filed Jul. 31, 1991, Ser. No. 738,342

Int. Cl.^{5} H04M *1/00*

U.S. Cl. 379—265 **35 Claims**



1. A private branch exchange for establishing a telephone call between a first telephone terminal and a second telephone terminal, comprising:

- (a) a call handler;
- (b) receiving means, associated with said call handler, for receiving signals from a host computer identifying said first and second telephone terminals;
- (c) first call setup means, associated with said call handler, for transmitting from said call handler a first call setup signal to a virtual terminal interface;
- (d) first call answer means, associated with said virtual terminal interface, for transmitting, without initiation by a corresponding signal from a telephone terminal and automatically in response to said first call setup signal, a first call answer signal from said virtual terminal interface to said call handler;
- (e) second call setup means, associated with said call handler, for transmitting from said call handler a second call setup signal to a destination interface associated with said second telephone terminal;
- (f) second call answer means, associated with said destination interface, for transmitting, upon initiation by a corresponding signal from said second telephone terminal, a second call answer signal from said destination interface to said call handler;
- (g) third call setup means, associated with said call handler, for transmitting from said call handler a third call setup signal to a physical terminal interface associated with said first telephone terminal;
- (h) third call answer means, associated with said physical terminal interface, for transmitting, upon initiation by a corresponding signal from said first telephone terminal, a third call answer signal from said physical terminal interface to said call handler; and
- (i) switching means for establishing, following receipt by said call handler of said third call answer signal, a communication path between said first telephone terminal and said second telephone terminal for said telephone call.

5,315,648
RETAINER MEMBER FOR ANCHORING A TELEPHONE HANDSET TO A TELEPHONE HOUSING

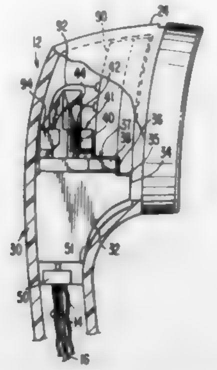
Allen W. Vogl, 642 Tulane Ave., Melbourne, Fla. 32901, and John H. MacNeill, 1320 S. Riverside Dr., Indialantic, Fla. 32903

Filed Dec. 9, 1992, Ser. No. 987,810

Int. Cl.^{5} H04M *1/00*

U.S. Cl. 379—438 **11 Claims**

1. A retainer member for securing a telephone handset to a telephone housing via a cable, the handset having a yoke portion and a receiver portion connected at a yoke/receiver junction, wherein said retainer member, comprises:



- a front surface curved in only one plane parallel to a longitudinal axis of the headset, allowing the retainer member to be inserted into the yoke-receiver junction such that only a bottom portion and side edges of the front surface contact an interior surface of the yoke/receiver junction, the majority of said front surface being in a non-contacting relationship with the interior surface; and
- a bottom surface, rear surface and a top surface portion, said top surface portion including an integral stop to prevent an end plug of said cable from extending out of the top surface of said retainer member.

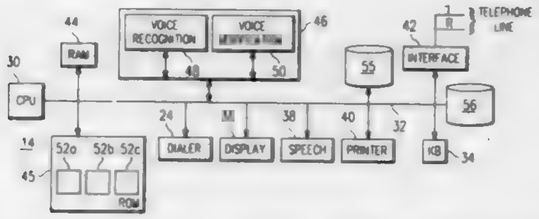
5,315,649
TOLL CALL TELEPHONE SERVICE CENTER

Peter J. Foster, Dallas, and Kim S. Terry, Richardson, both of Tex., assignors to VCS Industries, Inc., Dallas, Tex.

Filed Apr. 15, 1992, Ser. No. 869,242

Int. Cl.^{5} H04M *3/44*

U.S. Cl. 379—355 **3 Claims**



1. Toll call service center means accessible by subscribers to a toll call service comprising;

- storage means for storing a set of identifiers at storage locations uniquely identified with each subscriber to the toll call service, the set of identifiers being associated with a particular plurality of called stations uniquely determined by the subscriber with the identifiers being unique subscriber-encoded representations of the called station numbers desired to be accessed by the subscriber, the identifiers being stored in the storage means in an off-line enrollment process to the toll call service;
- announcing means;
- processor means, operative under the control of a program stored therein and responsive to reception of an incoming call from a subscriber, for controlling the announcing means to request the subscriber to speak an identifier associated with one of the plurality of called stations;
- voice recognition means, responsive to receipt of the identifier, for determining whether the identifier is valid for the subscriber; and
- dialer means, operative under the control of the processor means and responsive to recognition of a valid identifier for the subscriber, for dialing a telephone number of the called station associated with the identifier.

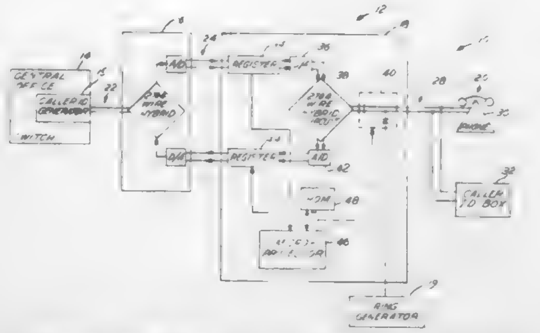
5,315,650
CALLER IDENTIFICATION TRANSMIT PATH LIMITER

Earl L. Smith, Downers Grove, and Van Nguyen, Wheaton, both of Ill., assignors to Teltrend Inc., St. Charles, Ill.

Filed May 3, 1993, Ser. No. 56,678

Int. Cl.^{5} H04M *1/00, 9/00*

U.S. Cl. 379—399 **7 Claims**



1. A transmit path limiter for use with a digital transmission line system, said system including a customer loop telephone line and a digital carrier transmission line comprising, in combination:

- an initial ring detector for sensing that a call is coming to said customer loop telephone line and responsively providing an initiation signal;
- an analog to digital converter for accepting an analog telephone signal and converting said telephone signal to an intermediate digital signal;
- a register for receiving said intermediate digital signal and responsively transmitting a digital data signal to said digital carrier transmission line; and
- a controller, interconnected to said initial ring detector, for receiving said initiation signal and substituting therefore a quiet code in said register for a predetermined interval.

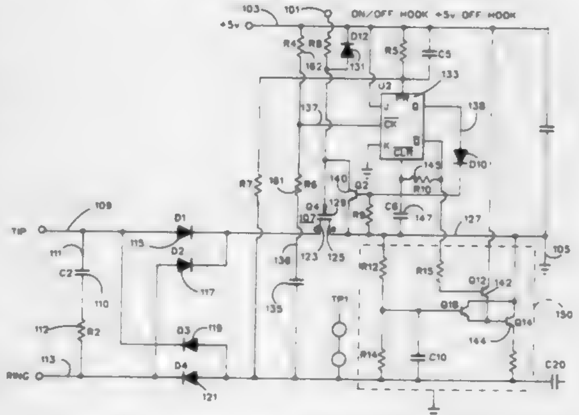
5,315,651
ACTIVE SURGE REJECTION CIRCUIT

Raphael Rahamim, Orange, and Dale E. Folwell, Placentia, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 9, 1993, Ser. No. 895,969

Int. Cl.^{5} H02H *3/00, 3/22, 9/04;* **H04M** *9/00*

U.S. Cl. 379—412 **13 Claims**



1. A modem surge protection circuit, comprising in combination:

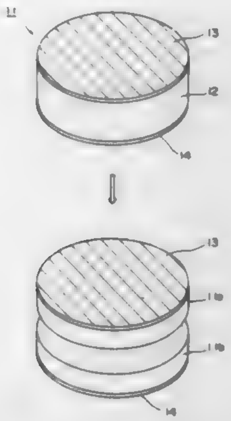
- (a) TIP and RING leads for communication between a telephone line and a modem;
- (b) a FET connected to open and close one of said leads;
- (c) an ON/OFF HOOK circuit for supplying operating voltage to said FET when line is in an OFF HOOK mode;

(d) a modem power source for dc voltage which is positive relative to ground;
(e) a first sub-circuit and a second sub-circuit;
(f) a flip-flop for activating said first sub-circuit in one condition and said second sub-circuit in its other condition;
(g) sensing means connected across said leads for activating said flip-flop to said one condition upon sensing a surge voltage;
(h) said first sub-circuit preventing said FET from conducting current when said first sub-circuit is activated; and
(i) said second sub-circuit resetting the flip-flop after a predetermined time.

5,315,652

TERMINAL FOR TELEGRAPH AND TELEPHONE SYSTEMS

Kenji Takakura, and Katsuyuki Uchida, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Mar. 11, 1992, Ser. No. 850,698
Claims priority, application Japan, Mar. 13, 1991, 3-014382[U]
Int. Cl.^{5} H04M *9/08*
U.S. Cl. 379—413 **13 Claims**



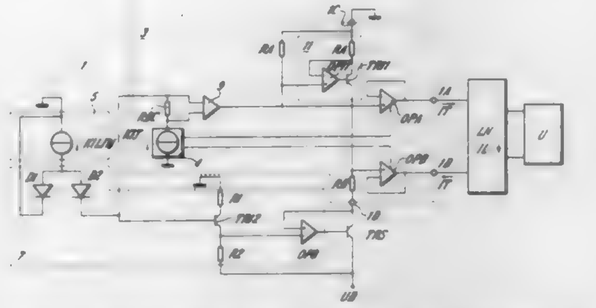
1. In a terminal for telegraph and telephone systems, comprising an overvoltage/overcurrent protecting component having a positive temperature coefficient thermistor element, the terminal for telegraph and telephone systems being characterized in that said positive temperature coefficient thermistor element comprises:
a ceramic body made of a ceramic material whose Curie temperature is in the range of 60° to 120° C., and having a thickness in the range of 2.5 to 5.0 mm; and
electrodes formed on both major surfaces of said ceramic body.

5,315,653

CURRENT LIMITED SUBSCRIBER INTERFACE CIRCUIT

Marco Siligoni, Vittuone; Vanni Saviotti, Monza, both of Italy, and Maria L. Marcioni legal representative of said Marco Siligoni, deceased , assignors to SGS-Thomson Microelectronics s.r.l., Milan, Italy
Filed May 5, 1992, Ser. No. 880,213
Claims priority, application Italy, Jun. 25, 1991, MI91A001747
Int. Cl.^{5} H04M *19/00*
U.S. Cl. 379—413 **17 Claims**

4. An electronic interface circuit connectable between a telephone subscriber line and a main exchange and having a threshold current with a predetermined value, the circuit comprising:
first and second supply terminals adapted to be connected to poles of a main exchange battery:
first and second output terminals adapted to be connected to wires of the telephone subscriber line:
a first resistance circuit coupled between said first supply terminal and said first output terminal and having a first resistance value;
a second resistance circuit having a substantially equal resistance value to said first resistance value and connectable between said second supply terminal and said second output terminal;
a detector coupled to the subscriber lines and detecting a current flowing therethrough, said detector extracting a transverse component of said current from the subscriber lines; and

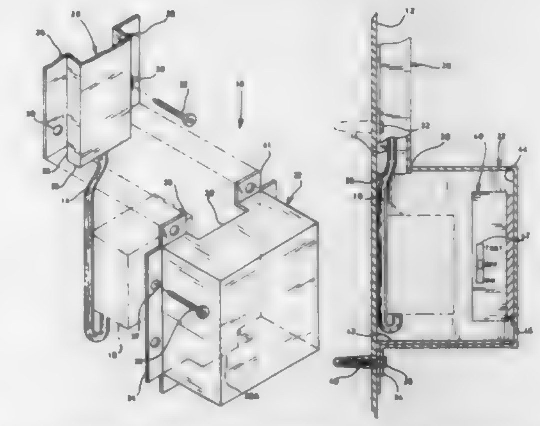


a current limiter for limiting current, said current limiter using said first resistance and said second resistance when the value of said transverse component is less than the predetermined value of the threshold current, said current limiter using only said first resistance when the value of said transverse component is equal to the predetermined value of the threshold current causing the circuit to operate in a balanced configuration when the value of said transverse component is less than the predetermined value of the value of said transverse component is equal to the predetermined value of the threshold current.

5,315,654

ARMORED TELEPHONE LINE PROTECTIVE SYSTEM

Carroll K. Kraft, 1999 Valencia Way, Clearwater, Fla. 34624
Filed Dec. 2, 1992, Ser. No. 984,321
Int. Cl.^{5} H04M *1/00*
U.S. Cl. 379—438 **17 Claims**

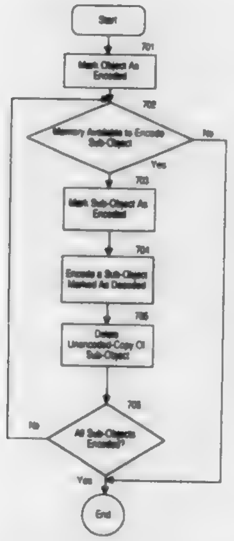


1. An armored protective system to cover telephone wires and equipment installed on an exterior of a building to prevent severing the wires and tampering with the equipment by an intended intruder into the building, said system comprising:
an elongated armor protector channel for covering the telephone wires, said protector channel being open toward the exterior of the building and having oppositely disposed edge flanges provided with openings to receive fastener means for attaching said protector channel to the exterior of the building, said protector channel preventing severing of the wires;
an armor enclosure for covering the telephone equipment, said enclosure receiving a terminal end of said protector channel, said enclosure being open toward the exterior of the building and having outwardly extending flanges provided with openings to receive fastener means for attaching said enclosure to the exterior of the building, said enclosure preventing tampering with the telephone equipment, said enclosure being provided with an edge notch to closely receive said terminal end of said protector channel; and
a self-contained motion-sensitive alarm means mounted within said enclosure, said alarm means providing an audible sound when said enclosure is disturbed on the exterior of the building.

5,315,655

METHOD AND APPARATUS FOR ENCODING DATA OBJECTS ON A COMPUTER SYSTEM

Michael Chaplin, Berkeley, Calif., assignor to Notable Technologies, Inc., Oakland, Calif.
Filed Dec. 16, 1992, Ser. No. 991,366
Int. Cl.^{5} H04L *9/00*
U.S. Cl. 380—4 **11 Claims**

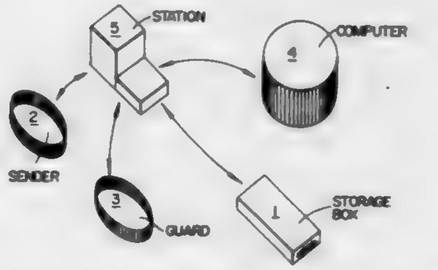

Start
701
Mark Object As Encoded
702
Memory Available to Encode Sub-Object
No
Yes
703
Mark Sub-Object As Encoded
704
Encode a Sub-Object Marked As Decoded
705
Delete Unencoded-Copy Of Sub-Object
706
No
All Sub-Objects Encoded?
Yes
End

1. In a computer system having a compression/decompression means for compressing and decompressing data objects, a method for managing the operation of said compression/-decompression means to transparently cause data objects to be, compressed said method comprising the steps of:
a) compressing a first data object and a second data object;
b) when a user causes said first data object to be opened:
  c) determining whether said second data object is stored uncompressed;
  d) if said second data object is stored uncompressed:
    e) re-compressing said second data object;
    f) storing said second data object as compressed;
    g) removing an indication that said second data object is stored uncompressed;
  h) decompressing said first data object;
i) when said user causes said first data object to be closed:
  j) storing said first data object uncompressed;
  k) indicating that said first data object is stored uncompressed;
l) when said user causes said second data object to be opened:
  m) determining whether said first data object is stored uncompressed;
  n) if said first data object is stored uncompressed:
    o) recompressing said first data object;
    p) storing said first data object as compressed;
    q) removing an indication that said first data object is stored uncompressed;
  r) decompressing said second data object;
s) when said user causes said second data object to be closed:
  t) storing said second data object uncompressed;
  u) indicating that said second data object is stored uncompressed;
v) repeating steps b–k each time said first data object is opened and closed;
w) repeating steps l–u each time said second data object is opened and closed.

5,315,656

SYSTEM FOR PROTECTING DOCUMENTS OR OBJECTS ENCLOSED IN A TAMPER-PROOF CONTAINER

Franklin Devaux, Couternon; Marc Geoffroy, Saint Julien, and Christophe Genevois, Dijon, all of France, assignors to AXYVAL (Societe Anonyme), Dijon Cedex, France
Filed Mar. 16, 1992, Ser. No. 876,712
Claims priority, application France, Jul. 17, 1989, 89 09579
Int. Cl.^{5} H04L *9/10*
U.S. Cl. 380—23 **18 Claims**

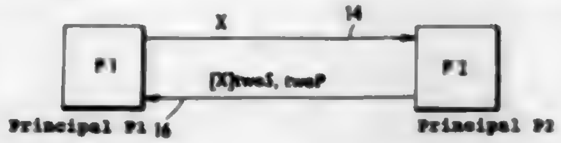


1. A system for protecting items transported between a plurality of locations, comprising:
a plurality of storage boxes, one storage box housing an item and having an internal management system for controlling a plurality of operating modes of said protecting system, said internal management system having a memory that stores data pertaining to a current operating mode of said one storage box, in which transitions between operating modes take place upon the occurrence of specific events;
a security receptacle for maintaining the security of said plurality of storage boxes;
a supervisory computer that communicates with said internal management system to determine an existence of an unauthorized action, wherein if an unauthorized action is determined to exist, said item in said one storage box is destroyed and said data in said memory is erased, said supervisory computer further authorizing an operating mode transition of said one storage box when said operating mode is a global mode;
a station, wherein said plurality of storage boxes, said security receptacle, said computer and said station are arranged in the configuration of a star network to communicate with each other and effect said transitions between operating modes; and
means for authorizing and verifying said transitions between operating modes.

5,315,657

COMPOUND PRINCIPALS IN ACCESS CONTROL LISTS

Martin Abadi, Palo Alto, Calif.; Andrew C. Goldstein, Hudson, and Butler W. Lampson, Cambridge, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Sep. 28, 1990, Ser. No. 589,923
Int. Cl.⁵ H04L *9/32;* **G06F** *13/14*
U.S. Cl. 380—25 **8 Claims**



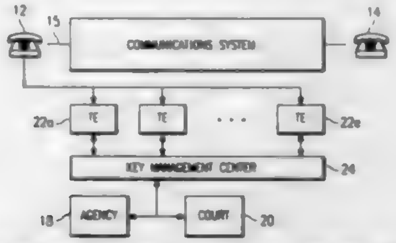
1. In a distributed system, a method for defining the access of a user on a specified workstation to a system resource having an access control list, the method comprising the steps of:

(a) generating an access code indicating that the user has delegated access authority to the specified workstation; and
(b) allowing the specified workstation to have access to the system resource when all of the following conditions (1)–(3) are met:
(1) the system resource receives an access request from the specified workstation;
(2) the access control list for the system resource has an entry allowing the specified workstation to have access to the system resource if the user has delegated access authority to the specified workstation; and
(3) the system resource determines that the user has delegated access authority to the specified workstation.

5,315,658

FAIR CRYPTOSYSTEMS AND METHODS OF USE

Silvio Micali, 459 Chestnut Hill Ave., Brookline, Mass. 02146
Continuation-in-part of Ser. No. 870,935, Apr. 20, 1992, Pat. No. 5,276,737. This application Apr. 19, 1993, Ser. No. 49,929
The portion of the term of this patent subsequent to Jan. 4, 2011, has been disclaimed.
Int. Cl.⁵ H04K *1/00*
U.S. Cl. 380—30 **13 Claims**



1. A method, using a public-key cryptosystem, for enabling a predetermined entity to monitor communications of users suspected of unlawful activities while protecting the privacy of law-abiding users, wherein each user is assigned a pair of matching secret and public keys, comprising the steps of:

breaking each user's secret key into shares;
providing trustees pieces of information enabling the trustees to verify that the pieces of information include shares of a secret key of some given public key; and
upon a predetermined request, having the trustees reveal the shares of the secret key of a user suspected of unlawful activity to enable the entity to attempt reconstruction of the secret key; and
monitoring communications to the suspect user during a time period specified in the predetermined request.

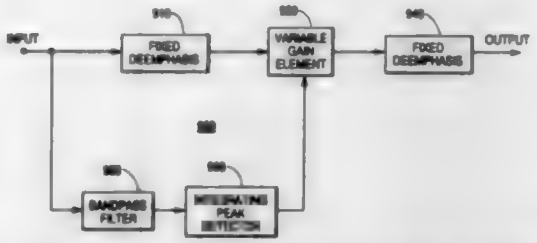
5,315,659

Patent Not Issued For This Number

5,315,660

WIDEBAND EXPANDER FOR STEREO AND SAP SIGNALS

Mark R. Anderson, Indianapolis, Ind., and Robert P. Parker, Westborough, Mass., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Continuation of Ser. No. 839,645, Feb. 21, 1992, abandoned, which is a division of Ser. No. 511,716, Apr. 18, 1990, Pat. No. 5,091,957. This application Jul. 26, 1993, Ser. No. 96,874
Int. Cl.⁵ H04H *5/00*
U.S. Cl. 381—13 **4 Claims**



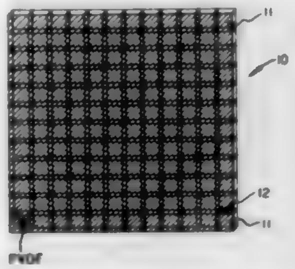
1. A decoder circuit for decoding audio signals, comprising:

means for receiving an L—R audio signal which has been encoded in accordance with the dbx companding system including both spectral compression and wideband compression, wherein said wideband compression is controlled in response to a control signal generated by compression control signal generation means exhibiting a given transient response;
means for performing wideband expansion of said encoded L—R audio signal; and gain control signal generating means for controlling said wideband expansion in response to said dbx encoded L—R audio signal and exhibiting a slower gain control transient response than that of said compression control signal generation means of said encoder; and wherein
said decoder circuit does not perform spectral expansion of said dbx encoded audio signal.

5,315,661

ACTIVE HIGH TRANSMISSION LOSS PANEL

William Gossman, Silver Spring, Md., and Graham Eatwell, Cambridge, United Kingdom, assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.
Filed Aug. 12, 1992, Ser. No. 928,472
Int. Cl.⁵ G10K *11/16*
U.S. Cl. 381—71 **17 Claims**



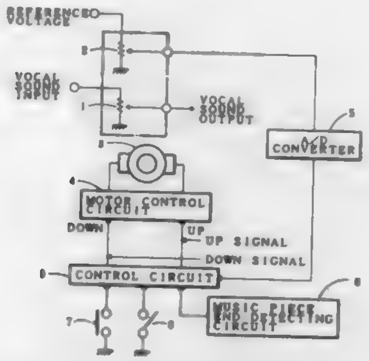
1. An active high transmission loss panel for use in quieting broadband sound radiation, said panel comprising

panel means providing passive sound attenuation, said panel means including a plurality of first and second partition or partitioning means, with said panel means defining a number of contiguous cell means and being spaced from each other along the sound radiation path,
each first said partition means having a first sensor means thereon and each said corresponding second partition means having a first actuator and second sensor means thereon,
said actuator and sensor means, in conjunction with an active noise control means, adapted to attenuate noise impacting on said panel means from passing through to the opposite side.

5,315,662

KARAOKE EQUIPMENT

Kazuhiro Hayashi; Jun Honda; Michitaka Fujita, and Kunihiro Miyata, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 7, 1992, Ser. No. 909,690
Claims priority, application Japan, Jul. 12, 1991, 3-172710
Int. Cl.⁵ H03G *3/00*
U.S. Cl. 381—107 **5 Claims**



1. A karaoke apparatus which generates through a loudspeaker a music piece from a recording medium and vocals from a singer when the singer sings into a microphone, comprising:

an adjustor for adjusting a volume level of said microphone;
a level detector for detecting said volume level;
a music piece detector for detecting an ending or starting point of each music piece; and
a controller that previously stores a standard volume level, and further compares, when a detected signal is outputted from said music piece detector, the level of an output value from said level detector and said previously stored standard volume level, and controls said adjustor so as to equalize the level of said output value from said level detector to said previously stored standard level.

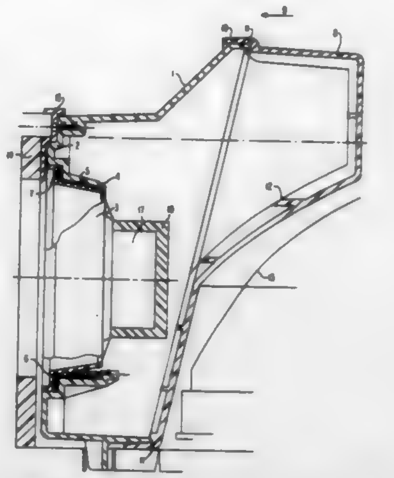
5,315,663

PASSIVE LOUDSPEAKER ENCLOSURE FOR A TELEVISION RECEIVER

Karl-Heinz Thiele, Essinghausen, Fed. Rep. of Germany, assignor to Electronic-Werke Deutschland GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
PCT No. PCT/EP89/00667, § 371 Date Feb. 8, 1991, § 102(e) Date Feb. 8, 1991, PCT Pub. No. WO89/12946, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 14, 1989, Ser. No. 656,055
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821166
Int. Cl.⁵ H04R *25/00*
U.S. Cl. 371—188 **7 Claims**

1. A passive multipath loudspeaker enclosure for a television receiver for minimizing magnetic interference in a proximal picture tube, comprising the combination of the following features:

a) the only magnetic part within the enclosure is a loudspeaker magnet structure, which has a screen for magnetic stray fields, with other portions of a loudspeaker frame and a diaphragm being made from non-magnetic materials;
b) a plurality of housing components, said components being made from non-magnetic material and fitted together without any metal parts using a plurality of interlocking clip connectors and an adhesive connection; and

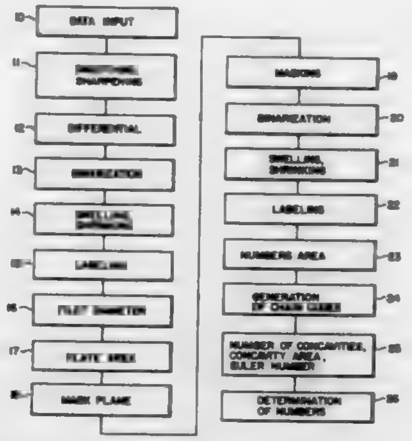


c) filters for dividing the frequency bands between a plurality of loudspeakers being realized by means of mechanical measures disposed at the loudspeakers.

5,315,664

NUMBER PLATE RECOGNITION SYSTEM

Ryohei Kumagai, Tokyo, Japan, assignor to Ezel, Inc., Tokyo, Japan
Continuation of Ser. No. 620,008, Nov. 30, 1990, abandoned. This application May 26, 1993, Ser. No. 67,166
Claims priority, application Japan, Dec. 2, 1989, 1-313910
Int. Cl.⁵ G06K *9/00*
U.S. Cl. 382—1 **5 Claims**



1. A number plate recognition system comprising:

a video camera which obtains an image which includes a number plate to be recognized;
processing means, receiving said image, for:
1) determining an outline of the number plate in both the vertical and the horizontal directions;
2) labeling portions of the image to determine continuous configurations within the image, each continuous configuration within the image being classified as a group having a different labelling number,
3) determining sizes of the image portions bounded by the labeling to determine a configuration,
4) setting one of the configurations having a maximal diameter which is a largest size diameter, based on said sizes, as a diameter of the number plate,
5) determining variances for each said pixel within said groups;

6) dividing the pixels into subgroups according to their densities;

7) calculating a threshold whereby a ratio between variance within a group and variance between groups is maximum; and

8) using said threshold to binarize said pixels; and

means for calculating values within an area defined by said maximal diameter from which numbers on said number plate can be calculated.

5,315,665

X-RAY COMPUTERIZED TOMOGRAPHY APPARATUS FOR OBTAINING CONSECUTIVE TOMOGRAPHIC IMAGES IN EITHER A FORWARD OR BACKWARD DIRECTION WITHOUT PERFORMING INTERPOLATION FOR VIEWS OVER AN ENTIRE 360°

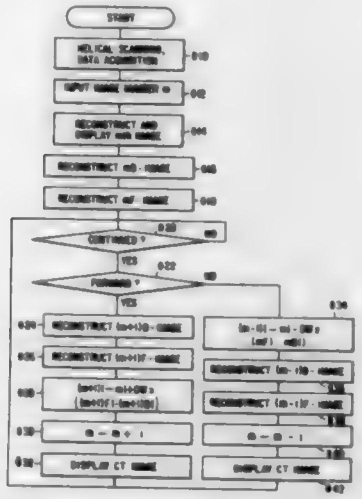
Akinami Ohhashi, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1992, Ser. No. 853,046

Claims priority, application Japan, Mar. 20, 1991, 3-57063; Mar. 22, 1991, 3-58769

Int. Cl.⁵ G06F *15/42*

U.S. Cl. 382—6 **15 Claims**



3. An X-ray computerized tomography apparatus for acquiring views by helical scanning, comprising:

means for obtaining a tomographic image at a first slice position by reconstructing views at the first slice position which are obtained by interpolating 360° views in a first range next to the first slice position in a backward direction in which a slice position number decreases and 360° views in a second range next to the first slice position in a forward direction in which the slice position number increases;

means for obtaining a first backward image by reconstructing the views in the first range without interpolation processing;

means for obtaining a first forward image by reconstructing the views in the second range without interpolation processing; and

means for obtaining a tomographic image at a second slice position which is separated from the first slice position by 360° in the backward direction by multiplying a difference between the first forward image and the first backward image by a coefficient, and subtracting the result of multiplication from the tomographic image at the first slice position.

5,315,666

METHOD AND APPARATUS FOR MEASURING LENGTHS ON AN ARTICLE

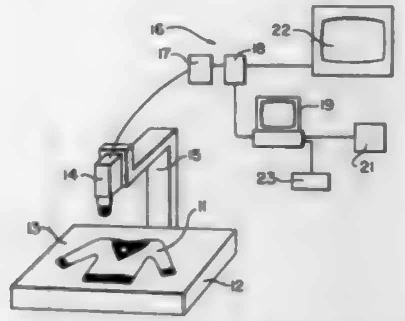
Leonard Norton-Wayne, Leicester, United Kingdom, assignor to De Montfort University, The Gateway, England

Continuation of Ser. No. 295,433, Jan. 10, 1989, abandoned. This application May 21, 1991, Ser. No. 703,359

Claims priority, application United Kingdom, Jan. 12, 1988, 8800570

Int. Cl.⁵ G06K *9/00, 9/20*

U.S. Cl. 382—8 **22 Claims**



1. A method for measuring lengths on a flexible textile article with the aid of data processing means including a digital computer, comprising the steps of

(a) arranging the article flat on a table for measurement in a field of view of an imaging device which forms a pixel image in an x-y array,

(b) forming by said imaging device a pixel image of the so-arranged article,

(c) identifying measurement points on said pixel image in terms of x and y coordinates of said array,

(d) using said digital computer for applying corrections algorithms to the x and y coordinates thus identified to yield new x and y coordinates corrected for scale and system distortions, and

(e) further using said digital computer for evaluating actual lengths between identified measurement points on said article by carrying out appropriate Pythagorean calculations based on said new, corrected x and y coordinates.

5,315,667

ON-LINE HANDWRITING RECOGNITION USING A PROTOTYPE CONFUSABILITY DIALOG

Tetsunosuke Fujisaki, Armonk; Joonki Kim, White Plains; George J. Leibman, Mt. Kisco, and Charles C. Tappert, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1991, Ser. No. 785,735

Int. Cl.⁵ G06K *9/00*

U.S. Cl. 382—13 **20 Claims**

1. In a handwriting recognition system, the combination comprising:

an integrated electronic tablet on which a user may write characters with a stylus and display on which recognized characters may be displayed, said tablet including action button surfaces which when touched by the user with the stylus invoke predetermined actions relative to written characters and displayed recognized characters;

a prototype processor for processing prototype characters written on said tablet by the user in a training session;

a character prototype memory in which said prototype characters processed by said prototype processor are stored;

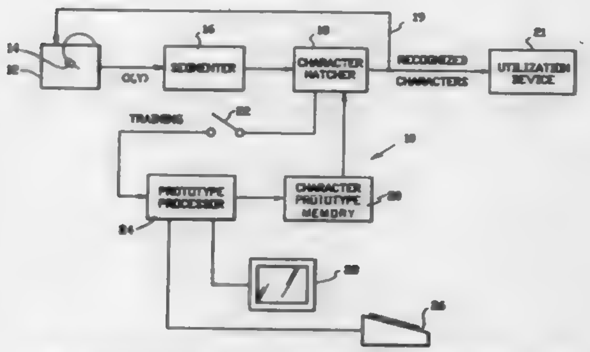
a character matcher which compares unknown characters written by the user with prototype characters stored in said character prototype memory to determine the best match between the unknown characters and the prototype characters for producing recognized characters;

means for displaying on said display what the user is writing on said tablet;

means for displaying recognized characters from said character matches on said display in response to the user writing on said tablet;

means for determining if any characters in corresponding character positions in what the user has written and is displayed on said display, and what is recognized and displayed on said display as a recognized character are different;

means responsive to said means for determining for displaying the written character and the recognized character at the corresponding character position as an intended character indicative of the displayed written character and an unintended character indicative of the displayed recognized character, respectively;



means for displaying at least one prototype character stored in said character prototype memory for each of the intended character and the unintended character; and

means for removing or replacing intended and unintended character prototypes in said character prototype memory in response to the user touching predetermined ones of the action button surfaces with the stylus in response to viewing the intended character and the unintended character and their respective prototypes on the display.

5,315,668

OFFLINE TEXT RECOGNITION WITHOUT INTRAWORD CHARACTER SEGMENTATION BASED ON TWO-DIMENSIONAL LOW FREQUENCY DISCRETE FOURIER TRANSFORMS

Mark A. O'Hair, Huber Heights, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1991, Ser. No. 800,174

Int. Cl.⁵ G06K *9/62*

U.S. Cl. 382—14 **6 Claims**

1. The method of recognizing text, with a system having representative digital images stored in memory, comprising the steps:

(a) building a library of library images of known entities comprising words, phrases and numbers using low frequency filtered Fourier coefficients, using many different font styles, and assembling them into font groups; the font groups being created by averaging Fourier coefficients of a particular entity in different font styles, with first and second properties generated for each coefficient, the first property being a mean value which equates to a unique location in Fourier space, the second property being a standard deviation associated with the averaging of the coefficients, this standard deviation being considered as a radius of a chosen font group, a font group center being a mean value derived by averaging Fourier coefficients of a particular entity in the different font styles;

(b) inputting an image representing text;

(c) digitizing the image to form a digital picture thereof;

(d) storing the image in memory;

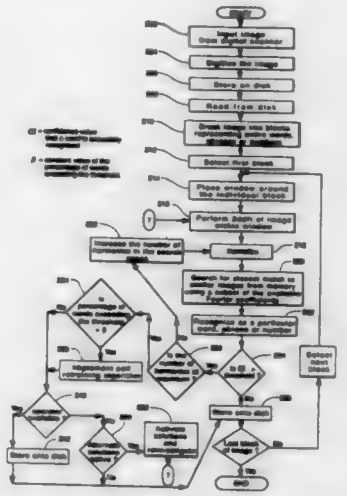
(e) breaking the image into blocks of data, wherein the blocks represent entire words, phrases, or numbers;

(f) placing a window around the first individual block;

(g) performing a two-dimensional discrete Fourier Transform (2DDFT) of the image within the window;

(h) adjusting the punctuations;

(i) filtering both the real (cosine) and imaginary (sine) coefficients to the first N harmonics in both the vertical and horizontal axis, these coefficients then make up a total of M unique vectors which defines a M orthogonal vector space, wherein N is at least five and M is $(2N+1)^2$;



(j) energy normalizing to unity the M unique vectors, which will eliminate the effects due to image brightness;

(k) searching the library of known coefficients and finding the closest match by computing the smallest error between library image and input image;

(l) calculating a confidence value of the closest match based on the radius of the chosen font group and the distance between the font group center and the input image;

(m) storing the match if confidence is high, or further investigating if confidence is low.

5,315,669

DITHER PROCESSING METHOD

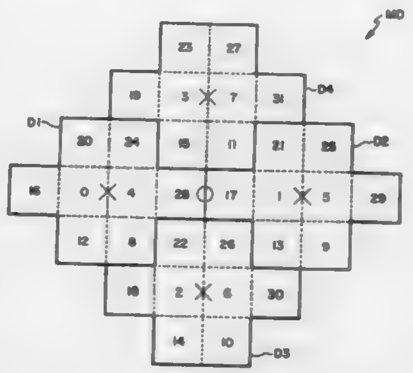
Ryohei Kumagai, Tokyo, Japan, assignor to Ezel Inc., Tokyo, Japan

Division of Ser. No. 512,258, Apr. 20, 1990, Pat. No. 5,201,013. This application May 8, 1992, Ser. No. 881,730

Claims priority, application Japan, Apr. 24, 1989, 1-103695; Jun. 9, 1989, 1-147229; Jun. 20, 1989, 1-157164

Int. Cl.⁵ G06K *9/38*

U.S. Cl. 382—50 **8 Claims**



1. A machine method for generating a binarized image from an original image comprising steps of:

generating an electronic representation of a random image as an array of random image pixels;
generating electronic representations of a plurality of sets of dither cell threshold values;
generating an electronic representation of the original image as an array of image pixels, each image pixel having a pixel density value;
establishing a corresponding between original image pixels and positions within a macro-dither cell, said macro-dither cell having positions corresponding to a union of a plurality of dither cells;
selecting a pixel from the random image, and based on the random value of the pixel from the random image, selecting one of the plurality of sets of dither call threshold values;
selecting one threshold value from the randomly selected set according to a position within the macro-dither cell that corresponds to the original image pixel;
electronically replacing the density value of the image pixel with a binary value according to a predetermined relationship between the density value of the image pixel and the selected threshold value, thereby generating a binarized image.

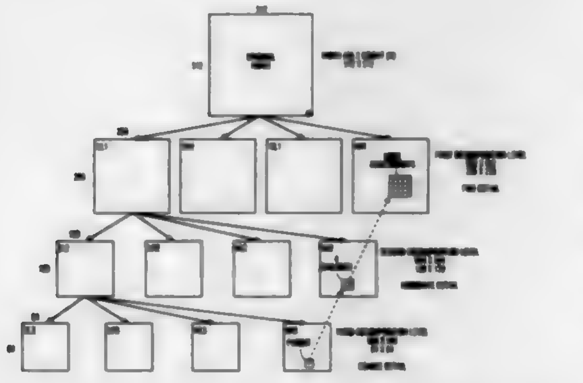
5,315,670
DIGITAL DATA COMPRESSION SYSTEM INCLUDING ZEROTREE COEFFICIENT CODING

Jerome M. Shapiro, Philadelphia, Pa., assignor to General Electric Company, Princeton, N.J.

Filed Nov. 12, 1991, Ser. No. 790,860

Int. Cl.^{5} G06K *9/00*

U.S. Cl. 382—56 **5 Claims**



1. A system for processing digital data comprising a plurality of image representative data elements, said system including:
means responsive to said data elements for providing coefficients representing data elements:
means for evaluating said coefficients to determine significant and insignificant coefficients:
means responsive to evaluated coefficients from said evaluating means for generating a zerotree structure of data representative coefficients, said tree structure having a path from an insignificant single root coefficient generated at a coarse level of information to insignificant descendant coefficients generated at all levels of relatively finer information, where coarse information is image information in a low frequency subband derived from image information over a given spatial area, and finer information is image information in relatively higher frequency subbands derived from image information over a relatively smaller spatial area:
first means for generating a symbol representing a related association of insignificant coefficients within said tree structure along said path encompassing said root coefficient and said descendant coefficients of said tree structure, said first means including means for comparing coefficients to a reference level so that said symbol represents that neither said root coefficient nor any descendant thereof has a magnitude greater than said reference level:
second means for generating a symbol representing a significant coefficient:
means for producing a dominant list of entries corresponding to insignificant coefficients, and a subordinate list of entries corresponding to significant coefficients: and
means for coding said symbols generated by said first and second generating means to produce an output bitstream; wherein
said evaluating means evaluates each coefficient associated with respective entries of said dominant and subordinate lists at successively finer thresholds for progressively refining the contents of said dominant and subordinate lists.

5,315,671
IMAGE PROCESSING METHOD AND APPARATUS

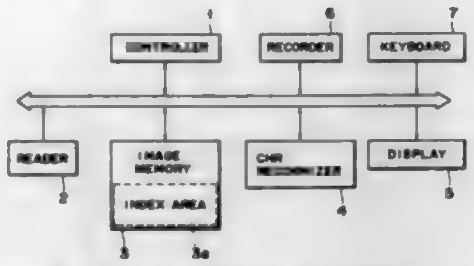
Hirokazu Higuchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,496

Claims priority, application Japan, Aug. 6, 1990, 2-206783

Int. Cl.^{5} G06K *9/00*

U.S. Cl. 382—57 **12 Claims**



1. An image processing apparatus, comprising:
input means for inputting image data;
recognizing means for recognizing input image data and for producing corresponding index data from recognized image data;
memory means for storing input image data and index data obtained by recognizing the input image data;
searching means for searching said memory means for desired index data in accordance with an input request;
changing means for changing the request on the basis of stored information regarding a character recognition error in the case desired index data does not exist in said memory means; and
control means for controlling said searching means to search said memory means for the desired index data on the basis of the changed request.

5,315,672
FIBER OPTIC CHEMICAL SENSOR

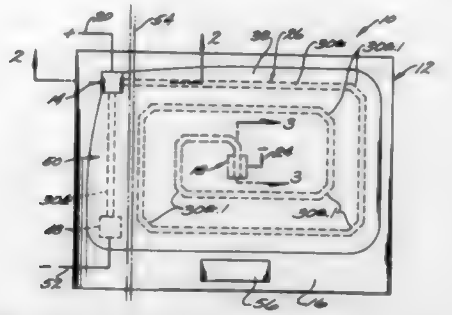
Francois A. Padovani, Westwood, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 23, 1991, Ser. No. 764,257

Int. Cl.^{5} G02B *6/02, 6/12*

U.S. Cl. 385—12 **16 Claims**

1. A sensor comprising a body of semiconductor material accommodating a light-emitting and light-detecting element, an optical fiber formed in situ on the body in optically coupled relation to the elements for normally transmitting light from the light-emitting element to the light-detecting element to provide an electrical signal corresponding to the light, the optical fiber having a core for transmitting the light and having cladding means around at least a portion of the core responsive to a particular chemical or biological species to change light transmission of the optical fiber for regulating the signal to be representative of presence of the species, and an additional light-detecting element accommodated by the body and having an additional optical fiber formed in situ on the body in optically coupled relation to the light-emitting element and the additional light-detecting element to transmit light to the additional light-detecting element for providing a comparison electrical signal representative of the light output of the light-emitting element.



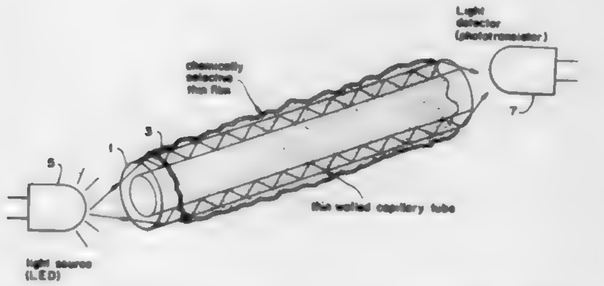
5,315,673
OPTICAL WAVEGUIDE VAPOR SENSOR

Joseph R. Stetter, Naperville; G. Jordan Maclay, Maywood, and David S. Ballantine, Jr., DeKalb, all of Ill., assignors to Transducer Research, Inc., Naperville, Ill.

Filed Mar. 9, 1992, Ser. No. 848,240

Int. Cl.^{5} G02B *6/02*

U.S. Cl. 385—12 **20 Claims**


Light detector (phototransistor)
chemically selective thin film
1
3
5
7
thin walled capillary tube
light source (LED)

1. A sensor for detecting a selected air constituent comprising: an optical waveguide having a front end and a rear end; a light source for transmitting light of a selected wavelength to one end of the waveguide; and means for measuring the intensity of light emitted from the other end of the waveguide, said waveguide comprising a film of material disposed on a substrate such that multiple internal light reflections occur at the interfaces between the film and the substrate and between the film and air, said material having optical properties that are susceptible to change in the presence of said air constituent, wherein said film comprises a reagent embedded in or forming a part of a polymer, said reagent yielding a substance having characteristic light-transmissive or light-adsorptive properties upon exposure to said air constituent.

5,315,674
REPEATERED OPTICAL TRANSMISSION SYSTEM HAVING FULL-OPTICAL LOOPBACK FACILITIES

Katsuhiro Asako, Tokyo, Japan, assignor to NEC Corporation, Japan

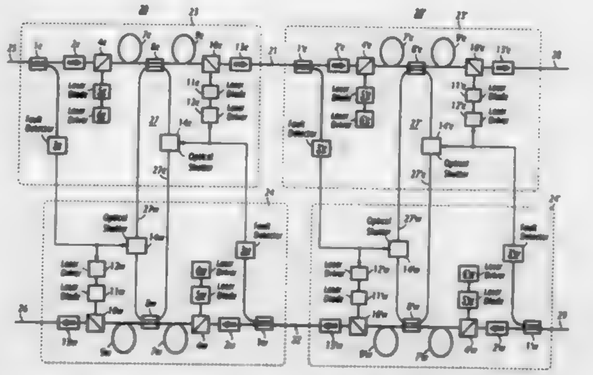
Filed May 7, 1993, Ser. No. 59,202

Claims priority, application Japan, May 7, 1992, 4-114359

Int. Cl.^{5} G02B *6/26;* **G02F** *1/00*

U.S. Cl. 385—15 **3 Claims**

1. A repeater station for a fiber optic transmission system, said repeater station having first and second repeaters of identical structure for relaying optical signals travelling in opposite directions, each of said first and second repeaters comprising:
a first fiber optic section doped with a substance of rare-earth group for receiving an optical signal from a first fiber optic transmission medium;
means including a first excitation source for generating excitation light energy and injecting the energy into said first fiber optic section for causing light amplification to occur therein;
a second fiber optic section doped with said substance for transmitting an amplified version of the optical signal to a second fiber optic transmission medium;
means including a second excitation source for generating excitation light energy and injecting the energy into said second fiber optic section for causing light amplification to occur therein;
an optical coupler connected between said first and second fiber optic sections;



a fiber optic loopback circuit connected at one end thereof through the optical coupler of the repeater to the output of the first fiber optic section of the repeater and connected at the other end thereof through the optical coupler of the other repeater to the input of the second fiber optic section of the other repeater;
an optical shutter connected in said fiber optic loopback circuit for normally blocking said loopback circuit; and
absence-of-signal detector means for monitoring said first fiber optic transmission medium, and on detecting that there is no optical signal present in said first fiber optic transmission medium, operating said optical shutter of the other repeater to establish a path through said fiber optic loopback circuit of the other repeater and deactivating said excitation source of the other repeater.

5,315,675
OPTICAL TAP HAVING A V-SHAPED RECESS WITHIN THE RANGE OF FROM 152° TO 179°

Simon M. Dennis; Philip R. Steward; Roland W. Downing; Simon M. James; David A. Ferguson, and Dominik Drouet, all of Suffolk, England, assignors to British Telecommunications Public Limited Company, London, England

PCT No. PCT/GB91/01184, § 371 Date Mar. 12, 1993, § 102(e) Date Mar. 12, 1993, PCT Pub. No. WO92/01961, PCT Pub. Date Feb. 6, 1992

PCT Filed Jul. 17, 1991, Ser. No. 989,012

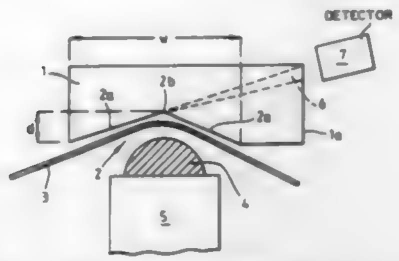
Claims priority, application United Kingdom, Jul. 20, 1990, 9015992

Int. Cl.^{5} G02B *6/26*

U.S. Cl. 385—32 **20 Claims**

1. Optical tap apparatus for coupling light including a range of wavelengths into, or out of, an optical fibre substantially independent of wavelength, the apparatus comprising:
an optical head having a V-shaped recess, and
an abutment member disposed for movement towards and away from the apex of said V-shaped recess to deform the optical fibre into the apex of said recess,
the recess being shaped and sized to subject the optical fibre to a tight curve of short arcuate length when the fibre is

deformed into the recess whereby light over a range of wavelengths can be coupled into, or out of, the optical fibre at a punctiform region of its curved portion, wherein



the angle at the apex of the V-shaped recess is within the range of from 152° to 179° to provide coupling that is substantially independent of wavelength.

5,315,676
OPTICAL WAVEGUIDE DEVICE

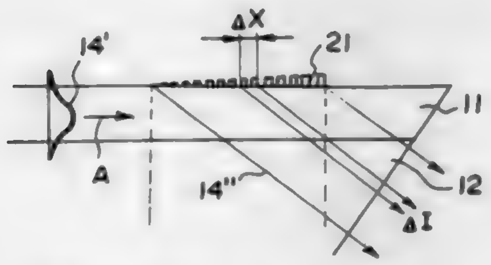
Hiroshi Sunagawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 8, 1993, Ser. No. 117,617

Claims priority, application Japan, Sep. 9, 1992, 4-241004

Int. Cl.^{5} G02B ***6/26***

U.S. Cl. 385—37 **8 Claims**



1. An optical waveguide device comprising:

i) an optical waveguide for guiding an optical wave therethrough, and

ii) a grating coupler located on a surface of the optical waveguide in order to radiate the guided optical wave, which travels in the optical waveguide, out of the optical waveguide,

wherein the grating coupler is provided with a plurality of bars each bar having a height h, the heights h of the bars gradually and approximately linearly increase relative to each other in the direction along which the guided optical wave travels, and each bar having an inclination b relative to the direction along the heights of the bars,

the inclination b satisfies the condition

$$b \geq 2\left(\frac{m}{aL^{m+1}}\right)^{1/m}$$

where a represents a coefficient which determines a radiation loss coefficient α ($\alpha = ah^m$, where $2 < m$), and L represents the length of the grating coupler, which length is taken in the direction along which the guided optical wave travels.

5,315,677
OPTICAL PULSE GENERATOR

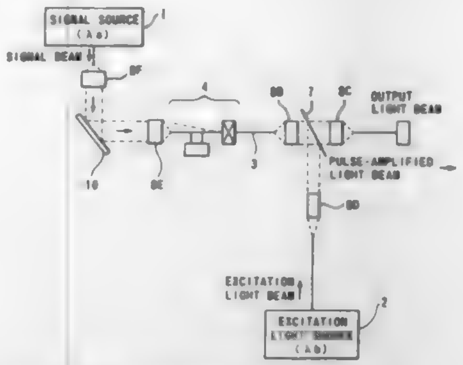
Masaaki Furahashi, and Ryoji Handa, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1993, Ser. No. 118,766

Claims priority, application Japan, Sep. 14, 1992, 4-270893

Int. Cl.^{5} G02B ***6/34***

U.S. Cl. 385—37 **4 Claims**



1. An optical pulse generator comprising:

a signal source for producing a signal beam having a first wavelength;

an excitation light source for producing an excitation beam having a second wavelength;

a first optical fibre for inputting and transmitting said signal beam radiated from said signal source;

a first lens for transmitting said signal beam outputted from said first optical fibre;

a diffraction grating for diffracting said signal beam transmitted thereto through said first lens;

a second lens for converging said signal beam diffracted by said diffraction grating;

a second optical fibre having a terminal portion, said signal beam diffracted by said diffraction grating being converged onto and being incident to said terminal portion of said second optical fibre by said second lens; and

an optical switch for alternatively opening or closing an optical path to be formed between said first optical fibre and said second optical fibre,

whereby said second optical fibre is excited by said excitation beam outputted from said excitation light source, while under an operation of said optical switch, said optical path formed between said first optical fibre and said second optical fibre is opened or closed by vibrating said terminal portion of said second optical fibre so that said second optical fibre eventually outputs an optical pulse of which pulse width is amplified.

5,315,678
OPTICAL FIBER CONNECTOR

Koichiro Maekawa, Ichinomiya; Takashi Ota, Kasugai; Masashi Fukuyama, Nagoya, and Shinji Nagasawa, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Corporation and NGK Insulators, Ltd., Japan

Filed Mar. 25, 1993, Ser. No. 37,007

Claims priority, application Japan, Mar. 30, 1992, 4-17751; Mar. 30, 1992, 4-17752; Mar. 30, 1992, 4-74149

Int. Cl.^{5} G02B ***6/40***

U.S. Cl. 385—59 **10 Claims**

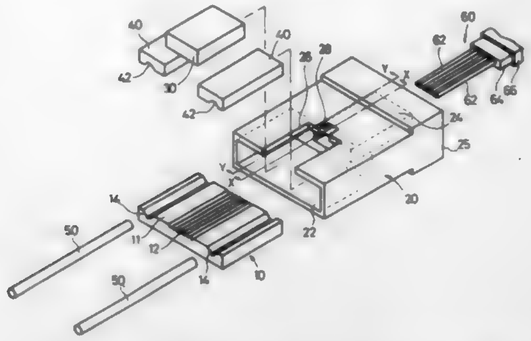
1. An optical fiber connector for a plurality of optical fibers, each optical fiber having a covered portion, comprising:

a lower ceramics plate with a top plane surface having a plurality of V-grooves, each V-groove for respectively holding one optical fiber;

an upper plate, in combination with said lower ceramics plate, for firmly holding the optical fibers in said V-grooves;

a holder having first and second opposed end portions,

wherein a first cavity is profiled in the first end portion to accommodate the combination of said upper plate and said lower ceramics plate, and a second cavity is profiled in the second end portion to accommodate the covered portions of the optical fibers, said first cavity having a connection portion for connecting said first and second cavities to



each other such that said optical fibers pass through said connection portion, said connection portion being proximate to an inner end of said second cavity; and

narrowing means disposed above said lower ceramics plate for loosely holding each optical fiber in its respective V-groove by narrowing a cross section of the connection portion.

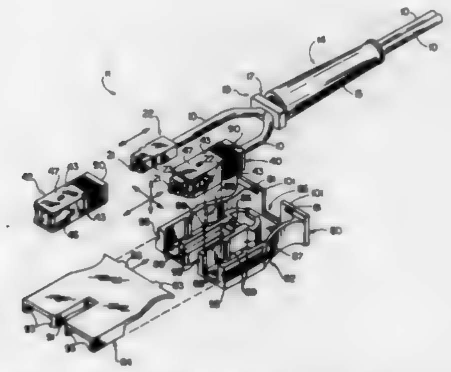
5,315,679
OPTICAL FIBERS DUPLEX CONNECTOR ASSEMBLY

Clark F. Baldwin, Vestal; David B. Howe, and Thomas B. Kellerman, both of Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1992, Ser. No. 874,162

Int. Cl.^{5} G02B ***6/00, 6/36***

U.S. Cl. 385—76 **24 Claims**



1. An optical fiber duplex connector assembly comprising:

a first housing;

a pair of second housings, each of said second housings including therein an optical fiber and a ferrule secured to an end of said optical fiber, said ferrule movably positioned within said second housing; and

a pair of third housings, each of said second housings being positioned within a respective one of said third housings, each of said third housings being movably positioned within said first housing.

5,315,680
OPTICAL FIBER CONNECTOR STRUCTURE INCLUDING THREE FERRULES AND AN OPTICAL BAFFLE

Robert W. Musk, Suffolk, and Christopher F. Beesley, Norfolk, both of England, assignors to BT&D Technologies, Suffolk, England

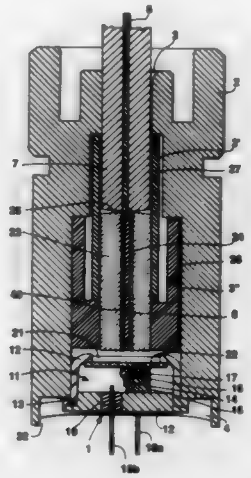
PCT No. PCT/GB91/00080, § 371 Date Aug. 11, 1992, § 102(e) Date Aug. 11, 1992, PCT Pub. No. WO91/10932, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 16, 1991, Ser. No. 917,004

Claims priority, application United Kingdom, Jan. 16, 1990, 9000969

Int. Cl.^{5} G02B ***6/26, 6/32***

U.S. Cl. 385—88 **15 Claims**



1. An optical device comprising:

a housing;

an optical source positioned within the housing;

a first ferrule for receiving an end of an optical transmission waveguide;

a second ferrule having an optical baffle disposed therein;

a third ferrule inserted in the housing for receiving at least a portion of the second ferrule and at least a portion of the first ferrule, whereby the second ferrule is disposed between the optical source and the first ferrule whereby the source, the optical baffle, and the optical transmission waveguide are optically aligned within the housing, the first ferrule and the second ferrule having substantially the same external diameters.

5,315,681
DETECTOR CARD STRAIN RELIEF ASSEMBLY

Dale Smith, Baltimore; Greg Behrmann, Columbia, both of Md., and Greg Ronan, Palo Alto, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1993, Ser. No. 39,736

Int. Cl.^{5} G02B ***6/36***

U.S. Cl. 385—89 **20 Claims**

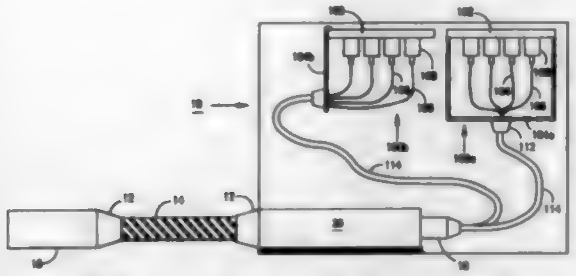
1. An optical detector card strain relief system for use with an optical detector card having a plurality of optical detector cans secured thereto, comprising:

a plurality of optical fibers each secured at a first end to one of said plurality of optical detector cans by suitable securing means;

a brace member secured to said optical detector card and extending away from said optical detector card; and

strain relief means attached at a first end to said brace member and at a second end to a fiber optic termination mount;

whereby a second end of each of said plurality of optical fibers passes through said strain relief means to reach said fiber optic termination mount such that said plurality of optical fibers is protected from damage by said optical detector card strain relief system.



5,315,682
SPLICE DEVICE FOR SPLICING TOGETHER UNDER-SEA OPTICAL CABLES

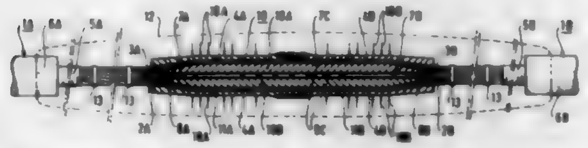
Bruno Daguet, and Géry Marlier, both of Calais, France, assignors to Alcatel Cable, Clichy Cedex, France

Filed Jul. 12, 1993, Ser. No. 89,548

Claims priority, application France, Jul. 16, 1992, 92 08799; Feb. 1, 1993, 93 01032

Int. Cl.⁵ G02B *6/38*

U.S. Cl. 385—95 **17 Claims**



1. A splice device for splicing together two under-sea optical cables, each of the cables including a bundle of optical fibers inside a protective tube covered with a protective "inner" sheath, armoring wires which are stranded to form at least one layer on said inner sheath, and a protective "outer" sheath covering the armoring wires, the cables having their component parts separated from one another over those of their end portions which are to be interconnected, said splice device including a multifiber weld between the bundles of fibers of the cables, which fibers are left to project from their respective protective tubes, a metal support extending between the protective tubes and over the end portions of said protective tubes, and receiving the end portions of the armoring wires on its periphery, longitudinal locking means for longitudinally locking the support relative to the protective tubes, and pressure radial clamping means for pressure clamping the armoring wires radially on the support, wherein said support has an outside diameter greater than the outside diameter of the inner sheaths of the cables, is mounted so that it abuts between the inner sheaths of the cables, which inner sheaths constitute said longitudinal locking means, and receives the end portions of the armoring wires longitudinally tensioned and disposed in a single layer on its periphery, and wherein said radial clamping means are constituted by an outer metal sleeve mounted and crimped on said support and on the armoring wires between the support and the sleeve.

5,315,683
VENTILATED FIBER OPTIC BUSHING

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

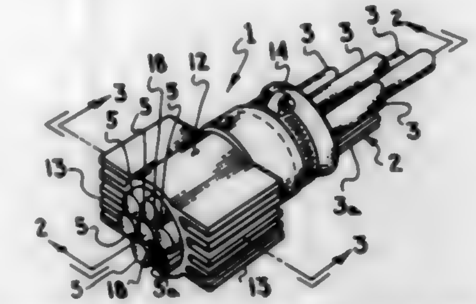
Filed Mar. 19, 1993, Ser. No. 34,224

Int. Cl.⁵ G02B *6/00*

U.S. Cl. 385—136 **7 Claims**

1. A ventilated fiber optic bushing for receiving light from a light-emitting window within an aperture of a light projector, said window being transversely disposed in said aperture and wherein a cooling fan within the projector draws external air through said aperture around said window; the fiber optic bushing including:

- a bundle of elongated, optical fiber light guides, said bundle having generally the same size and shape as the light-emitting window of the projector, each of said light guides having a generally cylindrical diameter, a first end remotely emitting light and a second end having a convex termination receiving light from the light-emitting window of the projector;



- a rigid tube for holding the bundle of light guides in the shape of the light-emitting window of the projector with the convex second ends of the light guides held in a common plane against the window of the projector;
- a means for clamping the fibers into the rigid tube;
- wherein a portion of the external air drawn through the projector aperture is drawn longitudinally through interstices between the light guides and transversely between the interstices formed by the convex light guide ends and the transparent window.

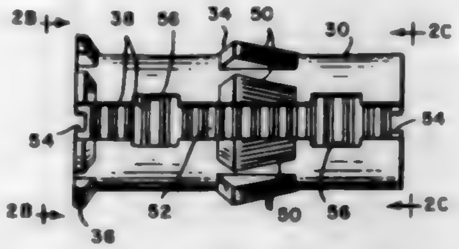
5,315,684
FIBER OPTIC CABLE END CONNECTOR

Andrew Szegda, Canastota, N.Y., assignor to John Mezzalingua Assoc. Inc., Manlius, N.Y.

Continuation-in-part of Ser. No. 713,821, Jun. 12, 1991, abandoned. This application Feb. 7, 1992, Ser. No. 832,706

Int. Cl.⁵ G02B *6/26*

U.S. Cl. 385—139 **15 Claims**



1. An end connector for connecting a fiber optic cable to a port associated with a piece of equipment, said cable having at least one optic fiber and at least one other support member surrounded by a jacket, said end connector comprising:

- a housing member having a front end and a rear end, said housing member defining a passageway extending from said rear end to said front end for passing said cable therethrough;
- coupling means for coupling said housing member to said port;
- clamp means received in said passageway and adapted to at least partially surround said cable, said clamp means being adjustable between an expanded state which accommodates movement of said cable with respect to said housing and a constricted state which fixedly secures said cable with respect to said housing, said clamp means being adapted to receive an insert, said insert including means for axially supporting said insert within said clamp means while engaging said cable jacket; and
- clamp adjustment means for adjusting said clamp means between said expanded and said constricted states.

5,315,685
COMPONENT FOR THE TRANSMISSION OF HIGH-ENERGY LIGHT, AND THE APPLICATION OF THE COMPONENT

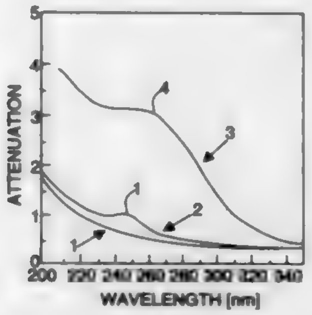
Heinz Fabian, Hanau, and Stephan Thomas, Grobkrotzenburg, both of Fed. Rep. of Germany, assignors to Heraeus Quarzglas GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Jun. 15, 1992, Ser. No. 898,439

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1992, 4206182.2

Int. Cl.⁵ G02B *5/172*

U.S. Cl. 385—142 **19 Claims**



1. Component for the transmission of light of high energy density with a wavelength between 250 nm and 400 nm, made of synthetic, high-purity fused vitreous silica, with a light input section having a light entry surface, a light output section having a light exit surface, and a light transmission section disposed between the light input section and the light output section, wherein the fused silica has a hydroxyl ion content in the range between 50 ppm and 1200 ppm and an under-stoichiometric content of oxygen.

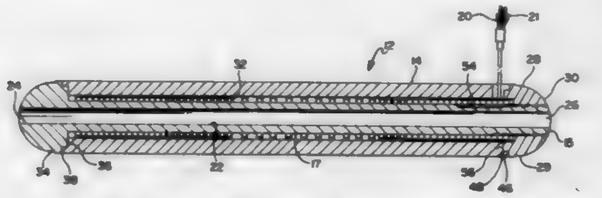
5,315,686
ELECTRICALLY HEATED NOZZLE FOR DIE CASTING

William Caugherty, 10605 Oak Valley Rd., Fort Wayne, Ind. 46845, and Harold Booton, 19990 23 Mile Rd., Marshall, Mich. 49068

Filed Apr. 26, 1991, Ser. No. 692,114

Int. Cl.⁵ B67D *5/62;* **B22D** *35/06, 41/015, 41/05*

U.S. Cl. 392—480 **8 Claims**



1. A nozzle assembly for use in metal casting, the nozzle assembly comprising:

- (a) An outer sleeve;
- (b) A unitary core member having an end cap and a core section disposed within the sleeve, the core member having a hollow cylindrical flow passage formed therethrough, the flow passage being of a constant diameter throughout the length of the core member and having an inlet and an outlet, the end cap having a rounded portion disposed adjacent the inlet of the flow passage;
- (c) a nozzle tip, the nozzle tip surrounding the core member opposite the end cap, the nozzle tip having a rounded portion adjacent the outlet of the flow passage;
- (d) A coil of electrical resistance heater wire wrapped around at least a portion of the core section;
- (e) means for regulating current flow through the heater wire to adjust the temperature of the nozzle; and
- wherein the curved portions of the nozzle cooperate to permit for easy insertion into a die and a furnace and to permit adjustability for varying die heights.

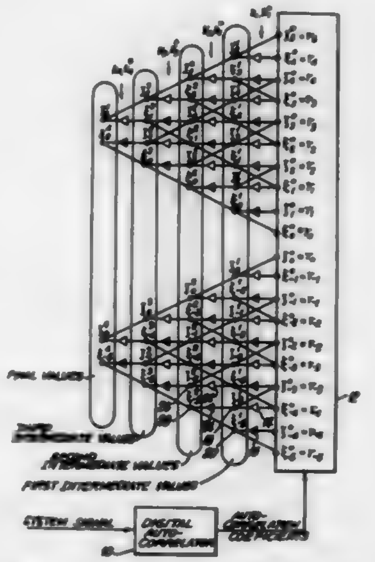
5,315,687
SIDE FED SUPERLATTICE FOR THE PRODUCTION OF LINEAR PREDICTOR AND FILTER COEFFICIENTS

George Carayannis; Christos Halkias, both of Athens, Greece; Dimitris Manolakis, Chestnut Hill, Mass., and Elias Koukoutsis, Athens, Greece, assignors to Adler Research Associates, Union, N.J.

Continuation of Ser. No. 826,211, Jan. 22, 1992, abandoned, which is a continuation of Ser. No. 443,048, Nov. 27, 1989, abandoned, which is a continuation of Ser. No. 310,492, Feb. 14, 1989, abandoned, which is a continuation of Ser. No. 84,929, Aug. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 837,260, Mar. 7, 1986, abandoned. This application Sep. 24, 1992, Ser. No. 950,728

Int. Cl.⁵ G10L *9/02*

U.S. Cl. 395—2.28 **24 Claims**



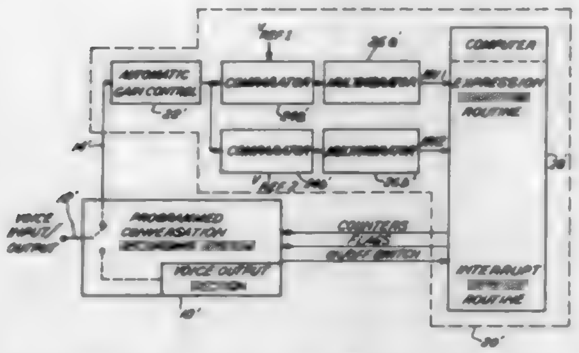
1. Apparatus for receiving a plurality of lattice predictor coefficients of a system having an order, and for producing therefrom direct predictor coefficients of said system, comprising:

- a plurality of parallel processing units, the number of which is less than the order of said system, each of said processing units having input and output terminals and producing values at said output terminals as a function of values applied to said input terminals in accordance with a predefined recursion;
- a buffer for initially applying to said input terminals of said plurality of parallel processing units less than all of said lattice predictor coefficients; and
- controlled feedback circuitry for feeding back selected ones of the values produced at the output terminals of said parallel processing units to selected input terminals thereof, said controlled feedback circuitry continuing said feeding back of selected outputs of said processing units to selected input terminals to thereby produce a first partition;
- said buffer applying at least one additional lattice predictor coefficient to at least one of said input terminals of at least one of said plurality of parallel processing units after said first partition is produced, and said controlled feedback circuitry continuing said feeding back of selected outputs

of said processing units to selected input terminals to thereby produce at least a second partition, and any subsequent partitions that are necessary, until said direct predictor coefficients are produced at said output terminals.

5,315,688
SYSTEM FOR RECOGNIZING OR COUNTING SPOKEN ITEMIZED EXPRESSIONS

Peter F. Theis, 3203 Bay View La., McHenry, Ill. 60050
Continuation-in-part of Ser. No. 586,089, Sep. 21, 1990, Pat. No. 5,201,028. This application Jan. 18, 1991, Ser. No. 643,047
Int. Cl.⁵ G10L *9/02*
U.S. Cl. 395—2.42 **25 Claims**



20. A speech categorization system for categorizing portions of a voice message comprising at least one higher amplitude segment and at least one lower amplitude segment, at least some of said higher amplitude segments indicative of voiced speech, at least some of said lower amplitude segments indicative of periods of non-speech between adjacent voiced speech, said system comprising:

means for developing a classification parameter indicative of comparative duration of at least some of the higher amplitude segments with respect to adjacent lower amplitude segments;

means for classifying the higher amplitude segments into at least two categories, wherein one of said categories is indicative of a spoken itemized expression, said classifying means applying at least one classification test, said test operative to place one of the higher amplitude segments in a first category when the respective classification parameter is greater than a threshold value and to place said one of the higher amplitude segments in a second category when the respective classification parameter is less than the threshold value;

means for recognizing and counting an accented portion of at least one of the higher amplitude segments; and

a counter that compares the higher amplitude segments in one of the two categories to characterize the voice message.

5,315,689
SPEECH RECOGNITION SYSTEM HAVING WORD-BASED AND PHONEME-BASED RECOGNITION MEANS

Hiroshi Kanazawa, Kawasaki, and Yoichi Takebayashi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 701,561, May 13, 1991, abandoned, which is a continuation of Ser. No. 357,715, May 26, 1989, abandoned. This application Dec. 21, 1992, Ser. No. 996,859
Claims priority, application Japan, May 27, 1988, 63-129919
Int. Cl.⁵ G10L *9/00*
U.S. Cl. 395—2.47 **20 Claims**

1. A speech recognition system comprising:

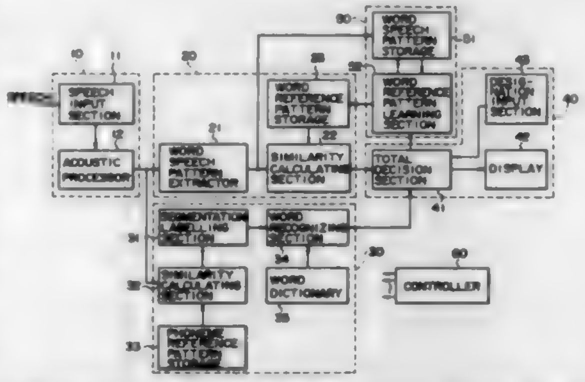
parameter extracting means for analyzing input speech and extracting a speech parameter from the input speech;

first storage means for storing a word reference pattern;

first word recognizing means for segmenting the speech parameter extracted by said parameter extracting means into units of words and outputting a word speech pattern corresponding to one of the words, and for performing word recognition by matching the word speech pattern with the word reference pattern stored in said first storage means and outputting a first word-recognition result;

second storage means for storing at least one word constituent element reference pattern;

second word recognizing means for segmenting the speech parameter into units of word constituent elements and outputting a word constituent element speech pattern corresponding to one of the word constituent elements, for performing recognition of each of the word constituent elements by matching the word constituent element speech pattern with the word constituent element reference pattern stored in said second storage means and outputting a series of recognized word constituent elements, and for performing word recognition on the basis of the series of recognized word constituent elements and outputting a second word recognition result;


SPEECH INPUT SECTION
ACOUSTIC PROCESSOR
WORD SPEECH PATTERN EXTRACTOR
WORD REFERENCE PATTERN STORAGE
SIMILARITY CALCULATING SECTION
WORD SPEECH PATTERN STORAGE
WORD REFERENCE PATTERN LEARNING SECTION
DESIGNATION INPUT SECTION
TOTAL DECISION SECTION
DISPLAY
SEGMENTATION LABELLING SECTION
WORD RECOGNIZING SECTION
SIMILARITY CALCULATING SECTION
WORD DICTIONARY
PHONEME REFERENCE PATTERN STORAGE
CONTROLLER
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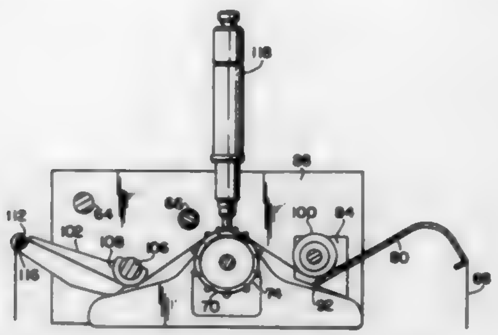
60

recognition result output means connected to said first and second word recognizing means, for obtaining a final recognition result from the first and second word recognition results from said first and second word recognizing means, said recognition result output means including means for increasing a value representing a contribution of the first word recognition result to the final recognition result to be larger than a value representing a contribution of the second word recognition result to the final recognition result in accordance with an increase in the number of word speech patterns used in learning for the first recognition and means for determining the final recognition result in accordance with the increasing value representing the contribution of the first word recognition result thereto; and

learning means for executing learning for forming a new word reference pattern from the recognition result obtained by said recognition result output means and the word speech pattern, said learning means transferring the new word reference pattern to said first storage means, to store it therein and increase the number of word speech patterns being stored in said first storage means.

5,315,690
METHOD AND ASSOCIATED APPARATUS FOR USE WITH AN AUTOMATED SIGN GENERATOR TO PRODUCE ENHANCED GRAPHICS

Thomas A. Gordon, Hebron; Barrett C. Gray, Tolland; William McKenna, Vernon; Joseph W. Stempien, Newington, and Ken P. Magnon, Bristol, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.
Filed Aug. 19, 1991, Ser. No. 746,871
Int. Cl.⁵ G06K *15/00*
U.S. Cl. 395—104 **14 Claims**



1. Method for producing an enhanced graphic text on a laminated sheet material using an automated sign generator of the general type including a controller for directing the operation of the sign generator to produce relative coordinate movement between the head of the sign generator and the surface of the sheet material in accordance with a programmed instruction set stored in a memory, said method comprising the steps of:

painting a stripe defining the peripheral outline of a desired graphic text directly on the surface of the sheet material with a paint pen carried by the sign generator head wherein the step of painting with the paint pen further includes using at least one a number of different style paint nibs each of which paint a different figuration stripe on the sheet material;

cutting the surface layer of the laminated sheet material along a path following the painted stripe defining the graphic text and within the width of the painted stripe, and

removing the graphic text from the sheet material along the cut line whereby the graphic text having the enhanced visual special effect is produced.

5,315,691
PRINT CONTROL APPARATUS

Hiroshi Sumiya, Nagoya; Kousuke Fukaya, Kariya; Sunao Kawai, Nagoya; Hiroyuki Sasaki, Gamagori; Yoshiyuki Ban, Aichi; Ryohei Komiya, Nagoya, and Kiyoji Muramatsu, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Jan. 22, 1993, Ser. No. 7,968
Claims priority, application Japan, Jan. 22, 1992, 4-009511; Jan. 22, 1992, 4-009512; Feb. 18, 1992, 4-030862; Feb. 18, 1992, 4-030863; Feb. 18, 1992, 4-030864; Feb. 18, 1992, 4-030867
Int. Cl.⁵ G06F *15/00*
U.S. Cl. 395—109 **15 Claims**

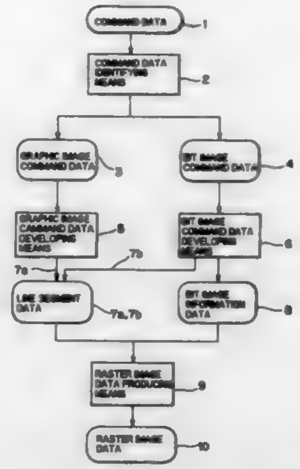
1. A print control apparatus for converting command data representative of at least one desired image to be printed by a printer device onto one page of print output into raster image data representative of color density data to be printed on respective ones of plurality of rasters in the one page of print output, said print control apparatus comprising:

input means for receiving command data representative of at least one desired image to be printed by a printer device onto one page of print output;

line segment data conversion means for converting the command data into at least one line segment data allotted for each raster of a plurality of rasters in the print output, each of the at least one line segment data representing a line segment image of a single color distribution extending in the corresponding raster and bearing information on a position and a length, in a direction in which the corresponding raster extends, of the line segment image and the single color distribution state of the line segment image;

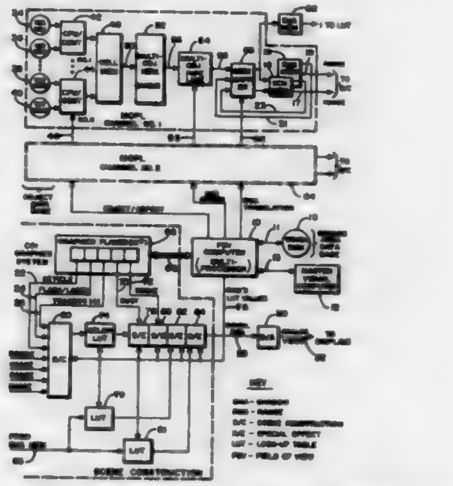
raster image data conversion means for converting the at least one line segment data to a raster image data representative of color density data to be printed on the corresponding raster in the one page of print output; and

output means for outputting the raster image data for respective one of the plurality of rasters to a printer device one by one, to thereby allow the printer device to print the plurality of rasters one by one and produce the one page of print output.


COMMAND DATA
1
COMMAND DATA IDENTIFYING MEANS
2
GRAPHIC IMAGE COMMAND DATA
3
BIT IMAGE COMMAND DATA
4
GRAPHIC IMAGE COMMAND DATA DEVELOPING MEANS
5
BIT IMAGE COMMAND DATA DEVELOPING MEANS
6
7a
7b
7a,7b
LINE SEGMENT DATA
BIT IMAGE INFORMATION DATA
8
RASTER IMAGE DATA PRODUCING MEANS
9
RASTER IMAGE DATA
10

5,315,692
MULTIPLE OBJECT PIPELINE DISPLAY SYSTEM

Dennis D. Hansen, Glendora; Michael D. Sedlar, Walnut, and James N. Clay, Jr., La Habra, all of Calif., assignors to Hughes Training, Inc., Arlington, Tex.
Continuation of Ser. No. 622,128, Dec. 3, 1990, abandoned, which is a continuation of Ser. No. 222,940, Jul. 22, 1988, abandoned. This application Aug. 18, 1992, Ser. No. 956,313
Int. Cl.⁵ G06F *15/62*
U.S. Cl. 395—119 **8 Claims**



1. A computer-controlled imaging system for providing a realistic three-dimensional scene on a two-dimensional medium comprising:

(a) a gaming area data base storage means (15) for storing coordinate locations and identifications of a plurality of objects comprising a scene;
(b) an object data base comprising a multiplicity of digital mass storage means (34, 36, 38, 40) for storing data representative of said objects as viewed for a multiplicity of aspect angles;
(c) master visual computer means (12) for determining position and orientation of an imaginary observer relative to said gaming area;
(d) field-of-view computing means (10) operatively coupled to said master visual computer means (12) and said gaming area data base storage means (15) for developing digital control words specifying identity, size, rotation and aspect of each object present in said observer's field-of-view;
(e) a plurality of channels (64), at least one channel for sequentially processing a plurality of objects one at a time within one video frame and providing predetermined translation and occlusion between said objects, said at least one channel including:
  (i) predetermined ones of said digital mass storage means (34, 36, 38, 40) of said object data base;
  (ii) multiple object memory means (52) for temporarily storing data representative of all selected objects required for said channel to compose an assigned portion of the resultant scene, and read from said object data base mass storage means;
  (iii) means (42, 44, 48) for coupling said object data base mass storage means (34, 36, 38, 40) to said multiple object memory means (52), said coupling means (42, 44, 48) operating under control of said field-of-view computing means (10) to select and buffer data representative of objects identified by the FOV computer from the mass storage means for presentation to the multiple object memory;
  (iv) pipeline processing means (54) operable at a video rate under control of said field-of-view computing means (10) for transforming said data representative of selected objects read from said multiple object memory means (52) so as to represent the same object but having a size and orientation as required for a constructed scene;
  (v) scene memory means (16) and range memory means (18) for storing a raster representation of a current scene being constructed; and
  (vi) memory mapper means (58) coupled to said field-of-view computing means and coupling said scene memory means (16) for entering objects into said range memory means and scene memory means in a region corresponding to the coordinate location of said objects with predetermined translation and occlusion as determined by input data received from said field-of-view computing means.

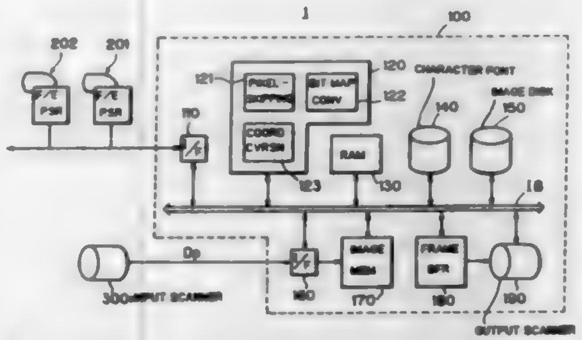
5,315,693

METHOD AND SYSTEM FOR INTEGRATING IN A SINGLE IMAGE, CHARACTER AND GRAPHICAL INFORMATION BY EMPLOYING DATA OF DIFFERENT PIXEL RESOLUTION

Makoto Hirosawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Mar. 22, 1991, Ser. No. 674,537
Claims priority, application Japan, Mar. 28, 1990, 2-82597
Int. Cl.^{5} G06F *15/62*
U.S. Cl. 395—128 **14 Claims**

9. An integrated image recorder for recording an integrated image including images of a character, a graphic and a picture, comprising:
(a) first interface means for receiving first pictorial image data of a given amount representing an image of a picture obtained from an input device;
(b) means for reducing the amount of said first pictorial image data to obtain second pictorial image data representing said image of said picture in a second resolution lower than said first resolution;
(c) memory means for storing said first and second pictorial image data under a file name;
(d) second interface means for transmitting said second pictorial image data from said memory means to a front end processor coupled to said integrated image recorder and for receiving from said front end processor a page description program representing an integrated image in a page description language,
said front end processor being effective to integrate an image of said picture represented by said second pictorial image data with respective images of a character and a graphic on an image plane corresponding to a page to generate said page description program;



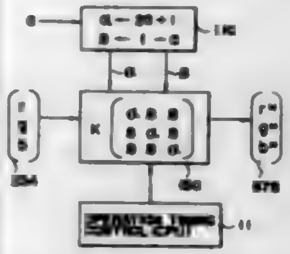
(e) means for converting said integrated image into a bit-mapped image as a function of said image description program and said first pictorial image data to obtain image data of said integrated image;
(f) buffer memory means for storing said image data of said integrated image; and
(g) recording means for recording said integrated image on a recording medium as a function of said image data of said integrated image,
wherein the means (b) comprises:
(b-1) means for skipping pixels of said first pictorial image data at a predetermined rate to obtain said second pictorial image data, wherein
the means (e) comprises:
(e-1) means for converting coordinates of said character, said graphic and said picture on said image plane.

5,315,694

HIGH-SPEED COLOR SATURATION CONVERTER FOR DIGITAL COLOR DATA

Akira Kasano, Kokubunji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1989, Ser. No. 398,948
Claims priority, application Japan, Aug. 31, 1988, 63-216830
Int. Cl.^{5} G06F *15/00*
U.S. Cl. 395—131 **11 Claims**



1. A high-speed saturation converter for a color image, comprising:
first R, G, and B image memories for storing digital color image data separated into R, G, and B components, r, g, and b;.
matrix coefficient calculating means for calculating two types of matrix coefficients α and β defined by the following equation based on a predetermined saturation conversion coefficient a:

$$\alpha = 1 + 2a,\ \beta = 1 - a;$$

processor means for calculating R, G, and B components r*, g*, and b* of a first pixel position when saturation conversion $S^* = aS$ is performed with respect to vector S, in an RGB color space, of saturation components r, g, and b of a second pixel position of said first R, G, and B image memories that corresponds to the first pixel position, in accordance with the following matrix equation defined when an intensity before and after the conversion is constant:

$$\begin{pmatrix} r^* \\ g^* \\ b^* \end{pmatrix} = (1/3) \begin{pmatrix} \alpha & \beta & \beta \\ \beta & \alpha & \beta \\ \beta & \beta & \alpha \end{pmatrix} \begin{pmatrix} r \\ g \\ b \end{pmatrix};$$

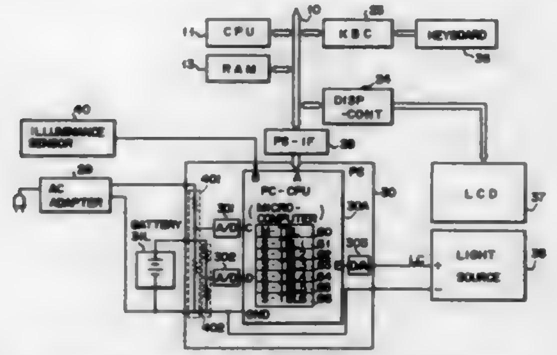
and second R, G, and B image memories for storing the R, G, and B components r*, g*, and b* calculated by said processor means in a position of the first pixel.

5,315,695

PERSONAL COMPUTER CAPABLE OF ALTERING DISPLAY LUMINANCE THROUGH KEY OPERATION

Toshimitsu Saito; Mayumi Oka; Atsuhiro Ootake, and James Mason, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 24, 1991, Ser. No. 718,408
Claims priority, application Japan, Jun. 25, 1990, 2-166323
Int. Cl.^{5} G06F *15/62*
U.S. Cl. 395—132 **10 Claims**



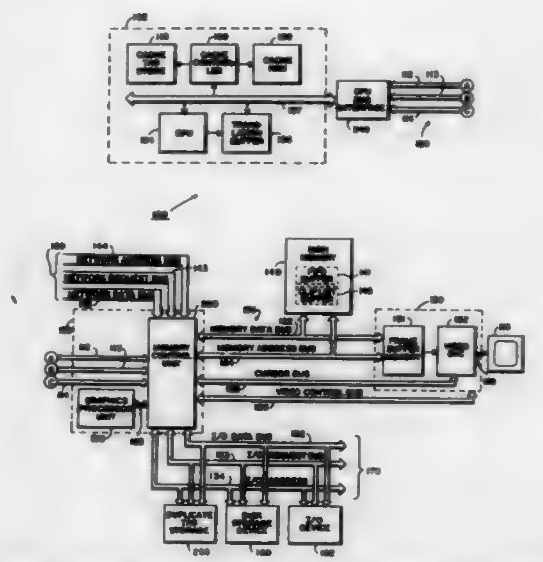
9. A battery operable personal computer comprising:
a display for displaying various types of data at a luminance level according to a value of a luminance control signal;
a keyboard for entering first data and second data respectively instructing an increase and a decrease in luminance level of said display;
battery power detecting means for detecting remaining capacity of said battery;
instructing means for instructing said luminance level of said display in such a manner as to set said luminance level of said display to a standard luminance level in initialization mode, and to sequentially increase a target luminance level to be instructed level by level from said standard luminance level upon each reception of said first data from said keyboard, and sequentially decrease said target luminance level to be instructed level by level from said standard luminance level upon each reception of said second data from said keyboard in data processing mode in which data entered through said keyboard is accepted; and
luminance control means for controlling said value of said luminance control signal to be supplied to said display in such a way that said luminance level of said display becomes one specified by said instructing means, said luminance control means including:
  first table means having multiple luminance levels and values of multiple luminance control signals corresponding to said multiple luminance levels defined therein;
  second table means having multiple pieces of power data indicating remaining capacity of said battery and values of multiple luminance control signals corresponding to said multiple pieces of power data;
  means for selecting one of said first and second table means in accordance with whether or not remaining capacity of said battery detected by said batter power detecting means is equal to or below a predetermined value;
  means for referring to said first table means when said first table means is selected to thereby acquire the value of that luminance control signal corresponding to said luminance level specified by said instructing means; and
  means for referring to said second tale means when said second table means is selected to thereby acquire the value of that luminance control signal corresponding to said remaining capacity of said battery detected by said battery power detecting means.

5,315,696

GRAPHICS COMMAND PROCESSING METHOD IN A COMPUTER GRAPHICS SYSTEM

Colyn Case, Amherst, N.H.; Kim Meinerth, Middleton, Mass.; John Irwin, Hudson, N.H., and Blaine Fanning, Overland Park, Kans., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 21, 1991, Ser. No. 748,352
Int. Cl.^{5} G06F *15/62*
U.S. Cl. 395—133 **3 Claims**



1. In a computer graphics system, a method of performing desired graphics operations on specified data, comprising the steps of:
providing a plurality of drawing graphics commands, each for specifying a different raster drawing operation;
using a plurality of context graphics commands to define a context in which drawing graphics commands operate to provide desired graphic operations on specified data, said context including destination location for resulting data,

type of graphics operation, foreground color of resulting data, and background color of resulting data, said plurality of context graphics commands including different context graphics commands for defining different parts of the context independent of other parts of the context; and

selecting and executing in the defined context, one of the drawing graphics commands such that the raster drawing operation corresponding to the selected drawing graphics command is performed on specified data with respect to the defined context to provide desired graphics operations on the specified data.

5,315,697

METHOD FOR LINKING PROGRAM EXECUTION STATUS INFORMATION

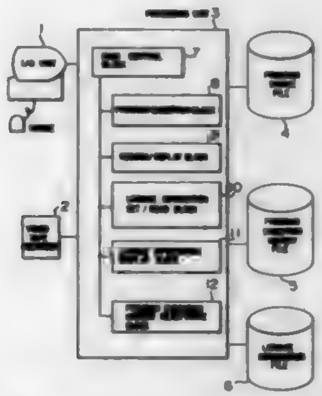
Yuji Nagamatsu, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 661,411

Claims priority, application Japan, Mar. 2, 1990, 2-052214

Int. Cl.⁵ G06F *15/62*

U.S. Cl. 395—155 3 Claims



1. A method for linking program execution status information by correlatively linking text data of a program, execution history information generated in eh course of execution of the program and image information related to the execution of the program, the method comprising steps of:

(A) storing the test data of the program including a plurality of instruction statements executed sequentially by line number;

(B) storing the image information which is continuously obtained by recording at least one of a moving image of a machine controlled by the program and an operation image of an operator produced as the program is executed, together with recorded image data identification numbers determined in accordance with a predetermined rule;

(C) storing execution history information inputted by an operator or generated in the course of the execution of the program, together with history numbers assigned in a predetermined sequence; and

(D) correlatively storing in a table the recorded image data identification numbers, line numbers of the program corresponding to the recorded image information having the recorded image data identification numbers assigned thereto and the history numbers assigned to the execution history information corresponding to the programs designated by the line numbers.

5,315,698

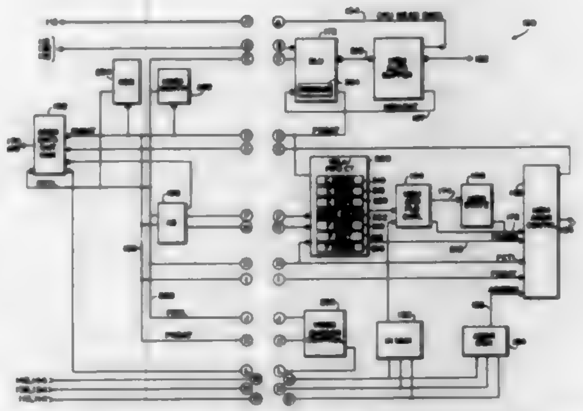
METHOD AND APPARATUS FOR VARYING COMMAND LENGTH IN A COMPUTER GRAPHICS SYSTEM

Colyn Case, Amherst, N.H.; Kim Meinerth, Middleton, Mass.; John Irwin, Hudson, N.H., and Blaise Fanning, Overland Park, Kans., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 21, 1991, Ser. No. 748,354

Int. Cl.⁵ G06F *15/20*

U.S. Cl. 395—162 8 Claims



7. In a computer graphics system having graphics commands for providing desired graphics operations a method of processing graphics commands comprising the steps of:

providing a graphics command format having a multiplicity of fields arranged in order of common use such that fields required for each use of a command are at a beginning of the graphics command format and less commonly used fields are at an end of the graphics command format;

specifying for a first time a graphics command including providing a respective value in each of the multiplicity of fields;

processing the specified graphics command including storing in respective registers the values provided in the fields of the graphics command format;

specifying for a second time the graphics command by providing respective values in a first plurality of fields and by leaving a second plurality of fields unspecified such that length of the desired graphics command is shortened with respect to the first time of specifying the desired graphics command; and

transmitting the shortened graphics command as specified the second time for processing thereafter.

5,315,699

FILTERING OPERATION METHOD FOR VERY HIGH-SPEED IMAGE PROCESSING SYSTEM

Masaharu Imai; Kanio Honsawa, both of Toyohashi, and Jota Tomita, Tokyo, all of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Filed Mar. 11, 1992, Ser. No. 851,024

Claims priority, application Japan, Mar. 20, 1991, 3-57117; Mar. 20, 1991, 3-57118

Int. Cl.⁵ G06F *15/20*

U.S. Cl. 395—162 2 Claims

1. A filtering system for very high-speed image processing performing image processing in parallel for each unit sequentially in each line, comprising:

an input unit having a plurality of input elements for taking up all or a part of image data of each line in the order of raster scan;

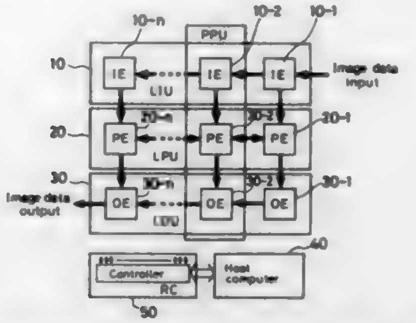
a processing unit having a plurality of processing elements for performing image processing computation in parallel

for each pixel as image data from each input element is transferred simultaneously;

an output unit having a plurality of output elements where processing data from each processing element is simultaneously transferred; and

a controller for controlling the input unit, the processing unit, and the output unit;

each processing element comprising an endless memory having memory capacity for storing as much data as required of a row in charge of processing and having a terminal address connected to a top address, a base pointer for writing the top address next to the terminal address such that each content is changed for each line by a command from said controller, and a reference pointer for writing the content of the base pointer for each line and for specifying an address of said memory by changing each content of the data read from the endless memory, whereby a region of the endless memory corresponding to a mask size of the filter is sequentially accessed by the reference pointer.



5,315,700

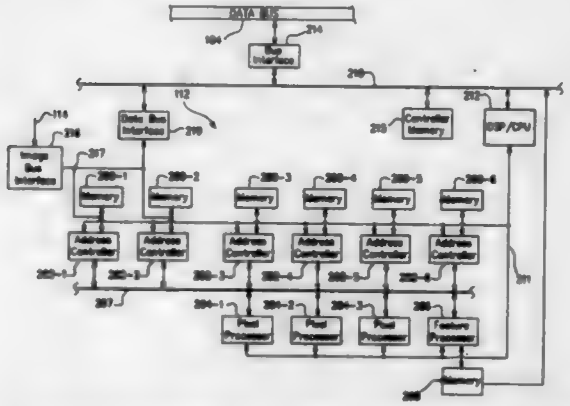
METHOD AND APPARATUS FOR RAPIDLY PROCESSING DATA SEQUENCES

Richard S. Johnston, Issaquah; Paul V. Budak; Robert C. Schmidt, both of Redmond, and Shih-Jong J. Lee, Bellevue, all of Wash., assignors to NeoPath, Inc., Bellevue, Wash.

Filed Feb. 18, 1992, Ser. No. 838,070

Int. Cl.⁵ G06F *3/14*

U.S. Cl. 395—163 14 Claims



1. Apparatus for rapidly processing data sequences comprising:

a plurality of memory circuits for storing the data sequences wherein each of said plurality of memory circuits includes a memory input and a memory output;

a plurality of processing circuits for processing the data sequences wherein each of said plurality of processing circuits includes a data output for providing an output data sequence, each of said plurality of processing circuits further including a first multiplexer circuit for receiving a plurality of input data sequences wherein said first multiplexer circuit is responsive to a first select control signal for selecting at least one of the plurality of input data sequences to be processed to provide the output data sequence;

a plurality of controller circuits, each associated with a respective one of said plurality of memory circuits for simultaneously transferring the data sequences between one of said plurality of memory circuits and each of said plurality of processing circuits, said plurality of controller circuits each including a second multiplexer circuit for receiving the plurality of output data sequences and being responsive to a second select control signal for selecting at least one of the plurality of output data sequences to be stored in its respective one of said plurality of memory circuits; and

central processor means responsive to user provided input for providing said first and second select control signals to control the transfer of the data sequences between said plurality of memory circuits and said plurality of processor circuits.

5,315,701

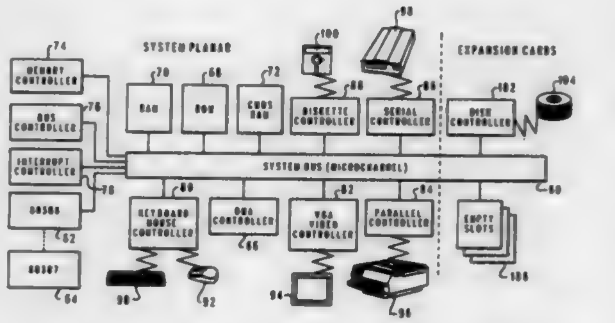
METHOD AND SYSTEM FOR PROCESSING GRAPHICS DATA STREAMS UTILIZING SCALABLE PROCESSING NODES

Paul D. DiNicola, Hurley; Joseph Kantz, Saugerties; Omar M. Rahim, Kingston; David A. Rice, New Paltz, and Edward M. Ruddick, Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1992, Ser. No. 926,724

Int. Cl.⁵ G06F *3/14*

U.S. Cl. 395—163 22 Claims



1. A method in a data processing system for processing a graphics data stream, said data processing system having a plurality of processing nodes and a graphics display device, said method comprising:

partitioning a graphics data stream into a plurality of data segments for processing by said plurality of processing nodes;

attaching a plurality of tags to said plurality of data segments, wherein said plurality of tags indicate an order of said plurality of data segments;

distributing said plurality of data segments for processing to said plurality of processing nodes;

in response to receiving a data segment at one of said plurality of processing nodes, processing said data segment to produce a processed data segment;

recombining a plurality of processed data segments processed by said plurality of processing nodes to produce a processed graphics data stream, wherein said plurality of processed data segments are recombined according to said order indicated by said plurality of tags; and

coupling said processed graphics data stream to said graphics display device.

5,315,702

TERMINAL APPARATUS WITH TRANSMISSION FUNCTION

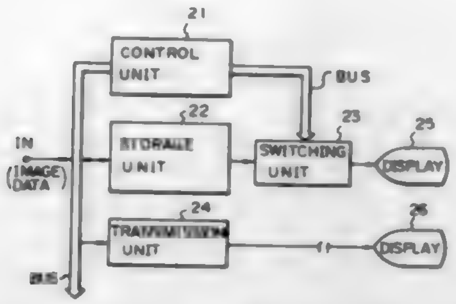
Mari Kusakawa, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 14, 1989, Ser. No. 407,945

Claims priority, application Japan, Sep. 14, 1988, 63-230734

Int. Cl.^{5} G06F *15/20, 15/66*

U.S. Cl. 395—164 **8 Claims**



1. A terminal apparatus for displaying a natural image on a display unit and sending said natural image to another terminal apparatus, comprising:

only one storage means for storing RGB data, luminance/-color difference data and compression data, said RGB data being obtained by scanning said natural image, said luminance/color difference data being obtained by converting said RGB data, and compression data being obtained by compressing said luminance/color difference data under a predetermined method;

switching means operatively connected to said storage means for switching content of display on said display unit from said RGB data stored in said storage means to image data not stored in said storage means when said RGB data is converted to said luminance/color difference data and said luminance/color difference data is converted to said compression data; and

control means operatively connected to said storage means and said switching means for reading out said RGB data from said storage means, converting said RGB data to said luminance/color difference data, storing said luminance/-color difference data into said storage means, and compressing said luminance/color difference data to said compression data after read out from said storage means, further, for controlling switching operation of said switching means.

5,315,703

OBJECT-ORIENTED NOTIFICATION FRAMEWORK SYSTEM

John R. Matheny; Christopher White, both of Mountain View; David R. Anderson, Cupertino, and Arnold Schaeffer, Belmont, all of Calif., assignors to Taligent, Inc., Cupertino, Calif.

Filed Dec. 23, 1992, Ser. No. 996,782

Int. Cl.^{5} G06F *15/62*

U.S. Cl. 395—164 **14 Claims**

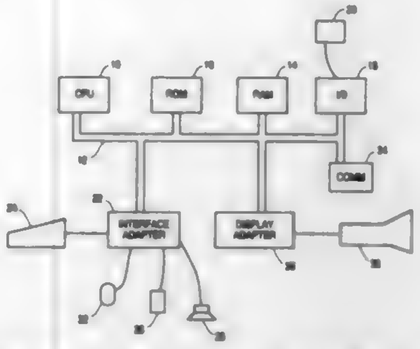
1. An object-oriented notification framework system, comprising:

(a) means for connecting a plurality of objects to a notification source;

(b) memory means for storing connection information for the plurality of objects in a connection object of an object-oriented operating system;

(c) means for registering connection information, including registration information indicative of a notification status, in the connection object of the object-oriented operating system;

(d) means for selectively dispatching notification to at least one of the plurality of objects based on the registration information stored in the connection object of the object-oriented system; and



(e) means for the at least one of the plurality of objects to receive the notification and take action based on the notification.

5,315,704

SPEECH/VOICEBAND DATA DISCRIMINATOR

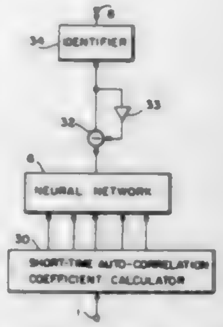
Minoru Shinta; Shinichi Aikoh, and Takao Nishitani, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1990, Ser. No. 618,844

Claims priority, application Japan, Nov. 28, 1989, 1-310134; Feb. 28, 1990, 2-47869

Int. Cl.^{5} G10L *9/00*

U.S. Cl. 95—2 **9 Claims**



1. A speech/voiceband data discriminator comprising:

signal processing means for processing input signals to generate a plurality of signals having different characteristics according to whether the input signals are speech signals or voiceband data signals,

a neural network responsive to said plurality of signals for generating functional value data to indicate whether the input signals have features close to speech signals or to voiceband data signals, and

decision means responsive to said functional value data for deciding based on said functional value data whether said input signals are speech signals or voiceband data signals and for supplying signals to indicate the decision, wherein said signal processing means calculates the short time auto-correlation coefficients of said input signals, and generate and send to said neural network a plurality of signals indicating such coefficients,

wherein said decision means further comprising means for smoothening the data of said functional value with an integrator, and means for comparing the magnitudes of the smoothened data and a predetermined threshold and for outputting a signal indicating whether said input signals are speech signals or voiceband data signals.

5,315,705

COMMUNICATION ADDRESS MANAGEMENT SYSTEM

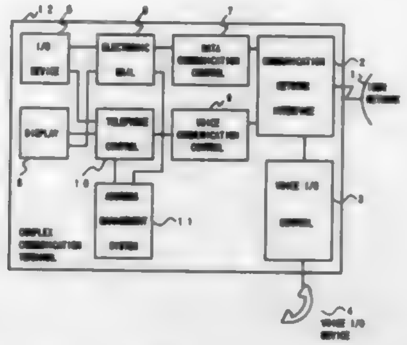
Naoko Iwami; Susumu Matsui, both of Machida, and Toru Saito, Yamoto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1992, Ser. No. 833,678

Claims priority, application Japan, Feb. 25, 1991, 3-29801

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—200 **15 Claims**



1. A communication address management system comprising:

storage means for storing identification information of a plurality of communication destinations, and data relating to types of communication services available to the communication destinations and communication addresses therefor;

acceptance means for accepting a communication address inquiry request from a communication address inquiry requestor;

discrimination means for discriminating a type of communication service available to the communication address inquiry requestor based on contents of the accepted communication address inquiry request;

retrieval means for searching the data in said storage means based on contents of the identification information in the accepted communication address inquiry request and the discriminated type of communication service to retrieve a desired communication address; and

response means for sending the retrieved communication address back to the communication address inquiry requestor.

5,315,706

HIGH SPEED IEEE 488 BUS INTERFACE SYSTEM AND METHOD

Andrew C. Thomson, Austin; Brian K. Odom, Pflugerville; C. Paul Butler, Austin; Michael G. Jablin, Austin; William C. Nowlin, Jr., Austin, and Robert W. Canik, Cedar Park, all of Tex., assignors to National Instruments Corporation, Austin, Tex.

Filed May 27, 1992, Ser. No. 889,596

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—200 **21 Claims**

1. A bus interface that couples a first device to an IEEE 488 bus, said IEEE 488 bus including data lines, a data valid (DAV) line, a not-ready for data (NRFD) line, and a data accepted (DAC) line; said bus interface comprising:

an input/output port which transmits and receives data to and from said first device; and

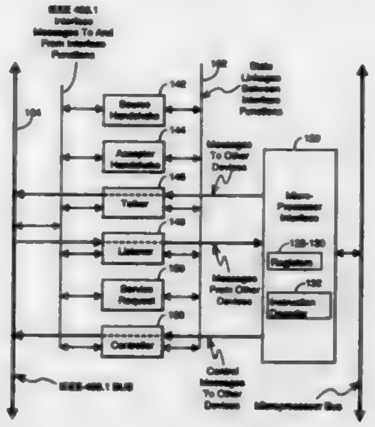
source handshake means, coupled to said IEEE 488 bus, for asserting a data message, comprising a sequence of data bytes from said first device via said input/output port, onto said data lines of said IEEE 488 bus, and for asserting a data valid signal on said DAV line in coordination with asserting said sequence of data bytes on said data lines of said IEEE 488 bus;

said source handshake means including source mode determination means (A) for automatically transmitting via said IEEE 488 bus, to specified acceptor devices coupled to said IEEE 488 bus, a high-speed-capable message that indicates that said bus interface is capable of high speed data transmissions, and (B) for monitoring said IEEE 488 bus for a predefined response signal indicating whether all of said specified acceptor device have bus interfaces capable of high speed data transmissions;

said source handshake means including source handshake state machine means for asserting said data valid signal on said DAV line using a first, low speed, data transmission protocol when said predefined response signal is not detected by said source mode determination means, and for asserting said data valid signal on said DAV line using a second, high speed, data transmission protocol when said predefined response signal is detected by said source mode determination means;

wherein said source handshake means automatically determines whether all of said specified acceptor devices have bus interfaces capable of high speed data transmission each time transmission of a data message begins;

said source handshake state machine means including



first sourcing means for coordinating assertion of said data valid signal on said DAV line with interlock signals received from said specified acceptor devices on said NRFD line and DAC line when using said first, low speed, data transmission protocol, and

second sourcing means for asserting and deasserting said data valid signal on said DAV line in a predefined pulsing pattern, so long as (A) said sequence of data bytes are available for transmission, and (B) said interlock signals are not received from said specified acceptor devices on said NRFD line and DAC line, when using said second, high speed, data transmission protocol;

said source mode determination means further including means for deactivating said second sourcing means and activating said first sourcing means when any of said specified acceptor devices transmits a terminate-high-speed-mode message via said IEEE 488 bus.

5,315,707

MULTIPROCESSOR BUFFER SYSTEM

Michael J. Seaman, San Jose, Calif., and Stewart F. Bryant, Redhill, England, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 10, 1992, Ser. No. 818,608

Int. Cl.^{5} G06F *13/00, 12/00*

U.S. Cl. 395—250 **27 Claims**

1. A computer system, which comprises:

a first computer device;

a second computer device;

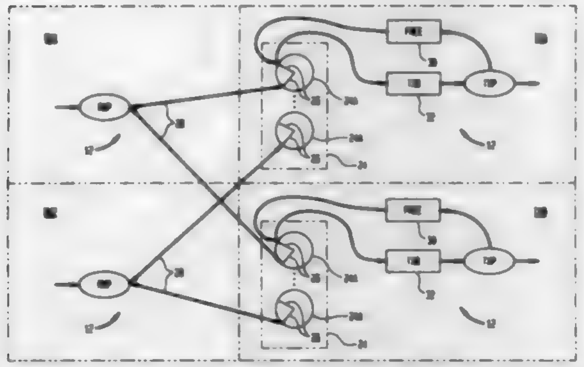
a common memory comprising a plurality of buffers for storing messages to be transferred from the first computer device to the second computer device;

the first computer device and the second computer device each being coupled to the common memory;

a pointer memory coupled to each of the first computer device and the second computer device, the pointer memory having a set of locations for storing pointers to the plurality of buffers of the common memory, preselected ones of the locations each storing a pointer to a buffer of the common memory that is available for use to store a message; and

a pool of pointers to the plurality of buffers of the common memory that are available for use to store messages;

the first computer device storing a pointer to at least one of the plurality of buffers and operating to transfer a message to the second computer device by writing the message to the one of the plurality of buffers, reading a preselected location of the pointer memory to obtain an available pointer to the plurality of buffers and writing the pointer to the one of the plurality of buffers to the preselected location of the pointer memory;



the second computer device operating to read the preselected location of the pointer memory to obtain the pointer to the one of the plurality of buffers storing the message and to thereafter remove a pointer to a buffer available for use from the pool of pointers and to write the removed pointer to the preselected location of the pointer memory.

5,315,708

METHOD AND APPARATUS FOR TRANSFERRING DATA THROUGH A STAGING MEMORY

Chris W. Eidler, Morgan Hill; Hoke S. Johnson, III, Monte Sereno, and Kaushik S. Shah, Santa Clara, all of Calif., assignors to Micro Technology, Inc., Anaheim, Calif.

Continuation of Ser. No. 886,301, May 21, 1992, abandoned, which is a continuation of Ser. No. 486,535, Feb. 28, 1990, abandoned. This application Apr. 6, 1993, Ser. No. 42,751

Int. Cl.^{5} G06F *5/00*

U.S. Cl. 395—250 **25 Claims**

1. In a data processing system, an apparatus for staging data during a transfer of data between at least one device in a first group of devices and at least one device in a second group of devices, the apparatus comprising:

a staging memory having a plurality of staging elements which when unoccupied are available for storing data transmitted by the first and second groups of devices and first and second port means for accessing the plurality of staging elements;

first data bus means coupled to the first port means and to the first group of devices for receiving a plurality of data packets comprising a first logical set of data from at least one device in the first group of devices and for transferring the first logical set of data to the first port means of the staging memory in divided portions;

first programmable staging memory addressing means coupled to the first port means for accessing available staging elements in the staging memory to store the divided portions of the first logical set of data transferred to the first port means in staging elements that are not necessarily contiguous;

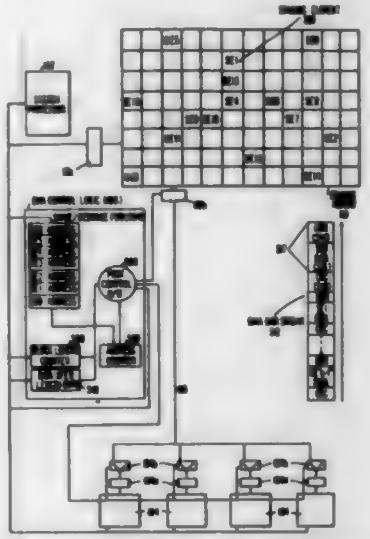
second data bus means coupled to the second port means and to the second group of devices for receiving a second logical set of data transmitted by at least one device in the second group of devices and for transferring the second logical set of data of the second port means of the staging memory;

second programmable staging memory addressing means coupled to the second port means for accessing available staging elements in the staging memory to store the second logical set of data in divided portions in a single transmission to staging elements which are not necessarily contiguous; and

processor means, coupled to the staging memory and to the first and second programmable staging memory addressing means, the processor means including,

means for determining staging elements available for storing divided portions of the first and second logical sets of data,

means for programming the first and second programmable staging memory addressing means with staging element identifiers corresponding to available staging elements such that the staging element identifiers are programmed into the first and second programmable staging memory addressing means without prior allocation of any particular staging element to any particular device in the first and second groups of devices,



means for storing the staging element identifiers defining staging elements that contain divided portions of the first and second logical sets of data in a logical order for reassembling the first and second logical sets of data when the first and second logical sets of data are retrieved from the staging memory, and

means for programming the second programmable staging memory addressing means with staging element identifiers defining the staging elements containing the divided portions of the first logical set of data in a first logical sequence for reassembling the first logical set of data from the divided portions of the first logical set of data and for programming the first programmable staging memory addressing means with staging element identifiers identifying the staging elements containing the divided portions of the second logical set of data in a second logical sequence for reassembling the second logical set of data from the divided portions of the second logical set of data.

5,315,709

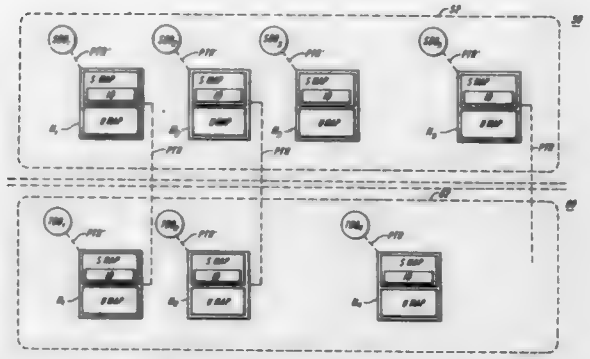
METHOD AND APPARATUS FOR TRANSFORMING OBJECTS IN DATA MODELS

Lawrence E. Alston, Jr., Framingham; John J. Farrell, III, Lowell, and Kenneth W. Quayle, III, Stow, all of Mass., assignors to Bachman Information Systems, Inc., Burlington, Mass.

Filed Dec. 3, 1990, Ser. No. 621,751

Int. Cl.^{5} G06F *15/40*

U.S. Cl. 395—600 **98 Claims**



1. A digital computer implemented method for automatically coordinating objects in a first data model, said first data model having source design objects in a source design space, with corresponding objects in a second data model, said second data model having target design objects in a target design space, one or more of said target design objects being associated with a corresponding one of said source design objects, and for synchronizing, in real time, said first data model and said second data model, comprising steps of:

A. associating a unique source identifier with each of said source design objects;

B. associating at least one selectively modifiable source map with one or more of said source design objects, said source map having source map objects and being associated with said unique source identifier for said one or more of said source design objects, at least one of said source map objects being representative of source parameters for use in implementing a predetermined set of rules in said source design space, said rules including source design object transformation rules;

C. associating a unique target identifier with each of said target design objects;

D. associating at least one selectively modifiable target map with one or more of said target design objects, said target map having target map objects and being associated with said unique target identifier for said one or more of said target design objects, at least one of said target map objects being representative of target parameters for use in implementing said predetermined set of rules in said target design space;

E. generating from one or more of said source design objects one or more conversion objects in said target design space in accordance with said source design object transformation rules, said conversion objects each having an associated conversion map; and

F. merging one or more of said conversion objects and said associated conversion maps into one or more of said corresponding target design objects and said associated target maps to establish a merged object and associated merged map, whereby said one or more of said target design objects have their associated unique target identifier related to said unique source identifier associated with said one or more of said source design objects.

5,315,710

PROGRAM SYNTHESIZING METHOD AND APPARATUS

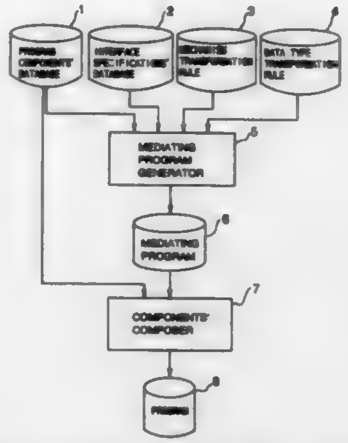
Yoshinori Kishimoto, Sagamihara, and Koichi Yamano, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1992, Ser. No. 819,869

Claims priority, application Japan, Jan. 25, 1991, 3-007546

Int. Cl.^{5} G06F *7/32*

U.S. Cl. 395—700 **7 Claims**


1
2
3
4
PROGRAM COMPONENTS' DATABASE
INTERFACE SPECIFICATIONS' DATABASE
MECHANISM TRANSFORMATION RULE
DATA TYPE TRANSFORMATION RULE
5
MEDIATING PROGRAM GENERATOR
6
MEDIATING PROGRAM
7
COMPONENTS' COMPOSER
8
PROGRAM

1. A program generating apparatus for generating a new program from at least first and second program components, the first and second program components having non-matching interface specifications, each interface specification including a program connection mechanism by which the corresponding program component interacts with other program components and a data type which the corresponding program component processes, the program generating apparatus comprising:

a program components' database means for storing said program components;

an interface specifications' database means for storing the interface specifications of said program components;

means for storing a connection mechanism transformation rule for controlling transforming the connection mechanisms of the first and second program components to be compatible with each other;

means for storing a data type transformation rule for controlling transforming the data type of the first program component into the data type of the second program component and the data type of the second program component into the data type of the first program component;

a mediating program generator for detecting that the interface specifications of the first and second program components are non-matching and without modifying the first and second program components generating a mediating program which has said connection mechanisms of the interface specifications of the first and second programs for interconnection with both the first and second program components and which (i) transforms said data types of the first program component into the data type of the second program component and the data type of the second program component into the data type of the first program component and (ii) transforms connection mechanisms of the first and second program components to be compatible with each other in accordance with said connection mechanism transformation rule and said data type transformation rule; and,

a components' composer means for generating the new program by combining said first and second program component and said mediating program, the new program being stored in the program components' database means.

5,315,711

METHOD AND APPARATUS FOR REMOTELY AND CENTRALLY CONTROLLING A PLURALITY OF HOST PROCESSORS

Stan T. Barone, Fridley; Ian R. Hepburn, Minnetonka, both of Minn.; Gary E. Fladmoe, Salt Lake City, Utah, and Robert D. Vavra, Roseville, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

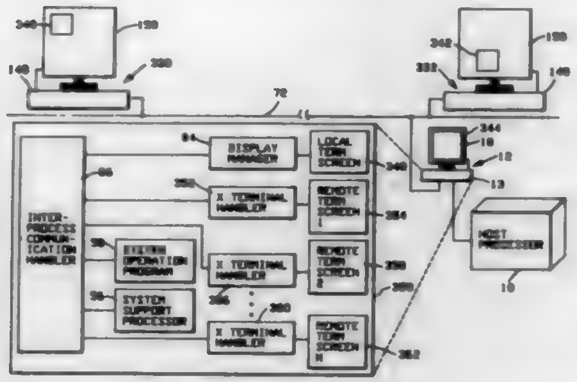
Filed Nov. 1, 1991, Ser. No. 786,858

Int. Cl.^{5} G06F ***15/02***

U.S. Cl. 395—275 **29 Claims**

MICROFICHE APPENDIX INCLUDED

(10 Microfiche, 1961 Pages)



1. In a data processing system including a first host processor, a second host processor, a first control console coupled to the first hose processor, a second control console coupled to the second host processor, and a communications network to which each of the control consoles is coupled, wherein each of the host processors includes an operator system for controlling allocation of available data processing resources, and each of the control consoles provides an operational control user interface for the associated host processor, wherein each of the control consoles can execute one or more console application programs for interfacing with the host processor operating system, the data processing system further including a remotely located workstation coupled to the communications network, a method for providing alterative operational control of the host processors from the workstation, comprising the steps of:

selecting the first control console from the remotely located workstation for exercising alternative operational control at the remotely located workstation of the first host processor;

replicating the first control console user interface at the remotely located workstation in a first console window, whereby operational control provided by the first control console is alternatively provided at the workstation in said first console window; and

selectively inputting a first operational control command in said first console window, whereby operational control is exercised over the first host processor from the remotely located workstation.

DESIGN PATENTS

GRANTED MAY 24, 1994

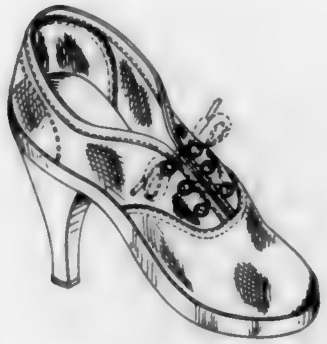
ERRATA

For CLASS	See PATENT NO.
025-038	D 347,186
021-226	D 347,237

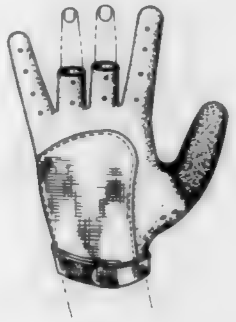
DESIGNS

MAY 24, 1994

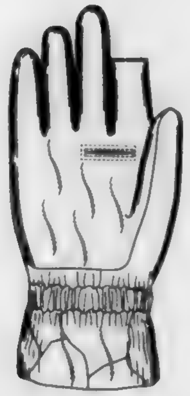
347,099
HIGH HEELED SHOE
Brenda Nelson, P.O. Box 1280, Kihei, Hi. 96753
Filed Dec. 12, 1991, Ser. No. 805,905
Term of patent 14 years
U.S. Cl. D2—935



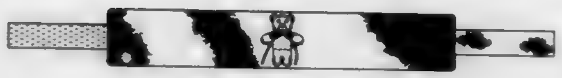
347,100
BOWLING GLOVE
Timothy Greene, 324 Pine St., Buffalo, N.Y. 14204
Filed Jul. 31, 1992, Ser. No. 922,753
Term of patent 14 years
U.S. Cl. D2—610



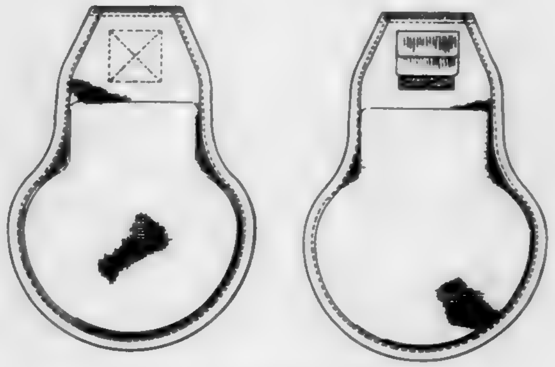
347,101
BAKER'S RELEASE GLOVE
Ronnie J. Baker, Rte. 1 Box 77, Goldston, N.C. 27252
Filed Aug. 12, 1992, Ser. No. 928,206
Term of patent 14 years
U.S. Cl. D2—616



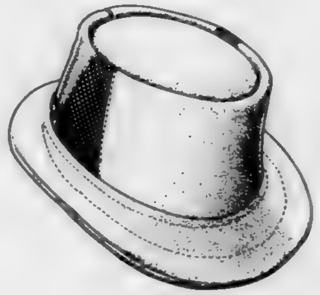
347,102
TEDDY BELT
Gay L. Strasner, 1615 Astoria Ave., Lancaster, Calif. 93535
Filed Jul. 1, 1991, Ser. No. 724,347
Term of patent 14 years
U.S. Cl. D2—627



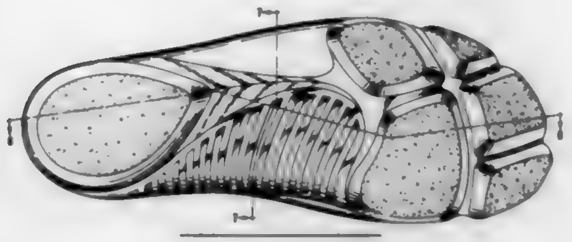
347,103
HIP PAD
Andrew C. Berry, P.O. Box 4967, Greenville, S.C. 29608
Filed Sep. 13, 1991, Ser. No. 759,083
Term of patent 14 years
U.S. Cl. D2—860



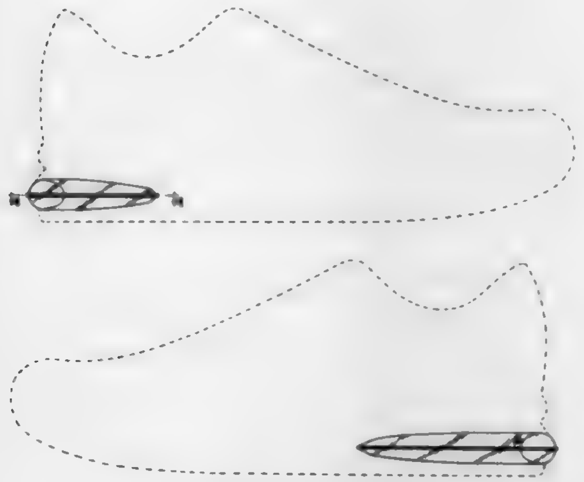
347,104
HAT
Roy L. Vossler, 1797-6th. Ave., SW., Medicine Hat, Alberta, Canada T1A 8B1
Filed Sep. 29, 1992, Ser. No. 953,146
Term of patent 14 years
U.S. Cl. D2—887



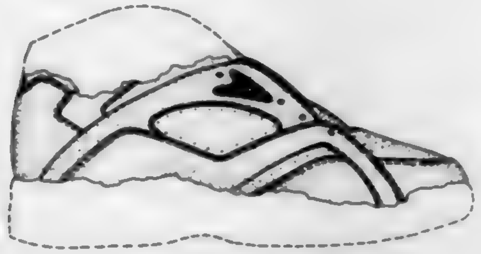
347,105
SHOE SOLE
Bradford A. Johnson, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Sep. 1, 1993, Ser. No. 12,359
Term of patent 14 years
U.S. Cl. D2—952



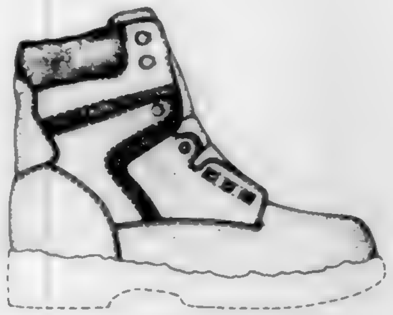
347,106
BLADDER ELEMENT FOR A SHOE SOLE
James C. Sell, Jr., Beaverton; Robert J. Lucas; Michael T. Donaghu, both of Portland, and Robert M. Lyden, Beaverton, all of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Sep. 1, 1993, Ser. No. 12,388
Term of patent 14 years
U.S. Cl. D2—961



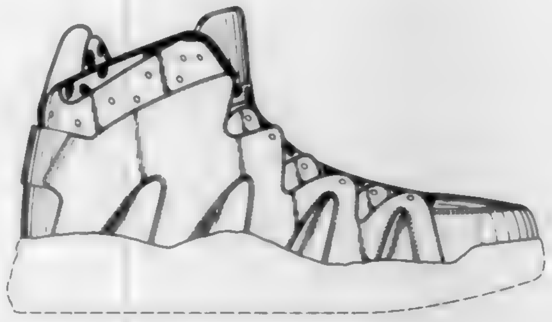
347,107
PORTION OF A SHOE UPPER
Fiona J. Adams, North Quincy, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Aug. 23, 1993, Ser. No. 12,128
Term of patent 14 years
U.S. Cl. D2—969



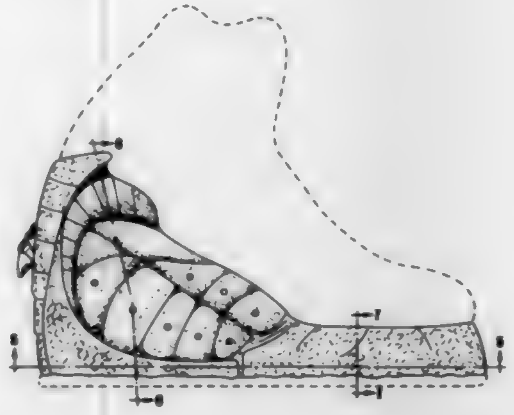
347,108
SHOE UPPER
David W. Foster, Bolton, England, and Peter A. von Conta, Brighton, Mass., assignors to The Rockport Company, Inc., Marlboro, Mass.
Filed Aug. 19, 1993, Ser. No. 11,994
Term of patent 14 years
U.S. Cl. D2—970



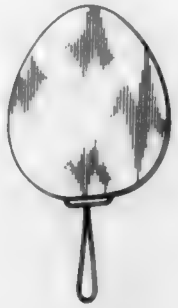
347,109
SHOE UPPER
Eric P. Avar, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Sep. 17, 1993, Ser. No. 13,624
Term of patent 14 years
U.S. Cl. D2—970



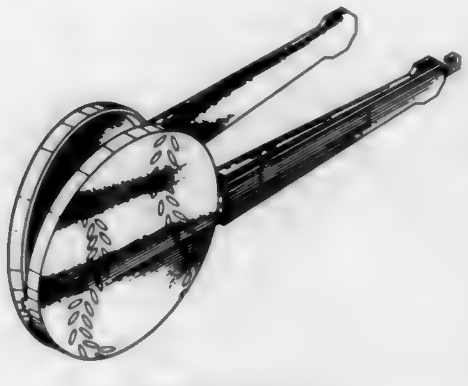
347,110
SHOE MIDSOLE
David W. Hoeft; Tinker A. Hatfield, Portland, and Bradford A. Johnson, all of Portland, Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Sep. 10, 1992, Ser. No. 943,202
Term of patent 14 years
U.S. Cl. D2—977



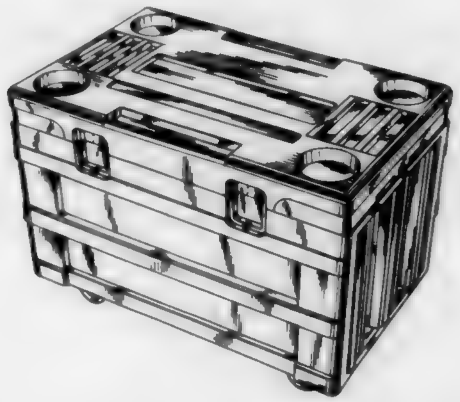
347,111
HAND FAN
Patrice E. Wheeler, 4312 Bellaire Dr. S. #224E, Fort Worth, Tex. 76109
Filed Apr. 30, 1992, Ser. No. 876,217
Term of patent 14 years
U.S. Cl. D3—1



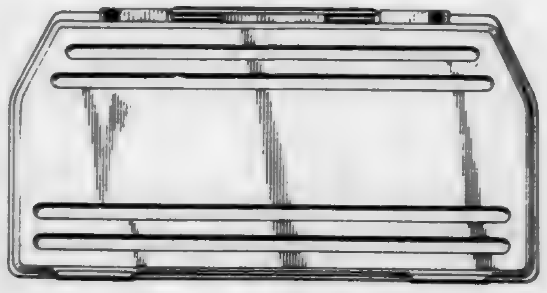
347,112
FAN
Francis E. Monica, Jr., 211 McGuire Rd., Greece, N.Y. 14616
Filed Apr. 26, 1993, Ser. No. 7,546
Term of patent 14 years
U.S. Cl. D3—4



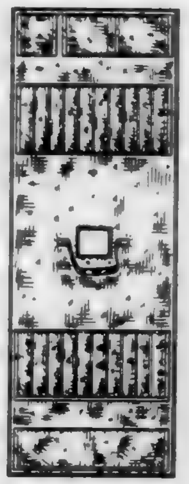
347,113
STORAGE AND TRANSPORTATION TRUNK
James M. Bornhorst, DeSoto; Edwin B. Dangerfield, Arlington; James Maddux, III, Carrollton; Timothy D. Stacy, Plano, and Timothy W. Terleski, Garland, all of Tex., assignors to Vari-Lite, Inc., Dallas, Tex.
Filed Sep. 4, 1992, Ser. No. 940,729
Term of patent 14 years
U.S. Cl. D3—272



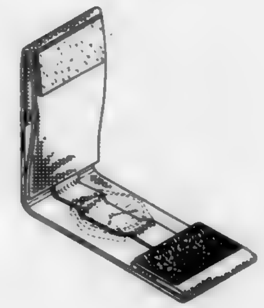
347,114
CASE FOR HOLDING HAND TOOLS
Henri A. Tengvall, 14 Royal Crescent Mews, London, England W11 4SY
Filed Nov. 6, 1992, Ser. No. 1,219
Claims priority, application United Kingdom, May 7, 1992, 2022735
Term of patent 14 years
U.S. Cl. D3—281



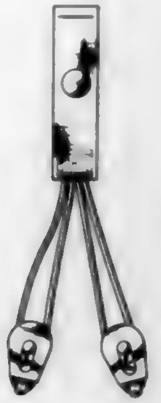
347,115
PACKAGE WRAPPING ACCESSORIES CADDY
Jacqueline Breedlove, 3751 Bembow Dr., Redding, Calif. 96002
Filed Sep. 15, 1992, Ser. No. 945,341
Term of patent 14 years
U.S. Cl. D3—315



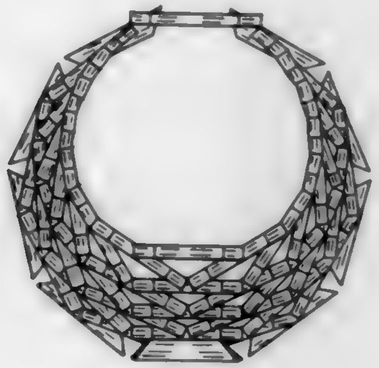
347,116
WATCHBAND FOR ATTACHMENT TO A BELT
Arthur G. Guzman, 14527 E. Los Angeles St., Baldwin Park, Calif. 91706
Filed Jul. 19, 1991, Ser. No. 732,700
Term of patent 14 years
U.S. Cl. D3—215



347,117
RELEASABLE SMALL GAME CARRIER
James E. Crichton, Rte. 3, Box 233, and Gorden R. Munneke, Rte. 3, Box 209, both of Harrison, S. Dak. 57344
Filed Dec. 24, 1992, Ser. No. 2,990
Term of patent 14 years
U.S. Cl. D3—221

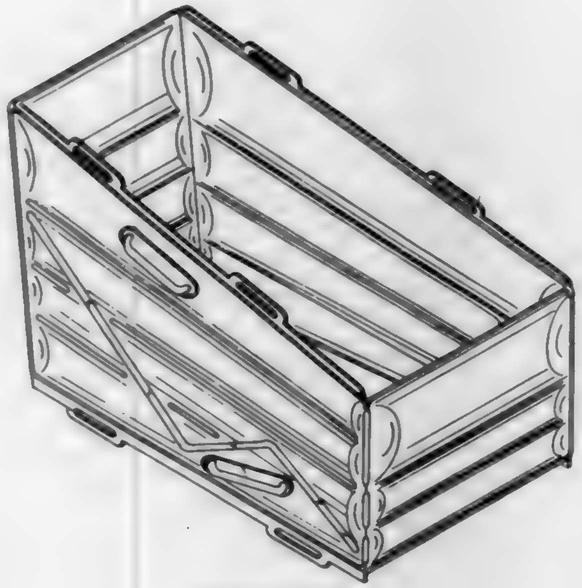


347,118
WOOD LATTICE BASKET
Herman A. Ferrara, 1346 Lemar Dr., Cincinnati, Ohio 45238, assignor to Herman A. Ferrara, Cincinnati, Ohio
Filed Aug. 27, 1992, Ser. No. 924,534
Term of patent 14 years
U.S. Cl. D3—306

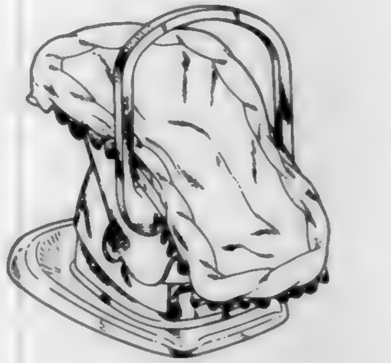


347,119
TEXTILE
Paola Fendi, Rome, Italy, assignor to Fendi Paola & Sorelle S.P.S., Rome, Italy
Filed Jan. 2, 1991, Ser. No. 636,943
Claims priority, application Hague, Jul. 6, 1990, DM/017094
Term of patent 14 years
U.S. Cl. D5—52

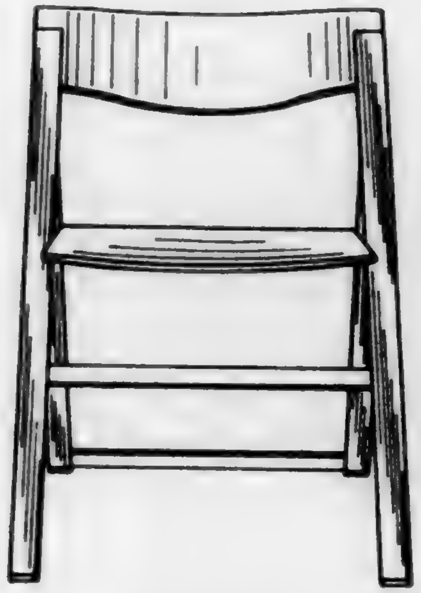
347,120
INFLATABLE INFANT VEHICLE SEAT/BED
Lawrence Artz, Wilton, Conn., assignor to Starmark, Inc., Brooklyn, N.Y.
Filed Sep. 4, 1992, Ser. No. 939,528
Term of patent 14 years
U.S. Cl. D6—333



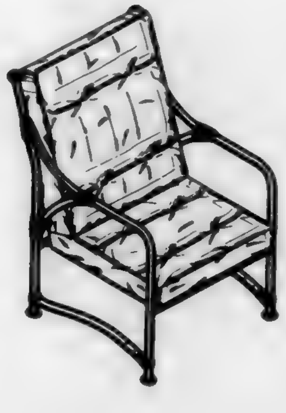
347,121
INFANT BOUNCER
Marjorie G. Harper, Littleton, and T. Brent Freese, Westminster, both of Colo., assignors to Gerry Baby Products Company, Denver, Colo.
Filed Sep. 9, 1992, Ser. No. 942,530
Term of patent 14 years
U.S. Cl. D6—333



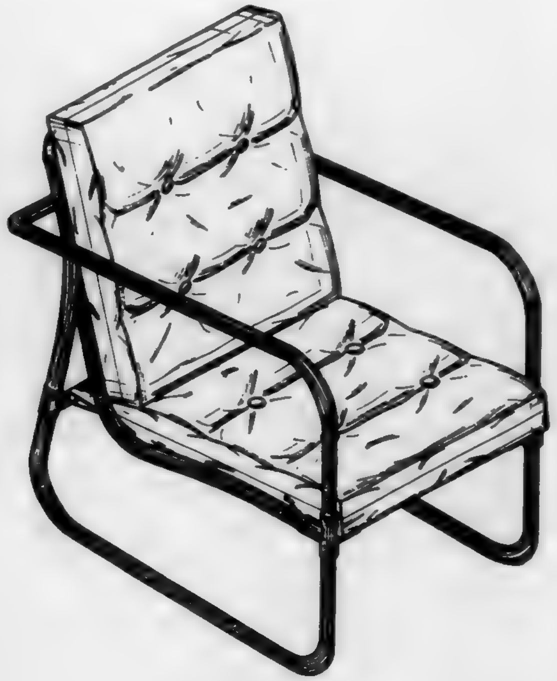
347,122
FOLDING CHAIR
Justus Kolberg, Selk, Fed. Rep. of Germany, assignor to Tecno S.P.A. Mobili E Forniture Per Arredamento, Milan, Italy
Filed Mar. 12, 1992, Ser. No. 850,073
Claims priority, application Hague, Sep. 17, 1991, DMA/001591
Term of patent 14 years
U.S. Cl. D6—368



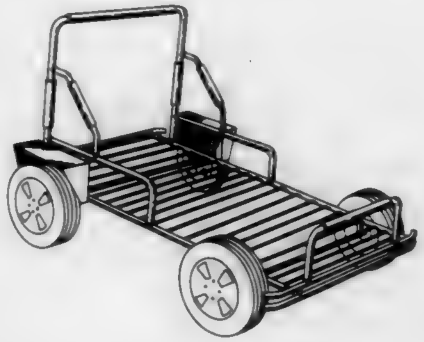
347,123
CHAIR
Bernie Lowsky, 1000 W. Island Blvd., Apt. #1810, North Miami Beach, Fla. 33160
Filed Jun. 1, 1992, Ser. No. 891,995
Term of patent 14 years
U.S. Cl. D6—369



347,124
CHAIR
Bernie Lowsky, 1000 W. Island Blvd., Apt. #1810, North, Miami Beach, Fla. 33160
Filed Jun. 1, 1992, Ser. No. 891,811
Term of patent 14 years
U.S. Cl. D6—373

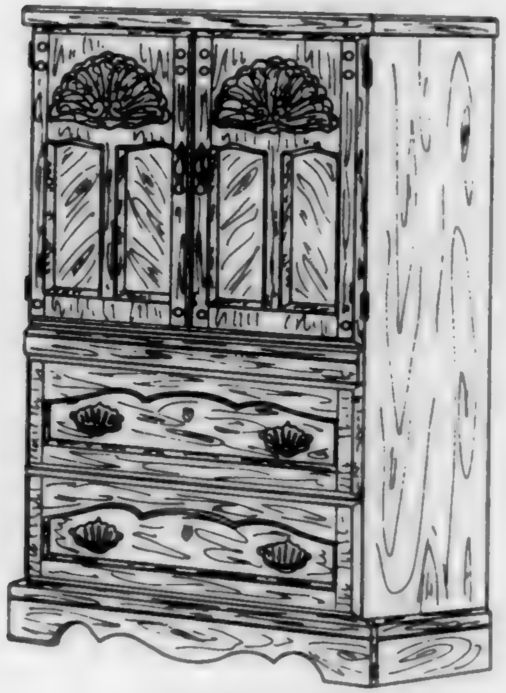


347,125
BED ON WHEELS
Jean Brunel, Montmagny, Canada, assignor to Les Induries Amisco LTÉE, L'Islet, Canada
Filed Sep. 24, 1992, Ser. No. 948,802
Term of patent 14 years
U.S. Cl. D6—388



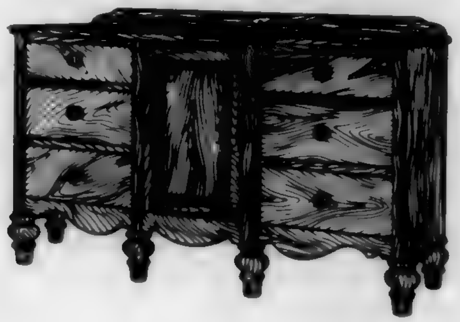
347,126
CHEST

John L. Roser, Jr., High Point, N.C., assignor to Vaughan Bassett Williams, Sumter, S.C.
Filed Jul. 1, 1992, Ser. No. 907,323
Term of patent 14 years
U.S. Cl. D6—439



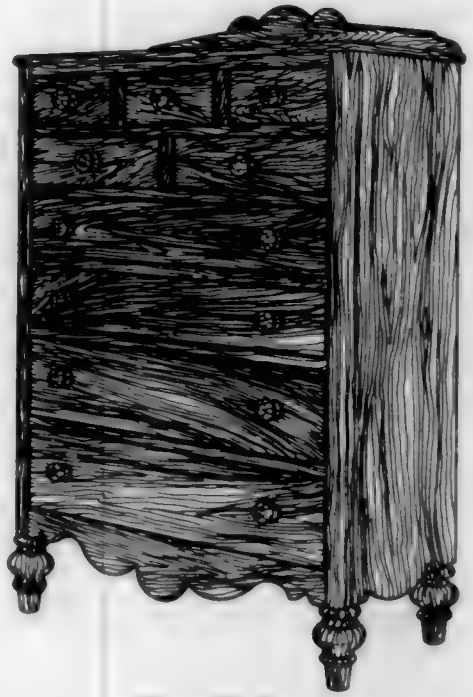
347,127
DRESSER

Edwin L. Ball, Thomasville, N.C., assignor to Lexington Furniture Industries, Inc., Lexington, N.C.
Filed Mar. 18, 1992, Ser. No. 854,049
Term of patent 14 years
U.S. Cl. D6—445



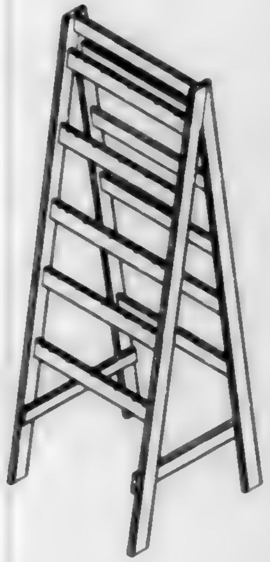
347,128
CHEST

Edwin L. Ball, Thomasville, N.C., assignor to Lexington Furniture Industries, Inc., Lexington, N.C.
Filed Mar. 18, 1992, Ser. No. 854,460
Term of patent 14 years
U.S. Cl. D6—445



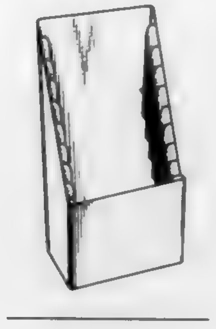
347,129
DISPLAY RACK

Lenora A. Zinke; Ernest E. Zinke, both of Silver Spring, Md.; Jerry W. Robertson, Sparta, N.C., and Henry L. Dunn, Parkton, Md., assignors to Ann's House of Nuts, Inc., Jessup, Md.
Filed Sep. 26, 1991, Ser. No. 765,708
Term of patent 14 years
U.S. Cl. D6—468



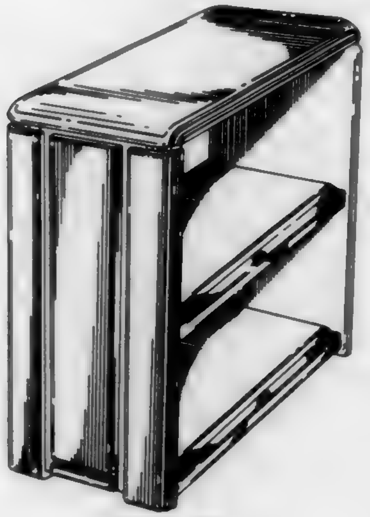
347,130
DISKETTE HOLDER

Mark D. Dean, 610 Penn St., El Segundo, Calif. 90245
Filed Apr. 23, 1992, Ser. No. 873,044
Term of patent 14 years
U.S. Cl. D6—630



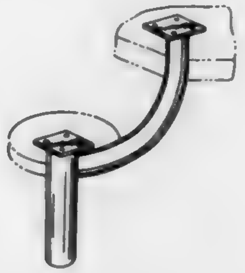
347,131
BOOKCASE

Stacy L. Wolff, Akron, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 5, 1993, Ser. No. 3,197
Term of patent 14 years
U.S. Cl. D6—479



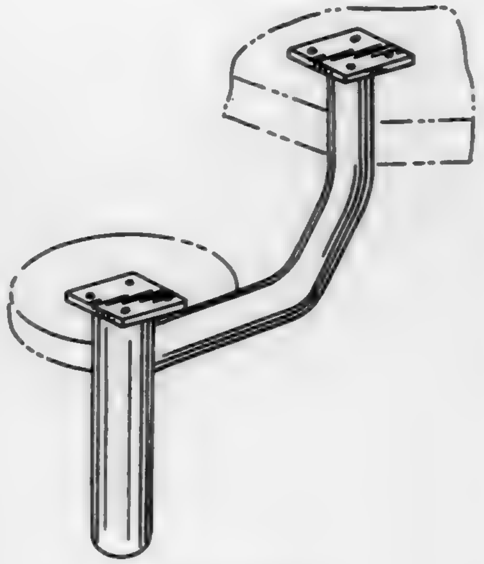
347,132
TABLE LEG

Richard B. Karl, 1825 Persimmon Dr., St. Charles, Ill. 60174
Filed Sep. 28, 1992, Ser. No. 952,184
Term of patent 14 years
U.S. Cl. D6—499



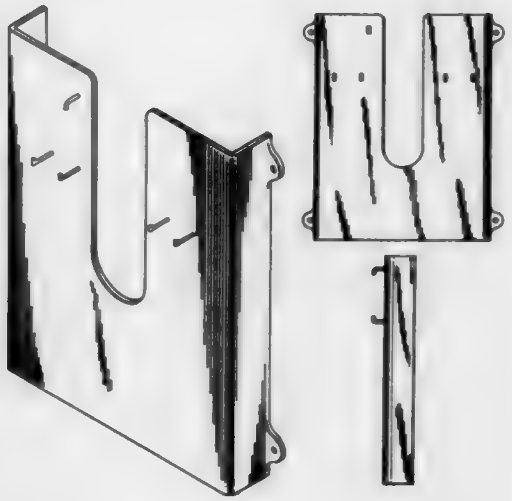
347,133
TABLE LEG

Richard B. Karl, 1825 Persimmon Dr., St. Charles, Ill. 60174
Filed Sep. 28, 1992, Ser. No. 952,185
Term of patent 14 years
U.S. Cl. D6—499



347,134
BAG HOLDER

Homer F. Bruggeman, 3564 Rolling View Dr., White Bear Lake, Minn. 55110
Filed May 8, 1992, Ser. No. 880,358
Term of patent 14 years
U.S. Cl. D6—515



347,135

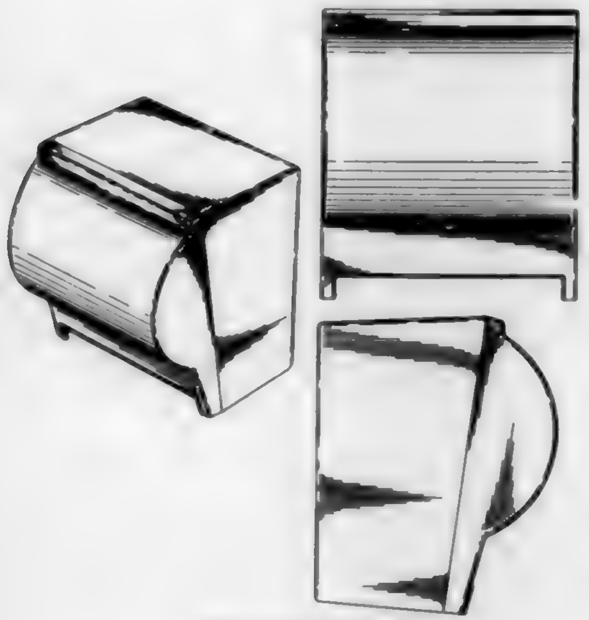
PAPER TOWEL DISPENSER HOUSING

Michel Morand, Montreal, Canada, assignor to Wyant & Company Limited, Lachine, Canada

Filed Jan. 4, 1993, Ser. No. 3,246

Term of patent 14 years

U.S. Cl. D6—522



347,136

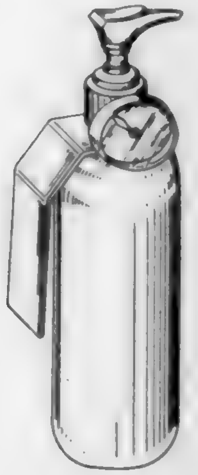
LIQUID SOAP DISPENSER

Richard Costa, Piscataway, N.J., assignor to Pharma Design, Inc., Warren, N.J.

Filed Oct. 16, 1992, Ser. No. 524

Term of patent 14 years

U.S. Cl. D6—546



347,137

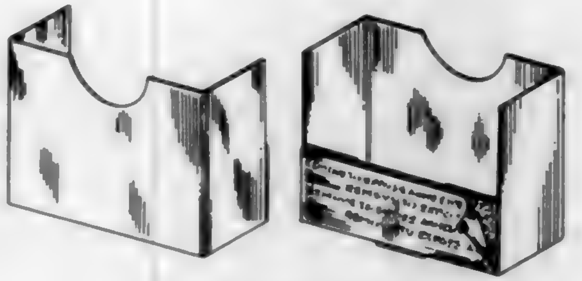
STICK-ON CONDOM HOLDER/DISPENSER

Andrew W. McWhirter, P.O. Box 44316, Tucson, Ariz. 85733

Filed Nov. 27, 1992, Ser. No. 1,879

Term of patent 14 years

U.S. Cl. D6—567



347,138

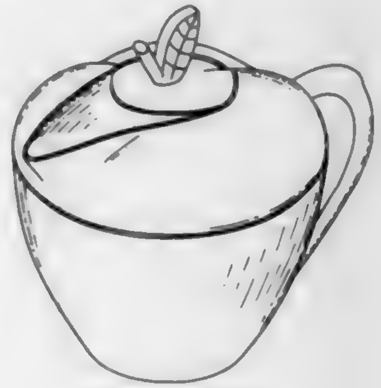
CARAFE

Bruce Ancona, 21 E. 22nd St., Apt. 6K, New York, N.Y. 10010

Filed May 11, 1993, Ser. No. 8,180

Term of patent 14 years

U.S. Cl. D7—302



347,139

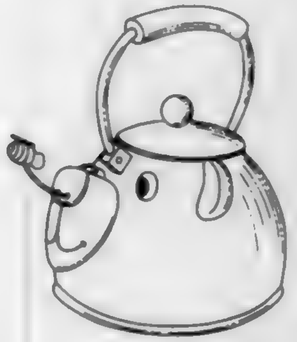
KETTLE

Bruce Ancona, and Jane Ancona, both of 21 E. 22nd St., Apt. 6K, New York, N.Y. 10010

Filed Apr. 30, 1993, Ser. No. 7,759

Term of patent 14 years

U.S. Cl. D7—302



347,140

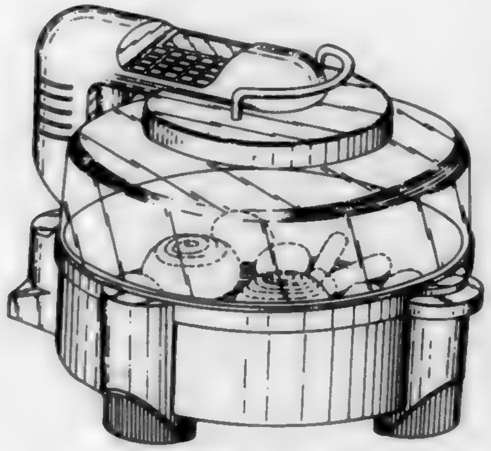
COUNTERTOP AIR OVEN

David A. Dornbush, Prior Lake, and Robert Worrell, Hopkins, both of Minn., assignors to Alternative Pioneering Systems, Inc., Chaska, Minn.

Filed Jul. 2, 1992, Ser. No. 909,803

Term of patent 14 years

U.S. Cl. D7—350



347,141

COOKING PAN

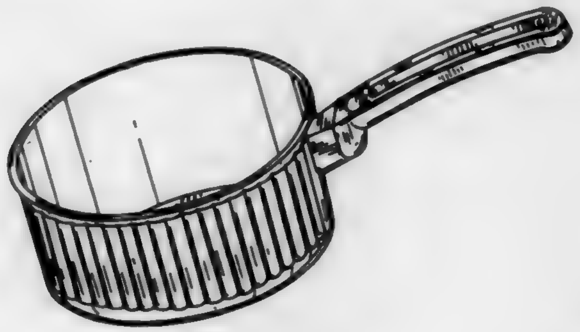
Philippe Maillard, Moye, France, assignor to Tefal S.A., Rumilly, France

Filed Nov. 20, 1992, Ser. No. 1,883

Claims priority, application France, May 20, 1992, 923192

Term of patent 14 years

U.S. Cl. D7—361



347,142

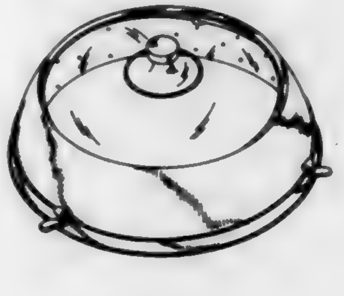
PAN LID

Joseph S. Falvo, 137 Mason St., Calumet City, Ill. 60409

Filed Jul. 18, 1991, Ser. No. 731,881

Term of patent 14 years

U.S. Cl. D7—391



347,143

POULTRY ROASTING DISH

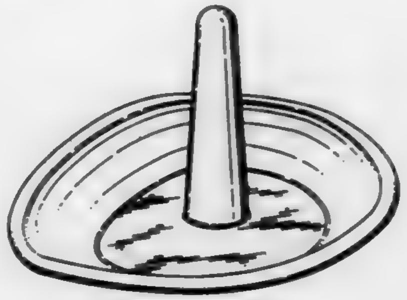
Soen T. Awyong, 46 Chartfield Avenue, London, England SW15 6HG

Filed Nov. 6, 1991, Ser. No. 789,156

Claims priority, application United Kingdom, May 8, 1991, 2014610

Term of patent 14 years

U.S. Cl. D7—403



347,144

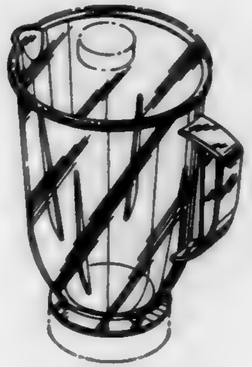
CONTAINER FOR BLENDER

Martin Brady, Richmond, Va., assignor to Hamilton Beach/-Proctor - Silex, Inc., Glen Allen, Va.

Filed Dec. 18, 1992, Ser. No. 2,662

Term of patent 14 years

U.S. Cl. D7—413



347,145

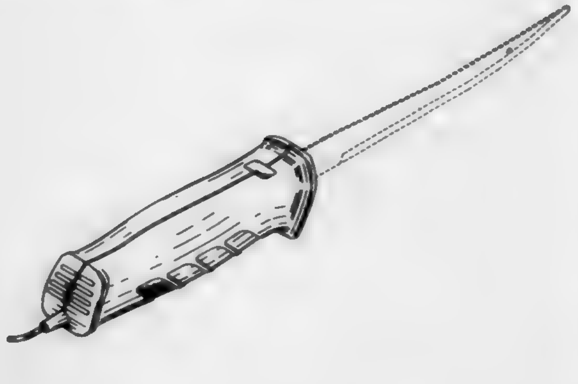
ELECTRIC KNIFE HANDLE

Mike A. Nesbat, Jonesboro, and William G. Badley, Pocahontas, both of Ark., assignors to The Scott Fetzer Company, Westlake, Ohio

Filed Sep. 30, 1992, Ser. No. 954,075

Term of patent 14 years

U.S. Cl. D7—646



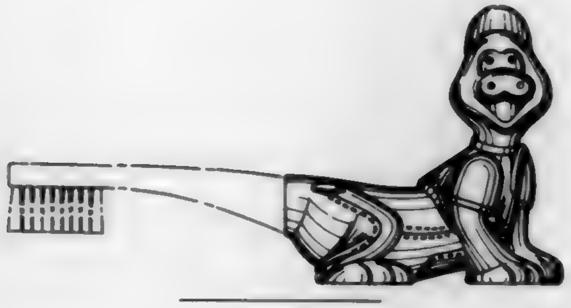
347,146
HANDLE FOR FLATWARE AND TOOTHBRUSHES

Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.

Filed Mar. 11, 1993, Ser. No. 5,755

Term of patent 14 years

U.S. Cl. D7—656



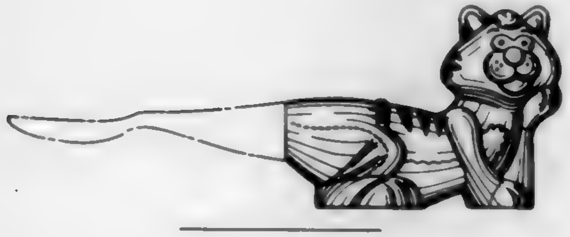
347,147
HANDLE FOR FLATWARE AND TOOTHBRUSHES

Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.

Filed Mar. 11, 1993, Ser. No. 5,756

Term of patent 14 years

U.S. Cl. D7—656



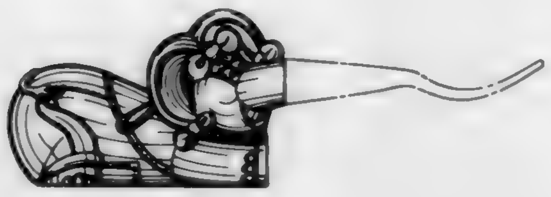
347,148
HANDLE FOR FLATWARE AND TOOTHBRUSHES

Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.

Filed Mar. 11, 1993, Ser. No. 5,774

Term of patent 14 years

U.S. Cl. D7—656



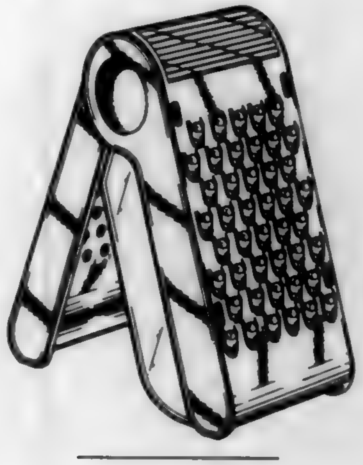
347,149
FOOD SHREDDER

David L. Feer, Dorchester, Mass., and Rex R. Mast, Orrville, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jan. 4, 1993, Ser. No. 3,333

Term of patent 14 years

U.S. Cl. D7—678



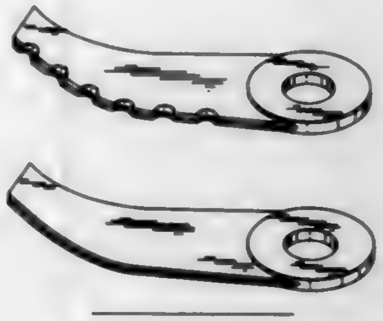
347,150
CUTTING BLADE FOR ROTATING CUTTERS

Mark Falconbridge, 8 Barbara Street, Smithville, Ontario, Canada L0R 2A0

Filed Feb. 14, 1992, Ser. No. 836,114

Term of patent 14 years

U.S. Cl. D8—8



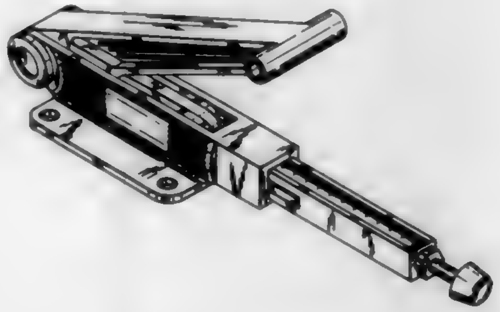
347,151
PLASTIC TOGGLE CLAMP

Edwin G. Sawdon, St. Clair, Mich., assignor to BTM Corporation, Marysville, Mich.

Filed Mar. 15, 1993, Ser. No. 5,868

Term of patent 14 years

U.S. Cl. D8—72



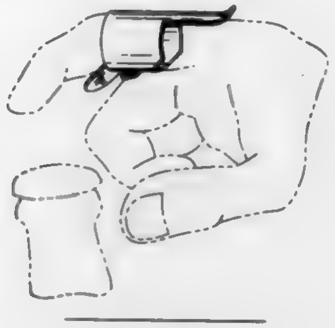
347,152
RING BOTTLE OPENER

Michael L. Mohawk, 10515 W. Grand Ave. #804, Melrose Park, Ill. 60164; Mario Marino, 1203 Winston St., Melrose Park, Ill. 60160, and Jasper Marino, 1216 S. Lombard, Berwyn, Ill. 60402

Filed Oct. 19, 1992, Ser. No. 606

Term of patent 14 years

U.S. Cl. D8—40



347,153
PORTABLE ELECTRIC GRINDER

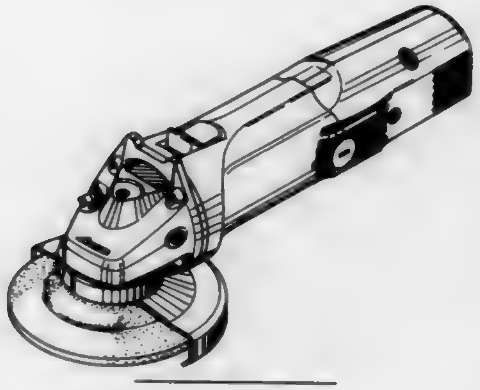
Tsunehito Uneyama, Anjo, Japan, assignor to Makita Corporation, Anjo, Japan

Filed May 14, 1993, Ser. No. 8,360

Claims priority, application Japan, Nov. 17, 1992, 4-33947

Term of patent 14 years

U.S. Cl. D8—62



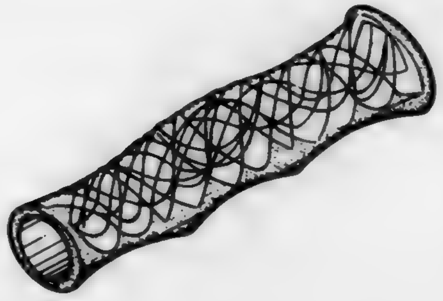
347,154
BICYCLE HANDLEBAR GRIP

Chen Ming-Chang, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Jul. 28, 1992, Ser. No. 920,627

Term of patent 14 years

U.S. Cl. D8—303



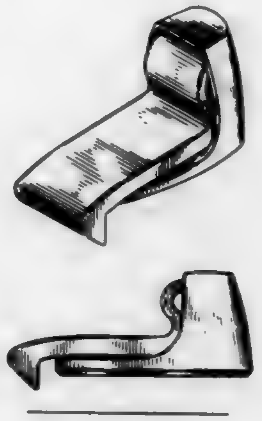
347,155
SLAM LATCH

Richard E. Schlack, Rising Sun, Md., and Paul E. Krape, Slingerland, N.Y., assignors to Southco, Inc., Concordville, Pa.

Continuation of Ser. No. 978,900, Nov. 19, 1992. This application Aug. 31, 1993, Ser. No. 12,404

Term of patent 14 years

U.S. Cl. D8—331



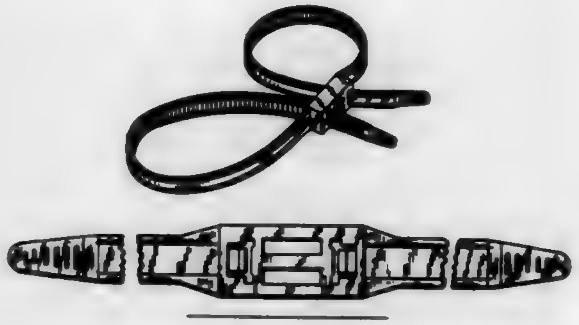
347,156
HANDCUFFS

Paul D. Starrett, Jaffrey, and Gary Pelkey, Fitzwilliam, both of N.H., assignors to Monadnock Lifetime Products, Inc., Fitzwilliams, N.H.

Filed Sep. 17, 1991, Ser. No. 761,025

Term of patent 14 years

U.S. Cl. D8—333



347,157
SECURITY SEAL ASSEMBLY

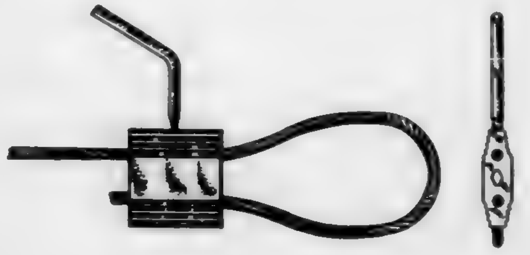
Clive A. Brown, Birmingham, England, assignor to Blair Security Products Limited, Walsall, England

Filed Mar. 18, 1992, Ser. No. 853,447

Claims priority, application United Kingdom, Nov. 30, 1991, 2019277

Term of patent 14 years

U.S. Cl. D8—333



347,158

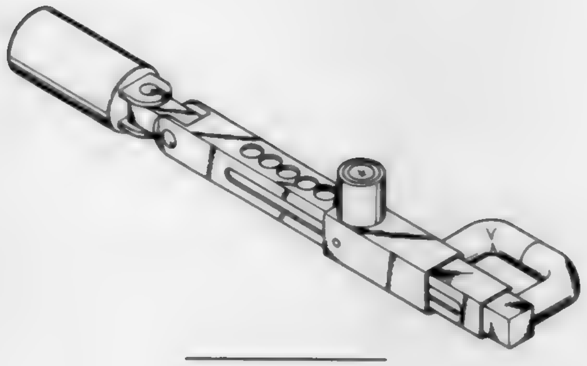
LOCK FOR AN AUTOMATIC GEAR SHIFT LEVER

Alice Shen, P.O. Box 82-144, Taipei, Taiwan

Filed Feb. 9, 1993, Ser. No. 4,601

Term of patent 14 years

U.S. Cl. D8—333



347,159

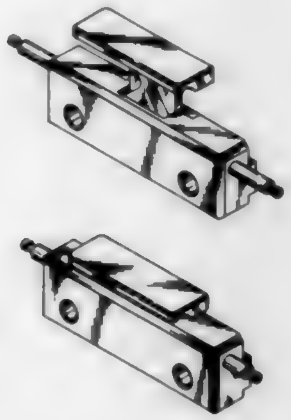
LATCH MECHANISM

Courtenay Crocker, III, West Simsbury, and Stephen J. Sekulski, New Hartford, both of Conn., assignors to Paneloc Corporation, Farmington, Conn.

Filed Apr. 30, 1992, Ser. No. 876,391

Term of patent 14 years

U.S. Cl. D8—339



347,160

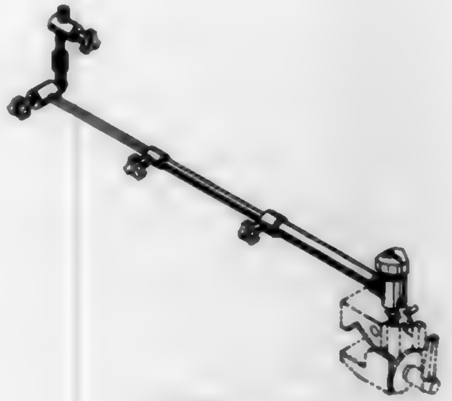
ADJUSTABLE MOUNTING SYSTEM FOR HOLDING AN OBJECT IN A DESIRED SPATIAL POSITION

Leander Hallgren, St. Paul, Minn., assignor to AbleNet, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 817,845, Jan. 8, 1992. This application Jun. 8, 1992, Ser. No. 896,925

Term of patent 14 years

U.S. Cl. D8—355



347,161

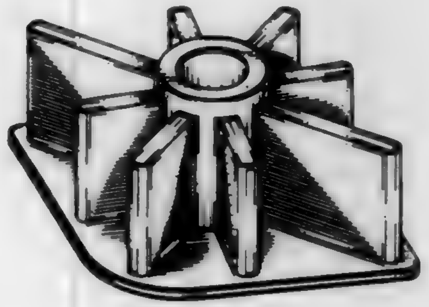
CASTER PLUG

Brian J. Conaway, Wooster, and Tyrone M. Keyes, Mason, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 8, 1992, Ser. No. 909,820

Term of patent 14 years

U.S. Cl. D8—375



347,162

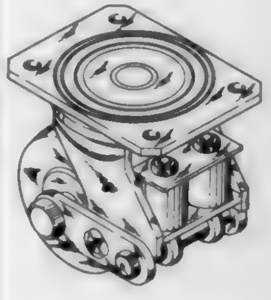
SHOCK ABSORBING CASTER

Robert J. Simonsen, Evansville, Ind., assignor to Babcock Industries Inc., Fairfield, Conn.

Filed Oct. 23, 1992, Ser. No. 736

Term of patent 14 years

U.S. Cl. D8—375



347,163

U BOLT ASSEMBLY

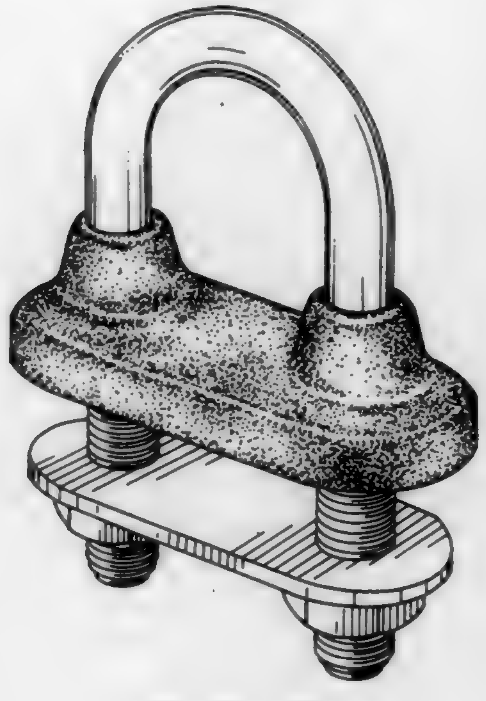
Gerard Issard, Thiers, France, assignor to Wichard, Thiers, France

Filed Sep. 23, 1991, Ser. No. 766,173

Claims priority, application France, Apr. 29, 1991, 912680

Term of patent 14 years

U.S. Cl. D8—387



347,164

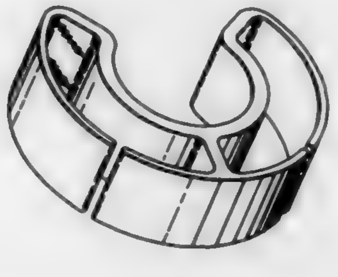
POLE CLIP FOR WIRES OR TUBING

Michael A. Wodka, Ann Arbor, Mich., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 1, 1992, Ser. No. 907,208

Term of patent 14 years

U.S. Cl. D8—395



347,165

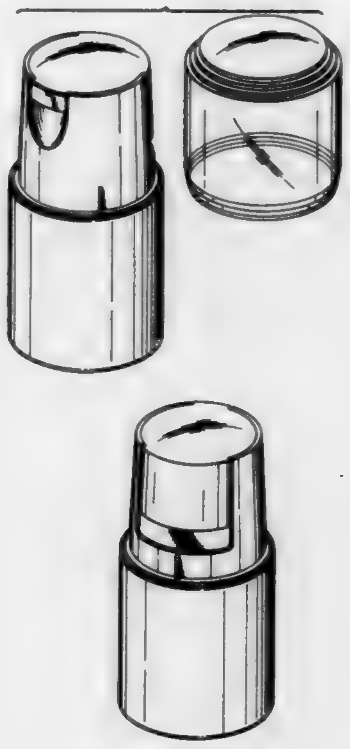
COMBINED DISPENSER AND CAP

Peter Schneider, Konigstein, Fed. Rep. of Germany, assignor to Jafra Cosmetics, Inc., Westlake Village, Calif.

Filed May 28, 1992, Ser. No. 889,745

Term of patent 14 years

U.S. Cl. D9—300



347,166

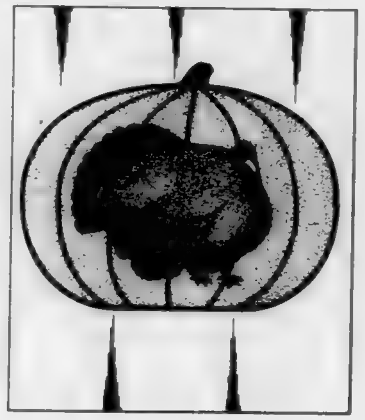
BAG

Richard Ross, Montgomery Center, Vt., and Dennis E. Bynum, 23 Alpine St., Boston, Mass. 02119, assignors to Dennis E. Bynum, Boston, Mass.

Filed Dec. 9, 1992, Ser. No. 2,362

Term of patent 14 years

U.S. Cl. D9—305



347,167

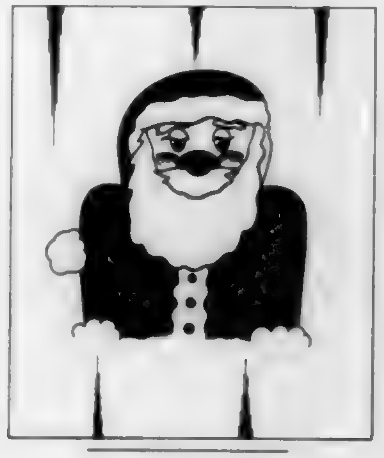
BAG

Richard Ross, Montgomery Center, Vt., and Dennis E. Bynum, 23 Alpine St., Boston, Mass. 02119, assignors to Dennis E. Bynum, Boston, Mass.

Filed Dec. 9, 1992, Ser. No. 2,363

Term of patent 14 years

U.S. Cl. D9—305



347,168

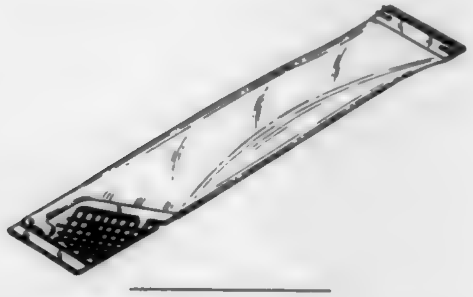
DISPENSING CONTAINER

Robert C. Smith, Short Hills, N.J., assignor to Unette Corporation, Parsippany, N.J.

Filed Nov. 6, 1992, Ser. No. 1,273

Term of patent 14 years

U.S. Cl. D9—306



347,169

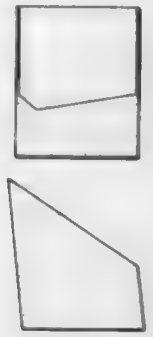
DISPLAY BOX

George A. Bezzerides, Benicia, and James Y. Maki, Richmond, both of Calif., assignors to Bezzerides Company, Benicia, Calif.

Filed Jul. 21, 1992, Ser. No. 917,471

Term of patent 14 years

U.S. Cl. D9—414



347,170

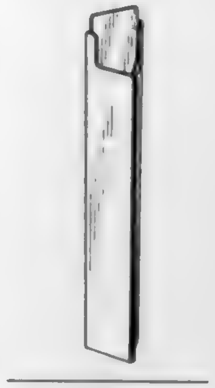
PLANT GUARD

Graham R. Due; Robert A. Turnbull, and Leigh Gryst, all of Camden Park, Australia, assignors to Gro-Guard Australia Pty. Ltd., Camden Park, Australia

Filed Sep. 29, 1992, Ser. No. 953,580

Term of patent 14 years

U.S. Cl. D9—430



347,171

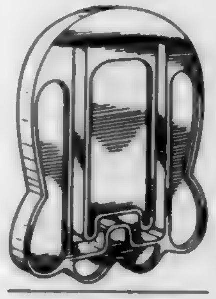
BAG CLIP

James D. Specht, Flower Mound; John L. Center, Dallas, and David R. Swift, Plano, all of Tex., assignors to Recot, Inc., Plano, Tex.

Continuation-in-part of Ser. No. 543,301, Jun. 25, 1990, Pat. No. Des. 332,220. This application Oct. 9, 1992, Ser. No. 251

Term of patent 14 years

U.S. Cl. D9—434



347,172

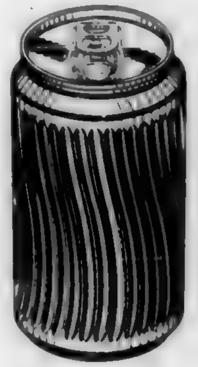
FLUTED CONTAINER

Thomas W. Heynen, Wilmette; Andrew Halasz, Crystal Lake, and Christopher L. Caliendo, Wood Dale, all of Ill., assignors to American National Can Company, Chicago, Ill.

Filed Sep. 24, 1991, Ser. No. 765,112

Term of patent 14 years

U.S. Cl. D9—520



347,173

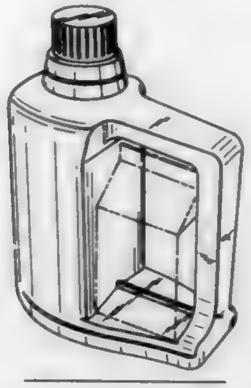
CONTAINER

David A. Bogstad, and Larry J. Bauer, both of Eau Claire, Wis., assignors to Jennico, Inc., Eau Claire, Wis.

Filed Oct. 14, 1992, Ser. No. 446

Term of patent 14 years

U.S. Cl. D9—528



347,174

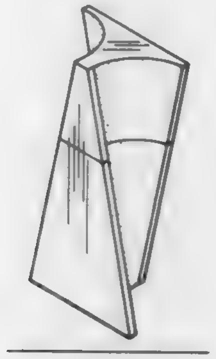
COMBINED BOTTLE AND CAP

Raymond E. Bareiss, 1033 Stillman, Eugene, Oreg. 97404

Filed Jan. 14, 1992, Ser. No. 821,615

Term of patent 14 years

U.S. Cl. D9—529



347,175

COMBINED BOTTLE AND CAP

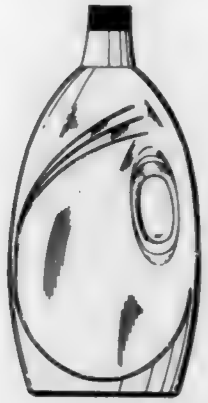
Umberto D. I. Segati, Vincennes, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 22, 1991, Ser. No. 688,207

The portion of the term of this patent subsequent to Feb. 23, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—531



347,176

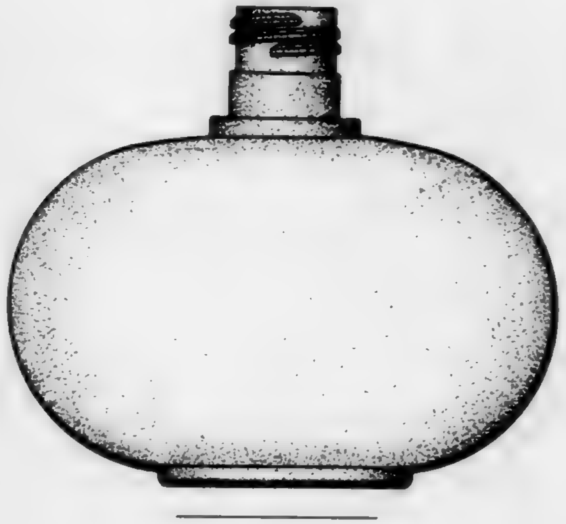
BOTTLE

Morris Braun, 4100 Marine Dr., Chicago, Ill. 60613

Filed Jan. 29, 1992, Ser. No. 827,957

Term of patent 14 years

U.S. Cl. D9—558



347,177

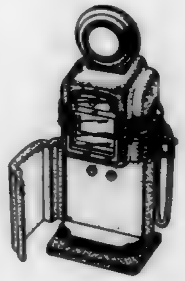
CLOCK WITH ALARM

Richard F. M. Peersmann, Scheveningen, Netherlands, assignor to Pollyflame International B.V., Roelofarendsveen, Netherlands

Filed Jan. 7, 1992, Ser. No. 817,688

Term of patent 14 years

U.S. Cl. D10—6



347,178

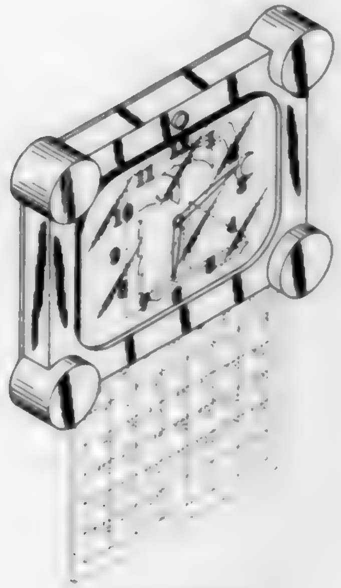
CLOCK FOR A CALENDAR

Warren K. Taphorn, R.R. 2 Box 187, Altamont, Ill. 62411-9637

Filed Sep. 28, 1992, Ser. No. 951,431

Term of patent 14 years

U.S. Cl. D10—24



347,179

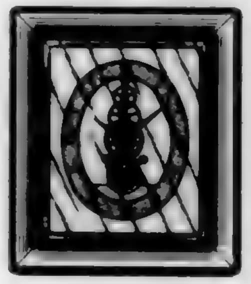
CLOCK

Tsuyoshi Oyanagi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Jul. 28, 1992, Ser. No. 920,996

Term of patent 14 years

U.S. Cl. D10—25



347,180

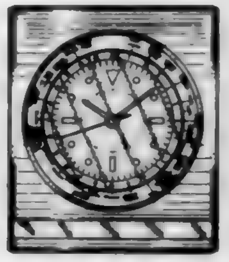
CLOCK

Masumi Mukoyama, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Aug. 5, 1992, Ser. No. 926,214

Term of patent 14 years

U.S. Cl. D10—26



347,181

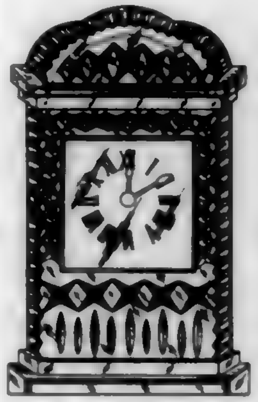
CLOCK

Arnold Godinger, Brooklyn, N.Y., assignor to Godinger Silver Art Co., Ltd., New York, N.Y.

Filed Jun. 17, 1992, Ser. No. 900,106

Term of patent 14 years

U.S. Cl. D10—28



347,182

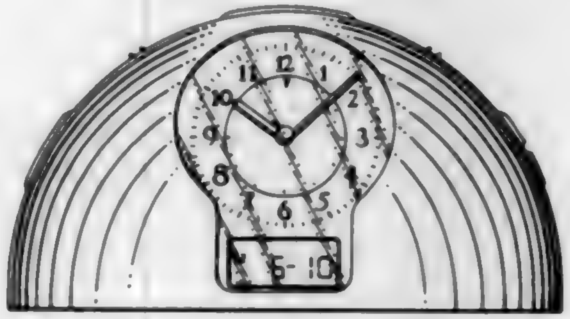
CLOCK

Mitsuo Wada, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Jul. 15, 1992, Ser. No. 914,937

Term of patent 14 years

U.S. Cl. D10—28



347,183

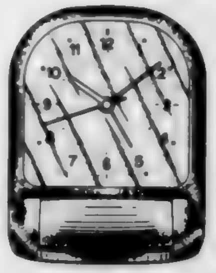
CLOCK

Yasuo Inora, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Jul. 20, 1992, Ser. No. 916,511

Term of patent 14 years

U.S. Cl. D10—28



347,184

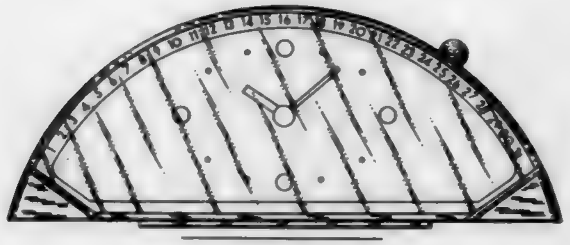
CLOCK

Tsunemi Kawashima, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Sep. 28, 1992, Ser. No. 953,574

Term of patent 14 years

U.S. Cl. D10—28



347,185

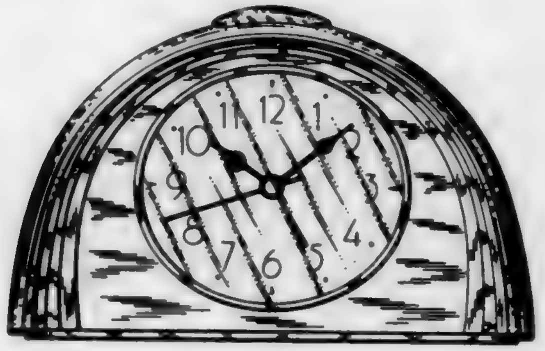
CLOCK

Katsumi Shimamura, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Oct. 2, 1992, Ser. No. 54

Term of patent 14 years

U.S. Cl. D10—28



347,186

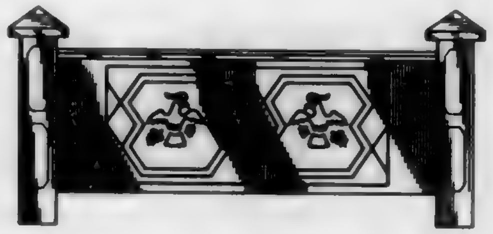
CONCRETE FENCE

Puiu Caval, and Gina Caval, both of 451 Quincy St., Twin Falls, Id. 83301

Filed May 4, 1992, Ser. No. 878,027

Term of patent 14 years

U.S. Cl. D25—38



347,187

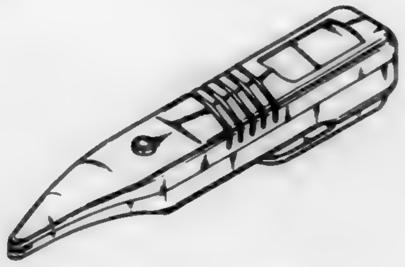
ELECTRIC TEST PEN

Shu-Hui Chou, 104, Sec. 2, Hai Wan Rd., Hsi Chih Chen, Taipei Hsien, Taiwan

Filed Feb. 20, 1992, Ser. No. 838,076

Term of patent 14 years

U.S. Cl. D10—78



347,188

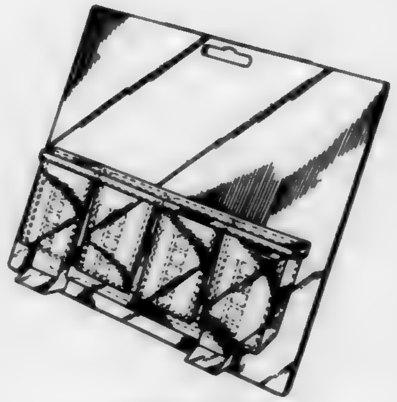
SOIL TEST KIT

Guy W. Grimes, Tilston Nr. Malpas, United Kingdom, assignor to Rapitest, Inc., Crystal Lake, Ill.

Filed Oct. 25, 1991, Ser. No. 782,468

Term of patent 14 years

U.S. Cl. D10—81



347,189

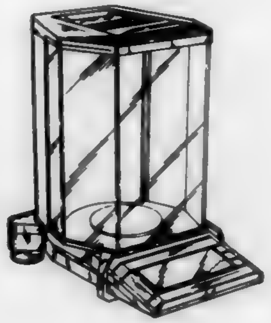
WEIGHING SCALE WITH WINDSCREEN HOUSING

Paul Luechinger, Uster; Peter Handlbauer, La Chaux-de-Fonds; Rémy C. Jacquet, Le Locle; Yves Marmier; William Kohler, both of La Chaux-de-Fonds, and Fulvio Honegger, Montezillon, all of Switzerland, assignors to Mettler-Toledo AG, Greifensee, Switzerland

Filed Apr. 7, 1993, Ser. No. 6,773

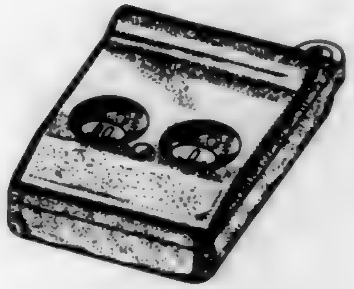
Term of patent 14 years

U.S. Cl. D10—91



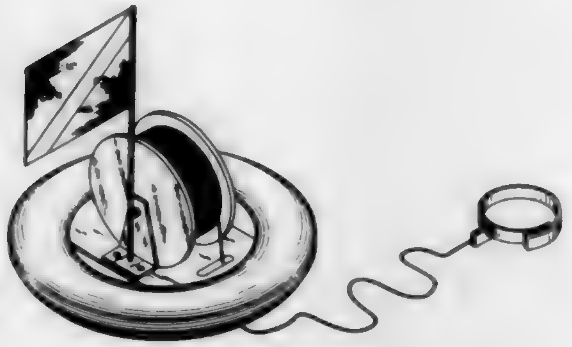
347,190
VEHICLE ALARM TRANSMITTER

Darrell E. Issa, 1598 Parkview Dr., Vista, Calif. 92083
Filed Sep. 28, 1992, Ser. No. 951,439
The portion of the term of this patent subsequent to Mar. 9, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—106



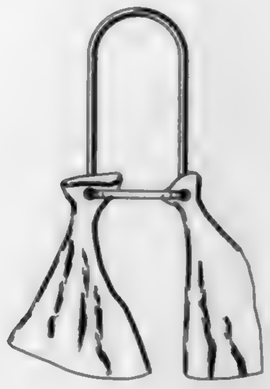
347,191
INDICATOR FLAG BUOY FOR DIVERS

Todd A. Kinney, 131 Wighill Rd., Haddam, Conn. 06438, and Kenneth J. Wynkoop, 3 INA Blvd., Waterford, Conn. 06385
Filed Jun. 4, 1993, Ser. No. 9,083
Term of patent 14 years
U.S. Cl. D10—107



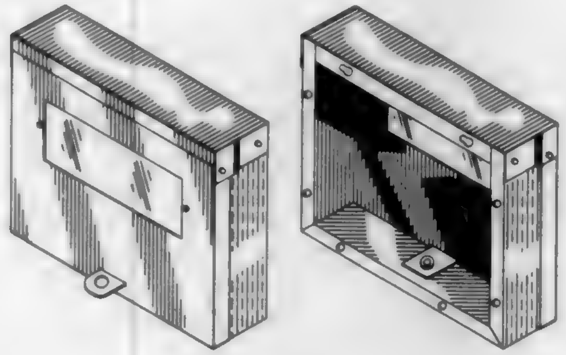
347,192
MOOSE RATTLER

William G. Konichek, P.O. Box 1282, Delta Jct, Ak. 99737
Filed Sep. 21, 1992, Ser. No. 948,997
Term of patent 14 years
U.S. Cl. D10—116



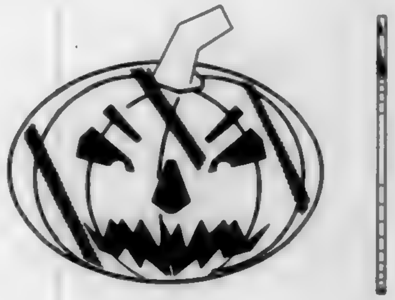
347,193
SECURITY LOCKBOX WITH VISUAL INSPECTION WINDOW FOR TEMPERATURE CONTROLS ON SWIMMING POOL AND SPA HEATERS

Ricky G. Keyser, 2557 Canterbury Dr. S., West Palm Bch., Fla. 33407
Filed May 19, 1992, Ser. No. 886,017
Term of patent 14 years
U.S. Cl. D10—49



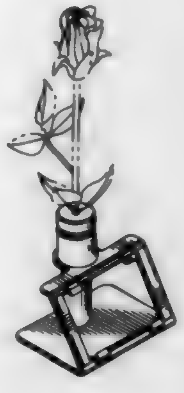
347,194
NOVELTY PLAQUE

Mark E. Skinner, 49 E. Point Rd., Palmyra, Va. 22963
Filed May 8, 1992, Ser. No. 880,337
Term of patent 14 years
U.S. Cl. D11—133



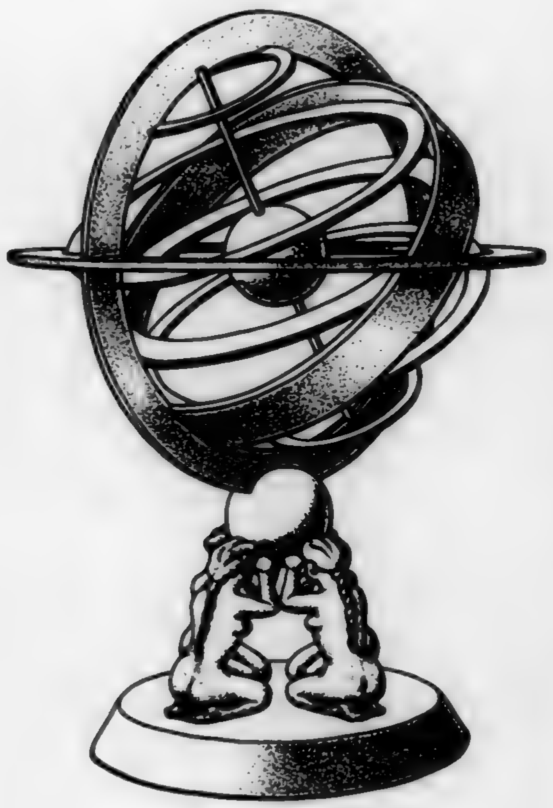
347,195
COMBINATION VIAL AND CARD HOLDER

William G. Carroll, Salt Lake City, Utah, assignor to Maxim, Inc., Salt Lake City, Utah
Filed Aug. 27, 1992, Ser. No. 935,732
Term of patent 14 years
U.S. Cl. D11—144



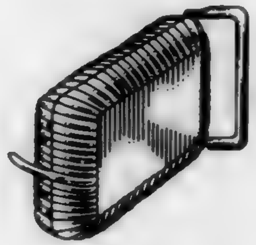
347,196
ARMILLARY SPHERE

Alvin Boyd, 16007 Scenic Oak Trail, and Nancy Foster, 409 Leisurewoods Dr., both of Buda, Tex. 78610
Filed Mar. 1, 1993, Ser. No. 5,331
Term of patent 14 years
U.S. Cl. D11—157



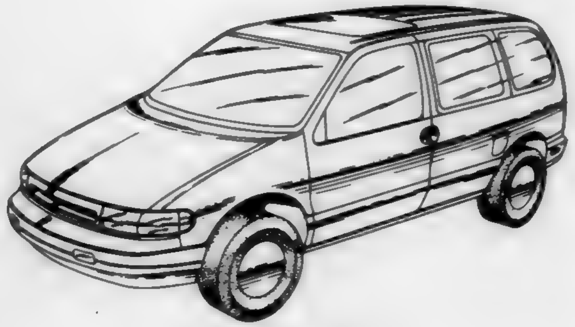
347,197
BELT BUCKLE

Jennifer L. Greene, 3795 27th Ave., SW., Naples, Fla. 33999
Filed Nov. 9, 1992, Ser. No. 1,241
Term of patent 14 years
U.S. Cl. D11—231



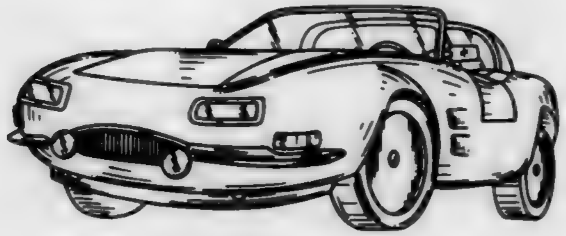
347,198
AUTOMOBILE

Thomas H. Semple, Olivenhain, Calif., assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Mar. 5, 1992, Ser. No. 845,461
Term of patent 14 years
U.S. Cl. D12—91



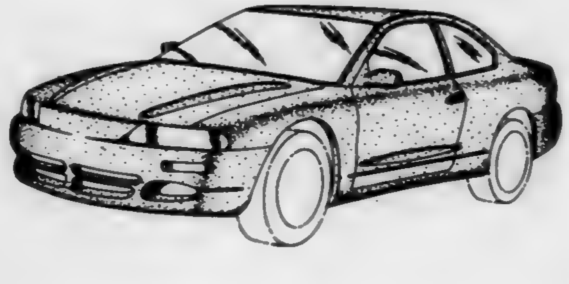
347,199
VEHICLE

James D. Weinstein, 1109 Woodland Dr., Bridgeport, W. Va. 26330
Filed Mar. 12, 1992, Ser. No. 850,072
Term of patent 14 years
U.S. Cl. D12—92



347,200
AUTOMOBILE BODY

Timothy W. Anness, San Diego, Calif.; Dennis Myles, W. Bloomfield; Robert J. Janoske, Bloomfield Hills, both of Mich.; Daniel J. Sims, Lake Forest; Richard C. Kong, LaCosta, both of Calif., and Erich O. Kugler, Royal Oak, Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Apr. 17, 1992, Ser. No. 870,708
Term of patent 14 years
U.S. Cl. D12—92



347,201

AUTOMOBILE

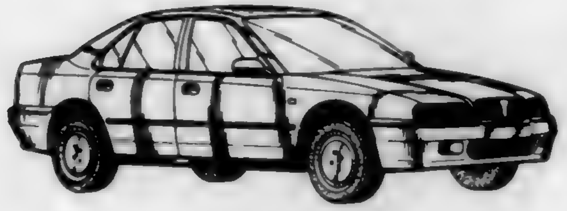
Daiya Kaku, Tokyo; Shinri Chibuka, Saitama, both of Japan; Gordon G. Sked, Kenilworth, England; Geoffrey Upex, Solihull, England, and Richard Woolley, Eastern, England, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1992, Ser. No. 943,508

Claims priority, application Japan, Mar. 11, 1992, 4-6820

Term of patent 14 years

U.S. Cl. D12—92



347,202

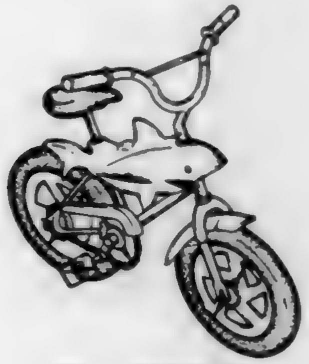
BICYCLE

Lin Y. Tsun, No. 160, Sec. 1, Chang Hsi Road, Tainan, Taiwan

Filed Oct. 26, 1992, Ser. No. 850

Term of patent 14 years

U.S. Cl. D12—108



347,203

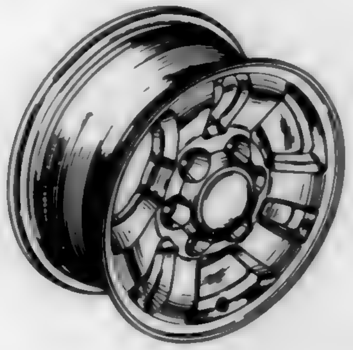
WHEEL FOR ROAD VEHICLE

Allan W. Buyze, Laguna Niguel, and Donald T. Cammorata, Orange, both of Calif., assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 24, 1993, Ser. No. 6,272

Term of patent 14 years

U.S. Cl. D12—211



347,204

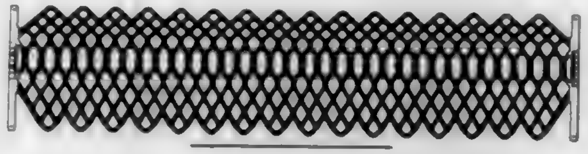
ANTI-SKID TIRE TRACTION UNIT

Masao Hori, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan

Filed Oct. 23, 1992, Ser. No. 754

Term of patent 14 years

U.S. Cl. D12—154



347,205

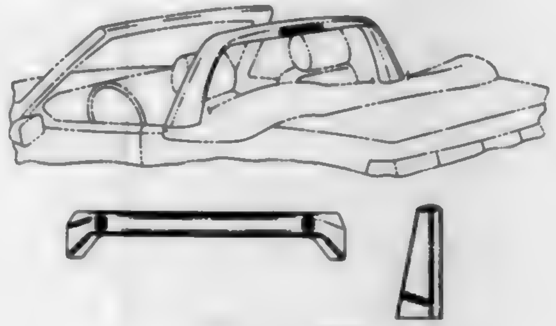
AUTOMOTIVE LIGHT BAR

George Huisman, 2408 Pontiac Trail, Walled Lake, Mich. 48390

Filed Jan. 15, 1992, Ser. No. 821,980

Term of patent 14 years

U.S. Cl. D1—222



347,206

ANCHOR (BOWER AND MOORING)

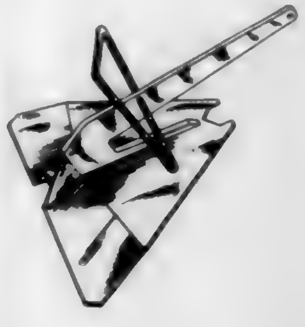
Richard H. Smith, Aberdeenshire, Scotland, assignor to Glynwed Engineering, Ltd., Birmingham, England

Filed Jan. 15, 1992, Ser. No. 821,115

Claims priority, application United Kingdom, Jul. 15, 1991, 2015981

Term of patent 14 years

U.S. Cl. D12—215



347,207

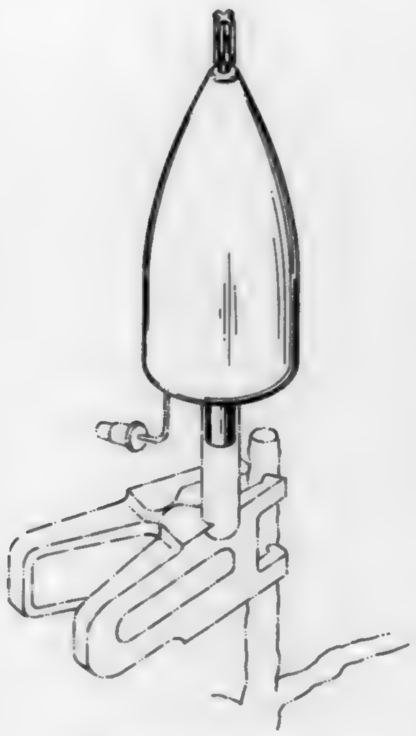
CHRISTMAS TREETOP ORNAMENT ROTATOR

David A. Fussell, 5400 Summer Cove Dr., Stone Mountain, Ga. 30087

Filed Aug. 19, 1992, Ser. No. 932,027

Term of patent 14 years

U.S. Cl. D13—112



347,208

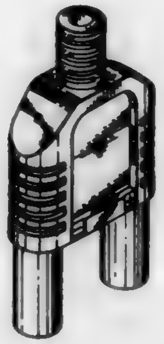
SHIELDED DOUBLE BANANA PLUG

Edward A. Martin, Moreland Hills, and Michael S. Mendicino, Medina, both of Ohio, assignors to Mueller Electric Co., Cleveland, Ohio

Filed Jan. 25, 1993, Ser. No. 4,063

Term of patent 14 years

U.S. Cl. D13—133



347,209

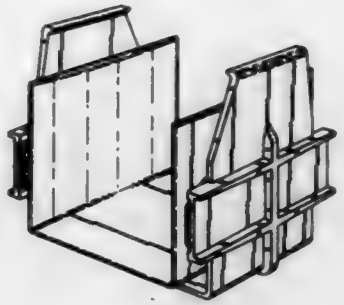
FIBER TROUGH COUPLING

Roy Henneberger, Eagan, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Apr. 1, 1991, Ser. No. 677,882

Term of patent 14 years

U.S. Cl. D13—155



347,210

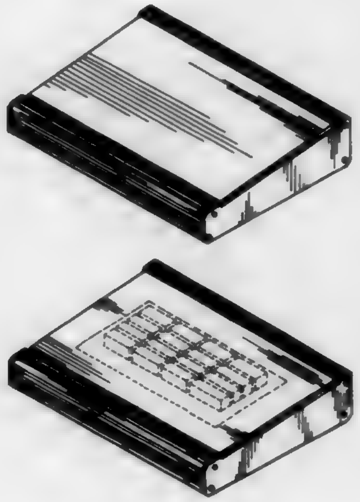
ENCLOSURE FOR ELECTRICAL EQUIPMENT

James M. Sharpe, Canton, Mass., assignor to Extrusion Technology, Inc., Randolph, Mass.

Continuation-in-part of Ser. No. 687,292, Apr. 18, 1991. This application Feb. 24, 1992, Ser. No. 840,708

Term of patent 14 years

U.S. Cl. D13—162



347,211

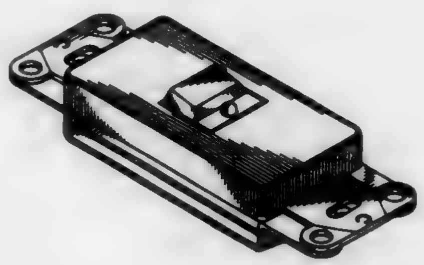
ILLUMINATED INDICATOR WALL SWITCH

James W. Dickens, Lexington, Ky., assignor to Square D Company, Palatine, Ill.

Filed Jan. 8, 1992, Ser. No. 817,898

Term of patent 14 years

U.S. Cl. D13—171



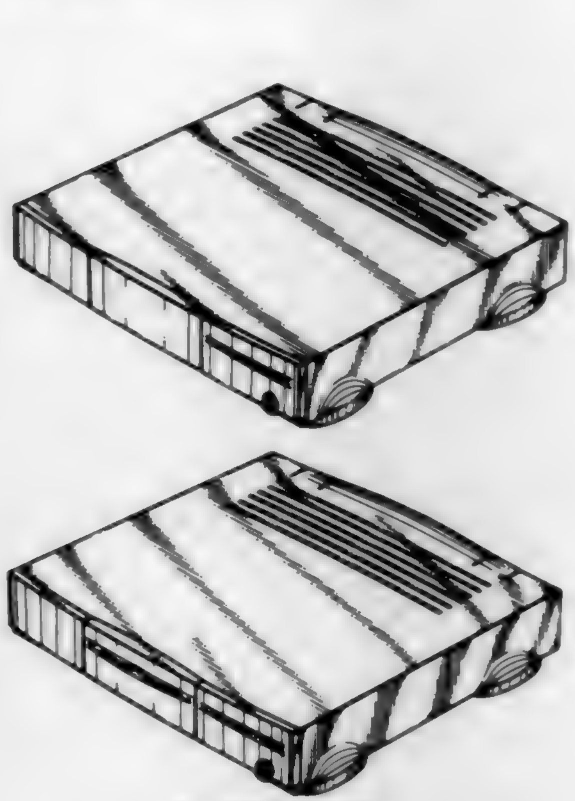
347,212
ENCLOSURE FOR A COMPUTER

Raymond W. Riley, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 8, 1993, Ser. No. 4,531

Term of patent 14 years

U.S. Cl. D14—100



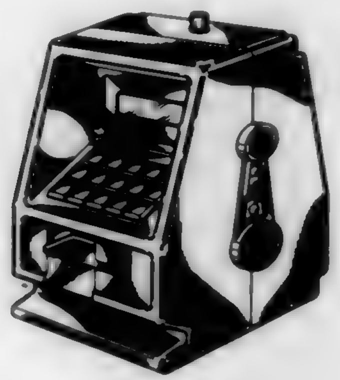
347,213
SLOT CARD READER

James W. Bianco, Enfield, Conn., assignor to Control Module Inc., Enfield, Conn.

Filed Aug. 4, 1993, Ser. No. 11,396

Term of patent 14 years

U.S. Cl. D21—38



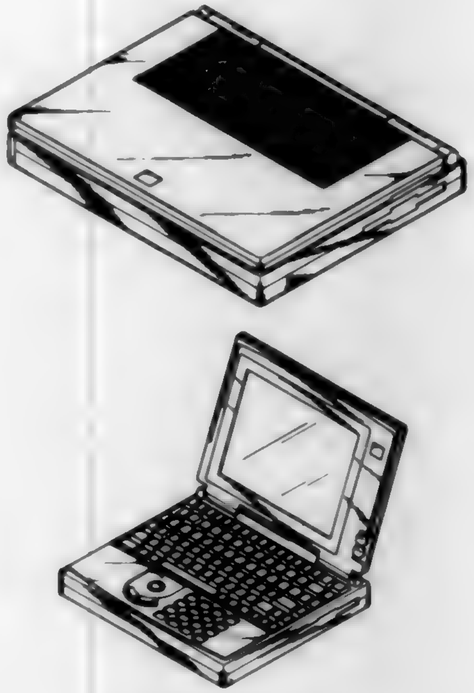
347,214
NOTEBOOK COMPUTER

Liu You-Chi, Taipei, Taiwan, assignor to Sunrex Technology Corp., Taichung, Taiwan

Filed Jul. 8, 1992, Ser. No. 912,627

Term of patent 14 years

U.S. Cl. D14—106



347,215
OPTICAL DISC CARTRIDGE

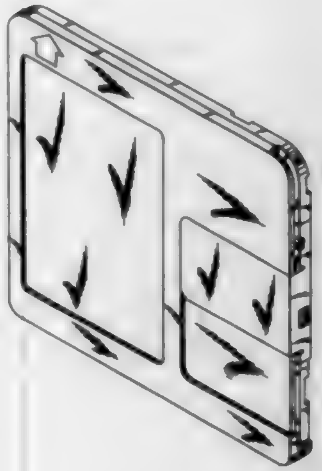
Takashi Ikenaga, Hadano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1992, Ser. No. 855,944

Claims priority, application Japan, Oct. 1, 1991, 3-29613

Term of patent 14 years

U.S. Cl. D14—114



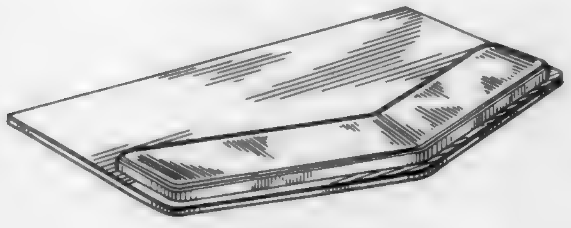
347,216
COMBINED ERGONOMIC KEYBOARD PAD AND WRIST REST

David C. Ciccone, 5663 Balboa Ave., #156, San Diego, Calif. 92111, assignor to David C. Ciccone, San Diego, Calif.

Filed Jul. 20, 1992, Ser. No. 916,385

Term of patent 14 years

U.S. Cl. D14—114



347,217
TELEVISION RECEIVER

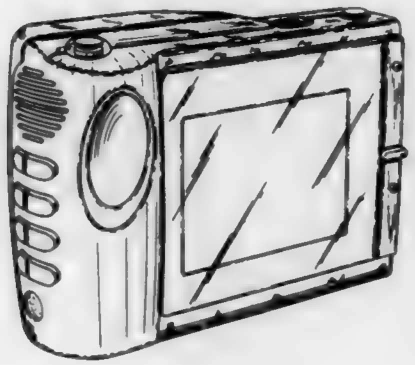
Scott D. McLachlan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 3, 1990, Ser. No. 461,481

Claims priority, application PCT Int'l Appl., Jul. 13, 1989, DM/014065

Term of patent 14 years

U.S. Cl. D14—126



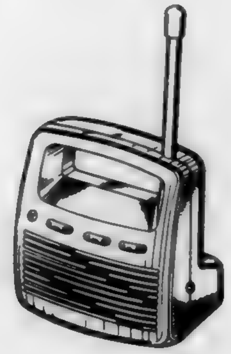
347,218
MONITOR TRANSMITTER

Eric T. Shuler, Orchard Park, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.

Filed Apr. 27, 1992, Ser. No. 877,044

Term of patent 14 years

U.S. Cl. D14—137



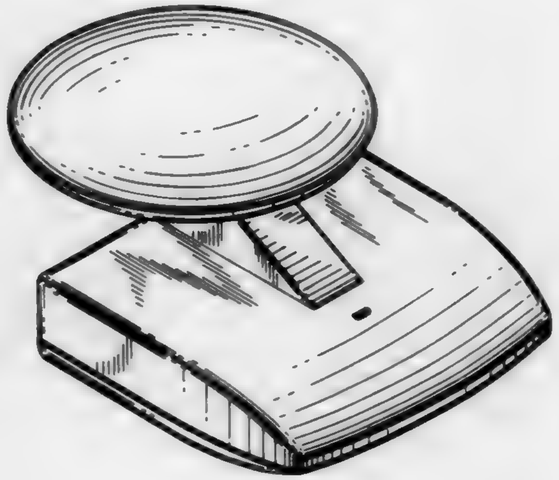
347,219
LOW POWER TRANSMITTER AND RECEIVER

William T. McGreevy, Babylon, N.Y., assignor to Recoton Corporation, Long Island City, N.Y.

Filed Nov. 18, 1992, Ser. No. 1,641

Term of patent 14 years

U.S. Cl. D14—137



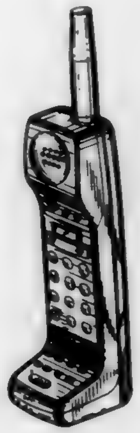
347,220
CORDLESS TELEPHONE

Kazue Katoh, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 17, 1992, Ser. No. 900,702

Term of patent 14 years

U.S. Cl. D14—138



347,221

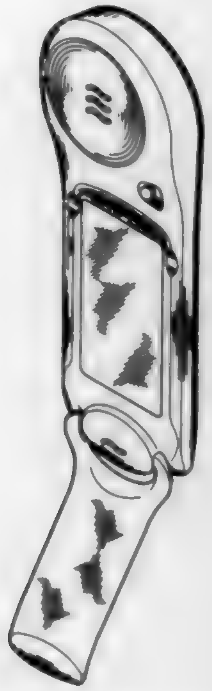
PORTABLE COMMUNICATION DEVICE

Craig F. Siddoway, Davie, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 11, 1993, Ser. No. 3,626

Term of patent 14 years

U.S. Cl. D14—138



347,222

RELAY MACHINE FOR CORDLESS TELEPHONE

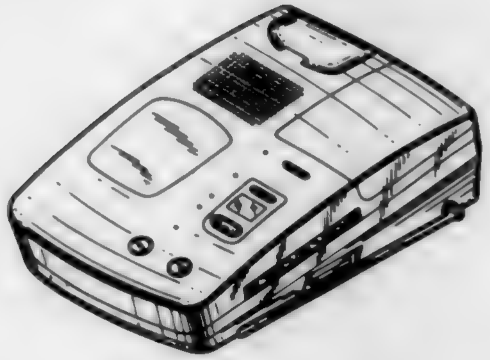
Ichiroh Hino, and Tomoyuki Shundoh, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 10, 1992, Ser. No. 915,194

Claims priority, application Japan, Jan. 21, 1992, 4-1208

Term of patent 14 years

U.S. Cl. D14—149



347,223

DIGITAL AUDIO TAPE RECORDER

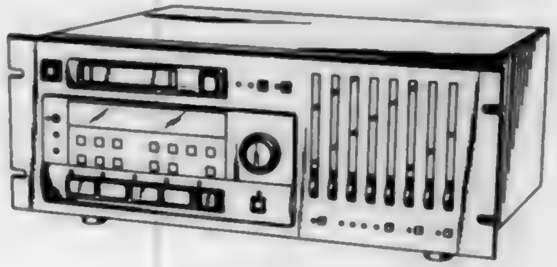
Masafumi Ito, Tokyo; Shigeru Hasegawa, Kodaira, and Katsuhiro Takashima, Urawa, all of Japan, assignors to TEAC Corporation, Japan

Filed Jun. 30, 1992, Ser. No. 906,793

Claims priority, application Japan, Jan. 13, 1992, 4-499

Term of patent 14 years

U.S. Cl. D14—164



347,224

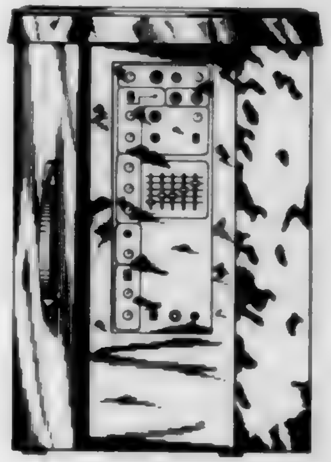
CABINET FOR AMPLIFIER OR AUDIO COMPONENTS

Charles Faas, Elm Grove, Wis., assignor to U.S. Music Corporation, New Berlin, Wis.

Filed Jun. 16, 1992, Ser. No. 900,098

Term of patent 14 years

U.S. Cl. D14—193



347,225

LOUDSPEAKER

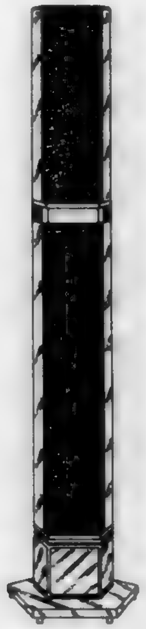
Lone L. Löwy, and Gideon L. Löwy, both of Copenhagen K, Denmark, assignors to Bang & Olufsen A/S, Struer, Denmark

Filed Sep. 11, 1986, Ser. No. 906,841

Claims priority, application Denmark, Mar. 18, 1986, MA 0254 1986

Term of patent 14 years

U.S. Cl. D14—211



347,226

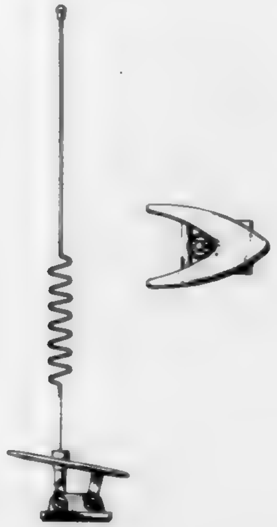
IMITATION CAR PHONE ANTENNA

Carl W. Leu, Miami, Fla., assignor to Poli-Auto, Inc., Miami, Fla.

Filed Mar. 12, 1993, Ser. No. 5,923

Term of patent 14 years

U.S. Cl. D14—234



347,227

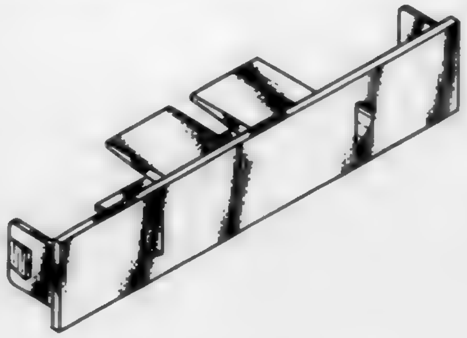
COVER FOR A VCR TAPE SLOT

Kevin Ernst, 5448 Randolph Crescent, and Dan Davidson, 679 Inverary Rd., both of Burlington, Ontario, Canada L7L-3C5

Filed Jul. 14, 1992, Ser. No. 913,538

Term of patent 14 years

U.S. Cl. D14—239



347,228

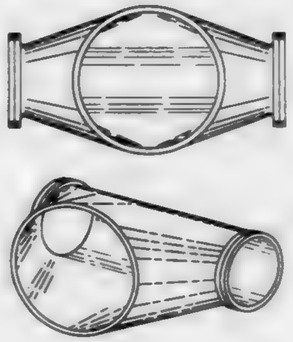
TELEPHONE DUAL EARPIECE

Daryl R. Cox, 3305 W. Spring Mt. Rd. Ste. 60, Las Vegas, Nev. 89102

Filed Jul. 6, 1992, Ser. No. 909,462

Term of patent 14 years

U.S. Cl. D14—243



347,229

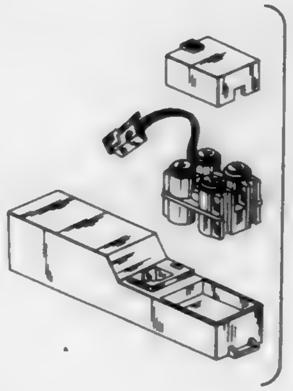
TELEPHONE NETWORK INTERFACE MODULE

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries, Inc., Copiagoe, N.Y.

Continuation-in-part of Ser. No. 418,473, Oct. 6, 1989, Pat. No. Des. 320,796. This application Jul. 22, 1991, Ser. No. 733,388

Term of patent 14 years

U.S. Cl. D14—240



347,230

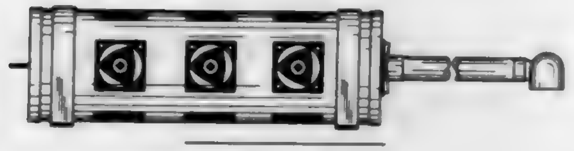
UTILITY TRUNK PUMP

Ronald G. Ferris, 7940 N. Porto Fino Cir., Tucson, Ariz. 85741-4340, and Robert C. Scholl, 2842 W. Mesa Verde Pl., Tucson, Ariz. 85741

Filed May 21, 1992, Ser. No. 886,469

Term of patent 14 years

U.S. Cl. D15—9



347,231

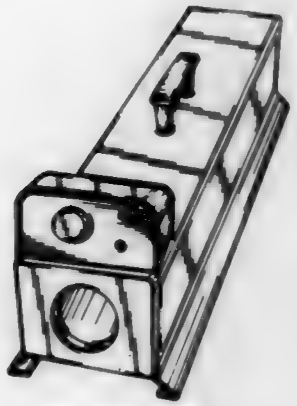
INDUCTION BENDER

Bill T. Bradshaw, 4391 Parkwest Oval, Cleveland, Ohio 44135

Filed Feb. 8, 1993, Ser. No. 4,526

Term of patent 14 years

U.S. Cl. D15—122



347,232

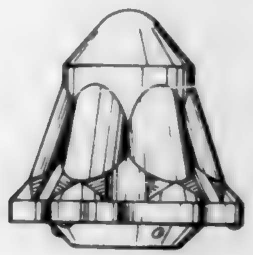
TIP WITH LOBES

Ted R. Massa, Latrobe, and John J. Prizzi, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 992,950, Dec. 17, 1992. This application Jan. 21, 1993, Ser. No. 3,898

Term of patent 14 years

U.S. Cl. D15—139



347,233

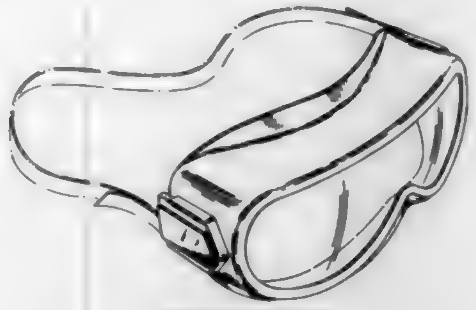
SAFETY GOGGLES

Charles D. Hewitt, North Tonawanda, and Andrew T. Kelley, Buffalo, both of N.Y., assignors to American Allsafe Company, Tonawanda, N.Y.

Filed May 4, 1992, Ser. No. 878,874

Term of patent 14 years

U.S. Cl. D21—112



347,234

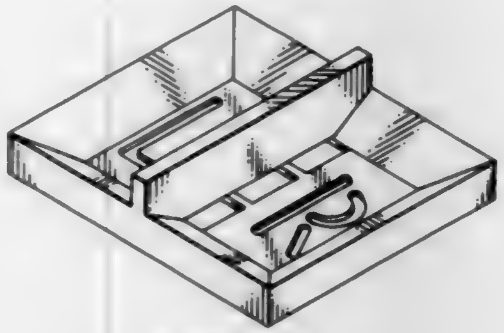
CONTACT LENS TRAY

Ray C. Ives, Dallas, Tex., assignor to Ives Ideas Inc., Dallas, Tex.

Division of Ser. No. 656,637, Feb. 19, 1991, Pat. No. Des. 338,217. This application May 19, 1993, Ser. No. 8,601

Term of patent 14 years

U.S. Cl. D16—124



347,235

COMBINED VIDEO TAPE RECORDER AND CAMERA

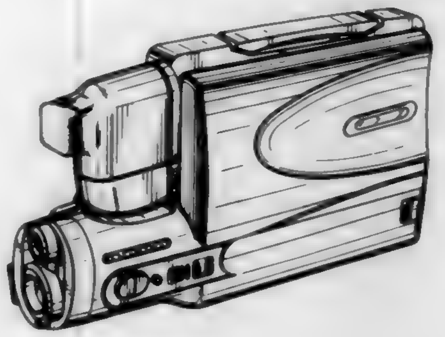
Hiroshi Ooi, and Seiji Kurokawa, both of Tochigi, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1992, Ser. No. 478

Claims priority, application Japan, May 27, 1992, 4-15581

Term of patent 14 years

U.S. Cl. D16—202



347,236

COMBINED VIDEO TAPE RECORDER AND CAMERA

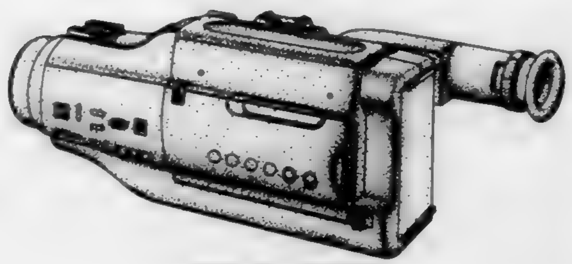
Hiroshi Ooi, and Seiji Kurokawa, both of Tochigi, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1993, Ser. No. 7,281

Claims priority, application Japan, Oct. 21, 1992, 4-30974

Term of patent 14 years

U.S. Cl. D16—202



347,237

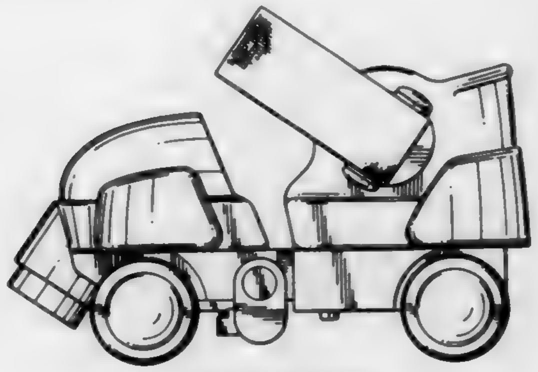
ROLLER SKATE

Frederick B. Robjent, Orchard Park, and Lee Spielberger, East Aurora, both of N.Y., assignors to Fisher-Price, Inc., East Aurora, N.Y.

Filed Mar. 12, 1992, Ser. No. 850,070

Term of patent 14 years

U.S. Cl. D21—226



347,238

HAND HELD LABELING GUN

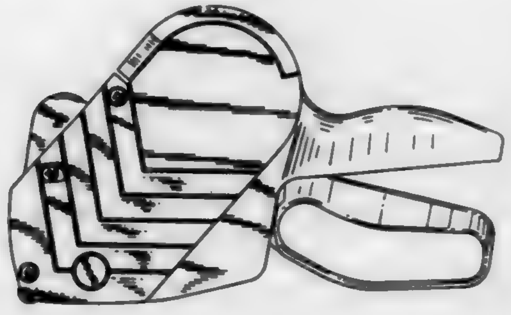
Peter Patzak, Muehltal, Fed. Rep. of Germany, assignor to Esselte Meto International Produktions GmbH, Hirschorn, Fed. Rep. of Germany

Filed Jul. 27, 1992, Ser. No. 919,127

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1992, M9200747.3

Term of patent 14 years

U.S. Cl. D18—19



347,239

INK JET PRINTER

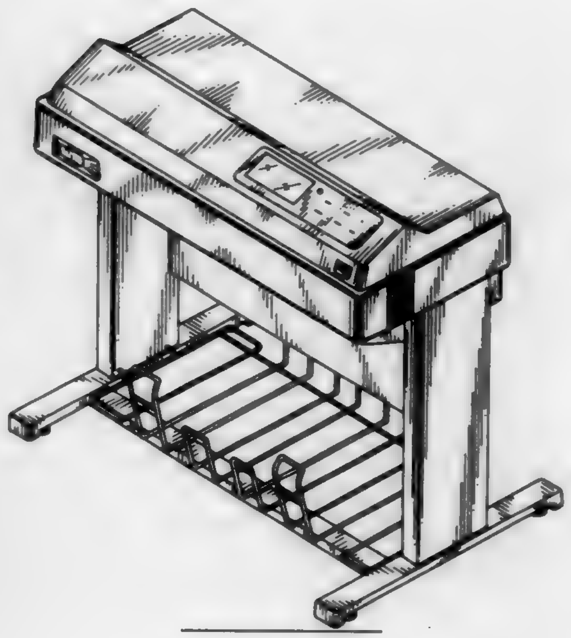
Eiichi Okamoto, and Kenji Kojima, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 24, 1992, Ser. No. 1,789

Claims priority, application Japan, May 25, 1992, 4-15205

Term of patent 14 years

U.S. Cl. D18—53



347,240

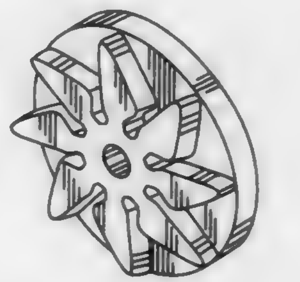
PAWL AND RATCHET FOR ALIGNING CONTINUOUS FEED PAPER IN A PRINTER AND EMBOSSER

Raymond W. Kenney, Tulsa, Okla., assignor to Sandco, Inc., Tulsa, Okla.

Filed Jun. 26, 1992, Ser. No. 905,843

Term of patent 14 years

U.S. Cl. D18—56



347,241
TAPE CARTRIDGE FOR TAPE WRITING MACHINE

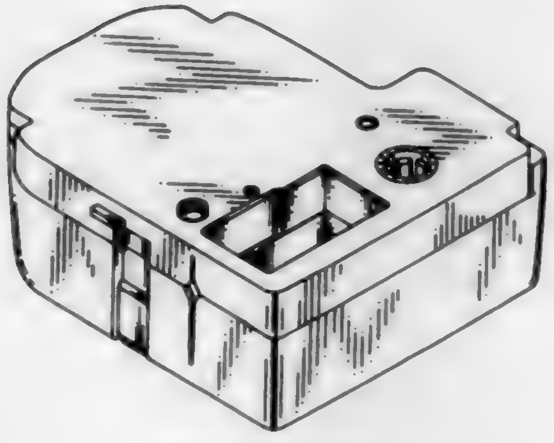
Kenji Watanabe; Takanobu Kameda; Takeyasu Suzuki; Yuichiro Taniguchi; Atsuko Yamaguchi; Machiko Kano, and Chieko Aida, all of Tokyo, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1992, Ser. No. 2,721

Claims priority, application Japan, Jul. 2, 1992, 4-19570

Term of patent 14 years

U.S. Cl. D18—56



347,242
GREETING CARD

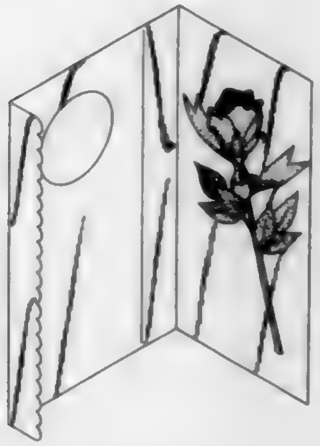
Udom Yaramunilert, c/o Mr. Manit Harnvanich, 1435 West Bonita La., Mount Prospects, Ill. 60056

Filed Aug. 7, 1992, Ser. No. 925,928

Claims priority, application Thailand, Mar. 3, 1992, 015596

Term of patent 14 years

U.S. Cl. D19—6



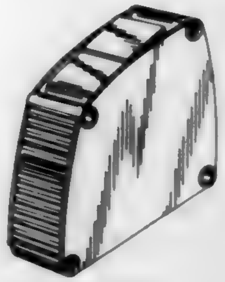
347,243
LABEL DISPENSER

Nancy Thomas-Cote, Long Beach, and Charles Curbun, Leucadia, both of Calif., assignors to Barbara Thomas Enterprises, Inc., Huntington Beach, Calif.

Filed Jul. 14, 1992, Ser. No. 914,202

Term of patent 14 years

U.S. Cl. D19—69



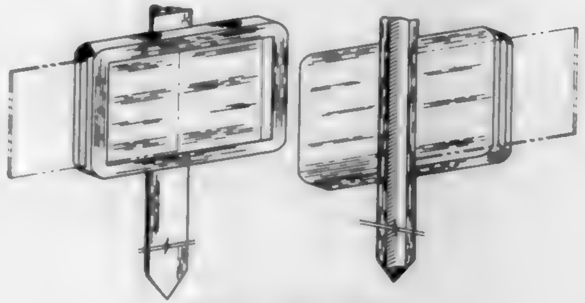
347,244
SIGN HOLDER

Betty A. Whitmire, 2600 Ridge Crest Ave., Orange Park, Fla. 32065

Filed Jul. 6, 1990, Ser. No. 548,779

Term of patent 14 years

U.S. Cl. D20—41



347,245
SOCCER TABLE

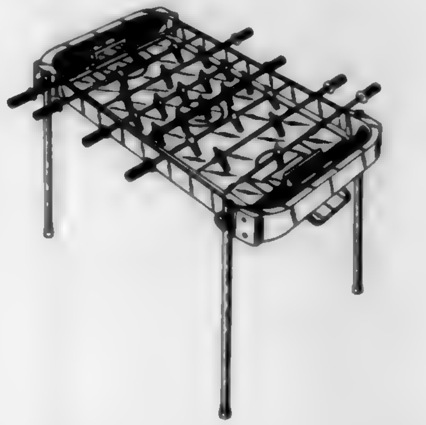
Claudio Cecchetti, Via Verdi, 54, Cernusco Sul Naviglio, (Milano), Italy

Filed Jul. 12, 1991, Ser. No. 729,400

Claims priority, application Italy, Feb. 6, 1991, M1910000109

Term of patent 14 years

U.S. Cl. D21—11



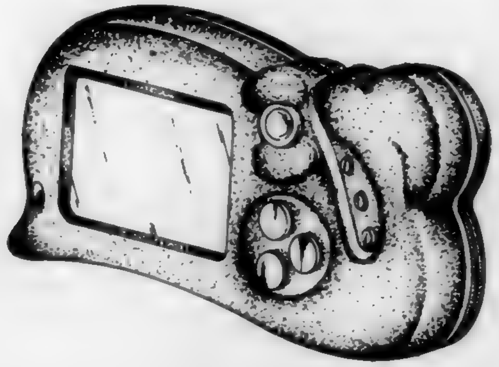
347,246
COMPUTER GAME UNIT

M. C. Wen, 9F, No. 85, Sec. 1, Kuang Fu Rd., San Chung City, Taipei Hsien, Taiwan

Filed Jan. 28, 1993, Ser. No. 4,218

Term of patent 14 years

U.S. Cl. D21—13



347,247
HAND-HELD ELECTRONIC GAME HOUSING

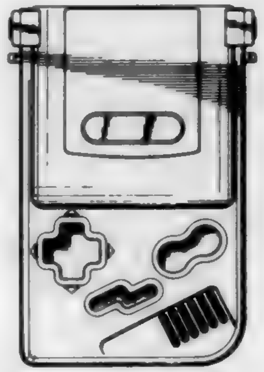
Patrick T.-M. Ho, Kwai Chung, Hong Kong, assignor to STD Electronic International Ltd., Hong Kong

Filed Feb. 11, 1993, Ser. No. 4,671

Claims priority, application United Kingdom, Aug. 28, 1992, 2025304

Term of patent 14 years

U.S. Cl. D21—13



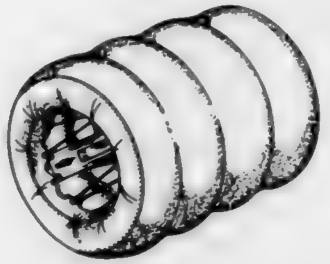
347,248
INFLATED RIDING TOY

Marshall D. Franzman, 4330 - 167th Ave. NE., Ham Lake, Minn. 55304

Filed May 1, 1992, Ser. No. 877,592

Term of patent 14 years

U.S. Cl. D21—71



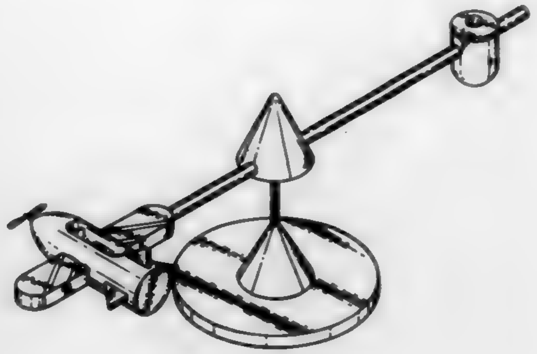
347,249
WATER FILLED RIDING TOY

Steven J. Cull, 5838 Wolf Rd., Alexandria, Ky. 41001

Filed Feb. 21, 1992, Ser. No. 838,003

Term of patent 14 years

U.S. Cl. D21—77



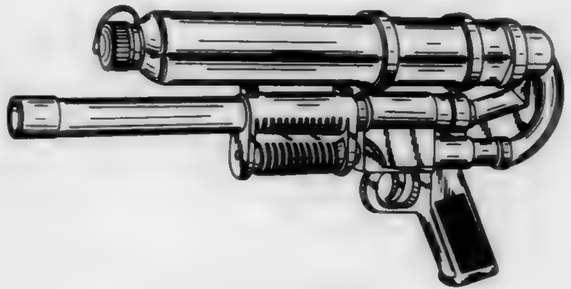
347,250
TOY WATER GUN

Jack Yu, Flushing, N.Y., assignor to Regency Merchandise, Inc., New York, N.Y.

Filed Oct. 28, 1992, Ser. No. 889

Term of patent 14 years

U.S. Cl. D21—147



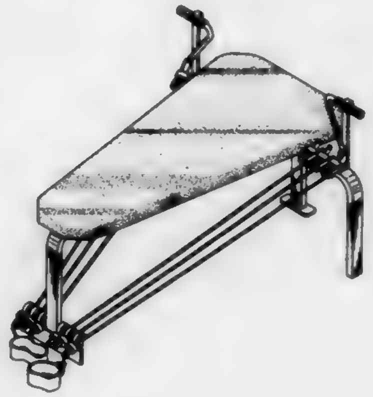
347,251
STRENGTH TRAINING BENCH

John S. Dreibelbis, Shakopee; Daniel R. Rydquist, and David S. Douglas, both of Plymouth, all of Minn., assignors to NordicTrack, Inc., Chaska, Minn.

Filed Mar. 6, 1992, Ser. No. 846,395

Term of patent 14 years

U.S. Cl. D21—195



347,252

GOLF BALL

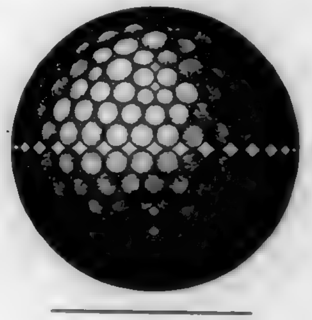
Kengo Oka, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jun. 18, 1991, Ser. No. 717,118

Claims priority, application Japan, Dec. 19, 1990, 2-42502

Term of patent 14 years

U.S. Cl. D21—205



347,253

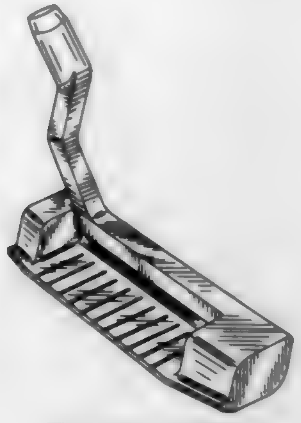
GOLF PUTTER HEAD

Raymon W. Cook, 13615 Pebble Way, San Antonio, Tex. 78231

Filed Jun. 19, 1992, Ser. No. 902,280

Term of patent 14 years

U.S. Cl. D21—219



347,254

GOLF CLUB HEAD

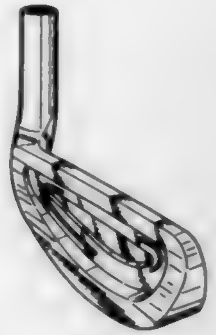
Kanji Iinuma, Musashino, Japan, assignor to Daiwa Golf Co., Ltd., Higashikurume, Japan

Filed Dec. 26, 1991, Ser. No. 814,010

Claims priority, application Japan, Jun. 27, 1991, 3-19183

Term of patent 14 years

U.S. Cl. D21—220



347,255

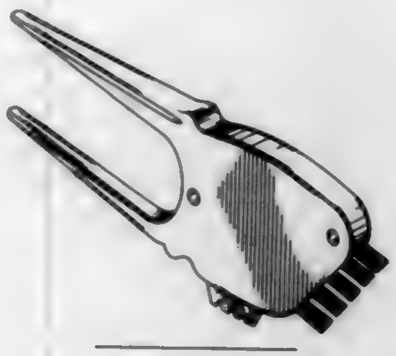
MULTIPURPOSE GOLFER'S TOOL

Macauley D. Kerr, 1120 Tale Ave., Billings, Mont. 59102, and Gary D. McCormick, 1860 W. University, Suite 114, Tempe, Ariz. 85281

Filed Feb. 28, 1992, Ser. No. 844,386

Term of patent 14 years

U.S. Cl. D21—234



347,256

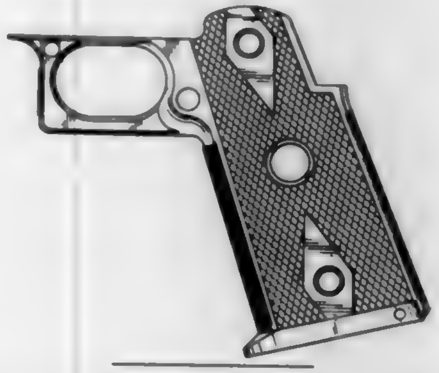
COMBINED GRIP AND TRIGGER GUARD FOR A HANDGUN

Sandy L. Strayer, 305 Hickok, Round Rock, Tex. 78681, and Virgil P. Tripp, 8907 Sparkling Creek Cir., Austin, Tex. 78729

Continuation-in-part of Ser. No. 844,392, Mar. 2, 1992. This application Sep. 9, 1992, Ser. No. 943,610

Term of patent 14 years

U.S. Cl. D22—108



347,257

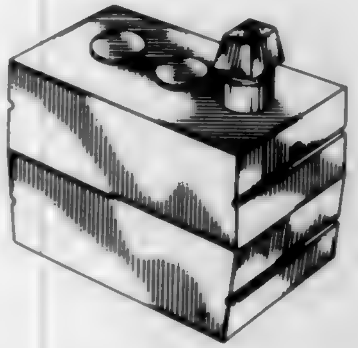
SEPTIC TANK FOR HOLDING SEWERAGE

Henry E. McGrew, Jr., 9591 Wallace Lake Rd., Shreveport, La. 71107

Filed Jun. 20, 1991, Ser. No. 718,110

Term of patent 14 years

U.S. Cl. D23—202



347,258

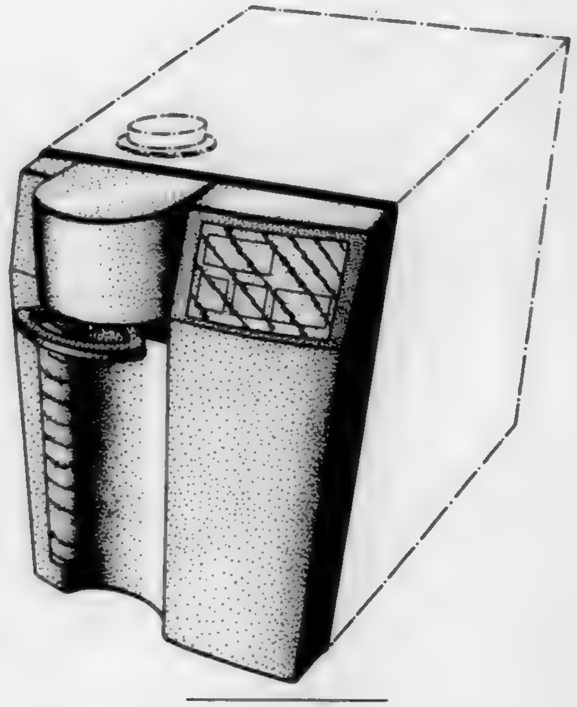
FRONT PANEL FOR A WATER PURIFIER

Lawrence J. Fenske, Madison, Wis., assignor to Barnstead Thermolyne Corporation, Dubuque, Iowa

Filed Sep. 24, 1992, Ser. No. 951,153

Term of patent 14 years

U.S. Cl. D23—209



347,259

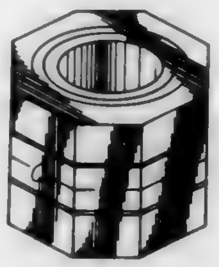
SPRINKLER HEAD PROTECTOR

Mavis Fewell, and Joe Fewell, both of 11602 Candy La., Garden Grove, Calif. 92640

Filed Aug. 20, 1992, Ser. No. 933,036

Term of patent 14 years

U.S. Cl. D23—214



347,260

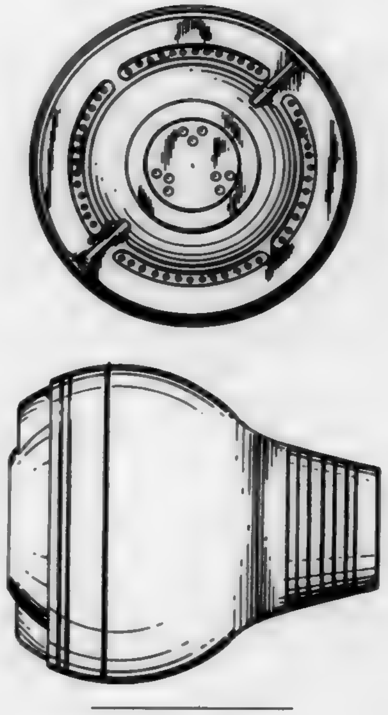
SHOWER HEAD

Gilad Ben-Zur, Kibbituz Kfar Hachoresh, Israel, assignor to Unitrol Amcor Ltd., Tel Aviv, Israel

Division of Ser. No. 786,948, Nov. 4, 1991, Pat. No. Des. 334,048. This application Nov. 30, 1992, Ser. No. 2,020

Term of patent 14 years

U.S. Cl. D23—213



347,261

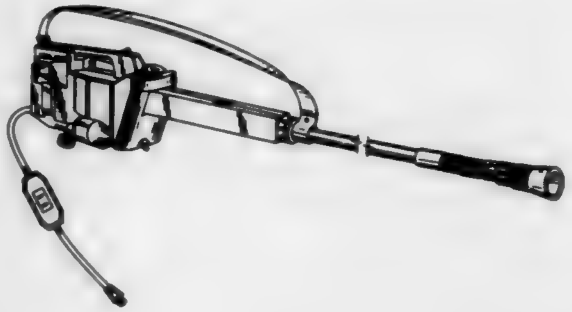
PRESSURE WASHER

Robert C. Berfield, Jersey Shore, and Craig A. Seasholtz, Avis, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Division of Ser. No. 580,504, Sep. 11, 1990, Pat. No. D. 334,972. This application Apr. 29, 1992, Ser. No. 875,727

Term of patent 14 years

U.S. Cl. D23—225



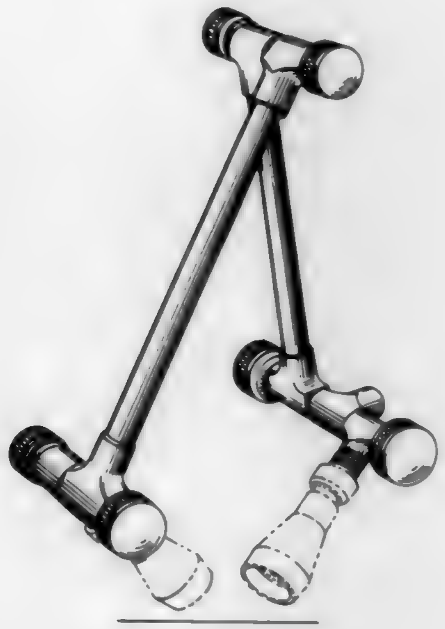
347,262
ADJUSTABLE UNIT FOR A DUAL HEADED SHOWER FIXTURE

David Black, Coral Gables, Fla.; Timothy A. Wedemyer, Bedford, N.H., and Mark Shufelt, Albion, Pa., assignors to Hydrokinetic design, Inc., Coral Gables, Fla.

Filed Jun. 22, 1992, Ser. No. 902,588

Term of patent 14 years

U.S. Cl. D23—230



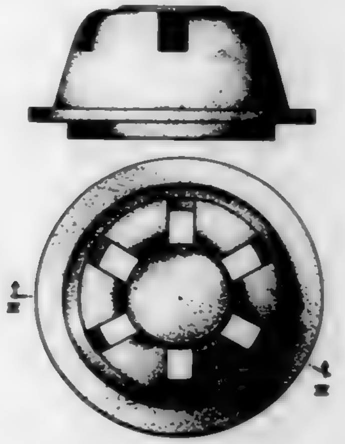
347,263
COMBINED COVER AND CONNECTOR FOR USE WITH AN INFLATION MECHANISM FOR ATHLETIC EQUIPMENT

Matthew Phillips, North Easton, Mass., assignor to Reebok International Ltd., Stoughton, Mass.

Division of Ser. No. 973,670, Nov. 9, 1992. This application Mar. 31, 1993, Ser. No. 6,555

Term of patent 14 years

U.S. Cl. D23—231



347,264
SHOWER FAUCET

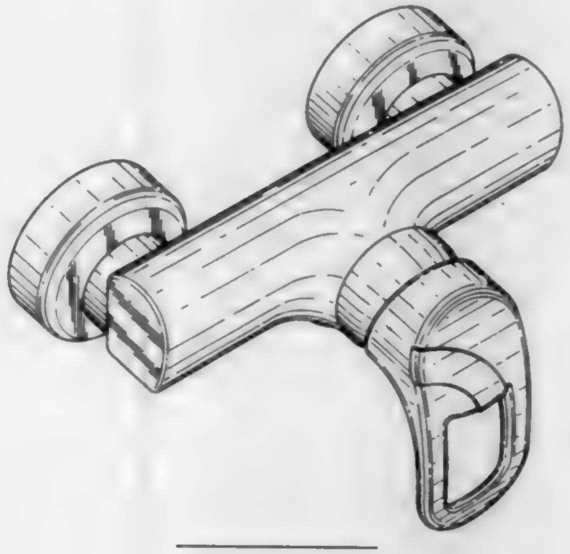
Adolf Gottwald, Iserlohn, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany

Filed May 13, 1992, Ser. No. 882,317

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1991, 9108292

Term of patent 14 years

U.S. Cl. D23—238



347,265
COMBINED BATHTUB FAUCET AND HAND SHOWER

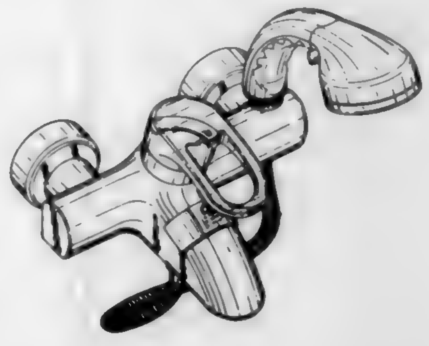
Adolf Gottwald, Iserlohn, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany

Filed May 13, 1992, Ser. No. 882,318

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1991, 9108292

Term of patent 14 years

U.S. Cl. D23—239



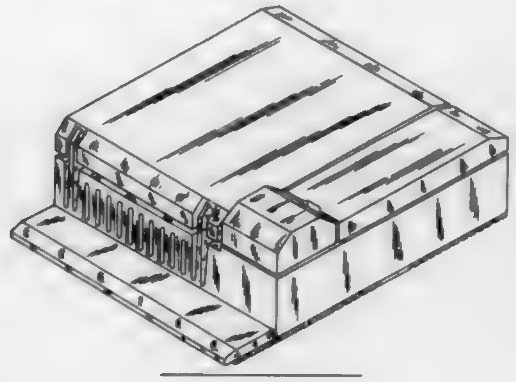
347,266
ENVIRONMENTAL CONTROL MODULE

Robert D. Giese, Kenosha; Bruce E. Kierstead; Thomas O. Kautz, both of Mequon; Robin D. Shaffer, Sussex; Kirk P. Henderson, Oconomowoc, and Bruce R. Schultz, West Allis, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jul. 13, 1992, Ser. No. 912,637

Term of patent 14 years

U.S. Cl. D23—245



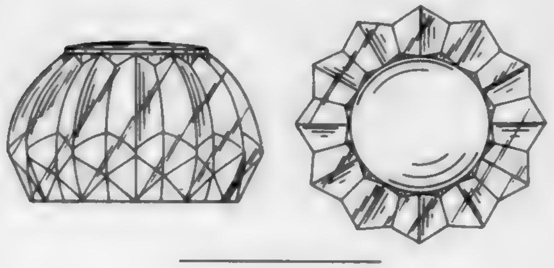
347,267
LAVATORY FAUCET KNOB

Hollis K. Yost, Santa Monica, Calif., assignor to Emhart Inc., Newark, Del.

Filed Jul. 16, 1992, Ser. No. 914,063

Term of patent 14 years

U.S. Cl. D23—250



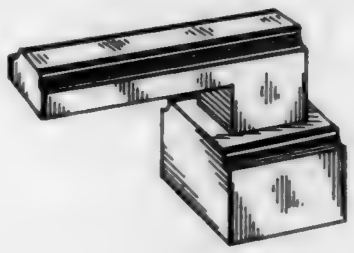
347,268
FAUCET HANDLE

Stanley M. Paul, Greenwich, Conn., assignor to Chicago Faucet Company, Des Plaines, Ill.

Filed Jun. 3, 1992, Ser. No. 893,344

Term of patent 14 years

U.S. Cl. D23—252



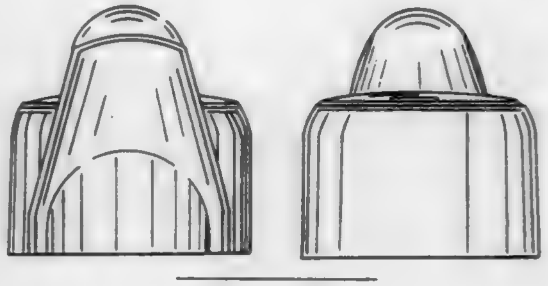
347,269
FAUCET HANDLE

Hollis K. Yost, Santa Monica, Calif., assignor to Emhart Inc., Newark, Del.

Filed Jul. 16, 1992, Ser. No. 914,064

Term of patent 14 years

U.S. Cl. D23—252



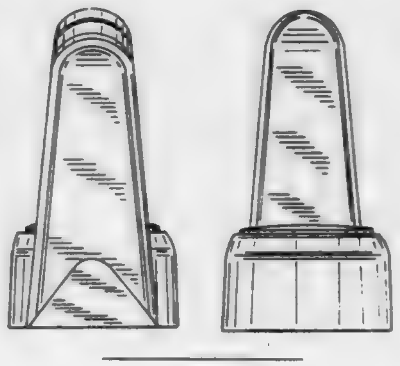
347,270
FAUCET HANDLE

Hollis K. Yost, Santa Monica, Calif., assignor to Emhart Inc., Newark, Del.

Filed Jul. 16, 1992, Ser. No. 914,065

Term of patent 14 years

U.S. Cl. D23—252



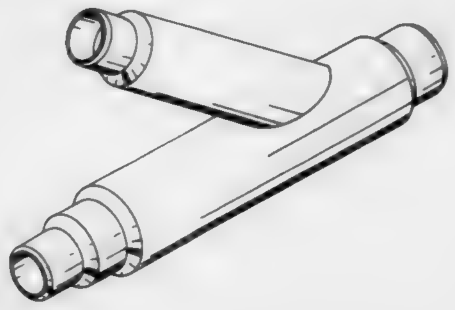
347,271
PIPE FITTING

John P. Inda, Shawnee, and Joseph J. Inda, Tecumseh, both of Okla., assignors to General Plastics, Inc., Shawnee, Okla.

Filed Mar. 30, 1992, Ser. No. 860,672

Term of patent 14 years

U.S. Cl. D23—263



347,272

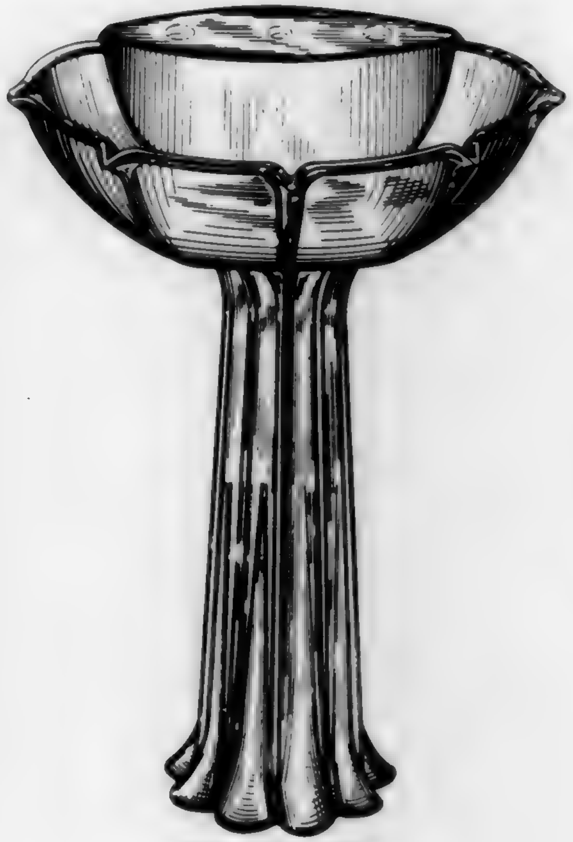
PEDESTAL LAVATORY

Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 22, 1992, Ser. No. 825,715

Term of patent 14 years

U.S. Cl. D23—292



347,273

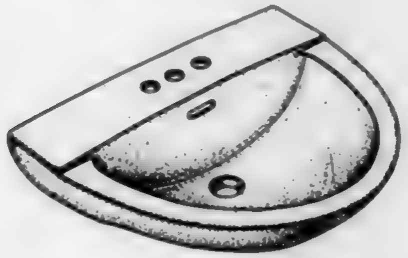
LAVATORY

Rambo Wei, Taipei, Taiwan, assignor to Hocheng Pottery Mfg. Co. Ltd., Taipei, Taiwan

Filed May 18, 1992, Ser. No. 885,404

Term of patent 14 years

U.S. Cl. D23—294



347,274

WATER HEATER

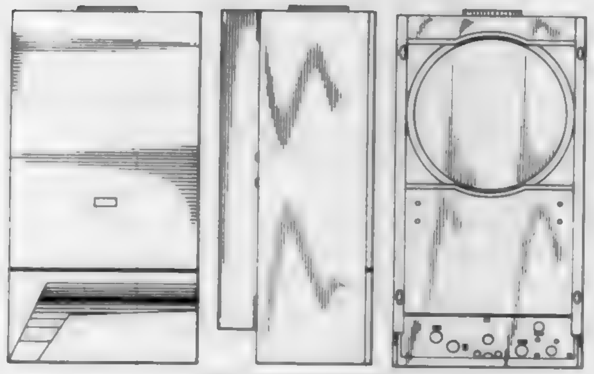
Rene Prevost, Drancy, France, assignor to Societe Elm Leblanc, Drancy, France

Filed Sep. 20, 1991, Ser. No. 763,077

Claims priority, application France, Mar. 22, 1991, 91 1794

Term of patent 14 years

U.S. Cl. D23—318



347,275

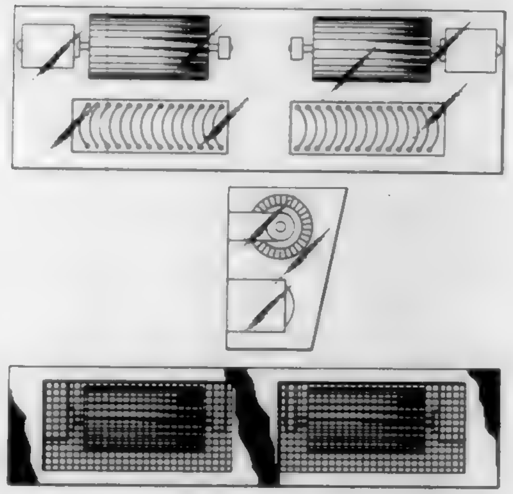
COMBINED DRYER AND DEFOGGER FOR A BATHROOM MIRROR

Russell G. Lovell, 8004 Dottie Ct., Bakersfield, Calif. 93308

Continuation-in-part of Ser. No. 47,992, May 11, 1987, abandoned. This application Oct. 7, 1991, Ser. No. 772,015

Term of patent 14 years

U.S. Cl. D23—355



347,276

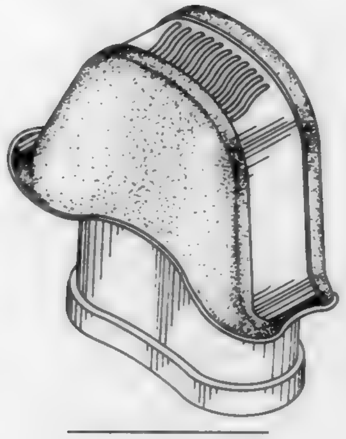
AIR FRESHENER

Allen Y. L. Wang, Taipei, Taiwan, assignor to Eutech Enterprise Co., Ltd., Taipei, Taiwan

Filed May 4, 1993, Ser. No. 7,914

Term of patent 14 years

U.S. Cl. D23—366



347,277

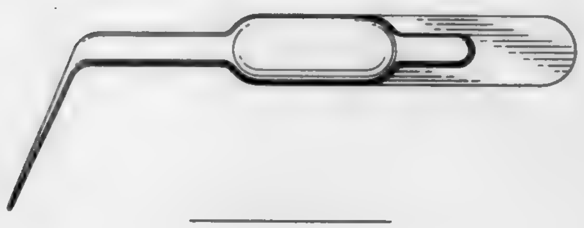
PRE-MEASURED DISPENSING AMPULE

John Snedden, P.O. Box 1827, Sandpoint, Id. 83864

Filed Nov. 20, 1992, Ser. No. 1,705

Term of patent 14 years

U.S. Cl. D24—115



347,278

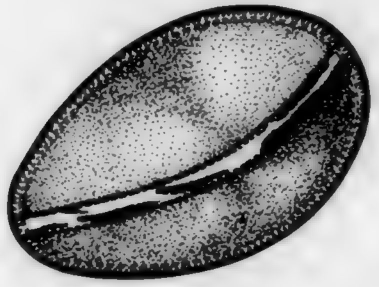
NURSING PAD

Angela M. Higa, 91-919 Wailewa Pl., Ewa, Hi. 96706

Filed Mar. 18, 1992, Ser. No. 853,612

Term of patent 14 years

U.S. Cl. D24—124



347,279

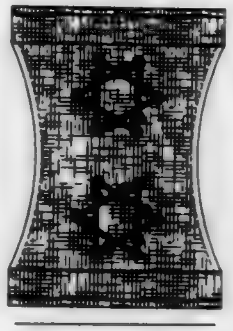
DIAPER

Sarah D. Perkins, R.D. #3 Box 664, St. Johnsville, N.Y. 13452

Filed Jun. 3, 1991, Ser. No. 709,407

Term of patent 14 years

U.S. Cl. D24—126



347,280

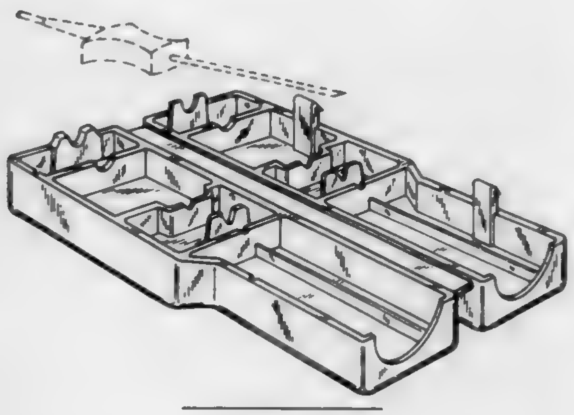
PHLEBOTOMIST PROTECTOR

Eldridge P. Herrington, West Covina, and Richard Spielberg, Alameda, both of Calif., assignors to Miles Inc., Berkeley, Calif.

Filed Oct. 28, 1991, Ser. No. 782,146

Term of patent 14 years

U.S. Cl. D24—130



347,281

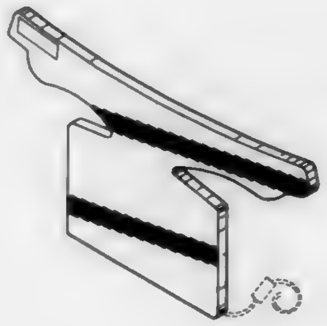
THERAPEUTIC PAD FOR ALLEVIATION OF HEADACHES AND RELATED PAIN

Gary M. Cohen, 9694 Sun Pointe Dr., Boynton Beach, Fla. 33437

Filed Mar. 5, 1993, Ser. No. 5,545

Term of patent 14 years

U.S. Cl. D24—206



347,282

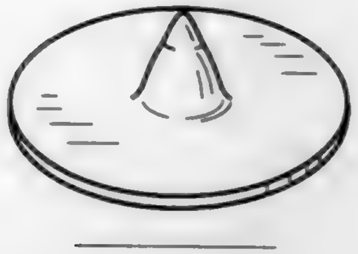
ACUPRESSURE STIMULATOR

Tae W. Yoo, 807, 1-Dong, Hanyang Apt. San 189-1, Seocho-dong, Seocho-ku, Seoul, Rep. of Korea

Filed Dec. 10, 1990, Ser. No. 624,780

Term of patent 14 years

U.S. Cl. D24—211



347,283

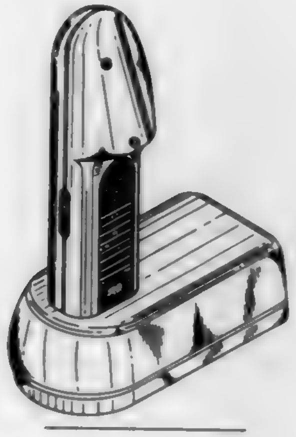
RECHARGEABLE IFRADERM

Cyril Von Winckler, Fairfield, N.J., assignor to Kar Bow Industrial Co., Ltd., Taipei, Taiwan

Filed Jan. 31, 1992, Ser. No. 829,153

Term of patent 14 years

U.S. Cl. D24—214



347,284

GATE FOR USE IN SUPERMARKETS

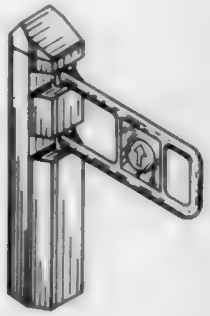
Garry Brigden, Aspley Guise, Great Britain, assignor to CMB Manufacturing Limited, Milton Keynes, England

Filed May 29, 1992, Ser. No. 889,765

Claims priority, application United Kingdom, Jan. 15, 1992, 2020209

Term of patent 14 years

U.S. Cl. D25—50



347,285

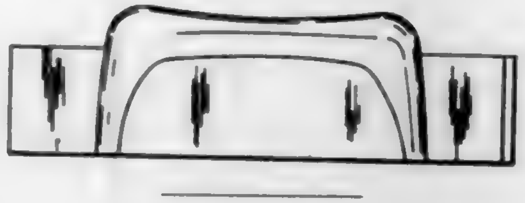
RETAINING WALL BUILDING BLOCK

Mark A. Woolbright, St. Louis, Mo., assignor to St. Louis Retaining Wall Co., Inc., St. Louis, Mo.

Filed Jun. 18, 1992, Ser. No. 900,853

Term of patent 14 years

U.S. Cl. D25—113



347,286

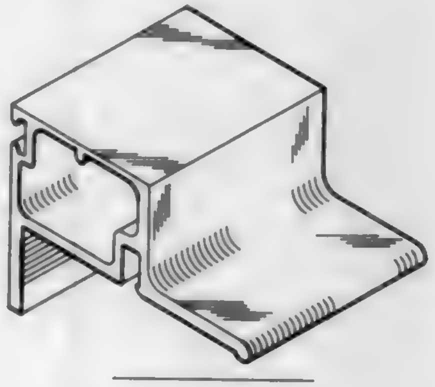
UPPER VENT HEAD

Joseph C. Bancroft, 134 Harmony La., McComb, Miss. 39648

Filed Sep. 8, 1992, Ser. No. 940,835

Term of patent 14 years

U.S. Cl. D25—124



347,287

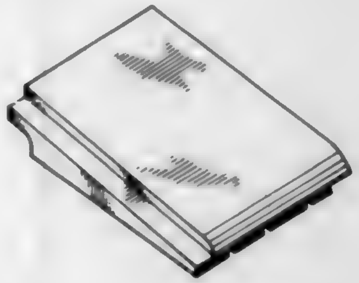
MOLDED ROOF TILE

David Mayer, 14391 Morning Glory, Tustin, Calif. 92680

Filed May 26, 1992, Ser. No. 887,853

Term of patent 14 years

U.S. Cl. D25—140



347,288

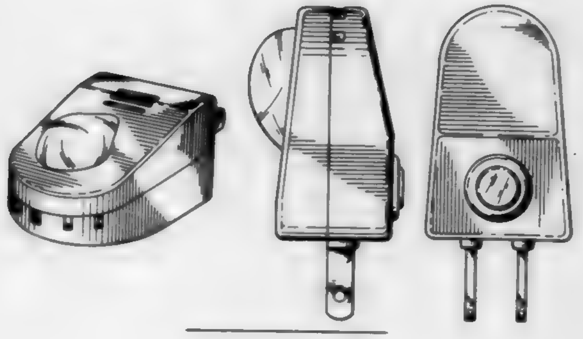
MINI-FLUORESCENT LIGHT

Byung I. Ham, 16550 E. Blackburn Dr., La Mirada, Calif. 90638

Filed Sep. 16, 1993, Ser. No. 13,049

Term of patent 14 years

U.S. Cl. D26—26



347,289

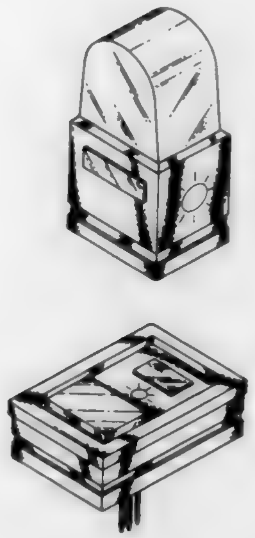
COMBINED SCHOOL BUS WARNING LIGHT AND REMOTE CONTROL THEREFOR

John J. Maki, 102 S. Harbor St., Aberdeen, Wash. 98520

Filed May 14, 1992, Ser. No. 881,548

Term of patent 14 years

U.S. Cl. D26—28



347,290

ADJUSTABLE TABLE LAMP

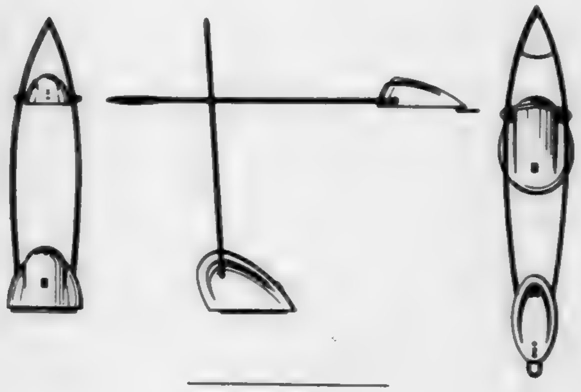
Thomas Y. Lam, Hong Kong, Hong Kong, assignor to Dipper Industrial Ltd., Hong Kong

Filed Jun. 22, 1992, Ser. No. 901,802

Claims priority, application United Kingdom, Feb. 23, 1991, 2019793

Term of patent 14 years

U.S. Cl. D26—63



347,291

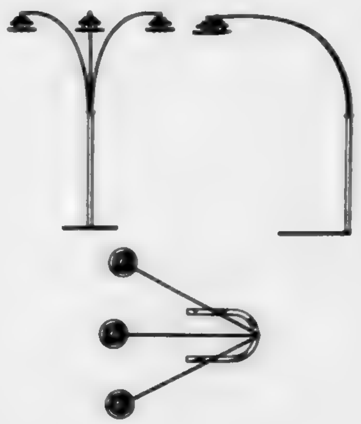
MULTI-SHADE ARC BOOM LAMP

Barry L. Kramer, 6180 S. St. Andrews Pl., Los Angeles, Calif. 90047

Division of Ser. No. 884,959, May 18, 1992, Des. No. 341,000. This application Jun. 24, 1993, Ser. No. 9,772

Term of patent 14 years

U.S. Cl. D26—102



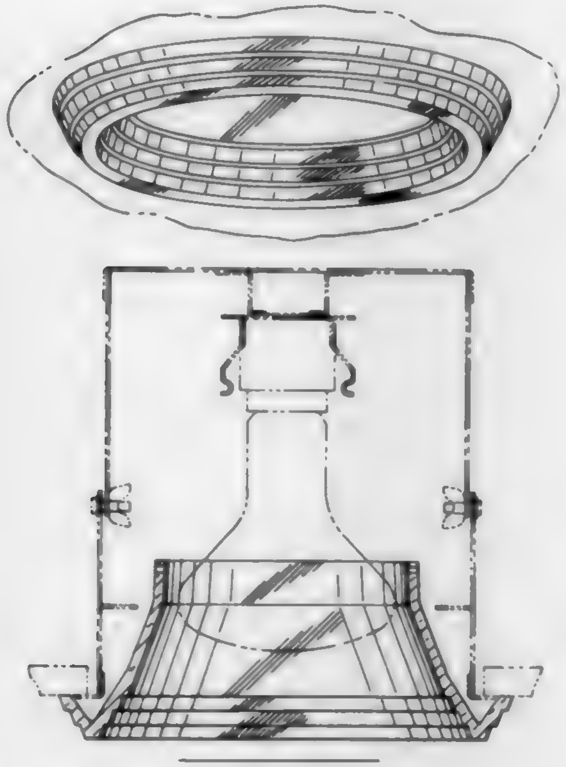
347,292
RECESSED LIGHTING FIXTURE BAFFLE WITH INTEGRAL STEPPED COLLAR

Scott L. Roos, Glenview, Ill., and Kevin Von Kluck, Hudson, Ohio, assignors to Juno Lighting, Inc., Des Plaines, Ill.

Filed Oct. 2, 1992, Ser. No. 3

Term of patent 14 years

U.S. Cl. D26—118



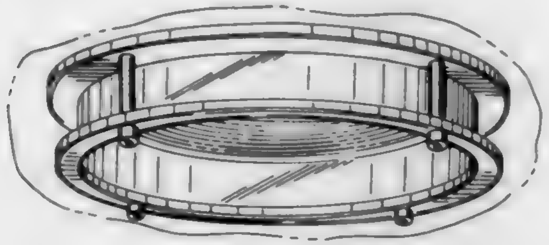
347,293
RECESSED LIGHTING FIXTURE TRIM HAVING A DECORATIVE PORTION WITH A TRANSLUCENT BAND

Scott L. Roos, Glenview, Ill., and Kevin Von Kluck, Hudson, Ohio, assignors to Juno Lighting, Inc., Des Plaines, Ill.

Filed Oct. 2, 1992, Ser. No. 80

Term of patent 14 years

U.S. Cl. D26—118



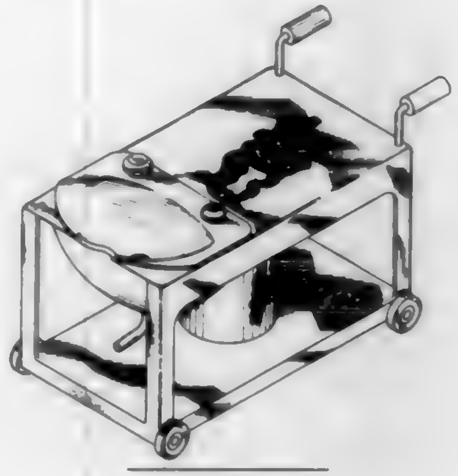
347,294
PORTABLE SHAMPOO CART

Barbara K. Jackson, 284 Rte. 1, Box 47 B, Hardeeville, S.C. 29927

Filed Sep. 3, 1991, Ser. No. 753,679

Term of patent 14 years

U.S. Cl. D28—20



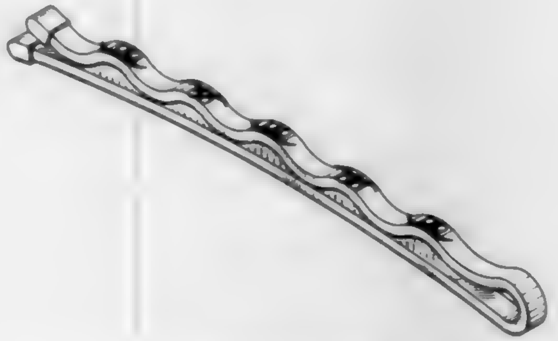
347,295
HAIR PIN

David J. McCabe, and Karen McCabe, both of 1507 Fox Pl., Utica, N.Y. 13502

Filed Jan. 31, 1992, Ser. No. 828,644

Term of patent 14 years

U.S. Cl. D28—39



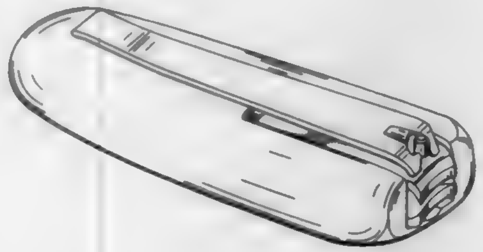
347,296
NAIL CLIPPER WITH NAIL CLIPPINGS RECEPTACLE

Mark Adelman, 2697 Sandy Plains Rd., Marietta, Ga. 30066, assignor to Douglas Johnson, a Georgia general partnership; Mark Adelman, both of Marietta, Ga.

Filed Dec. 18, 1992, Ser. No. 2,738

Term of patent 14 years

U.S. Cl. D28—60



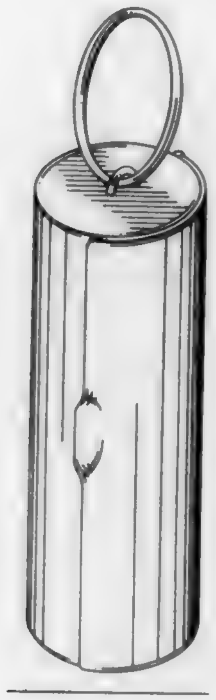
347,297
LIPSTICK CADDY

Rene Vesco, 940 W. Winnemucca Blvd., Winnemucca, Nev. 89446, assignor to Rene Vesco, Winnemucca, Nev.

Filed Oct. 13, 1992, Ser. No. 357

Term of patent 14 years

U.S. Cl. D28—77



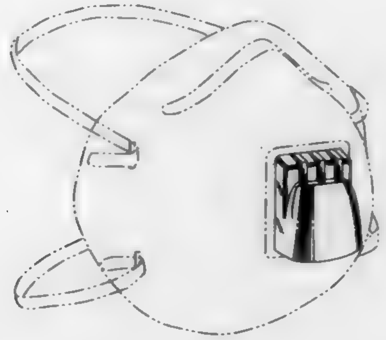
347,298
VALVE COVER

Daniel A. Japuntich, St. Paul, Minn.; David C. Byram, River Falls, Wis., and James E. Steffen, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing company, St. Paul, Minn.

Filed Oct. 13, 1992, Ser. No. 382

Term of patent 14 years

U.S. Cl. D29—7



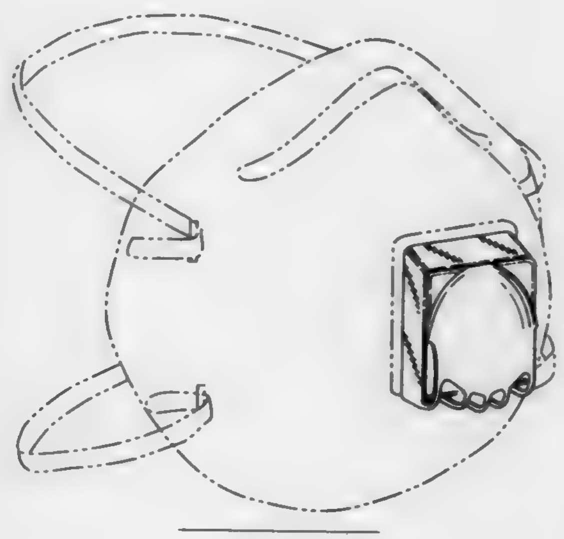
347,299
VALVE COVER

John W. Bryant, High Shincliffe; Alan G. Kellett, Woodham Village; Richard A. Lees, Durham City, all of United Kingdom; Daniel A. Japuntich, St. Paul, Minn., and David C. Byram, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1992, Ser. No. 384

Term of patent 14 years

U.S. Cl. D29—7



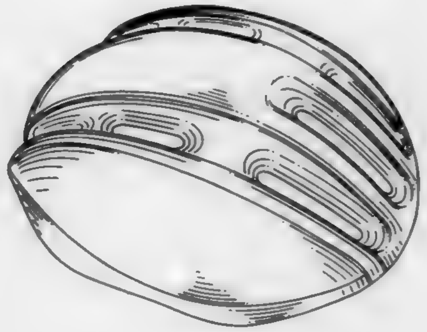
347,300
VENTILATED BICYCLE HELMET

James J. Gentes, Soquel, Calif., assignor to Giro Sport Design, Inc., Soquel, Calif.

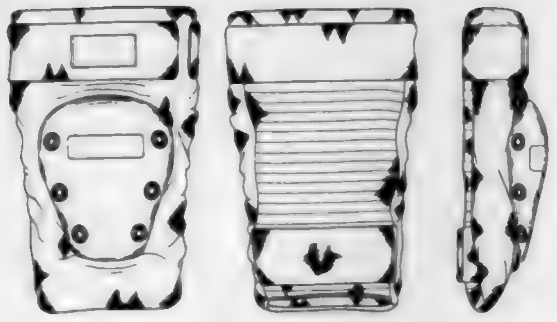
Division of Ser. No. 374,398, Aug. 23, 1989. This application Mar. 23, 1992, Ser. No. 855,349

Term of patent 14 years

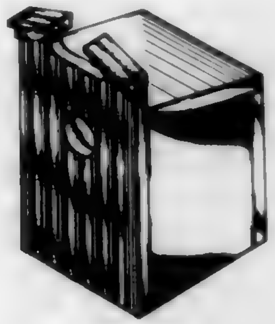
U.S. Cl. D29—12



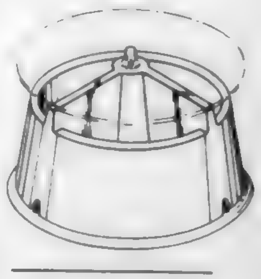
347,301
PROTECTIVE KNEE PAD FOR USE BY SNOWBOARDERS, ROLLER BLADERS, SKATERS, ETC.
Norman D. Levine, P.O. Box 1867, Pompano Beach, Fla. 33061
Filed Dec. 19, 1991, Ser. No. 810,812
Term of patent 14 years
U.S. Cl. D29—20



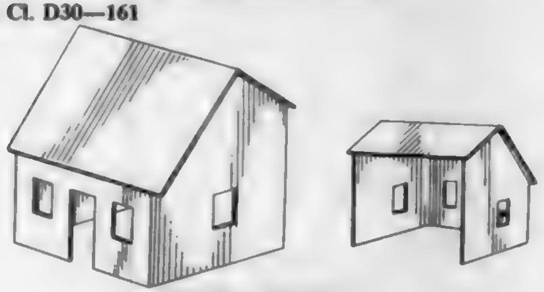
347,302
BIRD HOUSE
Wade A. F. Maple, Sherrills Ford, N.C. assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 12, 1992, Ser. No. 928,196
Term of patent 14 years
U.S. Cl. D30—110



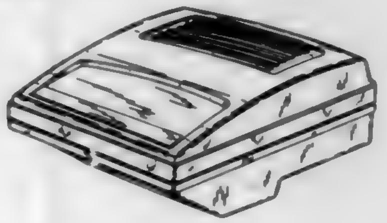
347,303
COMPARTMENTED ANIMAL FEEDER
Fred W. Mann, Box 444, Waterville, Kans. 66548
Filed Oct. 30, 1992, Ser. No. 957
Term of patent 14 years
U.S. Cl. D30—130



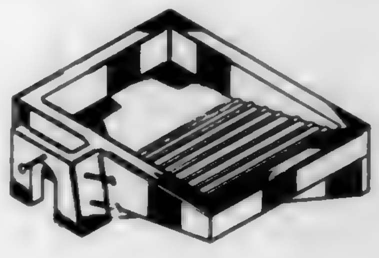
347,304
ANIMAL LITTER CONTAINER ENCLOSURE
Anna A. Hellem, 16214 Zane Grey La., Fountain Hills, Ariz. 85268
Filed Dec. 3, 1992, Ser. No. 2,176
Term of patent 14 years
U.S. Cl. D30—161



347,305
VACUUM CLEANER NOZZLE
Dean R. Rohn; Gary A. Kasper, both of Cadillac, and Daniel M. Laramie, Falmouth, all of Mich., assignors to Rexair, Inc., Troy, Mich.
Filed Feb. 4, 1992, Ser. No. 830,588
Term of patent 14 years
U.S. Cl. D32—32



347,306
EXTENSION LADDER PAINT TRAY
John D. Rogers, 1420 10th St., and Donald J. Webb, 2505 26th Street Rd., both of Greeley, Colo. 80631
Filed Jun. 7, 1993, Ser. No. 9,109
Term of patent 14 years
U.S. Cl. D32—53.1



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TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF MAY, 1994

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See—*
  Bias, Donald R.; and , 5,313,997, Cl. 152-427.000.
A. B. Carter, Inc.: *See—*
  Poquette, Gerry E.; and Groves, Gary P., 5,313,773, Cl. 57-125.000.
A. C. Leadbetter & Son, Inc.: *See—*
  Kamlani, Vijay M.; Kuby, Otakar A.; Operacz, Walter J.; and Vereecke, Frank J., 5,314,169, Cl. 266-105.000.
A. C. Nielsen Company: *See—*
  Stewart, Roy A., 5,315,093, Cl. 235-381.000.
AB Specialty Packaging, Inc.: *See—*
  Happ, Thomas W., 5,314,252, Cl. 383-126.000.
Abadi, Martin; Goldstein, Andrew C.; and Lampson, Butler W., to Digital Equipment Corporation. Compound principals in access control lists. 5,315,657, Cl. 380-25.000.
ABB Lummus Crest Inc.: *See—*
  Feldman, Robert J.; Dufallo, Joseph M.; Schwartz, William A.; and Williams, Theodore S., 5,315,056, Cl. 585-659.000.
  Gartside, Robert J., 5,314,610, Cl. 208-80.000.
ABB Vetco Gray Inc.: *See—*
  Smith, J. Douglas, 5,315,110, Cl. 250-227.270.
Abbiate, Jean-Claude; Blanc, Alain; and Ungerboeck, Gottfried, to International Business Machines Corporation. Data circuit terminating equipment (DCE) including timing arrangements circuits controlled by processing means. 5,315,622, Cl. 375-106.000.
Abbott Laboratories: *See—*
  Grabenkort, Richard W., 5,313,992, Cl. 141-104.000.
Abdo, Mahammed: *See—*
  Folts, Michael E.; and Abdo, Mahammed, 5,314,545, Cl. 134-22.110.
Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, to Kao Corporation. Tertiary aminoalcohol and process for producing the same, and, polyurethane and process for producing the same. 5,315,041, Cl. 564-506.000.
Abe, Nobuo; Horie, Tatsuo; Yamanaka, Toshio; and Simada, Atsui, to Hitachi, Ltd. Method of working scroll member of scroll compressor. 5,314,317, Cl. 418-55.200.
Abe, Tomiya: *See—*
  Okinoshima, Hiroshige; Kozakai, Shohei; and Abe, Tomiya, 5,314,979, Cl. 528-15.000.
Abe, Tsutomu; Makida, Seigo; and Kobayashi, Kenichi, to Fuji Xerox Co., Ltd. Driving device and method for driving two-dimensional contact image sensor. 5,315,102, Cl. 250-208.100.
Abou-Sayed, Ibrahim S.: *See—*
  Jennings, Alfred R., Jr.; and Abou-Sayed, Ibrahim S., 5,314,020, Cl. 166-281.000.
Abramov, Igor, to Xerox Corporation. Micromechanical light modulator with optically interlaced output. 5,315,429, Cl. 359-224.000.
Abreu, Leonard W.; Kneizys, Francis X.; Anderson, Gail P.; Chetwynd, James H.; Berk, Lex; Bernstein, Larry; and Robertson, David, to United States of America, Air Force. System for modelling moderate resolution atmospheric propagation. 5,315,513, Cl. 364-420.000.
Academy of Applied Science, Inc.: *See—*
  Chien, James C. W., 5,314,988, Cl. 528-353.000.
AccSys Technology, Inc.: *See—*
  Potter, James M., 5,315,120, Cl. 250-396.00R.
Acer Incorporated: *See—*
  Cheng, Chia-Lin, 5,315,187, Cl. 307-542.100.
ACF Industries, Incorporated: *See—*
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Ackerman, Susan. Woman's calendar. 5,313,722, Cl. 40-110.000.
Acovic, Alexandre; Hsu, Ching-Hsiang; and Wu, Being S., to International Business Machines Corporation. High performance trench EEPROM cell. 5,315,142, Cl. 257-316.000.
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  Allen, Fritz S., 5,315,375, Cl. 356-417.000.
Actron Entwick Lungs AG: *See—*
  Muller, Philipp; and Wacker, Alain, 5,315,096, Cl. 235-462.000.
Adachi, Osamu; and Hoshi, Kazunori, to Ricoh Company, Ltd. Communication control unit. 5,315,593, Cl. 370-94.300.
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  Nozaki, Nobuharu; Mitsumoto, Shinji; Okazaki, Yoji; and Adachi, Takashi, 5,315,613, Cl. 372-69.000.
Adam, Gerard: *See—*
  Le Baut, Guillaume; Babingui, Jean-Paul; Courant, Jacqueline; Robert, Jean-Michel; Renard, Pierre; Caignard, Daniel-Henri; de la Faverie, Jean-Francois R.; and Adam, Gerard, 5,315,017, Cl. 549-408.000.
Adams, Gary V.; and Smith, Bradley W., to Morton International, Inc. Driver-side module attach bracket. 5,314,203, Cl. 280-728.00A.
Adams, Joseph B. Tree stand-transport vehicle. 5,314,042, Cl. 182-187.000.
Adams, Steven P.: *See—*
  Tjoeng, Foe S.; Toth, Mihaly V.; McMackins, Dudley E.; and Adams, Steven P., 5,314,902, Cl. 514-357.000.
Adams, Theodore P.: *See—*
  Kroll, Mark W.; and Adams, Theodore P., 5,314,448, Cl. 607-5.000.
Adamson, Colin: *See—*
  Rieger, Heinz H.; and Adamson, Colin, 5,313,932, Cl. 126-531.000.
Adept Technology, Inc.: *See—*
  Carlisle, Brian R.; Witham, Carl R.; Allan, Donald R.; and Meadows, John W., 5,314,293, Cl. 414-744.500.
Adir et Compagnie: *See—*
  Guillaumet, Gerald; and Guardiola, Beatrice, 5,314,907, Cl. 514-414.000.
  Le Baut, Guillaume; Babingui, Jean-Paul; Courant, Jacqueline; Robert, Jean-Michel; Renard, Pierre; Caignard, Daniel-Henri; de la Faverie, Jean-Francois R.; and Adam, Gerard, 5,315,017, Cl. 549-408.000.
Adler, Meryle D. W.; Bagley, Rodney D.; Frost, Rodney I.; Lanning, John G.; and Shafer, H. Gordon, Jr., to Corning Incorporated. Method for extruding honeycombs. 5,314,650, Cl. 264-56.000.
Adler Research Associates: *See—*
  Carayannis, George; Halkias, Christos; Manolakis, Dimitris; and Koukoutsis, Elias, 5,315,687, Cl. 395-2.280.
Advanced Magnetics Inc.: *See—*
  Lewis, Jerome M.; Menz, Edward T.; Kenny, Francis E.; Groman, Ernest V.; and Josephson, Lee, 5,314,679, Cl. 424-9.000.
Advanced Micro Devices, Inc.: *See—*
  Chang, Herman M.; and Chan, Melvin, 5,315,174, Cl. 307-443.000.
  Vijeh, Nader; and Staab, David, 5,315,590, Cl. 370-79.000.
Advanced Technology Incubator, Inc.: *See—*
  Yaniv, Zvi; Robbins, Lionel; and Catchpole, Clive, 5,313,726, Cl. 40-361.000.
Advanced Turret Engineering Co.: *See—*
  Layton, Richard D., 5,313,865, Cl. 83-635.000.
Aerojet-General Corporation: *See—*
  Nahlovsky, Boris D.; and Wong, Michael K., 5,314,550, Cl. 179-109.600.
Aeroport De Paris: *See—*
  Cernon, Robert, 5,315,106, Cl. 250-215.000.
Aeroquip Corporation: *See—*
  Highlen, John L.; and Clark, Alan K., 5,314,214, Cl. 285-233.000.
Aerospatiale Societe Nationale Industrielle: *See—*
  Pascual, Nathalie; Fleury, Christophe; Sagnes, Georges; N'Guyen, Christian; and Lassale, Jacques, 5,315,271, Cl. 331-25.000.
Agano, Toshitaka: *See—*
  Nakajima, Nobuyoshi; and Agano, Toshitaka, 5,315,507, Cl. 364-413.230.
Agfa-Gevaert, N.V.: *See—*
  Vanmaele, Luc J.; and Janssens, Wilhelmus, 5,314,860, Cl. 503-227.000.
Agostini, Orenzo; Bacciarelli, Carla; Bonacchi, Graziano; Fedi, Mauro; and Manzini, Stefano, to Malesci Istituto Farmacobiologico S.p.A. 1-7 disubstituted xanthine derivatives having antiasthmatic activity, their physiologically acceptable salts, pharmaceutical compositions containing them and process for their preparation. 5,314,890, Cl. 514-263.000.
Agouron Pharmaceuticals, Inc.: *See—*
  Tyle, Praveen; and Freebern, Kenneth R., 5,314,685, Cl. 424-401.000.
Agrawal, Rakesh; and Feldman, Steven L., to Air Products and Chemicals, Inc. Process to produce a krypton/xenon enriched stream directly from the main air distillation column. 5,313,802, Cl. 62-22.000.
Agren, Anders, to SEM AB. Flywheel magneto arrangement. 5,313,918, Cl. 123-149.00D.
Ahagon, Akira: *See—*
  Sakiyama, Kazuyuki; Ahagon, Akira; Kotera, Hidetoshi; and Kita, Hiromi, 5,315,233, Cl. 324-72.000.
Ahmad, Saleem: *See—*
  Tino, Joseph A.; Bisacchi, Gregory S.; and Ahmad, Saleem, 5,314,893, Cl. 514-274.000.
Ahmed, Riaz: *See—*
  Nield, Eric; Ahmed, Riaz; and Choudhery, Riaz A., 5,314,751, Cl. 428-412.000.
Aihara, Kintaro; and Honda, Tadashi, to Nippon Petrochemicals Co., Ltd. Apparatus for forming slits. 5,313,863, Cl. 83-171.000.
Aikoh, Shinichi: *See—*
  Shinta, Minoru; Aikoh, Shinichi; and Nishitani, Takao, 5,315,704, Cl. 95-2.000.

Air Products and Chemicals, Inc.: *See*—
  Agrawal, Rakesh; and Feldman, Steven L., 5,313,802, Cl. 62-22.000.
Aircast, Inc.: *See*—
  Johnson, Glenn W., Jr.; McVicker, Henry J.; and Shelbourne, K. Donald, 5,314,455, Cl. 607-104.000.
Airmar Technology Corporation: *See*—
  Lagace, Maurice, 5,313,834, Cl. 73-290.00V.
Airo Clean Inc.: *See*—
  Pelosi, Michael H., III, 5,314,377, Cl. 454-187.000.
Aisin Aw Co., Ltd.: *See*—
  Hara, Takashi; Maeda, Koji; Morisawa, Kunio; and Habuchi, Ryoji, 5,313,794, Cl. 60-365.000.
Aisin Seiki Kabushiki Kaisha: *See*—
  Hashiride, Tadaaki, 5,313,896, Cl. 112-121.120.
AIWA Co., Ltd.: *See*—
  Niki, Mamoru; Hosaka, Yoshiaki; Mogi, Takao; and Saito, Haruo, 5,315,446, Cl. 360-48.000.
Aizawa, Takayuki: *See*—
  Iwamura, Keiichi; Aizawa, Takayuki; Narita, Izumi; and Suzuki, Takatoshi, 5,315,600, Cl. 371-37.600.
Akashi, Masakatsu: *See*—
  Hirobe, Junichi; Akashi, Masakatsu; Kobayashi, Masahiko; and Sugaya, Tsutomu, 5,315,350, Cl. 355-208.000.
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Akatsuka, Yuichiro, to Olympus Optical Co., Ltd. Optical information recording apparatus. 5,315,575, Cl. 369-112.000.
Akazawa, Yoji: *See*—
  Sakamoto, Kazuhiko; Tanaka, Hiroaki; Ueoka, Masatoshi; Akazawa, Yoji; and Baba, Masao, 5,315,037, Cl. 562-545.000.
Akeel, Hadi A., to Fanuc Robotics North America, Inc. Light weight robot mechanism. 5,313,854, Cl. 74-479.0BF.
Akimoto, Kengo; Shinmen, Yoshifumi; Yamada, Hideaki; and Shimizu, Sakayu, to Suntory Limited. Microbiological process for production of fatty acids having high degree of unsaturation with echinosporangium. 5,314,812, Cl. 435-134.000.
Akiyama, Jun: *See*—
  Maeda, Shigemi; Kojima, Kunio; Akiyama, Jun; Terashima, Shigeo; and Numata, Tomiyuki, 5,315,571, Cl. 369-50.000.
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  Tada, Takeshi; Akiyama, Toshikazu; Tanaka, Ryoichi; and Kawamoto, Masao, 5,314,170, Cl. 266-156.000.
Aksoy, Adnan; Austin, Micheal M.; and Gyenes, Russell E., to Motorola, Inc. Battery latch. 5,314,763, Cl. 429-97.000.
Akzo N.V.: *See*—
  Thorpe, Thurman C.; and Weaver, John F., 5,314,855, Cl. 502-80.000.
  Torenbeek, Reinder, 5,314,639, Cl. 252-186.230.
Al-Awadhi, Nader M.: *See*—
  Hamdan, Ibrahim Y.; ElNawawy, Amin S.; Banat, Ibrahim M.; and Al-Awadhi, Nader M., 5,314,820, Cl. 435-252.100.
Alberts, Heinrich: *See*—
  Muller, Michael; Probst, Joachim; Alberts, Heinrich; Konig, Joachim; Baumgen, Heinz; and Puchner, Fritz, 5,314,721, Cl. 427-388.000.
Alcan International Limited: *See*—
  Allaire, Claude, 5,314,599, Cl. 204-243.00R.
Alcan Tech Co., Inc.: *See*—
  Maeda, Kazuo; Tokumasu, Noboru; and Nishimoto, Yuhko, 5,314,538, Cl. 118-715.000.
Alcatel Cable: *See*—
  Daguet, Bruno; and Marlier, Gery, 5,315,682, Cl. 385-95.000.
  Guillard, Jacques; Girard, Christian; and Morin, Pierre, 5,315,257, Cl. 324-627.000.
Alcatel CIT: *See*—
  Le Goe, Gerard; and Roger, Jacques, 5,315,487, Cl. 361-796.000.
Alcatel Network Systems, Inc.: *See*—
  Noser, Francis G., 5,315,594, Cl. 370-110.100.
Alcatel N.V.: *See*—
  Allouis, Jacques; and Fuhrer, Jean-Claude, 5,315,595, Cl. 370-110.100.
Alcock, Alfred J.; and Bernard, John E., to National Research Council of Canada. High efficiency transversely pumped solid-state slab laser. 5,315,612, Cl. 372-69.000.
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  York, Billie M.; and Kyba, Evan P., 5,314,916, Cl. 514-542.000.
Alderman, Wayne: *See*—
  Sawyer, Elmer E.; Glover, Sanford; and Alderman, Wayne, 5,313,974, Cl. 137-12.000.
Aldrich, Paul E.; Earl, Richard A.; and Ma, Philip, to Du Pont Merck Pharmaceutical Company, The. 2-amino-1, 4-dihydropyridine derivatives with calcium agonist and alphlal-antagonist activity. 5,314,887, Cl. 514-252.000.
Alewelt, Wolfgang: *See*—
  Kuhling, Steffen; Alewelt, Wolfgang; Kauth, Hermann; and Freitag, Dieter, 5,314,985, Cl. 528-198.000.
Alexander, George R., to Terronics Development Corporation. Material feeder. 5,314,090, Cl. 222-1.000.
Alexander, James C., to Serco Corporation, The. Vertically storing dock leveler. 5,313,681, Cl. 14-71.100.
Alexander Machinery, Inc.: *See*—
  Alexander, William J., III, 5,314,128, Cl. 242-57.000.
Alexander Manufacturing Company: *See*—
  Alexandres, Richard B., 5,314,764, Cl. 429-121.000.
  Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, 5,315,253, Cl. 324-429.000.
Alexander, William J., III, to Alexander Machinery, Inc. Cloth measuring apparatus and method. 5,314,128, Cl. 242-57.000.
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Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, to Alexander Manufacturing Company. Method and apparatus for measuring the voltage and charge of a battery. 5,315,253, Cl. 324-429.000.
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  Egidio, Marchi; Gabriele, Rotini L.; Subhash, Desai; and Massimo, Grillli, 5,314,904, Cl. 514-394.000.
Alfano, Robert R.; and Yoo, Kwong M. Protective device for selectively reflecting high-intensity light over a broad spectral bandwidth. 5,315,437, Cl. 359-588.000.
Alff, Harald: *See*—
  Goebel, Thomas; Michel, Rudolf; Alff, Harald; and Karl, Josef, 5,314,533, Cl. 106-287.130.
Alfred Karcher GmbH & Co.: *See*—
  Feal, Robert; Stelzmuller, Helmut; and Janssen, Peter, 5,314,096, Cl. 222-401.000.
Alger, Terry; Uhlich, Dennis M.; Benett, William J.; and Ault, Earl R., to United States of America, Energy. System for controlling the flow of gas into and out of a gas laser. 5,315,610, Cl. 372-55.000.
Ali, Mohammed I.: *See*—
  Anton, Waifong L.; Coleman, Henry D.; Ali, Mohammed I.; and Weintraub, Lester, 5,314,961, Cl. 525-280.000.
  Spinelli, Harry J.; Anton, Waifong L.; Seidner, Leonard; Coleman, Henry D.; Ali, Mohammed I.; Weintraub, Lester; and White, Paul, 5,314,960, Cl. 525-280.000.
Allaire, Claude, to Alcan International Limited. Barrier layer against fluoride diffusion in linings of aluminum reduction cells. 5,314,599, Cl. 204-243.00R.
Allan, Donald R.: *See*—
  Carlisle, Brian R.; Witham, Carl R.; Allan, Donald R.; and Meadows, John W., 5,314,293, Cl. 414-744.500.
Allen, Bernie; Clark, Douglas E.; Edington, Christopher J.; Parracho, Rui; and Swartz, Eric, to Converse Inc. Reactive energy fluid filled apparatus providing cushioning, support, stability and a custom fit in a shoe. 5,313,717, Cl. 36-28.000.
Allen, Fritz S., to Acrogen, Inc. Sensitive light detection system. 5,315,375, Cl. 356-417.000.
Allen, Michael E.: *See*—
  Tuller, F. Norman; and Allen, Michael E., 5,314,718, Cl. 427-394.000.
AlliedSignal Inc.: *See*—
  Barr, Kevin P., 5,313,790, Cl. 60-267.000.
  Crumb, Donald A.; and Wilson, Robert K., 5,313,796, Cl. 60-549.000.
  Farmer, James L., 5,314,307, Cl. 416-2.000.
  Noll, John M., 5,315,305, Cl. 342-185.000.
  Van Der Puy, Michael; and Nalewajek, David, 5,315,048, Cl. 570-176.000.
Allouis, Jacques; and Fuhrer, Jean-Claude, to Alcatel N.V. Packet mode method and concentrator arrangement for data terminals served by an ISDN. 5,315,595, Cl. 370-110.100.
Almblad, Robert E.: *See*—
  Heredia, George L.; Almblad, Robert E.; and Mueller, Mike A., 5,314,274, Cl. 409-81.000.
Almedica Services Corp.: *See*—
  Pritchet, Warren A., 5,314,560, Cl. 156-238.000.
Aloka Co., Ltd.: *See*—
  Murashita, Masaru; and Matsunaka, Toshiyuki, 5,313,948, Cl. 128-662.020.
Alps Electric Co., Ltd.: *See*—
  Ida, Yuichi; Kato, Hironori; Sasaki, Kunihiko; and Bannai, Hiroyuki, 5,314,344, Cl. 439-164.000.
Alston, Lawrence E., Jr.; Farrell, John J., III; and Quayle, Kenneth W., III, to Bachman Information Systems, Inc. Method and apparatus for transforming objects in data models. 5,315,709, Cl. 395-600.000.
Alt, Peter. Process and apparatus for coating motor pistons. 5,314,717, Cl. 427-282.000.
Altera Corporation: *See*—
  Reddy, Srinivas T., 5,315,172, Cl. 307-443.000.
Althaus, Rolf, to Asea Brown Boveri Ltd. Gas turbine plant. 5,313,783, Cl. 60-39.181.
Althaus, Rolf; Chyou, Yau-Pin; and Zauner, Erwin, to Asea Brown Boveri Ltd. Dynamic pressure machine. 5,313,785, Cl. 60-39.450.
Aluminum Company of America: *See*—
  Bias, Donald R.; and , 5,313,997, Cl. 152-427.000.
Alusick, Michael P.: *See*—
  Kling, Michael J., III; Alusick, Michael P.; Kercheck, Gary R.; Krueger, Jeff C.; Schmitz, Duane M.; and Visser, James L., 5,313,711, Cl. 33-288.000.
Alvarez, Oscar E. Hammer mill apparatus. 5,314,126, Cl. 241-189.100.
Alza Corporation: *See*—
  Gale, Robert M.; Nedberge, Diane E.; and Atkinson, Linda E., 5,314,694, Cl. 424-448.000.
  McNichols, Larry A.; Bedzinski, John D.; and Hayden, Gary K., 5,314,502, Cl. 604-20.000.
AMAX, Inc.: *See*—
  Meendering, David N.; Malhotra, Deepak; and Baltich, Linda K., 5,314,658, Cl. 419-33.000.

  Nichting, Roger A.; Nicholas, Norman H.; and Young, Kenneth P., 5,313,815, Cl. 72-364.000.
Ambroziak, Andrzej; Lison, Rudolf; and Ricanek, Rudolf, to Asea Brown Boveri AG. Method for joining steel to aluminum alloy components or titanium alloy components, and turbochargers obtained by the method. 5,314,106, Cl. 228-114.500.
AMEI Technologies Inc.: *See*—
  Tepper, John C., 5,314,401, Cl. 600-14.000.
American Home Products Corporation: *See*—
  Felman, Steven W.; Jirkovsky, Ivo L.; and Memoli, Kevin A., 5,314,913, Cl. 514-473.000.
American Ingenuity, Inc.: *See*—
  Spencer, Andrew B.; Guastamachio, Richard J.; and Marsh, Bryan D., 5,315,491, Cl. 362-84.000.
American National Can Company: *See*—
  Kim, Yong J.; and Germonprez, Ray, 5,314,987, Cl. 528-289.000.
American Thermocraft Corporation Subsidiary of Jeneric/Pentron Incorporated: *See*—
  Panzera, Carlino; and Prasad, Arun, 5,314,334, Cl. 433-206.000.
Ames, Stephen J.: *See*—
  Collins, Donald A., Jr.; Nye, Andrew B., III; Ames, Stephen J.; and Houggy, David, 5,315,097, Cl. 235-472.000.
Amick, David R.; Emmons, William D.; and Lorah, Dennis P., to Rohm and Haas Company. Graft copolymers prepared by two staged aqueous emulsion polymerization. 5,314,977, Cl. 526-286.000.
Amoco Corporation: *See*—
  Mican, Stephen G., 5,315,393, Cl. 348-268.000.
Amrus Corporation: *See*—
  Shpigel, Vladimir, 5,314,425, Cl. 606-53.000.
Analog Devices, Incorporated: *See*—
  Barber, Herbert J.; and Mayernik, Pamela A., 5,314,837, Cl. 437-89.000.
  Core, Theresa A.; and Howe, Roger T., 5,314,572, Cl. 156-643.000.
Anderson, David R.: *See*—
  Matheny, John R.; White, Christopher; Anderson, David R.; and Schaeffer, Arnold, 5,315,703, Cl. 395-164.000.
Anderson, Gail P.: *See*—
  Abreu, Leonard W.; Kneizys, Francis X.; Anderson, Gail P.; Chetwynd, James H.; Berk, Lex; Bernstein, Larry; and Robertson, David, 5,315,513, Cl. 364-420.000.
Anderson, James E.: *See*—
  Davis, Walter L.; and Anderson, James E., 5,314,056, Cl. 198-396.000.
Anderson, Mark R.; and Parker, Robert P., to Thomson Consumer Electronics, Inc. Wideband expander for stereo and SAP signals. 5,315,660, Cl. 381-13.000.
Anderson-Martin Machine Company: *See*—
  Martin, Wendell S., 5,313,765, Cl. 53-317.000.
Anderson, Stephen P.; Higgins, Deborah L.; Hotchkiss, Adair J.; and Marks, Cara B., to Genentech, Inc. Human tissue plasminogen activator variants. 5,314,818, Cl. 435-226.000.
Anderson, William L.; and Otero, Dennis, to University of New Mexico. Immobilized hydrophobically-modified antibodies. 5,314,830, Cl. 436-524.000.
Andersson, Jan. Finger pen. 5,314,260, Cl. 401-7.000.
Ando Electric Co., Ltd.: *See*—
  Furuhashi, Masaaki; and Handa, Ryoji, 5,315,677, Cl. 385-37.000.
Ando, Masatoshi; Mochizuki, Hiromine; and Yamamoto, Mitsuo, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kanzaki Paper Mfg. Co., Ltd. Method for changing spools and apparatus therefor. 5,314,132, Cl. 242-56.00R.
Andreasen, Hans B.: *See*—
  Christensen, Henry M.; and Andreasen, Hans B., 5,314,878, Cl. 514-59.000.
Andrews, Dean D., to William D. Piper. Suspended line breakaway device. 5,315,064, Cl. 174-40.0TD.
Anes, John M.: *See*—
  Folta, Christopher M.; Anes, John M.; and Brown, Homer J., 5,314,084, Cl. 215-249.000.
Angeion Corporation: *See*—
  Kroll, Mark W.; and Adams, Theodore P., 5,314,448, Cl. 607-5.000.
Anglin, Noah L.: *See*—
  Cadwell, Peter F.; and Anglin, Noah L., 5,315,478, Cl. 361-684.000.
Anma, Hideyuki, to Kabushiki Kaisha Toshiba. Sheet stacking apparatus. 5,314,177, Cl. 271-3.100.
Anseth, Kristi; and Koch, Theodore A., to Du Pont de Nemours, E. I., and Company. Process for the conversion of N_2O. 5,314,673, Cl. 423-239.100.
Anthony, Jim: *See*—
  Colson, Wendell B.; Swiszcz, Paul G.; Anthony, Jim; and Jansen, Cees M., 5,313,998, Cl. 160-84.10D.
Anthony, Vivienne M.: *See*—
  Bushell, Michael J.; Beautement, Kevin; Clough, John M.; Anthony, Vivienne M.; deFraine, Paul; and Godfrey, Christopher R., 5,315,025, Cl. 560-60.000.
Anthony's Manufacturing Company, Inc.: *See*—
  Ditlevsen, Claes; Pope, Dusan P.; Ter-Oganesian, Artak; and Paugh, Gary F., 5,315,211, Cl. 315-50.000.
Anton, Waifong L.; Coleman, Henry D.; Ali, Mohammed I.; and Weintraub, Lester, to Permeable Technologies, Inc. Silicone-containing polymers, compositions and improved oxygen permeable hydrophilic contact lenses. 5,314,961, Cl. 525-280.000.
Anton, Waifong L.: *See*—
  Spinelli, Harry J.; Anton, Waifong L.; Seidner, Leonard; Coleman, Henry D.; Ali, Mohammed I.; Weintraub, Lester; and White, Paul, 5,314,960, Cl. 525-280.000.
Aoki, Satoshi: *See*—
  Tanaka, Tsuyoshi; Aoki, Satoshi; and Fukuda, Kazuyuki, 5,315,609, Cl. 372-43.000.
Aoki, Yasuhiro, to NEC Corporation. Optical transmitter. 5,315,426, Cl. 359-180.000.
Aoyagi, Takuo: *See*—
  Fuse, Masayoshi; Xie, Cheng T.; and Aoyagi, Takuo, 5,313,940, Cl. 128-633.000.
APD Cryogenics, Inc.: *See*—
  Bonney, Glenn, 5,313,801, Cl. 62-51.200.
APLS Co., Ltd.: *See*—
  Morita, Susumu, 5,314,442, Cl. 606-182.000.
Aponte, Marivel. Educational medical mannequin. 5,314,339, Cl. 434-267.000.
Apparatebau Rothemuhle Brandt & Kritler Gesellschaft mit beschrankter Haftung: *See*—
  Kaastra, Simon; and Koster, Gerd, 5,314,006, Cl. 165-10.000.
Applied Magnetics Corporation: *See*—
  McNeil, Michael, 5,315,469, Cl. 360-119.000.
Applied Materials, Inc.: *See*—
  Collins, Kenneth S.; and Gritters, Edward A., 5,315,473, Cl. 361-234.000.
  Lee, Peter W.; Wang, David N.; Nagashima, Makoto; Fukuma, Kazuto; and Sato, Tatsuya, 5,314,845, Cl. 437-238.000.
Apps, William P.; Koefelda, Gerald R.; and Shermer, Larry E., to Rehrig-Pacific Company, Inc.; and Coca-Cola Company, The. Bottle case and divider assembly. 5,314,089, Cl. 220-510.000.
AptarGroup, Inc.: *See*—
  Gross, Richard A.; Nottingham, John R.; and Panasewicz, Dale A., 5,314,093, Cl. 222-153.000.
Aptix Corporation: *See*—
  Guo, Ta-Pan; and Srinivasan, Adi, 5,315,545, Cl. 365-156.000.
Arai, Kazuo: *See*—
  Marui, Tomohiro; and Arai, Kazuo, 5,314,249, Cl. 374-128.000.
Arai, Kunio; and Kanaya, Yasuhiko, to Hitachi Seiko, Ltd. Printed wiring board having blind holes. 5,315,072, Cl. 174-262.000.
Arai, Shigeyoshi: *See*—
  Majima, Tetsuro; Sugita, Kyoko; and Arai, Shigeyoshi, 5,314,592, Cl. 204-157.200.
Arai, Tatsuo; Saito, Takayoshi; and Hayashizaki, Hiroaki, to Mitsubishi Materials Corporation. Cutting insert and cutter. 5,314,269, Cl. 407-42.000.
Araujo, Kenneth S., to Teleos Communications, Inc. Private branch exchange adapted for telemarketing. 5,315,647, Cl. 379-265.000.
Archer, Shreve M., III, to Entropy Racing. Cervical protection system. 5,313,670, Cl. 2-411.000.
Arco Chemical Technology, L.P.: *See*—
  Liotta, Frank J., Jr.; and Kesling, Haven S., Jr., 5,314,511, Cl. 44-322.000.
Arena, Aldo, to Grumman Aerospace Corporation. Differential linear actuator. 5,313,852, Cl. 74-89.150.
Aretz, Werner; Bottger, Dirk; Seibert, Gerhard; Tumulka, Alois; Welzel, Peter; and Hobert, Kurt, to Hoechst Aktiengesellschaft. Microorganism for breaking down moenomycins, a process for the breakdown, and the use of the breakdown products. 5,315,038, Cl. 562-587.000.
Arfsten, Nanning; Piehlke, Hermann; and Kaufmann, Reinhard, to Schott Glaswerke. Coating process. 5,314,715, Cl. 427-240.000.
Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., to Symbiosis Corporation. Endoscopic electrosurgical suction-irrigation instrument. 5,314,406, Cl. 604-21.000.
Arima, Hideaki: *See*—
  Sugahara, Kazuyuki; and Arima, Hideaki, 5,315,140, Cl. 257-306.000.
Arimento, Daniel R.: *See*—
  Porter, Frank K., Jr.; Nelson, Eliot D.; Arimento, Daniel R.; and Reidy, Terence J., 5,314,144, Cl. 244-132.000.
Arimoto, Akira: *See*—
  Nakao, Takeshi; Arimoto, Akira; Ogawa, Kensuke; Sukeda, Hirofumi; and Sugiyama, Hisataka, 5,315,573, Cl. 369-100.000.
Arimoto, Kazutami, to Mitsubishi Denki Kabushiki Kaisha. Substrate voltage generator and method therefor in a semiconductor device having selectively activated internal stepped-down power supply voltages. 5,315,166, Cl. 307-296.200.
Arimoto, Kazutami: *See*—
  Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.
Arion, Douglas N.; and Baird, David E., to Science Applications International, Inc. Gauge for measuring strong shock waves. 5,315,364, Cl. 356-32.000.
Aristech Chemical Corporation: *See*—
  Stipanovich, John, Jr.; and Wible, David Q., 5,314,609, Cl. 208-41.000.
Arizona Board of Regents: *See*—
  Kozicki, Michael N.; and Hsia, Shao-Wen, 5,314,772, Cl. 430-14.000.
Ark, Inc.: *See*—
  Cole, William R., Jr.; and Clanton, Joel D., 5,314,178, Cl. 271-18.300.
Armstrong World Industries, Inc.: *See*—
  Frecska, Sandor A.; and Sauer, Gale E., 5,313,750, Cl. 52-232.000.

Arnott, Randy M.: *See—*
  Noya, Eric S.; Arnott, Randy M.; and Rosich, Mitchell N., 5,315,602, Cl. 371-40.400.
Arsenault, Cathleen M.: *See—*
  Hector, Wayne M.; and Arsenault, Cathleen M., 5,315,579, Cl. 369-290.000.
Arseneault, Wayne J.: *See—*
  Flynn, Michael R.; Arseneault, Wayne J.; Boutet, John C.; Yaskow, Jeffrey J.; and Baker, Thomas D., 5,315,632, Cl. 378-167.000.
Arthur D. Little, Inc.: *See—*
  Shibamoto, Yoshitaka; Taniwa, Hiroyuki; Ueno, Hiromichi; Hagiwara, Shigeki; Forni, Ronald J.; and McCullough, John E., 5,314,316, Cl. 418-55.100.
Asahi Glass Company Ltd.: *See—*
  Yoneda, Takashige; Wakabayashi, Tsuneo; and Takano, Yukiko, 5,314,731, Cl. 428-429.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
  Ito, Takayuki, 5,315,439, Cl. 359-689.000.
  Kawasaki, Masahiro; Takahashi, Hiroyuki; and Tanimura, Yoshinari, 5,315,345, Cl. 354-484.000.
  Miyadera, Shunichi, 5,315,396, Cl. 348-792.000.
  Nishikawa, Tomoyuki, 5,315,359, Cl. 355-315.000.
  Suzuka, Shinya; and Takahashi, Norimichi, 5,315,336, Cl. 354-[illegible].
Asaka, Shunichi: *See—*
  Kawase, Kei; Ishikawa, Shigeki; and Asaka, Shunichi, 5,315,517, Cl. 364-424.020.
Asako, Katsuhiro, to NEC Corporation. Repeatered optical transmission system having full-optical loopback facilities. 5,315,674, Cl. 385-15.000.
Asakura, Mikio: *See—*
  Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.
Asakura, Tsutou: *See—*
  Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Koyama, Yoshihisa; and Bonde, Hiroyuki, 5,315,318, Cl. 346-76.0PH.
  Takanshi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,315,410, Cl. 358-471.000.
Asano, Seiji, to Fuji Photo Film Co., Ltd. Printed circuit board and method for attaching movable switch thereto. 5,315,484, Cl. 361-765.000.
Asanuma, Tadashi; Shiomura, Tetsunosuke; Uchikawa, Nobutaka; Iwatani, Tutomu; and Takeuchi, Katsumi, to Mitsui Toatsu Chemicals, Incorporated. Polypropylene resin compositions of high syndiotacticity and preparation process thereof. 5,314,956, Cl. 525-240.000.
Asanuma, Tadashi; and Yamamoto, Kazuhiko, to Mitsui Toatsu Chemicals, Inc. Molded article of crosslinked polyolefin and method for preparing it. 5,314,957, Cl. 515-245.000.
Asaumi, Masaji; and Kuroda, Takao, to Matsushita Electronics Corporation. Charge transfer device, process for its manufacture, and method of driving the device. 5,315,137, Cl. 257-221.000.
Asea Brown Boveri AG: *See—*
  Ambroziak, Andrzej; Lison, Rudolf; and Ricanek, Rudolf, 5,314,106, Cl. 228-114.500.
Asea Brown Boveri Ltd.: *See—*
  Althaus, Rolf, 5,313,783, Cl. 60-39.181.
  Althaus, Rolf; Chyou, Yau-Pin; and Zauner, Erwin, 5,313,785, Cl. 60-39.450.
  Frutschi, Hans U.; Hausermann, Alfred; and Wettstein, Hans, 5,313,782, Cl. 60-39.170.
Asmo Co., Ltd.: *See—*
  Kanno, Kazunobu; Hamano, Satoru; and Kawamura, Mikio, 5,313,697, Cl. 29-527.400.
Ast, Adolf; Enzmann, Erwin; and Holike, Walter, to Mettler-Toledo (Albstadt) GmbH. Load measuring apparatus, in particular weighing scale. 5,315,073, Cl. 177-212.000.
AT&T Bell Laboratories: *See—*
  Bleich, Larry L.; Nutt, Wendell G.; and Zerbe, Stephen T., 5,314,712, Cl. 427-118.000.
  Chen, Li-Han; and Jin, Sungho, 5,313,840, Cl. 73-763.000.
  Cho, Alfred Y.; Chu, Sung-Nee G.; Tai, Kuochou; and Wang, Yeong-Her, 5,314,838, Cl. 437-105.000.
  Hunt, Neil E. J.; Schubert, Erdmann F.; and Zydzik, George J., 5,315,128, Cl. 257-16.000.
  Jewell, Tanya E.; and Thompson, Kevin, 5,315,629, Cl. 378-34.000.
  Leonowich, Robert H., 5,315,270, Cl. 331-1.00A.
  Petisce, James R., 5,314,519, Cl. 65-3.110.
Atencio, Anne M.: *See—*
  Koskan, Larry P.; Low, Kim C.; Meah, Abdul R. Y.; and Atencio, Anne M., 5,315,010, Cl. 548-520.000.
Athena Incorporated: *See—*
  Rotter, Gerhard, 5,314,140, Cl. 242-192.000.
Atherton, Kenneth W.; Dastous, Susan D.; Grogan, Kevin P.; Lavoie, Gregory P.; Mancuso, Marjorie J.; and Plis, Mark J., to General Electric Company. Electrical energy meter with programmable register component. 5,315,235, Cl. 324-116.000.
Atkinson, Linda E.: *See—*
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  Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Bacon, David P., 5,314,892, Cl. 514-269.000.
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  Walker, Francis H.; and Baker, Don R., 5,314,865, Cl. 504-244.000.
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  Meendering, David N.; Malhotra, Deepak; and Baltich, Linda K., 5,314,658, Cl. 419-33.000.
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  Hamdan, Ibrahim Y.; ElNawawy, Amin S.; Banat, Ibrahim M.; and Al-Awadhi, Nader M., 5,314,820, Cl. 435-252.100.
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  Ida, Yuichi; Kato, Hironori; Sasaki, Kunihiko; and Bannai, Hiroyuki, 5,314,344, Cl. 439-164.000.
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  Muller, Michael; Probst, Joachim; Alberts, Heinrich; Konig, Joachim; Baumgen, Heinz; and Puchner, Fritz, 5,314,721, Cl. 427-386.000.
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  Bax, Vickie R.; and Bax, Dale F., 5,313,666, Cl. 2-9.000.
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  Leuenberger, Mark, 5,314,421, Cl. 604-403.000.
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  Stich, Frederick A.; Zahrte, Donald K., Sr.; Baxter, Richard V., Jr.; Folts, Douglas C.; Hubert, Thomas G.; Medina, Juan M.; Hazen, William J.; and Beistle, Edward G., 5,315,533, Cl. 364-480.000.
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  Woiceshyn, D. Mark, 5,314,556, Cl. 156-177.000.
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  Lindner, Christian; and Wittmann, Dieter, 5,314,963, Cl. 525-281.000.
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  - Guillemet, Guy, 5,313,762, Cl. 52-790.000.
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  - Bushell, Michael J.; Beautement, Kevin; Clough, John M.; Anthony, Vivienne M.; deFraine, Paul; and Godfrey, Christopher R., 5,315,025, Cl. 560-60.000.
- Bechtel, Richard L.: *See—*
  - Hively, James W.; Thomas, Mammen; and Bechtel, Richard L., 5,315,130, Cl. 257-48.000.
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  - Beikirch, Thomas R.; Beck, Richard A.; Fullerton, Jack K.; and Taillie, Joseph P., 5,315,414, Cl. 358-512.000.
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  - Monthony, James F.; and Livingston, Dwight, 5,313,959, Cl. 128-759.000.
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- Beer, Douglas C.: *See—*
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- Beharry, Christopher R.; Diosady, Levente L.; Rubin, Leon J.; and Hussein, Ahmed A., to Procter & Gamble Company, The. Process for removing chlorophyll color impurities from vegetable oils. 5,315,021, Cl. 554-190.000.
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  - Smith, Dale; Behrmann, Greg; and Ronan, Greg, 5,315,681, Cl. 385-89.000.
- Beikirch, Thomas R.; Beck, Richard A.; Fullerton, Jack K.; and Taillie, Joseph P., to Xerox Corporation. System for controlling multiple filters in a color raster input scaner. 5,315,414, Cl. 358-512.000.
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- Beistle, Edward G.: *See—*
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- Bell Atlantic Network Services, Inc.: *See—*
  - Montgomery, Robert H.; and Deiss, Lawrence A., 5,315,641, Cl. 379-94.000.
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  - Babson, David L., III; Bajzath, James A., Jr.; and Ely, Thomas C., 5,315,646, Cl. 379-201.000.
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  - Morine, Gerald H.; and Spigarelli, Steven A., 5,314,638, Cl. 252-184.000.
- Bendix Espana: *See—*
  - Bacardit, Juan S., 5,314,163, Cl. 251-129.070.
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- Berfield, Robert C., to Shop-Vac Corporation. Tool caddy for attachment to container, particularly for a vacuum cleaner tank. 5,313,686, Cl. 15-323.000.
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  - Kramer, Carl; Konrath, Bernd; Berger, Bernd; and Reinthal, Peter, 5,313,685, Cl. 15-309.100.
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- Bernardini, Attilio: *See—*
  - Scandurra, Laura; and Aurelian, Laure, 5,314,689, Cl. 424-433.000.
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  - Tomasi, Barbara R., 5,313,960, Cl. 128-848.000.
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- Bromma Conquip AB: *See—*
  - Nielsen, Erik, 5,314,047, Cl. 191-12.00R.
- Brosch, Carsten: *See—*
  - Fernschild, Guenter; Rudolph, Werner; and Brosch, Carsten, 5,315,046, Cl. 570-167.000.
- Brosius, David J.; and Sim, Joseph M., to Mid-American Dental Specialties, Inc. Orthodontic spacing spring. 5,314,331, Cl. 433-21.000.
- Brosow, Jorgen. Resonance oscillator. 5,315,565, Cl. 367-140.000.
- Brother Kogyo Kabushiki Kaisha: *See—*
  - Niwa, Akihiko, 5,314,256, Cl. 400-61.000.
  - Shoji, Yoshihisa, 5,313,902, Cl. 112-454.000.
  - Sumiya, Hiroshi; Fukaya, Kousuke; Kawai, Sunao; Sasaki, Hiroyuki; Ban, Yoshiyuki; Komiya, Ryohei; and Muramatsu, Kiyoji, 5,315,691, Cl. 395-109.000.
- Broudy, Ronald A.; and Pine, Joan. Soft and flexible toy and game system. 5,314,192, Cl. 273-282.300.
- Broughton, Robert S., to NEC America, Inc. Adaptive clock duty cycle controller. 5,315,164, Cl. 307-265.000.
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  - LeBarny, Pierre; Broussoux, Dominique; and DuBois, Jean-Claude, 5,314,939, Cl. 524-241.000.
- Brown, Homer J.: *See—*
  - Folta, Christopher M.; Anes, John M.; and Brown, Homer J., 5,314,084, Cl. 215-249.000.
- Brown, Jeffrey A.: *See—*
  - Blakeley, Anthony; Horihan, Gregory E.; Konicek, Timothy S.; O'Callaghan, Patrick J.; Carrington, Martin W.; and Brown, Jeffrey A., 5,314,309, Cl. 416-226.000.
- Brown, Neil H.: *See—*
  - Liebert, Richard T.; and Brown, Neil H., 5,314,415, Cl. 604-218.000.
- Brown, Peter G.: *See—*
  - March, David A.; Brown, Peter G.; and Hotham, David A., 5,313,846, Cl. 73-864.810.
- Brown, Robert W.; Coopes, Ian H.; Fusca, Joseph; Gifkins, Kenneth J.; and Irvin, John A., to Eastman Kodak Company. Apparatus for plasma treatment of continuous material. 5,314,539, Cl. 118-718.000.
- Brown, Scott M., to Corvas International, Inc. Tissue factor based prothrombin time reagent. 5,314,695, Cl. 424-450.000.
- Brown, William R.; and Casey, Don E. Self-contained re-inking insert and ribbon cartridge device. 5,314,258, Cl. 400-202.400.
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  - Blair, Eddie L.; Brownwood, John B.; and Chun, Delo K. K., 5,315,273, Cl. 333-81.00R.
- Bruce, Richard H. D.: *See—*
  - Sprague, Robert A.; Silverstein, Louis D.; and Bruce, Richard H. D., 5,315,418, Cl. 359-41.000.
- Brunila, Esko: *See—*
  - Willman, Tarmo; Brunila, Esko; Pelto, Bjarne; and Heselius, Lars, 5,313,758, Cl. 52-415.000.
- Brunnengraeber, Steven P.: *See—*
  - Krauth, Richard G.; and Brunnengraeber, Steven P., 5,314,116, Cl. 239-99.000.
- Brusasco, Enzo; and Boero, Giuseppe, to Roltra-Morse S.p.A. Actuator device for an electric window winder. 5,315,194, Cl. 310-68.00R.
- Brust, Thomas B.; and Mis, Mark R., to Eastman Kodak Company. Iodide banded tabular grain emulsion. 5,314,798, Cl. 430-567.000.
- Bryant, Brent S.: *See—*
  - Malhotra, Shadi L.; and Bryant, Brent S., 5,314,747, Cl. 428-341.000.
- Bryant, Stewart F.: *See—*
  - Seaman, Michael J.; and Bryant, Stewart F., 5,315,707, Cl. 395-250.000.
- BT&D Technologies: *See—*
  - Musk, Robert W.; and Beesley, Christopher F., 5,315,680, Cl. 385-88.000.
- BTU International: *See—*
  - Orbeck, Gary A., 5,314,330, Cl. 432-128.000.
- Buchanan, D. Scott: *See—*
  - Crowley, Christopher; Buchanan, D. Scott; and Hinshaw, Waldo S., 5,313,944, Cl. 128-653.100.
- Buck Werke GmbH & Company: *See—*
  - Bannasch, Heinz, 5,315,125, Cl. 250-504.00R.
- Budak, Paul V.: *See—*
  - Johnston, Richard S.; Budak, Paul V.; Schmidt, Robert C.; and Lee, Shih-Jong J., 5,315,700, Cl. 395-163.000.
- Buechler, John G.: *See—*
  - Williams, Charles L.; Buechler, John G.; Miller, Tod W.; and Reilly, Steven J., 5,313,780, Cl. 60-39.080.
- Buerger, Klaus Georg: *See—*
  - Schaeftlmeier, Roland; Pflueger, Gerhard; Fakler, Bernhard; Buerger, Klaus Georg; and Knorpp, Albrecht, 5,313,698, Cl. 29-596.000.
- Build-A-Mold Limited: *See—*
  - Schmidt, Horst, 5,314,288, Cl. 414-463.000.
- Bull S.A: *See—*
  - Remy, Le Gallo; Gerard, Lyvet; and Malgogne, Bernard, 5,315,488, Cl. 361-796.000.
- Bulow, Jeffrey A. Interferometric modulator for optical signal processing. 5,315,370, Cl. 356-345.000.
- Bulow, Per-Anders: *See—*
  - Nilsson, Per-Inge; and Bulow, Per-Anders, 5,314,319, Cl. 418-170.000.
- Burgoon, Charles E.: *See—*
  - Hughes, Travis K.; Campbell, Glenn W.; Burgoon, Charles E.; Gossett, John B.; and Spencer, Keith R., 5,315,089, Cl. 219-137.0PS.
- Burnell, Ann M.; Berzinis, Albin P.; Conroy, Timothy M.; and Balfour, Kim G., to General Electric Company. Use of polytetrafluoroethylene resins as a nucleating agent for foam molded thermoplastics. 5,314,925, Cl. 521-92.000.
- Burnett Oil Co., Inc.: *See—*
  - Teel, Dale, 5,315,054, Cl. 585-14.000.
- Burns, Bruce P.: *See—*
  - Wilkerson, Stephen A.; Kaste, Robert P.; and Burns, Bruce P., 5,313,889, Cl. 102-439.000.
- Burns, Leslie L.; Barrett, William; and Tsai, Robert, to Lasa Industries, Inc. Method and apparatus for laser beam drift compensation. 5,315,111, Cl. 250-235.000.
- Burns, Paul A.: *See—*
  - Hershey, Stephen A.; Vargas, J. Ramon; and Burns, Paul A., 5,314,790, Cl. 430-356.000.
- Burns, Stephen K.: *See—*
  - Potash, Robert L.; Jentges, Carl J.; Burns, Stephen K.; and Potash, Richard J., 5,314,391, Cl. 482-7.000.
- Busch, Dietrich: *See—*
  - Thurk, Jurgen; Taplan, Martin; Dudek, Roland; Hubert, Stefan; and Busch, Dietrich, 5,313,929, Cl. 126-39.00B.
- Buser, Rudolph G., to United States of America, Army. Illuminated sign device. 5,315,495, Cl. 362-373.000.
- Bush, Lyle J.: *See—*
  - Renkes, Kenneth R.; and Bush, Lyle J., 5,315,076, Cl. 200-5.0EB.
- Bushell, Michael J.; Beautement, Kevin; Clough, John M.; Anthony, Vivienne M.; deFraine, Paul; and Godfrey, Christopher R., to Imperial Chemical Industries PLC. Fungicides. 5,315,025, Cl. 560-60.000.
- Buss, Grahame Y.; and Loh, Wai L., to Shell Oil Company. Discharge device. 5,314,121, Cl. 239-553.300.
- Bussard, Janice W. Holographic products with improved seals. 5,314,767, Cl. 430-1.000.
- Butcher, Jared A., Jr., to Ohio University. Method of cracking polymeric materials catalyzed by copper. 5,315,055, Cl. 585-241.000.
- Butler, C. Paul: *See—*
  - Thomson, Andrew C.; Odom, Brian K.; Butler, C. Paul; Jablin, Michael G.; Nowlin, William C., Jr.; and Canik, Robert W., 5,315,706, Cl. 395-200.000.
- Butler, Douglas B.: *See—*
  - Cordoba, Michael V.; Hardee, Kim C.; and Butler, Douglas B., 5,315,230, Cl. 323-313.000.
- Butt, Martin H. D.; and Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Ester hydrolysis. 5,315,033, Cl. 560-190.000.
- Butz, Hans; Diederich, Gerd; Ehrenberg, Hans-Juergen; Lohse, Dietmar; Parschat, Lothar; and Pleschiutschnigg, Fritz-Peter, to Mannesmann AG. Casting spout for metallurgical vessels. 5,314,099, Cl. 222-606.000.
- Buysch, Hans-Josef: *See—*
  - Ooms, Pieter; Schrage, Heinrich; Buysch, Hans-Josef; Loix, Rene ; and Graf, Hans-Joachim, 5,314,986, Cl. 528-219.000.
- Caballero, Luis X., to Diamond Technologies Company. Nickel-cobalt-boron alloy, implement, plating solution and method for making same. 5,314,608, Cl. 205-238.000.
- Cachier, Gerard, to Thomson-CSF. Device for the mounting of very wide-band microwave integrated circuits. 5,313,693, Cl. 29-25.030.
- Cadwell, Peter F.; and Anglin, Noah L., to Fujitsu Personal Systems, Inc. Memory card tray for portable computer. 5,315,478, Cl. 361-684.000.
- CAE Machinery Ltd.: *See—*
  - Dunne, Michael J.; Beer, Douglas C.; and Marek, Jan, 5,313,696, Cl. 29-426.100.
- Cahaly, James E.; and Pitstick, Brian R., to TRW Inc. Electrical connection system with interlock. 5,314,345, Cl. 439-188.000.
- Caignard, Daniel-Henri: *See—*
  - Le Baut, Guillaume; Babingui, Jean-Paul; Courant, Jacqueline; Robert, Jean-Michel; Renard, Pierre; Caignard, Daniel-Henri; de

la Faverie, Jean-Francois R.; and Adam, Gerard, 5,315,017, Cl. 548-408.000.
Cain, Eunice F. Communion apparatus. 5,314,060, Cl. 206-216.000.
Cain, Michael B., to Corning Incorporated. Method and apparatus for fiber cooling. 5,314,515, Cl. 65-3.110.
Calandra, Frank, Jr.; Stankus, John C.; and Oldsen, John G., to Jennmar Corporation. Non-metallic reinforcing rod and method of use in supporting a rock formation. 5,314,268, Cl. 405-259.500.
Caldarise, Salvatore: *See—*
Hamilton, John V.; Caldarise, Salvatore; and Treacy, Debra J., 5,314,492, Cl. 623-23.000.
Calderazzo, Fausto: *See—*
Sommazzi, Anna; Lugli, Gabriele; Garbassi, Fabio; Calderazzo, Fausto; and Dell'Amico, Daniela B., 5,314,856, Cl. 502-167.000.
Calderon, Albert A. Twin wing sailing yacht. 5,313,905, Cl. 114-140.000.
Calgene Inc.: *See—*
Kridl, Jean C.; and Knauf, Vic C., 5,315,001, Cl. 536-23.600.
California Institute of Technology: *See—*
Coles, L. Stephen, 5,314,829, Cl. 436-165.000.
Kaiser, William J.; Waltman, Steven B.; and Kenny, Thomas W., 5,315,247, Cl. 324-244.000.
Callaway Golf Company: *See—*
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,314,184, Cl. 273-164.100.
Callaway, Randy A.: *See—*
Lester, James W.; Wagner, Randall M.; and Callaway, Randy A., 5,315,644, Cl. 379-103.000.
Calmettes, Lionel; and Detable, Pascal, to Etablissements Caillau. Device for connecting a flexible pipe to a rigid tubular joining piece. 5,314,210, Cl. 285-93.000.
Calvert, Rodney K.; Fishbeck, Alton J.; and Van Horne, George R., to Mead Corporation, The. Flight bar path having a large radius. 5,314,057, Cl. 198-483.100.
Calvo, Jose R.: *See—*
Cheng, Alan T. Y.; Calvo, Jose R.; and Barrado, Ramon R., 5,315,020, Cl. 554-184.000.
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Garavaglia, Carlo; and Mirenna, Luigi, to Ministero Dell 'Universita'E Della Ricerca Scientifica E Tecnologica. Silanyl oxypropylamines endowed with antifungal activity. 5,314,879, Cl. 514-63.000.
Camco International Inc.: *See—*
Pringle, Ronald E.; and Morris, Arthur J., 5,314,032, Cl. 175-74.000.
Camfield, David K.; Hahn, Daniel G.; Niemeyer, Duane; and Brashear, Daniel F., to Roadmaster Corporation. Bicycle with simulated motorcycle parts. 5,314,207, Cl. 280-828.000.
Camis, Thomas, to Hewlett-Packard Company. Method and apparatus for developing color images using dry toners and an intermediate transfer member. 5,314,774, Cl. 430-47.000.
Campbell, Glenn W.: *See—*
Hughes, Travis K.; Campbell, Glenn W.; Burgoon, Charles E.; Gossett, John B.; and Spencer, Keith R., 5,315,089, Cl. 219-137.0PS.
Campos, Rafael E.; and Hernandez, Jose A., to Intevep, S.A. In-situ reduction of oil viscosity during steam injection process in EOR. 5,314,615, Cl. 208-370.000.
Camps, Antoine N. J. M.; Grandjean, Pierre A.; Johnson, Gary M.; Lee, Philip H. J.; Lokhoff, Nicolaas M. H.; and Van Driel, Willem J., to Medtronic, Inc. Bipolar nerve electrode. 5,314,463, Cl. 607-129.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Kempster, Robert W.; and George, Douglas B., 5,315,243, Cl. 324-204.000.
Canadian Institute for Broadband & Information Network Technologies, Inc. (CIBINT): *See—*
Lee, Townes T. H., 5,315,596, Cl. 370-112.000.
Canemex Corporation: *See—*
Fernandez, Jorge D., 5,315,642, Cl. 379-96.000.
Canik, Robert W.: *See—*
Thomson, Andrew C.; Odom, Brian K.; Butler, C. Paul; Jablin, Michael G.; Nowlin, William C., Jr.; and Canik, Robert W., 5,315,706, Cl. 395-200.000.
Canney, William M.: *See—*
Howard, Henry E.; Bonaquist, Dante P.; Canney, William M.; and Nash, William A., 5,313,800, Cl. 62-22.000.
Cannon, Alan J.: *See—*
Glew, Derek A.; Staines, Alan D.; Cannon, Alan J.; and Dunlop, Roger N., 5,314,598, Cl. 204-224.00M.
Cannone, Gregory M.: *See—*
Caveza, Martin J.; Chung, Caleb S.; and Cannone, Gregory M., 5,314,373, Cl. 446-481.000.
Canon Kabushiki Kaisha: *See—*
Higuchi, Hirokazu, 5,315,671, Cl. 382-57.000.
Hirai, Nobuyuki; and Hara, Masato, 5,315,403, Cl. 358-404.000.
Hirasawa, Masahide, 5,315,340, Cl. 354-400.000.
Horiuchi, Akihisa, 5,315,435, Cl. 359-554.000.
Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, 5,315,397, Cl. 358-296.000.
Iwamura, Keiichi; Aizawa, Takayuki; Narita, Izumi; and Suzuki, Takatoshi, 5,315,600, Cl. 371-37.600.
Kawahara, Norihiro; and Nakatani, Yoshihiro, 5,315,408, Cl. 358-458.000.
Kawai, Takashi; Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Shono, Seita; and Ohta, Eiji, 5,315,415, Cl. 358-515.000.
Kimura, Takashi, 5,315,459, Cl. 360-85.000.
Kuboki, Keiju; Sugishima, Kiyohisa; Udagawa, Yutaka; Otsubo, Toshihiko; and Nishio, Masahiro, 5,315,404, Cl. 358-433.000.
Mihara, Akio; and Hashimoto, Seiji, 5,315,412, Cl. 358-512.000.
Mori, Takahiro; and Sato, Hiroshi, 5,314,713, Cl. 427-152.000.
Nakajima, Hiroharu; and Ozawa, Toshiaki, 5,314,259, Cl. 400-216.200.
Nakazato, Hiroshi; Nakamura, Gen; and Yoshinari, Satoshi, 5,314,068, Cl. 206-454.000.
Otsuki, Shinnichiro, 5,315,398, Cl. 358-304.000.
Sato, Keiji, 5,315,453, Cl. 360-75.000.
Suzuki, Hideyuki; Kitani, Masashi; Masaki, Yuichi; and Morimoto, Kenji, 5,314,788, Cl. 430-313.000.
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,314,780, Cl. 430-128.000.
Tanioka, Hiroshi, 5,315,382, Cl. 358-523.000.
Terasawa, Koji; Takemura, Makoto; Nojima, Takashi; and Miyakawa, Akira, 5,315,317, Cl. 346-1.100.
Yoshida, Fumio; and Nakasugi, Mikio, 5,315,196, Cl. 310-90.000.
Yoshida, Takehiro; and Sakakibara, Kenzo, 5,315,643, Cl. 379-100.000.
Canon Kasbushiki Kaisha: *See—*
Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; and Sato, Chikara, 5,315,379, Cl. 348-713.000.
Canon Sales Co., Inc.: *See—*
Maeda, Kazuo; Tokumasu, Noboru; and Nishimoto, Yuhko, 5,314,538, Cl. 118-715.000.
Cappi, Angelo: *See—*
Rimondi, Renato; and Cappi, Angelo, 5,313,766, Cl. 53-451.000.
Caprathe, Bradley W.; Downing, Dennis M.; Jaen, Juan C.; Johnson, Stephen J.; Smith, William J., III; Wise, Lawrence D.; Wright, Jonathan; and Wustrow, David J., to Warner-Lambert Company. 1,3-substituted cycloalkenes and cycloalkanes as central nervous system agents. 5,314,896, Cl. 514-332.000.
Carayannis, George; Halkias, Christos; Manolakis, Dimitris; and Koukoutsis, Elias, to Adler Research Associates. Side fed superlattice for the production of linear predictor and filter coefficients. 5,315,687, Cl. 395-2.280.
Cardiac Pacemakers, Inc.: *See—*
Heil, Ronald W., Jr.; Wickham, Jr. Robert W.; and Kenknight, Bruce H., 5,314,462, Cl. 607-128.000.
KenKnight, Bruce H.; Hall, Jeffrey A.; and Eastman, William J., 5,314,464, Cl. 607-132.000.
Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., 5,314,459, Cl. 607-122.000.
Cardiovascular Imaging Systems, Inc.: *See—*
Salmon, Stephen M.; McKenzie, John R.; Thornton, Peter; and Ginn, Richard, 5,314,408, Cl. 604-22.000.
Yock, Paul G., 5,313,949, Cl. 128-662.060.
Carey, Jay F., II; and Zamanzadeh, Mehrooz, to Louis Berkman Company, The. Hot dip terne coated roofing material. 5,314,758, Cl. 428-648.000.
Caribbean Microparticles Corporation: *See—*
Schwartz, Abraham, 5,314,824, Cl. 436-10.000.
Carini, David J.; Duncia, John Jonas V.; and Wells, Gregory J., to Du Pont de Nemours, E. I., and Company. Substituted pyrazole angiotensin II antagonists. 5,315,013, Cl. 548-376.100.
Carl Edelmann GmbH: *See—*
Heuberger, Erich; Knorrich, Wolf-Dieter; Dziallas, Joachim W.; Plester, George; and Troska, Georg, 5,314,088, Cl. 220-465.000.
Carl Freudenberg, Firma: *See—*
Schwerdt, Hans-Werner, 5,314,255, Cl. 384-536.000.
Carlisle, Brian R.; Witham, Carl R.; Allan, Donald R.; and Meadows, John W., to Adept Technology, Inc. Direct drive robotic system. 5,314,293, Cl. 414-744.500.
Carlson, Bengt A. Method of and valve for controlling flow in a hydronic system. 5,313,980, Cl. 137-557.000.
Carlson, Richard C.: *See—*
Hardee, Kenneth L.; Ernes, Lynne M.; and Carlson, Richard C., 5,314,601, Cl. 204-290.00R.
Carolina Products, Inc.: *See—*
Blackmon, William S.; and Blackmon, John G., 5,313,805, Cl. 62-195.000.
Carrico, Robert J.: *See—*
Boguslaski, Robert C.; and Carrico, Robert J., 5,314,804, Cl. 435-12.000.
Carrier Corporation: *See—*
Kujawa, Matthew; and Waterman, Timothy J., 5,313,930, Cl. 126-116.00R.
Carrington, Martin W.: *See—*
Blakeley, Anthony; Horihan, Gregory E.; Konicek, Timothy S.; O'Callaghan, Patrick J.; Carrington, Martin W.; and Brown, Jeffrey A., 5,314,309, Cl. 416-226.000.
Carroll, Francis A., to Carroll Products and Designs Limited. Riser and divider system for a display apparatus. 5,314,081, Cl. 211-184.000.
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Carroll, Francis A., 5,314,081, Cl. 211-184.000.
Carter-Mann, Candice. Plastic bag hanger device. 5,314,151, Cl. 248-100.000.
Cascami Seta-Filature Seriche Riunite SpA: *See—*
Salvador, Pierantonio; and Viciguerra, Paolo, 5,315,367, Cl. 156-238.000.
Case, Colyn; Meinerth, Kim; Irwin, John; and Fanning, Blaise, to Digital Equipment Corporation. Graphics command processing method in a computer graphics system. 5,315,696, Cl. 395-133.000.
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Case Corporation: *See—*
Dunn, Donnell L., 5,313,795, Cl. 60-413.000.
Casey, Don E.: *See—*
Brown, William R.; and Casey, Don E., 5,314,258, Cl. 400-202.400.
Cassidy, Edward J.; and Jones, Ronald D., to Precision Aquarium Testing, Inc. Nitrosomonas preservation and reactivation for aquaria. 5,314,542, Cl. 119-231.000.
Castrogiovannia, John, Jr.: *See—*
Papke, Brian L.; Rubin, Issac D.; and Castrogiovannia, John, Jr., 5,314,632, Cl. 252-18.000.
Catalytica, Inc.: *See—*
Dalla Betta, Ralph A.; Sheridan, David R.; and Reed, Daniel L., 5,314,828, Cl. 436-118.000.
Catchpole, Clive: *See—*
Yaniv, Zvi; Robbins, Lionel; and Catchpole, Clive, 5,313,726, Cl. 40-361.000.
Cathey, David A., to Micron Technology, Inc. Process for etching a multi-layer substrate. 5,314,578, Cl. 156-662.000.
Catholic University of America, The: *See—*
Kovach, Ildiko M., 5,314,815, Cl. 435-184.000.
Caugherty, William; and Booton, Harold. Electrically heated nozzle for die casting. 5,315,686, Cl. 392-480.000.
Cavanaugh, Peter F.: *See—*
Schumacher, Richard W.; Perzan, Denis A.; Cavanaugh, Peter F.; and Boucher, George J., 5,315,477, Cl. 361-678.000.
Caveza, Martin J.; and Gable, Derek, to Mattel, Inc. Shape-matching spin-action toy. 5,314,338, Cl. 434-259.000.
Caveza, Martin J.; Chung, Caleb S.; and Cannone, Gregory M., to Mattel, Inc. Toy food processor and simulated oven. 5,314,373, Cl. 446-481.000.
Cayocca, Iver D.: *See—*
Stokoe, Geoffrey A.; Green, George M.; and Cayocca, Iver D., 5,314,263, Cl. 405-1.000.
Cenedella, Philip W.: *See—*
Vaida, Robert M.; Kuchta, Richard; and Cenedella, Philip W., 5,314,136, Cl. 242-75.400.
Cerestar Holding B.V.: *See—*
Gonze, Michel H. A.; Van der Schueren, Freddy M. L.; and Rapille, Andre L. I., 5,314,708, Cl. 426-660.000.
Cernon, Robert, to Aeroport De Paris. Apparatus for evaluating beacon lights, in particular on runways and taxiways for airplanes having a light diffusing reflection box. 5,315,106, Cl. 250-215.000.
Cetinkaya, Ismail B., to UOP. External integrated disengager stripper and its use in fluidized catalytic cracking process. 5,314,611, Cl. 208-113.000.
CGE Compagnia Generale Elettromeccanica SpA: *See—*
Fiorino, Falchi, 5,313,731, Cl. 40-642.000.
Chaboud, Gilbert; and Kalenine, Yvan, to Merlin Gerin. Microprocessor-based monitoring or protection device comprising an analog data acquisition system. 5,315,599, Cl. 371-25.100.
Chambers, William R., to Neff Instrument Corporation. Composite differential direct-coupled instrumentation amplifier. 5,315,267, Cl. 330-275.000.
Chamieh, Naji. Hand held domestic utensil cleaning device. 5,313,682, Cl. 15-29.000.
Champa, John J., to UNISYS Corporation. Digital video switch for video teleconferencing. 5,315,633, Cl. 348-16.000.
Champion International Corporation: *See—*
Ward, Kevin C., 5,314,585, Cl. 162-274.000.
Chan, Alexander; and Pan, Yuh-Guo, to Clairol, Inc. Aminoanthraquinone dyes having a quaternary center with a long aliphatic chain. 5,314,505, Cl. 8-426.000.
Chan, Melvin: *See—*
Chang, Herman M.; and Chan, Melvin, 5,315,174, Cl. 307-443.000.
Chan, Yuen H.; Pelella, Anthony R.; and Reohr, William R., to International Business Machines Corporation. Voltage burn-in scheme for BICMOS circuits. 5,315,167, Cl. 307-296.600.
Chang, Andrew K.: *See—*
Christian, Donald J.; Feng, Chin-Hu; McComas, Jerry L.; and Chang, Andrew K., 5,314,071, Cl. 209-4.000.
Chang, Elizabeth P.; and Friday, James A., to Eastman Kodak Company. Multicolor photographic elements exhibiting an enhanced speed-granularity relationship. 5,314,793, Cl. 430-506.000.
Chang, Herman M.; and Chan, Melvin, to Advanced Micro Devices, Inc. Programmable output slew rate control. 5,315,174, Cl. 307-443.000.
Chang, Ming Cheng. Sequentially shifting control circuit for extendible light strings. 5,315,160, Cl. 307-41.000.
Channel Products, Inc.: *See—*
Pim, Kendall A.; Romanak, Alfred J.; and Moss, Russell W., 5,314,149, Cl. 248-56.000.
Chany, Charles: *See—*
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Chevallier, Bruno: *See—*
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  - Ryan, Ralph L., 5,314,568, Cl. 156-504.000.
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  - Kubelik, Igor; and Simmonds, Michael, 5,315,324, Cl. 346-159.000.
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Crivello, James V.; and Dougherty, James A., 5,314,929, Cl. 522-31.000.

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Zagar, Paul S.; and Douglas, Kurt P., 5,315,177, Cl. 307-465.000.

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Gan, Joseph; and Bertram, James L., 5,314,720, Cl. 427-386.000.

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Tucker, Andrew J., 5,314,014, Cl. 166-124.000.

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Matthiessen, Hans, 5,314,605, Cl. 204-415.000.

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Aldrich, Paul E.; Earl, Richard A.; and Ma, Philip, 5,314,887, Cl. 514-252.000.

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LeBarny, Pierre; Broussoux, Dominique; and DuBois, Jean-Claude, 5,314,939, Cl. 524-241.000.

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Tiollais, Pierre; Chany, Charles; Dubois, Marie-Francoise; Pourcel, Christine; and Louise, Anne, 5,314,808, Cl. 435-69.300.

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Gerhart, Donald J.; Rittschof, Dan; and Bonaventura, Joseph, 5,314,932, Cl. 523-122.000.

Thomas, John E., 5,315,109, Cl. 250-251.000.

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Dutta, Arunava; and Dullea, Lenoard V., 5,314,723, Cl. 427-476.000.

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Glew, Derek A.; Staines, Alan D.; Cannon, Alan J.; and Dunlop, Roger N., 5,314,598, Cl. 204-224.00M.

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Gorman, Geoffrey W., 5,314,185, Cl. 273-167.00A.

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Nordstrom, Paul D., 5,314,049, Cl. 192-4.00A.

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Ferguson, Hugo S., 5,315,085, Cl. 219-50.000.

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Michaels, Edwin B.; and Malamud, Daniel, 5,314,917, Cl. 514-556.000.

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Wright, George L., Jr., 5,314,996, Cl. 530-387.300.

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Brust, Thomas B.; and Mis, Mark R., 5,314,798, Cl. 430-567.000.

Chang, Elizabeth P.; and Friday, James A., 5,314,793, Cl. 430-506.000.

Cocca, J. David, 5,315,342, Cl. 354-403.000.

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Derezinski, Stephen J., 5,314,246, Cl. 366-79.000.

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Gresh, Timothy F., 5,314,066, Cl. 206-389.000.

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Hibbard, Robert H., 5,315,341, Cl. 354-402.000.

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Johnson, Kevin M., 5,315,355, Cl. 355-277.000.

Lavine, James P., 5,314,836, Cl. 437-53.000.

Merrill, James P., 5,314,792, Cl. 430-505.000.

Mulqueen, Paul J., 5,314,661, Cl. 422-57.000.

Rieth, John E., 5,314,647, Cl. 264-25.000.

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Skye, David A., 5,315,337, Cl. 354-298.000.

Sutton, James E., 5,314,794, Cl. 430-506.000.

White, Weimar W.; and Kiehl, Gary G., 5,314,670, Cl. 423-22.000.

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Bojas, Edward J.; Kyle, Robert J.; and Weeks, Leo M., 5,314,048, Cl. 192-3.290.

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Slicker, James; Mazur, Joseph S.; and Breen, Michael T., 5,314,050, Cl. 477-171.000.

Steeby, Jon A.; Edelen, Stephen A.; and Davis, Alan R., 5,315,514, Cl. 364-424.100.

Eatwell, Graham: *See—*

Gossman, William; and Eatwell, Graham, 5,315,661, Cl. 381-71.000.

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Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.

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van Laar, Gerardus J. C., 5,314,054, Cl. 198-347.100.

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Runyon, Larry, 5,314,619, Cl. 210-606.000.

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Oakes, Thomas R.; Stanley, Patricia M.; and Keller, Jerome D., 5,314,687, Cl. 424-405.000.

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Steeby, Jon A.; Edelen, Stephen A.; and Davis, Alan R., 5,315,514, Cl. 364-424.100.

Edgar, William A.: *See—*

Dickie, Robert G.; Tousson, Maurice; Edgar, William A.; and Jennings, Peter, 5,313,683, Cl. 15-117.000.

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Houser, Russell A.; Edwards, Stuart D.; and Kordis, Thomas F., 5,313,943, Cl. 128-642.000.

Stern, Roger A.; Edwards, Stuart D.; Jackson, Jerome; and Rosen, Arye, 5,314,466, Cl. 607-156.000.

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Nakane, Rintaro; and Egawa, Jiro, 5,315,352, Cl. 355-246.000.

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Eglash, Stephen J.: *See—*

Choi, Hong K.; Eglash, Stephen J.; Fan, Tso Y.; and Nabors, C. David, 5,315,608, Cl. 372-41.000.

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Eide, Russel L.; and Eide, Eric P., 5,314,386, Cl. 474-84.000.

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Tsou, Yu-Min; Door, Robert D.; and Eisman, Glenn A., 5,314,760, Cl. 429-12.000.

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Jones, Elmer R., 5,315,240, Cl. 324-158.00F.

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Thomassen, Jan M.; and Lekang, Odd I., 5,313,911, Cl. 119-231.000.

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Inbar, Michael; Slutzky, Gerald; Radushetzky, Mordechai; and Shitrit, David, 5,314,074, Cl. 209-208.000.

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Auclair, William T., 5,315,063, Cl. 174-78.000.

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Heinrich, Theodore M.; and Schauder, Colin D., 5,315,225, Cl. 318-712.000.

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Coward, Mark T., 5,315,288, Cl. 340-463.000.

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Nykerk, Michael, 5,315,285, Cl. 340-426.000.

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Thiele, Karl-Heinz, 5,315,663, Cl. 371-188.000.
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Lee, Kyung-Ho; Cho, Kyoung-Ik; and Lee, Yong-Tak, 5,314,833, Cl. 437-41.000.
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Chaverot, Pierre; and Lacour, Claude, 5,314,935, Cl. 524-64.000.
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Elgue, Jean; and Tournier-Lasserve, Jacques, 5,314,671, Cl. 423-220.000.
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MacLeay, Ronald E.; Kmiec, Jennifer P.; and Kazmierczak, Robert T., 5,314,970, Cl. 525-450.000.
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Berthe, Bernard; and Cognion, Jean-Marie, 5,315,045, Cl. 570-153.000.
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Boigegrain, Robert; Brodin, Roger; Gully, Danielle; Molimard, Jean-Charles; and Olliero, Dominique, 5,314,889, Cl. 514-253.000.
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Hamill, Robert L.; and Yao, Raymond C., 5,314,875, Cl. 514-25.000.
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Wright, Jack D.; and Ellis, Joe E., 5,313,788, Cl. 60-226.200.
Elloy, Martin A.; and Johnson, Robert, to DePuy International Ltd. Patellar components. 5,314,480, Cl. 623-20.000.
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Oravetz, David M.; Elms, Robert T.; Engel, Joseph C.; Klancher, Frank; and Kenny, Thomas J., 5,315,531, Cl. 364-550.000.
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Hamdan, Ibrahim Y.; ElNawawy, Amin S.; Banat, Ibrahim M.; and Al-Awadhi, Nader M., 5,314,820, Cl. 435-252.100.
Elpatronic AG: *See—*
Gross, Norbert, 5,315,108, Cl. 250-223.00B.
Elsaesser, Andreas; and Brenk, Michael, to Hoechst Aktiengesellschaft. Process for treating lithographic printing forms and lithographic printing forms produced thereby. 5,314,787, Cl. 430-302.000.
Elsen, Joseph J.: *See—*
Kester, Jeffrey J.; Elsen, Joseph J.; Wehmeier, Thomas J.; and Young Jerry D., 5,314,707, Cl. 426-611.000.
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Hardee, Kenneth L.; Ernes, Lynne M.; and Carlson, Richard C., 5,314,601, Cl. 204-290.00R.
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Bebson, David L., III; Bajzath, James A., Jr.; and Ely, Thomas C., 5,315,646, Cl. 379-201.000.
Emhart Industries, Inc.: *See—*
Giometti, Stephen M., 5,313,847, Cl. 73-865.800.
Emmons, William D.: *See—*
Amick, David R.; Emmons, William D.; and Lorah, Dennis P., 5,314,977, Cl. 526-286.000.
Emori, Katsuhiko: *See—*
Matuzawa, Tomoki; Yokota, Seiji; Emori, Katsuhiko; and Harada, Junichi, 5,314,229, Cl. 296-189.000.
Emotron Aktiebolag: *See—*
Zellman, Per, 5,315,224, Cl. 318-701.000.
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Turricchia, Arnaldo, 5,315,625, Cl. 376-280.000.
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Stephens, Barry D., 5,314,261, Cl. 404-6.000.
Engel, Joseph C.: *See—*
Oravetz, David M.; Elms, Robert T.; Engel, Joseph C.; Klancher, Frank; and Kenny, Thomas J., 5,315,531, Cl. 364-550.000.
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Rockwood, Charles A., Jr.; Engelhardt, John A.; and Oudria, Jeffrey M., 5,314,479, Cl. 623-19.000.
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England, Michael E., 5,314,234, Cl. 297-248.000.
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Custro, Sergio; and Zazzetta, Alessandro, 5,314,951, Cl. 525-88.000.
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Bilcke, Walter; Faes, Ludo; and Noppe, Chris, 5,313,988, Cl. 139-1.00E.
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La Place, Christian; Martin, Nathalie; and Faivre, Michel, 5,314,076, Cl. 210-205.000.
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Phillips, Gerald W.; Falling, Stephen N.; Godleski, Stephen A.; and Monnier, John R., 5,315,019, Cl. 549-507.000.
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Choi, Hong K.; Eglash, Stephen J.; Fan, Tso Y.; and Nabors, C. David, 5,315,608, Cl. 372-41.000.
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Ramesh, Manian; Shetty, Chandrashekar S.; and Finck, Martha R., 5,314,627, Cl. 210-734.000.
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Fink, Willy, 5,314,305, Cl. 415-202.000.
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Kirkwood, Malcolm E.; and Fingerman, Michael E., 5,313,793, Cl. 60-361.000.
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Rodgers, Aubrey; Hope, Kenneth P.; and Hope, Norman B., 5,313,928, Cl. 126-38.000.
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  - Kuhling, Steffen; Alewelt, Wolfgang; Kauth, Hermann; and Freitag, Dieter, 5,314,985, Cl. 528-198.000.
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  - Hilger, Robert L.; Davis, John R.; and Meister, John A., 5,313,876, Cl. 99-330.000.
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  - Roeschert, Horst; Pawlowski, Georg; and Fuchs, Juergen, 5,314,786, Cl. 430-270.000.
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  - Ohno, Tomeji; Yoshida, Tetsuo; and Fuda, Yoshiaki, 5,315,205, Cl. 310-357.000.
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  - Lieber, Glen L.; Solar, Ronald J.; Wolf, Erich H.; and Fugoso, Mauricio L., Jr., 5,313,967, Cl. 128-772.000.
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  - Asano, Seiji, 5,315,484, Cl. 361-765.000.
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  - Abe, Tsutomu; Makida, Seigo; and Kobayashi, Kenichi, 5,315,102, Cl. 250-208.100.
  - Taniuchi, Kazuman; Kouno, Katuyuki; and Sekine, Hiroshi, 5,315,416, Cl. 358-537.000.
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- Fujimura, Yasushi, to Sumitomo Electric Industries, Ltd. Photo-sensing device. 5,315,148, Cl. 257-458.000.
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  - Takedoi, Atsushi; Tanihara, Mamoru; Harada, Tosiharu; Isoai, Masaru; and Fujita, Kazuhiro, 5,314,750, Cl. 428-402.000.
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  - Ishikawa, Hiroshi; Watanabe, Kazuhiro; Kawabe, Kenji; and Shimura, Takaki, 5,313,950, Cl. 128-662.060.
  - Kajiwara, Yasuhiro; and Yazawa, Shigehiko, 5,315,588, Cl. 370-60.100.
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  - Kotani, Seigo, 5,315,180, Cl. 307-480.000.
  - Kurihara, Kazuaki; Kawarada, Motonobu; Sasaki, Ken-ichi; and Teshima, Akitomo, 5,314,726, Cl. 427-577.000.
  - Kusakawa, Mari, 5,315,702, Cl. 395-164.000.
  - Morizono, Toshiaki; and Suga, Takaaki, 5,315,582, Cl. 370-16.000.
  - Norton, David E., Jr., 5,315,168, Cl. 307-351.000.
  - Sato, Atsushi; and Kusakari, Kouichi, 5,315,458, Cl. 360-78.080.
  - Sato, Yoshihide, 5,315,146, Cl. 257-390.000.
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  - Usimaru, Imao, 5,315,185, Cl. 307-520.000.
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  - Cadwell, Peter F.; and Anglin, Noah L., 5,315,478, Cl. 361-684.000.
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  - Tsukune, Atuhiro; Furumura, Yuji; and Masanobu, Hatanaka, 5,314,724, Cl. 427-489.000.
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  - Yamamoto, Akihiko; Yamada, Toshihiro; Natori, Tatsuo; Naya, Kotaro; Satoo, Motohiro; Fujiwara, Mitsuru; Matsubara, Katsumi; Shinoki, Kazuaki; and Kameya, Hirotaka, 5,314,321, Cl. 418-178.000.
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  - Higuchi, Fumihiko; and Fukasawa, Yoshio, 5,314,573, Cl. 156-643.000.
- Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; and Sato, Chikara, to Canon Kasbushiki Kaisha. Apparatus for the demodulation of a carrier chrominance signal into color difference signals. 5,315,379, Cl. 348-713.000.
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- Fukayama, Junichi: *See—*
  - Hata, Hiroaki; Ichimoto, Kazuhisa; Morita, Kazunori; and Fukayama, Junichi, 5,314,318, Cl. 418-60.000.
- Fukazawa, Fumio, to Bridgestone Sports Co., Ltd. Production of rubber thread - wound golf balls. 5,314,555, Cl. 156-170.000.
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  - Murase, Hiroshi; and Fukuda, Kazuyuki, 5,315,536, Cl. 364-569.000.
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Fukuda Metal Foil & Powder Co., Ltd.: *See—*
  Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
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  Nomura, Shinichi; Fukuda, Yoichi; Nagasaki, Atsushi; and Suda, Fumiyuki, 5,314,776, Cl. 430-65.000.
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  Lee, Peter W.; Wang, David N.; Nagashima, Makoto; Fukuma, Kazuto; and Sato, Tatsuya, 5,314,845, Cl. 437-238.000.
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  Tomita, Mamoru; Kitazawa, Takesi; Kawaura, Seiji; Fukuwatari, Yasuo; and Nojiri, Masanobu, 5,314,873, Cl. 514-21.000.
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  Maekawa, Koichiro; Ota, Takashi; Fukuyama, Masashi; and Nagasawa, Shinji, 5,315,678, Cl. 385-59.000.
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Fuller, Terry A.; and Jennings, Thomas. Anticipatory interactive protective system. 5,315,289, Cl. 340-532.000.
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  Beikirch, Thomas R.; Beck, Richard A.; Fullerton, Jack K.; and Taillie, Joseph P., 5,315,414, Cl. 358-512.000.
Fullerton, Ritchie J.: *See—*
  Georgopoulos, George; Fullerton, Ritchie J.; and Mattos, Louis J., 5,314,219, Cl. 292-320.000.
Fumakilla Limited: *See—*
  Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,314,991, Cl. 530-350.000.
Fumio, Nakahara: *See—*
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Fung, John. Dental crown. 5,314,335, Cl. 433-223.000.
Furahashi, Masaaki; and Handa, Ryoji, to Ando Electric Co., Ltd. Optical pulse generator. 5,315,677, Cl. 385-37.000.
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  Goode, Charles H., 5,313,830, Cl. 73-198.000.
Furr, Mark A. Leak detection device. 5,315,291, Cl. 340-605.000.
Furugohri, Yoshihiro; and Kumagai, Yukihisa, to Polyplastics Co. Ltd. Mold having a resin well forming a weld at the union of two separate resin streams. 5,314,326, Cl. 425-573.000.
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  Hashimoto, Dai; Yamamoto, Shoji; and Iwata, Zensuke, 5,314,649, Cl. 264-45.900.
  Yagi, Takeshi; Satoh, Tsuguo; Koinuma, Yoshiaki; and Yoshida, Kazuaki, 5,314,520, Cl. 65-3.110.
Furukawa, Isao: *See—*
  Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
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  Tsukune, Atuhiro; Furumura, Yuji; and Masanobu, Hatanaka, 5,314,724, Cl. 427-489.000.
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  Takanshi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,315,410, Cl. 358-471.000.
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  Toda, Hiromichi; Ishigami, Shigeyasu; Kobayashi, Norihisa; Furuya, Takaaki; and Izumi, Jun, 5,313,781, Cl. 60-39.120.
Fusca, Joseph: *See—*
  Brown, Robert W.; Coopes, Ian H.; Fusca, Joseph; Gifkins, Kenneth J.; and Irvin, John A., 5,314,539, Cl. 118-718.000.
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  Luria, David, 5,314,143, Cl. 244-118.100.
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  Midler, Michael, Jr.; Paul, Edward L.; Whittington, Edwin F.; Futran, Mauricio; Liu, Paul D.; Hsu, Jaanpyng; and Pan, Shih-Hsie, 5,314,506, Cl. 23-295.00R.
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  Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
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  Becker, Daniel P.; Flynn, Daniel L.; and Villamil, Clara I., 5,314,886, Cl. 514-252.000.
  Chen, Barbara B.; Hanson, Gunnar J.; and Baran, John S., 5,314,920, Cl. 514-616.000.
  Desai, Bipinchandra N.; Koehler, Konrad F.; and Russell, Mark A., 5,314,895, Cl. 514-318.000.
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  Bergsma, Rudolph; and Waldorf, Lindsey E., 5,313,977, Cl. 137-43.000.
Gable, Derek: *See—*
  Caveza, Martin J.; and Gable, Derek, 5,314,338, Cl. 434-259.000.
Gabriele, Rotini L.: *See—*
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Gaddis, Ronald A., to Texas Instruments Incorporated. Electronic teaching apparatus having two-part partially and wholly actuated for indication of correct and incorrect answers. 5,314,340, Cl. 434-327.000.
Gagliardi, Matthew; and Mass, Noah B., to Ford Motor Company. Settable height adjusting fastener. 5,314,280, Cl. 411-182.000.
Gale, Robert M.; Nedberge, Diane E.; and Atkinson, Linda E., to Alza Corporation. Transdermal formulations, methods and devices. 5,314,694, Cl. 424-448.000.
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  Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogaert, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., 5,314,748, Cl. 428-345.000.
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Gallagher, Dennis M.; Pfeifer, Thomas M.; and Schoonmaker, Richard P., to Pitney Bowes Inc. Mailing machine including low speed sheet feeding and jam detection structure. 5,314,566, Cl. 156-441.500.
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  De Bortoli, Giuseppe; Zorzi, Claudio; and Gallina, Luca, 5,313,720, Cl. 36-117.000.
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  Raverdy, Yvan; Marillat, Christian; and Gally, Daniel, 5,315,103, Cl. 250-214.0VT.
Galperin, Leonid B., to UOP. Stable, high-yield reforming catalyst. 5,314,854, Cl. 502-66.000.
Gamble, Paul H. Twirling toy. 5,314,369, Cl. 446-247.000.
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Gan, Joseph; and Bertram, James L., to Dow Chemical Company, The. Cure inhibited epoxy resin compositions and laminates prepared from the compositions. 5,314,720, Cl. 427-386.000.
Gao, Hua, to Milwaukee Heart Research Foundation. Artificial heart. 5,314,469, Cl. 623-3.000.
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  Barnes, Ronny L.; and Mathews, H. Wayne, 5,313,769, Cl. 56-10.200.
Garavaglia, Carlo: *See—*
  Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Garavaglia, Carlo; and Mirenna, Luigi, 5,314,879, Cl. 514-63.000.
Garbassi, Fabio: *See—*
  Sommazzi, Anna; Lugli, Gabriele; Garbassi, Fabio; Calderazzo, Fausto; and Dell'Amico, Daniela B., 5,314,856, Cl. 502-167.000.
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Garcia-Mallol, Juan A., to Foster Wheeler Energy Corporation. Fluid-cooled jacket for an air-swept distributor. 5,314,008, Cl. 165-47.000.
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  Garfield, Allan S.; White, Noam; de Vriend, Max S.; and Cook, David J., 5,313,938, Cl. 128-205.160.
Garner, Ricky B.: *See—*
  Kansy, Robert J.; and Garner, Ricky B., 5,315,114, Cl. 250-332.000.
Garraffo, Hugo M.: *See—*
  Daly, John W.; Spande, Thomas F.; and Garraffo, Hugo M., 5,314,899, Cl. 514-339.000.
Garrison, Bobby D.: *See—*
  Gatley, William S., Jr.; and Garrison, Bobby D., 5,314,300, Cl. 415-119.000.
Gartside, Robert J., to ABB Lummus Crest Inc. Staged catalytic cracking process. 5,314,610, Cl. 208-80.000.
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  Yates, Jan B.; Procknow, David W.; Peterson, Brett J.; and Goplen, Gary D., 5,314,009, Cl. 165-72.000.

Gaskill, David K.: *See—*
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  Heister, Aloisius H. M.; and Nijsen, Andreas J. L., 5,314,213, Cl. 285-231.000.
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George, Douglas B.: *See—*
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  Gunz, Stefan; and Ghisleni, Livio, 5,315,099, Cl. 250-201.100.
Ghoneim, Youssef A.: *See—*
  Chin, Yuen-Kwok; and Ghoneim, Youssef A., 5,315,519, Cl. 364-426.020.
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  La Place, Christian; Martin, Nathalie; and Faivre, Michel, 5,314,076, Cl. 210-205.000.
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  Tseng, Mingchih M.; and Sweeney, Philip J., 5,313,909, Cl. 116-208.000.

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  - Harder, Abraham; DeHaan, Ben R.; Van der Plaat, Johannes B.; and Cummings, Marsha, 5,314,814, Cl. 435-177.000.
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- Goodman, Steven F.: *See—*
  - Swets, Mark D.; Williams, George A.; and Goodman, Steven F., 5,314,244, Cl. 312-330.100.
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  - Mace, Carl L., Jr.; Rex, William A.; and Chlebina, Lawrence E., 5,313,745, Cl. 51-326.000.
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  - Yovichin, Albert J., 5,313,827, Cl. 73-146.000.
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  - Miller, Bernhard; Gorny, Stefan; Kallenbach, Rainer; and Klug, Andreas, 5,315,516, Cl. 364-424.010.
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  - Smith, Scott; Pietrzykoski, Anthony; and Goss, Floyd, 5,315,107, Cl. 250-222.200.
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  - Fujii, Tetsuo; Kuroyanagi, Susumu; and Gotoh, Yoshitaka, 5,313,836, Cl. 73-517.00R.
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  - Rossoll, Mary P., 5,314,507, Cl. 29-623.400.
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- Grace Dearborn Inc.: *See—*
  - Clark, Brian E.; and Oleka, Ronald L., 5,314,660, Cl. 422-15.000.
- Grace, Kenneth P.; Donnelly, Michael B.; and Geraci, Dean J., to Spectranetics Corporation, The. Apparatus and method for soft focusing energy into an optical fiber array. 5,315,614, Cl. 372-101.000.
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- Graham, S. Neal. Vibratory drive unit. 5,314,058, Cl. 198-753.000.
- Gramnas, Finn. Artificial toggle joint. 5,314,498, Cl. 623-39.000.
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  - Olmsted, Bruce E.; and Tjapkes, Stanley A., 5,313,853, Cl. 74-473.00P.

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  - Camps, Antoine N. J. M.; Grandjean, Pierre A.; Johnson, Gary M.; Lee, Philip H. J.; Lokhoff, Nicolaas M. H.; and Van Driel, Willem J., 5,314,463, Cl. 607-129.000.
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  - Knutsson, Evert; and Gransberg, Lennart, 5,313,956, Cl. 128-741.000.
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  - Windrem, Kevin D., 5,315,390, Cl. 348-584.000.
- Gratzinger, Paul: *See—*
  - Simon, Thomas E.; Nguyen, Thanh; and Gratzinger, Paul, 5,315,077, Cl. 200-11.00R.
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  - Gordon, Thomas A.; Gray, Barrett C.; McKenna, William; Stempien, Joseph W.; and Magnon, Ken P., 5,315,690, Cl. 395-104.000.
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  - Robin, Mark L.; Iikubo, Yuichi; Register, W. Douglas; and Rose, Richard S., 5,314,926, Cl. 521-98.000.
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- Green, David; Bolanos, Henry; and Leahy, Patrick F., to United States Surgical Corporation. Anvil delivery system. 5,314,435, Cl. 606-153.000.
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  - Stokoe, Geoffrey A.; Green, George M.; and Cayocca, Iver D., 5,314,263, Cl. 405-1.000.
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- Greetham, Geoffrey, to Manganese Bronze Limited. Method and apparatus for producing continuous powder metallurgy compacts. 5,314,655, Cl. 419-3.000.
- Gregory, David L.: *See—*
  - DuPree, Donald G.; Gregory, David L.; and Housman, Robert J., 5,315,116, Cl. 250-352.000.
- Greisinger, Martin: *See—*
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- Gribnau, Wilhelmus H. J. K., to Holec Projects B.V. Wind turbins. 5,315,159, Cl. 290-55.000.
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Wasinger, Eric; and Hall, David, 5,313,811, Cl. 68-5.00C.

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Furahashi, Masaaki; and Handa, Ryoji, 5,315,677, Cl. 385-37.000.

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Okazaki, Yoji; Goto, Chiaki; Hyuga, Hiroaki; and Harada, Akinori, 5,315,433, Cl. 359-328.000.

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Matuzawa, Tomoki; Yokota, Seiji; Emori, Katsuhiko; and Harada, Junichi, 5,314,229, Cl. 296-189.000.

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Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, 5,315,041, Cl. 564-506.000.

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Kawaguchi, Chikakazu; Meguro, Yoshio; and Harada, Takashi, 5,314,736, Cl. 428-143.000.

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Takedoi, Atsushi; Tanihara, Mamoru; Harada, Tosiharu; Isoai, Masaru; and Fujita, Kazuhiro, 5,314,750, Cl. 428-402.000.

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Konop, Jeffrey A., 5,314,082, Cl. 212-147.000.

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Foote, James C.; Harral, Michael W.; and Rowland, Peter J., 5,314,402, Cl. 600-20.000.

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Cherne, Richard D., 5,315,144, Cl. 257-351.000.

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Staniec, Robert, 5,314,620, Cl. 210-611.000.

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Szarata, Mathias, 5,314,159, Cl. 248-476.000.

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Pal, Uday B.; Gazula, Gopala K. M.; and Hasham, Ali, 5,314,524, Cl. 75-10.350.

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Koibuchi, Shigeru; Isobe, Asao; and Hashimoto, Michiaki, 5,314,783, Cl. 430-191.000.

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Mihara, Akio; and Hashimoto, Seiji, 5,315,412, Cl. 358-512.000.

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Sakashita, Kazuhiro; Yusa, Terukazu; Takimoto, Isao; Hashizume, Takeshi; and Komoike, Tatsunori, 5,315,182, Cl. 307-482.100.

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Hatala, Edward: *See—*

Brent, Jason B.; Hatala, Edward; and Timms, John, 5,315,591, Cl. 370-85.600.

Hataoka, Seiichi: *See—*

Ono, Koichi; Okada, Tsunekazu; and Hataoka, Seiichi, 5,315,457, Cl. 360-77.140.

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Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,314,508, Cl. 29-623.500.

Hatton, Gregory J.; Helms, David A.; and Durrett, Michael G., to Texaco Inc. Volume meter system. 5,315,117, Cl. 250-356.100.

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Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,314,897, Cl. 514-332.000.

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Frutschi, Hans U.; Hausermann, Alfred; and Wettstein, Hans, 5,313,782, Cl. 60-39.170.

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Sandner, Helmut G.; Ulrich, Peter; Francois, Robert N.; and Hawkins, Michael, 5,314,133, Cl. 242-67.30R.

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Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.

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Arai, Tatsuo; Saito, Takayoshi; and Hayashizaki, Hiroaki, 5,314,269, Cl. 407-42.000.

Hayden, Gary K.: *See—*

McNichols, Larry A.; Badzinski, John D.; and Hayden, Gary K., 5,314,502, Cl. 604-20.000.

Haynes, John, to ICO, Inc. Ultrasonic thickness gage for pipe. 5,313,837, Cl. 73-622.000.

Hazen, William J.: *See—*

Stich, Frederick A.; Zahrte, Donald K., Sr.; Baxter, Richard V., Jr.; Folts, Douglas C.; Hubert, Thomas G.; Medina, Juan M.; Hazen, William J.; and Beistle, Edward G., 5,315,533, Cl. 364-480.000.

Hazleton Environmental: *See—*

Stirling, Thomas E., 5,314,622, Cl. 210-629.000.

Healey, Thomas C.: *See—*

Harris, Clark E.; Shaw, Joel R.; Healey, Thomas C.; and Morse, Mark J., 5,314,134, Cl. 242-71.100.

Health Research, Inc.: *See—*

Pandey, Ravindra K.; and Dougherty, Thomas J., 5,314,905, Cl. 514-410.000.

Hearn, Anthony R.: *See—*

Dew, Graham N.; Hearn, Anthony R.; Sebborn, David J.; and Young, Julian T., 5,315,463, Cl. 360-98.080.

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Auth, David C.; Intlekofer, Michael J.; Slota, Michael W.; Hinchcliffe, John S.; and Clement, Thomas J., 5,314,407, Cl. 604-22.000.

Hebert-Robinson, Carol A.: *See—*

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Hector, Wayne M.; and Arsenault, Cathleen M., to Minnesota Mining and Manufacturing Company. Recording disk hub bond. 5,315,579, Cl. 369-290.000.

Hedengren, Kristina H. V.: *See—*

Sutton, George H., Jr.; Little, Francis H.; Hedengren, Kristina H. V.; Charles, Richard J.; Kornrumpf, William P.; and Hurley, Donna C., 5,315,234, Cl. 324-242.000.

Hedrich, Roland: *See—*

Kaczynski, Ulrich; and Hedrich, Roland, 5,315,080, Cl. 200-47.000.

Hedrick, Paul A., to General Cable Industries, Inc. Male conductor plug for a cord set. 5,315,476, Cl. 361-652.000.

Heffington, Jack C.; and Squyres, H. Parks, to Simco/Ramic Corporation. Color line scan video camera for inspection system. 5,315,384, Cl. 348-93.000.

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Goss, John D.; Axelrod, Steve; Boissevain, Mathew; Hegland, Philip M.; and Wiley, Scott C., 5,315,124, Cl. 250-497.100.

Heidelberger Druckmaschinen AG: *See—*

Muller, Tobias, 5,313,886, Cl. 101-486.000.

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Heidmueller nee Degwitz, Elke; and Heidmueller, Harald, 5,314,445, Cl. 606-208.000.

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- Heilmann, Steven M.: *See—*
  - Babirad, Stefan A.; Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 5,314,975, Cl. 526-248.000.
- Heinrich, Theodore M.; and Schauder, Colin D., to Electric Power Research Institute. Converter for synchronous motor starting. 5,315,225, Cl. 318-712.000.
- Heister, Aloisius H. M.; and Nijsen, Andreas J. L., to Georg Fischer N.V. Pipe coupling. 5,314,213, Cl. 285-231.000.
- Heitze, Gerhard; and Meinhardt, Ulrich, to SMS Schloemann-Siemag Aktiengesellschaft. Upsetting press for reducing the width of rolling stock with internally cooled retaining rolls and driver rolls. 5,313,813, Cl. 72-201.000.
- Held, Robert P., to Du Pont de Nemours, E. I., and Company. Process for detackifying transferred toned images. 5,314,784, Cl. 430-254.000.
- Helfer, Jeffrey L.: *See—*
  - Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribbajan S.; and Wagner, Paul W., 5,315,338, Cl. 354-320.000.
- Hella KG Hueck & Co.: *See—*
  - Hoffmann, Wolfgang; Korner, Andre ; and Zimmer, Maik, 5,315,275, Cl. 335-86.000.
- Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., to Minnesota Mining and Manufacturing Company. Thermal-dye-bleach construction comprising a polymethine dye and a thermal carbanion-generating agent. 5,314,795, Cl. 430-517.000.
- Helling, David E.: *See—*
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- Helms, David A.: *See—*
  - Hatton, Gregory J.; Helms, David A.; and Durrett, Michael G., 5,315,117, Cl. 250-356.100.
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- Helmstetter, Richard C.: *See—*
  - Schmidt, Glenn H.; and Helmstetter, Richard C., 5,314,184, Cl. 273-164.100.
- Help Yourself Designs, Incorporated: *See—*
  - Hammer, Nicholas A., 5,314,221, Cl. 294-19.100.
- Helsel, Sherry L. F.: *See—*
  - d'Aragona, Frank S.; Wells, Raymond C.; and Helsel, Sherry L. F., 5,314,107, Cl. 228-116.000.
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  - Stein, Walter, 5,314,327, Cl. 425-589.000.
- Hemzy, Wayne R.; and Knapp, Thomas G., to Leco Corporation. Sample autoloader for use with an analytical combustion furnace. 5,314,662, Cl. 422-62.000.
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  - Tuller, F. Norman; and Allen, Michael E., 5,314,718, Cl. 427-394.000.
- Henrion, Philippe, to Valeo. Progressive dry friction clutch plate. 5,314,052, Cl. 192-107.00C.
- Henry, Richard L.: *See—*
  - Berry, Alan D.; Gaskill, David K.; Holm, Ronald T.; Cukauskas, Edward J.; Kaplan, Raphael; and Henry, Richard L., 5,314,866, Cl. 505-447.000.
- Henson, Carle C., III: *See—*
  - Kepley, W. Robert; Kay, Stanley E.; Roy, Ashim; Kee, Steven M.; Henson, Carle C., III; Morris, Adrian J.; and Drago, Randy, 5,315,589, Cl. 370-62.000.
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  - Barone, Stan T.; Hepburn, Ian R.; Fladmoe, Gary E.; and Vavra, Robert D., 5,315,711, Cl. 395-275.000.
- Heraeus Quarzglas GmbH: *See—*
  - Fabian, Heinz; and Thomas, Stephan, 5,315,685, Cl. 385-142.000.
- Herber, Wayne K.: *See—*
  - Bailey, Fred J.; and Herber, Wayne K., 5,314,822, Cl. 435-253.400.
- Heredia, George L.; Almblad, Robert E.; and Mueller, Mike A., to Axxess Entry Technologies. Method and apparatus for duplicating keys using tip-referenced alignment between key blank and master key. 5,314,274, Cl. 409-81.000.
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- Hergenrother, William L.; and Doshak, John M., to Bridgestone/Firestone, Inc. Process and isomerizing agent for isomerizing partially hydrogenated diene polymers. 5,314,967, Cl. 525-337.000.
- Herguth Laboratories: *See—*
  - Herguth, William R.; and Yates, Peter, 5,313,824, Cl. 73-53.050.
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  - Swets, Mark D.; Williams, George A.; and Goodman, Steven F., 5,314,244, Cl. 312-330.100.
- Hermann, Allen M.; and Sheng, Zhengzhi, to University of Arkansas. Process for making Tl-Ba-Ca-Cu-O superconductors using thallium vapor. 5,314,867, Cl. 505-430.000.
- Hernandez, Jose A.: *See—*
  - Campos, Rafael E.; and Hernandez, Jose A., 5,314,615, Cl. 208-370.000.
- Herndon, Oma L.; Russell, Ruis; and Hite, John D., Jr. Method and apparatus for stack separator and restacker. 5,314,297, Cl. 414-796.500.
- Herrig, Wolfgang: *See—*
  - Jansen, Ulrich; Ott, Karl-Heinz; Herrig, Wolfgang; Koch, Otto; Pischtschan, Alfred; and Wittmann, Dieter, 5,314,990, Cl. [illegible].
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  - Rober, Stefan; Mugge, Joachim; Feinauer, Roland; Jadamus, Hans; Herrmann, Hans-Dieter; and Ries, Hans, 5,313,987, Cl. 138-137.000.
- Hersch, Brian L., to Hersch & Company. Game apparatus. 5,314,197, Cl. 273-430.000.
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  - Hersch, Brian L., 5,314,197, Cl. 273-430.000.
- Hershey, Stephen A.; Vargas, J. Ramon; and Burns, Paul A., to Eastman Kodak Company. Tone control of photographic silver images. 5,314,790, Cl. 430-356.000.
- Heselius, Lars: *See—*
  - Willman, Tarmo; Brunila, Esko; Pelto, Bjarne; and Heselius, Lars, 5,313,758, Cl. 52-415.000.
- Hesketh, Kevin W.; and Hexter, Brian C., to British Nuclear Fuels PLC. Production of nuclear fuel. 5,315,624, Cl. 376-261.000.
- Heskett, Don E., to KDF Fluid Treatment, Inc. Method for treating fluids. 5,314,623, Cl. 210-638.000.
- Hess, Randall L.; Cooper, Patrick R.; Interiano, Armando; and Freiman, Joseph F., to Compaq Computer Corp. Battery charge monitor and fuel gauge. 5,315,228, Cl. 320-31.000.
- Hessing, Charles E.; Shelton, Boyd N.; and Barnes, Robert K., to Hewlett-Packard Company. Programmable servo timing generator. 5,315,456, Cl. 360-77.080.
- Heuberger, Erich; Knorrich, Wolf-Dieter; Dziallas, Joachim W.; Plester, George; and Troska, Georg, to Coca-Cola Company, The; and Carl Edelmann GmbH. Cardboard packaging for liquids. 5,314,088, Cl. 220-465.000.
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  - Camis, Thomas, 5,314,774, Cl. 430-47.000.
  - Draving, Steven D., 5,315,627, Cl. 377-20.000.
  - Figge, Timothy A., 5,314,342, Cl. 439-66.000.
  - Fong, Jon J.; and Reid, William B., 5,315,472, Cl. 361-212.000.
  - Hessing, Charles E.; Shelton, Boyd N.; and Barnes, Robert K., 5,315,456, Cl. 360-77.080.
  - Huson, F. Russell; Pissanetzky, Sergio; and Larson, John D., III, 5,315,276, Cl. 335-216.000.
  - Khormaee, Izadpour, 5,315,316, Cl. 346-1.100.
  - Melton, Hewlett E., Jr., 5,313,946, Cl. 128-660.020.
  - Phaal, Peter, 5,315,580, Cl. 370-13.000.
  - Snider, Gregory S., 5,315,178, Cl. 307-465.000.
  - Swedberg, Sally A., 5,314,593, Cl. 204-180.100.
- Hexter, Brian C.: *See—*
  - Hesketh, Kevin W.; and Hexter, Brian C., 5,315,624, Cl. 376-261.000.
- Hibbard, Robert H., to Eastman Kodak Company. Method and apparatus for through-the-lens distance determination. 5,315,341, Cl. 354-402.000.
- Hibbs, Richard N.: *See—*
  - Freige, D. Edmond; and Hibbs, Richard N., 5,313,699, Cl. 29-632.000.
- Hibel, George R.: *See—*
  - Moser, Mark D.; Kalnes, Tom N.; Jan, Chwu-Ching; and Hibel, George R., 5,314,614, Cl. 208-262.100.
- Hicks, Ray. Automated photographic negative card holder. 5,315,348, Cl. 355-50.000.
- Hidaka, Akio; Terajima, Tsutomu; Haga, Yuu; Nakabayashi, Shigemitsu; and Okumura, Akihiro, to Honda Giken Kabushiki Kaisha. Method of casting vehicle wheel. 5,314,001, Cl. 164-125.000.
- Hidaka, Hidemasa: *See—*
  - Kono, Toshiaki; Yamaguchi, Goichi; and Hidaka, Hidemasa, 5,314,810, Cl. 435-97.000.
- Hidaka, Hideto: *See—*
  - Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.
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- Higaki, Kenjiro: *See—*
  - Matsuura, Takashi; Higaki, Kenjiro; and Itozaki, Hideo, 5,314,870, Cl. 505-476.000.
- Higashio, Yasuhiko: *See—*
  - Kajikuri, Hiroshi; Kitamura, Masaru; and Higashio, Yasuhiko, 5,315,039, Cl. 564-2.000.
- Higgins, Deborah L.: *See—*
  - Anderson, Stephen P.; Higgins, Deborah L.; Hotchkiss, Adair J.; and Marks, Cara B., 5,314,818, Cl. 435-226.000.
- High Voltage Engineering Europa B.V.: *See—*
  - Mous, Dirk J. W., 5,315,118, Cl. 250-396.0ML.
- Highland Supply Corporation: *See—*
  - Weder, Donald E.; and Straeter, Joseph G., 5,314,398, Cl. 493-121.000.
- Highlen, John L.; and Clark, Alan K., to Aeroquip Corporation. Flexible joint. 5,314,214, Cl. 285-233.000.

- Hightower, James C.: *See—*
  - Wang, Taylor G.; Lin, Kuan-Chan; and Hightower, James C., 5,315,254, Cl. 324-452.000.
- Higley, Lin R.: *See—*
  - McHardy, John; Townsend, Carl W.; Higley, Lin R.; and Ludwig, Frank A., 5,315,162, Cl. 307-201.000.
- Higuchi, Fumihiko; and Fukasawa, Yoshio, to Tokyo Electron Limited. Dry etching polysilicon using a bromine-containing gas. 5,314,573, Cl. 156-643.000.
- Higuchi, Hirokazu, to Canon Kabushiki Kaisha. Image processing method and apparatus. 5,315,671, Cl. 382-57.000.
- Higuchi, Russell G.: *See—*
  - Erlich, Henry A.; and Higuchi, Russell G., 5,314,809, Cl. 435-91.200.
- Hijiri, Masao: *See—*
  - Yamagishi, Masahiro; Hijiri, Masao; Komatsu, Yasuo; Edagawa, Hiroshi; and Imaeda, Naoki, 5,314,180, Cl. 273-73.00F.
- Hilger, Robert L.; Davis, John R.; and Meister, John A., to Frymaster Corporation, The. Spaghetti cooking system. 5,313,876, Cl. 99-330.000.
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  - Hill, Giles A., III; Hill, Giles A., Jr.; and Birdsong, Duane S., 5,313,994, Cl. 152-323.000.
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- Hill, Ronald S.: *See—*
  - Brauker, James H.; Hill, Ronald S.; Martinson, Laura A.; Boggs, Daniel R.; and Johnson, Robert C., 5,314,471, Cl. 623-11.000.
- Hillen, Walter; and Snoeren, Rudolph M., to U.S. Philips Corporation. Method of generating X-ray images, and X-ray apparatus for carrying out the method. 5,315,631, Cl. 378-98.800.
- Himori, Shunichi, to Mitsubishi Petrochemical Company Limited. Process for preparing graft copolymers. 5,314,958, Cl. 525-256.000.
- Himori, Shunichi: *See—*
  - Otsu, Takayuki; Himori, Shunichi; and Kiriyama, Takashi, 5,314,962, Cl. 525-280.000.
- Hinchcliffe, John S.: *See—*
  - Auth, David C.; Intlekofer, Michael J.; Slota, Michael W.; Hinchcliffe, John S.; and Clement, Thomas J., 5,314,407, Cl. 604-22.000.
- Hinkle, Stanley J., to Detroit Diesel Corporation. Two-cycle engine compressor. 5,314,314, Cl. 417-364.000.
- Hinks, Richard S.: *See—*
  - Le Roux, Patrick L.; and Hinks, Richard S., 5,315,249, Cl. 324-309.000.
- Hinshaw, Waldo S.: *See—*
  - Crowley, Christopher; Buchanan, D. Scott; and Hinshaw, Waldo S., 5,313,944, Cl. 128-653.100.
- Hintz, John: *See—*
  - Puetz, Peter A.; and Hintz, John, 5,315,252, Cl. 324-402.000.
- Hirabayashi, Koichi: *See—*
  - Morikawa, Michio; and Hirabayashi, Koichi, 5,313,880, Cl. 99-537.000.
  - Morikawa, Michio; and Hirabayashi, Koichi, 5,314,322, Cl. 425-142.000.
- Hirae, Sadao; Kondo, Noriyuki; and Sato, Seiichiro, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for evaluating crystal rate in silicon thin film. 5,314,831, Cl. 437-8.000.
- Hirai, Nobuyuki; and Hara, Masato, to Canon Kabushiki Kaisha. Facsimile apparatus in which input to memory is controlled based upon capacity of external storage device. 5,315,403, Cl. 358-404.000.
- Hiramatsu, Koji; and Yoshida, Ryoichi, to Takata Corporation. Buckle pretensioner for seat belt systems. 5,313,690, Cl. 24-641.000.
- Hirasaki, Norio; and Takagi, Junichi, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package and flash unit. 5,315,332, Cl. 354-149.110.
- Hirasawa, Masahide, to Canon Kabushiki Kaisha. Video camera apparatus. 5,315,340, Cl. 354-400.000.
- Hirayama, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with precharging voltage level unchanged by defective memory cell. 5,315,551, Cl. 365-200.000.
- Hirobe, Junichi; Akashi, Masakatsu; Kobayashi, Masahiko; and Sugaya, Tsutomu, to Mita Industrial Co., Ltd. Image forming apparatus provided with a controller for fixing roller heater. 5,315,350, Cl. 355-208.000.
- Hiroi, Masao: *See—*
  - Tada, Eiichi, 5,314,311, Cl. 417-50.000.
- Hirosawa, Makoto, to Dainippon Screen Mfg. Co., Ltd. Method and system for integrating in a single image, character and graphical information by employing data of different pixel resolution. 5,315,693, Cl. 395-128.000.
- Hirose, Hisataka: *See—*
  - Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; and Sato, Chikara, 5,315,379, Cl. 348-713.000.
- Hirose, Youji: *See—*
  - Simazaki, Yuzuru; Kumasaka, Takao; Satoh, Kunio; and Hirose, Youji, 5,315,353, Cl. 355-251.000.
- Hiroshima University: *See—*
  - Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,314,991, Cl. 530-350.000.
- Hirota, Takao; Shinohara, Hideo; and Kuroda, Katsuhiko, to Mitsubishi Kasei Corporation. Thermal transfer recording sheet. 5,314,862, Cl. 503-227.000.
- Hirschberg, Jakub; and Strandberg, Hans, to Siemens Aktiengesellschaft. Protective arrangement for an implantable defibrillator. 5,314,452, Cl. 607-36.000.
- Hiscock, Laura J.: *See—*
  - Cooke, Michael T.; and Hiscock, Laura J., 5,314,923, Cl. 521-64.000.
- Hishiki, Teruo: *See—*
  - Atsumi, Yukihiko; Hishiki, Teruo; and Onodera, Makoto, 5,313,704, Cl. 30-43.600.
- Hitachi Cable Ltd.: *See—*
  - Okinoshima, Hiroshige; Kozakai, Shohei; and Abe, Tomiya, 5,314,979, Cl. 528-15.000.
- Hitachi Chemical Co., Ltd.: *See—*
  - Koibuchi, Shigeru; Isobe, Asao; and Hashimoto, Michiaki, 5,314,783, Cl. 430-191.000.
- Hitachi Construction Machinery Co., Ltd.: *See—*
  - Hashimoto, Hisayoshi; and Tamura, Morio, 5,314,553, Cl. 156-153.000.
- Hitachi Engineering, Inc.: *See—*
  - Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, 5,315,460, Cl. 360-85.000.
- Hitachi Koki Co., Ltd.: *See—*
  - Simazaki, Yuzuru; Kumasaka, Takao; Satoh, Kunio; and Hirose, Youji, 5,315,353, Cl. 355-251.000.
- Hitachi, Ltd.: *See—*
  - Abe, Nobuo; Horie, Tatsuo; Yamanaka, Toshio; and Simada, Atsui, 5,314,317, Cl. 418-55.200.
  - Hata, Hiroaki; Ichimoto, Kazuhisa; Morita, Kazunori; and Fukayama, Junichi, 5,314,318, Cl. 418-60.000.
  - Itoh, Hiroyuki; and Sasaki, Minoru, 5,315,123, Cl. 250-492.200.
  - Iwami, Naoko; Matsui, Susumu; and Saito, Toru, 5,315,705, Cl. 395-200.000.
  - Kambara, Hideki; and Nagai, Keiichi, 5,314,602, Cl. 204-299.00R.
  - Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, 5,314,509, Cl. 34-406.000.
  - Kirino, Fumiyoshi; Nakamura, Junko; Suzuki, Ryo; Yoshihiro, Masafumi; Yamada, Yukinori; and Ohta, Norio, 5,315,577, Cl. 369-116.000.
  - Kishimoto, Yoshinori; and Yamano, Koichi, 5,315,710, Cl. 395-700.000.
  - Koibuchi, Shigeru; Isobe, Asao; and Hashimoto, Michiaki, 5,314,783, Cl. 430-191.000.
  - Matsuura, Kunihisa; and Horiba, Yoshio, 5,315,511, Cl. 364-408.000.
  - Mimura, Tomonori, 5,314,663, Cl. 422-67.000.
  - Mizutani, Tatsumi; Yunogami, Takashi; Yokokawa, Kenetsu; and Kobayashi, Nobuyoshi, 5,314,839, Cl. 437-173.000.
  - Nagamatsu, Yuji, 5,315,697, Cl. 395-155.000.
  - Nakano, Yukio; Takase, Akihiko; Takatori, Masahiro; and Yanagi, Junichirou, 5,315,581, Cl. 370-16.000.
  - Nakao, Takeshi; Arimoto, Akira; Ogawa, Kensuke; Sukeda, Hirofumi; and Sugiyama, Hisataka, 5,315,573, Cl. 369-100.000.
  - Nakayama, Masahiro; Takeuchi, Hisaharu; Tohchi, Mamoru; and Numakura, Satoshi, 5,315,447, Cl. 360-49.000.
  - Nakayama, Masahiro; Takeuchi, Hisaharu; Takamatsu, Hisashi; Tohchi, Mamoru; and Kurano, Akira, 5,315,451, Cl. 360-72.200.
  - Nishida, Tetsuya; and Horigome, Shinkichi, 5,314,734, Cl. 428-64.000.
  - Shoji, Kazuyoshi; Muto, Tadashi; Kubota, Yasurou; Seki, Koichi; Izawa, Kazuto; and Nabetani, Shinji, deceased, 5,315,547, Cl. 365-185.000.
  - Simazaki, Yuzuru; Kumasaka, Takao; Satoh, Kunio; and Hirose, Youji, 5,315,353, Cl. 355-251.000.
  - Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, 5,315,460, Cl. 360-85.000.
  - Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, 5,315,482, Cl. 361-707.000.
  - Tanaka, Kazuaki; Matsuki, Takeshi; and Takaragi, Kazuo, 5,315,634, Cl. 379-57.000.
  - Tanaka, Tsuyoshi; Aoki, Satoshi; and Fukuda, Kazuyuki, 5,315,609, Cl. 372-43.000.
  - Yamamoto, Akihiko; Yamada, Toshihiro; Natori, Tatsuo; Naya, Kotaro; Satoo, Motohiro; Fujiwara, Mitsuru; Matsubara, Katsumi; Shinoki, Kazuaki; and Kameya, Hirotaka, 5,314,321, Cl. 418-178.000.
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  - Kurashige, Tomoyuki; Imaide, Takuya; and Tarumizu, Hiroyuki, 5,315,394, Cl. 348-229.000.
- Hitachi Maxell, Ltd.: *See—*
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- Hitachi Seiko, Ltd.: *See—*
  - Arai, Kunio; and Kanaya, Yasuhiko, 5,315,072, Cl. 174-262.000.
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  - Aihara, Kintaro; and Honda, Tadashi, 5,313,863, Cl. 83-171.000.
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  - Anderson, Stephen P.; Higgins, Deborah L.; Hotchkiss, Adair J.; and Marks, Cara B., 5,314,818, Cl. 435-226.000.
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  - Elwell, Dennis F., 5,315,154, Cl. 257-707.000.
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  - Fischer, Adam, Jr.; Strauss, Richard F.; Chu, Kwang-Ho; Levy, Sidney; and Hurt, Mark, 5,313,702, Cl. 29-883.000.
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  - Rendahl, Ingvar F.; and Tornqvist, Borje G. S., 5,313,900, Cl. 112-316.000.
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  - Girard, Yves; Hutchinson, John H.; Therien, Michel; and Delorme, Daniel, 5,314,900, Cl. 514-339.000.
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  - Coulcher, Richard D., Jr.; Hyde, Alan A.; and Ridley, Michael L., 5,313,931, Cl. 126-401.000.
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  - Hauser, Ray M.; and Johnson, Alan W., 5,314,387, Cl. 475-74.000.
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- Ichikawa, Katsumi; Ozaki, Keiji; and Ohshiba, Hisanori, to Kabushiki Kaisha Kobe Seiko Sho. Tire vulcanizing machine and method. 5,314,648, Cl. 264-40.500.
- Ichikawa, Kousyu: *See—*
  - Nakao, Mitsuya; Tanaka, Keiichiro; Ichikawa, Kousyu; Yamamoto, Akio; and Matsubara, Tadakazu, 5,315,395, Cl. 348-789.000.
- Ichikawa, Naoki: *See—*
  - Yamanaka, Masahiro; Hori, Kazuya; Ichikawa, Naoki; and Washimi, Mizuo, 5,314,941, Cl. 524-425.000.
- Ichikawa, Shunichi: *See—*
  - Kaneko, Hitoshi; and Ichikawa, Shunichi, 5,313,871, Cl. 91-361.000.
- Ichimoto, Kazuhisa: *See—*
  - Hata, Hiroaki; Ichimoto, Kazuhisa; Morita, Kazumori; and Fukayama, Junichi, 5,314,318, Cl. 418-60.000.
- ICI Americas, Inc.: *See—*
  - Coogan, Richard G.; and Vartan-Boghossian, Raznik, 5,314,942, Cl. 524-457.000.
  - Walker, Francis H.; and Baker, Don R., 5,314,865, Cl. 504-244.000.
- ICI Pharma: *See—*
  - Edwards, Philip N.; Oldham, Keith; and Waterson, David, 5,314,891, Cl. 514-269.000.
- ICO, Inc.: *See—*
  - Haynes, John, 5,313,837, Cl. 73-622.000.
- Ida, Yuichi; Kato, Hironori; Sasaki, Kunihiko; and Bannai, Hiroyuki, to Alps Electric Co., Ltd. Clock spring connector. 5,314,344, Cl. 439-164.000.
- Ide, Akiyoshi; and Muramatsu, Atsushi, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having vacuum-receiving chamber partially defined by elastic member for isolating high-frequency vibrations. 5,314,173, Cl. 267-140.140.
- Ide, Bruce H.: *See—*
  - Pohl, Anthony P.; and Ide, Bruce H., 5,314,426, Cl. 606-58.000.
- Idemitsu Petrochemical Co., Ltd.: *See—*
  - Kozakura, Shiro; Kuze, Shigeki; and Tanaka, Kenji, 5,314,949, Cl. 525-67.000.
- Ieyama, Kazuo: *See—*
  - Sekiguchi, Yoshitoshi; Saeki, Kunio; Okigami, Noboru; Hamabe, Kohei; Ieyama, Kazuo; and Knodo, Mamoru, 5,313,895, Cl. 110-346.000.
- Igarashi, Koichi: *See—*
  - Shindo, Kiyotaka; Igarashi, Koichi; Mizumoto, Kunihiko; and Hashimoto, Hidehiko, 5,314,757, Cl. 428-627.000.
- IGEN, Inc.: *See—*
  - Durfor, Charles N.; Bolin, Richard J.; Schantz, Allen R., II; and Massey, Richard J., 5,314,642, Cl. 252-309.000.
- Iguchi, Katsuji; Kakimoto, Seizo; and Shinmura, Naoyuki, to Sharp Kabushiki Kaisha. Semiconductor memory device. 5,314,835, Cl. 437-52.000.
- Iguchi, Satoshi: *See—*
  - Katoh, Kenji; Iguchi, Satoshi; and Kihara, Tetsuro, 5,313,792, Cl. 60-301.000.
- Iikubo, Yuichi: *See—*
  - Robin, Mark L.; Iikubo, Yuichi; Register, W. Douglas; and Rose, Richard S., 5,314,926, Cl. 521-98.000.
  - Sweval, Mark A.; Register, W. Douglas; Robin, Mark L.; and Iikubo, Yuichi, 5,314,682, Cl. 424-45.000.
- Iizuka, Kazuaki: *See—*
  - Ohshima, Kiyoshi; Tamiya, Yoshiyumi; Shimizu, Kenichi; Suzuki, Tadahiro; and Iizuka, Kazuaki, 5,315,323, Cl. 346-159.000.
- Iizuka, Shigeru; and Yatsuzuka, Youtaro, to Kokusai Denshin Denwa Co., Ltd. Echo canceller using two residual echoes. 5,315,585, Cl. 370-32.100.
- Ikada, Yoshito: *See—*
  - Oka, Masanori; Gen, Shokyu; Ikada, Yoshito; and Okimatsu, Hideaki, 5,314,478, Cl. 623-18.000.
- Ikari, Makoto: *See—*
  - Taira, Tetsusaburo; and Ikari, Makoto, 5,315,443, Cl. 359-885.000.
- Ikeda Bussan Co., Ltd.: *See—*
  - Mouri, Takayuki, 5,314,158, Cl. 248-429.000.
  - Suzuki, Mamoru; Inabe, Shinya; and Seki, Junko, 5,314,236, Cl. 297-284.800.
- Ikeda, Masaki: *See—*
  - Mizuno, Yasuo; Sugai, Masakatsu; Ikeda, Masaki; and Yoshida, Akihiko, 5,315,434, Cl. 359-355.000.
- Ikeda, Towl: *See—*
  - Saito, Masasi; Iwata, Teruo; Ishii, Nobuo; Ikeda, Towl; and Saeki, Hiroaki, 5,314,541, Cl. 118-725.000.
- Ikeda, Yoshiaki, to Fanuc Ltd. Workpiece exchanging system. 5,313,861, Cl. 82-1.110.
- Ikegaya, Akihiko; and Fujimori, Naoji, to Sumitomo Electric Industries Ltd. Process and apparatus for the production of diamond. 5,314,570, Cl. 117-103.000.
- Ikemoto, Yoshihiro; and Maruyama, Teruo, to Matsushita Electric Industrial Co., Ltd. Fluid-rotating apparatus. 5,314,312, Cl. 417-16.000.
- Ikemoto, Yoshihiro: *See—*
  - Kubo, Keishi; Ikemoto, Yoshihiro; and Itou, Tatsuo, 5,315,373, Cl. 356-373.000.
- Ikeo, Jirou: *See—*
  - Shimizu, Hiroshi; Ikeo, Jirou; Kabeta, Katsutoshi; and Miyazaki, Yoshito, 5,315,347, Cl. 355-043.000.
- Ikezoe, Mitsunori; and Motomiya, Shigeru, to Dainippon Ink and Chemicals, Inc. Artificial marble. 5,314,729, Cl. 428-15.000.
- Ikola, Kimmo J.; and Stenman, Kimmo E., to Tamglass Engineering OY. Method for removing a marginal zone external of an outline cut in a glass sheet. 5,314,523, Cl. 65-112.000.
- Illinois Tool Works Inc.: *See—*
  - Gierut, Joseph J., 5,315,079, Cl. 200-16.00D.
- Im, Catherine L.: *See—*
  - Tsou, Hai-Shen E.; Im, Catherine L.; Shreve, Gregory A.; and LaCon, Martin M., 5,315,303, Cl. 342-27.000.
- Imaeda, Naoki: *See—*
  - Yamagishi, Masahiro; Hijiri, Masao; Komatsu, Yasuo; Edagawa, Hiroshi; and Imaeda, Naoki, 5,314,180, Cl. 273-73.00F.
- Imai, Masaharu; Honsawa, Kunio; and Tomita, Jota, to Research Development Corporation of Japan. Filtering operation method for very high-speed image processing system. 5,315,699, Cl. 395-162.000.
- Imai, Shinichi: *See—*
  - Yasui, Takatoshi; Kudo, Chiaki; Nakao, Ichiro; Fujii, Toyokazu; Terai, Yuka; Imai, Shinichi; Yamamoto, Hiroshi; and Naito, Yasushi, 5,314,848, Cl. 437-248.000.
- Imaide, Takuya: *See—*
  - Kurashige, Tomoyuki; Imaide, Takuya; and Tarumizu, Hiroyuki, 5,315,394, Cl. 348-229.000.
- Imaizumi, Mitsuhiro; Kotani, Masataka; Kondo, Haruhiko; Iwasa, Takeshi; and Takiyama, Eiichiro, to Showa Highpolymer Co., Ltd. Polyester sheet. 5,314,969, Cl. 525-440.000.
- Imaizumi, Mitsuhiro: *See—*
  - Kondo, Haruhiko; Imaizumi, Mitsuhiro; Kamei, Ryosuke; Kimura, Hideharu; and Takiyama, Eiichiro, 5,314,927, Cl. 521-159.000.
- Imamura, Souichi, to Kabushiki Kaisha Toshiba. Method for dicing a semiconductor wafer. 5,314,844, Cl. 437-226.000.
- Impacto Enterprises, Inc.: *See—*
  - Sawyer, Elmer E.; Glover, Sanford; and Alderman, Wayne, 5,313,974, Cl. 137-12.000.
- Imperial Chemical Industries PLC: *See—*
  - Austin, Peter W.; and Tyreman, Neville, 5,315,009, Cl. 548-209.000.
  - Bushell, Michael J.; Beautement, Kevin; Clough, John M.; Anthony, Vivienne M.; deFraine, Paul; and Godfrey, Christopher R., 5,315,025, Cl. 560-60.000.
  - Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Bacon, David P., 5,314,892, Cl. 514-269.000.
  - Edwards, Philip N.; Oldham, Keith; and Waterson, David, 5,314,891, Cl. 514-269.000.
  - Johnson, Trevor; and Rennie, Robert A. C., 5,315,002, Cl. 536-122.000.
  - Nield, Eric; Ahmed, Riaz; and Choudhery, Riaz A., 5,314,751, Cl. 428-412.000.
  - Verhelst, Gabriel, 5,314,928, Cl. 521-159.000.
- Inaba, Shinji: *See—*
  - Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
- Inabe, Shinya: *See—*
  - Suzuki, Mamoru; Inabe, Shinya; and Seki, Junko, 5,314,236, Cl. 297-284.800.
- Inada, Kenichi; Takeshita, Akihiko; and Masai, Tetsuji, to Murata Kikai Kabushiki Kaisha. Yarn package inspecting apparatus. 5,315,366, Cl. 356-238.000.
- Inana, Katsuya, to Fuji Photo Film Co., Ltd. Liquid crystal finder/projector for video camera. 5,315,334, Cl. 354-219.000.
- Inbar, Michael; Slutzky, Gerald; Radushetzky, Mordechai; and Shitrit, David, to Eldan Technologies Co. Ltd. Method and means for density gradient centrifugation. 5,314,074, Cl. 209-208.000.
- InControl, Inc.: *See—*
  - Yomtov, Barry M.; and Kreyenhagen, Paul E., 5,313,953, Cl. 128-696.000.
- Indena S.p.A.: *See—*
  - Bombardelli, Ezio, 5,314,906, Cl. 514-411.000.
- Ingraham, John; Winslow, Brad; and Fargo, Foster, to Iris Graphics Inc. Apparatus and method for transforming the digital representation of a color input image. 5,315,380, Cl. 358-500.000.

- Innes, Mark E.: *See—*
  - Hurley, Rick A.; and Innes, Mark E., 5,315,471, Cl. 361-160.000.
- Innovate Limited: *See—*
  - Barker, Colin G., 5,315,238, Cl. 324-158.00F.
- Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, to Canon Kabushiki Kaisha. Apparatus and method for receiving and transmitted recording data. 5,315,397, Cl. 358-296.000.
- Inoue, Nobuyoshi: *See—*
  - Watabe, Ken-ichi; and Inoue, Nobuyoshi, 5,315,335, Cl. 354-252.000.
- Inoue, Tadashi: *See—*
  - Misao, Hitoshi; Yamauchi, Katsuhisa; Inoue, Tadashi; and Okita, Tomoyoshi, 5,314,549, Cl. 148-325.000.
- Input/Output, Inc.: *See—*
  - Berquist, Richard J., 5,315,074, Cl. 181-0.500.
- Institut Nationale de la Sante et de la Recherche Medicale: *See—*
  - Tiollais, Pierre; Chany, Charles; Dubois, Marie-Francoise; Pourcel, Christine; and Louise, Anne, 5,314,808, Cl. 435-69.300.
- Institut Pasteur: *See—*
  - Tiollais, Pierre; Chany, Charles; Dubois, Marie-Francoise; Pourcel, Christine; and Louise, Anne, 5,314,808, Cl. 435-69.300.
- Instrumentarium Corporation: *See—*
  - Ehnholm, Gosta J.; and Petersson, John S., 5,315,250, Cl. 324-309.000.
- Insul Holz-Beton Systems Inc.: *See—*
  - Walter, Hansruedi; and Walter-Gurzeler, Leni M., 5,314,744, Cl. 428-326.000.
- Intelligent Automation Systems, Inc.: *See—*
  - Gordon, Steven J., 5,314,055, Cl. 198-395.000.
- Interiano, Armando: *See—*
  - Hess, Randall L.; Cooper, Patrick R.; Interiano, Armando; and Freiman, Joseph F., 5,315,228, Cl. 320-31.000.
- International Business Machines Corporation: *See—*
  - Abbiate, Jean-Claude; Blanc, Alain; and Ungerboeck, Gottfried, 5,315,622, Cl. 375-106.000.
  - Acovic, Alexandre; Hsu, Ching-Hsiang; and Wu, Being S., 5,315,142, Cl. 257-316.000.
  - Baldwin, Clark F.; Howe, David B.; and Kellerman, Thomas B., 5,315,679, Cl. 385-76.000.
  - Bentley, Steven R.; Hutchins, Robert A.; Melas, Constantin M.; and Sutardja, Pantas, 5,315,284, Cl. 340-146.200.
  - Berrios, Miguel A.; and Covi, Kevin R., 5,315,498, Cl. 363-98.000.
  - Brady, Frederick T.; and Haddad, Nadim F., 5,314,841, Cl. 437-203.000.
  - Chan, Yuen H.; Pelella, Anthony R.; and Reohr, William R., 5,315,167, Cl. 307-296.600.
  - Chiu, George; Singh, Rama N.; and Wilczynski, Janusz S., 5,315,604, Cl. 372-25.000.
  - Dente, James J.; Jaquette, Glen A.; and Williams, William C., 5,315,568, Cl. 369-32.000.
  - Dew, Graham N.; Hearn, Anthony R.; Sebborn, David J.; and Young, Julian T., 5,315,463, Cl. 360-98.080.
  - DiNicola, Paul D.; Kantz, Joseph; Rahim, Omar M.; Rice, David A.; and Ruddick, Edward M., 5,315,701, Cl. 395-163.000.
  - Doany, Fuad E.; Grube, Gary W.; and Saraf, Ravi, 5,314,709, Cl. 427-96.000.
  - Eagle, David J.; and Morrish, Andrew J., 5,315,310, Cl. 345-14.000.
  - Fujisaki, Tetsunosuke; Kim, Joonki; Leibman, George J.; and Tappert, Charles C., 5,315,667, Cl. 382-13.000.
  - Harrison, Roy B.; and Wood, Roger T., 5,315,314, Cl. 345-186.000.
  - Hsieh, Chang-Ming; Hsu, Louis L.; and Silvestri, Victor J., 5,315,151, Cl. 257-592.000.
  - Kawase, Kei; Ishikawa, Shigeki; and Asaka, Shunichi, 5,315,517, Cl. 364-424.020.
  - Lawless, William F., 5,315,540, Cl. 364-764.000.
  - Lemble, Philippe, 5,315,504, Cl. 364-400.000.
  - Lin, Tsann; Howard, James K.; Hwang, Cherngye; Mauri, Daniele; and Staud, Norbert, 5,315,468, Cl. 360-113.000.
  - Natarajan, Bharath, 5,315,509, Cl. 364-401.000.
  - Owens, Gene R.; Reis, Robert J.; Shomo, Richard G.; and Wickus, Scott D., 5,314,346, Cl. 439-189.000.
  - Schepis, Dominic J.; Srikrishnan, Kris V.; Subbanna, Seshardi; and Tijwani, Manu J., 5,314,840, Cl. 437-194.000.
  - Tsujino, Hitoshi, 5,315,464, Cl. 360-99.080.
- International Foundation for Biochemical Endocrinology: *See—*
  - Pantic, Vladimir; Sijacki, Nestor; and Kolaric, Svetislav, 5,314,882, Cl. 514-170.000.
- International Technidyne Corporation: *See—*
  - Cusack, Robert; and Samo, Robert, 5,314,441, Cl. 606-182.000.
- Interroll Holding AG: *See—*
  - vom Stein, Hans, 5,314,296, Cl. 414-786.000.
- Intevep, S.A.: *See—*
  - Campos, Rafael E.; and Hernandez, Jose A., 5,314,615, Cl. 208-370.000.
- Intlekofer, Michael J.: *See—*
  - Auth, David C.; Intlekofer, Michael J.; Slota, Michael W.; Hinchcliffe, John S.; and Clement, Thomas J., 5,314,407, Cl. 604-22.000.
- Ireco, Inc.: *See—*
  - Nadherny, Rudolph E., 5,314,218, Cl. 292-256.500.
- Irie, Taka; and Nomura, Aki, to Kyocera America, Inc. Leadless ceramic package with improved solderabilty. 5,314,606, Cl. 205-128.000.
- Irigoite, Fabio; and Mallmann, Breno S., to Grupoutil Desenvolvimento de Produtos de/Utilidade Ltda. Support for consumption of elongated foods. 5,314,113, Cl. 229-117.120.
- Iris Graphics Inc.: *See—*
  - Ingraham, John; Winslow, Brad; and Fargo, Foster, 5,315,380, Cl. 358-500.000.
- Irisa, Shinsuke:.*See—*
  - Terada, Norishige; and Irisa, Shinsuke, 5,313,867, Cl. 84-404.000.
- Irmer, Joachim; and Kersting, Detlef, to Irmer, Joachim. Device for generating oscillations for dental applications. 5,314,333, Cl. 433-120.000.
- Irvin, John A.: *See—*
  - Brown, Robert W.; Coopes, Ian H.; Fusca, Joseph; Gifkins, Kenneth J.; and Irvin, John A., 5,314,539, Cl. 118-718.000.
- Irwin, John: *See—*
  - Case, Colyn; Meinerth, Kim; Irwin, John; and Fanning, Blaise, 5,315,696, Cl. 395-133.000.
  - Case, Colyn; Meinerth, Kim; Irwin, John; and Fanning, Blaise, 5,315,698, Cl. 395-162.000.
- Isaacson, Gary S.; and Old, Lansing A. Insulating wrap. 5,313,809, Cl. 62-530.000.
- Isayama, Yasutoshi: *See—*
  - Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, 5,315,041, Cl. 564-506.000.
- Ishi, Yuji; Nagao, Toru; and Sato, Harumatsu, to Itoki Co., Ltd. Shell structure for use with a chair having synchronously moving seat and seat back. 5,314,240, Cl. 297-452.150.
- Ishibashi, Kenji: *See—*
  - Hamada, Masataka; Ishibashi, Kenji; Ueda, Hiroshi; Otsuka, Hiroshi; and Hara, Yoshihiro, 5,315,339, Cl. 354-400.000.
- Ishibashi, Shinji, to Pegasus Sewing Machine Mfg. Co., Ltd. Automatic sewing apparatus. 5,313,898, Cl. 112-141.000.
- Ishida, Noriyuki: *See—*
  - Hayashi, Kazuo; and Ishida, Noriyuki, 5,314,488, Cl. 623-22.000.
- Ishigami, Shigeyasu: *See—*
  - Toda, Hiromichi; Ishigami, Shigeyasu; Kobayashi, Norihisa; Furuya, Takaaki; and Izumi, Jun, 5,313,781, Cl. 60-39.120.
- Ishigami, Toshio: *See—*
  - Sawaya, Hiromichi; and Ishigami, Toshio, 5,314,842, Cl. 437-211.000.
- Ishiguro, Mamoru; Yokota, Masato; and Yamauchi, Shingo, to Sony Corporation. Cassette autochanger systems. 5,315,444, Cl. 360-15.000.
- Ishihara, Hideshi: *See—*
  - Yamashita, Haruo; Ishihara, Hideshi; and Matsumoto, Yasuki, 5,315,381, Cl. 358-500.000.
- Ishii, Akira; Minomo, Syoichiro; Taniguchi, Michio; and Sugiyo, Masato, to Daihen Corporation. Plasma processing apparatus for generating uniform strip-shaped plasma by propagating microwave through rectangular slit. 5,315,212, Cl. 315-111.510.
- Ishii, Kenji; Kondo, Yoshinori; Matsumoto, Hiroyuki; and Sayama, Norio, to Mitsubishi Gas Chemical Company, Inc. Base board for printed circuit board. 5,314,740, Cl. 428-209.000.
- Ishii, Masami; Murayama, Osamu; Kasahara, Kenji; Horiuchi, Yoshimori; and Tokito, Toshihiro, to Sony Corporation. Cassette loading device for accommodating cassettes of different sizes in a tape cassette recording and/or reproducing apparatus. 5,314,141, Cl. 242-199.000.
- Ishii, Nobuo: *See—*
  - Saito, Masasi; Iwata, Teruo; Ishii, Nobuo; Ikeda, Towl; and Saeki, Hiroaki, 5,314,541, Cl. 118-725.000.
- Ishikawa, Hiroshi; Watanabe, Kazuhiro; Kawabe, Kenji; and Shimura, Takaki, to Fujitsu Limited. Ultrasonic probe. 5,313,950, Cl. 128-662.060.
- Ishikawa, Masao; Ueda, Yutaka; and Koboshi, Shigeharu, to Konica Corporation. Processing solution for light-sensitive silver halide color photographic material and processing method using the same. 5,314,791, Cl. 430-393.000.
- Ishikawa, Shigeki: *See—*
  - Kawase, Kei; Ishikawa, Shigeki; and Asaka, Shunichi, 5,315,517, Cl. 364-424.020.
- Ishikawa, Shinji: *See—*
  - Ito, Masumi; Hoshino, Sumio; and Ishikawa, Shinji, 5,314,518, Cl. 65-3.110.
- Ishikawa, Shiro, to Kankyouhozen Kotobuki-Seisakusyo Co., Ltd. Structure of incinerator plant. 5,313,894, Cl. 110-235.000.
- Ishikawa, Yoji; and Otani, Takashi, to Sony Corporation. Apparatus for display and selection of available television channels. 5,315,392, Cl. 348-570.000.
- Ishino, Masaru: *See—*
  - Nomura, Kotohiro; and Ishino, Masaru, 5,315,040, Cl. 564-422.000.
- Isoai, Masaru: *See—*
  - Takedoi, Atsushi; Tanihara, Mamoru; Harada, Tosiharu; Isoai, Masaru; and Fujita, Kazuhiro, 5,314,750, Cl. 428-402.000.
- Isobe, Asao: *See—*
  - Koibuchi, Shigeru; Isobe, Asao; and Hashimoto, Michiaki, 5,314,783, Cl. 430-191.000.
- Isohata, Shigeru; and Wakamatsu, Hisayoshi, to Whitaker Corporation, The. Connector and method for variable polarization. 5,314,356, Cl. 439-681.000.
- Isono, Haruo; and Yasuda, Minoru, to Nippon Hoso Kyokai. Three-dimensional image display using electrically generated parallax barrier stripes. 5,315,377, Cl. 348-51.000.
- ISP Investments Inc.: *See—*
  - Crivello, James V.; and Dougherty, James A., 5,314,929, Cl. 522-31.000.

- Itazaki, Hiroshi: *See—*
  - Yoshida, Tadashi; Koizumi, Kenzo; Kawamura, Yoshimi; Matumoto, Koichi; and Itazaki, Hiroshi, 5,314,911, Cl. 514-451.000.
- Ito, Hiroshi, to Kabushiki Kaisha Toshiba. Data recording/reproducing apparatus. 5,315,455, Cl. 360-75.000.
- Ito, Masao: *See—*
  - Hosotani, Shiro; Miki, Takahiro; and Ito, Masao, 5,315,301, Cl. 341-94.000.
- Ito, Masumi; Hoshino, Sumio; and Ishikawa, Shinji, to Sumitomo Electric Industries, Ltd. Method for producing glass preform for optical fiber. 5,314,518, Cl. 65-3.110.
- Ito, Nobuei: *See—*
  - Nakamura, Satoshi; Yamamoto, Minoru; Ito, Nobuei; and Hattori, Tadasi, 5,314,540, Cl. 118-723.0DC.
- Ito, Shinichiro; and Kinoshita, Yukiharu, to TDK Corporation. Coil device. 5,315,279, Cl. 336-178.000.
- Ito, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens system. 5,315,439, Cl. 359-689.000.
- Ito, Tsuyoshi; Watanabe, Junya; and Sawada, Shintaro, to Mitsubishi Kasei Corporation. Method for producing a spherical acrylonitrile crosslinked copolymer. 5,314,974, Cl. 526-206.000.
- Ito, Yasuyuki; Kawabe, Takeshi; Tojo, Yukio; and Takase, Takeo, to Sharp Kabushiki Kaisha. Video signal recording/reproducing system for increasing recording density of a frequency modulated signal. 5,315,402, Cl. 358-342.000.
- Ito, Yoshihiko: *See—*
  - Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
- Itoh, Hiroyuki; and Sasaki, Minoru, to Hitachi, Ltd. Electron beam lithography apparatus. 5,315,123, Cl. 250-492.200.
- Itoh, Tetsuro, to Mitsubishi Denki Kabushiki Kaisha. Wirecut electrical discharge machine utilizing silicon powder suspended in a dielectric material. 5,315,087, Cl. 219-69.120.
- Itoki Co., Ltd.: *See—*
  - Ishi, Yuji; Nagao, Toru; and Sato, Harumatsu, 5,314,240, Cl. 297-452.150.
- Itou, Atsushi: *See—*
  - Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, 5,314,509, Cl. 34-406.000.
- Itou, Tatsuo: *See—*
  - Kubo, Keishi; Ikemoto, Yoshihiro; and Itou, Tatsuo, 5,315,373, Cl. 356-373.000.
- Itou, Tetsuo: *See—*
  - Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, 5,315,460, Cl. 360-85.000.
- Itozaki, Hideo: *See—*
  - Matsuura, Takashi; Higaki, Kenjiro; and Itozaki, Hideo, 5,314,870, Cl. 505-476.000.
- ITT Corporation: *See—*
  - DuRocher, Dan; and Miller, Ellsworth, 5,314,204, Cl. 280-777.000.
  - Field, Robert J., 5,315,126, Cl. 257-10.000.
  - Murray, Timothy G., 5,314,363, Cl. 445-14.000.
- Iwakuni, Mikio: *See—*
  - Katsukura, Shuichi; and Iwakuni, Mikio, 5,315,302, Cl. 342-20.000.
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  - Watanabe, Kazuhito; Nanya, Toshiki; and Iwamoto, Yasuaki, 5,314,777, Cl. 430-106.000.
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- Iwasaka, Seiichi: *See—*
  - Maeda, Yutaka; Hanaki, Yoshimaro; and Iwasaka, Seiichi, 5,315,526, Cl. 364-474.280.
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  - Tomita, Mamoru; Kitazawa, Takesi; Kawaura, Seiji; Fukuwatari, Yasuo; and Nojiri, Masanobu, 5,314,873, Cl. 514-21.000.
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  - Suzuki, Koji; Enoki, Shigekazu; Takashima, Hiroshi; Iwata, Naoki; and Ueno, Yuichi, 5,315,061, Cl. 118-651.000.
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  - Stern, Roger A.; Edwards, Stuart D.; Jackson, Jerome; and Rosen, Arye, 5,314,466, Cl. 607-156.000.
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  - Rober, Stefan; Mugge, Joachim; Feinauer, Roland; Jadamus, Hans; Herrmann, Hans-Dieter; and Ries, Hans, 5,313,987, Cl. 138-137.000.
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  - Grinnell, Gary C.; Klowak, Bernard G.; and Bouchette, Michael P., 5,314,584, Cl. 162-109.000.
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  - Dennis, Simon M.; Steward, Philip R.; Downing, Roland W.; James, Simon M.; Ferguson, David A.; and Drouet, Dominik, 5,315,675, Cl. 385-32.000.
- Jameson, Lee K.: *See—*
  - Cohen, Bernard; and Jameson, Lee K., 5,314,737, Cl. 428-156.000.
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  - Moser, Mark D.; Kalnes, Tom N.; Jan, Chwu-Ching; and Hibel, George R., 5,314,614, Cl. 208-262.100.
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  - Paslay, Paul R.; and Jan, Yih-Min, 5,313,829, Cl. 73-151.000.
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  - Feal, Robert; Stelzmuller, Helmut; and Janssen, Peter, 5,314,096, Cl. 222-401.000.
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  - Vanmaele, Luc J.; and Janssens, Wilhelmus, 5,314,860, Cl. 503-227.000.
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  - Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.
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  - Huiskes, Hendrik W. J.; Ypma, Franciscus A. M.; and Jaspers, Pierre J. T. M., 5,314,494, Cl. 623-23.000.
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- Jennings, Alfred R., Jr.; and Abou-Sayed, Ibrahim S., to Mobil Oil Corporation. Technique for maximizing effectiveness of fracturing in massive intervals. 5,314,020, Cl. 166-281.000.
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  - Dickie, Robert G.; Tousson, Maurice; Edgar, William A.; and Jennings, Peter, 5,313,683, Cl. 15-117.000.
- Jennings, Thomas: *See—*
  - Fuller, Terry A.; and Jennings, Thomas, 5,315,289, Cl. 340-532.000.
- Jennmar Corporation: *See—*
  - Calandra, Frank, Jr.; Stankus, John C.; and Oldsen, John G., 5,314,268, Cl. 405-259.500.
- Jensen, Martin. Baby bottle caterer with separate refrigeration and heating units. 5,315,084, Cl. 219-689.000.
- Jensen, William L, to Manufacturing Technologies, Inc. Magnetic corner protector. 5,313,754, Cl. 52-255.000.
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  - Potash, Robert L.; Jentges, Carl J.; Burns, Stephen K.; and Potash, Richard J., 5,314,391, Cl. 482-7.000.
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  - Hauser, Ray M.; and Johnson, Alan W., 5,314,387, Cl. 475-74.000.
- Johnson, David G. Portable back support. 5,314,235, Cl. 297-284.500.
- Johnson, Gary G.: *See—*
  - Edwards, Daniel R.; and Johnson, Gary G., 5,314,239, Cl. 297-352.000.
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  - Camps, Antoine N. J. M.; Grandjean, Pierre A.; Johnson, Gary M.; Lee, Philip H. J.; Lokhoff, Nicolaas M. H.; and Van Driel, Willem J., 5,314,463, Cl. 607-129.000.
- Johnson, Glenn W., Jr.; McVicker, Henry J.; and Shelbourne, K. Donald, to Aircast, Inc. Thermal compress system. 5,314,455, Cl. 607-104.000.
- Johnson, Hoke S., III: *See—*
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- Johnson & Johnson Orthopaedics, Inc.: *See—*
  - Hamilton, John V.; Caldarise, Salvatore; and Treacy, Debra J., 5,314,492, Cl. 623-23.000.
  - Hoffman, William H.; Scott, Richard D.; and Rand, James A., 5,314,489, Cl. 623-22.000.
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- Johnson, Kevin M., to Eastman Kodak Company. Transfer drum with shim member to reduce system velocity fluctuations. 5,315,355, Cl. 355-277.000.
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- Johnson, Robert C.: *See—*
  - Brauker, James H.; Hill, Ronald S.; Martinson, Laura A.; Boggs, Daniel R.; and Johnson, Robert C., 5,314,471, Cl. 623-11.000.
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- Johnston, Richard S.; Budak, Paul V.; Schmidt, Robert C.; and Lee, Shih-Jong J., to NeoPath, Inc. Method and apparatus for rapidly processing data sequences. 5,315,700, Cl. 395-163.000.
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- Jones, Eric M. Folder/portfolio and origami construction for forming it from a rectangular blank. 5,314,112, Cl. 229-117.010.
- Jones, Jackie D.: *See—*
  - Murphy, Guy C.; Fuhrmann, Barrett J.; and Jones, Jackie D., 5,314,282, Cl. 411-426.000.
- Jones, Mark R.: *See—*
  - Forrest, Albert W., Jr.; and Jones, Mark R., 5,314,135, Cl. 242-72.100.
- Jones, Ronald D.: *See—*
  - Cassidy, Edward J.; and Jones, Ronald D., 5,314,542, Cl. 119-231.000.
- Jones, Roy, to CSL Lighting, Inc. Spring mount fixture housing. 5,314,148, Cl. 248-27.300.
- Jones, Roy K.: *See—*
  - Dartez, Terry R.; and Jones, Roy K., 5,314,023, Cl. 166-295.000.
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  - Guida, Allan A.; and Jonnalagadda, Krishnamurthy, 5,315,617, Cl. 375-39.000.
- Jordan, Michael D.: *See—*
  - Hanson, Thomas C.; Bonaquist, Dante P.; and Jordan, Michael D., 5,315,521, Cl. 364-468.000.
- Jose Collado Bonet, S.A.: *See—*
  - Bonet, Collado, 5,314,085, Cl. 215-252.000.
- Josefowicz, Jack Y.: *See—*
  - Doughty, John K.; Brand, Gerald; and Josefowicz, Jack Y., 5,315,306, Cl. 342-192.000.
- Josephson, Lee: *See—*
  - Lewis, Jerome M.; Menz, Edward T.; Kenny, Francis E.; Groman, Ernest V.; and Josephson, Lee, 5,314,679, Cl. 424-9.000.
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  - Rao, Vemulapalli D. N.; Kabat, Daniel M.; and Yeager, David A., 5,313,919, Cl. 123-193.400.
- Kabeta, Katsutoshi: *See—*
  - Shimizu, Hiroshi; Ikeo, Jirou; Kabeta, Katsutoshi; and Miyazaki, Yoshito, 5,315,347, Cl. 355-043.000.
- Kabushiki Kaisha Biomaterial Universe: *See—*
  - Oka, Masanori; Gen, Shokyu; Ikada, Yoshito; and Okimatsu, Hideaki, 5,314,478, Cl. 623-18.000.
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  - Nagai, Yuji; Tanikawa, Eiki; Ohshima, Hisao; and Kato, Kazushige, 5,315,153, Cl. 257-701.000.
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  - Ichikawa, Katsumi; Ozaki, Keiji; and Ohshiba, Hisanori, 5,314,648, Cl. 264-40.500.
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  - Yamamoto, Makoto; and Matsumoto, Tsuyoshi, 5,313,814, Cl. 72-319.000.
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  - Watanabe, Yasutaka; Matsui, Kenji; Teraoka, Fuminori; and Tanaka, Kohbun, 5,314,138, Cl. 242-107.200.
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  - Anma, Hideyuki, 5,314,177, Cl. 271-3.100.
  - Endo, Koichi, 5,315,139, Cl. 257-409.000.
  - Imamura, Souichi, 5,314,844, Cl. 437-226.000.
  - Ito, Hiroshi, 5,315,455, Cl. 360-75.000.

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Komatsu, Fumio; Okumura, Katsuya; and Miyoshi, Motosuke, 5,315,119, Cl. 250-398.000.
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Nagato, Hitoshi; and Koike, Yuzo, 5,315,356, Cl. 355-289.000.
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Ohhashi, Akinami, 5,315,665, Cl. 382-6.000.
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Yamaguchi, Kojiro, 5,315,248, Cl. 324-306.000.
Yamamoto, Naofumi; and Sekizawa, Hidekazu, 5,315,413, Cl. 358-512.000.

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Kamiya, Toshikazu, 5,315,293, Cl. 340-664.000.

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Morishita, Shinya, 5,314,725, Cl. 427-553.000.

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Chaboud, Gilbert; and Kalenine, Yvan, 5,315,599, Cl. 371-25.100.

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Fernschild, Guenter; Rudolph, Werner; and Brosch, Carsten, 5,315,046, Cl. 570-167.000.

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Miller, Bernhard; Gorny, Stefan; Kallenbach, Rainer; and Klug, Andreas, 5,315,516, Cl. 364-424.010.

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Moser, Mark D.; Kalnes, Tom N.; Jan, Chwu-Ching; and Hibel, George R.; 5,314,614, Cl. 208-262.100.

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Lang, Hans W.; and Straka, Alfred, 5,314,332, Cl. 433-66.000.

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Corby, Kenneth D.; Didas, Michael W.; Kalyandurg, Satyan R.; Ojha, Purnendu S.; Baister, Michael E.; Lenhard, Suzanne M.; and Gaudino, David M., 5,313,993, Cl. 141-364.000.

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Yamamoto, Akihiko; Yamada, Toshihiro; Natori, Tatsuo; Naya, Kotaro; Satoo, Motohiro; Fujiwara, Mitsuru; Matsubara, Katsumi; Shinoki, Kazuaki; and Kameya, Hirotaka, 5,314,321, Cl. 418-178.000.

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Shoshi, Masayuki; and Kanemoto, Akihiko, 5,314,997, Cl. 534-577.000.

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DiNicola, Paul D.; Kantz, Joseph; Rahim, Omar M.; Rice, David A.; and Ruddick, Edward M., 5,315,701, Cl. 395-163.000.

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Ando, Masatoshi; Mochizuki, Hiromine; and Yamamoto, Mitsuo, 5,314,132, Cl. 242-56.00R.

Kao Corporation: *See—*
Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, 5,315,041, Cl. 564-506.000.

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Kennedy, John; Kaplan, Donald S.; and Muth, Ross R., 5,314,989, Cl. 528-354.000.

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Karterman, Don S. Accumulator for oil slick skimmer. 5,314,617, Cl. 210-242.300.

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Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, 5,314,418, Cl. 604-282.000.

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Wilkerson, Stephen A.; Kaste, Robert P.; and Burns, Bruce P., 5,313,889, Cl. 102-439.000.

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Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,314,780, Cl. 430-128.000.

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Kato, Kenji; and Momochi, Takeshi, to Toshiba Kikai Kabushiki Kaisha. Numerical control apparatus having a teaching function and a method of teaching a machining program thereby. 5,315,503, Cl. 364-192.000.

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Saimi, Tetsuo; Momoo, Kazuo; and Kato, Makoto, 5,315,574, Cl. 369-109.000.

Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, to Hitachi, Ltd. Vacuum processing apparatus and operating method therefor. 5,314,509, Cl. 34-406.000.

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Katoh, Hiroaki; Murakawa, Yoshitaka; Miyazaki, Toshimasa; Kitamura, Nobuyuki; and Sato, Shinichi, to Fujitsu Limited. Stationary bar code reader which can be detected and separated into a hand-held bar code reader. 5,314,631, Cl. 235-467.000.

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Goldstein, Stephen L.; Hamer, Anthony D.; Katz, Lawrence E.; McGeary, Michael J.; and Smith, Curtis P., 5,315,004, Cl. 540-202.000.

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Arfsten, Nanning; Piehlke, Hermann; and Kaufmann, Reinhard, 5,314,715, Cl. 427-240.000.

Kauth, Hermann: *See—*
Kuhling, Steffen; Alewelt, Wolfgang; Kauth, Hermann; and Freitag, Dieter, 5,314,985, Cl. 528-198.000.

Kawabe, Kenji: *See—*
Ishikawa, Hiroshi; Watanabe, Kazuhiro; Kawabe, Kenji; and Shimura, Takaki, 5,313,950, Cl. 128-662.060.

Kawabe, Masanao: *See—*
Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.

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Ito, Yasuyuki; Kawabe, Takeshi; Tojo, Yukio; and Takase, Takeo, 5,315,402, Cl. 358-342.000.

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Kato, Koichi; Kawahara, Kenji; and Kajio, Tomoko, 5,314,872, Cl. 514-12.000.

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Kawai Musical Inst. Manufacturing Co., Ltd.: *See—*
Saito, Tsutomu, 5,315,059, Cl. 84-656.000.

Kawai, Shinji: *See—*
Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.

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Sumiya, Hiroshi; Fukaya, Kousuke; Kawai, Sunao; Sasaki, Hiroyuki; Ban, Yoshiyuki; Komiya, Ryohei; and Muramatsu, Kiyoji, 5,315,691, Cl. 395-109.000.

Kawai, Tadatomo: *See—*
Miyata, Teruo; and Kawai, Tadatomo, 5,314,874, Cl. 514-21.000.

Kawai, Takashi; Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Shono, Seita; and Ohta, Eiji, to Canon Kabushiki Kaisha. Color image processing apparatus. 5,315,415, Cl. 358-515.000.

Kawai, Takeshi: *See—*
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Kawakura, Akio; Yonekawa, Motoki; Sakashita, Eiji; and Kamogawa, Hiroshi, to Otsuka Pharmaceutical Factory, Inc. Process for filtering plasma and regenerating a secondary filter therefor. 5,314,624, Cl. 210-645.000.

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Tada, Takeshi; Akiyama, Toshikazu; Tanaka, Ryoichi; and Kawamoto, Masao, 5,314,170, Cl. 266-156.000.

Kawamura, Mikio: *See—*
Kanno, Kazunobu; Hamano, Satoru; and Kawamura, Mikio, 5,313,697, Cl. 29-527.400.

Kawamura, Yoshimi: *See—*
Yoshida, Tadashi; Koizumi, Kenzo; Kawamura, Yoshimi; Matsumoto, Koichi; and Itazaki, Hiroshi, 5,314,911, Cl. 514-451.000.

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Kawasaki, Masaki. Method of making luminous construction material. 5,314,536, Cl. 106-712.000.

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Marui, Tomohiro; and Arai, Kazuo, 5,314,249, Cl. 374-128.000.
Yoneda, Hideki, 5,315,552, Cl. 365-200.000.

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Tomita, Mamoru; Kitazawa, Takesi; Kawaura, Seiji; Fukuwatari, Yasuo; and Nojiri, Masanobu, 5,314,873, Cl. 514-21.000.

- Kay, Stanley E.: *See—*
  - Kepley, W. Robert; Kay, Stanley E.; Roy, Ashim; Kee, Steven M.; Henson, Carle C., III; Morris, Adrian J.; and Drago, Randy, 5,315,589, Cl. 370-62.000.
- Kayanuma, Nobuaki: *See—*
  - Otsuka, Takayuki; Kayanuma, Nobuaki; Osawa, Kouichi; Okamizu, Hironori; and Kunimasa, Chikao, 5,313,925, Cl. 123-520.000.
- Kaye, Glen A., to Maritime Geothermal Ltd. Direct expansion geothermal heat pump. 5,313,804, Cl. 62-160.000.
- Kaylor, Timothy R.; and Weaver, Donald R. Oil skimmer. 5,314,618, Cl. 210-242.300.
- Kazita, Hidenobu; and Nishi, Toshinobu, to Nippondenso Co., Ltd. Electrical connector device. 5,314,341, Cl. 439-15.000.
- Kazmierczak, Robert T.: *See—*
  - MacLeay, Ronald E.; Kmiec, Jennifer P.; and Kazmierczak, Robert T., 5,314,970, Cl. 525-450.000.
- KDF Fluid Treatment, Inc.: *See—*
  - Heskett, Don E., 5,314,623, Cl. 210-638.000.
- Keck, Richard G.: *See—*
  - Perkins, Thomas K.; and Keck, Richard G., 5,314,265, Cl. 405-128.000.
- Kee, Steven M.: *See—*
  - Kepley, W. Robert; Kay, Stanley E.; Roy, Ashim; Kee, Steven M.; Henson, Carle C., III; Morris, Adrian J.; and Drago, Randy, 5,315,589, Cl. 370-62.000.
- Kelledes, William L.: *See—*
  - Fortune, Glenn C.; and Kelledes, William L., 5,315,218, Cl. 318-54.000.
- Keller, Jerome D.: *See—*
  - Oakes, Thomas R.; Stanley, Patricia M.; and Keller, Jerome D., 5,314,687, Cl. 424-405.000.
- Kellerman, Thomas B.: *See—*
  - Baldwin, Clark F.; Howe, David B.; and Kellerman, Thomas B., 5,315,679, Cl. 385-76.000.
- Kelley, Donald W., to Qualtec Data Products, Inc. Security apparatus. 5,314,162, Cl. 248-553.000.
- Kelln, Norman: *See—*
  - Weyrauch, Bruce; Kelln, Norman; Tiffany, Thomas; and Olson, Robin, 5,314,825, Cl. 436-43.000.
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- KenKnight, Bruce H.; Hall, Jeffrey A.; and Eastman, William J., to Cardiac Pacemakers, Inc. Method and applicator tool for implanting cardiac defibrillation electrodes. 5,314,464, Cl. 607-132.000.
- Kenknight, Bruce H.: *See—*
  - Heil, Ronald W., Jr.; Wickham, Jr. Robert W.; and Kenknight, Bruce H., 5,314,462, Cl. 607-128.000.
- Kennametal Inc.: *See—*
  - Rowlett, Don C., 5,314,029, Cl. 172-699.000.
- Kennedy, John; Kaplan, Donald S.; and Muth, Ross R., to United States Surgical Corporation. Absorbable composition. 5,314,989, Cl. 528-354.000.
- Kenny, Francis E.: *See—*
  - Lewis, Jerome M.; Menz, Edward T.; Kenny, Francis E.; Groman, Ernest V.; and Josephson, Lee, 5,314,679, Cl. 424-9.000.
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  - Oravetz, David M.; Elms, Robert T.; Engel, Joseph C.; Klancher, Frank; and Kenny, Thomas J., 5,315,531, Cl. 364-550.000.
- Kenny, Thomas W.: *See—*
  - Kaiser, William J.; Waltman, Steven B.; and Kenny, Thomas W., 5,315,247, Cl. 324-244.000.
- Kent State University: *See—*
  - Saupe, Alfred; and Jakli, Antal, 5,315,419, Cl. 259-46.000.
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  - Kling, Michael J., III; Alusick, Michael P.; Kercheck, Gary R.; Krueger, Jeff C.; Schmitz, Duane M.; and Visser, James L., 5,313,711, Cl. 33-288.000.
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  - Effenberger, Reinhard; Shorr, Leonard; and Keren, Yehuda, 5,315,008, Cl. 548-182.000.
- Kerivan, David W. Modern chess set using architectural language to shape playable pieces. 5,314,189, Cl. 273-260.000.
- Kerr, William K.: *See—*
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- Kersting, Detlef: *See—*
  - Irmer, Joachim; and Kersting, Detlef, 5,314,333, Cl. 433-120.000.
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  - Liotta, Frank J., Jr.; and Kesling, Haven S., Jr., 5,314,511, Cl. 44-322.000.
- Kesslertech GmbH: *See—*
  - Detzer, Rudiger, 5,313,803, Cl. 62-89.000.
- Kester, Jeffrey J.; Elsen, Joseph J.; Wehmeier, Thomas J.; and Young Jerry D., to Procter & Gamble Company, The. Polyol fatty acid polyester cooking mediums. 5,314,707, Cl. 426-611.000.
- Key Technology, Inc.: *See—*
  - Davis, Walter L.; and Anderson, James E., 5,314,056, Cl. 198-396.000.
- Keystone International Holdings, Corp.: *See—*
  - Beasley, Marvin E., 5,313,976, Cl. 137-15.000.
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  - White, Weimar W.; and Kiehl, Gary G., 5,314,670, Cl. 423-22.000.
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  - Katoh, Kenji; Iguchi, Satoshi; and Kihara, Tetsuro, 5,313,792, Cl. 60-301.000.
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- Kim, Deog-Il; Kwak, Pil-Gyou; and Park, O-Gyoon, to SKC Limited. Anaerobic curing compositions comprising a lutidine. 5,314,933, Cl. 523-176.000.
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  - Lee, Man-young; Park, Hak-song; Kim, Young-cheol; Kim, Tae-yong; Choi, Yong-jin; and Kim, Jae-moon, 5,315,601, Cl. 371-39.100.
- Kim, Ji-Hong: *See—*
  - Kim, Seong-Ju; Kim, Ji-Hong; Jang, Seong-Geun; and Lee, Dae-Youp, 5,314,978, Cl. 528-9.000.
- Kim, Joonki: *See—*
  - Fujisaki, Tetsunosuke; Kim, Joonki; Leibman, George J.; and Tappert, Charles C., 5,315,667, Cl. 382-13.000.
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  - Lee, Man-young; Park, Hak-song; Kim, Young-cheol; Kim, Tae-yong; Choi, Yong-jin; and Kim, Jae-moon, 5,315,601, Cl. 371-39.100.
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  - Koepke, Marcus C.; and Koepke, Earl H., 5,314,237, Cl. 297-318.000.
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  - Cohen, Bernard; and Jameson, Lee K., 5,314,737, Cl. 428-156.000.
  - Meirowitz, Randy E.; Riese, Jerome W.; and Phelan, Robert J., 5,314,743, Cl. 428-297.000.
- Kimura, Hideharu: *See—*
  - Kondo, Haruhiko; Imaizumi, Mitsuhiro; Kamei, Ryosuke; Kimura, Hideharu; and Takiyama, Eiichiro, 5,314,927, Cl. 521-159.000.
- Kimura, Kaoru: *See—*
  - Katamine, Kuniaki; and Kimura, Kaoru, 5,313,897, Cl. 112-121.140.
- Kimura, Katsuji, to NEC Corporation. Compressing and expanding operational circuit with no use of clock signal. 5,315,261, Cl. 328-168.000.
- Kimura, Masao: *See—*
  - Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
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  - Miyazaki, Atsushi; and Kimura, Seiji, 5,313,936, Cl. 128-6.000.

- Kimura, Takashi, to Canon Kabushiki Kaisha. Video cassette recorder device. 5,315,459, Cl. 360-85.000.
- Kimura, Takashi: *See—*
  - Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, 5,314,418, Cl. 604-282.000.
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  - Takago, Toshio; Sato, Shinichi; Kinami, Hitoshi; and Yamada, Hirokazu, 5,314,981, Cl. 528-36.000.
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  - Miller, Philip; Larson, Eric G.; and Kincaid, Don H., 5,314,513, Cl. 51-295.000.
- Kindig, James K., to Genesis Research Corporation. Coal cleaning process. 5,314,124, Cl. 241-20.000.
- Kindschuh, Dennis P.: *See—*
  - Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, 5,315,253, Cl. 324-429.000.
- Kinetics Technology International Group B.V.: *See—*
  - Pietrogrande, Paolo; and Giacobbe, Francesco, 5,314,761, Cl. 429-17.000.
- Kinoshita, Yukiharu: *See—*
  - Ito, Shinichiro; and Kinoshita, Yukiharu, 5,315,279, Cl. 336-178.000.
- Kinugasa, Yasushi, to Rohm Co., Ltd. Double-balanced mixer. 5,315,136, Cl. 257-208.000.
- Kioritz Corporation: *See—*
  - Suga, Takayuki, 5,314,693, Cl. 424-196.100.
- Kipnis, Alexander: *See—*
  - Maurer, Donald D.; and Kipnis, Alexander, 5,314,465, Cl. 607-138.000.
- Kippenberg, Horst: *See—*
  - Hartmann, Werner; and Kippenberg, Horst, 5,315,081, Cl. 200-144.00B.
- Kirayoglu, Birol; Sillivan, William J.; and Zussman, Melvin P., to Du Pont de Nemours, E. I., and Company. Resin impregnated laminate for wiring board applications. 5,314,742, Cl. 428-285.000.
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- Kiriyama, Takashi: *See—*
  - Otsu, Takayuki; Himori, Shunichi; and Kiriyama, Takashi, 5,314,962, Cl. 525-280.000.
- Kirk, David A.: *See—*
  - Lewandowski, Daniel J.; and Kirk, David A., 5,314,702, Cl. 426-128.000.
- Kirk, Mark P.: *See—*
  - Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
- Kirkwood, Malcolm E.; and Fingerman, Michael E., to Borg-Warner Automotive, Inc. Torque converter having axial type reactor. 5,313,793, Cl. 60-361.000.
- Kirschenheuter, Gary P.; Cunningham, Raymond T.; and Cheronis, John C., to Cortech Inc. Ester inhibitors. 5,314,910, Cl. 514-443.000.
- Kirshenbaum, Kenneth S.: *See—*
  - Chung, Ding Y.; and Kirshenbaum, Kenneth S., 5,314,594, Cl. 204-181.400.
- Kishi, Jun, to NEC Corporation. Driving circuit for direct-current (DC) motor. 5,315,219, Cl. 318-254.000.
- Kishida, Kazuo; Kitai, Kiyokazu; Kaneda, Masahiro; and Matsumoto, Kohji, to Mitsubishi Rayon Company Ltd. Lubricant for thermoplastic resin and thermoplastic resin composition comprising said lubricant. 5,314,965, Cl. 525-309.000.
- Kishimoto, Munehisa: *See—*
  - Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, 5,315,482, Cl. 361-707.000.
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  - Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
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- Kishimoto, Yoshio; and Suzuki, Masaaki, to Matsushita Electric Industrial Co., Ltd. Electrically reprogrammable nonvolatile memory device. 5,315,131, Cl. 257-57.000.
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  - Cipullo, Michael J.; Kissinger, Gaylord M.; and Matos, Isabel M., 5,315,042, Cl. 568-727.000.
- Kita, Hideki: *See—*
  - Fuji, Kazuo; Kita, Hideki; and Takeuchi, Toshimitsu, 5,315,362, Cl. 355-326.00R.
- Kita, Hiromi: *See—*
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- Kitagawa, Hiroshi: *See—*
  - Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, 5,315,041, Cl. 564-506.000.
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- Kitakado, Ryuji: *See—*
  - Matsumura, Akira; and Kitakado, Ryuji, 5,315,409, Cl. 358-458.000.
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  - Katoh, Hiroaki; Murakawa, Yoshitaka; Miyazaki, Toshimasa; Kitamura, Nobuyuki; and Sato, Shinichi, 5,314,631, Cl. 235-467.000.
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- Kitazawa, Takesi: *See—*
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  - Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
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  - Hansen, Henrik F.; and Kjoernaes, Kim, 5,315,016, Cl. 549-298.000.
- Klancher, Frank: *See—*
  - Oravetz, David M.; Elms, Robert T.; Engel, Joseph C.; Klancher, Frank; and Kenny, Thomas J., 5,315,531, Cl. 364-550.000.
- Klarhoefer, Christian: *See—*
  - Schneider, Arthur; and Klarhoefer, Christian, 5,313,856, Cl. 477-80.000.
- Klatte, Fred. Chemically impregnated zeolite and method for chemically impregnating and coating zeolite. 5,314,852, Cl. 502-60.000.
- Klauber, Robert D.; Vigmostad, Erik B.; Sprague, Frederick P.; and Mandarino, Joseph V., to Sensortech L.P. Engine misfire, knock or roughness detection method and apparatus. 5,313,826, Cl. 73-118.100.
- Klaveness, Jo: *See—*
  - Leunbach, Ib; Golman, Klaes; and Klaveness, Jo, 5,314,681, Cl. 424-9.000.
- Klein, Peter: *See—*
  - Uerrmann, Peter; and Klein, Peter, 5,314,816, Cl. 435-188.000.
- Klemmer, Robert A.; Krzeczowski, Ronald S.; Peloza, Kirk B.; and Wende, Russell E., to Molex Incorporated. Terminal position assurance system for electrical connectors. 5,314,358, Cl. 439-741.000.
- Klimek, Thaddeus W.: *See—*
  - Johnson, Lisa K.; Bowen, Paul E.; Klimek, Thaddeus W.; and Edwards, Michael B., 5,314,746, Cl. 428-338.000.
- Kline, Fred: *See—*
  - Thongpreda, Nisra; and Kline, Fred, 5,314,491, Cl. 623-22.000.
- Kling, Michael J., III; Alusick, Michael P.; Kercheck, Gary R.; Krueger, Jeff C.; Schmitz, Duane M.; and Visser, James L., to Bear Automotive Service Equipment Company. Wheel alignment system. 5,313,711, Cl. 33-288.000.
- Klinger, Herbert; Thomas, Gerhard; and Petrzik, Martin, to Robert Bosch GmbH. Assembly and testing of electronic power components insulation. 5,313,701, Cl. 29-840.000.
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  - Grinnell, Gary C.; Klowak, Bernard G.; and Bouchette, Michael P., 5,314,584, Cl. 162-109.000.
- Klug, Andreas: *See—*
  - Miller, Bernhard; Gorny, Stefan; Kallenbach, Rainer; and Klug, Andreas, 5,315,516, Cl. 364-424.010.
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- Klusman, Larry: *See—*
  - Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, 5,315,253; Cl. 324-429.000.
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  - MacLeay, Ronald E.; Kmiec, Jennifer P.; and Kazmierczak, Robert T., 5,314,970, Cl. 525-450.000.
- Knapp, Thomas G.: *See—*
  - Hemzy, Wayne R.; and Knapp, Thomas G., 5,314,662, Cl. 422-62.000.
- Knauf, Vic C.: *See—*
  - Kridl, Jean C.; and Knauf, Vic C., 5,315,001, Cl. 536-23.600.
- Kneizys, Francis X.: *See—*
  - Abreu, Leonard W.; Kneizys, Francis X.; Anderson, Gail P.; Chetwynd, James H.; Berk, Lex; Bernstein, Larry; and Robertson, David, 5,315,513, Cl. 364-420.000.
- Knight, Adrian T., to Goodman Fielder Wattie Australia Limited. Starch derived shaped articles. 5,314,754, Cl. 428-532.000.
- Knight, Mark J., to Rolls-Royce plc. Variable camber stator vane. 5,314,301, Cl. 415-160.000.

- Knodo, Mamoru: *See—*
  - Sekiguchi, Yoshitoshi; Saski, Kunio; Okigami, Noboru; Hamabe, Kobei; Ieyama, Kazuo; and Knodo, Mamoru, 5,313,895, Cl. 110-346.000.
- Knorpp, Albrecht: *See—*
  - Schaeftlmeier, Roland; Pflueger, Gerhard; Fakler, Bernhard; Buerger, Klaus Georg; and Knorpp, Albrecht, 5,313,698, Cl. 79-396.000.
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  - Heuberger, Erich; Knorrich, Wolf-Dieter; Dziallas, Joachim W.; Plester, George; and Troska, Georg, 5,314,088, Cl. 220-465.000.
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- Koatsu Gas Kogyo Co., Ltd.: *See—*
  - Tada, Eiichi, 5,314,311, Cl. 417-50.000.
- Kobayashi, Akira; Kawai, Takeshi; and Sasaki, Hiroshi, to Yamatake-Honeywell Co., Ltd. Photoelectric conversion apparatus for detecting movement of object with spatial filter electrode. 5,315,100, Cl. 250-208.100.
- Kobayashi, Hidetoshi: *See—*
  - Yoshioka, Yasuhiro; Shimura, Yoshio; and Kobayashi, Hidetoshi, 5,314,797, Cl. 430-546.000.
- Kobayashi, Hirohiko, to Fanuc Ltd. Method of applying a material to a rotating object by using a robot. 5,314,722, Cl. 427-425.000.
- Kobayashi, Kenichi: *See—*
  - Abe, Tsutomu; Makida, Seigo; and Kobayashi, Kenichi, 5,315,102, Cl. 250-208.100.
- Kobayashi, Kenji, to Lintec Corporation. Apparatus for attaching bar codes to reticle cases. 5,314,564, Cl. 156-384.000.
- Kobayashi, Masahiko: *See—*
  - Hirobe, Junichi; Akashi, Masakatsu; Kobayashi, Masahiko; and Sugaya, Tsutomu, 5,315,350, Cl. 355-208.000.
- Kobayashi, Nobuyoshi: *See—*
  - Mizutani, Tatsumi; Yunogami, Takashi; Yokokawa, Kenetsu; and Kobayashi, Nobuyoshi, 5,314,839, Cl. 437-173.000.
- Kobayashi, Norihisa: *See—*
  - Toda, Hiromichi; Ishigami, Shigeyasu; Kobayashi, Norihisa; Furuya, Takaaki; and Izumi, Jun, 5,313,781, Cl. 60-39.120.
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  - Ishikawa, Masao; Ueda, Yutaka; and Koboshi, Shigeharu, 5,314,791, Cl. 430-393.000.
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- Koch, John, Jr.: *See—*
  - Liebert, Curt H.; and Koch, John, Jr., 5,314,247, Cl. 374-29.000.
- Koch, Otto: *See—*
  - Jansen, Ulrich; Ott, Karl-Heinz; Herrig, Wolfgang; Koch, Otto; Pischtschan, Alfred; and Wittmann, Dieter, 5,314,990, Cl. [illegible]
- Koch, Theodore A.: *See—*
  - Anseth, Kristi; and Koch, Theodore A., 5,314,673, Cl. 423-239.100.
- Koch, William A.: *See—*
  - Lim, John C.; and Koch, William A., 5,314,667, Cl. 117-213.000.
- Kocher, Haribbajan S.: *See—*
  - Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribbajan S.; and Wagner, Paul W., 5,315,338, Cl. 354-320.000.
- Kodaira, Makoto: *See—*
  - Saadi, Robert E.; Ball, Christopher J.; and Kodaira, Makoto, 5,313,673, Cl. 4-313.000.
- Koefelda, Gerald R.: *See—*
  - Apps, William P.; Koefelda, Gerald R.; and Shermer, Larry E., 5,314,089, Cl. 220-510.000.
- Koehler, Konrad F.: *See—*
  - Desai, Bipinchandra N.; Koehler, Konrad F.; and Russell, Mark A., 5,314,895, Cl. 514-318.000.
- Koenig, Joseph M., Jr., to Trim-Tex, Inc. Drywall corner-finishing accessory. 5,313,755, Cl. 52-255.000.
- Koening, David M.; Majestic, Peter J.; and Maschmeyer, Richard O., to Corning Incorporated. Method controlling the draw rate in the drawing of a glass feedstock. 5,314,517, Cl. 65-2.000.
- Koepke, Earl H.: *See—*
  - Koepke, Marcus C.; and Koepke, Earl H., 5,314,237, Cl. 297-318.000.
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- Koes, Thomas A.: *See—*
  - Lazarus, Richard M.; and Koes, Thomas A., 5,314,782, Cl. 430-165.000.
- Koethe, Terence L. Shoe shield. 5,313,719, Cl. 36-72.00R.
- Kogure, Shinji: *See—*
  - Uchishiba, Izumi; Kawai, Kathuhito; and Kogure, Shinji, 5,315,500, Cl. 364-183.000.
- Kohira, Yoshio: *See—*
  - Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
- Koht, Lowell I.: *See—*
  - McCall, Mark; Del Fava, Donald; Wong, Thomas; and Koht, Lowell I., 5,315,489, Cl. 361-801.000.
- Koibuchi, Shigeru; Isobe, Asao; and Hashimoto, Michiaki, to Hitachi Chemical Co., Ltd.; and Hitachi, Ltd. Photosensitive quinone diazide and resin composition having high absorbency for a wavelength of 365 nm containing a benzotriazole ultraviolet absorbing compound. 5,314,783, Cl. 430-191.000.
- Koike, Yuzo: *See—*
  - Nagato, Hitoshi; and Koike, Yuzo, 5,315,356, Cl. 355-289.000.
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- Koizumi, Kenzo: *See—*
  - Yoshida, Tadashi; Koizumi, Kenzo; Kawamura, Yoshimi; Matsumoto, Koichi; and Itazaki, Hiroshi, 5,314,911, Cl. 514-451.000.
- Koizumi, Yuuji, to NEC Corporation. Semiconductor integrated circuit device having voltage level converting circuits. 5,315,157, Cl. 257-734.000.
- Kojima, Kunio: *See—*
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  - Miyata, Shigeru; Matsubara, Yoshiaki; and Kojima, Takao, 5,313,849, Cl. 73-866.500.
- Koken Co., Ltd.: *See—*
  - Miyata, Teruo; and Kawai, Tadatomo, 5,314,874, Cl. 514-21.000.
- Kokusai Denshin Denwa Co., Ltd: *See—*
  - Iizuka, Shigeru; and Yatsuzuka, Youtaro, 5,315,585, Cl. 370-32.100.
- Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
  - Utaka, Katsuyuki; Nagao, Yasuyuki; Matsushima, Yuichi; and Sakai, Kazuo, 5,315,422, Cl. 359-107.000.
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  - Kaneda, Shinichi; Tamaki, Shouji; and Sakai, Osamu, 5,313,893, Cl. 108-152.000.
- Kolaric, Svetislav: *See—*
  - Pantic, Vladimir; Sijacki, Nestor; and Kolaric, Svetislav, 5,314,882, Cl. 514-170.000.
- Komatsu, Fumio; Okumura, Katsuya; and Miyoshi, Motosuke, to Kabushiki Kaisha Toshiba. Electron beam irradiating apparatus and electric signal detecting apparatus. 5,315,119, Cl. 250-398.000.
- Komatsu, Yasuo: *See—*
  - Yamagishi, Masahiro; Hijiri, Masao; Komatsu, Yasuo; Edagawa, Hiroshi; and Imaeda, Naoki, 5,314,180, Cl. 273-73.00F.
- Komiya, Ryohei: *See—*
  - Sumiya, Hiroshi; Fukaya, Kousuke; Kawai, Sunao; Sasaki, Hiroyuki; Ban, Yoshiyuki; Komiya, Ryohei; and Muramatsu, Kiyoji, 5,315,691, Cl. 395-109.000.
- Komiya, Yuji, to Toppan Printing Co., Ltd. Method of preparing laminated packaging material. 5,314,561, Cl. 156-244.110.
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  - Sakashita, Kazuhiro; Yusa, Terukazu; Takimoto, Isao; Hashizume, Takeshi; and Komoike, Tatsunori, 5,315,182, Cl. 307-482.100.
- Komorowski, Karl J.; Saul, Jonathan R.; and LaPointe, Larry P., to La-Z-Boy Chair Company. Cam guide drive mechanism for power-assisted chairs. 5,314,238, Cl. 297-325.000.
- Komuro, Hitoshi: *See—*
  - Morikiyo, Akira; Kanbe, Toshio; Shinbo, Shuichi; Yoshikawa, Shigeru; Shimodaira, Yoshikazu; Ohminami, Kazuya; and Komuro, Hitoshi, 5,314,078, Cl. 211-59.200.
- Kondo, Haruhiko; Imaizumi, Mitsuhiro; Kamei, Ryosuke; Kimura, Hideharu; and Takiyama, Eiichiro, to Showa Highpolymer Co., Ltd. Polyester foamed articles and method for producing the same. 5,314,927, Cl. 521-159.000.
- Kondo, Haruhiko: *See—*
  - Imaizumi, Mitsuhiro; Kotani, Masataka; Kondo, Haruhiko; Iwasa, Takeshi; and Takiyama, Eiichiro, 5,314,969, Cl. 525-440.000.
- Kondo, Masahiro: *See—*
  - Nishihira, Keigo; Tanaka, Shuji; Mizutare, Katsuhiko; and Kondo, Masahiro, 5,315,032, Cl. 560-157.000.
- Kondo, Nobuhiro; and Ono, Hirokazu, to Seikosha Co., Ltd. Method of processing photosensitive glass with a pulsed laser to form grooves. 5,314,522, Cl. 65-31.000.
- Kondo, Noriyuki: *See—*
  - Hirae, Sadao; Kondo, Noriyuki; and Sato, Seiichiro, 5,314,831, Cl. 437-8.000.
- Kondo, Yoshinori: *See—*
  - Ishii, Kenji; Kondo, Yoshinori; Matsumoto, Hiroyuki; and Sayama, Norio, 5,314,740, Cl. 428-209.000.
- Konforti, Naim: *See—*
  - Marom, Emanuel; Konforti, Naim; and Mendlovic, David, 5,315,095, Cl. 235-462.000.
- Konica Corporation: *See—*
  - Ishikawa, Masao; Ueda, Yutaka; and Koboshi, Shigeharu, 5,314,791, Cl. 430-393.000.
  - Murai, Kazuhiro; Kajiwara, Makoto; Sato, Hirokazu; Tanaka, Shinri; and Okumura, Mitsuhiro, 5,314,796, Cl. 430-522.000.
- Konicek, Timothy S.: *See—*
  - Blakeley, Anthony; Horihan, Gregory E.; Konicek, Timothy S.; O'Callaghan, Patrick J.; Carrington, Martin W.; and Brown, Jeffrey A., 5,314,309, Cl. 416-226.000.
- Konig, Christian: *See—*
  - Zarnack, Uwe J.; Weintritt, Volker; and Konig, Christian, 5,314,588, Cl. 203-38.000.
- Konig, Joachim: *See—*
  - Muller, Michael; Probst, Joachim; Alberts, Heinrich; Konig, Joachim; Baumgen, Heinz; and Puchner, Fritz, 5,314,721, Cl. 427-386.000.
- Koninklijke PTT Nederland N.V.: *See—*
  - van Deventer, Mattijs O.; and Bekooij, Johan P., 5,315,425, Cl. 359-153.000.
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  - Kramer, Carl; Konrath, Bernd; Berger, Bernd; and Reinthal, Peter, 5,313,685, Cl. 15-309.100.
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  - Heger, Charles E.; and Kook, Donald D., 5,313,713, Cl. 33-366.000.
- Koontz, Steven L., to United States of America, National Aeronautics and Space Administration. Microporous structure with layered interstitial surface treatment, and method and apparatus for preparation thereof. 5,314,857, Cl. 502-258.000.
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- Kordis, Thomas F.: *See—*
  - Houser, Russell A.; Edwards, Stuart D.; and Kordis, Thomas F., 5,313,943, Cl. 128-642.000.
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  - Hoffmann, Wolfgang; Korner, Andre ; and Zimmer, Maik, 5,315,275, Cl. 335-86.000.
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  - Fillion, Raymond A.; Kornrumpf, William P.; and Bernard, Edward S., 5,315,486, Cl. 361-795.000.
  - Sutton, George H., Jr.; Little, Francis H.; Hedengren, Kristina H. V.; Charles, Richard J.; Kornrumpf, William P.; and Hurley, Donna C., 5,315,234, Cl. 324-242.000.
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  - Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., 5,314,406, Cl. 604-21.000.
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  - Kurai, Hisako; Mochizuki, Hideaki; and Kosako, Shinya, 5,315,421, Cl. 359-76.000.
- Koskan, Larry P.; Low, Kim C.; Meah, Abdul R. Y.; and Atencio, Anne M., to Donlar Corporation. Polyaspartic acid manufacture. 5,315,010, Cl. 548-520.000.
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  - Kaastra, Simon; and Koster, Gerd, 5,314,006, Cl. 165-10.000.
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  - Yoshioka, Mamoru; Nakata, Kunihiko; Kotani, Akira; and Makino, Makoto, 5,313,798, Cl. 60-600.000.
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  - Imaizumi, Mitsuhiro; Kotani, Masataka; Kondo, Haruhiko; Iwasa, Takeshi; and Takiyama, Eiichiro, 5,314,969, Cl. 525-440.000.
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  - Sakiyama, Kazuyuki; Ahagon, Akira; Kotera, Hidetoshi; and Kita, Hiromi, 5,315,233, Cl. 324-72.000.
- Kotlyar, Anatoly D.: *See—*
  - Tsyb, Anatoly F.; Sergeev, Pavel V.; Sharlai, Vladimir I.; Dikun, Vladimir S.; Sobchuk, Nikolai S.; Raiskaya, Tatyana N.; Kotlyar, Anatoly D.; Bolshov, Vladimir M.; Tsarenkov, Valery M.; Suloeva, Ljudmila V.; and Bogatov, Oleg G., 5,314,400, Cl. 600-9.000.
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  - Suzuki, Souroku, 5,314,399, Cl. 494-54.000.
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  - Carayannis, George; Halkias, Christos; Manolakis, Dimitris; and Koukoutsis, Elias, 5,315,687, Cl. 395-2.280.
- Kouno, Katuyuki: *See—*
  - Taniuchi, Kazuman; Kouno, Katuyuki; and Sekine, Hiroshi, 5,315,416, Cl. 358-537.000.
- Kounosu, Naohiro: *See—*
  - Tsuruoka, Michihiko; Nakagawa, Wataru; Kashimura, Osamu; Kounosu, Naohiro; and Suzawa, Hiromi, 5,313,843, Cl. 73-861.240.
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  - Halawani, Natalie; Koutsoudis, Theodore; and Kowalski, John M., 5,315,620, Cl. 375-102.000.
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  - Oda, Keisuke; and Kouzai, Fumio, 5,314,179, Cl. 271-145.000.
- Kovach, Ildiko M., to Catholic University of America, The. Method for temporarily inhibiting or deactivating serine hydrolase and adduct of serine hydrolase with a phosphonate or phosphate compound. 5,314,815, Cl. 435-184.000.
- Kovacs, Gregory T. A., to Leland Stanford Junior University, The Board of Trustees of the. Microelectronic interface. 5,314,495, Cl. 623-25.000.
- Koven, Melvin R. Neckwear knot enhancer. 5,313,810, Cl. 63-2.000.
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  - Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Koyama, Yoshihisa; and Bonde, Hiroyuki, 5,315,318, Cl. 346-76.0PH.
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- Koyo Seiko Co., Ltd.: *See—*
  - Takahata, Ryoichi; and Ueyama, Hirochika, 5,314,868, Cl. 505-166.000.
- Kozakai, Shohei: *See—*
  - Okinoshima, Hiroshige; Kozakai, Shohei; and Abe, Tomiya, 5,314,979, Cl. 528-15.000.
- Kozakura, Shiro; Kuze, Shigeki; and Tanaka, Kenji, to Idemitsu Petrochemical Co., Ltd. Polycarbonate resin composition. 5,314,949, Cl. 525-67.000.
- Kozicki, Michael N.; and Hsia, Shao-Wen, to Arizona Board of Regents. High resolution, multi-layer resist for microlithography and method therefor. 5,314,772, Cl. 430-14.000.
- Krackov, Mark H.: *See—*
  - Fernandez, Richard E.; and Krackov, Mark H., 5,315,043, Cl. 568-932.000.
- Kraft, Carroll K. Armored telephone line protective system. 5,315,654, Cl. 379-438.000.
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- Kramer, Fred J. Simulated engine with sound generator. 5,314,372, Cl. 446-404.000.
- Krause, Edward A.: *See—*
  - Shen, Paul; Paik, Woo H.; and Krause, Edward A., 5,315,388, Cl. 348-718.000.
- Krauth, Richard G.; and Brunnengraeber, Steven P., to Wade Manufacturing Co. Pulsator for irrigation systems and the like. 5,314,116, Cl. 239-99.000.
- Kreckel, Karl W.: *See—*
  - Schwartz, Mark E.; and Kreckel, Karl W., 5,314,557, Cl. 156-229.000.
- Kreitzer, Melvyn H.: *See—*
  - Betensky, Ellis I.; and Kreitzer, Melvyn H., 5,315,440, Cl. 359-612.000.
- Krepski, Larry R.: *See—*
  - Babirad, Stefan A.; Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 5,314,975, Cl. 526-248.000.
- Kreyenhagen, Paul E.: *See—*
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- Kriesel, Marshall S.; and Thompson, Thomas N., to Science Incorporated. Liquid delivery apparatus. 5,314,405, Cl. 604-8.000.
- Kroll, Mark W.; and Adams, Theodore P., to Angeion Corporation. Process for defibrillation pretreatment of a heart. 5,314,448, Cl. 607-5.000.
- Kronberg, James W., to United States of America, Energy. Surface coating for prevention of crust formation. 5,314,735, Cl. 428-116.000.
- Kronseder, Hermann. Packing apparatus. 5,313,764, Cl. 53-247.000.
- Krueger, Jeff C.: *See—*
  - Kling, Michael J., III; Alusick, Michael P.; Kercheck, Gary R.; Krueger, Jeff C.; Schmitz, Duane M.; and Visser, James L., 5,313,711, Cl. 33-288.000.
- Krusos, Denis A.: *See—*
  - DiSanto, Frank J.; and Krusos, Denis A., 5,315,312, Cl. 345-107.000.
- Krzeczowski, Ronald S.: *See—*
  - Klemmer, Robert A.; Krzeczowski, Ronald S.; Peloza, Kirk B.; and Wende, Russell E., 5,314,358, Cl. 439-741.000.
- KSB Aktiengesellschaft: *See—*
  - Beiss, Gunter; and Schafer, Horst, 5,314,306, Cl. 415-213.100.
- Kubelik, Igor; and Simmonds, Michael, to Delphax Systems. High precision charge imaging cartridge. 5,315,324, Cl. 346-159.000.
- Kubo, Keishi; Ikemoto, Yoshihiro; and Itou, Tatsuo, to Matsushita Electric Industrial Co., Ltd. Method of measuring a minute displacement. 5,315,373, Cl. 356-373.000.
- Kubo, Masahiko; Watanabe, Akihiro; Nagai, Takafumi; and Maruyama, Hironori, to Mita Industrial Co., Ltd. Black toner for electrophotography. 5,314,773, Cl. 430-45.000.
- Kuboki, Keiju; Sugishima, Kiyohisa; Udagawa, Yutaka; Otsubo, Toshihiko; and Nishio, Masahiro, to Canon Kabushiki Kaisha. Image processing method and apparatus for processing an image signal in each of a plurality of processing modes. 5,315,404, Cl. 358-433.000.
- Kubota Corporation: *See—*
  - Okumura, Yoshinobu, 5,314,745, Cl. 428-336.000.
- Kubota, Masao. Drill. 5,314,272, Cl. 408-224.000.
- Kubota, Yasurou: *See—*
  - Shoji, Kazuyoshi; Muto, Tadashi; Kubota, Yasurou; Seki, Koichi; Izawa, Kazuto; and Nabetani, Shinji, deceased, 5,315,547, Cl. 365-185.000.

Kubota, Yukio: *See*—
  Okada, Hiroshi; Kanota, Keiji; and Kubota, Yukio, 5,315,401, Cl. 358-337.000.
Kuby, Otakar A.: *See*—
  Kamlani, Vijay M.; Kuby, Otakar A.; Operacz, Walter J.; and Vereecke, Frank J., 5,314,169, Cl. 266-105.000.
Kuchta, Richard: *See*—
  Vaida, Robert M.; Kuchta, Richard; and Cenedella, Philip W., 5,314,136, Cl. 242-75.400.
Kudo, Chiaki: *See*—
  Yasui, Takatoshi; Kudo, Chiaki; Nakao, Ichiro; Fujii, Toyokazu; Terai, Yuka; Imai, Shinichi; Yamamoto, Hiroshi; and Naito, Yasushi, 5,314,848, Cl. 437-248.000.
Kudra, Paul D.: *See*—
  Chlus, Wieslaw A.; Gonsor, Michael; Houston, David P.; and Kudra, Paul D., 5,313,786, Cl. 60-39.750.
Kuhling, Steffen; Alewelt, Wolfgang; Kauth, Hermann; and Freitag, Dieter, to Bayer Aktiengesellschaft. Molten, catalytic process for the preparation of polycarbonates. 5,314,985, Cl. 528-198.000.
Kuhne, Karl F., to Vermont American Corporation. Blast joint for snubbing unit. 5,314,209, Cl. 285-45.000.
Kujawa, Matthew; and Waterman, Timothy J., to Carrier Corporation. Air intake for furnace. 5,313,930, Cl. 126-116.00R.
Kullander, Jan, to Telefonaktiebolaget L M Ericsson. Data flow control. 5,315,587, Cl. 370-60.000.
Kulwicki, Bernard M., to Texas Instruments Incorporated. Fine-grain pyroelectric detector material and method. 5,314,651, Cl. 264-65.000.
Kumagai, Ryohei, to Ezel, Inc. Number plate recognition system. 5,315,664, Cl. 382-1.000.
Kumagai, Ryohei, to Ezel Inc. Dither processing method. 5,315,669, Cl. 382-50.000.
Kumagai, Yukihisa: *See*—
  Furugohri, Yoshihiro; and Kumagai, Yukihisa, 5,314,326, Cl. 425-573.000.
Kumasaka, Takao: *See*—
  Simazaki, Yuzuru; Kumasaka, Takao; Satoh, Kunio; and Hirose, Youji, 5,315,353, Cl. 355-251.000.
Kumho Petrochemical Company, Limited: *See*—
  Kim, Seong-Ju; Kim, Ji-Hong; Jang, Seong-Geun; and Lee, Dae-Youp, 5,314,978, Cl. 528-9.000.
Kummer, Martin; Rieker, Werner; Strotgen, Eckerhard; and Prahst, Eberhard, to Robert Bosch GmbH. Hand-guided machine tool comprising a radial blower. 5,315,193, Cl. 310-50.000.
Kunimasa, Chikao: *See*—
  Otsuka, Takayuki; Kayanuma, Nobuaki; Osawa, Kouichi; Okamizu, Hironori; and Kunimasa, Chikao, 5,313,925, Cl. 123-320.000.
Kunz, Daniel W. Car topable catamaran with collapsible frame and universal tiller/rudder-mast daggerboard mounting constructions. 5,313,908, Cl. 114-354.000.
Kuo, Yao H., to Ford Motor Company. Dual mode phase-locked loop. 5,315,623, Cl. 375-120.000.
Kurai, Hisako; Mochizuki, Hideaki; and Kosako, Shinya, to Matsushita Electric Industrial Co., Ltd. Rubbing apparatus including double refraction phase difference measuring means and manufacturing method for liquid crystal display device. 5,315,421, Cl. 359-76.000.
Kuramarohit, Kullapat. Air conditioner. 5,314,376, Cl. 454-186.000.
Kurano, Akira: *See*—
  Nakayama, Masahiro; Takeuchi, Hisaharu; Takamatsu, Hisashi; Tohchi, Mamoru; and Kurano, Akira, 5,315,451, Cl. 360-72.200.
Kurashige, Tomoyuki; Imaide, Takuya; and Tarumizu, Hiroyuki, to Hitachi, Ltd; and Hitachi Video & Information System, Inc. Auto-iris method and apparatus for imaging device. 5,315,394, Cl. 348-229.000.
Kurata, Junichi; and Nomura, Satoru, to Pioneer Electronic Corp.; and Pioneer Video Corp. Method of recording and reproducing picture information, recording medium, and recording medium playing apparatus. 5,315,400, Cl. 358-335.000.
Kurihara, Kazuaki; Kawarada, Motonobu; Sasaki, Ken-ichi; and Teshima, Akitomo, to Fujitsu Ltd. Process for forming a mixed layer of a plasma sprayed material and diamond. 5,314,726, Cl. 427-577.000.
Kuritzky, Eric: *See*—
  Rosenberg, Howard; and Kuritzky, Eric, 5,313,736, Cl. 43-44.830.
Kuriyama, Chojiro, to Rohm Co., Ltd. Solid electrolytic capacitor. 5,315,474, Cl. 361-534.000.
Kuroda, Katsuhiko: *See*—
  Hirota, Takao; Shinohara, Hideo; and Kuroda, Katsuhiko, 5,314,862, Cl. 503-227.000.
Kuroda, Takao: *See*—
  Asaumi, Masaji; and Kuroda, Takao, 5,315,137, Cl. 257-221.000.
Kuroyanagi, Susumu: *See*—
  Fujii, Tetsuo; Kuroyanagi, Susumu; and Gotoh, Yoshitaka, 5,313,836, Cl. 73-517.00R.
Kusakari, Kouichi: *See*—
  Sato, Atsushi; and Kusakari, Kouichi, 5,315,458, Cl. 360-78.080.
Kusakawa, Mari, to Fujitsu Limited. Terminal apparatus with transmission function. 5,315,702, Cl. 395-164.000.
Kuse, Takashi; and Nakashima, Nobuaki, to Kabushiki Kaisha Toshiba. Lead frame with improved adhesiveness property against plastic and plastic sealing type semiconductor packaging using said lead frame. 5,315,152, Cl. 257-677.000.
Kussi, Siegfried: *See*—
  Rasp, Christian; Timmermann, Ralf; Perrey, Hermann; Lehmann, Bernhard; and Kussi, Siegfried, 5,314,982, Cl. 528-48.000.
Kutsuna, Kiyoharu: *See*—
  Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.
Kuttner, Thomas: *See*—
  Brauninger, Jurgen; Schramm, Herbert; Kadelbach, Volker; Wirz, Josef; Kuttner, Thomas; Seher, Dieter; and Flogel, Wolfgang, deceased, 5,313,855, Cl. 477-111.000.
Kuwait Institute for Scientific Research: *See*—
  Hamdan, Ibrahim Y.; ElNawawy, Amin S.; Banat, Ibrahim M.; and Al-Awadhi, Nader M., 5,314,820, Cl. 435-252.100.
Kuze, Shigeki: *See*—
  Kozakura, Shiro; Kuze, Shigeki; and Tanaka, Kenji, 5,314,949, Cl. 525-67.000.
Kverneland Klepp AS: *See*—
  Mong, Oivind, 5,314,028, Cl. 172-219.000.
Kwak, Choong-keun: *See*—
  Lee, Seung-keun; Kwak, Choong-keun; and Kim, Chang-rae, 5,315,173, Cl. 307-443.000.
Kwak, Pil-Gyou: *See*—
  Kim, Deog-Il; Kwak, Pil-Gyou; and Park, O-Gyoon, 5,314,933, Cl. 523-176.000.
Kwan, Henry K.; and Liebowitz, Stephen M., to Schering Corporation. Stable extended release oral dosage composition comprising loratadine and pseudoephedrine. 5,314,697, Cl. 424-480.000.
Kyba, Evan P.: *See*—
  York, Billie M.; and Kyba, Evan P., 5,314,916, Cl. 514-542.000.
Kyle, Robert J.: *See*—
  Bojas, Edward J.; Kyle, Robert J.; and Weeks, Leo M., 5,314,048, Cl. 192-3.290.
Kyocera America, Inc.: *See*—
  Irie, Taka; and Nomura, Aki, 5,314,606, Cl. 205-128.000.
Kyocera Corporation: *See*—
  Hayashi, Kazuo; and Ishida, Noriyuki, 5,314,488, Cl. 623-22.000.
  Miyahara, Kenichiro, 5,314,850, Cl. 501-96.000.
  Murano, Shunji, 5,315,320, Cl. 346-107.00R.
  Oka, Masanori; Gen, Shokyu; Ikada, Yoshito; and Okimatsu, Hideaki, 5,314,478, Cl. 623-18.000.
Kyuda, Keizo: *See*—
  Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
L&P Property Management Company: *See*—
  Ayres, Donald B.; and Wells, Thomas J., 5,314,065, Cl. 206-340.000.
  Wells, Thomas J.; and Poffenberger, John D., 5,314,064, Cl. 206-340.000.
La-Z-Boy Chair Company: *See*—
  Komorowski, Karl J.; Saul, Jonathan R.; and LaPointe, Larry P., 5,314,238, Cl. 297-325.000.
Laboratoires Mayoly-Spindler: *See*—
  Seman, Michel; and Nicolay, Jean F., 5,314,999, Cl. 536-6.500.
Lackstrom, David, to R & D Technologies, Inc. High efficiency pool heating system and power unit. 5,313,874, Cl. 91-459.000.
LaCon, Martin M.: *See*—
  Tsou, Hsi-Shen E.; Im, Catherine L.; Shreve, Gregory A.; and LaCon, Martin M., 5,315,303, Cl. 342-27.000.
Lacour, Claude: *See*—
  Chaverot, Pierre; and Lacour, Claude, 5,314,935, Cl. 524-64.000.
Ladasky, John J., Jr.: *See*—
  Pinsky, Bertram G.; and Ladasky, John J., Jr., 5,315,122, Cl. 250-461.200.
Lagace, Maurice, to Airmar Technology Corporation. Phased array sonic transducers for marine instrument. 5,313,834, Cl. 73-290.00V.
Lai, Nelson, to Necer International Co., Ltd. Automatic controlled multi-level storage system. 5,314,285, Cl. 414-236.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
  Karinthi, Pierre, 5,315,163, Cl. 307-201.000.
  Monereau, Christian, 5,314,528, Cl. 95-55.000.
Lak, Tibor I.: *See*—
  Gerhardt, David L.; Su, Paul J.; Lak, Tibor I.; and Brakeville, Donna M., 5,315,530, Cl. 364-510.000.
Lamarre, William L.: *See*—
  Karlyn, William M.; Pink, Frederick C.; Lamarre, William L.; and Berry, Edward J., 5,313,882, Cl. 101-126.000.
Lambert, Nicolaas: *See*—
  Hoeberechts, Arthur M. E.; Lambert, Nicolaas; and Van Gorkom, Gerardus G. P., 5,315,207, Cl. 313-444.000.
Lambert, Tim L.: *See*—
  Ferraris, John P.; Lambert, Tim L.; and Rodriguez, Santiago, 5,315,014, Cl. 549-43.000.
Lampson, Butler W.: *See*—
  Abadi, Martin; Goldstein, Andrew C.; and Lampson, Butler W., 5,315,657, Cl. 380-25.000.
Land, Michael Z.; and McConnell, Peter N., to LucasArts Entertainment Company. Method and apparatus for dynamically composing music and sound effects using a computer entertainment system. 5,315,057, Cl. 84-601.000.
Landhuis, Kevin J., to Gates Rubber Company, The. Coupling member with a torque resistive-stop. 5,314,211, Cl. 285-110.000.
Lang, Douglas J.: *See*—
  Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., 5,314,459, Cl. 607-122.000.

Lang, Hans W.; and Straka, Alfred, to Kaltenbach & Voigt GmbH & Co. Dental articulator. 5,314,332, Cl. 433-66.000.
Langlade-Demoyen, Pierre: *See*—
  Peterson, Per A.; Jackson, Michael; and Langlade-Demoyen, Pierre, 5,314,813, Cl. 435-172.300.
Langner, Paul A., to Northern Telecom Limited. Quasi-differential bus. 5,315,175, Cl. 307-443.000.
Lanning, John G.: *See*—
  Adler, Meryle D. W.; Bagley, Rodney D.; Frost, Rodney I.; Lanning, John G.; and Shafer, H. Gordon, Jr., 5,314,650, Cl. 264-56.000.
La Place, Christian; Martin, Nathalie; and Faivre, Michel, to Gie Anjou-Recherche. Installation for the mixing of two fluid phases by mechanical stirring, notably for the treatment of water by transfer of oxidizing gas, and use of such an installation. 5,314,076, Cl. 210-205.000.
LaPointe, Larry P.: *See*—
  Komorowski, Karl J.; Saul, Jonathan R.; and LaPointe, Larry P., 5,314,238, Cl. 297-325.000.
Larsen Products, Inc.: *See*—
  Larsen, William H., 5,314,160, Cl. 248-547.000.
Larsen, William H., to Larsen Products, Inc. Wall hanger assembly. 5,314,160, Cl. 248-547.000.
Larson, Eric G.: *See*—
  Miller, Philip; Larson, Eric G.; and Kincaid, Don H., 5,314,513, Cl. 51-295.000.
Larson, John D., III: *See*—
  Huson, F. Russell; Pissanetzky, Sergio; and Larson, John D., III, 5,315,276, Cl. 335-216.000.
Larson, Paul E.; and Palmberg, Paul W., to Perkin-Elmer Corporation, The. Scanning and high resolution x-ray photoelectron spectroscopy and imaging. 5,315,113, Cl. 250-305.000.
Larson, Ralph I., Jr.: *See*—
  Samarov, Victor M.; Larson, Ralph I., Jr.; and Doumani, George A., 5,315,480, Cl. 361-705.000.
Lasa Industries, Inc.: *See*—
  Burns, Leslie L.; Barrett, William; and Tsai, Robert, 5,315,111, Cl. 250-235.000.
Laser Precision Corp.: *See*—
  Hakimi, Hosain; Bagetis, Scott; Williams, Walter; Sins, Howard; and Marolf, Dennis, 5,315,365, Cl. 356-73.100.
LaSota, Laurence. Rotary actuated linear latching motor. 5,315,202, Cl. 310-20.000.
Lassale, Jacques: *See*—
  Pascual, Nathalie; Fleury, Christophe; Sagnes, Georges; N'Guyen, Christian; and Lassale, Jacques, 5,315,271, Cl. 331-25.000.
Lassers, Arthur H. Hands-free intercom system. 5,315,639, Cl. 379-66.000.
Latanick Equipment, Inc.: *See*—
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  - Remy, Le Gallo; Gerard, Lyvet; and Malgogne, Bernard, 5,315,488, Cl. 361-796.000.
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  - Klauber, Robert D.; Vigmostad, Erik B.; Sprague, Frederick P.; and Mandarino, Joseph V., 5,313,826, Cl. 73-118.100.
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  - Greetham, Geoffrey, 5,314,655, Cl. 419-3.000.
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  - Lembke, Herbert, 5,314,118, Cl. 239-102.200.
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  - Kaye, Glen A., 5,313,804, Cl. 62-160.000.
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  - Suzuki, Hideyuki; Kitani, Masashi; Masaki, Yuichi; and Morimoto, Kenji, 5,314,788, Cl. 430-313.000.
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  - Tsukune, Atuhiro; Furumura, Yuji; and Masanobu, Hatanaka, 5,314,724, Cl. 427-489.000.
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  - Kappel, Johannes, 5,314,583, Cl. 162-25.000.
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  - Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,314,010, Cl. 165-104.260.
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  - Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; and Mason, James, 5,315,695, Cl. 395-132.000.
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  - Gagliardi, Matthew; and Mass, Noah B., 5,314,280, Cl. 411-182.000.
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  - Choi, Hong K.; Eglash, Stephen J.; Fan, Tso Y.; and Nabors, C. David, 5,315,608, Cl. 372-41.000.
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  - De Ferra, Lorenzo; Bonifacio, Fausto; Cifarelli, Guido; Massardo, Pietro; and Piccolo, Oreste, 5,315,023, Cl. 558-146.000.
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  - Durfor, Charles N.; Bolin, Richard J.; Schantz, Allen R., II; and Massey, Richard J., 5,314,642, Cl. 252-309.000.
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  - Egidio, Marchi; Gabriele, Rotini L.; Subhash, Desai; and Massimo, Grillli, 5,314,904, Cl. 514-394.000.
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  - Barnes, Ronny L.; and Mathews, H. Wayne, 5,313,769, Cl. 56-10.200.
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  - Fuji, Hiroshi; and Matoba, Hirotsugu, 5,315,567, Cl. 369-32.000.
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  - Cipullo, Michael J.; Kissinger, Gaylord M.; and Matos, Isabel M., 5,315,042, Cl. 568-727.000.
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  - Nakao, Mitsuya; Tanaka, Keiichiro; Ichikawa, Kousyu; Yamamoto, Akio; and Matsubara, Tadakazu, 5,315,395, Cl. 348-789.000.
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  - Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
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  - Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; and Matsudai, Tomoko, 5,315,134, Cl. 257-138.000.
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  - Watanabe, Yasutaka; Matsui, Kenji; Teraoka, Fuminori; and Tanaka, Kohbun, 5,314,138, Cl. 242-107.200.
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  - Takayama, Akira; Yoshida, Mitsuo; and Matsui, Shinichi, 5,315,640, Cl. 379-93.000.
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- Matsuki, Takeshi: *See—*
  - Tanaka, Kazuaki; Matsuki, Takeshi; and Takaragi, Kazuo, 5,315,634, Cl. 379-57.000.
- Matsumoto, Hiroyuki: *See—*
  - Ishii, Kenji; Kondo, Yoshinori; Matsumoto, Hiroyuki; and Sayama, Norio, 5,314,740, Cl. 428-209.000.
- Matsumoto, Junko: *See—*
  - Nishimoto, Masaki; and Matsumoto, Junko, 5,315,560, Cl. 365-238.500.
- Matsumoto, Kohji: *See—*
  - Kishida, Kazuo; Kitai, Kiyokazu; Kaneda, Masahiro; and Matsumoto, Kohji, 5,314,965, Cl. 525-309.000.
- Matsumoto, Koichi: *See—*
  - Yoshida, Tadashi; Koizumi, Kenzo; Kawamura, Yoshimi; Matsumoto, Koichi; and Itazaki, Hiroshi, 5,314,911, Cl. 514-451.000.
- Matsumoto, Mitsuo; Takahashi, Nobuo; and Sasaki, Yoshiyuki, to Teijin Limited. Blended synthetic short fiber yarn fabric. 5,313,774, Cl. 57-255.000.
- Matsumoto, Takashi, to Nissan Motor Co., Ltd. Multiplex data communicating apparatus applicable to automotive vehicle. 5,315,299, Cl. 341-53.000.
- Matsumoto, Takashi: *See—*
  - Tanikawa, Keizo; Saito, Akira; Matsumoto, Takashi; Sakoda, Ryozo; Tsuruzoe, Nobutomo; and Shikada, Ken-ichi, 5,314,883, Cl. 514-236.500.
- Matsumoto, Tsuyoshi: *See—*
  - Yamamoto, Makoto; and Matsumoto, Tsuyoshi, 5,313,814, Cl. 72-319.000.
- Matsumoto, Yasuki: *See—*
  - Yamashita, Haruo; Ishihara, Hideshi; and Matsumoto, Yasuki, 5,315,381, Cl. 358-500.000.
- Matsumura, Akira; and Kitakado, Ryuji, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for obtaining binary image. 5,315,409, Cl. 358-458.000.

Matsumura, Nobuya: *See—*

Izumi, Yasuo; Matsumura, Nobuya; Yamamoto, Akihiro; and Makino, Yutaka, 5,314,175, Cl. 269-224.000.

Matsumura, Teruyuki: *See—*

Fujita, Naoki; Matsumura, Teruyuki; and Murata, Koichi, 5,315,523, Cl. 364-474.220.

Matsunaka, Toshiyuki: *See—*

Murashita, Masaru; and Matsunaka, Toshiyuki, 5,313,948, Cl. 128-662.020.

Matsuo, Naoto; Ogawa, Hisashi; Nakata, Yoshiro; and Okada, Shozo, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device and a manufacturing method thereof. 5,315,543, Cl. 365-149.000.

Matsushima, Yuichi: *See—*

Utaka, Katsuyuki; Nagao, Yasuyuki; Matsushima, Yuichi; and Sakai, Kazuo, 5,315,422, Cl. 359-107.000.

Matsushiro, Moriyoshi; Toyoshi, Naoki; and Yoshiyama, Tsugihito, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 5,315,351, Cl. 355-246.000.

Matsushita electgric Industrial Co., Ltd.: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*

Fukakusa, Masaharu, 5,315,454, Cl. 360-75.000.

Ikemoto, Yoshihiro; and Maruyama, Teruo, 5,314,312, Cl. 417-16.000.

Izawa, Yosuke; and Okumura, Naoji, 5,315,389, Cl. 348-672.000.

Izumi, Yasuo; Matsumura, Nobuya; Yamamoto, Akihiro; and Makino, Yutaka, 5,314,175, Cl. 269-224.000.

Kishimoto, Yoshio; and Suzuki, Masaaki, 5,315,131, Cl. 257-57.000.

Kubo, Keishi; Ikemoto, Yoshihiro; and Itou, Tatsuo, 5,315,373, Cl. 356-373.000.

Kurai, Hisako; Mochizuki, Hideaki; and Kosako, Shinya, 5,315,421, Cl. 359-76.000.

Matsuda, Kenichi; and Shibata, Jun, 5,315,105, Cl. 250-214.0LS.

Matsuo, Naoto; Ogawa, Hisashi; Nakata, Yoshiro; and Okada, Shozo, 5,315,543, Cl. 365-149.000.

Mizuno, Yasuo; Sugai, Masakatsu; Ikeda, Masaki; and Yoshida, Akihiko, 5,315,434, Cl. 359-355.000.

Saimi, Tetsuo; Momoo, Kazuo; and Kato, Makoto, 5,315,574, Cl. 369-109.000.

Sakiyama, Kazuyuki; Ahagon, Akira; Kotera, Hidetoshi; and Kita, Hiromi, 5,315,233, Cl. 324-72.000.

Satou, Hiroaki; and Muraji, Tsutomu, 5,315,378, Cl. 348-655.000.

Shinagawa, Tomonori, 5,315,313, Cl. 345-145.000.

Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,314,508, Cl. 29-623.500.

Tsuji, Kazuhiko, 5,315,143, Cl. 257-351.000.

Yamashita, Haruo; Ishihara, Hideshi; and Matsumoto, Yasuki, 5,315,381, Cl. 358-500.000.

Yasui, Takatoshi; Kudo, Chiaki; Nakao, Ichiro; Fujii, Toyokazu; Terai, Yuka; Imai, Shinichi; Yamamoto, Hiroshi; and Naito, Yasushi, 5,314,848, Cl. 437-248.000.

Yoshizumi, Keiichi, 5,315,374, Cl. 356-376.000.

Matsushita Electronics Corporation: *See—*

Asaumi, Masaji; and Kuroda, Takao, 5,315,137, Cl. 257-221.000.

Matsushita, Souichi, to Toyota Jidosha Kabushiki Kaisha. Control device for internal combustion engine. 5,313,920, Cl. 123-295.000.

Matsuura, Kunihisa; and Horiba, Yoshio, to Hitachi, Ltd. Method of determining the acceptability of a request to preengage receipt and/or payment of money in an ATM system using the same. 5,315,511, Cl. 364-408.000.

Matsuura, Shizutaka: *See—*

Fujimura, Yoshiichi; and Matsuura, Shizutaka, 5,314,137, Cl. 242-107.000.

Matsuura, Takashi; Higaki, Kenjiro; and Itozaki, Hideo, to Sumitomo Electric Industries, Ltd. Preparing thin film of oxide superconductor. 5,314,870, Cl. 505-476.000.

Matsuura, Yozo: *See—*

Kamijo, Masahiko; Matsuura, Yozo; and Saitoh, Hiroshi, 5,315,357, Cl. 355-298.000.

Mattel, Inc.: *See—*

Caveza, Martin J.; and Gable, Derek, 5,314,338, Cl. 434-259.000.

Caveza, Martin J.; Chung, Caleb S.; and Cannone, Gregory M., 5,314,373, Cl. 446-481.000.

Matthews, Gary B.; and Pratt, Jerome A., to Minnesota Mining and Manufacturing Company. Pluggable modular splicing connector and bridging adapter. 5,314,350, Cl. 439-404.000.

Matthiessen, Hans, to Dragerwerk Aktiengesellschaft. Measuring cell for electrochemically detecting a gas. 5,314,605, Cl. 204-415.000.

Mattos, Louis J.: *See—*

Georgopoulos, George; Fullerton, Ritchie J.; and Mattos, Louis J., 5,314,219, Cl. 292-320.000.

Matuzawa, Tomoki; Yokota, Seiji; Emori, Katsuhiko; and Harada, Junichi, to Toyota Jidosha Kabushiki Kaisha. Front body structure. 5,314,229, Cl. 296-189.000.

Maubiter Trading Inc.: *See—*

Dickie, Robert G.; Tousson, Maurice; Edgar, William A.; and Jennings, Peter, 5,313,683, Cl. 15-117.000.

Maurer, Donald D.; and Kipnis, Alexander, to Empi, Inc. Incontinence electrode apparatus and method. 5,314,465, Cl. 607-138.000.

Maurer, Ruprecht, to Ringspann GmbH. Detent arrangement for the coupling pin of an overload element, particularly in an overload clutch. 5,314,381, Cl. 464-30.000.

Mauri, Daniele: *See—*

Lin, Tsann; Howard, James K.; Hwang, Cherngye; Mauri, Daniele; and Staud, Norbert, 5,315,468, Cl. 360-113.000.

Mauvin Material & Chemical Processing Limited: *See—*

Di Tullio, Venanzio, 5,314,580, Cl. 162-5.000.

Maxtor Corporation: *See—*

Schowe, Lester, 5,315,181, Cl. 307-480.000.

Mayas, Marcel B. Word forming board game with mirrors. 5,314,191, Cl. 273-272.000.

Mayernik, Pamela A.: *See—*

Barber, Herbert J.; and Mayernik, Pamela A., 5,314,837, Cl. 437-89.000.

Mazda Motor Corporation: *See—*

Fujii, Yutaka, 5,315,295, Cl. 340-936.000.

Mazur, Joseph S.: *See—*

Slicker, James; Mazur, Joseph S.; and Breen, Michael T., 5,314,050, Cl. 477-171.000.

Mazur, Richard J.: *See—*

Drake, John B.; Wood, James A.; Slavick, Carl J., Jr.; and Mazur, Richard J., 5,315,520, Cl. 364-426.050.

Mazure, Carlos A.; and Orlowski, Marius K., to Motorola, Inc. Field effect transistor having a gate dielectric with variable thickness. 5,314,834, Cl. 437-43.000.

Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogaert, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., to Minnesota Mining & Manufacturing Company. Radiation-curable silicone elastomers and pressure sensitive adhesives. 5,314,748, Cl. 428-345.000.

McAdams, John B., to Nishika Limited. Simultaneous stereo fundus camera. 5,315,329, Cl. 351-206.000.

McAfee, Donald A., to Whitby Research, Inc. Compounds useful as antiproliferative agents. 5,314,908, Cl. 514-415.000.

McCall, Mark; Del Fava, Donald; Wong, Thomas; and Koht, Lowell I., to Raynet Corporation. Pressure clamp for telecommunications closure. 5,315,489, Cl. 361-801.000.

McCallum, Richard W.: *See—*

Sarosiek, Jerzy; McCallum, Richard W.; and Mittal, Ravinder K., 5,314,409, Cl. 604-101.000.

McCalpin, William H.: *See—*

Wisherd, David S.; and McCalpin, William H., 5,315,265, Cl. 330-277.000.

McCanless, Forrest S.; and Boone, Bruce T., to Georgia-Pacific Corporation. Apparatus for dispensing rolled flexible sheet material. 5,314,131, Cl. 242-55.300.

McComas, Jerry L.: *See—*

Christian, Donald J.; Feng, Chin-Hu; McComas, Jerry L.; and Chang, Andrew K., 5,314,071, Cl. 209-4.000.

McConnell, Frank E.: *See—*

Goldbach, Richard A.; McConnell, Frank E.; and Salzer, J. Richard, 5,313,903, Cl. 114-65.00R.

McConnell, Peter N.: *See—*

Land, Michael Z.; and McConnell, Peter N., 5,315,057, Cl. 84-601.000.

McCormick, Fred B.; Gladfelter, Wayne L.; and Senzaki, Yoshihide, to Minnesota Mining & Mfg. Co./Regents of the University of Minnesota. Chemical vapor deposition of iron, ruthenium, and osmium. 5,314,727, Cl. 427-584.000.

McCowan, Deborah; and McCoy, Diana. Safety vial-handler tool and method. 5,314,413, Cl. 604-192.000.

McCoy, Christopher: *See—*

Bolejack, Kevin J.; Forgnone, Frederick; and McCoy, Christopher, 5,314,286, Cl. 414-416.000.

McCoy, Diana: *See—*

McCowan, Deborah; and McCoy, Diana, 5,314,413, Cl. 604-192.000.

McCracken, Robert; and McCurry, Ronald C., to Ryobi Motor Products Corp. Bidirectional brush holder assembly. 5,315,199, Cl. 310-239.000.

McCullough, John E.: *See—*

Shibamoto, Yoshitaka; Taniwa, Hiroyuki; Ueno, Hiromichi; Hagiwara, Shigeki; Forni, Ronald J.; and McCullough, John E., 5,314,316, Cl. 418-55.100.

McCurry, Ronald C.: *See—*

McCracken, Robert; and McCurry, Ronald C., 5,315,199, Cl. 310-239.000.

McDonald, Dennis K.: *See—*

Bees, William J.; and McDonald, Dennis K., 5,313,822, Cl. 73-37.000.

McDonald, Robert H.: *See—*

McDonald, Sean C.; McDonald, Robert H.; Lunak, Richard R.; and Zini, Aldo, 5,314,243, Cl. 312-215.000.

McDonald, Sean C.; McDonald, Robert H.; Lunak, Richard R.; and Zini, Aldo, to Automated Healthcare, Inc. Portable nursing center. 5,314,243, Cl. 312-215.000.

McDonnell Douglas Corporation: *See—*

Bicos, Andrew S., 5,315,203, Cl. 310-326.000.

McDonnell Douglas Helicopter Company: *See—*

Rudow, Richard W.; and Wroblewski, Kenneth A., 5,315,309, Cl. 343-705.000.

McDonnell, Patrick F.; Wren, Gerard M.; and Welch, Edward K., II, to Loctite Corporation. Consumer polyolefin primer. 5,314,562, Cl. 156-314.000.

McDowell, Robert E.; Basic, Steven L.; and Smith, Russel M., to General Electric Company. Coal slurry fuel supply and purge system. 5,313,915, Cl. 123-23.000.

McGeary, Michael J.: *See—*

Goldstein, Stephen L.; Hamer, Anthony D.; Katz, Lawrence E.; McGeary, Michael J.; and Smith, Curtis P., 5,315,004, Cl. 540-202.000.

McHardy, John; Townsend, Carl W.; Higley, Lin R.; and Ludwig, Frank A., to Hughes Aircraft Company. Electrochemical synapses for artificial neural networks. 5,315,162, Cl. 307-201.000.

McKee, William B. Movable medical examination chair. 5,313,961, Cl. 128-897.000.

McKenna, William: *See—*

Gordon, Thomas A.; Gray, Barrett C.; McKenna, William; Stempien, Joseph W.; and Magnon, Ken P., 5,315,690, Cl. 395-104.000.

McKenzie, John R.: *See—*

Salmon, Stephen M.; McKenzie, John R.; Thornton, Peter; and Ginn, Richard, 5,314,408, Cl. 604-22.000.

McKillip, William D.: *See—*

Pratt, William C.; and McKillip, William D., 5,315,505, Cl. 364-413.010.

McMackins, Dudley E.: *See—*

Tjoeng, Foe S.; Toth, Mihaly V.; McMackins, Dudley E.; and Adams, Steven P., 5,314,902, Cl. 514-357.000.

McMahon, Thomas A.; and Valiant, Gordon A., to Nike, Inc. Athletic shoe with bendable traction projections. 5,313,718, Cl. 36-59.00C.

McMullen, Patrick T.: *See—*

Meeks, Crawford R.; and McMullen, Patrick T., 5,315,197, Cl. 310-90.500.

MCNC: *See—*

Magill, Paul A.; Koopman, Nicholas G.; and Rinne, Glenn A., 5,315,485, Cl. 361-767.000.

McNeil, Michael, to Applied Magnetics Corporation. Magnetic recording head which produces variable erase bands. 5,315,469, Cl. 360-119.000.

McNeil-PPC, Inc.: *See—*

Rencher, William F., 5,314,915, Cl. 514-535.000.

McNeilab, Inc.: *See—*

Berta, Norbert I., 5,314,537, Cl. 118-30.000.

Scott, Malcolm K.; Reitz, Allen B.; Maryanoff, Cynthia A.; and Villani, Frank J., Jr., 5,314,885, Cl. 514-252.000.

McNichols, Larry A.; Badzinski, John D.; and Hayden, Gary K., to Alza Corporation. Iontophoretic delivery device. 5,314,502, Cl. 604-20.000.

McReynolds, John M.: *See—*

Boden, David E.; Fong, Mandy M. H.; and McReynolds, John M., 5,315,424, Cl. 359-152.000.

McVicker, Henry J.: *See—*

Johnson, Glenn W., Jr.; McVicker, Henry J.; and Shelbourne, K. Donald, 5,314,455, Cl. 607-104.000.

MDT Corporation: *See—*

Thakur, Bhabesh K.; Gilbert, Maurice; Hancock, Charles O.; and Feathers, Charles H., 5,313,738, Cl. 49-394.000.

Mead Corporation, The: *See—*

Bates, Aaron, 5,314,224, Cl. 294-87.200.

Calvert, Rodney K.; Fishback, Alton J.; and Van Horne, George R., 5,314,057, Cl. 198-483.100.

Suttles, J. Marshall, 5,313,891, Cl. 108-108.000.

Meade, Ronald A. Quick release safety device for firearms. 5,313,733, Cl. 42-70.110.

Meadows, John W.: *See—*

Carlisle, Brian R.; Witham, Carl R.; Allan, Donald R.; and Meadows, John W., 5,314,293, Cl. 414-744.500.

Meadox Medicals, Inc.: *See—*

Rudnick, James J., 5,314,443, Cl. 606-192.000.

Meah, Abdul R. Y.: *See—*

Koskan, Larry P.; Low, Kim C.; Meah, Abdul R. Y.; and Atencio, Anne M., 5,315,010, Cl. 548-520.000.

Measurex Corporation: *See—*

Goss, John D.; Axelrod, Steve; Boissevain, Mathew; Hegland, Philip M.; and Wiley, Scott C., 5,315,124, Cl. 250-497.100.

MedAmicus, Inc.: *See—*

Little, Richard L., 5,313,957, Cl. 128-748.000.

Medina, Juan M.: *See—*

Stich, Frederick A.; Zahrte, Donald K., Sr.; Baxter, Richard V., Jr.; Folts, Douglas C.; Hubert, Thomas G.; Medina, Juan M.; Hazen, William J.; and Beistle, Edward G., 5,315,533, Cl. 364-480.000.

Medina, Ramiro: *See—*

Schmidt, Hanns-Ludwig; and Medina, Ramiro, 5,314,827, Cl. 436-106.000.

Medtronic Hemotec, Inc.: *See—*

Baugh, Robert F., 5,314,826, Cl. 436-69.000.

Medtronic, Inc.: *See—*

Camps, Antoine N. J. M.; Grandjean, Pierre A.; Johnson, Gary M.; Lee, Philip H. J.; Lokhoff, Nicolaas M. H.; and Van Driel, Willem J., 5,314,463, Cl. 607-129.000.

Gust, H. Bardy, 5,314,430, Cl. 607-5.000.

Lieber, Glen L.; Solar, Ronald J.; Wolf, Erich H.; and Fugoso, Mauricio L., Jr., 5,313,967, Cl. 128-772.000.

Mulier, Peter M. J., 5,314,451, Cl. 607-33.000.

Shu, Mark C. S., 5,314,467, Cl. 623-2.000.

Thompson, David L., 5,314,450, Cl. 607-32.000.

Meeks, Crawford R.; and McMullen, Patrick T., to AVCON - Advance Controls Technology, Inc. Electromagnetic thrust bearing using passive and active magnets, for coupling a rotatable member to a stationary member. 5,315,197, Cl. 310-90.500.

Meendering, David N.; Malhotra, Deepak; and Baltich, Linda K., to AMAX, Inc. Conditioning metal powder for injection molding. 5,314,658, Cl. 419-33.000.

Meguro, Yoshio: *See—*

Kawaguchi, Chikakazu; Meguro, Yoshio; and Harada, Takashi, 5,314,736, Cl. 428-143.000.

Mehrotra, Sanjay: *See—*

Harari, Eliyahou; and Mehrotra, Sanjay, 5,315,541, Cl. 365-63.000.

Meiji Seika Kaisha, Ltd.: *See—*

Kono, Toshiaki; Yamaguchi, Goichi; and Hidaka, Hidemasa, 5,314,810, Cl. 435-97.000.

Meinders, Larry L. Wheelable, storable cooler. 5,313,817, Cl. 62-457.100.

Meinerth, Kim: *See—*

Case, Colyn; Meinerth, Kim; Irwin, John; and Fanning, Blaise, 5,315,696, Cl. 395-133.000.

Case, Colyn; Meinerth, Kim; Irwin, John; and Fanning, Blaise, 5,315,698, Cl. 395-162.000.

Meinhardt, Ulrich: *See—*

Heitze, Gerhard; and Meinhardt, Ulrich, 5,313,813, Cl. 72-201.000.

Meirowitz, Randy E.; Riese, Jerome W.; and Phelan, Robert J., to Kimberly-Clark Corporation. Nonwoven web containing shaped fibers. 5,314,743, Cl. 428-297.000.

Meisinger, Eduard; and Steiner, Herbert, to Man Gutehoffnungshuette Aktienegesellschaft. Hoisting gear on the trolley of a container crane. 5,314,262, Cl. 414-137.100.

Meisner, Gregory P.: *See—*

Panchanathan, Viswanathan; Meisner, Gregory P.; and Croat, John J., 5,314,548, Cl. 148-101.000.

Meister, John A.: *See—*

Hilger, Robert L.; Davis, John R.; and Meister, John A., 5,313,876, Cl. 99-330.000.

Melas, Constantin M.: *See—*

Bentley, Steven R.; Hutchins, Robert A.; Melas, Constantin M.; and Sutardja, Pantas, 5,315,284, Cl. 340-146.200.

Melton, Hewlett E., Jr., to Hewlett-Packard Company. Method and apparatus for the characterization of tissue or other structure. 5,313,946, Cl. 128-660.020.

Melzer, Jeffrey I.; and Gunagan, Barry P., to Betz Laboratories, Inc. Process for enhanced drainage of residual aqueous rinse on the external surface of plastic parts. 5,314,546, Cl. 134-42.000.

Melzner, Hanno, to Siemens Aktiengesellschaft. Bit line arrangement for integrated circuits. 5,315,542, Cl. 365-72.000.

Memoli, Kevin A.: *See—*

Felman, Steven W.; Jirkovsky, Ivo L.; and Memoli, Kevin A., 5,314,913, Cl. 514-473.000.

Mendlovic, David: *See—*

Marom, Emanuel; Konforti, Naim; and Mendlovic, David, 5,315,095, Cl. 235-462.000.

Menicon Co., Ltd.: *See—*

Sugita, Juntaro, 5,314,439, Cl. 606-166.000.

Mentink, Leon; and Serpelloni, Michel, to Roquette Freres. Sugar-free "hard candy" and process for its manufacture. 5,314,701, Cl. 426-103.000.

Menz, Edward T.: *See—*

Lewis, Jerome M.; Menz, Edward T.; Kenny, Francis E.; Groman, Ernest V.; and Josephson, Lee, 5,314,679, Cl. 424-9.000.

Mercedes-Benz AG: *See—*

Gall, Heinz; and Senn, Kurt, 5,313,873, Cl. 91-429.000.

Kotzle, Horst; Oelmann, Bernd; Schafer, Ulrich; and Schwarz, Gerhard, 5,313,828, Cl. 73-146.000.

Merck & Co., Inc.: *See—*

Bailey, Fred J.; and Herber, Wayne K., 5,314,822, Cl. 435-253.400.

Chung, John Y. L.; Reamer, Robert A.; Girard, Yves; and Hamel, Pierre, 5,314,898, Cl. 514-338.000.

Dollerup, Jens, 5,314,909, Cl. 514-420.000.

Lee, Ann L.; Rienstra, Mark S.; Manger, Walter E.; and Sitrin, Robert D., 5,314,811, Cl. 435-101.000.

Midler, Michael, Jr.; Paul, Edward L.; Whittington, Edwin F.; Futran, Mauricio; Liu, Paul D.; Hsu, Jaanpyng; and Pan, Shih-Hsie, 5,314,506, Cl. 23-295.00R.

Merck Frosst Canada Inc.: *See—*

Chung, John Y. L.; Reamer, Robert A.; Girard, Yves; and Hamel, Pierre, 5,314,898, Cl. 514-338.000.

Girard, Yves; Hutchinson, John H.; Therien, Michel; and Delorme, Daniel, 5,314,900, Cl. 514-339.000.

Merigan, Thomas C.: *See—*

Rasmussen, Lucy E.; and Merigan, Thomas C., 5,314,800, Cl. 435-4.000.

Merlin Gerin: *See—*

Chaboud, Gilbert; and Kalenine, Yvan, 5,315,599, Cl. 371-25.100.

Merrill, James P., to Eastman Kodak Company. Photographic element and process providing improved color rendition. 5,314,792, Cl. 430-505.000.

Merton Company, Ltd.: *See—*

Murray, Joseph E., Jr., 5,313,727, Cl. 40-410.000.

Metcal, Inc.: *See—*

Lesea, Ronald A., 5,315,214, Cl. 315-209.00R.

Lesea, Ronald A., 5,315,215, Cl. 315-219.000.

Metex Corporation Limited: *See—*

Toth, Andrew S., 5,315,294, Cl. 340-679.000.

Metro Machine Corp.: *See—*

Goldbach, Richard A.; McConnell, Frank E.; and Salzer, J. Richard, 5,313,903, Cl. 114-65.00R.

- Mettler-Toledo (Albstadt) GmbH: *See—*
  - Ast, Adolf; Enzmann, Erwin; and Holike, Walter, 5,315,073, Cl. 177-212.000.
- Metz, Barbara A.: *See—*
  - Neubauer, Frank; Pickett, Gordon; and Metz, Barbara A., 5,314,379, Cl. 462-6.000.
- Meyer, Charles R.: *See—*
  - Yashar, Frank D.; Meyer, Charles R.; and Gurley, John A., 5,314,254, Cl. 384-49.000.
- Meyer, Ruediger: *See—*
  - Leidinger, Bernhard; Meyer, Ruediger; and Nickel, Klaus P., 5,314,011, Cl. 165-104.260.
- Micali, Silvio. Fair cryptosystems and methods of use. 5,315,658, Cl. 380-30.000.
- Mican, Stephen G., to Amoco Corporation. Robust pixel array scanning with image signal isolation. 5,315,393, Cl. 348-268.000.
- Micco, Alexander J., to University Patents, Inc. CW and pulsed doppler diagnostic system. 5,313,947, Cl. 128-661.090.
- Michaels, Edwin B.; and Malamud, Daniel, to E. B. Michaels Research Associates, Inc. Method for inactivating enveloped viruses and sperm. 5,314,917, Cl. 514-556.000.
- Michel, Rudolf: *See—*
  - Goebel, Thomas; Michel, Rudolf; Alff, Harald; and Karl, Josef, 5,314,533, Cl. 106-287.130.
- Michelsen, Donald L.; and Sebba, Felix, to Virginia Polytechnic Institute and State University. Microbubble generator. 5,314,644, Cl. 261-84.000.
- Michiyama, Katsunori: *See—*
  - Takeuchi, Shigeru; Sugiura, Junji; and Michiyama, Katsunori, 5,313,923, Cl. 123-497.000.
- Michne, William F.: *See—*
  - Stecher, Vera J.; and Michne, William F., 5,314,894, Cl. 514-313.000.
- Micro-Blend, Inc.: *See—*
  - Gibney, Michael W.; Lucas, Lawrence M.; and Culver, Roy, Jr., 5,314,703, Cl. 426-231.000.
- Micro Chemical, Inc.: *See—*
  - Pratt, William C.; and McKillip, William D., 5,315,505, Cl. 364-413.010.
- Micro Hydraulics Inc.: *See—*
  - Kadlicko, George, 5,313,844, Cl. 73-861.540.
- Micro Technology, Inc.: *See—*
  - Eidler, Chris W.; Johnson, Hoke S., III; and Shah, Kaushik S., 5,315,708, Cl. 395-250.000.
- MicroAire Surgical Instruments, Inc.: *See—*
  - Zang, Kerry; and Huebner, Randall J., 5,314,486, Cl. 623-21.000.
- Microelectronics and Computer Technology Corporation: *See—*
  - Mackay, Colin A., 5,314,003, Cl. 164-494.000.
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  - Zagar, Paul S.; and Douglas, Kurt P., 5,315,177, Cl. 307-465.000.
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  - Bettinger, Michael J., 5,315,255, Cl. 324-457.000.
  - Cathey, David A., 5,314,578, Cl. 156-662.000.
  - Yu, Chris C.; Sandhu, Gurtej S.; and Doan, Trung T., 5,314,843, Cl. 437-225.000.
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  - Brosius, David J.; and Sim, Joseph M., 5,314,331, Cl. 433-21.000.
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  - Smrt, Thomas J.; and Mierzwinski, Walter S., 5,314,097, Cl. 222-402.100.
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  - Haley, William J.; Miller, Alan L.; and Schneider, Karl F., 5,314,385, Cl. 474-28.000.
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  - Clark, Peter P.; Miller, Douglas E.; Mulford, Deborah A.; and Ostrowski, John C., 5,315,344, Cl. 354-456.000.
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- Miller, Jack V. Ventilated fiber optic bushing. 5,315,683, Cl. 385-136.000.
- Miller, John L.: *See—*
  - Ball, Don G.; Birx, Daniel L.; Cook, Edward G.; and Miller, John L., 5,315,611, Cl. 372-56.000.
- Miller, Paul C. H., to British Technology Group Ltd. Electrostatic spraying. 5,314,123, Cl. 239-708.000.
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  - Ryer, Jack; Gutierrez, Antonio; Puckace, James S.; Watts, Raymond F.; Gleason, Craig W.; Mills, Daniel R.; Braun, Edmund H., II; and Brois, Stanley J., 5,314,633, Cl. 252-46.700.
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  - Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Garavaglia, Carlo; and Mirenna, Luigi, 5,314,879, Cl. 514-63.000.
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  - Babirad, Stefan A.; Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 5,314,975, Cl. 526-248.000.
  - Drtina, Gary J.; and Christensen, Leif, 5,315,006, Cl. 546-43.000.
  - Hector, Wayne M.; and Arsenault, Cathleen M., 5,315,579, Cl. 369-290.000.
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  - Morrison, Eric D., 5,314,980, Cl. 528-19.000.
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  - Wiste, Orville M., 5,314,732, Cl. 428-35.300.
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  - Hamada, Masataka; Ishibashi, Kenji; Ueda, Hiroshi; Otsuka, Hiroshi; and Hara, Yoshihiro, 5,315,339, Cl. 354-400.000.
  - Matsushiro, Moriyoshi; Toyoshi, Naoki; and Yoshiyama, Tsugihito, 5,315,351, Cl. 355-246.000.
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  - Hutchison, Wayne R.; Teal, Richard D.; Wasson, Steven C.; Mirdamadi, Mansour; Moore, Earl T.; Lorenzo, Luis; Coffey, Michael J.; and Nickles, Daniel R., 5,314,230, Cl. 296-203.000.
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  - Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Garavaglia, Carlo; and Mirenna, Luigi, 5,314,879, Cl. 514-63.000.
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  - Frankel, Henry; Miroshnichenko, Sergey; and Whitlock, Jonathan B., 5,314,072, Cl. 209-44.100.
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  - Brust, Thomas B.; and Mis, Mark R., 5,314,798, Cl. 430-567.000.
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  - Pal, Uday B.; Gazula, Gopala K. M.; and Hasham, Ali, 5,314,524, Cl. 75-10.350.

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  - Fuji, Kazuo; Kita, Hideki; and Takeuchi, Toshimitsu, 5,315,362, Cl. 355-326.00R.
  - Hirobe, Junichi; Akashi, Masakatsu; Kobayashi, Masahiko; and Sugaya, Tsutomu, 5,315,350, Cl. 355-208.000.
  - Kubo, Masahiko; Watanabe, Akihiro; Nagai, Takafumi; and Maruyama, Hironori, 5,314,773, Cl. 430-45.000.
  - Nishimura, Kohzoh, 5,314,053, Cl. 192-41.00S.
- Mitchell, James N.: *See—*
  - Holloman, Jesse H., 5,314,167, Cl. 256-69.000.
- Mitek Surgical Products, Inc.: *See—*
  - Li, Lehmann K., 5,314,433, Cl. 606-139.000.
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  - Arimoto, Kazutami, 5,315,166, Cl. 307-296.200.
  - Hayafuji, Norio, 5,315,133, Cl. 257-102.000.
  - Hayashi, Kiyoshi; Ootera, Susumu; Sato, Hirosh; and Utsui, Yoshihiko, 5,313,845, Cl. 73-862.334.
  - Hirayama, Kazutoshi, 5,315,551, Cl. 365-200.000.
  - Hosotani, Shiro; Miki, Takahiro; and Ito, Masao, 5,315,301, Cl. 341-94.000.
  - Itoh, Tetsuro, 5,315,087, Cl. 219-69.120.
  - Iwasaki, Yasuo, 5,315,209, Cl. 313-478.000.
  - Kamon, Kazuya, 5,315,349, Cl. 355-53.000.
  - Koyama, Kenji; and Uchihara, Shoichi, 5,315,502, Cl. 364-184.000.
  - Muramoto, Yoshifumi, 5,315,386, Cl. 348-569.000.
  - Nishimoto, Masaki; and Matsumoto, Junko, 5,315,560, Cl. 365-238.500.
  - Oda, Keisuke; and Kouzai, Fumio, 5,314,179, Cl. 271-145.000.
  - Ohtagaki, Shigeki; and Watanabe, Hirosi, 5,314,378, Cl. 475-150.000.
  - Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.
  - Sadamori, Masaaki, 5,313,966, Cl. 134-76.000.
  - Sakashita, Kazuhiro; Yusa, Terukazu; Takimoto, Isao; Hashizume, Takeshi; and Komoike, Tatsunori, 5,315,182, Cl. 307-482.100.
  - Sugahara, Kazuyuki; and Arima, Hideaki, 5,315,140, Cl. 257-306.000.
  - Tachibana, Miyuki, 5,315,387, Cl. 348-521.000.
  - Takaishi, Tado, 5,313,927, Cl. 123-634.000.
  - Taniguchi, Takao; and Sato, Hiroshi, 5,314,294, Cl. 414-744.600.
  - Tobita, Youichi, 5,315,550, Cl. 365-194.000.
  - Yamada, Hisashi; and Magara, Takuji, 5,315,088, Cl. 219-69.120.
- Mitsubishi Gas Chemical Company, Inc.: *See—*
  - Ishii, Kenji; Kondo, Yoshinori; Matsumoto, Hiroyuki; and Sayama, Norio, 5,314,740, Cl. 428-209.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Ando, Masatoshi; Mochizuki, Hiromine; and Yamamoto, Mitsuo, 5,314,132, Cl. 242-56.00R.
  - Toda, Hiromichi; Ishigami, Shigeyasu; Kobayashi, Norihisa; Furuya, Takaaki; and Izumi, Jun, 5,313,781, Cl. 60-39.120.
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  - Hirota, Takao; Shinohara, Hideo; and Kuroda, Katsuhiko, 5,314,862, Cl. 503-227.000.
  - Ito, Tsuyoshi; Watanabe, Junya; and Sawada, Shintaro, 5,314,974, Cl. 526-206.000.
  - Omae, Yoshihiro; Watanabe, Haruo; Sonoki, Susumu; Kanemasa, Yoichi; Sagara, Kazuo; Yoshimune, Takashi; and Yamasaki, Tetsuo, 5,314,168, Cl. 266-92.000.
  - Yamada, Kazunori; Ochiai, Masanori; Yotsumoto, Yoshihisa; Morimoto, Yuuki; and Teranishi, Yutaka, 5,314,819, Cl. 435-232.000.
- Mitsubishi Kasei Vinyl Company: *See—*
  - Yamanaka, Masahiro; Hori, Kazuya; Ichikawa, Naoki; and Washimi, Mizuo, 5,314,941, Cl. 524-425.000.
- Mitsubishi Materials Corporation: *See—*
  - Arai, Tatsuo; Saito, Takayoshi; and Hayashizaki, Hiroaki, 5,314,269, Cl. 407-42.000.
  - Nakayama, Masaaki; Okawa, Masayuki; and Saito, Junichi, 5,314,273, Cl. 408-233.000.
- Mitsubishi Petrochemical Company Limited: *See—*
  - Himori, Shunichi, 5,314,958, Cl. 525-256.000.
  - Otsu, Takayuki; Himori, Shunichi; and Kiriyama, Takashi, 5,314,962, Cl. 525-280.000.
  - Saito, Keiichi; and Nishida, Koji, 5,314,733, Cl. 428-36.600.
- Mitsubishi Rayon Company Ltd.: *See—*
  - Kishida, Kazuo; Kitai, Kiyokazu; Kaneda, Masahiro; and Matsumoto, Kohji, 5,314,965, Cl. 525-309.000.
- Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
  - Ohashi, Hirotaka; and Yasunobe, Toru, 5,314,291, Cl. 414-719.000.
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  - Shindo, Kiyotaka; Igarashi, Koichi; Mizumoto, Kunihiko; and Hashimoto, Hidehiko, 5,314,757, Cl. 428-627.000.
- Mitsui Toatsu Chemicals, Incorporated: *See—*
  - Asanuma, Tadashi; Shiomura, Tetsunosuke; Uchikawa, Nobutaka; Iwatani, Tutomu; and Takeuchi, Katsumi, 5,314,956, Cl. 525-240.000.
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  - Nozaki, Nobuharu; Mitsumoto, Shinji; Okazaki, Yoji; and Adachi, Takashi, 5,315,613, Cl. 372-69.000.
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  - Sarosiek, Jerzy; McCallum, Richard W.; and Mittal, Ravinder K., 5,314,409, Cl. 604-101.000.
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  - Terasawa, Koji; Takemura, Makoto; Nojima, Takashi; and Miyakawa, Akira, 5,315,317, Cl. 346-1.100.
- Miyake, Hidehiko: *See—*
  - Yonemoto, Katsuyuki; Miyake, Hidehiko; and Enoki, Kazumasa, 5,313,694, Cl. 29-27.00R.
- Miyamoto, Takashi: *See—*
  - Ohkubo, Hiroshi; and Miyamoto, Takashi, 5,315,462, Cl. 360-96.500.
- Miyata, Kunihiro: *See—*
  - Hayashi, Kazuhiro; Honda, Jun; Fujita, Michitaka; and Miyata, Kunihiro, 5,315,662, Cl. 381-107.000.
- Miyata, Shigeru; Matsubara, Yoshiaki; and Kojima, Takao, to NGK Spark Plug Co., Ltd. Device for temporarily holding pressure sensor in place within spark plug attaching hole of cylinder head. 5,313,849, Cl. 73-866.500.
- Miyata, Teruo; and Kawai, Tadatomo, to Koken Co., Ltd. Intracorporeally injectable composition for implanting highly concentrated cross-linked atelocollagen. 5,314,874, Cl. 514-21.000.
- Miyawaki, Keiichi: *See—*
  - Tajima, Yoshihisa; and Miyawaki, Keiichi, 5,314,946, Cl. 524-513.000.
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- Miyazaki, Toshimasa: *See—*
  - Katoh, Hiroaki; Murakawa, Yoshitaka; Miyazaki, Toshimasa; Kitamura, Nobuyuki; and Sato, Shinichi, 5,314,631, Cl. 235-467.000.
- Miyazaki, Yoshito: *See—*
  - Shimizu, Hiroshi; Ikeo, Jirou; Kabeta, Katsutoshi; and Miyazaki, Yoshito, 5,315,347, Cl. 355-043.000.
- Miyoshi, Motosuke: *See—*
  - Komatsu, Fumio; Okumura, Katsuya; and Miyoshi, Motosuke, 5,315,119, Cl. 250-398.000.
- Miyoshi, Norihisa: *See—*
  - Ohshita, Takahiro; Nagato, Shuichi; Miyoshi, Norihisa; and Toyoda, Seiichiro, 5,313,913, Cl. 122-4.00D.
- Mizen, Mark B.: *See—*
  - Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
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  - Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.
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  - Nishihira, Keigo; Tanaka, Shuji; Mizutare, Katsuhiko; and Kondo, Masahiro, 5,315,032, Cl. 560-157.000.
- Mizuuchi, Sotoo; and Nishimura, Isao, to Tsudakoma Kogyo Kabushiki Kaisha. Warp yarn breakage detecting system. 5,313,692, Cl. 28-187.000.
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  - Smith, Daniel E., 5,314,164, Cl. 251-129.170.
- Mobil Oil Corporation: *See—*
  - Honarpour, Mehdi M., 5,314,019, Cl. 166-270.000.
  - Jennings, Alfred R., Jr.; and Abou-Sayed, Ibrahim S., 5,314,020, Cl. 166-281.000.
- Mochizuki, Hideaki: *See—*
  - Kurai, Hisako; Mochizuki, Hideaki; and Kosako, Shinya, 5,315,421, Cl. 359-76.000.
- Mochizuki, Hiromine: *See—*
  - Ando, Masatoshi; Mochizuki, Hiromine; and Yamamoto, Mitsuo, 5,314,132, Cl. 242-56.00R.
- Mochizuki, Masataka: *See—*
  - Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,314,010, Cl. 165-104.260.

- Modinger, Roland: *See—*
  - Czeschka, Franz; and Modinger, Roland, 5,314,349, Cl. 439-394.000.
- Mogi, Takao: *See—*
  - Niki, Mamoru; Hosaka, Yoshiaki; Mogi, Takao; and Saito, Haruo, 5,315,446, Cl. 360-48.000.
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  - Axelsson, Oskar; Thaning, Mikkel; and Moldt, Peter, 5,314,903, Cl. 514-388.000.
- Molecular Probes, Inc.: *See—*
  - Haugland, Richard P.; MacCoubrey, Ian C.; and Moore, Patrick L., 5,314,805, Cl. 435-29.000.
- Molex Incorporated: *See—*
  - Colleran, Stephen A.; Mackowiak, Russell L.; Manassero, Lorenzo; and Wilson, Bill B., 5,314,347, Cl. 439-350.000.
  - Klemmer, Robert A.; Krzeczowski, Ronald S.; Peloza, Kirk B.; and Wende, Russell E., 5,314,358, Cl. 439-741.000.
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  - Boigegrain, Robert; Brodin, Roger; Gully, Danielle; Molimard, Jean-Charles; and Olliero, Dominique, 5,314,889, Cl. 514-253.000.
- Momochi, Takeshi: *See—*
  - Kato, Kenji; and Momochi, Takeshi, 5,315,503, Cl. 364-192.000.
- Momoo, Kazuo: *See—*
  - Saimi, Tetsuo; Momoo, Kazuo; and Kato, Makoto, 5,315,574, Cl. 369-109 000.
- Monarch Marking System: *See—*
  - Bain, James M.; Best, David J.; Markham, James G.; Morrow, Mark S.; Stellwag, Debra A.; and Tavener, Raymond D., 5,315,508, Cl. 364-401.000.
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  - Phillips, Gerald W.; Falling, Stephen N.; Godleski, Stephen A.; and Monnier, John R., 5,315,019, Cl. 549-507.000.
- Monsanto Company: *See—*
  - Tjoeng, Foe S.; Toth, Mihaly V.; McMackins, Dudley E.; and Adams, Steven P., 5,314,902, Cl. 514-357.000.
- Montefiore Medical Center: *See—*
  - Roth, James A., 5,315,512, Cl. 364-413.250.
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  - Chao, Hung Y., 5,314,944, Cl. 524-501.000.
- Moore Business Forms, Inc.: *See—*
  - Lombardo, Leo, 5,314,110, Cl. 229-92.100.
- Moore, Earl T.: *See—*
  - Hutchison, Wayne R.; Teal, Richard D.; Wasson, Steven C.; Mirdamadi, Mansour; Moore, Earl T.; Lorenzo, Luis; Coffey, Michael J.; and Nickles, Daniel R., 5,314,230, Cl. 296-203.000.
- Moore, Marshall N. Portable splice taping machine. 5,314,565, Cl. 156-392.000.
- Moore, Patrick L.: *See—*
  - Haugland, Richard P.; MacCoubrey, Ian C.; and Moore, Patrick L., 5,314,805, Cl. 435-29.000.
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  - Babirad, Stefan A.; Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 5,314,975, Cl. 526-248.000.
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  - Beach, David L.; Bercik, Paul G.; and Morganson, Neal E., 5,315,053, Cl. 585-7.000.
- Morgenstern, Wolfgang: *See—*
  - Humbrecht, Remy; and Morgenstern, Wolfgang, 5,313,776, Cl. 57-287 000.
- Mori, Kazuhiko: *See—*
  - Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
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  - Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, 5,315,041, Cl. 564-506.000.
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- Morikiyo, Akira; Kanbe, Toshio; Shinbo, Shuichi; Yoshikawa, Shigeru; Shimodaira, Yoshikazu; Ohminami, Kazuya; and Komuro, Hitoshi, to Tsubakimoto Chain Co. First-in first-out article storage rack apparatus. 5,314,078, Cl. 211-59.200.
- Morimoto, Kenji: *See—*
  - Suzuki, Hideyuki; Kitani, Masashi; Masaki, Yuichi; and Morimoto, Kenji, 5,314,788, Cl. 430-313.000.
- Morimoto, Yuuki: *See—*
  - Yamada, Kazunori; Ochiai, Masanori; Yotsumoto, Yoshihisa; Morimoto, Yuuki; and Teranishi, Yutaka, 5,314,819, Cl. 435-232.000.
- Morin, Pierre: *See—*
  - Guillard, Jacques; Girard, Christian; and Morin, Pierre, 5,315,257, Cl. 324-627 000.
- Morinaga Milk Industry Co., Ltd.: *See—*
  - Tomita, Mamoru; Kitazawa, Takesi; Kawaura, Seiji; Fukuwatari, Yasuo; and Nojiri, Masanobu, 5,314,873, Cl. 514-21.000.
- Morine, Gerald H.; and Spigarelli, Steven A., to Bemidji State University Foundation. Ion exchange materials produced from hydrolyzed, debituminized, sulfonated peat. 5,314,638, Cl. 252-184.000.
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  - Hara, Takashi; Maeda, Koji; Morisawa, Kunio; and Habuchi, Ryoji, 5,313,794, Cl. 60-365.000.
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- Morita, Kenji, to Clarion Co., Ltd. Apparatus and method of displaying car-navigating map. 5,315,298, Cl. 340-995.000.
- Morita, Susumu, to APLS Co., Ltd. Blood collecting apparatus. 5,314,442, Cl. 606-182.000.
- Moriya, Koichi: *See—*
  - Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,314,897, Cl. 514-332.000.
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- Morohoshi, Naoya; Uemura, Hiroyuki; and Nogawa, Chiharu, to Ricoh Company, Ltd. Sublimation type thermal image transfer image receiving medium. 5,314,861, Cl. 503-227.000.
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  - Kepley, W. Robert; Kay, Stanley E.; Roy, Ashim; Kee, Steven M.; Henson, Carle C., III; Morris, Adrian J.; and Drago, Randy, 5,315,589, Cl. 370-62.000.
- Morris, Arthur J.: *See—*
  - Pringle, Ronald E.; and Morris, Arthur J., 5,314,032, Cl. 175-74.000.
- Morris, John O., to Texas Instruments Incorporated. Memory circuit test system using separate ROM having test values stored therein. 5,315,553, Cl. 365-201.000.
- Morris, Nigel, to J.E.M. Smoke Machine Company. Pyrotechnic device. 5,313,887, Cl. 102-331.000.
- Morrish, Andrew J.: *See—*
  - Eagle, David J.; and Morrish, Andrew J., 5,315,310, Cl. 345-14.000.
- Morrison, Eric D., to Minnesota Mining and Manufacturing Company. Epoxy coating compositions with metal-containing stabilizers. 5,314,980, Cl. 528-19.000.
- Morrison, Thomas G.: *See—*
  - Palomares, S. Travis; and Morrison, Thomas G., 5,314,666, Cl. 422-191.000.
- Morrow, Mark S.: *See—*
  - Bain, James M.; Best, David J.; Markham, James G.; Morrow, Mark S.; Stellwag, Debra A.; and Tavener, Raymond D., 5,315,508, Cl. 364-401.000.
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  - Harris, Clark E.; Shaw, Joel R.; Healey, Thomas C.; and Morse, Mark J., 5,314,134, Cl. 242-71.100.
- Morton International, Inc.: *See—*
  - Adams, Gary V.; and Smith, Bradley W., 5,314,203, Cl. 280-728.00A.
  - Lazarus, Richard M.; and Koes, Thomas A., 5,314,782, Cl. 430-165.000.
- Morton, Robert A.; Dilworth, Michael J.; and Wienecke, Barbara, to Worsley Alumina Pty. Limited. Biological degradation of sodium oxalate with *bacillus* agal N91/005579. 5,314,806, Cl. 435-41.000.
- Moser, Mark D.; Kalnes, Tom N.; Jan, Chwu-Ching; and Hibel, George R., to UOP. Process for hydrotreating an organic feedstock containing olefinic compounds and a halogen component. 5,314,614, Cl. 208-262.100.
- Moser, Walter: *See—*
  - Wehrli, Ueli; and Moser, Walter, 5,314,483, Cl. 623-20.000.
- Moses, James A., to Unistrut International Corp. Channel support system. 5,314,156, Cl. 248-317.000.
- Moss, Gaylord E.; and Wreede, John E., to Hughes Aircraft Company. Low noise transmission holographic optical element. 5,315,417, Cl. 359-3.000.
- Moss, John: *See—*
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  - Pim, Kendall A.; Romanak, Alfred J.; and Moss, Russell W., 5,314,149, Cl. 248-56.000.
- Mosse, Richard W. E.; and Franklin, Nicholas K., to Beckswift Limited. Apparatus for effecting heat exchange between a liquid and a particulate material. 5,314,012, Cl. 165-111.000.
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  - Takaku, Yutaka; Suzuki, Toshihiro; Wake, Jiro; Motegi, Kanji; and Yanazawa, Masakatu, 5,314,111, Cl. 229-110.000.
- Motomiya, Shigeru: *See—*
  - Ikezoe, Mitsunori; and Motomiya, Shigeru, 5,314,729, Cl. 428-15.000.
- Motorola, Inc.: *See—*
  - Aksoy, Adnan; Austin, Micheal M.; and Gyenes, Russell E., 5,314,763, Cl. 429-97.000.
  - Breeden, Robert L.; and Muppidi, Prabhakar, 5,315,637, Cl. 379-58.000.
  - d'Aragona, Frank S.; Wells, Raymond C.; and Helsel, Sherry L. F., 5,314,107, Cl. 228-116.000.
  - Dunn, William C., 5,313,835, Cl. 73-505.000.
  - Kane, John R.; Schwendeman, Robert J.; and Wright, James A., 5,315,635, Cl. 379-57.000.
  - Mazure, Carlos A.; and Orlowski, Marius K., 5,314,834, Cl. 437-43.000.
  - Pelley, Perry H., III; and Ghassemi, Hamed, 5,315,179, Cl. 307-475.000.
  - Schulz, Gary, 5,315,262, Cl. 329-302.000.
  - Tracy, James L., 5,315,483, Cl. 361-752.000.
- Motorola Lighting, Inc.: *See—*
  - Stokes, Rembert R.; and Upadhyay, Anand K., 5,315,280, Cl. 336-192.000.
- Motoyama, Akio: *See—*
  - Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
- Motta, Vincent C.; and Ferraro, Frank A., to Warner-Lambert Company. Razor head with variable shaving geometry. 5,313,706, Cl. 30-57.000.
- Moucessian, Andranik, to Bombardier Inc. Rail cross-tie for LIM transit system. 5,314,115, Cl. 238-30.000.
- Moudgil, Brij M.: *See—*
  - Sharma, Mahendra K.; O'Neill, George J.; and Moudgil, Brij M., 5,314,073, Cl. 209-166.000.
- Mount, Mason B., to TPI Corporation. Thermostatically controlled switch. 5,315,281, Cl. 337-319.000.
- Mouri, Takayuki, to Ikeda Bussan Co., Ltd. Powered seat slide device. 5,314,158, Cl. 248-429.000.
- Mous, Dirk J. W., to High Voltage Engineering Europa B.V. Dual ion injector for tandem accelerators. 5,315,118, Cl. 250-396.0ML.
- Mousset-Jones, Pierre: *See—*
  - Danko, George; Mousset-Jones, Pierre; and Wirtz, Richard A., 5,314,264, Cl. 405-128.000.
- Mravic, Brian: *See—*
  - O'Donnelly, Brian E.; Mravic, Brian; Crane, Jacob; and Mahulikar, Deepak, 5,315,155, Cl. 257-711.000.
- Mudra, Robert E.; and Scholten, Mark A., to Zenith Electronics Corp. Push-pull amplifier having bootstrap capacitor isolation. 5,315,263, Cl. 330-156.000.
- Mueller, Mike A.: *See—*
  - Heredia, George L.; Almblad, Robert E.; and Mueller, Mike A., 5,314,274, Cl. 409-81.000.
- Mugge, Joachim: *See—*
  - Rober, Stefan; Mugge, Joachim; Feinauer, Roland; Jadamus, Hans; Herrmann, Hans-Dieter; and Ries, Hans, 5,313,987, Cl. 138-137.000.
- Muir Engineering Pty. Limited: *See—*
  - Muir, Robert J., 5,314,166, Cl. 254-371.000.
- Muir, Robert J., to Muir Engineering Pty. Limited. Self-tailing winch with free-fall capacity. 5,314,166, Cl. 254-371.000.
- Mukai, Hiroshi: *See—*
  - Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
- Mukari, Timo, to Nokia Mobile Phones Ltd. Method for programming of installation data in a mobile telephone. 5,315,638, Cl. 379-58.000.
- Mulford, Deborah A.: *See—*
  - Clark, Peter P.; Miller, Douglas E.; Mulford, Deborah A.; and Ostrowski, John C., 5,315,344, Cl. 354-456.000.
- Mulier, Peter M. J., to Medtronic, Inc. Replaceable battery for implantable medical device. 5,314,451, Cl. 607-33.000.
- Muller, Michael; Probst, Joachim; Alberts, Heinrich; Konig, Joachim; Baumgen, Heinz; and Puchner, Fritz, to Bayer Aktiengesellschaft. Process for sizing paper. 5,314,721, Cl. 427-386.000.
- Muller, Philipp; and Wacker, Alain, to Actron Entwick Lungs AG. Deactivator for resonance labels. 5,315,096, Cl. 235-462.000.
- Muller, Tobias, to Heidelberger Druckmaschinen AG. Electronic method of positioning a register mark sensor of a sheet printing machine. 5,313,886, Cl. 101-486.000.
- Mulqueen, Paul J., to Eastman Kodak Company. Kit of test elements and liquid-bearing containers. 5,314,661, Cl. 422-57.000.
- Multicolor Specialties, Inc.: *See—*
  - Lynch, James F.; and Predkelis, John, 5,314,535, Cl. 106-311.000.
- Mumper, Eric W.: *See—*
  - Scherpenberg, Francis A.; Mumper, Eric W.; Rea, John W.; and Lee, Robert D., 5,315,549, Cl. 365-189.090.
- Munir, Zuhair A. R.; and Eslamloo-Grami, Maryam, to University of California, The Regents of the. Synthesis of transition metal carbonitrides. 5,314,656, Cl. 419-13.000.
- Muppidi, Prabhakar: *See—*
  - Breeden, Robert L.; and Muppidi, Prabhakar, 5,315,637, Cl. 379-58.000.
- Murai, Kazuhiro; Kajiwara, Makoto; Sato, Hirokazu; Tanaka, Shinri; and Okumura, Mitsuhiro, to Konica Corporation. Silver halide color photographic light sensitive material. 5,314,796, Cl. 430-522.000.
- Muraji, Tsutomu: *See—*
  - Satou, Hiroaki; and Muraji, Tsutomu, 5,315,378, Cl. 348-655.000.
- Murakami Kaimeido Co., Ltd.: *See—*
  - Sato, Hidenori; and Iwanabe, Naoto, 5,315,442, Cl. 359-877.000.
- Murakawa, Yoshitaka: *See—*
  - Katoh, Hiroaki; Murakawa, Yoshitaka; Miyazaki, Toshimasa; Kitamura, Nobuyuki; and Sato, Shinichi, 5,314,631, Cl. 235-467.000.
- Muramatsu, Atsushi: *See—*
  - Ide, Akiyoshi; and Muramatsu, Atsushi, 5,314,173, Cl. 267-140.140.
- Muramatsu, Kiyoji: *See—*
  - Sumiya, Hiroshi; Fukaya, Kousuke; Kawai, Sunao; Sasaki, Hiroyuki; Ban, Yoshiyuki; Komiya, Ryohei; and Muramatsu, Kiyoji, 5,315,691, Cl. 395-109.000.
- Muramoto, Yoshifumi, to Mitsubishi Denki Kabushiki Kaisha. Television receiver and decoder for closed-caption broadcast providing simple character display showing existence of a closed-caption signal irrespective of user selection of closed caption demodulation. 5,315,386, Cl. 348-569.000.
- Murano, Shunji, to Kyocera Corporation. Mirror image printing printhead. 5,315,320, Cl. 346-107.00R.
- Murase, Hiroshi; and Fukuda, Kazuyuki, to Rohm Co., Ltd. Meter driving system. 5,315,536, Cl. 364-569.000.
- Murashita, Masaru; and Matsunaka, Toshiyuki, to Aloka Co., Ltd. Ultrasonic diagnostic apparatus. 5,313,948, Cl. 128-662.020.
- Murata Kikai Kabushiki Kaisha: *See—*
  - Inada, Kenichi; Takeshita, Akihiko; and Masai, Tetsuji, 5,315,366, Cl. 356-238.000.
- Murata, Koichi: *See—*
  - Fujita, Naoki; Matsumura, Teruyuki; and Murata, Koichi, 5,315,523, Cl. 364-474.220.
- Murata Manufacturing Co., Ltd.: *See—*
  - Takakura, Kenji; and Uchida, Katsuyuki, 5,315,652, Cl. 379-413.000.
- Murayama, Osamu: *See—*
  - Ishii, Masami; Murayama, Osamu; Kasahara, Kenji; Horiuchi, Yoshimori; and Tokito, Toshihiro, 5,314,141, Cl. 242-199.000.
- Muroya, Masaaki: *See—*
  - Tada, Eiichi, 5,314,311, Cl. 417-50.000.
- Muroyama, Masakazu, to Sony Corporation. Insulation layer forming method. 5,314,710, Cl. 427-96.000.
- Murphy, Guy C.; Fuhrmann, Barrett J.; and Jones, Jackie D., to General Electric Company. Composite fastener. 5,314,282, Cl. 411-426.000.
- Murphy, John L.; and Rich, Mark J., to USA Digital Radio. Method and apparatus for digital audio broadcasting and reception. 5,315,583, Cl. 370-18.000.
- Murphy, Richard F., to Torrington Company, The. Rocker arm assembly. 5,313,916, Cl. 123-90.390.
- Murray, Bill D.; and Brewer, Jack G., to Pollution Control, Inc. Apparatus for containing oil and waste spills at a loading and unloading line connection. 5,313,991, Cl. 141-86.000.
- Murray, Joseph E., Jr., to Merton Company, Ltd. Decorative kinetic device. 5,313,727, Cl. 40-410.000.
- Murray, Timothy G., to ITT Corporation. Automated system and method for assembling image intensifier tubes. 5,314,363, Cl. 445-14.000.
- Musk, Robert W.; and Beesley, Christopher F., to BT&D Technologies. Optical fiber connector structure including three ferrules and an optical baffle. 5,315,680, Cl. 385-88.000.
- Muth, Ross R.: *See—*
  - Kennedy, John; Kaplan, Donald S.; and Muth, Ross R., 5,314,989, Cl. 528-354.000.
- Muto, Tadashi: *See—*
  - Shoji, Kazuyoshi; Muto, Tadashi; Kubota, Yasurou; Seki, Koichi; Izawa, Kazuto; and Nabetani, Shinji, deceased, 5,315,547, Cl. 365-185.000.
- Mutoh Industries Ltd.: *See—*
  - Okuwaki, Hirotaka, 5,315,405, Cl. 358-445.000.
- Nabetani, Shinji, deceased: *See—*
  - Shoji, Kazuyoshi; Muto, Tadashi; Kubota, Yasurou; Seki, Koichi; Izawa, Kazuto; and Nabetani, Shinji, deceased, 5,315,547, Cl. 365-185.000.
- Nabetani, Yuko, administratrix: *See—*
  - Shoji, Kazuyoshi; Muto, Tadashi; Kubota, Yasurou; Seki, Koichi; Izawa, Kazuto; and Nabetani, Shinji, deceased, 5,315,547, Cl. 365-185.000.
- Nabors, C. David: *See—*
  - Choi, Hong K.; Eglash, Stephen J.; Fan, Tso Y.; and Nabors, C. David, 5,315,608, Cl. 372-41.000.
- Nadherny, Rudolph E., to Ireco, Inc. Hatch cover lock and hinge. 5,314,218, Cl. 292-256.500.
- Nagahora, Osamu, to Sanshin Kogyo Kabushiki Kaisha. Throttle opening limiting system for a marine propulsion unit. 5,314,362, Cl. 440-86.000.
- Nagai, Keiichi: *See—*
  - Kambara, Hideki; and Nagai, Keiichi, 5,314,602, Cl. 204-299.00R.

- Nagai, Takafumi: *See—*
  - Kubo, Masahiko; Watanabe, Akihiro; Nagai, Takafumi; and Maruyama, Hironori, 5,314,773, Cl. 430-45.000.
- Nagai, Yuji; Tanikawa, Eiki; Ohshima, Hisao; and Kato, Kazushige, to Toyo Aluminium Kabushiki Kaisha; and Kabushiki Kaisha Enplas. Packages for semiconductor integrated circuit. 5,315,153, Cl. 257-701.000.
- Nagamatsu, Yuji, to Hitachi, Ltd. Method for linking program execution status information. 5,315,697, Cl. 395-155.000.
- Nagano, Eiki: *See—*
  - Enomoto, Masayuki; Nagano, Eiki; Sato, Ryo; and Sakaki, Masaharu, 5,314,864, Cl. 504-225.000.
- Nagao, Toru: *See—*
  - Ishi, Yuji; Nagao, Toru; and Sato, Harumatsu, 5,314,240, Cl. 297-452.150.
- Nagao, Yasuyuki: *See—*
  - Utaka, Katsuyuki; Nagao, Yasuyuki; Matsushima, Yuichi; and Sakai, Kazuo, 5,315,422, Cl. 359-107.000.
- Nagasaki, Atsushi: *See—*
  - Nomura, Shinichi, Fukuda, Yoichi; Nagasaki, Atsushi; and Suda, Fumiyuki, 5,314,776, Cl. 430-65.000.
- Nagasawa, Shinji: *See—*
  - Maekawa, Koichiro; Ota, Takashi; Fukuyama, Masashi; and Nagasawa, Shinji, 5,315,678, Cl. 385-59.000.
- Nagase, Fumio; and Tanabe, Toru, to TEAC Corporation. Dual head type magnetic disk recording/reproducing apparatus. 5,315,450, Cl. 360-65.000.
- Nagashima, Makoto: *See—*
  - Lee, Peter W.; Wang, David N.; Nagashima, Makoto; Fukuma, Kazuto; and Sato, Tatsuya, 5,314,845, Cl. 437-238.000.
- Nagato, Hitoshi; and Koike, Yuzo, to Kabushiki Kaisha Toshiba. Fixing apparatus. 5,315,356, Cl. 355-289.000.
- Nagato, Shuichi: *See—*
  - Ohshita, Takahiro; Nagato, Shuichi; Miyoshi, Norihisa; and Toyoda, Seiichiro, 5,313,913, Cl. 122-4.00D.
- Nagura, Sigehiro: *See—*
  - Maruyama, Kazumasa; Yamamoto, Kazuyuki; Nagura, Sigehiro; and Homma, Taira, 5,315,003, Cl. 536-124.000.
- Nahlovsky, Boris D.; and Wong, Michael K., to Aerojet-General Corporation. Recovery of aluminum and hydrocarbon values from composite energetic compositions. 5,314,550, Cl. 179-109.600.
- Nahm, James J. W.: *See—*
  - Cowan, Kenneth M.; Hale, Arthur H.; and Nahm, James J. W., 5,314,022, Cl. 166-293.000.
  - Hale, Arthur H.; Cowan, Kenneth M.; and Nahm, James J. W., 5,314,031, Cl. 175-61.000.
- Naito, Yasushi: *See—*
  - Yasui, Takatoshi; Kudo, Chiaki; Nakao, Ichiro; Fujii, Toyokazu; Terai, Yuka; Imai, Shinichi; Yamamoto, Hiroshi; and Naito, Yasushi, 5,314,848, Cl. 437-248.000.
- Naito, Yukio: *See—*
  - Sugiyama, Kazuhiko; Shimizu, Masafumi; Naito, Yukio; Nishimura, Eiichi; and Oshima, Kouichi, 5,314,603, Cl. 204-298.320.
- Najafi, Khalil; and Wise, Kensall D., to University of Michigan. Single channel microstimulator. 5,314,458, Cl. 607-116.000.
- Nakabayashi, Shigemitsu: *See—*
  - Hidaka, Akio; Terajima, Tsutomu; Haga, Yuu; Nakabayashi, Shigemitsu; and Okumura, Akihiro, 5,314,001, Cl. 164-125.000.
- Nakagaki, Shintaro: *See—*
  - Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Koyama, Yoshihisa; and Bonde, Hiroyuki, 5,315,318, Cl. 346-76.0PH.
  - Takanshi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,315,410, Cl. 358-471.000.
- Nakagawa, Akio: *See—*
  - Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; and Matsudai, Tomoko, 5,315,134, Cl. 257-138.000.
- Nakagawa, Akira, to Tomei Sangyo Kabushiki Kaisha. Method for cleaning a contact lens. 5,314,823, Cl. 435-264.000.
- Nakagawa, Makoto: *See—*
  - Kamiya, Hideaki; and Nakagawa, Makoto, 5,314,590, Cl. 204-131.000.
- Nakagawa, Masahiro: *See—*
  - Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
- Nakagawa, Wataru: *See—*
  - Tsuruoka, Michihiko; Nakagawa, Wataru; Kashimura, Osamu; Kounosu, Naohiro; and Suzawa, Hiromi, 5,313,843, Cl. 73-861.240.
- Nakajima, Hiroharu; and Ozawa, Toshiaki, to Canon Kabushiki Kaisha. Recording apparatus having an improved mechanism for moving the recording section thereof. 5,314,259, Cl. 400-216.200.
- Nakajima, Masatoshi: *See—*
  - Seki, Masaki; Takegahara, Takashi; and Nakajima, Masatoshi, 5,315,524, Cl. 364-474.250.
- Nakajima, Nobuyoshi; and Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Energy subtraction processing method and apparatus, superposition processing method and apparatus, and radiation image read-out apparatus. 5,315,507, Cl. 364-413.230.
- Nakajima, Shigeru: *See—*
  - Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Shigeru; Nakamura, Kazunari; Okada, Yoshihiro; Saito, Katsuyuki; and Yamaguchi, Seiji, 5,315,383, Cl. 348-68.000.
- Nakajima, Yoshio: *See—*
  - Akatsuka, Yuichiro; and Nakajima, Yoshio, 5,315,572, Cl. 369-54.000.
- Nakamura, Gen: *See—*
  - Nakazato, Hiroshi; Nakamura, Gen; and Yoshinari, Satoshi, 5,314,068, Cl. 206-454.000.
- Nakamura, Hideaki; and Karaki, Eiji, to Seiko Epson Corporation. At-cut crystal oscillating reed and method of etching the same. 5,314,577, Cl. 156-659.100.
- Nakamura, Hisakazu: *See—*
  - Narutaki, Yozo; and Nakamura, Hisakazu, 5,315,420, Cl. 359-53.000.
- Nakamura, Junko: *See—*
  - Kirino, Fumiyoshi; Nakamura, Junko; Suzuki, Ryo; Yoshihiro, Masafumi; Yamada, Yukinori; and Ohta, Norio, 5,315,577, Cl. 369-116.000.
- Nakamura, Kazunari: *See—*
  - Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Shigeru; Nakamura, Kazunari; Okada, Yoshihiro; Saito, Katsuyuki; and Yamaguchi, Seiji, 5,315,383, Cl. 348-68.000.
- Nakamura, Kozo, to Kabushiki Kaisha Komatsu Seisakusho. Substrate of single crystal of oxide, device using said substrate and method of producing said superconductive device. 5,314,871, Cl. 505-238.000.
- Nakamura, Satoshi; Yamamoto, Minoru; Ito, Nobuei; and Hattori, Tadasi, to Nippondenso Co., Ltd. Apparatus for forming diamond film. 5,314,540, Cl. 118-723.0DC.
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  - Kuse, Takashi; and Nakashima, Nobuaki, 5,315,152, Cl. 257-677.000.
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  - Yoshida, Fumio; and Nakasugi, Mikio, 5,315,196, Cl. 310-90.000.
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  - Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, 5,314,418, Cl. 604-282.000.
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  - Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; and Sato, Chikara, 5,315,379, Cl. 348-713.000.
  - Kawahara, Norihiro; and Nakatani, Yoshihiro, 5,315,408, Cl. 358-458.000.
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  - Smith, Scott J.; and Lind, Eric J., 5,314,420, Cl. 604-358.000.
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  - Van Der Puy, Michael; and Nalewajek, David, 5,315,048, Cl. 570-176.000.
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  - Watanabe, Kazuhito; Nanya, Toshiki; and Iwamoto, Yasuaki, 5,314,777, Cl. 430-106.000.
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  - Iwamura, Keiichi; Aizawa, Takayuki; Narita, Izumi; and Suzuki, Takatoshi, 5,315,600, Cl. 371-37.600.
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  - Thomson, Andrew C.; Odom, Brian K.; Butler, C. Paul; Jablin, Michael G.; Nowlin, William C., Jr.; and Canik, Robert W., 5,315,706, Cl. 395-200.000.
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  - Alcock, Alfred J.; and Bernard, John E., 5,315,612, Cl. 372-69.000.
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  - Chen, Show-An; and Liao, Chien-Hsiun, 5,314,976, Cl. 526-256.000.
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  - Lorenz, Perry S., 5,315,266, Cl. 330-294.000.
  - Sethi, Rakesh B., 5,314,768, Cl. 430-5.000.
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  - Yamamoto, Akihiko; Yamada, Toshihiro; Natori, Tatsuo; Naya, Kotaro; Satoo, Motohiro; Fujiwara, Mitsuru; Matsubara, Katsumi; Shinoki, Kazuaki; and Kameya, Hirotaka, 5,314,321, Cl. 418-178.000.
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  - Collins, Donald A., Jr.; Nye, Andrew B., III; Ames, Stephen J.; and Houggy, David, 5,315,097, Cl. 235-472.000.
  - Robinson, Thomas S.; Dieska, David E.; and Hebert-Robinson, Carol A., 5,315,161, Cl. 307-66.000.
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  - Broughton, Robert S., 5,315,164, Cl. 307-265.000.
- NEC Corporation: *See—*
  - Aoki, Yasubiro, 5,315,426, Cl. 359-180.000.
  - Asako, Katsuhiro, 5,315,674, Cl. 385-15.000.
  - Charvillat, Eric, 5,315,586, Cl. 370-60.000.
  - Enami, Tomokazu, 5,315,242, Cl. 324-158.00R.
  - Fujii, Takashi, 5,315,269, Cl. 331-1.00A.
  - Fukuda, Takeshi, 5,315,138, Cl. 257-296.000.
  - Kamaya, Michinori, 5,315,559, Cl. 365-233.500.
  - Kikuchi, Hideo; and Utsumi, Yasushi, 5,315,535, Cl. 364-490.000.
  - Kimura, Katsuji, 5,315,261, Cl. 328-168.000.
  - Kishi, Jun, 5,315,219, Cl. 318-254.000.
  - Koizumi, Yuuji, 5,315,157, Cl. 257-734.000.
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  - Shinta, Minoru; Aikoh, Shinichi; and Nishitani, Takao, 5,315,704, Cl. 95-2.000.
  - Yoshida, Atsushi, 5,315,618, Cl. 375-94.000.
- Necer International Co., Ltd.: *See—*
  - Lai, Nelson, 5,314,285, Cl. 414-236.000.
- Nedberge, Diane E.: *See—*
  - Gale, Robert M.; Nedberge, Diane E.; and Atkinson, Linda E., 5,314,694, Cl. 424-448.000.
- Needlepoint Guard, Inc.: *See—*
  - Hake, Lawrence W.; and Flodman, Michael R., 5,314,414, Cl. 604-198.000.
- Neff, Edward A.; Moss, John; and Parcels, Joseph S., to Systems, Machines, Automation Corporation. Actuator with translational and rotational control. 5,315,189, Cl. 310-12.000.
- Neff Instrument Corporation: *See—*
  - Chambers, William R., 5,315,267, Cl. 330-275.000.
- Neffgen, Bernd; and Scherzer, Wolfgang, to Witco GmbH. Urethane-modified polyoxyalkylene epoxy resins. 5,314,971, Cl. 525-504.000.
- Negre, Bernard; and de Filippis, Christian, to Renault Automation. Process and device for body assembly with lateral tools that can be interpositioned. 5,313,695, Cl. 29-33.00P.
- Nehorai, Arye; and Paldi, Eytan, to Yale University. Method for eletromagnetic source localization. 5,315,308, Cl. 342-448.000.
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  - Stokoe, Geoffrey A.; Green, George M.; and Cayocca, Iver D., 5,314,263, Cl. 405-1.000.
- Neil Pryde Limited: *See—*
  - Schmidtkunz, Klaus; and Vandijk, Raymond, 5,313,904, Cl. 114-99.000.
- Nelle, Peter: *See—*
  - Kluge, Andreas; and Nelle, Peter, 5,315,121, Cl. 250-423.00R.
- Nelson, Dennis H.: *See—*
  - Nelson, Nancy K.; and Nelson, Dennis H., 5,313,739, Cl. 49-404.000.
- Nelson, Eliot D.: *See—*
  - Porter, Frank K., Jr.; Nelson, Eliot D.; Arimento, Daniel R.; and Reidy, Terence J., 5,314,144, Cl. 244-132.000.
- Nelson Metal Products Corporation: *See—*
  - Shimmell, Dennis S., 5,313,703, Cl. 29-890.120.
- Nelson, Nancy K.; and Nelson, Dennis H. Sliding door closure system. 5,313,739, Cl. 49-404.000.
- NeoPath, Inc.: *See—*
  - Johnston, Richard S.; Budak, Paul V.; Schmidt, Robert C.; and Lee, Shih-Jong J., 5,315,700, Cl. 395-163.000.
- Nesheiwat, Afif M.; and Geibel, John F., to Phillips Petroleum Company. Acid wash of polyarylene sulfides. 5,314,972, Cl. 525-537.000.
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  - Colarow, Ladislas; Masson, Gerard; and Trueck, Hans U., 5,314,706, Cl. 426-605.000.
  - Hansson, Lars E. A.; and Palmquist, Sven L, 5,314,705, Cl. 426-574.000.
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- Neuberg, Herbert: *See—*
  - Halbinger, Evi; and Neuberg, Herbert, 5,314,352, Cl. 439-469.000.
- NeuroSearch A/S: *See—*
  - Axelsson, Oskar; Thaning, Mikkel; and Moldt, Peter, 5,314,903, Cl. 514-388.000.
- Newell Operating Company: *See—*
  - Coulcher, Richard D., Jr.; Hyde, Alan A.; and Ridley, Michael L., 5,313,931, Cl. 126-401.000.
- Newmark, Richard A.: *See—*
  - Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
- Ney, Reuben E.; Markle, Kenneth E.; and Zelko, William E., to Whitaker Corporation, The. Electrical contact with recessed wire connecting portion. 5,314,361, Cl. 439-874.000.
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  - Maekawa, Koichiro; Ota, Takashi; Fukuyama, Masashi; and Nagasawa, Shinji, 5,315,678, Cl. 385-59.000.
- NGK Spark Plug Co., Ltd.: *See—*
  - Miyata, Shigeru; Matsubara, Yoshiaki; and Kojima, Takao, 5,313,849, Cl. 73-866.500.
- Nguyen, Caroline P.; and Harrell, James M., Jr. Adjustable popcorn strainer. 5,314,075, Cl. 209-680.000.
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  - Pascual, Nathalie; Fleury, Christophe; Sagnes, Georges; N'Guyen, Christian; and Lassale, Jacques, 5,315,271, Cl. 331-25.000.
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  - Simon, Thomas E.; Nguyen, Thanh; and Gratzinger, Paul, 5,315,077, Cl. 200-11.00R.
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  - Smith, Earl L.; and Nguyen, Van, 5,315,650, Cl. 379-399.000.
- Nial, Ward J.: *See—*
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- Nibatec S.A.: *See—*
  - Nizzola, Guido M., 5,314,422, Cl. 606-5.000.
- Nicholas, David A., to United States Surgical Corporation. Surgical instrument locking mechanism. 5,314,424, Cl. 606-41.000.
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  - Nichting, Roger A.; Nicholas, Norman H.; and Young, Kenneth P., 5,313,815, Cl. 72-364.000.

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  Corcoran, Patrick H.; and Nickel, Gary W., 5,314,953, Cl. 525-123.000.
Nickel, Hubertus: *See*—
  Zadgorska, Zdravka; and Nickel, Hubertus, 5,315,369, Cl. 356-316.000.
Nickel, Klaus P.: *See*—
  Leidinger, Bernhard; Meyer, Ruediger; and Nickel, Klaus P., 5,314,011, Cl. 165-104.260.
Nickle, Stanley K.; and Werner, Ervin R., Jr., to Du Pont de Nemours, E. I., and Company. Waterbased coating compositions of methylol(meth)acrylamide acrylic polymer, polyurethane and melamine crosslinking agent. 5,314,945, Cl. 524-507.000.
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  Seman, Michel; and Nicolay, Jean F., 5,314,999, Cl. 536-6.500.
Nield, Eric; Ahmed, Riaz; and Choudhery, Riaz A., to Imperial Chemical Industries PLC. Coating process and product. 5,314,751, Cl. 428-412.000.
Nielsen, Erik, to Bromma Conquip AB. Cable guide for hoisting devices. 5,314,047, Cl. 191-12.00R.
Nielsen, Kaj, to Deltagraph A/S. Process for obtaining a package containing mutually reactive particulate materials and a package containing such materials. 5,314,069, Cl. 206-524.800.
Nielsen, Keith E., to Hughes Aircraft Company. Dual use power supply configuration for the double pulsed flashlamp pumped dye laser. 5,315,607, Cl. 372-38.000.
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  Camfield, David K.; Hahn, Daniel G.; Niemeyer, Duane; and Brashear, Daniel F., 5,314,207, Cl. 280-828.000.
Nihon Bayer Agrochem K.K.: *See*—
  Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,314,897, Cl. 514-332.000.
Nihon Kohden Corporation: *See*—
  Fuse, Masayoshi; Xie, Cheng T.; and Aoyagi, Takuo, 5,313,940, Cl. 128-633.000.
Niibe, Wataru: *See*—
  Nishimoto, Hideki; and Niibe, Wataru, 5,315,466, Cl. 360-106.000.
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  Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,314,508, Cl. 29-623.500.
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  Heister, Aloisius H. M.; and Nijsen, Andreas J. L., 5,314,213, Cl. 285-231.000.
Nika Health Products Ltd.: *See*—
  Uerrmann, Peter; and Klein, Peter, 5,314,816, Cl. 435-188.000.
Nike, Inc.: *See*—
  McMahon, Thomas A.; and Valiant, Gordon A., 5,313,718, Cl. 36-59.00C.
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  Hori, Kenji; and Tatsuno, Wataru, 5,315,441, Cl. 359-753.000.
  Ohshita, Koichi, 5,315,331, Cl. 354-94.000.
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Nimberger, Spencer M., to Precision General, Inc. Gas lockout system. 5,313,975, Cl. 137-14.000.
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  Sawaragi, Fujio, 5,314,947, Cl. 524-780.000.
Nippon Furnace Kogyo Kaisha, Ltd.: *See*—
  Tada, Takeshi; Akiyama, Toshikazu; Tanaka, Ryoichi; and Kawamoto, Masao, 5,314,170, Cl. 266-156.000.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
  Yoshikawa, Masaaki; Yokoyama, Keiichi; Hasegawa, Masayasu; Yasumoto, Ryouichi; and Fujita, Hiroyuki, 5,314,807, Cl. 435-68.100.
Nippon Hoso Kyokai: *See*—
  Isono, Haruo; and Yasuda, Minoru, 5,315,377, Cl. 348-51.000.
Nippon Mining Co., Ltd.: *See*—
  Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.
Nippon Oil Co., Ltd.: *See*—
  Yamasita, Yukio; Sato, Haruyoshi; Nakamura, Toru; Yuasa, Hitoshi; and Otsuki, Yutaka, 5,314,769, Cl. 430-7.000.
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  Yoshitani, Shouichi; Mizutani, Hiroki; Suzuki, Nobuyoshi; Ohara, Kazumine; Ohyanagi, Yasushi; and Sekiguchi, Isamu, 5,314,912, Cl. 524-458.000.
Nippon Petrochemicals Co., Ltd.: *See*—
  Aihara, Kintaro; and Honda, Tadashi, 5,313,863, Cl. 83-171.000.
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  Sakamoto, Kazuhiko; Tanaka, Hiroaki; Ueoka, Masatoshi; Akazawa, Yoji; and Baba, Masao, 5,315,037, Cl. 562-545.000.
Nippon Steel Chemical Co. Ltd.: *See*—
  Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
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  Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
  Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.
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  Cordoba, Michael V.; Hardee, Kim C.; and Butler, Douglas B., 5,315,230, Cl. 323-313.000.
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  Maekawa, Koichiro; Ota, Takashi; Fukuyama, Masashi; and Nagasawa, Shinji, 5,315,678, Cl. 385-59.000.
  Takayama, Akira; Yoshida, Mitsuo; and Matsui, Shinichi, 5,315,640, Cl. 379-93.000.
Nippondenso Co., Ltd.: *See*—
  Fujii, Tetsuo; Kuroyanagi, Susumu; and Gotoh, Yoshitaka, 5,313,836, Cl. 73-517.00R.
  Kazita, Hidenobu; and Nishi, Toshinobu, 5,314,341, Cl. 439-15.000.
  Nakamura, Satoshi; Yamamoto, Minoru; Ito, Nobuei; and Hattori, Tadasi, 5,314,540, Cl. 118-723.0DC.
  Takeuchi, Shigeru; Sugiura, Junji; and Michiyama, Katsunori, 5,313,923, Cl. 123-497.000.
  Takiguchi, Masahiro; and Kamiya, Masahiro, 5,315,165, Cl. 307-296.100.
  Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.
Nishi, Toshinobu: *See*—
  Kazita, Hidenobu; and Nishi, Toshinobu, 5,314,341, Cl. 439-15.000.
Nishida, Ikuo: *See*—
  Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, 5,315,460, Cl. 360-85.000.
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  Saito, Keiichi; and Nishida, Koji, 5,314,733, Cl. 428-36.600.
Nishida, Tetsuya; and Horigome, Shinkichi, to Hitachi, Ltd.; and Hitachi Maxell, Ltd. Information-recording medium. 5,314,734, Cl. 428-64.000.
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  Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, 5,314,509, Cl. 34-406.000.
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  Takahashi, Mitsukazu; Chiba, Takatoshi; and Nishii, Kiyofumi, 5,315,092, Cl. 219-497.000.
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  McAdams, John B., 5,315,329, Cl. 351-206.000.
Nishikawa, Tomoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Heat roll fixing unit. 5,315,359, Cl. 355-315.000.
Nishimoto, Hideki; and Niibe, Wataru, to Fuji Electric Co., Ltd. Magnetic disk unit having reduced profile and/or faster seek speed. 5,315,466, Cl. 360-106.000.
Nishimoto, Masaki; and Matsumoto, Junko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having a write per bit function in page mode. 5,315,560, Cl. 365-238.500.
Nishimoto, Masashi: *See*—
  Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.
Nishimoto, Yuhko: *See*—
  Maeda, Kazuo; Tokumasu, Noboru; and Nishimoto, Yuhko, 5,314,538, Cl. 118-715.000.
Nishimura, Eiichi: *See*—
  Sugiyama, Kazuhiko; Shimizu, Masafumi; Naito, Yukio; Nishimura, Eiichi; and Oshima, Kouichi, 5,314,603, Cl. 204-298.320.
Nishimura, Isao: *See*—
  Mizuuchi, Sotoo; and Nishimura, Isao, 5,313,692, Cl. 28-187.000.
Nishimura, Kohzoh, to Mita Industrial Co., Ltd. Torque transmission device. 5,314,053, Cl. 192-41.00S.
Nishio, Masahiro: *See*—
  Kuboki, Keiju; Sugishima, Kiyohisa; Udagawa, Yutaka; Otsubo, Toshihiko; and Nishio, Masahiro, 5,315,404, Cl. 358-433.000.
Nishioka, Makoto: *See*—
  Takahashi, Yoshiyuki; Nishioka, Makoto; Toyofuku, Kunitaka; and Uchida, Kyoko, 5,314,859, Cl. 503-207.000.
Nishitani, Takao: *See*—
  Shinta, Minoru; Aikoh, Shinichi; and Nishitani, Takao, 5,315,704, Cl. 95-2.000.
Nishizawa, Nobuyoshi: *See*—
  Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
Nissan Chemical Industries Ltd.: *See*—
  Tanikawa, Keizo; Saito, Akira; Matsumoto, Takashi; Sakoda, Ryozo; Tsuruzoe, Nobutomo; and Shikada, Ken-ichi, 5,314,883, Cl. 514-236.500.
Nissan Motor Co., Ltd.: *See*—
  Iwasa, Yoshio, 5,314,665, Cl. 422-180.000.

  Matsumoto, Takashi, 5,315,299, Cl. 341-53.000.
Niwa, Akihiko, to Brother Kogyo Kabushiki Kaisha. Printing device. 5,314,256, Cl. 400-61.000.
Nizzola, Guido M., to Nibatec S.A. Equipment for the correction of presbyopia by remodelling the corneal surface by means of photoablation. 5,314,422, Cl. 606-5.000.
NKK Corporation: *See*—
  Misao, Hitoshi; Yamauchi, Katsuhisa; Inoue, Tadashi; and Okita, Tomoyoshi, 5,314,549, Cl. 148-325.000.
  Tada, Takeshi; Akiyama, Toshikazu; Tanaka, Ryoichi; and Kawamoto, Masao, 5,314,170, Cl. 266-156.000.
Nogawa, Chiharu: *See*—
  Morohoshi, Naoya; Uemura, Hiroyuki; and Nogawa, Chiharu, 5,314,861, Cl. 503-227.000.
Noise Cancellation Technologies, Inc.: *See*—
  Friedlander, Paul, 5,313,945, Cl. 128-653.200.
  Gossman, William; and Eatwell, Graham, 5,315,661, Cl. 381-71.000.
Nojima, Takashi: *See*—
  Terasawa, Koji; Takemura, Makoto; Nojima, Takashi; and Miyakawa, Akira, 5,315,317, Cl. 346-1.100.
Nojiri, Masanobu: *See*—
  Tomita, Mamoru; Kitazawa, Takesi; Kawaura, Seiji; Fukuwatari, Yasuo; and Nojiri, Masanobu, 5,314,873, Cl. 514-21.000.
Nokia (Deutschland) GmbH: *See*—
  Reime, Gerd, 5,315,385, Cl. 348-441.000.
Nokia Mobile Phones Ltd.: *See*—
  Mukari, Timo, 5,315,638, Cl. 379-58.000.
  Ruotsalainen, Asko, 5,315,183, Cl. 307-511.000.
Nokia Telecommunications OY: *See*—
  Sarkka, Veli-Matti, 5,315,274, Cl. 333-219.100.
Nolan, Michael J. Vehicle security system. 5,315,286, Cl. 340-426.000.
Noll, John M., to AlliedSignal Inc. Scan converter for a radar display. 5,315,305, Cl. 342-185.000.
Noll, Marvin H. Modular apparatus for preparing articles to be mailed. 5,314,567, Cl. 156-441.500.
Nomura, Aki: *See*—
  Irie, Taka; and Nomura, Aki, 5,314,606, Cl. 205-128.000.
Nomura, Fumihiko; Maeda, Yuji; and Kamiyama, Tomotoshi, to Yazaki Corporation. Fuse box. 5,314,354, Cl. 439-621.000.
Nomura, Kotohiro; and Ishino, Masaru, to Sumitomo Chemical Company, Limited. Production of aromatic amines. 5,315,040, Cl. 564-422.000.
Nomura, Satoru: *See*—
  Kurata, Junichi; and Nomura, Satoru, 5,315,400, Cl. 358-335.000.
Nomura, Shinichi; Fukuda, Yoichi; Nagasaki, Atsushi; and Suda, Fumiyuki, to Stanley Electric Co., Ltd. Multi-layered photoreceptor for electrophotography. 5,314,776, Cl. 430-65.000.
Noppe, Chris: *See*—
  Bilcke, Walter; Faes, Ludo; and Noppe, Chris, 5,313,988, Cl. 139-1.00E.
Nordica S.p.A.: *See*—
  De Bortoli, Giuseppe; Zorzi, Claudio; and Gallina, Luca, 5,313,720, Cl. 36-117.000.
Nordstrom, Paul D., to Dura Mechanical Components, Inc. Shifter park position brake-transmission interlock. 5,314,049, Cl. 192-4.00A.
Normalair-Garrett (Holdings) Limited: *See*—
  Foote, James C.; Harral, Michael W.; and Rowland, Peter J., 5,314,402, Cl. 600-20.000.
North Carolina State University: *See*—
  Comins, Daniel L.; and Baevsky, Matthew F., 5,315,007, Cl. 546-116.000.
Northern Telecom Limited: *See*—
  Langner, Paul A., 5,315,175, Cl. 307-443.000.
  Magill, Paul A.; Koopman, Nicholas G.; and Rinne, Glenn A., 5,315,485, Cl. 361-767.000.
  Popescu, Petre, 5,315,176, Cl. 307-455.000.
Northwestern University: *See*—
  Patterson, Roy; and Harris, Kathleen E., 5,314,690, Cl. 424-88.000.
Norton Chemical Process Products Corp.: *See*—
  Rukovena, Frank, 5,314,645, Cl. 261-94.000.
Norton Company: *See*—
  Corcoran, Robert F., Jr.; and Ramanath, Srinivasan, 5,313,742, Cl. 51-206.00R.
  Simpson, Matthew; and Frey, Robert M., 5,314,652, Cl. 264-81.000.
Norton, David E., Jr., to Fujitsu Limited. Peak hold circuit with improved linearity. 5,315,168, Cl. 307-351.000.
Norton-Wayne, Leonard, to De Montfort University. Method and apparatus for measuring lengths on an article. 5,315,666, Cl. 382-8.000.
Noser, Francis G., to Alcatel Network Systems, Inc. Inter-network transport element of sonet overhead. 5,315,594, Cl. 370-110.100.
Notable Technologies, Inc.: *See*—
  Chaplin, Michael, 5,315,655, Cl. 380-4.000.
Nottingham, John R.: *See*—
  Gross, Richard A.; Nottingham, John R.; and Panasewicz, Dale A., 5,314,093, Cl. 222-153.000.
Novo Nordisk A/S: *See*—
  MacIntosh, Susan C., 5,314,698, Cl. 424-538.000.
  Rex, Jorn, 5,314,412, Cl. 604-191.000.
Nowak, Claude: *See*—
  Eidenbenz, Stefan; and Nowak, Claude, 5,313,740, Cl. 51-100.00R.
Nowlin, William C., Jr.: *See*—
  Thomson, Andrew C.; Odom, Brian K.; Butler, C. Paul; Jablin, Michael G.; Nowlin, William C., Jr.; and Canik, Robert W., 5,315,706, Cl. 395-200.000.
Noya, Eric S.; Arnott, Randy M.; and Rosich, Mitchell N., to Digital Equipment Corporation. Optimized stripe detection for redundant arrays of disk drives. 5,315,602, Cl. 371-40.400.
Nozaki, Nobuharu; Mitsumoto, Shinji; Okazaki, Yoji; and Adachi, Takashi, to Fuji Photo Film Co., Ltd. Laser diode pumped solid laser. 5,315,613, Cl. 372-69.000.
NSM Aktiengesellschaft: *See*—
  Schulze, Ulrich, 5,314,195, Cl. 273-371.000.
Nucida, Gilberto: *See*—
  Cipolli, Roberto; Masarati, Enrico; Rossi, Cristina; Oriani, Roberto; and Nucida, Gilberto, 5,314,937, Cl. 524-100.000.
  Cipolli, Roberto; Nucida, Gilberto; Masarati, Enrico; Oriani, Roberto; and Pirozzi, Mario, 5,314,938, Cl. 524-100.000.
Numakura, Satoshi: *See*—
  Nakayama, Masahiro; Takeuchi, Hisaharu; Tohchi, Mamoru; and Numakura, Satoshi, 5,315,447, Cl. 360-49.000.
Numata, Tomiyuki: *See*—
  Maeda, Shigemi; Kojima, Kunio; Akiyama, Jun; Terashima, Shigeo; and Numata, Tomiyuki, 5,315,571, Cl. 369-50.000.
Nunes, Peter M.: *See*—
  Santin, Ernest M.; Tout, William A.; Nunes, Peter M.; Vanderpot, John W.; and Berrian, Donald W., 5,313,848, Cl. 73-866.200.
Nunez, George: *See*—
  Kortenbach, Jurgen A.; Nunez, George; and Slater, Charles R., 5,313,935, Cl. 128-4.000.
Nutt, Wendell G.: *See*—
  Bleich, Larry L.; Nutt, Wendell G.; and Zerbs, Stephen T., 5,314,712, Cl. 427-118.000.
NVision, Inc.: *See*—
  Dayton, Birney D.; and Crabb, Thomas B., 5,315,449, Cl. 360-61.000.
Ny, Tor: *See*—
  Loskutoff, David J.; Ny, Tor; and Sawdey, Michael, 5,314,994, Cl. 530-350.000.
Nycomed Dak A/S: *See*—
  Hansen, Henrik F.; and Kjoernaes, Kim, 5,315,016, Cl. 549-298.000.
Nycomed Innovation AB: *See*—
  Leunbach, Ib; Golman, Klaes; and Klaveness, Jo, 5,314,681, Cl. 424-9.000.
Nycz, Colleen M.; Schram, James L.; Shank, Daryl D.; and Vonk, Glenn P., to Becton, Dickinson and Company. Probes to *Mycobacterium avium, Mycobacterium intracellulare,* and *Mycobacterium paratuberculosis.* 5,314,801, Cl. 435-6.000.
Nye, Andrew B., III: *See*—
  Collins, Donald A., Jr.; Nye, Andrew B., III; Ames, Stephen J.; and Houggy, David, 5,315,097, Cl. 235-472.000.
Nykerk, Michael, to Electronic Security Products of California, Inc. Alarm system for sensing and vocally warning a person approaching a protected object. 5,315,285, Cl. 340-426.000.
O.S. Designs, Inc.: *See*—
  Olson, Scott B.; and Polk, Louis F., 5,314,199, Cl. 280-7.130.
Oakes, Thomas R.; Stanley, Patricia M.; and Keller, Jerome D., to Ecolab Inc. Peroxyacid antimicrobial composition. 5,314,687, Cl. 424-405.000.
Obenchain, Theodore G. Method of performing laparoscopic lumbar discectomy. 5,313,962, Cl. 128-898.000.
Ober, Ludwig: *See*—
  Grauer, Peter; and Ober, Ludwig, 5,314,966, Cl. 525-317.000.
Obery, Lancelot: *See*—
  Ways, Bill; and Obery, Lancelot, 5,313,756, Cl. 52-263.000.
O'Brien, Larry S.; Ford, Gordon C.; Willis, Peter M.; and Tate, Robert S., to Leco Corporation. Resistively heated sample preparation apparatus. 5,315,091, Cl. 219-385.000.
O'Brien, William H.; and Malloy, James M., to Texas Beef Group. Method and apparatus for automatically segmenting animal carcasses. 5,314,375, Cl. 452-157.000.
O'Callaghan, Patrick J.: *See*—
  Blakeley, Anthony; Horihan, Gregory E.; Konicek, Timothy S.; O'Callaghan, Patrick J.; Carrington, Martin W.; and Brown, Jeffrey A., 5,314,309, Cl. 416-226.000.
Ochiai, Masanori: *See*—
  Yamada, Kazunori; Ochiai, Masanori; Yotsumoto, Yoshihisa; Morimoto, Yuuki; and Teranishi, Yutaka, 5,314,819, Cl. 435-232.000.
Ochii, Kiyofumi, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory using a thin film transistor. 5,315,546, Cl. 365-185.000.
O'Connor, John J.: *See*—
  Goodfellow, John W.; and O'Connor, John J., 5,314,482, Cl. 623-20.000.
Oda, Keisuke; and Kouzai, Fumio, to Mitsubishi Denki Kabushiki Kaisha. Printing paper protecting device. 5,314,179, Cl. 271-145.000.
Oda, Takashi: *See*—
  Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
Odell, Peter G.; and Martin, Trevor I., to Xerox Corporation. Imaging members and processes for the preparation thereof. 5,314,779, Cl. 430-127.000.
O'Dell, Robert L. Aquarium having submerged dry display area. 5,313,912, Cl. 119-246.000.
Odom, Brian K.: *See*—
  Thomson, Andrew C.; Odom, Brian K.; Butler, C. Paul; Jablin, Michael G.; Nowlin, William C., Jr.; and Canik, Robert W., 5,315,706, Cl. 395-200.000.

O'Donnelly, Brian E.; Mravic, Brian; Crane, Jacob; and Mahulikar, Deepak, to Olin Corporation. Electronic package with stress relief channel. 5,315,155, Cl. 257-711.000.

O'Donovan, James P. Versatile electrically insulating waterproof connectors. 5,315,065, Cl. 174-84.00C.

Oehninger, Jean E., to Cooper Industries, Inc. Vacuum manipulator. 5,314,222, Cl. 294-64.100.

Oelmann, Bernd: *See*—
Kotzle, Horst; Oelmann, Bernd; Schafer, Ulrich; and Schwarz, Gerhard, 5,313,828, Cl. 73-146.000.

Oexler, Rudolf, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Silver drawing rollers driven by belts including belt cleaners. 5,313,689, Cl. 19-293.000.

Ogawa, Hisashi: *See*—
Matsuo, Naoto; Ogawa, Hisashi; Nakata, Yoshiro; and Okada, Shozo, 5,315,543, Cl. 365-149.000.

Ogawa, Kensuke: *See*—
Nakao, Takeshi; Arimoto, Akira; Ogawa, Kensuke; Sukeda, Hirofumi; and Sugiyama, Hisataka, 5,315,573, Cl. 369-100.000.

Ogilvie, Francis B.: *See*—
Rao, Alison J.; and Ogilvie, Francis B., 5,314,142, Cl. 244-35.00A.

Ogletree, Richard: *See*—
Mills, Daniel M.; Ogletree, Richard; and Lindem, Thomas J., 5,314,397, Cl. 483-30.000.

O'Grady, Bernard J., to Panduit Corp. Through hole strap mount. 5,314,154, Cl. 248-231.900.

Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; and Matsudai, Tomoko, to Kabushiki Kaisha Toshiba. Thyristor with insulated gate. 5,315,134, Cl. 257-138.000.

O'Hair, Mark A., to United States of America, Air Force. Offline text recognition without intraword character segmentation based on two-dimensional low frequency discrete Fourier transforms. 5,315,668, Cl. 382-14.000.

Ohara, Kazumine: *See*—
Yoshitani, Shouichi; Mizutani, Hiroki; Suzuki, Nobuyoshi; Ohara, Kazumine; Ohyanagi, Yasushi; and Sekiguchi, Isamu, 5,314,912, Cl. 524-458.000.

Ohashi, Hirotaka; and Yasunobe, Toru, to Mitsui Engineering & Shipbuilding Co., Ltd. Load balancer. 5,314,291, Cl. 414-719.000.

Ohba, Takao: *See*—
Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, 5,315,482, Cl. 361-707.000.

Ohhashi, Akinami, to Kabushiki Kaisha Toshiba. X-ray computerized tomography apparatus for obtaining consecutive tomographic images in either a forward or backward direction without performing interpolation for views over an entire 360. 5,315,665, Cl. 382-6.000.

Ohio University: *See*—
Butcher, Jared A., Jr., 5,315,055, Cl. 585-241.000.

Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, to Unitika Ltd.; Nippon Steel Corporation; and Nippon Steel Chemical Co. Ltd. Process for preparing aromatic polyester-polystyrene block copolymers. 5,314,954, Cl. 525-132.000.

Ohken Seiko Co., Ltd.: *See*—
Kakizawa, Goro; and Fukami, Tadashi, 5,314,302, Cl. 415-169.100.

Ohkubo, Hiroshi; and Miyamoto, Takashi, to TEAC Corporation. Cartridge loading device having side-locking mechanism. 5,315,462, Cl. 360-96.500.

Ohls, Louis M.: *See*—
Elkins, William E.; Kerr, William K.; and Ohls, Louis M., 5,314,543, Cl. 134-1.000.

Ohmi, Tadahiro; Fumio, Nakahara; Satoh, Tuyosi; and Umeda, Masaru, to Ohmi, Tadahiro. Gas supply piping device for a process apparatus. 5,313,982, Cl. 137-597.000.

Ohminami, Kazuya: *See*—
Morikiyo, Akira; Kanbe, Toshio; Shinbo, Shuichi; Yoshikawa, Shigeru; Shimodaira, Yoshikazu; Ohminami, Kazuya; and Komuro, Hitoshi, 5,314,078, Cl. 211-59.200.

Ohmori, Motonori: *See*—
Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, 5,315,460, Cl. 360-85.000.

Ohno, Ietatsu. Grinding method and apparatus. 5,314,125, Cl. 241-175.000.

Ohno, Satoshi, to Ibiden Co., Ltd. Thin film of lithium niobate single crystal. 5,315,432, Cl. 359-326.000.

Ohno, Tomeji; Yoshida, Tetsuo; and Fuda, Yoshiaki, to Tokin Corporation. Piezoelectric vibrator capable of reliably preventing dielectric breakdown and a method of manufacturing the same. 5,315,205, Cl. 310-357.000.

Ohshiba, Hisanori: *See*—
Ichikawa, Katsumi; Ozaki, Keiji; and Ohshiba, Hisanori, 5,314,648, Cl. 264-40.500.

Ohshima, Hisao: *See*—
Nagai, Yuji; Tanikawa, Eiki; Ohshima, Hisao; and Kato, Kazushige, 5,315,153, Cl. 257-701.000.

Ohshima, Kiyoshi; Tamiya, Yoshiyumi; Shimizu, Kenichi; Suzuki, Tadahiro; and Iizuka, Kazuaki, to Ricoh Company, Ltd. Color image forming apparatus with means for biasing a recording head. 5,315,323, Cl. 346-159.000.

Ohshita, Koichi, to Nikon Corporation. Optical apparatus capable of performing a panoramic photographing. 5,315,331, Cl. 354-94.000.

Ohshita, Takahiro; Nagato, Shuichi; Miyoshi, Norihisa; and Toyoda, Seiichiro, to Ebara Corporation. Pressurized internal circulating fluidized-bed boiler. 5,313,913, Cl. 122-4.00D.

Ohta, Eiji: *See*—
Kawai, Takashi; Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Shono, Seita; and Ohta, Eiji, 5,315,415, Cl. 358-515.000.

Ohta, Ken-ichi: *See*—
Kawai, Takashi; Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Shono, Seita; and Ohta, Eiji, 5,315,415, Cl. 358-515.000.

Ohta, Norio: *See*—
Kirino, Fumiyoshi; Nakamura, Junko; Suzuki, Ryo; Yoshihiro, Masafumi; Yamada, Yukinori; and Ohta, Norio, 5,315,577, Cl. 369-116.000.

Ohtagaki, Shigeki; and Watanabe, Hirosi, to Mitsubishi Denki Kabushiki Kaisha. Rear differential gear lock controller with automatic unlock control means. 5,314,378, Cl. 475-150.000.

Ohtoshi, Hirokazu: *See*—
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,314,780, Cl. 430-128.000.

Ohtsuka, Tetsuo: *See*—
Iwakura, Kenichi; and Ohtsuka, Tetsuo, 5,315,237, Cl. 324-158.00F.

Ohyanagi, Yasushi: *See*—
Yoshitani, Shouichi; Mizutani, Hiroki; Suzuki, Nobuyoshi; Ohara, Kazumine; Ohyanagi, Yasushi; and Sekiguchi, Isamu, 5,314,912, Cl. 524-458.000.

Ojha, Purnendu S.: *See*—
Corby, Kenneth D.; Didas, Michael W.; Kalyandurg, Satyan R.; Ojha, Purnendu S.; Baister, Michael E.; Lenhard, Suzanne M.; and Gaudino, David M., 5,313,993, Cl. 141-364.000.

Oji Paper Co., Ltd.: *See*—
Takahashi, Yoshiyuki; Nishioka, Makoto; Toyofuku, Kunitaka; and Uchida, Kyoko, 5,314,859, Cl. 503-207.000.

Oka, Masanori; Gen, Shokyu; Ikada, Yoshito; and Okimatsu, Hideaki, to Kyocera Corporation; and Kabushiki Kaisha Biomaterial Universe. Artificial bone connection prosthesis. 5,314,478, Cl. 623-18.000.

Oka, Mayumi: *See*—
Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; and Mason, James, 5,315,695, Cl. 395-132.000.

Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, to Fumakilla Limited; and Hiroshima University. Recombinant 40 KDa *Dermatophagoides farinae* allergen. 5,314,991, Cl. 530-350.000.

Okada, Hiroshi; Kanota, Keiji; and Kubota, Yukio, to Sony Corporation. Apparatus for recording and/or reproducing digital video and audio signals operable in an after-recording mode. 5,315,401, Cl. 358-337.000.

Okada, Shozo: *See*—
Matsuo, Naoto; Ogawa, Hisashi; Nakata, Yoshiro; and Okada, Shozo, 5,315,543, Cl. 365-149.000.

Okada, Tsunekazu: *See*—
Ono, Koichi; Okada, Tsunekazu; and Hataoka, Seiichi, 5,315,457, Cl. 360-77.140.

Okada, Yoshihiro: *See*—
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Shigeru; Nakamura, Kazunari; Okada, Yoshihiro; Saito, Katsuyuki; and Yamaguchi, Seiji, 5,315,383, Cl. 348-68.000.

Okamizu, Hironori: *See*—
Otsuka, Takayuki; Kayanuma, Nobuaki; Osawa, Kouichi; Okamizu, Hironori; and Kunimasa, Chikao, 5,313,925, Cl. 123-520.000.

Okamoto, Ichiro: *See*—
Fukumoto, Kenji; Okamoto, Ichiro; and Yamashita, Keitaro, 5,315,445, Cl. 360-19.100.

Okamoto, Tetsuo; and Usa, Satoshi, to Yamaha Corporation. Electronic musical instrument having artificial string sound source with bowing effect. 5,315,058, Cl. 84-626.000.

Okamoto, Yuji: *See*—
Yamauchi, Yasuji; and Okamoto, Yuji, 5,315,360, Cl. 355-319.000.

Okamura, Ryuji: *See*—
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,314,780, Cl. 430-128.000.

Okawa, Masayuki: *See*—
Nakayama, Masaaki; Okawa, Masayuki; and Saito, Junichi, 5,314,273, Cl. 408-233.000.

Okazaki, Yoji; Goto, Chiaki; Hyuga, Hiroaki; and Harada, Akinori, to Fuji Photo Film Co., Ltd. Optical wavelength converting apparatus. 5,315,433, Cl. 359-328.000.

Okazaki, Yoji: *See*—
Nozaki, Nobuharu; Mitsumoto, Shinji; Okazaki, Yoji; and Adachi, Takashi, 5,315,613, Cl. 372-69.000.

Okiai, Ryuichi: *See*—
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,314,010, Cl. 165-104.260.

Okigami, Noboru: *See*—
Sekiguchi, Yoshitoshi; Saski, Kunio; Okigami, Noboru; Hamabe, Kohei; Ieyama, Kazuo; and Knodo, Mamoru, 5,313,895, Cl. 110-346.000.

Okimatsu, Hideaki: *See*—
Oka, Masanori; Gen, Shokyu; Ikada, Yoshito; and Okimatsu, Hideaki, 5,314,478, Cl. 623-18.000.

Okinoshima, Hiroshige; Kozakai, Shohei; and Abe, Tomiya, to Shin-Etsu Chemical Co., Ltd.; and Hitachi Cable Ltd. Optical fibers and core - forming compositions. 5,314,979, Cl. 528-15.000.

Okita, Tomoyoshi: *See*—
Misao, Hitoshi; Yamauchi, Katsuhisa; Inoue, Tadashi; and Okita, Tomoyoshi, 5,314,549, Cl. 148-325.000.

Okochi, Sadao; and Takoda, Terutaka, to Kabushiki Kaisha Toshiba. Current resonance converter having overload detecting function. 5,315,496, Cl. 363-21.000.

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Bromidge, Steven M.; Orlek, Barry S.; and Dabbs, Steven, 5,314,901, Cl. 514-357.000.

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Mazure, Carlos A.; and Orlowski, Marius K., 5,314,834, Cl. 437-43.000.

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Connolly, Peter J.; and Wachter, Michael P., 5,315,012, Cl. 548-360.100.

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Prewett, Annamarie B.; and Stikeleather, Roger C., 5,314,476, Cl. 623-16.000.

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Ishikawa, Yoji; and Otani, Takashi, 5,315,392, Cl. 348-570.000.

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Anderson, William L.; and Otero, Dennis, 5,314,830, Cl. 436-524.000.

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Williamson, Jimmie R., Jr., 5,314,026, Cl. 166-386.000.

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  - VanRens, Russell J.; and Lessard, Donald L., 5,314,002, Cl. 164-305.000.
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  - Chan, Alexander; and Pan, Yuh-Guo, 5,314,505, Cl. 8-426.000.
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  - Anderson, Mark R.; and Parker, Robert P., 5,315,660, Cl. 381-13.000.
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  - Butz, Hans; Diederich, Gerd; Ehrenberg, Hans-Juergen; Lohse, Dietmar; Parschat, Lothar; and Pleschiutschnigg, Fritz-Peter, 5,314,099, Cl. 222-606.000.
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  - Gallagher, Dennis M.; Pfeifer, Thomas M.; and Schoonmaker, Richard P., 5,314,566, Cl. 156-441.500.
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  - Murray, Bill D.; and Brewer, Jack G., 5,313,991, Cl. 141-86.000.
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  - Cassidy, Edward J.; and Jones, Ronald D., 5,314,542, Cl. 119-231.000.
- Precision General, Inc.: *See—*
  - Nimberger, Spencer M., 5,313,975, Cl. 137-14.000.
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  - Lynch, James F.; and Predkelis, John, 5,314,535, Cl. 106-311.000.
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  - Yates, Jan B.; Procknow, David W.; Peterson, Brett J.; and Goplen, Gary D., 5,314,009, Cl. 165-72.000.
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  - Aylsworth, Alonzo C., 5,313,820, Cl. 73-24.010.
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  - Kelley, Donald W., 5,314,162, Cl. 248-553.000.
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  - Lisy, Donald J., 5,315,094, Cl. 235-385.000.
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  - Shea, David B., 5,314,087, Cl. 220-450.000.
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  - Nau, Karl L.; Raffel, Hans; and David, Heinrich, 5,314,120, Cl. 239-310.000.
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- Rasor Associates, Inc.: *See—*
  - Bobrove, Arthur M.; Fernandez, Robert K.; Robinson, Thomas C.; and Sahines, Thomas P., 5,314,503, Cl. 604-164.000.
- Rasp, Christian; Timmermann, Ralf; Perrey, Hermann; Lehmann, Bernhard; and Kussi, Siegfried, to Bayer AG. Process for the preparation of polyurea greases. 5,314,982, Cl. 528-48.000.
- Rauch, Russell B.; and Harris, Ellis D., to Xerox Corporation. Pair of binary diffraction optics for use in overfilled raster output scanning systems. 5,315,427, Cl. 359-216.000.
- Rauckhorst, Richard L., III, to B.F. Goodrich Company, The. Compressible nose dynamic de-icer. 5,314,145, Cl. 244-134.00A.
- Raverdy, Yvan; Marillat, Christian; and Gally, Daniel, to Thomson Tubes Electroniques. Radiological image intensifier tube with dyed porous alumina layer. 5,315,103, Cl. 250-214.0VT.
- Raymond, Frank J., Jr.; and Dernovsek, John R., to Bray International, Inc. Rotary valve. 5,314,165, Cl. 251-305.000.
- Raynet Corporation: *See—*
  - McCall, Mark; Del Fava, Donald; Wong, Thomas; and Koht, Lowell I., 5,315,489, Cl. 361-801.000.
- Raytheon Company: *See—*
  - Grossi, Mario D., 5,315,561, Cl. 367-1.000.
  - Porter, Frank K., Jr.; Nelson, Eliot D.; Arimento, Daniel R.; and Reidy, Terence J., 5,314,144, Cl. 244-132.000.
  - Vinn, Charles L.; and Hang, Peter P., 5,315,170, Cl. 307-353.000.
- RCA Thomson Licensing Corporation: *See—*
  - Bhatt, Bhavesh B., 5,315,619, Cl. 375-94.000.
- Rea, John W.: *See—*
  - Scherpenberg, Francis A.; Mumper, Eric W.; Rea, John W.; and Lee, Robert D., 5,315,549, Cl. 365-189.090.
- Reamer, Robert A.: *See—*
  - Chung, John Y. L.; Reamer, Robert A.; Girard, Yves; and Hamel, Pierre, 5,314,898, Cl. 514-338.000.
- Reck, Gene P.: *See—*
  - Proscia, James W.; Wen, Gang G.; Williams, Keith B.; Winter, Charles H.; and Reck, Gene P., 5,314,716, Cl. 427-248.100.
- Recovermat Technologies, Inc.: *See—*
  - Smith, R. Paul; and Price, Michael I., 5,314,266, Cl. 405-129.000.
- Recycling Technologies International Corporation: *See—*
  - Strouth, James W., 5,315,325, Cl. 346-160.100.
- Reddy, Srinivas T., to Altera Corporation. Reduced noise output buffer. 5,315,172, Cl. 307-443.000.
- Redewill, Frances H. Acoustical pillow. 5,313,678, Cl. 5-639.000.
- Reed, Daniel L.: *See—*
  - Dalla Betta, Ralph A.; Sheridan, David R.; and Reed, Daniel L., 5,314,828, Cl. 436-118.000.
- Reed, Wilmer H., III, to Dynamic Engineering, Inc. System for controlling higher harmonic vibrations in helicopter rotor blades. 5,314,308, Cl. 416-91.000.
- Register, W. Douglas: *See—*
  - Robin, Mark L.; Iikubo, Yuichi; Register, W. Douglas; and Rose, Richard S., 5,314,926, Cl. 521-98.000.
  - Sweval, Mark A.; Register, W. Douglas; Robin, Mark L.; and Iikubo, Yuichi, 5,314,682, Cl. 424-45.000.
- Regueiro, Jose F., to Chrysler Corporation. Fuel injection system and method for a diesel or stratified charge engine. 5,313,924, Cl. 123-456.000.
- Rehrig-Pacific Company, Inc.: *See—*
  - Apps, William P.; Koefelda, Gerald R.; and Shermer, Larry E., 5,314,089, Cl. 220-510.000.
- Reid, Drew A.: *See—*
  - Bilas, Ron J.; Reid, Drew A.; and Wittrock, Martin J., 5,315,499, Cl. 364-140.000.
- Reid, William B.: *See—*
  - Fong, Jon J.; and Reid, William B., 5,315,472, Cl. 361-212.000.
- Reidy, Terence J.: *See—*
  - Porter, Frank K., Jr.; Nelson, Eliot D.; Arimento, Daniel R.; and Reidy, Terence J., 5,314,144, Cl. 244-132.000.
- Reilly, Steven J.: *See—*
  - Williams, Charles L.; Buechler, John G.; Miller, Tod W.; and Reilly, Steven J., 5,313,780, Cl. 60-39.080.
- Reime, Gerd, to Nokia (Deutschland) GmbH. Inverting the phase of the carrier of a first signal on a line-by-line basis to prevent co-channel interference with a second independently transmitted signal. 5,315,385, Cl. 348-441.000.
- Reinthal, Peter: *See—*
  - Kramer, Carl; Konrath, Bernd; Berger, Bernd; and Reinthal, Peter, 5,313,685, Cl. 15-309.100.
- Reis, Robert J.: *See—*
  - Owens, Gene R.; Reis, Robert J.; Shomo, Richard G.; and Wickus, Scott D., 5,314,346, Cl. 439-189.000.
- Reitz, Allen B.: *See—*
  - Scott, Malcolm K.; Reitz, Allen B.; Maryanoff, Cynthia A.; and Villani, Frank J., Jr., 5,314,885, Cl. 514-252.000.
- Rek, Johannes H.; Houghton, Mark P.; and Verheul, Rudolf C., to Lever Industrial Company, Division of Indopco Inc. Liquid cleaning products. 5,314,636, Cl. 252-139.000.
- Remy, Le Gallo; Gerard, Lyvet; and Malgogne, Bernard, to Bull S.A. Host structure for terminal adapters. 5,315,488, Cl. 361-796.000.
- Renard, Pierre: *See—*
  - Le Baut, Guillaume; Babingui, Jean-Paul; Courant, Jacqueline; Robert, Jean-Michel; Renard, Pierre; Caignard, Daniel-Henri; de la Faverie, Jean-Francois R.; and Adam, Gerard, 5,315,017, Cl. 545-408.000.
- Renault Automation: *See—*
  - Negre, Bernard; and de Filippis, Christian, 5,313,695, Cl. 29-33.00P.
- Rencher, William F., to McNeil-PPC, Inc. Bioadhesive pharmaceutical carrier. 5,314,915, Cl. 514-535.000.
- Rendahl, Ingvar F.; and Tornqvist, Borje G. S., to Husqvarna Sewing Machines Aktiebolag. Feed direction and stitch length cam for zigzag sewing machine. 5,313,900, Cl. 112-316.000.

Renkes, Kenneth R.; and Bush, Lyle J., to General Electric Company. Push button multiple circuit switch assembly with laminated sliders and membrane. 5,315,076, Cl. 200-5.0EB.

Rennex, Brian G. Hairpiece base. 5,313,963, Cl. 132-54.000.

Rennie, Robert A. C.: *See—*
Johnson, Trevor; and Rennie, Robert A. C., 5,315,002, Cl. 536-122.000.

Reohr, William R.: *See—*
Chan, Yuen H.; Pelella, Anthony R.; and Reohr, William R., 5,315,167, Cl. 307-296.600.

Repenning, Detlev. Method for producing osteo-integrating surfaces on skeletal implants and skeletal implants with osteo-integrating surfaces. 5,314,475, Cl. 623-16.000.

Repligen Corporation: *See—*
Love, Richard N.; and Profy, Albert T., 5,314,993, Cl. 530-350.000.

Research Development Corporation of Japan: *See—*
Imai, Masaharu; Honsawa, Kunio; and Tomita, Jota, 5,315,699, Cl. 395-162.000.

Respironics Inc.: *See—*
Zdrojkowski, Ronald J., 5,313,937, Cl. 128-202.220.

Rex, Jorn, to Novo Nordisk A S. Manifold for a two barrel syringe. 5,314,412, Cl. 604-191.000.

Rex, William A.: *See—*
Mace, Carl L., Jr.; Rex, William A.; and Chlebina, Lawrence E., 5,313,745, Cl. 51-326.000.

Reynes, Christopher D.: *See—*
Sayka, Anthony; Reynes, Christopher D.; Williams, Bradley G.; and Martinez, Gerardo F., 5,313,818, Cl. 73-19.100.

Rheon Automatic Machinery Co., Ltd.: *See—*
Morikawa, Michio; and Hirabayashi, Koichi, 5,313,880, Cl. 99-537.000.
Morikawa, Michio; and Hirabayashi, Koichi, 5,314,322, Cl. 425-142.000.

Rhone-Poulenc Chimie: *See—*
Collin, Marie-Pierre; Huguenin, Denis; and Le Govic, Anne-Marie, 5,314,641, Cl. 252-301.40P.

Rhone-Poulenc Viscosuisse SA: *See—*
Humbrecht, Remy; and Morgenstern, Wolfgang, 5,313,776, Cl. 57-287.000.

RIA Electronic Albert Metz: *See—*
Jaag, Dieter, 5,314,360, Cl. 439-811.000.

Ricanek, Rudolf: *See—*
Ambroziak, Andrzej; Lison, Rudolf; and Ricanek, Rudolf, 5,314,106, Cl. 228-114.500.

Rice, David A.: *See—*
DiNicola, Paul D.; Kantz, Joseph; Rahim, Omar M.; Rice, David A.; and Ruddick, Edward M., 5,315,701, Cl. 395-163.000.

Rice, Robert W.: *See—*
Ebert, Frederick J.; and Rice, Robert W., 5,314,147, Cl. 244-182.000.

Rich, Mark J.: *See—*
Murphy, John L.; and Rich, Mark J., 5,315,583, Cl. 370-18.000.

Richardson, Henry E.: *See—*
Forgash, Anthony R.; and Richardson, Henry E., 5,313,864, Cl. 83-349.000.

Ricoh Company, Ltd.: *See—*
Adachi, Osamu; and Hoshi, Kazunori, 5,315,593, Cl. 370-94.300.
Bannai, Kazunori, 5,315,322, Cl. 346-108.000.
Kamijo, Masahiko; Matsuura, Yozo; and Saitoh, Hiroshi, 5,315,357, Cl. 355-298.000.
Morohoshi, Naoya; Uemura, Hiroyuki; and Nogawa, Chiharu, 5,314,861, Cl. 503-227.000.
Ohshima, Kiyoshi; Tamiya, Yoshiyumi; Shimizu, Kenichi; Suzuki, Tadahiro; and Iizuka, Kazuaki, 5,315,323, Cl. 346-159.000.
Sato, Mitsuo; and Tanno, Yusuke, 5,315,319, Cl. 346-76.0PH.
Shoshi, Masayuki; and Kanemoto, Akihiko, 5,314,997, Cl. 534-577.000.
Suzuki, Koji; Enoki, Shigekazu; Takashima, Hiroshi; Iwata, Naoki; and Ueno, Yuichi, 5,315,061, Cl. 118-651.000.
Watanabe, Kazuhito; Nanya, Toshiki; and Iwamoto, Yasuaki, 5,314,777, Cl. 430-106.000.
Yoshida, Yoshihiro, 5,315,206, Cl. 313-306.000.

Ridenour, Ralph G. Transducer assembly and method. 5,313,839, Cl. 73-756.000.

Ridley, Michael L.: *See—*
Coulcher, Richard D., Jr.; Hyde, Alan A.; and Ridley, Michael L., 5,313,931, Cl. 126-401.000.

Rieger, Heinz H.; and Adamson, Colin, to 729819 Ontario Limited. Hood for fireplace. 5,313,932, Cl. 126-531.000.

Rieker, Werner: *See—*
Kummer, Martin; Rieker, Werner; Strotgen, Eckerhard; and Prahst, Eberhard, 5,315,193, Cl. 310-50.000.

Rienstra, Mark S.: *See—*
Lee, Ann L.; Rienstra, Mark S.; Manger, Walter E.; and Sitrin, Robert D., 5,314,811, Cl. 435-101.000.

Ries, Hans: *See—*
Rober, Stefan; Mugge, Joachim; Feinauer, Roland; Jadamus, Hans; Herrmann, Hans-Dieter; and Ries, Hans, 5,313,987, Cl. 138-137.000.

Riese, Jerome W.: *See—*
Meirowitz, Randy E.; Riese, Jerome W.; and Phelan, Robert J., 5,314,743, Cl. 428-297.000.

Rieth, John E., to Eastman Kodak Company. Method of making cellulose ester photographic film base. 5,314,647, Cl. 264-25.000.

Riikonen, Pirkko L. A.: *See—*
Haarasilta, Asko N. O.; Riikonen, Pirkko L. A.; and Vuorenlinna, Leo, 5,314,692, Cl. 424-94.200.

Rikagaku Kenkyusho: *See—*
Majima, Tetsuro; Sugita, Kyoko; and Arai, Shigeyoshi, 5,314,592, Cl. 204-157.200.

Rimondi, Renato; and Cappi, Angelo, to Awax S.R.L. Method and apparatus for on demand manufacturing of custom-sized bags conforming to the volume of articles received therein at a check-out counter. 5,313,766, Cl. 53-451.000.

Rinehart, Steven R.; Giles, James W., Jr.; Pendleton, Charles P.; and Grimsley, Marvin M., to Philip Morris Incorporated. Apparatus for applying glue to closure stamps for insertion onto packages. 5,314,559, Cl. 156-356.000.

Ringler, William G. Combination drilling and wrenching tool. 5,313,680, Cl. 7-138.000.

Ringspann GmbH: *See—*
Maurer, Ruprecht, 5,314,381, Cl. 464-30.000.

Rinne, Glenn A.: *See—*
Magill, Paul A.; Koopman, Nicholas G.; and Rinne, Glenn A., 5,315,485, Cl. 361-767.000.

Rittschof, Dan: *See—*
Gerhart, Donald J.; Rittschof, Dan; and Bonaventura, Joseph, 5,314,932, Cl. 523-122.000.

Rival Company, The: *See—*
Edwards, Billie R.; and Barrow, Mary K., 5,313,708, Cl. 30-417.000.

Rivara, Antonio, to Tekma Kinomat S.r.l. Coil winder with spindlehead movable in a horizontal plane. 5,314,129, Cl. 242-7.090.

Rivera, Jose C. Automobile anti-theft device. 5,314,040, Cl. 180-287.000.

Rivers, David F.; and Ferraro, Frank A., to Warner-Lambert Company. Segmented guard bar with improved skin flow control. 5,313,705, Cl. 30-50.000.

Rivetti, Franco: *See—*
Mizia, Franco; Rivetti, Franco; and Romano, Ugo, 5,315,034, Cl. 560-338.000.

Roadmaster Corporation: *See—*
Camfield, David K.; Hahn, Daniel G.; Niemeyer, Duane; and Brashear, Daniel F., 5,314,207, Cl. 280-828.000.

Robbins, Lionel: *See—*
Yaniv, Zvi; Robbins, Lionel; and Catchpole, Clive, 5,313,726, Cl. 40-361.000.

Rober, Stefan; Mugge, Joachim; Feinauer, Roland; Jadamus, Hans; Herrmann, Hans-Dieter; and Ries, Hans, to Huels Aktiengesellschaft. Multilayer plastic pipe comprising an outer polyamide layer and a layer of a molding formed from a mixture of thermoplastic polyester and a compound having at least two isocyanate groups. 5,313,987, Cl. 138-137.000.

Robert Bosch GmbH: *See—*
Brauninger, Jurgen; Schramm, Herbert; Kadelbach, Volker; Wirz, Josef; Kuttner, Thomas; Seher, Dieter; and Flogel, Wolfgang, deceased, 5,313,855, Cl. 477-111.000.
Demel, Herbert, 5,313,922, Cl. 123-333.000.
Friese, Karl-Hermann; Gruenwald, Werner; and Wiedenmann, Hans-Martin, 5,314,604, Cl. 204-410.000.
Klinger, Herbert; Thomas, Gerhard; and Petrzik, Martin, 5,313,701, Cl. 29-840.000.
Kummer, Martin; Rieker, Werner; Strotgen, Eckerhard; and Prahst, Eberhard, 5,315,193, Cl. 310-50.000.
Miller, Bernhard; Gorny, Stefan; Kallenbach, Rainer; and Klug, Andreas, 5,315,516, Cl. 364-424.010.
Schaeftlmeier, Roland; Pflueger, Gerhard; Fakler, Bernhard; Buerger, Klaus Georg; and Knorpp, Albrecht, 5,313,698, Cl. 29-596.000.
Winter, Martin F., 5,314,122, Cl. 239-585.100.

Robert, Jean-Michel: *See—*
Le Baut, Guillaume; Babingui, Jean-Paul; Courant, Jacqueline; Robert, Jean-Michel; Renard, Pierre; Caignard, Daniel-Henri; de la Faverie, Jean-Francois R.; and Adam, Gerard, 5,315,017, Cl. 549-408.000.

Roberts Filter Manufacturing Company: *See—*
Kim, Annabelle; and Roberts, R. Lee, 5,314,630, Cl. 210-794.000.

Roberts, Joseph M., to Attwood Corporation. Fishing rod holder having a flexible clamp for casting and spinning reels. 5,313,734, Cl. 43-21.200.

Roberts, R. Lee: *See—*
Kim, Annabelle; and Roberts, R. Lee, 5,314,630, Cl. 210-794.000.

Roberts, Robert F.; Parker, Dane K.; and Purdon, James R., Jr., to Goodyear Tire & Rubber Company, The. Rubber article having protective coating. 5,314,741, Cl. 428-215.000.

Robertshaw Controls Company: *See—*
Katchka, Jay R., 5,314,328, Cl. 431-66.000.

Robertson, David: *See—*
Abreu, Leonard W.; Kneizys, Francis X.; Anderson, Gail P.; Chetwynd, James H.; Berk, Lex; Bernstein, Larry; and Robertson, David, 5,315,513, Cl. 364-420.000.

Robin, Mark L.; Iikubo, Yuichi; Register, W. Douglas; and Rose, Richard S., to Great Lakes Chemical Corporation. Hydrofluorocarbon compositions as blowing agents for cellular plastics. 5,314,926, Cl. 521-98.000.

Robin, Mark L.: *See—*
Sweval, Mark A.; Register, W. Douglas; Robin, Mark L.; and Iikubo, Yuichi, 5,314,682, Cl. 424-45.000.

Robinson, Thomas C.: *See—*
Bobrove, Arthur M.; Fernandez, Robert K.; Robinson, Thomas C.; and Sahines, Thomas P., 5,314,503, Cl. 604-164.000.

Robinson, Thomas S.; Dieska, David E.; and Hebert-Robinson, Carol A., to NCR Corporation. Power failure detection and shut down timer. 5,315,161, Cl. 307-66.000.

Rockandel, Michael A.; and Twidwell, Larry G. Mercury contaminated mud treatment. 5,314,527, Cl. 75-742.000.

Rockwell International Corporation: *See—*
DiGenova, Phillip D., 5,313,883, Cl. 101-247.000.
Gerhardt, David L.; Su, Paul J.; Lak, Tibor I.; and Brakeville, Donna M., 5,315,530, Cl. 364-510.000.
Hong, John H., 5,315,423, Cl. 359-124.000.
Rahamim, Raphael; and Folwell, Dale E., 5,315,651, Cl. 379-412.000.

Rockwood, Charles A., Jr.; Engelhardt, John A.; and Ondrla, Jeffrey M., to DePuy Inc. Modular prosthesis. 5,314,479, Cl. 623-19.000.

Rocky Mountain Technology Engineering Corp.: *See—*
Wessels, Larry L., 5,314,201, Cl. 280-407.100.

Rodder, Jerome A. Pulmonary flow head. 5,313,955, Cl. 128-725.000.

Rodgers, Aubrey; Hope, Kenneth P.; and Hope, Norman B., to Firelight Leisure Products Ltd. Portable camp stove and barbecue grill. 5,313,928, Cl. 126-38.000.

Rodgers, Colin, to Sundstrand Corporation. Surge protected gas turbine engine for providing variable bleed air flow. 5,313,779, Cl. 60-39.070.

Rodgers, Tony A.; and Walker, Stephen J., to Cooper Industries, Inc. Angular and radial self-aligning coupling. 5,314,024, Cl. 166-347.000.

Rodriguez, Santiago: *See—*
Ferraris, John P.; Lambert, Tim L.; and Rodriguez, Santiago, 5,315,014, Cl. 549-43.000.

Roeschert, Horst; Pawlowski, Georg; and Fuchs, Juergen, to Hoechst Aktiengesellschaft. Positive-working radiation sensitive mixture comprising sulfonic acid esters of 2,4,6-tris-(2-hydroxyethoxy)-[1,3,5]triazine, and recording material containing these esters. 5,314,786, Cl. 430-270.000.

Rogalla, Franck, to OTV (Omnium De Traitements Et De Valorisation). Method for the biological purification of wastewater. 5,314,621, Cl. 210-618.000.

Roger, Jacques: *See—*
Le Goe, Gerard; and Roger, Jacques, 5,315,487, Cl. 361-796.000.

Rogers, W. Leslie: *See—*
Wang, Xiaohan; Koral, Kenneth F.; Clinthorne, Neal H.; Rogers, W. Leslie; and Slosar, Jeffrey M., 5,315,506, Cl. 364-413.190.

Rohm Co., Ltd.: *See—*
Kinugasa, Yasushi, 5,315,136, Cl. 257-208.000.
Kuriyama, Chojiro, 5,315,474, Cl. 361-534.000.
Murase, Hiroshi; and Fukuda, Kazuyuki, 5,315,536, Cl. 364-569.000.
Tanaka, Haruo, 5,315,606, Cl. 372-38.000.
Ueda, Shigeyuki, 5,315,135, Cl. 257-198.000.
Yoshimura, Tamotsu, 5,315,283, Cl. 338-162.000.

Rohm and Haas Company: *See—*
Amick, David R.; Emmons, William D.; and Lorah, Dennis P., 5,314,977, Cl. 526-286.000.

Rohm and Haax Company: *See—*
Steinwand, Paul J., 5,314,943, Cl. 524-501.000.

Rolando, Richard J.; and Sax, James E., to Minnesota Mining and Manufacturing Company. Graft copolymers containing fluoroaliphatic groups. 5,314,959, Cl. 525-276.000.

Rolls Royce PLC: *See—*
Glew, Derek A.; Staines, Alan D.; Cannon, Alan J.; and Dunlop, Roger N., 5,314,598, Cl. 204-224.00M.
Knight, Mark J., 5,314,301, Cl. 415-160.000.

Roltra-Morse S.p.A.: *See—*
Brusasco, Enzo; and Boero, Giuseppe, 5,315,194, Cl. 310-68.00R.

Romanak, Alfred J.: *See—*
Pim, Kendall A.; Romanak, Alfred J.; and Moss, Russell W., 5,314,149, Cl. 248-56.000.

Romano, Ugo: *See—*
Mizia, Franco; Rivetti, Franco; and Romano, Ugo, 5,315,034, Cl. 560-338.000.

Ronan, Greg: *See—*
Smith, Dale; Behrmann, Greg; and Ronan, Greg, 5,315,681, Cl. 385-89.000.

Ronan, John J. Spotting apparatus for assisting a weightlifter. 5,314,394, Cl. 482-104.000.

Ronkow, Leonid W.: *See—*
Friedrichs, Hans A.; and Ronkow, Leonid W., 5,314,171, Cl. 266-173.000.

Roquette Freres: *See—*
Mentink, Leon; and Serpelloni, Michel, 5,314,701, Cl. 426-103.000.

Rosco, Inc.: *See—*
Englander, Sol, 5,314,343, Cl. 439-100.000.

Rose, Richard S.: *See—*
Robin, Mark L.; Iikubo, Yuichi; Register, W. Douglas; and Rose, Richard S., 5,314,926, Cl. 521-98.000.

Rosen, Arye: *See—*
Stern, Roger A.; Edwards, Stuart D.; Jackson, Jerome; and Rosen, Arye, 5,314,466, Cl. 607-156.000.

Rosenberg, Howard; and Kuritzky, Eric. Flexible line coupling method and apparatus. 5,313,736, Cl. 43-44.830.

Rosich, Mitchell N.: *See—*
Noya, Eric S.; Arnott, Randy M.; and Rosich, Mitchell N., 5,315,602, Cl. 371-40.400.

Rosler, Matthias: *See—*
Junginger, Wolfgang; Rosler, Matthias; and Rupp, Thomas, 5,315,075, Cl. 181-240.000.

Ross-Sullivan, Mark. Collapsable ramp for projecting bowling balls. 5,314,384, Cl. 473-55.000.

Rossi, Cristina: *See—*
Cipolli, Roberto; Masarati, Enrico; Rossi, Cristina; Oriani, Roberto; and Nucida, Gilberto, 5,314,937, Cl. 524-100.000.

Rossoll, Mary P., to Gould Electronics Inc. Adhesive sealed solid electrolyte cell housed within a ceramic frame and the method for producing it. 5,314,507, Cl. 29-623.400.

Rost, Alvin S.; and Schurman, John M., to Dana Corporation. Remote hydraulic control systems. 5,313,983, Cl. 137-625.600.

Roth, Elliot J.: *See—*
Jaeger, Robert J.; and Roth, Elliot J., 5,314,454, Cl. 607-62.000.

Roth, James A., to Montefiore Medical Center. Apparatus and method for generating image representations of a body utilizing an ultrasonic imaging subsystem and a three-dimensional digitizer subsystem. 5,315,512, Cl. 364-413.250.

Rothe, Anselm: *See—*
Wilk, Hans-Erich; Rothe, Anselm; and Schneider, Erich, 5,314,803, Cl. 435-7.400.

Rotter, Gerhard, to Athana Incorporated. Tape cartridge drive belt having a low ratio of static to dynamic friction. 5,314,140, Cl. 242-192.000.

Rottmayr, Johann; and Billner, Werner, to Schubert & Salzer Maschinenfabrik AG. Spinning process and device for the production of a yarn. 5,313,777, Cl. 57-400.000.

Roussel-Uclaf: *See—*
Penny, Stuart J.; and Valentine, Roy H., 5,315,018, Cl. 549-445.000.

Rowe, Deines Instruments Inc.: *See—*
Bradley, Steven E.; and Rowe, Francis D., 5,315,562, Cl. 367-89.000.

Rowe, Francis D.: *See—*
Bradley, Steven E.; and Rowe, Francis D., 5,315,562, Cl. 367-89.000.

Rowland, Peter J.: *See—*
Foote, James C.; Harral, Michael W.; and Rowland, Peter J., 5,314,402, Cl. 600-20.000.

Rowlett, Don C., to Kennametal Inc. Pyramidal shaped, hardened insert for an agricultural tool. 5,314,029, Cl. 172-699.000.

Roy, Ashim: *See—*
Kepley, W. Robert; Kay, Stanley E.; Roy, Ashim; Kee, Steven M.; Henson, Carle C., III; Morris, Adrian J.; and Drago, Randy, 5,315,589, Cl. 370-62.000.

Roy, Melinda S. Handbag assembly. 5,314,102, Cl. 224-151.000.

Rubin, Arnold; and Poulin, Michael J. Water jump rope. 5,314,393, Cl. 482-82.000.

Rubin, Issac D.: *See—*
Papke, Brian L.; Rubin, Issac D.; and Castrogiovannia, John, Jr., 5,314,632, Cl. 252-18.000.

Rubin, Leon J.: *See—*
Beharry, Christopher R.; Diosady, Levente L.; Rubin, Leon J.; and Hussein, Ahmed A., 5,315,021, Cl. 554-190.000.

Ruddick, Edward M.: *See—*
DiNicola, Paul D.; Kantz, Joseph; Rahim, Omar M.; Rice, David A.; and Ruddick, Edward M., 5,315,701, Cl. 395-163.000.

Rudnick, James J., to Meadox Medicals, Inc. Prostate balloon dilatation catheter. 5,314,443, Cl. 606-192.000.

Rudolph, Werner: *See—*
Fernschild, Guenter; Rudolph, Werner; and Brosch, Carsten, 5,315,046, Cl. 570-167.000.

Rudow, Richard W.; and Wroblewski, Kenneth A., to McDonnell Douglas Helicopter Company. Dual polarization antenna. 5,315,309, Cl. 343-705.000.

Ruelle, Robert J. Arrow construction for use in bow hunting. 5,314,196, Cl. 273-416.000.

Rukovena, Frank, to Norton Chemical Process Products Corp. Packing element. 5,314,645, Cl. 261-94.000.

Runyon, Larry, to Eco-Soil Systems, Inc. Method and apparatus for pond water clarification and maintenance. 5,314,619, Cl. 210-606.000.

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Behrendt, Martin; Greisinger, Martin; and Winterhoff, Hans, 5,314,155, Cl. 248-301.000.

Ryan, Dana W.: *See—*
Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., 5,314,406, Cl. 604-21.000.
Ryan, Dawn M.: *See—*
Schryver, Jeff; Shea, Jeff; and Ryan, Dawn M., 5,314,487, Cl. 623-22.000.
Ryan, John O., to Macrovision Corporation. Copy protection for hybrid digital video tape recording and unprotected source material. 5,315,448, Cl. 360-60.000.
Ryan, Ralph L., to Compensating Tension Controls, Inc. Splice assembly for paper web transport apparatus. 5,314,568, Cl. 156-504.000.
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McCracken, Robert; and McCurry, Ronald C., 5,315,199, Cl. 310-239.000.
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Nilsson, Per-Inge; and Bulow, Per-Anders, 5,314,319, Cl. 418-170.000.
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Oweis, Salah, 5,314,544, Cl. 134-5.000.
Sagara, Kazuo: *See—*
Omae, Yoshihiro; Watanabe, Haruo; Sonoki, Susumu; Kanemasa, Yoichi; Sagara, Kazuo; Yoshimune, Takashi; and Yamasaki, Tetsuo, 5,314,168, Cl. 266-92.000.
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Sagnes, Georges: *See—*
Pascual, Nathalie; Fleury, Christophe; Sagnes, Georges; N'Guyen, Christian; and Lassale, Jacques, 5,315,271, Cl. 331-25.000.
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Berkman, Samuel; and Sahakian, Jack A., 5,313,823, Cl. 73-40.000.
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Saito, Akito; and Togawa, Tsuyoshi, to Olympus Optical Co., Ltd. Apparatus for recording and/or reproducing information on/from optical card-like information recording medium. 5,315,569, Cl. 369-44.320.
Saito, Haruo: *See—*
Niki, Mamoru; Hosaka, Yoshiaki; Mogi, Takao; and Saito, Haruo, 5,315,446, Cl. 360-48.000.
Saito, Junichi: *See—*
Nakayama, Masaaki; Okawa, Masayuki; and Saito, Junichi, 5,314,273, Cl. 408-233.000.
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Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Shigeru; Nakamura, Kazunari; Okada, Yoshihiro; Saito, Katsuyuki; and Yamaguchi, Seiji, 5,315,383, Cl. 348-68.000.
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Saito, Kiyoshi; Seko, Masahiko; and Masatsuji, Eiko, to Showa Denko K.K. Detergent comprising isolated cellulase from *bacillus* ferm bp-3431 or a mutant strain thereof, surfactant and builder. 5,314,637, Cl. 252-174.120.
Saito, Masaai; Iwata, Teruo; Ishii, Nobuo; Ikeda, Towl; and Saeki, Hiroaki, to Tokyo Electron Limited. Reduced pressure processing system and reduced pressure processing method. 5,314,541, Cl. 118-725.000.
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Arai, Tatsuo; Saito, Takayoshi; and Hayashizaki, Hiroaki, 5,314,269, Cl. 407-42.000.
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Iwami, Naoko; Matsui, Susumu; and Saito, Toru, 5,315,705, Cl. 395-200.000.
Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; and Mason, James, to Kabushiki Kaisha Toshiba. Personal computer capable of altering display luminance through key operation. 5,315,695, Cl. 395-132.000.
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Saitoh, Hiroshi: *See—*
Kamijo, Masahiko; Matsuura, Yozo; and Saitoh, Hiroshi, 5,315,357, Cl. 355-298.000.
Saka, Takashi: *See—*
Nakanishi, Tsutmu; Horinaka, Hiromichi; Saka, Takashi; and Kato, Toshihiro, 5,315,127, Cl. 257-11.000.
Sakai, Hiroo; Otobe, Shingo; Tamura, Hideo; and Kamikawa, Toshimi, to Stanley Electric Co., Ltd. LED display unit. 5,313,729, Cl. 40-452.000.
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Utaka, Katsuyuki; Nagao, Yasuyuki; Matsushima, Yuichi; and Sakai, Kazuo, 5,315,422, Cl. 359-107.000.
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Kaneda, Shinichi; Tamaki, Shouji; and Sakai, Osamu, 5,313,893, Cl. 108-152.000.
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Sakakibara, Kenzo: *See—*
Yoshida, Takehiro; and Sakakibara, Kenzo, 5,315,643, Cl. 379-100.000.
Sakamoto, Kazuhiko; Tanaka, Hiroaki; Ueoka, Masatoshi; Akazawa, Yoji; and Baba, Masao, to Nippon Shokubai Co., Ltd. Process for purification of acrylic acid. 5,315,037, Cl. 562-545.000.
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Suzuki, Tadasu; and Sakamoto, Kiyotaka, 5,314,388, Cl. 474-110.000.
Sakamoto, Takashi; and Usui, Nobuaki, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for generating halftone dots. 5,315,407, Cl. 358-456.000.
Sakashita, Eiji: *See—*
Kawakura, Akio; Yonekawa, Motoki; Sakashita, Eiji; and Kamogawa, Hiroshi, 5,314,624, Cl. 210-645.000.
Sakashita, Kazuhiro; Yuasa, Terukazu; Takimoto, Isao; Hashizume, Takeshi; and Komoike, Tatsunori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit having annular power supply with plural lines. 5,315,182, Cl. 307-482.100.
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Sakihara, Donn L. Collapsible and extensible playhouse. 5,313,747, Cl. 52-64.000.
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Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
Sakoda, Ryozo: *See—*
Tanikawa, Keizo; Saito, Akira; Matsumoto, Takashi; Sakoda, Ryozo; Tsuruzoe, Nobutomo; and Shikada, Ken-ichi, 5,314,883, Cl. 514-236.500.
Salmon, Stephen M.; McKenzie, John R.; Thornton, Peter; and Ginn, Richard, to Cardiovascular Imaging Systems, Inc. Expandable member for a catheter system. 5,314,408, Cl. 604-22.000.
Salome, Marc Louis Victor: *See—*
Lorneau, Jean-Claude; Chevallier, Bruno; and Salome, Marc Louis Victor, 5,314,876, Cl. 514-56.000.
Salvador, Pierantonio; and Viciguerra, Paolo, to Cascami Seta-Filature Seriche Riunite SpA. Method to detect man-made fibers and/or defective fibers and/or other foreign materials in the processing of silk waste, and relative apparatus. 5,315,367, Cl. 356-238.000.
Salzer, J. Richard: *See—*
Goldbach, Richard A.; McConnell, Frank E.; and Salzer, J. Richard, 5,313,903, Cl. 114-65.00R.
Samarov, Victor M.; Larson, Ralph I., Jr.; and Doumani, George A., to Digital Equipment Corporation. Conformal heat sink for electronic module. 5,315,480, Cl. 361-705.000.
Samo, Robert: *See—*
Cusack, Robert; and Samo, Robert, 5,314,441, Cl. 606-182.000.
Samsung Electron Devices Co., Ltd.: *See—*
Kim, Dae-il, 5,315,213, Cl. 315-169.100.
SamSung Electronics Co., Ltd.: *See—*
Choi, Yun-Ho, 5,315,555, Cl. 365-207.000.
Hong, Kwon-pyo, 5,315,452, Cl. 360-73.070.
Kim, Moon-Gone; and Yoon, Sei-Seung, 5,315,557, Cl. 365-222.000.
Lee, Man-young; Park, Hak-song; Kim, Young-cheol; Kim, Tae-yong; Choi, Yong-jin; and Kim, Jae-moon, 5,315,601, Cl. 371-39.100.
Lee, Seung-keun; Kwak, Choong-keun; and Kim, Chang-rae, 5,315,173, Cl. 307-443.000.
Lee, Woung-Moo, 5,315,188, Cl. 307-574.000.
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Lee, Jun H., 5,315,391, Cl. 348-553.000.
Sanden Corporation: *See—*
Tanabe, Kenichi, 5,314,013, Cl. 165-176.000.
Sanders, Gregory C., to GCS Innovations, Inc. Duct connector for leakfree attachment to the curved sidewall of highly flexible trunkline duct. 5,314,212, Cl. 285-197.000.
Sandhu, Gurtej S.: *See—*
Yu, Chris C.; Sandhu, Gurtej S.; and Doan, Trung T., 5,314,843, Cl. 437-225.000.

Sandner, Helmut G.; Ulrich, Peter; Francois, Robert N.; and Hawkins, Michael, to Du Pont de Nemours, E. I., and Company. Supply apparatus for color-bearing film. 5,314,133, Cl. 242-67.30R.
Sandvik AB: *See—*
Ostlund, Ake, 5,314,657, Cl. 419-15.000.
Sanger, Wallace D. Construction wall panel and panel structure. 5,313,753, Cl. 52-251.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Nagahora, Osamu, 5,314,362, Cl. 440-86.000.
Santa Barbara Research Center: *See—*
Garwood, Gerald A., Jr.; and Taylor, Scott M., 5,313,984, Cl. 137-625.480.
Santi, John, to Briggs & Stratton Corporation. Self-aligning valve assembly. 5,313,917, Cl. 123-90.670.
Santin, Ernest M.; Tout, William A.; Nunes, Peter M.; Vanderpot, John W.; and Berrian, Donald W., to Sensitech, Inc. Disposable electronic monitor device. 5,313,848, Cl. 73-866.200.
Sanyo Electric Co., Ltd.: *See—*
Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
Honda, Fumiaki; and Hosoya, Nobukazu, 5,315,399, Cl. 358-335.000.
Saraf, Ravi: *See—*
Doany, Fuad E.; Grube, Gary W.; and Saraf, Ravi, 5,314,709, Cl. 427-96.000.
Sarkka, Veli-Matti, to Nokia Telecommunications OY. Dielectric resonator having a displaceable disc. 5,315,274, Cl. 333-219.100.
Sarosiek, Jerzy; McCallum, Richard W.; and Mittal, Ravinder K., to UVA Patents Foundation. Catheter for esophageal perfusion. 5,314,409, Cl. 604-101.000.
Sasa, Hiroyuki: *See—*
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Shigeru; Nakamura, Kazunari; Okada, Yoshihiro; Saito, Katsuyuki; and Yamaguchi, Seiji, 5,315,383, Cl. 348-68.000.
Sasaki, Eisaku: *See—*
Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, 5,314,418, Cl. 604-282.000.
Sasaki, Hiroshi: *See—*
Kobayashi, Akira; Kawai, Takeshi; and Sasaki, Hiroshi, 5,315,100, Cl. 250-208.100.
Sasaki, Hiroyuki: *See—*
Sumiya, Hiroshi; Fukaya, Kousuke; Kawai, Sunao; Sasaki, Hiroyuki; Ban, Yoshiyuki; Komiya, Ryohei; and Muramatsu, Kiyoji, 5,315,691, Cl. 395-109.000.
Sasaki, Ken-ichi: *See—*
Kurihara, Kazuaki; Kawarada, Motonobu; Sasaki, Ken-ichi; and Teshima, Akitomo, 5,314,726, Cl. 427-577.000.
Sasaki, Kunihiko: *See—*
Ida, Yuichi; Kato, Hironori; Sasaki, Kunihiko; and Bannai, Hiroyuki, 5,314,344, Cl. 439-164.000.
Sasaki, Makoto: *See—*
Takatsu, Haruyoshi; Sasaki, Makoto; and Takeuchi, Kiyofumi, 5,315,024, Cl. 558-423.000.
Sasaki, Minoru: *See—*
Itoh, Hiroyuki; and Sasaki, Minoru, 5,315,123, Cl. 250-492.200.
Sasaki, Yoshiyuki: *See—*
Matsumoto, Mitsuo; Takahashi, Nobuo; and Sasaki, Yoshiyuki, 5,313,774, Cl. 57-255.000.
Sasazuka, Tadashi: *See—*
Suzuki, Hiroshi; Watano, Sigeru; Sasazuka, Tadashi; and Tsutsumi, Taira, 5,314,877, Cl. 514-58.000.
Saski, Kunio: *See—*
Sekiguchi, Yoshitoshi; Saski, Kunio; Okigami, Noboru; Hamabe, Kohei; Ieyama, Kazuo; and Knodo, Mamoru, 5,313,895, Cl. 110-346.000.
Sato, Akio: *See—*
Kato, Shinji; Takagi, Soya; Sato, Akio; Sugiyama, Mizuho; and Yokoya, Yuji, 5,314,036, Cl. 180-147.000.
Sato, Atsushi; and Kusakari, Kouichi, to Fujitsu Limited. Method and apparatus for positioning head on reference track of disk medium. 5,315,458, Cl. 360-78.080.
Sato, Chikara: *See—*
Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; and Sato, Chikara, 5,315,379, Cl. 348-713.000.
Sato, Harumatsu: *See—*
Ishi, Yuji; Nagao, Toru; and Sato, Harumatsu, 5,314,240, Cl. 297-452.150.
Sato, Haruyoshi: *See—*
Yamasita, Yukio; Sato, Haruyoshi; Nakamura, Toru; Yuasa, Hitoshi; and Otsuki, Yutaka, 5,314,769, Cl. 430-7.000.
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Sato, Hidenori; and Iwanabe, Naoto, to Murakami Kaimeido Co., Ltd. Electrically foldable rearview mirrors. 5,315,442, Cl. 359-877.000.
Sato, Hirokazu: *See—*
Murai, Kazuhiro; Kajiwara, Makoto; Sato, Hirokazu; Tanaka, Shinri; and Okumura, Mitsuhiro, 5,314,796, Cl. 430-522.000.
Sato, Hirosh: *See—*
Hayashi, Kiyoshi; Ootera, Susumu; Sato, Hirosh; and Utsui, Yoshihiko, 5,313,845, Cl. 73-862.334.
Sato, Hiroshi: *See—*
Mori, Takahiro; and Sato, Hiroshi, 5,314,713, Cl. 427-152.000.
Taniguchi, Takao; and Sato, Hiroshi, 5,314,294, Cl. 414-744.600.
Sato, Keiji, to Canon Kabushiki Kaisha. Rotating-head video signal recording apparatus. 5,315,453, Cl. 360-75.000.
Sato, Masami, to Fuji Photo Film Co., Ltd. Abrasive tape. 5,314,514, Cl. 51-295.000.
Sato, Mitsuo; and Tanno, Yusuke, to Ricoh Company, Ltd. Thermal plate-making apparatus and thermal head therefor. 5,315,319, Cl. 346-76.0PH.
Sato, Ryo: *See—*
Enomoto, Masayuki; Nagano, Eiki; Sato, Ryo; and Sakaki, Masaharu, 5,314,864, Cl. 504-225.000.
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Hirae, Sadao; Kondo, Noriyuki; and Sato, Seiichiro, 5,314,831, Cl. 437-8.000.
Sato, Shinichi: *See—*
Katoh, Hiroaki; Murakawa, Yoshitaka; Miyazaki, Toshimasa; Kitamura, Nobuyuki; and Sato, Shinichi, 5,314,631, Cl. 235-467.000.
Takago, Toshio; Sato, Shinichi; Kinami, Hitoshi; and Yamada, Hirokazu, 5,314,981, Cl. 528-36.000.
Sato, Tatsuya: *See—*
Lee, Peter W.; Wang, David N.; Nagashima, Makoto; Fukuma, Kazuto; and Sato, Tatsuya, 5,314,845, Cl. 437-238.000.
Sato, Yoshihide, to Fujitsu Limited. Semiconductor memory device having specific layout configuration of n-MOS memory cells. 5,315,146, Cl. 257-390.000.
Satoh, Kunio: *See—*
Simazaki, Yuzuru; Kumasaka, Takao; Satoh, Kunio; and Hirose, Youji, 5,315,353, Cl. 355-251.000.
Satoh, Tsuguo: *See—*
Yagi, Takeshi; Satoh, Tsuguo; Koinuma, Yoshiaki; and Yoshida, Kazuaki, 5,314,520, Cl. 65-3.110.
Satoh, Tuyosi: *See—*
Ohmi, Tadahiro; Fumio, Nakahara; Satoh, Tuyosi; and Umeda, Masaru, 5,313,982, Cl. 137-597.000.
Satomi, Hirobumi, to Oriental Motor Kabushiki Kaisha. Three-phase hybrid type stepping motor. 5,315,192, Cl. 310-49.00R.
Satoo, Motohiro: *See—*
Yamamoto, Akihiko; Yamada, Toshihiro; Natori, Tatsuo; Naya, Kotaro; Satoo, Motohiro; Fujiwara, Mitsuru; Matsubara, Katsumi; Shinoki, Kazuaki; and Kameya, Hirotaka, 5,314,321, Cl. 418-178.000.
Satou, Hiroaki; and Muraji, Tsutomu, to Matsushita Electric Industrial Co. Ltd. Gamma correction and white balance adjustment method and apparatus for projection display. 5,315,378, Cl. 348-655.000.
Sauer, Gale E.: *See—*
Frecska, Sandor A.; and Sauer, Gale E., 5,313,750, Cl. 52-232.000.
Saul, Jonathan R.: *See—*
Komorowski, Karl J.; Saul, Jonathan R.; and LaPointe, Larry P., 5,314,238, Cl. 297-325.000.
Saupe, Alfred; and Jakli, Antal, to Kent State University. Method of producing a homogeneously aligned chiral smectic C liquid crystal having homeotropic alignment layers. 5,315,419, Cl. 359-46.000.
Savary, Jean-Yves; and Blusseau, Floriane, to France Telecom and Telediffusion de France. System of data transmission by sharing in the time-frequency space with channel organization. 5,315,584, Cl. 370-18.000.
Saviotti, Vanni: *See—*
Siligoni, Marco; Saviotti, Vanni; and Marcioni, Maria L., 5,315,653, Cl. 379-413.000.
Sawada, Shigeru; Kasai, Shinichi; Tsujimoto, Jun; and Yokoyama, Masako, to Seiko Epson Corporation. Printer using electrostatic process including multiple sheet discharge receivers with a pivotal guide and a full tray detector. 5,315,361, Cl. 355-323.000.
Sawada, Shintaro: *See—*
Ito, Tsuyoshi; Watanabe, Junya; and Sawada, Shintaro, 5,314,974, Cl. 526-206.000.
Sawaragi, Fujio, to Nipon Arc Co., Ltd. Coating composition and article coated thereby. 5,314,947, Cl. 524-780.000.
Sawaya, Hiromichi; and Ishigami, Toshio, to Kabushiki Kaisha Toshiba. Resin-sealed type semiconductor device and method for manufacturing the same. 5,314,842, Cl. 437-211.000.
Sawdey, Michael: *See—*
Loskutoff, David J.; Ny, Tor; and Sawdey, Michael, 5,314,994, Cl. 530-350.000.
Sawyer, Elmer E.; Glover, Sanford; and Alderman, Wayne, to Impacto Enterprises, Inc. Pipeline pressure release apparatus and method. 5,313,974, Cl. 137-12.000.
Sax, James E.: *See—*
Rolando, Richard J.; and Sax, James E., 5,314,959, Cl. 525-276.000.
Sayama, Norio: *See—*
Ishii, Kenji; Kondo, Yoshinori; Matsumoto, Hiroyuki; and Sayama, Norio, 5,314,740, Cl. 428-209.000.
Sayka, Anthony; Reynes, Christopher D.; Williams, Bradley G.; and Martinez, Gerardo F., to VLSI Technology, Inc. Contaminant monitor for a flowing liquid. 5,313,818, Cl. 73-19.100.
Scandurra, Laura; and Aurelian, Laure, to Bernardini, Attilio. Acylcarnitine for the treatment and prevention of viral infections. 5,314,689, Cl. 424-433.000.
Schaefer, Nicholas E. Marble toy. 5,314,367, Cl. 446-168.000.
Schaeffer, Arnold: *See—*
Matheny, John R.; White, Christopher; Anderson, David R.; and Schaeffer, Arnold, 5,315,703, Cl. 395-164.000.
Schaeftlmeier, Roland; Pflueger, Gerhard; Fakler, Bernhard; Buerger, Klaus Georg; and Knorpp, Albrecht, to Robert Bosch GmbH. Process for the manufacture of the stator of an electrical machine. 5,313,698, Cl. 29-596.000.

- Schafer, Horst: *See—*
  - Beiss, Gunter; and Schafer, Horst, 5,314,306, Cl. 415-213.100.
- Schafer, Ulrich: *See—*
  - Kotzle, Horst; Oelmann, Bernd; Schafer, Ulrich; and Schwarz, Gerhard, 5,313,828, Cl. 73-146.000.
- Schantz, Allen R., II: *See—*
  - Durfor, Charles N.; Bolin, Richard J.; Schantz, Allen R., II; and Massey, Richard J., 5,314,642, Cl. 252-309.000.
- Schauder, Colin D.: *See—*
  - Heinrich, Theodore M.; and Schauder, Colin D., 5,315,225, Cl. 318-712.000.
- Schechter, David S.; Zhou, Dengen; and Orr, Franklin M., Jr., to Leland Stanford Junior University, Board of Trustees of the. Method of assisting the recovery of petroleum in vertically fractured formations utilizing carbon dioxide gas to establish gravity drainage. 5,314,017, Cl. 166-252.000.
- Scheidel, Allen T.; and Fuller, Glenn C. Electrician's free power cord. 5,315,475, Cl. 361-643.000.
- Schellhamer, Alan J.: *See—*
  - Lin, John T.; Schuster, Michael A.; Hobirk, Richard A.; and Schellhamer, Alan J., 5,314,581, Cl. 162-263.000.
- Schepis, Dominic J.; Srikrishnan, Kris V.; Subbanna, Seshardi; and Tijwani, Manu J., to International Business Machines Corporation. Method for forming an antifuse element with electrical or optical programming. 5,314,840, Cl. 437-194.000.
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  - Kwan, Henry K.; and Liebowitz, Stephen M., 5,314,697, Cl. [illegible].
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  - Deal, Michel, 5,314,095, Cl. 222-218.000.
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  - Stephens, Randy R.; Bishop, Gregory D.; Voegele, James; Welling, Diane; Smith, Richard; Collins, John M.; and Selecman, George, 5,314,417, Cl. 604-264.000.
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  - Wierer, Konrad A.; and Serafini, Franco, 5,314,530, Cl. 106-2.000.
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  - Alexander, James C., 5,313,681, Cl. 14-71.100.
- Sergeev, Pavel V.: *See—*
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  - Boguslaski, Robert C.; and Carrico, Robert J., 5,314,804, Cl. 435-12.000.
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Sharlai, Vladimir I.: *See—*
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  Yamauchi, Yasuji; and Okamoto, Yuji, 5,315,360, Cl. 355-319.000.
Shaw, David C.-H.; and Shaw, Judy Z.-Z. Automobile collision avoidance system. 5,314,037, Cl. 180-169.000.
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  Harris, Clark E.; Shaw, Joel R.; Healey, Thomas C.; and Morse, Mark J., 5,314,134, Cl. 242-71.100.
Shaw, Judy Z.-Z: *See—*
  Shaw, David C.-H.; and Shaw, Judy Z.-Z, 5,314,037, Cl. 180-169.000.
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Shaw, Rudy L.: *See—*
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Shea, David B., to Radiant Technologies, Inc. Thermal reflective packaging system. 5,314,087, Cl. 220-450.000.
Shea, Jeff: *See—*
  Schryver, Jeff; Shea, Jeff; and Ryan, Dawn M., 5,314,487, Cl. 623-22.000.
Sheaffer, Jeffrey D.: *See—*
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Shelbourne, K. Donald: *See—*
  Johnson, Glenn W., Jr.; McVicker, Henry J.; and Shelbourne, K. Donald, 5,314,455, Cl. 607-104.000.
Shell Oil Company: *See—*
  Buss, Grahame Y.; and Loh, Wai L., 5,314,121, Cl. 239-553.300.
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Shelton, Boyd N.: *See—*
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Shen, Paul; Paik, Woo H.; and Krause, Edward A., to General Instrument Corporation. Multiple serial access memory for use in feedback systems such as motion compensated television. 5,315,388, Cl. 348-718.000.
Sheng, Zhengzhi: *See—*
  Hermann, Allen M.; and Sheng, Zhengzhi, 5,314,867, Cl. 505-430.000.
Sheridan, David R.: *See—*
  Della Betta, Ralph A.; Sheridan, David R.; and Reed, Daniel L., 5,314,828, Cl. 436-118.000.
Sherman, Audrey A.: *See—*
  Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogaert, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., 5,314,748, Cl. 428-345.000.
Shermer, Larry E.: *See—*
  Apps, William P.; Koefelda, Gerald R.; and Shermer, Larry E., 5,314,089, Cl. 220-510.000.
Sherry, Steven H.: *See—*
  Conant, George E.; Sherry, Steven H.; and Wasson, Scott G., 5,315,592, Cl. 370-85.130.
Sherwood Medical Company: *See—*
  Lewis, Anthony K.; and Weilbacher, Eugene E., 5,314,416, Cl. 604-219.000.
Shetty, Chandrashekar S.: *See—*
  Ramesh, Manian; Shetty, Chandrashekar S.; and Finck, Martha R., 5,314,627, Cl. 210-734.000.
Shibamoto, Yoshitaka; Taniwa, Hiroyuki; Ueno, Hiromichi; Hagiwara, Shigeki; Forni, Ronald J.; and McCullough, John E., to Arthur D. Little, Inc.; and Daikin Industries, Ltd. Scroll apparatus with reduced inlet pressure drop. 5,314,316, Cl. 418-55.100.
Shibata, Hironori, to Olympus Optical Co., Ltd. Zoom lens system. 5,315,438, Cl. 359-687.000.
Shibata, Jun: *See—*
  Matsuda, Kenichi; and Shibata, Jun, 5,315,105, Cl. 250-214.0LS.
Shibayama, Takao: *See—*
  Wakamori, Takehisa; and Shibayama, Takao, 5,313,710, Cl. 33-203.120.
Shibuya, Katsuhiko: *See—*
  Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,314,897, Cl. 514-332.000.
Shigeta, Seiko: *See—*
  Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,314,991, Cl. 530-350.000.
Shikada, Ken-ichi: *See—*
  Tanikawa, Keizo; Saito, Akira; Matsumoto, Takashi; Sakoda, Ryozo; Tsuruzoe, Nobutomo; and Shikada, Ken-ichi, 5,314,883, Cl. 514-236.500.
Shimada, Shinya: *See—*
  Takaki, Hiroshi; and Shimada, Shinya, 5,313,978, Cl. 137-43.000.
Shimizu, Hiroshi; Ikeo, Jirou; Kabeta, Katsutoshi; and Miyazaki, Yoshito, to Fuji Photo Film Co., Ltd.; and Ushio Denki Kabushiki Kaisha. Diffusion transfer type duplicating camera. 5,315,347, Cl. 355-043.000.
Shimizu, Kenichi: *See—*
  Ohshima, Kiyoshi; Tamiya, Yoshiyumi; Shimizu, Kenichi; Suzuki, Tadahiro; and Iizuka, Kazuaki, 5,315,323, Cl. 346-159.000.
Shimizu, Masafumi: *See—*
  Sugiyama, Kazuhiko; Shimizu, Masafumi; Naito, Yukio; Nishimura, Eiichi; and Oshima, Kouichi, 5,314,603, Cl. 204-298.320.
Shimizu, Noburu; and Yanagisawa, Kiyoshi, to Ebara Corporation. Screw vacuum pump with a reduced starting load. 5,314,320, Cl. 418-201.100.
Shimizu, Sakayu: *See—*
  Akimoto, Kengo; Shinmen, Yoshifumi; Yamada, Hideaki; and Shimizu, Sakayu, 5,314,812, Cl. 435-134.000.
Shimmell, Dennis S., to Nelson Metal Products Corporation. Bearing cap and method for making same. 5,313,703, Cl. 29-890.120.
Shimodaira, Yoshikazu: *See—*
  Morikiyo, Akira; Kanbe, Toshio; Shinbo, Shuichi; Yoshikawa, Shigeru; Shimodaira, Yoshikazu; Ohminami, Kazuya; and Komuro, Hitoshi, 5,314,078, Cl. 211-59.200.
Shimura, Takaki: *See—*
  Ishikawa, Hiroshi; Watanabe, Kazuhiro; Kawabe, Kenji; and Shimura, Takaki, 5,313,950, Cl. 128-662.060.
Shimura, Yoshio: *See—*
  Yoshioka, Yasuhiro; Shimura, Yoshio; and Kobayashi, Hidetoshi, 5,314,797, Cl. 430-546.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
  Maruyama, Kazumasa; Yamamoto, Kazuyuki; Nagura, Sigehiro; and Homma, Taira, 5,315,003, Cl. 536-124.000.
  Okinoshima, Hiroshige; Kozakai, Shohei; and Abe, Tomiya, 5,314,979, Cl. 528-15.000.
  Takago, Toshio; Sato, Shinichi; Kinami, Hitoshi; and Yamada, Hirokazu, 5,314,981, Cl. 528-36.000.
  Yamada, Motoyuki; Furihata, Tomoyoshi; Watanabe, Osamu; and Yagihashi, Fujio, 5,314,931, Cl. 522-127.000.
Shin-Etsu Handotai Co., Ltd.: *See—*
  Toyama, Kohei, 5,313,741, Cl. 51-165.770.
Shinagawa, Tomonori, to Matsushita Electric Industrial Co., Ltd. Device for electing a figure from among figures depicted on a display device. 5,315,313, Cl. 345-145.000.
Shinbo, Shuichi: *See—*
  Morikiyo, Akira; Kanbe, Toshio; Shinbo, Shuichi; Yoshikawa, Shigeru; Shimodaira, Yoshikazu; Ohminami, Kazuya; and Komuro, Hitoshi, 5,314,078, Cl. 211-59.200.
Shindo, Kiyotaka; Igarashi, Koichi; Mizumoto, Kunihiko; and Hashimoto, Hidehiko, to Mitsui Petrochemical Industries, Ltd. Information recording media. 5,314,757, Cl. 428-627.000.
Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, to Ube Industries, Ltd.; Kanegafuchi Chemical Industry Co., Ltd.; Nippon Steel Corporation; TDK Corporation; Tosoh Corporation; Toyo Boseki Kabushiki Kaisha; Nippon Mining Co., Ltd.; NEC Corporation; Matsushita electgric Industrial Co., Ltd.; and Seisan Kaihatsu Kagaku Kenkyusho. Magnetoresistance effect element. 5,315,282, Cl. 338-32.00R.
Shinmen, Yoshifumi: *See—*
  Akimoto, Kengo; Shinmen, Yoshifumi; Yamada, Hideaki; and Shimizu, Sakayu, 5,314,812, Cl. 435-134.000.
Shinmura, Naoyuki: *See—*
  Iguchi, Katsuji; Kakimoto, Seizo; and Shinmura, Naoyuki, 5,314,835, Cl. 437-52.000.
Shinohara, Hideo: *See—*
  Hirota, Takao; Shinohara, Hideo; and Kuroda, Katsuhiko, 5,314,862, Cl. 503-227.000.
Shinohara, Hiroichi: *See—*
  Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, 5,315,482, Cl. 361-707.000.
Shinoki, Kazuaki: *See—*
  Yamamoto, Akihiko; Yamada, Toshihiro; Natori, Tatsuo; Naya, Kotaro; Satoo, Motohiro; Fujiwara, Mitsuru; Matsubara, Katsumi; Shinoki, Kazuaki; and Kameya, Hirotaka, 5,314,321, Cl. 418-178.000.
Shinta, Minoru; Aikoh, Shinichi; and Nishitani, Takao, to NEC Corporation. Speech/voiceband data discriminator. 5,315,704, Cl. 95-2.000.

Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, to Nihon Bayer Agrochem K.K. Nitro-substituted heterocyclic compounds. 5,314,897, Cl. 514-332.000.
Shiomura, Tetsunosuke: *See—*
  Asanuma, Tadashi; Shiomura, Tetsunosuke; Uchikawa, Nobutaka; Iwatani, Tutomu; and Takeuchi, Katsumi, 5,314,956, Cl. 525-240.000.
Shionogi Seiyaku Kabushiki Kaisha: *See—*
  Yoshida, Tadashi; Koizumi, Kenzo; Kawamura, Yoshimi; Matsumoto, Koichi; and Itazaki, Hiroshi, 5,314,911, Cl. 514-451.000.
Shipley Company Inc.: *See—*
  Hawkins, Robert E.; and Pai, Daniel Y., 5,314,789, Cl. 430-325.000.
Shirai, Yuji: *See—*
  Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, 5,315,482, Cl. 361-707.000.
Shiseido Company Ltd.: *See—*
  Yoshida, Masashi; Umishio, Kenichi; Uehara, Keiichi; and Nanba, Tomiyuki, 5,315,022, Cl. 556-437.000.
Shitrit, David: *See—*
  Inbar, Michael; Slutzky, Gerald; Radushetzky, Mordechai; and Shitrit, David, 5,314,074, Cl. 209-208.000.
Shkidt, Alexei N.: *See—*
  Sundby, James T.; and Shkidt, Alexei N., 5,315,264, Cl. 330-253.000.
Shoji, Kazuyoshi; Muto, Tadashi; Kubota, Yasurou; Seki, Koichi; Izawa, Kazuto; and Nabetani, Shinji, deceased (by Nabetani, Yuko, administratrix), to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Nonvolatile semiconductor memory device with selective tow erasure. 5,315,547, Cl. 365-185.000.
Shoji, Yoshihisa, to Brother Kogyo Kabushiki Kaisha. Pattern data processing device for sewing machine. 5,313,902, Cl. 112-454.000.
Shomo, Richard G.: *See—*
  Owens, Gene R.; Reis, Robert J.; Shomo, Richard G.; and Wickus, Scott D., 5,314,346, Cl. 439-189.000.
Shono, Seita: *See—*
  Kawai, Takashi; Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Shono, Seita; and Ohta, Eiji, 5,315,415, Cl. 358-515.000.
Shop-Vac Corporation: *See—*
  Berfield, Robert C., 5,313,686, Cl. 15-323.000.
Shorr, Leonard: *See—*
  Effenberger, Reinhard; Shorr, Leonard; and Keren, Yehuda, 5,315,008, Cl. 548-182.000.
Short, Robert. Thermal reflecting insulatable pad. 5,314,086, Cl. 220-400.000.
Shoshi, Masayuki; and Kanemoto, Akihiko, to Ricoh Company, Ltd. Optically active azo compound, producing method thereof, and liquid crystal composition containing said compound. 5,314,997, Cl. 534-577.000.
Showa Denko K.K.: *See—*
  Saito, Kiyoshi; Seko, Masahiko; and Masatsuji, Eiko, 5,314,637, Cl. 252-174.120.
Showa Highpolymer Co., Ltd.: *See—*
  Imaizumi, Mitsuhiro; Kotani, Masataka; Kondo, Haruhiko; Iwasa, Takeshi; and Takiyama, Eiichiro, 5,314,969, Cl. 525-440.000.
  Kondo, Haruhiko; Imaizumi, Mitsuhiro; Kamei, Ryosuke; Kimura, Hideharu; and Takiyama, Eiichiro, 5,314,927, Cl. 521-159.000.
Shpigel, Vladimir, to Amrus Corporation. Interlocking-body connective joint. 5,314,425, Cl. 606-53.000.
Shreve, Gregory A.: *See—*
  Tsou, Hsi-Shen E.; Im, Catherine L.; Shreve, Gregory A.; and LaCon, Martin M., 5,315,303, Cl. 342-27.000.
Shturman Cardiology Systems, Inc.: *See—*
  Shturman, Leonid, 5,314,438, Cl. 606-159.000.
Shturman, Leonid, to Shturman Cardiology Systems, Inc. Abrasive drive shaft device for rotational atherectomy. 5,314,438, Cl. 606-159.000.
Shu, Mark C. S., to Medtronic, Inc. Composite curvature bileaflet prosthetic heart valve with serpentine curve hinge recesses. 5,314,467, Cl. 623-2.000.
Shukovsky, Harold B.; Batra, Sharat; and Mallary, Michael L., to Digital Equipment Corporation. Process for fabricating magnetic film recording head for use with a magnetic recording media. 5,314,596, Cl. 204-192.200.
Shuster, Louis: *See—*
  Dodman, Nicholas H.; and Shuster, Louis, 5,314,888, Cl. 514-252.000.
Siegel, Israel. Magnetic ice cube. 5,313,799, Cl. 62-4.000.
Siemens Aktiengesellschaft: *See—*
  Guendel, Lutz, 5,315,628, Cl. 378-20.000.
  Halbinger, Evi; and Neuberg, Herbert, 5,314,352, Cl. 439-469.000.
  Hartmann, Werner; and Kippenberg, Horst, 5,315,081, Cl. 200-144.00B.
  Hirschberg, Jakub; and Strandberg, Hans, 5,314,452, Cl. 607-36.000.
  Lindgren, Anders, 5,314,449, Cl. 607-24.000.
  Lucioni, Gonzalo; and Gazsi, Lajos, 5,315,621, Cl. 375-103.000.
  Maiwald, Werner, 5,315,070, Cl. 174-250.000.
  Melzner, Hanno, 5,315,542, Cl. 365-72.000.
Siemens Automotive L.P.: *See—*
  Demere, Sims B.; Brinn, Benjamin F., Jr.; Bright, John S.; and Johnson, Kenric J., 5,315,278, Cl. 335-282.000.
Sijacki, Nestor: *See—*
  Pantic, Vladimir; Sijacki, Nestor; and Kolaric, Svetislav, 5,314,882, Cl. 514-170.000.
Siligoni, Marco; Saviotti, Vanni; and Marcioni, Maria L., to SGS-Thomson Microelectronics s.r.l. Current limited subscriber interface circuit. 5,315,653, Cl. 379-413.000.
Sillivan, William J.: *See—*
  Kirayoglu, Birol; Sillivan, William J.; and Zussman, Melvin P., 5,314,742, Cl. 428-285.000.
Silouette International Gesellschaft m.b.H.: *See—*
  Hofmair, Herbert; and Fuchs, Gerhard, 5,315,328, Cl. 351-121.000.
Silverstein, Louis D.: *See—*
  Sprague, Robert A.; Silverstein, Louis D.; and Bruce, Richard H. D., 5,315,418, Cl. 359-41.000.
Silvestri, Victor J.: *See—*
  Hsieh, Chang-Ming; Hsu, Louis L.; and Silvestri, Victor J., 5,315,151, Cl. 257-592.000.
Sim, Joseph M.: *See—*
  Brosius, David J.; and Sim, Joseph M., 5,314,331, Cl. 433-21.000.
Simada, Atsui: *See—*
  Abe, Nobuo; Horie, Tatsuo; Yamanaka, Toshio; and Simada, Atsui, 5,314,317, Cl. 418-55.200.
Simazaki, Yuzuru; Kumasaka, Takao; Satoh, Kunio; and Hirose, Youji, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Image recording method including determining a gap between a photosensitive medium and a developing roller and apparatus therefor. 5,315,353, Cl. 355-251.000.
Simco/Ramic Corporation: *See—*
  Heffington, Jack C.; and Squyres, H. Parks, 5,315,384, Cl. 348-93.000.
Simmonds, Michael: *See—*
  Kubelik, Igor; and Simmonds, Michael, 5,315,324, Cl. 346-159.000.
Simmonds Precision Products, Inc.: *See—*
  Lichtenfels, Frederick L., II; Birkett, Robert E.; Nial, Ward J.; and Hoff, Frederick G., 5,315,563, Cl. 367-99.000.
Simon, Thomas E.; Nguyen, Thanh; and Gratzinger, Paul, to Bourns, Inc. Rotary switch including cam operated flexible contacts. 5,315,077, Cl. 200-11.00R.
Simpson, Matthew; and Frey, Robert M., to Norton Company. Method for making free-standing diamond film. 5,314,652, Cl. 264-81.000.
Singh, Balwant; and Tynik, Robert J., to Cytec Technology Corp. Heat resistant resin composition comprising polymers of N-(substituted) maleimides and improved process for the preparation of said maleimides. 5,314,950, Cl. 525-73.000.
Singh, Jai P.: *See—*
  Kauffman, Raymond F.; and Singh, Jai P., 5,314,688, Cl. 424-423.000.
Singh, Rama N.: *See—*
  Chiu, George; Singh, Rama N.; and Wilczynski, Janusz S., 5,315,604, Cl. 372-25.000.
Sins, Howard: *See—*
  Hakimi, Hosain; Bagetis, Scott; Williams, Walter; Sins, Howard; and Marolf, Dennis, 5,315,365, Cl. 356-73.100.
Sitrin, Robert D.: *See—*
  Lee, Ann L.; Rienstra, Mark S.; Manger, Walter E.; and Sitrin, Robert D., 5,314,811, Cl. 435-101.000.
SKC Limited: *See—*
  Kim, Deog-Il; Kwak, Pil-Gyou; and Park, O-Gyoon, 5,314,933, Cl. 523-176.000.
Skinas, Kimberly A., adminstratrix: *See—*
  Borrell, Ronald A.; Breed, Ben R.; Lo, Allen K.; Skinas, Mark D., deceased; and Witzke, Kenneth A., 5,315,538, Cl. 364-574.000.
Skinas, Mark D., deceased: *See—*
  Borrell, Ronald A.; Breed, Ben R.; Lo, Allen K.; Skinas, Mark D., deceased; and Witzke, Kenneth A., 5,315,538, Cl. 364-574.000.
Skye, David A., to Eastman Kodak Company. Photographic film processing. 5,315,337, Cl. 354-298.000.
Slater, Charles R.: *See—*
  Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., 5,314,406, Cl. 604-21.000.
  Kortenbach, Jurgen A.; Nunez, George; and Slater, Charles R., 5,313,935, Cl. 128-4.000.
Slavick, Carl J., Jr.: *See—*
  Drake, John B.; Wood, James A.; Slavick, Carl J., Jr.; and Mazur, Richard J., 5,315,520, Cl. 364-426.050.
Slicker, James; Mazur, Joseph S.; and Breen, Michael T., to Eaton Corporation. Clutch mode control logic. 5,314,050, Cl. 477-171.000.
Sloan, Frank P. De-chlorinated water supply methods. 5,314,628, Cl. 210-754.000.
Slosar, Jeffrey M.: *See—*
  Wang, Xiaohan; Koral, Kenneth F.; Clinthorne, Neal H.; Rogers, W. Leslie; and Slosar, Jeffrey M., 5,315,506, Cl. 364-413.190.
Slota, Michael W.: *See—*
  Auth, David C.; Intlekofer, Michael J.; Slota, Michael W.; Hinchcliffe, John S.; and Clement, Thomas J., 5,314,407, Cl. 604-22.000.
Slutzky, Gerald: *See—*
  Inbar, Michael; Slutzky, Gerald; Radushetzky, Mordechai; and Shitrit, David, 5,314,074, Cl. 209-208.000.
Smith, Benny: *See—*
  Hammer, Leif; and Smith, Benny, 5,314,510, Cl. 44-317.000.
Smith, Bradley W.: *See—*
  Adams, Gary V.; and Smith, Bradley W., 5,314,203, Cl. 280-728.00A.

- Smith, Curtis P.: *See—*
  - Goldstein, Stephen L.; Hamer, Anthony D.; Katz, Lawrence E.; McGeary, Michael J.; and Smith, Curtis P., 5,315,004, Cl. 540-202.000.
- Smith, Dale; Behrmann, Greg; and Ronan, Greg, to United States of America, Army. Detector card strain relief assembly. 5,315,681, Cl. [illegible].
- Smith, Daniel E., to MKS Instruments, Inc. Pivotal diaphragm, flow control valve. 5,314,164, Cl. 251-129.170.
- Smith, Earl L.; and Nguyen, Van, to Teltrend Inc. Caller identification transmit path limiter. 5,315,650, Cl. 379-399.000.
- Smith, Gerald L., to Union Carbide Chemicals & Plastics Technology Corporation. Method for measuring reflux flow in a distillation process. 5,314,587, Cl. 203-1.000.
- Smith, J. Douglas, to ABB Vetco Gray Inc. Metal cup pressure transducer with a support having a plurality of thermal expansion coefficients. 5,315,110, Cl. 250-227.270.
- Smith, Kevin M., to Guitar & Light Fabrication. Guitar stand. 5,313,866, Cl. 84-327.000.
- Smith, Kevin W.: *See—*
  - Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., 5,314,406, Cl. 604-21.000.
- Smith, Lyle B., to Ford Motor Company. Partial flow filter system for an automatic power transmission mechanism. 5,314,616, Cl. 210-130.000.
- Smith & Nephew Richards Inc.: *See—*
  - Schryver, Jeff; Shea, Jeff; and Ryan, Dawn M., 5,314,487, Cl. 623-22.000.
- Smith, R. Paul; and Price, Michael I., to Recovermat Technologies, Inc. Method of recycling construction and demolition debris. 5,314,266, Cl. 405-129.000.
- Smith, Richard: *See—*
  - Stephens, Randy R.; Bishop, Gregory D.; Voegele, James; Welling, Diane; Smith, Richard; Collins, John M.; and Selecman, George, 5,314,417, Cl. 604-264.000.
- Smith, Robert S.: *See—*
  - Hawkins, Tranel; and Smith, Robert S., 5,314,392, Cl. 482-57.000.
- Smith, Russel M.: *See—*
  - McDowell, Robert E.; Basic, Steven L.; and Smith, Russel M., 5,313,915, Cl. 123-23.000.
- Smith, Scott; Pietrzykoski, Anthony; and Goss, Floyd, to WEA Manufacturing Inc. Compact disc counter arranged to minimize counting errors having a pair of beams and a pulse counting means. 5,315,107, Cl. 250-222.200.
- Smith, Scott J.; and Lind, Eric J., to Nalco Chemical Company. Superabsorbent polymer having improved absorption rate and absorption under pressure. 5,314,420, Cl. 604-358.000.
- Smith, Terrance P.; and Macomber, David W., to Minnesota Mining and Manufacturing Company. Organic solvent-soluble metal-azo and metal-azomethine dyes. 5,314,998, Cl. 534-701.000.
- Smith, Thomas W.; Luca, David J.; and Julien, Paul C., to Xerox Corporation. Toner compositions containing complexed ionomeric materials. 5,314,778, Cl. 430-111.000.
- Smith, William J., III: *See—*
  - Caprathe, Bradley W.; Downing, Dennis M.; Jaen, Juan C.; Johnson, Stephen J.; Smith, William J., III; Wise, Lawrence D.; Wright, Jonathan; and Wustrow, David J., 5,314,896, Cl. 514-332.000.
- SmithKline Beecham Corporation: *See—*
  - Frazee, James S.; Gleason, John G.; and Hall, Ralph F., 5,314,918, Cl. 514-570.000.
- Smolley, Robert, to TRW Inc. Packaging construction for semiconductor wafers. 5,315,481, Cl. 361-707.000.
- Smothers, Odis B. Jam-proof rotary weed cutter. 5,313,770, Cl. 56-12.700.
- Smrt, Thomas J.; and Mierzwinski, Walter S., to Fox Valley Systems, Inc. Long distance marking devices and related method. 5,314,097, Cl. 222-402.100.
- SMS Hasenclever GmbH: *See—*
  - Schubert, Peter; and Schubert, Hans-Albert, 5,313,816, Cl. 72-402.000.
- SMS Schloemann-Siemag Aktiengesellschaft: *See—*
  - Heitze, Gerhard; and Meinhardt, Ulrich, 5,313,813, Cl. 72-201.000.
- Snider, Gregory S., to Hewlett-Packard Company. IC which can be used as a programmable logic cell array or as a register file. 5,315,178, Cl. 307-465.000.
- Snijkers, Frans M. M.; and Crombeen, Jacobus E., to U.S. Philips Corporation. Scandate cathode and methods of making it. 5,314,364, Cl. 445-51.000.
- Snoeren, Rudolph M.: *See—*
  - Hillen, Walter; and Snoeren, Rudolph M., 5,315,631, Cl. 378-98.800.
- So, Franky F.: *See—*
  - Forrest, Stephen R.; and So, Franky F., 5,315,129, Cl. 257-21.000.
- Sobchuk, Nikolai S.: *See—*
  - Tsyb, Anatoly F.; Sergeev, Pavel V.; Sharlai, Vladimir I.; Dikun, Vladimir S.; Sobchuk, Nikolai S.; Raiskaya, Tatyana N.; Kotlyar, Anatoly D.; Bolshov, Vladimir M.; Tsarenkov, Valery M.; Suloeva, Ljudmila V.; and Bogatov, Oleg G., 5,314,400, Cl. 600-9.000.
- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA" : *See—*
  - Charbonnel, Jean-Louis; Naudet, Jacky; and Stangalini, Gerard J., 5,314,303, Cl. 415-173.100.
- Societe Nationale Elf Aquitaine: *See—*
  - Di R Francesco, Di Renzo; Fran ois, Fajula; Thierry, Des Courieres; and Didier, Anglerot, 5,314,674, Cl. 423-328.200.
- Sol, David. Energy monitoring system for recreational vehicles and marine vessels. 5,315,287, Cl. 340-455.000.
- Solar, Matthew S.: *See—*
  - Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., 5,314,406, Cl. 604-21.000.
- Solar, Ronald J.: *See—*
  - Lieber, Glen L.; Solar, Ronald J.; Wolf, Erich H.; and Fugoso, Mauricio L., Jr., 5,313,967, Cl. 128-772.000.
- Solayappan, Narayanan: *See—*
  - Pandey, Raghvendra K.; Raina, Kanwal; and Solayappan, Narayanan, 5,314,869, Cl. 505-452.000.
- Solomon, Allen L., to Grumman Aerospace Corporation. Monolithic focal plane array. 5,315,147, Cl. 257-448.000.
- Solvay (Societe Anonyme): *See—*
  - Derleth, Helmut; Walter, Robert; Weidenbach, Gunter; and Strebelle, Michel, 5,315,051, Cl. 570-245.000.
- Somers, W. Karl: *See—*
  - Goble, E. Marlowe; and Somers, W. Karl, 5,314,427, Cl. 606-72.000.
- Sommazzi, Anna; Lugli, Gabriele; Garbassi, Fabio; Calderazzo, Fausto; and Dell'Amico, Daniela B., to Enichem S.p.A. Preparation of alternating olefin/carbon monoxide copolymers by means of a heterogeneous supported catalyst. 5,314,856, Cl. 502-167.000.
- Sonoki, Susumu: *See—*
  - Omae, Yoshihiro; Watanabe, Haruo; Sonoki, Susumu; Kanemasa, Yoichi; Sagara, Kazuo; Yoshimune, Takashi; and Yamasaki, Tetsuo, 5,314,168, Cl. 266-92.000.
- Sony Corporation: *See—*
  - Fujino, Toyomi; and Yano, Hajime, 5,315,470, Cl. 360-133.000.
  - Fukumoto, Kenji; Okamoto, Ichiro; and Yamashita, Keitaro, 5,315,445, Cl. 360-19.100.
  - Ishiguro, Mamoru; Yokota, Masato; and Yamauchi, Shingo, 5,315,444, Cl. 360-15.000.
  - Ishii, Masami; Murayama, Osamu; Kasahara, Kenji; Horiuchi, Yoshimori; and Tokito, Toshihiro, 5,314,141, Cl. 242-199.000.
  - Ishikawa, Yoji; and Otani, Takashi, 5,315,392, Cl. 348-570.000.
  - Kadomura, Shingo, 5,314,576, Cl. 156-655.000.
  - Miura, Yoshihiro; and Takagi, Koji, 5,315,570, Cl. 369-48.000.
  - Muroyama, Masakazu, 5,314,710, Cl. 427-96.000.
  - Okada, Hiroshi; Kanota, Keiji; and Kubota, Yukio, 5,315,401, Cl. 358-337.000.
  - Ono, Koichi; Okada, Tsunekazu; and Hataoka, Seiichi, 5,315,457, Cl. 360-77.140.
  - Suzuki, Yoshinori, 5,315,327, Cl. 348-439.000.
  - Urayama, Kiyoshi; and Ozawa, Kazuo, 5,314,558, Cl. 156-251.000.
  - Yanagida, Toshiharu, 5,314,575, Cl. 156-651.000.
- Sony Electronics Inc.: *See—*
  - Baker, Ira, 5,315,186, Cl. 307-527.000.
  - Schmidt, David C., 5,315,300, Cl. 341-55.000.
- Sotoya, Kohshiro: *See—*
  - Abe, Hiroshi; Fukushima, Tetsuaki; Sotoya, Kohshiro; Harada, Shoichiro; Kitagawa, Hiroshi; Morii, Masayoshi; and Isayama, Yasutoshi, 5,315,041, Cl. 564-506.000.
- Southeast Tire Company: *See—*
  - Hill, Giles A., III; Hill, Giles A., Jr.; and Birdsong, Duane S., 5,313,994, Cl. 152-323.000.
- Sowash, Thomas R.: *See—*
  - Bradfield, Michael D.; and Sowash, Thomas R., 5,315,195, Cl. 310-89.000.
- Spande, Thomas F.: *See—*
  - Daly, John W.; Spande, Thomas F.; and Garraffo, Hugo M., 5,314,899, Cl. 514-339.000.
- Spawn, Terence D.: *See—*
  - Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
- Spectranetics Corporation, The: *See—*
  - Grace, Kenneth P.; Donnelly, Michael B.; and Geraci, Dean J., 5,315,614, Cl. 372-101.000.
- Spectrian, Inc.: *See—*
  - Wisherd, David S.; and McCalpin, William H., 5,315,265, Cl. 330-277.000.
- Spectrum Astro, Inc.: *See—*
  - Chicoine, Gerald M.; and Klupar, G. Joseph, 5,314,146, Cl. 244-158.00R.
- Spectrum Sciences B.V.: *See—*
  - Peled, Shalom; Greenberg, Abraham; and Livne, Haim, 5,315,321, Cl. 346-108.000.
- Spencer, Andrew B.; Guastamachio, Richard J.; and Marsh, Bryan D., to American Ingenuity, Inc. Reflecting and luminous layered material. 5,315,491, Cl. 362-84.000.
- Spencer, Keith R.: *See—*
  - Hughes, Travis K.; Campbell, Glenn W.; Burgoon, Charles E.; Gossett, John B.; and Spencer, Keith R., 5,315,089, Cl. 219-137.0PS.
- Sperling, Michael; and Tsalev, Dimiter L., to Bodenseewerk Perkin-Elmer GmbH. Sample supply system having integrated microwave disintegration. 5,314,664, Cl. 422-78.000.

- Spigarelli, Steven A.: *See—*
  - Morine, Gerald H.; and Spigarelli, Steven A., 5,314,638, Cl. 252-184.000.
- Spinal Cord Society: *See—*
  - Jeutter, Dean C., 5,314,453, Cl. 607-61.000.
- Spinelli, Harry J.; Anton, Waifong L.; Seidner, Leonard; Coleman, Henry D.; Ali, Mohammed I.; Weintraub, Lester; and White, Paul, to Permeable Technologies, Inc. Silicone-containing polymers, oxygen permeable hydrophilic contact lenses and methods for making these lenses and treating patients with visual impairment. 5,314,960, Cl. 525-280.000.
- Spiteri, Joseph, Sr., to Betts Industries, Inc. Sealed wire connector. 5,315,066, Cl. 174-87.000.
- Sprague, Frederick P.: *See—*
  - Klauber, Robert D.; Vigmostad, Erik B.; Sprague, Frederick P.; and Mandarino, Joseph V., 5,313,826, Cl. 73-118.100.
- Sprague, Robert A.; Silverstein, Louis D.; and Bruce, Richard H. D., to Xerox Corporation. Two path liquid crystal light valve color display with light coupling lens array disposed along the red-green light path. 5,315,418, Cl. 359-41.000.
- SPX Corporation: *See—*
  - Puetz, Peter A.; and Hintz, John, 5,315,252, Cl. 324-402.000.
- Square D Company: *See—*
  - Bilas, Ron J.; Reid, Drew A.; and Wittrock, Martin J., 5,315,499, Cl. 364-140.000.
- Squyres, H. Parks: *See—*
  - Heffington, Jack C.; and Squyres, H. Parks, 5,315,384, Cl. 348-93.000.
- Srikrishnan, Kris V.: *See—*
  - Schepis, Dominic J.; Srikrishnan, Kris V.; Subbanna, Seshardi; and Tijwani, Manu J., 5,314,840, Cl. 437-194.000.
- Srinivasan, Adi: *See—*
  - Guo, Ta-Pan; and Srinivasan, Adi, 5,315,545, Cl. 365-156.000.
- Staab, David: *See—*
  - Vijeh, Nader; and Staab, David, 5,315,590, Cl. 370-79.000.
- Stack, Darrell G.: *See—*
  - Lavancy, Wayne N.; and Stack, Darrell G., 5,314,270, Cl. 408-1.00R.
- Staines, Alan D.: *See—*
  - Glew, Derek A.; Staines, Alan D.; Cannon, Alan J.; and Dunlop, Roger N., 5,314,598, Cl. 204-224.00M.
- Stangalini, Gerard J.: *See—*
  - Charbonnel, Jean-Louis; Naudet, Jacky; and Stangalini, Gerard J., 5,314,303, Cl. 415-173.100.
- Staniec, Robert, to Harvey Universal, Inc. Cutting oil treatment. 5,314,620, Cl. 210-611.000.
- Stankus, John C.: *See—*
  - Calandra, Frank, Jr.; Stankus, John C.; and Oldsen, John G., 5,314,268, Cl. 405-259.500.
- Stanley Electric Co., Ltd.: *See—*
  - Nomura, Shinichi; Fukuda, Yoichi; Nagasaki, Atsushi; and Suda, Fumiyuki, 5,314,776, Cl. 430-65.000.
  - Sakai, Hiroo; Otobe, Shingo; Tamura, Hideo; and Kamikawa, Toshimi, 5,313,729, Cl. 40-452.000.
  - Yamauchi, Shigekazu; Kanagawa, Shinji; and Sekine, Hisao, 5,314,771, Cl. 430-7.000.
- Stanley, Patricia M.: *See—*
  - Oakes, Thomas R.; Stanley, Patricia M.; and Keller, Jerome D., 5,314,687, Cl. 424-405.000.
- Stanley Works, The: *See—*
  - Whitehouse, Hugh L., 5,315,501, Cl. 364-152.000.
- Staud, Norbert: *See—*
  - Lin, Tsann; Howard, James K.; Hwang, Cherngye; Mauri, Daniele; and Staud, Norbert, 5,315,468, Cl. 360-113.000.
- Stecher, Vera J.; and Michne, William F., to Sterling Winthrop Inc. (S)-(+)-hydroxychloroquine. 5,314,894, Cl. 514-313.000.
- Steckel, Mark: *See—*
  - Hunter, Alastair W.; Taylor, Arthur, Jr.; and Steckel, Mark, 5,314,446, Cl. 606-231.000.
- Steeby, Jon A.; Edelen, Stephen A.; and Davis, Alan R., to Eaton Corporation. Unexpected N logic for vehicular semi-automated mechanical transmissions. 5,315,514, Cl. 364-424.100.
- Steffen, Udo: *See—*
  - Wiggershaus, Fred; Steffen, Udo; and Erdmann, Rudolf, 5,314,083, Cl. 212-213.000.
- Stein, Samuel R., to Timing Solutions Corporation. Time scale computation system. 5,315,566, Cl. 368-46.000.
- Stein, Walter, to Hemscheidt Maschinentechnik Schwerin GmbH. Mold clamp for an injection molding machine. 5,314,327, Cl. 425-589.000.
- Steiner, Herbert: *See—*
  - Meisinger, Eduard; and Steiner, Herbert, 5,314,262, Cl. 414-137.100.
- Steinwand, Paul J., to Rohm and Haax Company. Low viscosity high strength acid binder. 5,314,943, Cl. 524-501.000.
- Stellwag, Debra A.: *See—*
  - Bain, James M.; Best, David J.; Markham, James G.; Morrow, Mark S.; Stellwag, Debra A.; and Tavener, Raymond D., 5,315,508, Cl. 364-401.000.
- Stelzmuller, Helmut: *See—*
  - Fesl, Robert; Stelzmuller, Helmut; and Janssen, Peter, 5,314,096, Cl. 222-401.000.
- Stempien, Joseph W.: *See—*
  - Gordon, Thomas A.; Gray, Barrett C.; McKenna, William; Stempien, Joseph W.; and Magnon, Ken P., 5,315,690, Cl. 395-104.000.
- Stenman, Kimmo E.: *See—*
  - Ikola, Kimmo J.; and Stenman, Kimmo E., 5,314,523, Cl. 65-112.000.
- Stephan, Craig H.; and Zanini-Fisher, Margherita, to Ford Motor Company. Composite mass air flow sensor. 5,313,832, Cl. 73-204.260.
- Stephens, Barry D., to Energy Absorption Systems, Inc. Vehicle crash cushion. 5,314,261, Cl. 404-6.000.
- Stephens, Randy R.; Bishop, Gregory D.; Voegele, James; Welling, Diane; Smith, Richard; Collins, John M.; and Selecman, George, to Ethicon, Inc. Safety trocar. 5,314,417, Cl. 604-264.000.
- Stepp, Lee W.: *See—*
  - Streich, Steven G.; Brandell, John T.; Giroux, Richard L.; and Stepp, Lee W., 5,314,015, Cl. 166-184.000.
- Sterling Winthrop Inc.: *See—*
  - Liebert, Richard T.; and Brown, Neil H., 5,314,415, Cl. 604-218.000.
  - Stecher, Vera J.; and Michne, William F., 5,314,894, Cl. 514-313.000.
- Stern, Roger A.; Edwards, Stuart D.; Jackson, Jerome; and Rosen, Arye, to EP Technologies, Inc. Articulated unidirectional microwave antenna systems for cardiac ablation. 5,314,466, Cl. 607-156.000.
- Stetter, Joseph R.; Maclay, G. Jordan; and Ballantine, Jr. David S., to Transducer Research, Inc. Optical waveguide vapor sensor. 5,315,673, Cl. 385-12.000.
- Stevenson, Dian E.: *See—*
  - Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.
- Steward, Philip R.: *See—*
  - Dennis, Simon M.; Steward, Philip R.; Downing, Roland W.; James, Simon M.; Ferguson, David A.; and Drouet, Dominik, 5,315,675, Cl. 385-32.000.
- Stewart, Michael F. Electric field measuring system. 5,315,232, Cl. 324-72.000.
- Stewart, Roy A., to A. C. Nielsen Company. Market research method and system for collecting retail store market research data. 5,315,093, Cl. 235-381.000.
- Stich, Frederick A.; Zahrte, Donald K., Sr.; Baxter, Richard V., Jr.; Folts, Douglas C.; Hubert, Thomas G.; Medina, Juan M.; Hazen, William J.; and Beistle, Edward G., to Best Power Technology, Inc. Back-up uninterruptible power system. 5,315,533, Cl. 364-480.000.
- Stihl, Andreas: *See—*
  - Junginger, Wolfgang; Rosler, Matthias; and Rupp, Thomas, 5,315,075, Cl. 181-240.000.
- Stikeleather, Roger C.: *See—*
  - Prewett, Annamarie B.; and Stikeleather, Roger C., 5,314,476, Cl. 623-16.000.
- Stipanovich, John, Jr.; and Wible, David Q., to Aristech Chemical Corporation. Process for preparing debenzolized tar and low-benzene centrifuged tar sludge. 5,314,609, Cl. 208-41.000.
- Stirling Technology Company: *See—*
  - Nasar, Syed A., 5,315,190, Cl. 310-12.000.
- Stirling, Thomas E., to Hazleton Environmental. Dual purpose oxygenator. 5,314,622, Cl. 210-629.000.
- Stitt, Robert R., to Midwest Research Institute. Rubber stopper remover. 5,313,858, Cl. 81-3.550.
- Stockmann, Bernard: *See—*
  - Gondard, Christian; Stockmann, Bernard; and Viard, Jacky, 5,313,838, Cl. 73-623.000.
- Stofko, John J., Jr.: *See—*
  - Vogel, Dennis E.; and Stofko, John J., Jr., 5,314,785, Cl. 430-269.000.
- Stokes, Michael: *See—*
  - Ghaleb, Sam; and Stokes, Michael, 5,315,304, Cl. 342-165.000.
- Stokes, Rembert R.; and Upadhyay, Anand K., to Motorola Lighting, Inc. Bobbin for electrical windings. 5,315,280, Cl. 336-192.000.
- Stokoe, Geoffrey A.; Green, George M.; and Cayocca, Iver D., to NEI Syncrolift Incorporated. Method of distributing loads generated between a ship and a supporting dry dock. 5,314,263, Cl. 405-1.000.
- Stone, Donald D. High wet-friction elastomeric coatings including a thermoplastic rubber and petrolatum. 5,314,940, Cl. 524-271.000.
- Stone, James L., to Packaging Corporation of America. Flip-top recloseable carton with positive closure arrangement. 5,314,114, Cl. 229-225.000.
- Stora Feldmuhle Aktiengesellschaft: *See—*
  - Bergmann, Werner, 5,314,753, Cl. 428-511.000.
- Storage Technology Corporation: *See—*
  - Todd, Christian A., 5,315,461, Cl. 360-90.000.
- Straeter, Joseph G.: *See—*
  - Weder, Donald E.; and Straeter, Joseph G., 5,314,398, Cl. 493-121.000.
- Strait, Clifford C., Jr. Microwave ovenware apparatus, hydrating microwave ovens and microwave water purifier. 5,313,878, Cl. 99-475.000.
- Straka, Alfred: *See—*
  - Lang, Hans W.; and Straka, Alfred, 5,314,332, Cl. 433-66.000.
- Strand, Rolf L.; and Uhrich, Daniel T., to Honeywell Inc. Thermostat for a variable capacity HVAC and method for providing a ramping set point on a setback thermostat. 5,314,004, Cl. 165-2.000.
- Strandberg, Hans: *See—*
  - Hirschberg, Jakub; and Strandberg, Hans, 5,314,452, Cl. 607-36.000.

Strauss, Richard F.: *See—*

Fischer, Adam, Jr.; Strauss, Richard F.; Chu, Kwang-Ho; Levy, Sidney; and Hurt, Mark, 5,313,702, Cl. 29-883.000.

Strebelle, Michel: *See—*

Derleth, Helmut; Walter, Robert; Weidenbach, Gunter; and Strebelle, Michel, 5,315,051, Cl. 570-245.000.

Streeting, Ian T.: *See—*

Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Bacon, David P., 5,314,892, Cl. 514-269.000.

Streich, Steven G.; Brandell, John T.; Giroux, Richard L.; and Stepp, Lee W., to Halliburton Company. Stage cementer and inflation packer apparatus. 5,314,015, Cl. 166-184.000.

Strickland, Ronald R. Comprehensive, par-relative golf scoreboard. 5,314,208, Cl. 283-116.000.

Strobel, Klaus; and Schwarzmeier, Karl, to Hutschenreuther AG. Method for the production of a ceramic moulding. 5,314,646, Cl. 264-6.000.

Strock, Sara. Bottle connection system. 5,314,067, Cl. 206-430.000.

Strotgen, Eckerhard: *See—*

Kummer, Martin; Rieker, Werner; Strotgen, Eckerhard; and Prahst, Eberhard, 5,315,193, Cl. 310-50.000.

Strouth, James W., to Recycling Technologies International Corporation. Laser printer cartridges. 5,315,325, Cl. 346-160.100.

Studiengesellschaft Kohle MBH: *See—*

Bogdanovic, Borislav; and Wilczok, Ursula, 5,314,676, Cl. 423-644.000.

Sturm, Volker; Pastyr, Otto; Schlegel, Wolgang; Uihlein, Christoph; and Mack, Thomas, to Bodenseewerk Geratetechnik GmbH. Positioning device in medical apparatus. 5,315,630, Cl. 378-65.000.

Sturm, Walter: *See—*

Link, Hermann; and Sturm, Walter, 5,315,260, Cl. 328-28.000.

Su, Paul J.: *See—*

Gerhardt, David L.; Su, Paul J.; Lak, Tibor I.; and Brakeville, Donna M., 5,315,530, Cl. 364-510.000.

Subbanna, Seshardi: *See—*

Schepis, Dominic J.; Srikrishnan, Kris V.; Subbanna, Seshardi; and Tijwani, Manu J., 5,314,840, Cl. 437-194.000.

Subhash, Desai: *See—*

Egidio, Marchi; Gabriele, Rotini L.; Subhash, Desai; and Massimo, Grillli, 5,314,904, Cl. 514-394.000.

Suda, Fumiyuki: *See—*

Nomura, Shinichi; Fukuda, Yoichi; Nagasaki, Atsushi; and Suda, Fumiyuki, 5,314,776, Cl. 430-65.000.

Suga, Takaaki: *See—*

Morizono, Toshiaki; and Suga, Takaaki, 5,315,582, Cl. 370-16.000.

Suga, Takayuki, to Kioritz Corporation. Pest control chemicals against pine wood nematodes. 5,314,693, Cl. 424-196.100.

Sugahara, Kazuyuki; and Arima, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a polysilicon capacitor with large grain diameter. 5,315,140, Cl. 257-306.000.

Sugai, Masakatsu: *See—*

Mizuno, Yasuo; Sugai, Masakatsu; Ikeda, Masaki; and Yoshida, Akihiko, 5,315,434, Cl. 359-355.000.

Sugaya, Tsutomu: *See—*

Hirobe, Junichi; Akashi, Masakatsu; Kobayashi, Masahiko; and Sugaya, Tsutomu, 5,315,350, Cl. 355-208.000.

Sugerman, Gerald. Beta keto mixed acylate monomers. 5,314,930, Cl. 522-34.000.

Sugino, Toshio: *See—*

Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, 5,315,397, Cl. 358-296.000.

Sugishima, Kiyohisa: *See—*

Kuboki, Keiju; Sugishima, Kiyohisa; Udagawa, Yutaka; Otsubo, Toshihiko; and Nishio, Masahiro, 5,315,404, Cl. 358-433.000.

Sugita, Juntaro, to Menicon Co., Ltd. Host cornea marking device. 5,314,439, Cl. 606-166.000.

Sugita, Kyoko: *See—*

Majima, Tetsuro; Sugita, Kyoko; and Arai, Shigeyoshi, 5,314,592, Cl. 204-157.200.

Sugiura, Junji: *See—*

Takeuchi, Shigeru; Sugiura, Junji; and Michiyama, Katsunori, 5,313,923, Cl. 123-497.000.

Sugiyama, Hisataka: *See—*

Nakao, Takeshi; Arimoto, Akira; Ogawa, Kensuke; Sukeda, Hirofumi; and Sugiyama, Hisataka, 5,315,573, Cl. 369-100.000.

Sugiyama, Kazuhiko; Shimizu, Masafumi; Naito, Yukio; Nishimura, Eiichi; and Oshima, Kouichi, to Tokyo Electron Yamanashi Limited. Plasma processing apparatus capable of detecting and regulating actual RF power at electrode within chamber. 5,314,603, Cl. 204-298.120.

Sugiyama, Kenji, to Victor Company of Japan, Ltd. Efficient coding/decoding apparatuses for processing digital image signal. 5,315,326, Cl. 348-415.000.

Sugiyama, Mizuho: *See—*

Kato, Shinji; Takagi, Soya; Sato, Akio; Sugiyama, Mizuho; and Yokoya, Yuji, 5,314,036, Cl. 180-147.000.

Sugiyo, Masato: *See—*

Ishii, Akira; Minomo, Syoichiro; Taniguchi, Michio; and Sugiyo, Masato, 5,315,212, Cl. 315-111.510.

Sukeda, Hirofumi: *See—*

Nakao, Takeshi; Arimoto, Akira; Ogawa, Kensuke; Sukeda, Hirofumi; and Sugiyama, Hisataka, 5,315,573, Cl. 369-100.000.

Suloeva, Ljudmila V.: *See—*

Tsyb, Anatoly F.; Sergeev, Pavel V.; Sharlai, Vladimir I.; Dikun, Vladimir S.; Sobchuk, Nikolai S.; Raiskaya, Tatyana N.; Kotlyar, Anatoly D.; Bolshov, Vladimir M.; Tsarenkov, Valery M.; Suloeva, Ljudmila V.; and Bogatov, Oleg G., 5,314,400, Cl. 600-9.000.

Sulzer Medizinaltechnik AG: *See—*

Wagner, Heinz; and Willi, Roland, 5,314,490, Cl. 623-22.000.

Suma, Katsuhiro: *See—*

Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.

Sumitomo Chemical Company, Limited: *See—*

Enomoto, Masayuki; Nagano, Eiki; Sato, Ryo; and Sakaki, Masaharu, 5,314,864, Cl. 504-225.000.

Kajikuri, Hiroshi; Kitamura, Masaru; and Higashio, Yasuhiko, 5,315,039, Cl. 564-2.000.

Nomura, Kotohiro; and Ishino, Masaru, 5,315,040, Cl. 564-422.000.

Sumitomo Electric Industries, Ltd.: *See—*

Fujimura, Yasushi, 5,315,148, Cl. 257-458.000.

Ikegaya, Akihiko; and Fujimori, Naoji, 5,314,570, Cl. 117-103.000.

Ito, Masumi; Hoshino, Sumio; and Ishikawa, Shinji, 5,314,518, Cl. 65-3.110.

Matsuura, Takashi; Higaki, Kenjiro; and Itozaki, Hideo, 5,314,870, Cl. 505-476.000.

Sumitomo Wiring Systems, Ltd.: *See—*

Hoshino, Kazuhiro, 5,315,062, Cl. 174-52.100.

Sumiya, Hiroshi; Fukaya, Kousuke; Kawai, Sunao; Sasaki, Hiroyuki; Ban, Yoshiyuki; Komiya, Ryohei; and Muramatsu, Kiyoji, to Brother Kogyo Kabushiki Kaisha. Print control apparatus. 5,315,691, Cl. 395-109.000.

Sunagawa, Hiroshi, to Fuji Photo Film Co., Ltd. Optical waveguide device. 5,315,676, Cl. 385-37.000.

Sundby, James T.; and Shkidt, Alexei N., to Exar Corporation. Rail-to-rail opamp with large sourcing current and small quiescent current. 5,315,264, Cl. 330-253.000.

SunDisk Corporation: *See—*

Harari, Eliyahou; and Mehrotra, Sanjay, 5,315,541, Cl. 365-63.000.

Sundstrand Corporation: *See—*

Rodgers, Colin, 5,313,779, Cl. 60-39.070.

Sundwiger Eisenhutte Maschinenfabrik GmbH: *See—*

Kramer, Carl; Konrath, Bernd; Berger, Bernd; and Reinthal, Peter, 5,313,685, Cl. 15-309.100.

Sung, Chieh-Yuan F., to Quantum Chemical Corporation. Process for removing hydrocarbons from polymer slurries. 5,314,579, Cl. 159-47.100.

Suntory Limited: *See—*

Akimoto, Kengo; Shinmen, Yoshifumi; Yamada, Hideaki; and Shimizu, Sakayu, 5,314,812, Cl. 435-134.000.

Sureguard, Inc.: *See—*

Hughes, Zephuren J.; and Torgussen, Ole G., 5,314,532, Cl. 106-253.000.

Sutardja, Pantas: *See—*

Bentley, Steven R.; Hutchins, Robert A.; Melas, Constantin M.; and Sutardja, Pantas, 5,315,284, Cl. 340-146.200.

Suttles, J. Marshall, to Mead Corporation, The. Beverage aisle unit. 5,313,891, Cl. 108-108.000.

Sutton, George H., *Jr.*; Little, Francis H.; Hedengren, Kristina H. V.; Charles, Richard J.; Kornrumpf, William P.; and Hurley, Donna C., to General Electric Company. Eddy current device for inspecting a component having a flexible support with a plural sensor array. 5,315,234, Cl. 324-242.000.

Sutton, James E., to Eastman Kodak Company. Elements and processes for producing superior photographic records. 5,314,794, Cl. 430-506.000.

Suzawa, Hiromi: *See—*

Tsuruoka, Michihiko; Nakagawa, Wataru; Kashimura, Osamu; Kounosu, Naohiro; and Suzawa, Hiromi, 5,313,843, Cl. 73-861.240.

Suzuka, Shinya; and Takahashi, Norimichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Battery housing structure. 5,315,336, Cl. 354-288.000.

Suzuki, Hideyuki; Kitani, Masashi; Masaki, Yuichi; and Morimoto, Kenji, to Canon Kabushiki Kaisha. Matrix printed board and process of forming the same. 5,314,788, Cl. 430-313.000.

Suzuki, Hiroshi; Watano, Sigeru; Sasazuka, Tadashi; and Tsutsumi, Taira, to Hokkaido Sugar Co., Ltd. Water-soluble pentacyclic triterpene composition and method for producing the same. 5,314,877, Cl. 514-58.000.

Suzuki, Koji; Enoki, Shigekazu; Takashima, Hiroshi; Iwata, Naoki; and Ueno, Yuichi, to Ricoh Company, Ltd. Developing apparatus using a developer carrier capable of forming microfields. 5,315,061, Cl. 118-651.000.

Suzuki, Mamoru; Inabe, Shinya; and Seki, Junko, to Ikeda Bussan Co., Ltd. Lumbar support apparatus for vehicular seat. 5,314,236, Cl. 297-284.800.

Suzuki, Masaaki: *See—*

Kishimoto, Yoshio; and Suzuki, Masaaki, 5,315,131, Cl. 257-57.000.

Suzuki, Nobuyoshi: *See—*

Yoshitani, Shouichi; Mizutani, Hiroki; Suzuki, Nobuyoshi; Ohara, Kazumine; Ohyanagi, Yasushi; and Sekiguchi, Isamu, 5,314,912, Cl. 524-458.000.

Suzuki, Ryo: *See—*

Kirino, Fumiyoshi; Nakamura, Junko; Suzuki, Ryo; Yoshihiro, Masafumi; Yamada, Yukinori; and Ohta, Norio, 5,315,577, Cl. 369-116.000.

Suzuki, Satoshi, to Mabuchi Motor Co., Ltd. Miniature motor. 5,315,191, Cl. 310-40.0MM.

Suzuki, Souroku, to Kotobuki Techrex Ltd. Sedimentation centrifuge with helical fins mounted on the screw conveyor. 5,314,399, Cl. 494-54.000.

Suzuki, Tadahiro: *See—*

Ohshima, Kiyoshi; Tamiya, Yoshiyumi; Shimizu, Kenichi; Suzuki, Tadahiro; and Iizuka, Kazuaki, 5,315,323, Cl. 346-159.000.

Suzuki, Tadasu; and Sakamoto, Kiyotaka, to Tsubakimoto Chain Co. Oil-operated tensioner with air bleeding mechanism. 5,314,388, Cl. 474-110.000.

Suzuki, Takatoshi: *See—*

Iwamura, Keiichi; Aizawa, Takayuki; Narita, Izumi; and Suzuki, Takatoshi, 5,315,600, Cl. 371-37.600.

Suzuki, Toshihiro: *See—*

Takaku, Yutaka; Suzuki, Toshihiro; Wake, Jiro; Motegi, Kanji; and Yanazawa, Masakatu, 5,314,111, Cl. 229-110.000.

Suzuki, Yoichi: *See—*

Masuda, Akihiro; Maeda, Ikuo; Yuri, Hideaki; and Suzuki, Yoichi, 5,315,431, Cl. 359-281.000.

Suzuki, Yoshinao: *See—*

Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.

Suzuki, Yoshinori, to Sony Corporation. High scanning rate to standard scanning rate television signal converter with smooth moving edge conversion. 5,315,327, Cl. 348-439.000.

Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., to Cardiac Pacemakers, Inc. Defibrillation electrode system having smooth current distribution with floating electrode. 5,314,459, Cl. 607-122.000.

Swartz, Eric: *See—*

Allen, Bernie; Clark, Douglas E.; Edington, Christopher J.; Parracho, Rui; and Swartz, Eric, 5,313,717, Cl. 36-28.000.

Swedberg, Sally A., to Hewlett-Packard Company. Capillary tube with reversible protein interaction and method. 5,314,593, Cl. 204-180.100.

Sweeney, Philip J.: *See—*

Tseng, Mingchih M.; and Sweeney, Philip J., 5,313,909, Cl. 116-208.000.

Sweet, David H.; and Evans, Charles W., to United Technologies Corporation. Automatic turbine engine bleed valve control for enhanced fuel management. 5,313,778, Cl. 60-39.020.

Sweetchem Corp.: *See—*

Vasil, James F., 5,314,672, Cl. 423-228.000.

Swets, Mark D.; Williams, George A.; and Goodman, Steven F., to Herman Miller, Inc. Pharmaceutical cabinet locking arrangement. 5,314,244, Cl. 312-330.100.

Sweval, Mark A.; Register, W. Douglas; Robin, Mark L.; and Iikubo, Yuichi, to Great Lakes Chemical Corp. Ozone friendly sterilant mixture. 5,314,682, Cl. 424-45.000.

Swiszcz, Paul G.: *See—*

Colson, Wendell B.; Swiszcz, Paul G.; Anthony, Jim; and Jansen, Cees M., 5,313,998, Cl. 160-84.10D.

Colson, Wendell B.; and Swiszcz, Paul G., 5,313,999, Cl. 160-121.100.

Symbiosis Corporation: *See—*

Arias, Juan J.; Bales, Thomas O.; Kortenbach, Jurgen A.; Ryan, Dana W.; Slater, Charles R.; Smith, Kevin W.; and Solar, Matthew S., 5,314,406, Cl. 604-21.000.

Kortenbach, Jurgen A.; Nunez, George; and Slater, Charles R., 5,313,935, Cl. 128-4.000.

Symbol Technologies, Inc.: *See—*

Marom, Emanuel; Konforti, Naim; and Mendlovic, David, 5,315,095, Cl. 235-462.000.

Systems, Machines, Automation Corporation: *See—*

Neff, Edward A.; Moss, John; and Parcels, Joseph S., 5,315,189, Cl. 310-12.000.

Szarata, Mathias, to Hasenkamp Internationale Transporte GmbH & Co. KG. Hanging system for frames of paintings or the like. 5,314,159, Cl. 248-476.000.

Szegda, Andrew, to John Mezzalingua Assoc. Inc. Fiber optic cable end connector. 5,315,684, Cl. 385-139.000.

Tachibana, Miyuki, to Mitsubishi Denki Kabushiki Kaisha. Horizontal synchronization circuit. 5,315,387, Cl. 348-521.000.

Tactical Fabs, Inc.: *See—*

Hively, James W.; Thomas, Mammen; and Bechtel, Richard L., 5,315,130, Cl. 257-48.000.

Tada, Eiichi, to Koatsu Gas Kogyo Co., Ltd.; Muroya, Masaaki; and Hiroi, Masao, part interest to each. Thrust generator. 5,314,311, Cl. 417-50.000.

Tada, Takeshi; Akiyama, Toshikazu; Tanaka, Ryoichi; and Kawamoto, Masao, to Nippon Furnace Kogyo Kaisha, Ltd.; and NKK Corporation. Steel heating furnace. 5,314,170, Cl. 266-156.000.

Taenaka, Yoshiyuki: *See—*

Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, 5,314,418, Cl. 604-282.000.

Tagaya, Atsushi, to Hitachi Metals, Ltd. Permanent magnet of rare-earth-element/transition-metal system having improved corrosion resistance and manufacturing method thereof. 5,314,756, Cl. 428-548.000.

Taguchi, Atsushi: *See—*

Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.

Tahkola, Esko: *See—*

Jakkula, Pekka; and Tahkola, Esko, 5,315,258, Cl. 324-640.000.

Tai, Kuochou: *See—*

Cho, Alfred Y.; Chu, Sung-Nee G.; Tai, Kuochou; and Wang, Yeong-Her, 5,314,838, Cl. 437-105.000.

Taikisha, Ltd.: *See—*

Kashima, Masakazu, 5,314,516, Cl. 55-484.000.

Taillie, Joseph P.: *See—*

Beikirch, Thomas R.; Beck, Richard A.; Fullerton, Jack K.; and Taillie, Joseph P., 5,315,414, Cl. 358-512.000.

Taira, Tetsusaburo; and Ikari, Makoto, to Tokyo Seihinkaihatsu Kenkyusho. Organic optical material. 5,315,443, Cl. 359-885.000.

Tajima, Yoshihisa; and Miyawaki, Keiichi, to Polyplastics Co., Ltd. Polyolefin resin compositions, methods of making such compositions, and molded articles formed thereof. 5,314,946, Cl. 524-513.000.

Takada, Toshio: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.

Takagi, Junichi: *See—*

Hirasaki, Norio; and Takagi, Junichi, 5,315,332, Cl. 354-149.110.

Takagi, Koji: *See—*

Miura, Yoshihiro; and Takagi, Koji, 5,315,570, Cl. 369-48.000.

Takagi, Soya: *See—*

Kato, Shinji; Takagi, Soya; Sato, Akio; Sugiyama, Mizuho; and Yokoya, Yuji, 5,314,036, Cl. 180-147.000.

Takagi, Yoshihiro, to Fuji Photo Film Co., Ltd. Method for preparing a fogged typed direct positive silver halide emulsion. 5,314,799, Cl. 430-569.000.

Takago, Toshio; Sato, Shinichi; Kinami, Hitoshi; and Yamada, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Room temperature curable organopolysiloxane composition and cured product of the same. 5,314,981, Cl. 528-36.000.

Takahashi, Hiroyuki: *See—*

Kawasaki, Masahiro; Takahashi, Hiroyuki; and Tanimura, Yoshinari, 5,315,345, Cl. 354-484.000.

Takahashi, Mitsukazu; Chiba, Takatoshi; and Nishii, Kiyofumi, to Dainippon Screen Mfg. Co., Ltd. Apparatus for heat-treating wafer by light-irradiation and device for measuring temperature of substrate used in such apparatus. 5,315,092, Cl. 219-497.000.

Takahashi, Nobuaki, to Tokyo Electron Kabushiki Kaisha. Surface treatment method and apparatus. 5,314,574, Cl. 156-646.000.

Takahashi, Nobuo: *See—*

Matsumoto, Mitsuo; Takahashi, Nobuo; and Sasaki, Yoshiyuki, 5,313,774, Cl. 57-255.000.

Takahashi, Norimichi: *See—*

Suzuka, Shinya; and Takahashi, Norimichi, 5,315,336, Cl. 354-288.000.

Takahashi, Teruhisa: *See—*

Takikawa, Kazunori; and Takahashi, Teruhisa, 5,314,108, Cl. 228-144.000.

Takahashi, Yoshiyuki; Nishioka, Makoto; Toyofuku, Kunitaka; and Uchida, Kyoko, to Oji Paper Co., Ltd. Thermosensitive recording material. 5,314,859, Cl. 503-207.000.

Takahata, Ryoichi; and Ueyama, Hirochika, to Koyo Seiko Co., Ltd. Bearing device. 5,314,868, Cl. 505-166.000.

Takai, Yasuyoshi: *See—*

Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,314,780, Cl. 430-128.000.

Takai, Yousuke, to Daiwabo Create Co., Ltd. Ion exchange fibers and method for manufacturing the same. 5,314,922, Cl. 521-33.000.

Takaishi, Tado, to Mitsubishi Denki Kabushiki Kaisha. Ignition coil device for an internal combustion engine. 5,313,927, Cl. 123-634.000.

Takaki, Hiroshi; and Shimada, Shinya, to Om Industrial Co., Ltd. Ventilation line opening/closing means of fuel tank. 5,313,978, Cl. 137-43.000.

Takaku, Yutaka; Suzuki, Toshihiro; Wake, Jiro; Motegi, Kanji; and Yanazawa, Masakatu, to Kabushiki Kaisha Kobe Seiko Sho. Packaging box and sheet for packaging box. 5,314,111, Cl. 229-110.000.

Takakura, Kenji; and Uchida, Katsuyuki, to Murata Manufacturing Co., Ltd. Terminal for telegraph and telephone systems. 5,315,652, Cl. 379-413.000.

Takamatsu, Hisashi: *See—*

Nakayama, Masahiro; Takeuchi, Hisaharu; Takamatsu, Hisashi; Tohchi, Mamoru; and Kurano, Akira, 5,315,451, Cl. 360-72.200.

Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Koyama, Yoshihisa; and Bonde, Hiroyuki, to Victor Company of Japan, Ltd. Image formation and erasure on and from scattering-mode light-modulation device. 5,315,318, Cl. 346-76.0PH.

Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, to Toyo Boseki Kabushiki Kaisha. Cannula. 5,314,418, Cl. 604-282.000.

Takano, Yukiko: *See—*

Yoneda, Takashige; Wakabayashi, Tsuneo; and Takano, Yukiko, 5,314,731, Cl. 428-429.000.

Takanshi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, to Victor Company of Japan, Ltd. Method and apparatus for recording optical information by using a photoelectric transducer. 5,315,410, Cl. 358-471.000.

Takaragi, Kazuo: *See—*

Tanaka, Kazuaki; Matsuki, Takeshi; and Takaragi, Kazuo, 5,315,634, Cl. 379-57.000.

Takase, Akihiko: *See—*

Nakano, Yukio; Takase, Akihiko; Takatori, Masahiro; and Yanagi, Junichirou, 5,315,581, Cl. 370-16.000.

- Takase, Takeo: *See—*
  - Ito, Yasuyuki; Kawabe, Takeshi; Tojo, Yukio; and Takase, Takeo, 5,315,402, Cl. 358-342.000.
- Takashima, Hiroshi: *See—*
  - Suzuki, Koji; Enoki, Shigekazu; Takashima, Hiroshi; Iwata, Naoki; and Ueno, Yuichi, 5,315,061, Cl. 118-651.000.
- Takata Corporation: *See—*
  - Fujimura, Yoshiichi; and Matsuura, Shizutaka, 5,314,137, Cl. 242-107.000.
  - Hiramatsu, Koji; and Yoshida, Ryoichi, 5,313,690, Cl. 24-641.000.
- Takatori, Masahiro: *See—*
  - Nakano, Yukio; Takase, Akihiko; Takatori, Masahiro; and Yanagi, Junichirou, 5,315,581, Cl. 370-16.000.
- Takatsu, Haruyoshi; Sasaki, Makoto; and Takeuchi, Kiyofumi, to Dainippon Ink and Chemicals, Inc. Cyano-substituted compound containing ether bond. 5,315,024, Cl. 558-423.000.
- Takayama, Akira; Yoshida, Mitsuo; and Matsui, Shinichi, to Yamaha Corporation; and Nippon Telegraph and Telephone Corporation. Data transfer device. 5,315,640, Cl. 379-93.000.
- Take, Yoshinari: *See—*
  - Katayama, Shinji; and Take, Yoshinari, 5,314,591, Cl. 204-257.000.
- Takebayashi, Yoichi: *See—*
  - Kanazawa, Hiroshi; and Takebayashi, Yoichi, 5,315,689, Cl. 395-2.470.
- Takeda Chemical Industries, Ltd.: *See—*
  - Kato, Koichi; Kawahara, Kenji; and Kajio, Tomoko, 5,314,872, Cl. 514-12.000.
- Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, to Hitachi, Ltd.; and Hitachi Engineering, Inc. Magnetic recording and reproducing apparatus including S fixed chassis for supporting a head drum and a movable chassis for mounting a tape cassette. 5,315,460, Cl. 360-85.000.
- Takedoi, Atsushi; Tanihara, Mamoru; Harada, Tosiharu; Isoai, Masaru; and Fujita, Kazuhiro, to Toda Kogyo Corp. Magnetic iron oxide particles and method of producing same. 5,314,750, Cl. 428-402.000.
- Takegahara, Takashi: *See—*
  - Seki, Masaki; Takegahara, Takashi; and Nakajima, Masatoshi, 5,315,524, Cl. 364-474.250.
- Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, to Canon Kabushiki Kaisha. Method for treating metal substrate for electro-photographic photosensitive member and method for manufacturing electrophotographic photosensitive member. 5,314,780, Cl. 430-128.000.
- Takemura, Makoto: *See—*
  - Terasawa, Koji; Takemura, Makoto; Nojima, Takashi; and Miyakawa, Akira, 5,315,317, Cl. 346-1.100.
- Takeshita, Akihiko: *See—*
  - Inada, Kenichi; Takeshita, Akihiko; and Masai, Tetsuji, 5,315,366, Cl. 356-238.000.
- Takeuchi, Hisaharu: *See—*
  - Nakayama, Masahiro; Takeuchi, Hisaharu; Tohchi, Mamoru; and Numakura, Satoshi, 5,315,447, Cl. 360-49.000.
  - Nakayama, Masahiro; Takeuchi, Hisaharu; Takamatsu, Hisashi; Tohchi, Mamoru; and Kurano, Akira, 5,315,451, Cl. 360-72.200.
- Takeuchi, Katsumi: *See—*
  - Asanuma, Tadashi; Shiomura, Tetsunosuke; Uchikawa, Nobutaka; Iwatani, Tutomu; and Takeuchi, Katsumi, 5,314,956, Cl. 125-240.000.
- Takeuchi, Kiyofumi: *See—*
  - Takatsu, Haruyoshi; Sasaki, Makoto; and Takeuchi, Kiyofumi, 5,315,024, Cl. 558-423.000.
- Takeuchi, Shigeru; Sugiura, Junji; and Michiyama, Katsunori, to Nippondenso Co., Ltd. Control apparatus for fuel pump. 5,313,923, Cl. 123-497.000.
- Takeuchi, Toshimitsu: *See—*
  - Fuji, Kazuo; Kita, Hideki; and Takeuchi, Toshimitsu, 5,315,362, Cl. 355-326.00R.
- Takiguchi, Masahiro; and Kamiya, Masahiro, to Nippondenso Co., Ltd. Output circuit for outputting control signal to controlled apparatus. 5,315,165, Cl. 307-296.100.
- Takikawa, Kazunori; and Takahashi, Teruhisa, to Usui Kokusai Sangyo Kaisha Limited. Method of producing welded tube with excellent corrosion-resistant inner surface. 5,314,108, Cl. 228-144.000.
- Takimoto, Akiyoshi; Tanaka, Tamotsu, and Yoshida, Yukio, to Yoshida Kogyo K.K. Memory method of door opening and shutting stroke value in automatic door. 5,315,220, Cl. 318-282.000.
- Takimoto, Isao: *See—*
  - Sakashita, Kazuhiro; Yusa, Terukazu; Takimoto, Isao; Hashizume, Takeshi; and Komoike, Tatsunori, 5,315,182, Cl. 307-482.100.
- Takisawa Machine Tool Co., Ltd.: *See—*
  - Yonemoto, Katsuyuki; Miyake, Hidehiko; and Enoki, Kazumasa, 5,313,694, Cl. 29-27.00R.
- Takiyama, Eiichiro: *See—*
  - Imaizumi, Mitsuhiro; Kotani, Masataka; Kondo, Haruhiko; Iwasa, Takeshi; and Takiyama, Eiichiro, 5,314,969, Cl. 525-440.000.
  - Kondo, Haruhiko; Imaizumi, Mitsuhiro; Kamei, Ryosuke; Kimura, Hideharu; and Takiyama, Eiichiro, 5,314,927, Cl. 521-159.000.
- Takoda, Terutaka: *See—*
  - Okochi, Sadao; and Takoda, Terutaka, 5,315,496, Cl. 363-21.000.
- Taligent, Inc.: *See—*
  - Matheny, John R.; White, Christopher; Anderson, David R.; and Schaeffer, Arnold, 5,315,703, Cl. 395-164.000.
- Tamaki, Shouji: *See—*
  - Kaneda, Shinichi; Tamaki, Shouji; and Sakai, Osamu, 5,313,893, Cl. 108-152.000.
- Tamglass Engineering OY: *See—*
  - Ikola, Kimmo J.; and Stenman, Kimmo E., 5,314,523, Cl. 65-112.000.
- Tamiya, Yoshiyumi: *See—*
  - Ohshima, Kiyoshi; Tamiya, Yoshiyumi; Shimizu, Kenichi; Suzuki, Tadahiro; and Iizuka, Kazuaki, 5,315,323, Cl. 346-159.000.
- Tamura, Hideo: *See—*
  - Sakai, Hiroe; Otobe, Shingo; Tamura, Hideo; and Kamikawa, Toshimi, 5,313,729, Cl. 40-452.000.
- Tamura, Morio: *See—*
  - Hashimoto, Hisayoshi; and Tamura, Morio, 5,314,553, Cl. 156-153.000.
- Tanabe, Kenichi, to Sanden Corporation. Heat exchanger. 5,314,013, Cl. 165-176.000.
- Tanabe, Toru: *See—*
  - Nagase, Fumio; and Tanabe, Toru, 5,315,450, Cl. 360-65.000.
- Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, to Hitachi, Ltd. Semiconductor apparatus of module installing type. 5,315,482, Cl. 361-707.000.
- Tanaka, Haruo, to Rohm Co., Ltd. Laser diode driving circuit. 5,315,606, Cl. 372-38.000.
- Tanaka, Hiroaki: *See—*
  - Sakamoto, Kazuhiko; Tanaka, Hiroaki; Ueoka, Masatoshi; Akazawa, Yoji; and Baba, Masao, 5,315,037, Cl. 562-545.000.
- Tanaka, Kanichi: *See—*
  - Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
- Tanaka, Kazuaki; Matsuki, Takeshi; and Takaragi, Kazuo, to Hitachi, Ltd. Automatic trading method and apparatus. 5,315,634, Cl. 379-57.000.
- Tanaka, Keiichiro: *See—*
  - Nakao, Mitsuya; Tanaka, Keiichiro; Ichikawa, Kousyu; Yamamoto, Akio; and Matsubara, Tadakazu, 5,315,395, Cl. 348-789.000.
- Tanaka, Kenji: *See—*
  - Kozakura, Shiro; Kuze, Shigeki; and Tanaka, Kenji, 5,314,949, Cl. 525-67.000.
- Tanaka, Kohbun: *See—*
  - Watanabe, Yasutaka; Matsui, Kenji; Teraoka, Fuminori; and Tanaka, Kohbun, 5,314,138, Cl. 242-107.200.
- Tanaka, Ryoichi: *See—*
  - Tada, Takeshi; Akiyama, Toshikazu; Tanaka, Ryoichi; and Kawamoto, Masao, 5,314,170, Cl. 266-156.000.
- Tanaka, Shinri: *See—*
  - Murai, Kazuhiro; Kajiwara, Makoto; Sato, Hirokazu; Tanaka, Shinri; and Okumura, Mitsuhiro, 5,314,796, Cl. 430-522.000.
- Tanaka, Shuji: *See—*
  - Nishihira, Keigo; Tanaka, Shuji; Mizutare, Katsuhiko; and Kondo, Masahiro, 5,315,032, Cl. 560-157.000.
- Tanaka, Takumi: *See—*
  - Ohishi, Hiroshi; Inaba, Shinji; Kimura, Masao; Fujishiro, Koichi; Kawabe, Masanao; Tanaka, Takumi; Kyuda, Keizo; Kishimoto, Souichiro; Owaki, Takamasa; and Motoyama, Akio, 5,314,954, Cl. 525-132.000.
- Tanaka, Tamotsu: *See—*
  - Takimoto, Akiyoshi; Tanaka, Tamotsu; and Yoshida, Yukio, 5,315,220, Cl. 318-282.000.
- Tanaka, Tsuyoshi; Aoki, Satoshi; and Fukuda, Kazuyuki, to Hitachi, Ltd. Semiconductor laser module with lens holder compensating for thermal stress. 5,315,609, Cl. 372-43.000.
- Taniguchi, Michio: *See—*
  - Ishii, Akira; Minomo, Syoichiro; Taniguchi, Michio; and Sugiyo, Masato, 5,315,212, Cl. 315-111.510.
- Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, to Matsushita Electric Industrial Co., Ltd. Solid electrolyte fuel cell and method for manufacture of same. 5,314,508, Cl. 29-623.500.
- Taniguchi, Takao; and Sato, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor substrate transport arm for semiconductor substrate processing apparatus. 5,314,294, Cl. 414-744.600.
- Tanihara, Mamoru: *See—*
  - Takedoi, Atsushi; Tanihara, Mamoru; Harada, Tosiharu; Isoai, Masaru; and Fujita, Kazuhiro, 5,314,750, Cl. 428-402.000.
- Tanikawa, Eiki: *See—*
  - Nagai, Yuji; Tanikawa, Eiki; Ohshima, Hisao; and Kato, Kazushige, 5,315,153, Cl. 257-701.000.
- Tanikawa, Keizo; Saito, Akira; Matsumoto, Takashi; Sakoda, Ryozo; Tsuruzoe, Nobutomo; and Shikada, Ken-ichi, to Nissan Chemical Industries Ltd. 5-heteroarylamino-6-oxy-substituted 3(2H)-pyridazinones. 5,314,883, Cl. 514-236.500.
- Tanimichi, Akihiro, to Fanuc Ltd. Line branching printed circuit board for a computer numerical controller. 5,315,071, Cl. 174-254.000.
- Tanimura, Yoshinari: *See—*
  - Kawasaki, Masahiro; Takahashi, Hiroyuki; and Tanimura, Yoshinari, 5,315,345, Cl. 354-484.000.
- Tanioka, Hiroshi, to Canon Kabushiki Kaisha. Image processing apparatus. 5,315,382, Cl. 358-523.000.
- Taniuchi, Kazuman; Kouno, Katuyuki; and Sekine, Hiroshi, to Fuji Xerox Co., Ltd. Mono-color editing method for color picture image recording. 5,315,416, Cl. 358-537.000.

- Taniwa, Hiroyuki: *See—*
  - Shibamoto, Yoshitaka; Taniwa, Hiroyuki; Ueno, Hiromichi; Hagiwara, Shigeki; Forni, Ronald J.; and McCullough, John E., 5,314,316, Cl. 418-55.100.
- Tanno, Yusuke: *See—*
  - Sato, Mitsuo; and Tanno, Yusuke, 5,315,319, Cl. 346-76.0PH.
- Taplan, Martin: *See—*
  - Thurk, Jurgen; Taplan, Martin; Dudek, Roland; Hubert, Stefan; and Busch, Dietrich, 5,313,929, Cl. 126-39.00B.
- Tappert, Charles C.: *See—*
  - Fujisaki, Tetsunosuke; Kim, Joonki; Leibman, George J.; and Tappert, Charles C., 5,315,667, Cl. 382-13.000.
- Tarafdar, Martin A. Watermelon seed remover. 5,313,707, Cl. 30-315.000.
- Tarumizu, Hiroyuki: *See—*
  - Kurashige, Tomoyuki; Imaide, Takuya; and Tarumizu, Hiroyuki, 5,315,394, Cl. 348-229.000.
- Tate, Robert S.: *See—*
  - O'Brien, Larry S.; Ford, Gordon C.; Willis, Peter M.; and Tate, Robert S., 5,315,091, Cl. 219-385.000.
- Tatsuno, Wataru: *See—*
  - Hori, Kenji; and Tatsuno, Wataru, 5,315,441, Cl. 359-753.000.
- Taudou, Christophe J.: *See—*
  - Evezard, Jean-Michel A.; and Taudou, Christophe J., 5,314,043, Cl. 187-51.000.
- Tavazzani, Claudio: *See—*
  - Botti, Edoardo; and Tavazzani, Claudio, 5,315,268, Cl. 330-298.000.
- Tavener, Raymond D.: *See—*
  - Bain, James M.; Best, David J.; Markham, James G.; Morrow, Mark S.; Stellwag, Debra A.; and Tavener, Raymond D., 5,315,508, Cl. 364-401.000.
- Taylor, Arthur, Jr.: *See—*
  - Hunter, Alastair W.; Taylor, Arthur, Jr.; and Steckel, Mark, 5,314,446, Cl. 606-231.000.
- Taylor, Scott M.: *See—*
  - Garwood, Gerald A., Jr.; and Taylor, Scott M., 5,313,984, Cl. 137-625.480.
- Taylor, Tommy G.; Mansell, J. Douglas; Shamburger, John P.; and Woodyear, Mark E., to PPG Industries, Inc. Concurrent production of trichloroethane isomers. 5,315,052, Cl. 570-247.000.
- Taylor, William A. Deposit envelope. 5,314,251, Cl. 383-106.000.
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  - Ito, Shinichiro; and Kinoshita, Yukiharu, 5,315,279, Cl. 336-178.000.
  - Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.
- TEAC Corporation: *See—*
  - Nagase, Fumio; and Tanabe, Toru, 5,315,450, Cl. 360-65.000.
  - Ohkubo, Hiroshi; and Miyamoto, Takashi, 5,315,462, Cl. 360-96.500.
  - Yoshida, Kobun, 5,315,467, Cl. 360-106.000.
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  - Hutchison, Wayne R.; Teal, Richard D.; Wasson, Steven C.; Mirdamadi, Mansour; Moore, Earl T.; Lorenzo, Luis; Coffey, Michael J.; and Nickles, Daniel R., 5,314,230, Cl. 296-203.000.
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  - Pasevic, Vladimir I.; and Pasevic, Dmitrii V., 5,315,626, Cl. 376-306.000.
- Teel, Dale, to Burnett Oil Co., Inc. Liquid fuel solutions of methane and liquid hydrocarbons. 5,315,054, Cl. 585-14.000.
- Teets, J. Michael: *See—*
  - Wiita, Bruce E.; Teets, J. Michael; and Wiita, Gregory D., 5,313,934, Cl. 128-4.000.
- Teijin Limited: *See—*
  - Matsumoto, Mitsuo; Takahashi, Nobuo; and Sasaki, Yoshiyuki, 5,313,774, Cl. 57-255.000.
- Tek Electronics Manufacturing Corporation: *See—*
  - Matheny, Mark, 5,315,645, Cl. 379-144.000.
- Tekma Kinomat S.r.l.: *See—*
  - Rivara, Antonio, 5,314,129, Cl. 242-7.090.
- Tekno, Inc.: *See—*
  - Clopton, Robert T., 5,314,059, Cl. 198-860.100.
- Teledyne Industries Inc.: *See—*
  - Blair, Eddie L.; Brownwood, John B.; and Chun, Delo K. K., 5,315,273, Cl. 333-81.00R.
- Telefonaktiebolaget L M Ericsson: *See—*
  - Kullander, Jan, 5,315,587, Cl. 370-60.000.
- Teleos Communications, Inc.: *See—*
  - Araujo, Kenneth S., 5,315,647, Cl. 379-265.000.
- Teltrend Inc.: *See—*
  - Smith, Earl L.; and Nguyen, Van, 5,315,650, Cl. 379-399.000.
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  - Leifeld, Ferdinand; and Temburg, Konrad, 5,313,688, Cl. 19-107.000.
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- Tepper, John C., to AMEI Technologies Inc. Conformable PEMF transducer. 5,314,401, Cl. 600-14.000.
- Terada, Norishige; and Irisa, Shinsuke, to Yamaha Corporation. Glockenspiel equipped with hammer heads different in hardness for changing tone color. 5,313,867, Cl. 84-404.000.
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  - Yasui, Takatoshi; Kudo, Chiaki; Nakao, Ichiro; Fujii, Toyokazu; Terai, Yuka; Imai, Shinichi; Yamamoto, Hiroshi; and Naito, Yasushi, 5,314,848, Cl. 437-248.000.
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  - Yamada, Kazunori; Ochiai, Masanori; Yotsumoto, Yoshihisa; Morimoto, Yuuki; and Teranishi, Yutaka, 5,314,819, Cl. 435-232.000.
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  - Maeda, Shigemi; Kojima, Kunio; Akiyama, Jun; Terashima, Shigeo; and Numata, Tomiyuki, 5,315,571, Cl. 369-50.000.
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- Terronics Development Corporation: *See—*
  - Alexander, George R., 5,314,090, Cl. 222-1.000.
- Terry, Kim S.: *See—*
  - Foster, Peter J.; and Terry, Kim S., 5,315,649, Cl. 379-355.000.
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  - Hatton, Gregory J.; Helms, David A.; and Durrett, Michael G., 5,315,117, Cl. 250-356.100.
  - Papke, Brian L.; Rubin, Issac D.; and Castrogiovannia, John, Jr., 5,314,632, Cl. 252-18.000.
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  - Pandey, Raghvendra K.; Raina, Kanwal; and Solayappan, Narayanan, 5,314,869, Cl. 505-452.000.
- Texas Beef Group: *See—*
  - O'Brien, William H.; and Malloy, James M., 5,314,375, Cl. 452-157.000.
- Texas Instruments Incorporated: *See—*
  - Gaddis, Ronald A., 5,314,340, Cl. 434-327.000.
  - Kansy, Robert J.; and Garner, Ricky B., 5,315,114, Cl. 250-332.000.
  - Kulwicki, Bernard M., 5,314,651, Cl. 264-65.000.
  - Morris, John O., 5,315,553, Cl. 365-201.000.
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  - Giersberg, Joachim; Gomm, Hartmut; and Naumann, Dirk, 5,314,534, Cl. 106-287.190.
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- Theis, Peter F. System for recognizing or counting spoken itemized expressions. 5,315,688, Cl. 395-2.420.
- Theosabrata, Yos S. Storage rack. 5,314,077, Cl. 211-40.000.
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  - Helms, Jan; Geyer, Gotz; Wanek, Erich; Zollner, Werner; and Gasser, Oswald, 5,314,474, Cl. 623-16.000.
- Therien, Michel: *See—*
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- Thiele, Karl-Heinz, to Electronic-Werke Deutschland GmbH. Passive loudspeaker enclosure for a television receiver. 5,315,663, Cl. 371-188.000.
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  - Fischer, Adam, Jr.; Strauss, Richard F.; Chu, Kwang-Ho; Levy, Sidney; and Hurt, Mark, 5,313,702, Cl. 29-883.000.
- Thomas, Gerhard: *See—*
  - Klinger, Herbert; Thomas, Gerhard; and Petrzik, Martin, 5,313,701, Cl. 29-840.000.
- Thomas, John E., to Duke University. Position measurement of moving atoms using optical fields. 5,315,109, Cl. 250-251.000.
- Thomas, Mammen: *See—*
  - Hively, James W.; Thomas, Mammen; and Bechtel, Richard L., 5,315,130, Cl. 257-48.000.
- Thomas, Stephan: *See—*
  - Fabian, Heinz; and Thomas, Stephan, 5,315,685, Cl. 385-142.000.
- Thomassen, Jan M.; and Lekang, Odd I., to Eka Nobel AB. Method for controlling aquatic parasites. 5,313,911, Cl. 119-231.000.
- Thompson, David L., to Medtronic, Inc. Dual channel telemetry for implanted medical device. 5,314,450, Cl. 607-32.000.
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  - Jewell, Tanya E.; and Thompson, Kevin, 5,315,629, Cl. 378-34.000.

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Anderson, Mark R.; and Parker, Robert P., 5,315,660, Cl. 381-13.000.

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Cachier, Gerard, 5,313,693, Cl. 29-25.030.

Comon, Pierre, 5,315,532, Cl. 364-553.000.

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Pressouyre, Gerard, 5,315,086, Cl. 219-753.000.

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Raverdy, Yvan; Marillat, Christian; and Gally, Daniel, 5,315,103, Cl. 250-214.0VT.

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Thorpe, Thurman C.; and Weaver, John F., to Akzo N.V. Adsorbent compositions and methods of manufacture. 5,314,855, Cl. 502-80.000.

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Heremans, Joseph P.; Partin, Dale L.; and Thrush, Christopher M., 5,314,547, Cl. 148-33.100.

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Tibbitts, Gordon A., to Baker Hughes Incorporated. Drill bit having combined positive and negative or neutral rake cutters. 5,314,033, Cl. 175-431.000.

Tice, William A. Table with height and tilt adjust. 5,313,892, Cl. 108-147.000.

Tien, Chen F. Action doll. 5,313,728, Cl. 40-420.000.

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Helland, Randall H.; Farnum, Sylvia A.; Kirk, Mark P.; Kitchin, Jonathan P.; Mader, Roger A.; Mizen, Mark B.; Newmark, Richard A.; Ramsden, William D.; Sakizadeh, Kumars; Spawn, Terence D.; Stevenson, Dian E.; and Tiers, George V., 5,314,795, Cl. 430-517.000.

Tiffany, Thomas: *See—*

Weyrauch, Bruce; Kelln, Norman; Tiffany, Thomas; and Olson, Robin, 5,314,825, Cl. 436-43.000.

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Schepis, Dominic J.; Srikrishnan, Kris V.; Subbanna, Seshardi; and Tijwani, Manu J., 5,314,840, Cl. 437-194.000.

Tiller, Dale K. Map holder. 5,313,730, Cl. 40-642.000.

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Tilton, Donald E.; and Tilton, Charles L., 5,314,529, Cl. 96-204.000.

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Timing Solutions Corporation: *See—*

Stein, Samuel R., 5,315,566, Cl. 368-46.000.

Timmermann, Ralf: *See—*

Rasp, Christian; Timmermann, Ralf; Perrey, Hermann; Lehmann, Bernhard; and Kussi, Siegfried, 5,314,982, Cl. 528-48.000.

Timms, John: *See—*

Brent, Jason B.; Hatala, Edward; and Timms, John, 5,315,591, Cl. 370-85.600.

Tinen, Jay. Bath aid device. 5,313,675, Cl. 4-580.000.

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Olmsted, Bruce E.; and Tjapkes, Stanley A., 5,313,853, Cl. 74-473.00P.

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Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Dynamic random access memory having sense amplifier activation delayed based on operation supply voltage and operating method thereof. 5,315,550, Cl. 365-194.000.

Toda, Hiromichi; Ishigami, Shigeyasu; Kobayashi, Norihisa; Furuya, Takaaki; and Izumi, Jun, to Mitsubishi Jukogyo Kabushiki Kaisha. Gasification-combined power plant. 5,313,781, Cl. 60-39.120.

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Takedoi, Atsushi; Tanihara, Mamoru; Harada, Tosiharu; Isoai, Masaru; and Fujita, Kazuhiro, 5,314,750, Cl. 428-402.000.

Todd, Christian A., to Storage Technology Corporation. Method and apparatus for eliminating the effect of staggerwrap on tape guidance. 5,315,461, Cl. 360-90.000.

Todd, Paul H., Jr., to Kalamazoo Holdings, Inc. Low micron-sized ascorbic acid particles, especially a suspension thereof in a medium in which they are insoluble, and the use thereof as an antioxidant for mediums in which the particles remain insoluble. 5,314,686, Cl. 424-401.000.

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Saito, Akito; and Togawa, Tsuyoshi, 5,315,569, Cl. 369-44.320.

Tohchi, Mamoru: *See—*

Nakayama, Masahiro; Takeuchi, Hisaharu; Tohchi, Mamoru; and Numakura, Satoshi, 5,315,447, Cl. 360-49.000.

Nakayama, Masahiro; Takeuchi, Hisaharu; Takamatsu, Hisashi; Tohchi, Mamoru; and Kurano, Akira, 5,315,451, Cl. 360-72.200.

Tojo, Tadatsune. Building wall construction method. 5,313,760, Cl. 52-747.000.

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Tokai Rubber Industries, Ltd.: *See—*

Ide, Akiyoshi; and Muramatsu, Atsushi, 5,314,173, Cl. 267-140.140.

Tokin Corporation: *See—*

Ohno, Tomeji; Yoshida, Tetsuo; and Fuda, Yoshiaki, 5,315,205, Cl. 310-357.000.

Tokito, Toshihiro: *See—*

Ishii, Masami; Murayama, Osamu; Kasahara, Kenji; Horiuchi, Yoshimori; and Tokito, Toshihiro, 5,314,141, Cl. 242-199.000.

Tokumasu, Noboru: *See—*

Maeda, Kazuo; Tokumasu, Noboru; and Nishimoto, Yuhko, 5,314,538, Cl. 118-715.000.

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Kimura, Yoshiharu; and Kikuchi, Akihiro, 5,315,510, Cl. 364-405.000.

Tokyo Electron Kabushiki Kaisha: *See—*

Takahashi, Nobuaki, 5,314,574, Cl. 156-646.000.

Tokyo Electron Limited: *See—*

Higuchi, Fumihiko; and Fukasawa, Yoshio, 5,314,573, Cl. 156-643.000.

Iwakura, Kenichi; and Ohtsuka, Tetsuo, 5,315,237, Cl. 324-158.00F.

Saito, Masasi; Iwata, Teruo; Ishii, Nobuo; Ikeda, Towl; and Saeki, Hiroaki, 5,314,541, Cl. 118-725.000.

Tokyo Electron Yamanashi Limited: *See—*

Sugiyama, Kazuhiko; Shimizu, Masafumi; Naito, Yukio; Nishimura, Eiichi; and Oshima, Kouichi, 5,314,603, Cl. 204-298.320.

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Taira, Tetsusaburo; and Ikari, Makoto, 5,315,443, Cl. 359-885.000.

Tomasi, Barbara R., to Bernstein, Marc S. Apparatus and method for reducing snoring and method of making same. 5,313,960, Cl. 128-848.000.

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Nakagawa, Akira, 5,314,823, Cl. 435-264.000.

Tomishima, Shigeki: *See—*

Ooishi, Tsukasa; Arimoto, Kazutami; Hidaka, Hideto; Hayashikoshi, Masanori; Kawai, Shinji; Asakura, Mikio; Tsukude, Masaki; Suma, Katsuhiro; Tomishima, Shigeki; and Fujishima, Kazuyasu, 5,315,548, Cl. 365-189.010.

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Imai, Masaharu; Honsawa, Kunio; and Tomita, Jota, 5,315,699, Cl. 395-162.000.

Tomita, Mamoru; Kitazawa, Takesi; Kawaura, Seiji; Fukuwatari, Yasuo; and Nojiri, Masanobu, to Morinaga Milk Industry Co., Ltd.; and Iwase Cosfa Co., Ltd. Milk-protein hydrolyzates and compositions for use as hair and skin treating agent. 5,314,873, Cl. 514-21.000.

Tomka, Ivan. Polymer mixture for producing films. 5,314,934, Cl. 524-53.000.

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Tonutti, Carletto, 5,313,772, Cl. 56-377.000.

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Komiya, Yuji, 5,314,561, Cl. 156-244.110.

Toray Industries, Inc.: *See—*

Yamagishi, Masahiro; Hijiri, Masao; Komatsu, Yasuo; Edagawa, Hiroshi; and Imaeda, Naoki, 5,314,180, Cl. 273-73.00F.

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Torgussen, Ole G.: *See—*

Hughes, Zephuren J.; and Torgussen, Ole G., 5,314,532, Cl. 106-253.000.

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Harkonen, Gitte; Harkonen, Kari; and Tornquist, Runar, 5,314,759, Cl. 428-690.000.

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Rendahl, Ingvar F.; and Tornqvist, Borje G. S., 5,313,900, Cl. 112-316.000.

Torok, Vilmos C. Synchronous machine. 5,315,198, Cl. 310-162.000.

Torrington Company, The: *See—*

Murphy, Richard F., 5,313,916, Cl. 123-90.390.

Toshiba America MRI, Inc.: *See—*

Derby, Kevin A., 5,315,251, Cl. 324-318.000.

Toshiba Kikai Kabushiki Kaisha: *See—*

Kato, Kenji; and Momochi, Takeshi, 5,315,503, Cl. 364-192.000.

Tosoh Corporation: *See—*

Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.

Toth, Andrew S., to Metex Corporation Limited. Fluid metering verification system. 5,315,294, Cl. 340-679.000.

Toth, Mihaly V.: *See—*

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Elgue, Jean; and Tournier-Lasserve, Jacques, 5,314,671, Cl. 423-220.000.

Tousson, Maurice: *See—*

Dickie, Robert G.; Tousson, Maurice; Edgar, William A.; and Jennings, Peter, 5,313,683, Cl. 15-117.000.

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Tow, Robert F., to Xerox Corporation. Methods and means for embedding machine readable digital data in halftone images. 5,315,098, Cl. 235-494.000.

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McHardy, John; Townsend, Carl W.; Higley, Lin R.; and Ludwig, Frank A., 5,315,162, Cl. 307-201.000.

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Nagai, Yuji; Tanikawa, Eiki; Ohshima, Hisao; and Kato, Kazushige, 5,315,153, Cl. 257-701.000.

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Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.

Takano, Hisateru; Taenaka, Yoshiyuki; Nakatani, Takeshi; Sasaki, Eisaku; Kashiwabara, Susumu; and Kimura, Takashi, 5,314,418, Cl. 604-282.000.

Toyoda, Seiichiro: *See—*

Ohshita, Takahiro; Nagato, Shuichi; Miyoshi, Norihisa; and Toyoda, Seiichiro, 5,313,913, Cl. 122-4.00D.

Toyofuku, Kunitaka: *See—*

Takahashi, Yoshiyuki; Nishioka, Makoto; Toyofuku, Kunitaka; and Uchida, Kyoko, 5,314,859, Cl. 503-207.000.

Toyoshi, Naoki: *See—*

Matsushiro, Moriyoshi; Toyoshi, Naoki; and Yoshiyama, Tsugihito, 5,315,351, Cl. 355-246.000.

Toyota Jidosha Kabushiki Kaisha: *See—*

Kato, Shinji; Takagi, Soya; Sato, Akio; Sugiyama, Mizuho; and Yokoya, Yuji, 5,314,036, Cl. 180-147.000.

Katoh, Kenji; Iguchi, Satoshi; and Kihara, Tetsuro, 5,313,792, Cl. 60-301.000.

Matsushita, Souichi, 5,313,920, Cl. 123-295.000.

Matuzawa, Tomoki; Yokota, Seiji; Emori, Katsuhiko; and Harada, Junichi, 5,314,229, Cl. 296-189.000.

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Yoshioka, Mamoru; Nakata, Kunihiko; Kotani, Akira; and Makino, Makoto, 5,313,798, Cl. 60-600.000.

TPI Corporation: *See—*

Mount, Mason B., 5,315,281, Cl. 337-319.000.

Traber, Jorg: *See—*

Seidel, Peter-Rudolf; Horstmann, Harald; Traber, Jorg; Dompert, Wolfgang; Glaser, Thomas; and Schuurman, Teunis, 5,314,884, Cl. 514-252.000.

Tracy, James L., to Motorola, Inc. Housing having non-planar radial seal. 5,315,483, Cl. 361-752.000.

Tran, Hiep V., to Texas Instruments Incorporated. Method to reduce burn-in time and inducing infant failure. 5,315,598, Cl. 371-21.100.

Tran, Kelvin T.: *See—*

Linder, Lloyd F.; Birdsall, Dwight D.; and Tran, Kelvin T., 5,315,231, Cl. 323-315.000.

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Stetter, Joseph R.; Maclay, G. Jordan; and Ballantine, Jr. David S., 5,315,673, Cl. 385-12.000.

Transfresh Corporation: *See—*

Bolejack, Kevin J.; Forgnone, Frederick; and McCoy, Christopher, 5,314,286, Cl. 414-416.000.

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Neubauer, Frank; Pickett, Gordon; and Metz, Barbara A., 5,314,379, Cl. 462-6.000.

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Koenig, Joseph M., Jr., 5,313,755, Cl. 52-255.000.

Troponwerke GmbH & Co.: *See—*

Seidel, Peter-Rudolf; Horstmann, Harald; Traber, Jorg; Dompert, Wolfgang; Glaser, Thomas; and Schuurman, Teunis, 5,314,884, Cl. 514-252.000.

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Heuberger, Erich; Knorrich, Wolf-Dieter; Dziallas, Joachim W.; Plester, George; and Troska, Georg, 5,314,088, Cl. 220-465.000.

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Midas, Thomas J., 5,313,737, Cl. 49-324.000.

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Leifeld, Ferdinand; and Temburg, Konrad, 5,313,688, Cl. 19-107.000.

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Smolley, Robert, 5,315,481, Cl. 361-707.000.

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Sperling, Michael; and Tsalev, Dimiter L., 5,314,664, Cl. 422-78.000.

Tsarenkov, Valery M.: *See—*

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Suzuki, Tadasu; and Sakamoto, Kiyotaka, 5,314,388, Cl. 474-110.000.

Tsuboi, Shinichi: *See—*

Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,314,897, Cl. 514-332.000.

Tsubone, Tsunehiko: *See—*

Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, 5,314,509, Cl. 34-406.000.

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Mizuuchi, Sotoo; and Nishimura, Isao, 5,313,692, Cl. 28-187.000.

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Tanikawa, Keizo; Saito, Akira; Matsumoto, Takashi; Sakoda, Ryozo; Tsuruzoe, Nobutomo; and Shikada, Ken-ichi, 5,314,883, Cl. 514-236.500.

Tsutsumi, Taira: *See—*

Suzuki, Hiroshi; Watano, Sigeru; Sasazuka, Tadashi; and Tsutsumi, Taira, 5,314,877, Cl. 514-58.000.

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Pavljuk, Vitaly G.; Tsvetaev, Krarm P.; Dolgopolov, Jury Y.; and Zhukov, Alexandr I., 5,314,117, Cl. 239-102.100.

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Dodman, Nicholas H.; and Shuster, Louis, 5,314,888, Cl. 514-252.000.
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Wood, Edwin H.; and Tullai, John P., 5,314,130, Cl. 242-54.00R.
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Rockandel, Michael A.; and Twidwell, Larry G., 5,314,527, Cl. 75-742.000.
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Singh, Balwant; and Tynik, Robert J., 5,314,950, Cl. 525-73.000.
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Austin, Peter W.; and Tyreman, Neville, 5,315,009, Cl. 548-209.000.
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Nishihira, Keigo; Tanaka, Shuji; Mizutare, Katsuhiko; and Kondo, Masahiro, 5,315,032, Cl. 560-157.000.
Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.
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Takakura, Kenji; and Uchida, Katsuyuki, 5,315,652, Cl. 379-413.000.
Uchida, Kyoko: *See*—
Takahashi, Yoshiyuki; Nishioka, Makoto; Toyofuku, Kunitaka; and Uchida, Kyoko, 5,314,859, Cl. 503-207.000.
Uchihara, Shoichi: *See*—
Koyama, Kenji; and Uchihara, Shoichi, 5,315,502, Cl. 364-184.000.
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Kuboki, Keiju; Sugishima, Kiyohisa; Udagawa, Yutaka; Otsubo, Toshihiko; and Nishio, Masahiro, 5,315,404, Cl. 358-433.000.
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Morohoshi, Naoya; Uemura, Hiroyuki; and Nogawa, Chiharu, 5,314,861, Cl. 503-227.000.
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Shibamoto, Yoshitaka; Taniwa, Hiroyuki; Ueno, Hiromichi; Hagiwara, Shigeki; Forni, Ronald J.; and McCullough, John E., 5,314,316, Cl. 418-55.100.
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Suzuki, Koji; Enoki, Shigekazu; Takashima, Hiroshi; Iwata, Naoki; and Ueno, Yuichi, 5,315,061, Cl. 118-651.000.
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Kaneko, Nobuyoshi; Kakai, Tsutomu; and Uesugi, Akio, 5,314,607, Cl. 205-139.000.
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Takahata, Ryoichi; and Ueyama, Hirochika, 5,314,868, Cl. 505-1[illegible].000.
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Strand, Rolf L.; and Uhrich, Daniel T., 5,314,004, Cl. 165-2.000.
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Sturm, Volker; Pastyr, Otto; Schlegel, Wolgang; Uihlein, Christoph; and Mack, Thomas, 5,315,630, Cl. 378-65.000.
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Sandner, Helmut G.; Ulrich, Peter; Francois, Robert N.; and Hawkins, Michael, 5,314,133, Cl. 242-67.30R.
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Abbiate, Jean-Claude; Blanc, Alain; and Ungerboeck, Gottfried, 5,315,622, Cl. 375-106.000.
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Katsukura, Shuichi; and Iwakuni, Mikio, 5,315,302, Cl. 342-20.000.
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Smith, Gerald L., 5,314,587, Cl. 203-1.000.
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Bova, Angela E.; and Tredinnick, Donald W., 5,314,752, Cl. 428-424.200.
Unistrut International Corp.: *See*—
Moses, James A., 5,314,156, Cl. 248-317.000.
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Champa, John J., 5,315,633, Cl. 348-16.000.
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Cordoba, Michael V.; Hardee, Kim C.; and Butler, Douglas B., 5,315,230, Cl. 323-313.000.
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Fuller, Carl M., 5,314,595, Cl. 204-182.800.
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Administrator, National Aeronautics and Space Administration: *See*—
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Crippen, Karen L.; and Johnsen, Peter B., 5,313,821, Cl. 73-23.340.
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Buser, Rudolph G., 5,315,495, Cl. 362-373.000.
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Kronberg, James W., 5,314,735, Cl. 428-116.000.
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Kaiser, Mary K.; and Johnson, Walter J., 5,315,296, Cl. 340-946.000.
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Liebert, Curt H.; and Koch, John, Jr., 5,314,247, Cl. 374-29.000.
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Hillen, Walter; and Snoeren, Rudolph M., 5,315,631, Cl. 378-98.800.
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Houben, Paulus A., 5,315,217, Cl. 315-382.000.
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Schwarze, Werner; and Voss, Joachim, 5,313,954, Cl. 128-702.000.
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Van Den Herik, Florus B., 5,315,216, Cl. 315-370.000.
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Green, David; Bolanos, Henry; and Leahy, Patrick F., 5,314,435, Cl. 606-153.000.
Kennedy, John; Kaplan, Donald S.; and Muth, Ross R., 5,314,989, Cl. 528-354.000.
Nicholas, David A., 5,314,424, Cl. 606-41.000.
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Dorman, Thomas E., 5,313,700, Cl. 29-889.700.
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Jostlein, Hans, 5,315,259, Cl. 324-690.000.
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Danko, George; Mousset-Jones, Pierre; and Wirtz, Richard A., 5,314,264, Cl. 405-128.000.
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Gonzalez, Rene M., 5,313,939, Cl. 128-207.140.
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Forrest, Stephen R.; and So, Franky F., 5,315,129, Cl. 257-21.000.
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Okamoto, Tetsuo; and Usa, Satoshi, 5,315,058, Cl. 84-626.000.
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Umezawa, Katsushi, 5,314,216, Cl. 285-319.000.
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Sakamoto, Takashi; and Usui, Nobuaki, 5,315,407, Cl. 358-456.000.
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Kikuchi, Hideo; and Utsumi, Yasushi, 5,315,535, Cl. 364-490.000.
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Potier, Michel; and Le Gauyer, Philippe, 5,314,021, Cl. 165-153.000.
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McMahon, Thomas A.; and Valiant, Gordon A., 5,313,718, Cl. 36-59.00C.
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  - Kuhne, Karl F., 5,314,209, Cl. 285-45.000.
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  - Sugiyama, Kenji, 5,315,326, Cl. 348-415.000.
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  - Petrosky, Jimmie T., 5,315,050, Cl. 570-234.000.
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  - Berkman, Samuel; and Sahakian, Jack A., 5,313,823, Cl. 73-40.000.
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  - Grauer, Peter; and Ober, Ludwig, 5,314,966, Cl. 525-317.000.
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  - Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,315,338, Cl. 354-320.000.
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  - Bergsma, Rudolph; and Waldorf, Lindsey E., 5,313,977, Cl. 137-43.000.
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  - Horoschak, John R.; and Wallace, Paul S., 5,314,684, Cl. 424-71.000.
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  - Derleth, Helmut; Walter, Robert; Weidenbach, Gunter; and Strebelle, Michel, 5,315,051, Cl. 570-245.000.
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  - Graebe, Christopher M.; and Ward, Paul C., 5,315,346, Cl. 355-1.000.
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  - Schroeder, Thaddeus; Leung, Chi H.; Lequesne, Bruno P. B.; and Ward, Robert W., 5,315,245, Cl. 324-207.210.
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  - Caprathe, Bradley W.; Downing, Dennis M.; Jaen, Juan C.; Johnson, Stephen J.; Smith, William J., III; Wise, Lawrence D.; Wright, Jonathan; and Wustrow, David J., 5,314,896, Cl. 514-332.000.
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  - Logan, Samuel E.; and Groszewski, Paul G., 5,313,968, Cl. 128-782.000.
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  - Conant, George E.; Sherry, Steven H.; and Wasson, Scott G., 5,315,592, Cl. 370-85.130.
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  - Hutchison, Wayne R.; Teal, Richard D.; Wasson, Steven C.; Mirdamadi, Mansour; Moore, Earl T.; Lorenzo, Luis; Coffey, Michael J.; and Nickles, Daniel R., 5,314,230, Cl. 296-203.000.
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  - Hamada, Akira; Nishizawa, Nobuyoshi; Mukai, Hiroshi; Furukawa, Isao; Oda, Takashi; Watanabe, Akira; and Matsubayashi, Takaaki, 5,314,762, Cl. 429-37.000.
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  - Ohtagaki, Shigeki; and Watanabe, Hirosi, 5,314,378, Cl. 475-150.000.
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  - Ito, Tsuyoshi; Watanabe, Junya; and Sawada, Shintaro, 5,314,974, Cl. 526-206.000.
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  - Kujawa, Matthew; and Waterman, Timothy J., 5,313,930, Cl. 126-116.00R.
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  - Edwards, Philip N.; Oldham, Keith; and Waterson, David, 5,314,891, Cl. 514-269.000.
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  - Smith, Scott; Pietrzykoski, Anthony; and Goss, Floyd, 5,315,107, Cl. 250-222.200.
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  - Kaylor, Timothy R.; and Weaver, Donald R., 5,314,618, Cl. 210-242.300.
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  - Thorpe, Thurman C.; and Weaver, John F., 5,314,855, Cl. 502-80.000.
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- Webster, Steve L.; and Williams, Thomas P., to United States of America, Army. Dual mass dynamic cone penetrometer. 5,313,825, Cl. 73-81.000.
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  - Bojas, Edward J.; Kyle, Robert J.; and Weeks, Leo M., 5,314,048, Cl. 192-3.290.
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  - Kester, Jeffrey J.; Elsen, Joseph J.; Wehmeier, Thomas J.; and Young Jerry D., 5,314,707, Cl. 426-611.000.
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  - Ciarlei, Joseph A., 5,314,070, Cl. 206-570.000.
- Welch, Edward K., II: *See—*
  - McDonnell, Patrick F.; Wren, Gerard M.; and Welch, Edward K., II, 5,314,562, Cl. 156-314.000.
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  - Carini, David J.; Duncia, John Jonas V.; and Wells, Gregory J., 5,315,013, Cl. 548-376.100.
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  - Aretz, Werner; Bottger, Dirk; Seibert, Gerhard; Tumulka, Alois; Welzel, Peter; and Hobert, Kurt, 5,315,038, Cl. 562-587.000.

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  - Hughes, Travis K.; Campbell, Glenn W.; Burgoon, Charles E.; Gossett, John B.; and Spencer, Keith R., 5,315,089, Cl. 219-137.0PS.
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  - Frutschi, Hans U.; Hausermann, Alfred; and Wettstein, Hans, 5,313,782, Cl. 60-39.170.
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- Winter, William E.: *See*—
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- Winters, Charles W.; and Winters, Janice F. Optical sight enhancing blade arrangement. 5,315,368, Cl. 356-251.000.
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  - Eyssa, Yehia M.; Huang, Xianrui; and Boom, Roger W., 5,315,277, Cl. 335-216.000.
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  - Neffgen, Bernd; and Scherzer, Wolfgang, 5,314,971, Cl. 525-504.000.
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- Wood, Roger T.: *See*—
  - Harrison, Roy B.; and Wood, Roger T., 5,315,314, Cl. 345-186.000.
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  - Moss, Gaylord E.; and Wreede, John E., 5,315,417, Cl. 359-3.000.
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  - Marsh, Lawrence B.; and Wright, John D., 5,313,842, Cl. 73-861.000.
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  - Caprathe, Bradley W.; Downing, Dennis M.; Jaen, Juan C.; Johnson, Stephen J.; Smith, William J., III; Wise, Lawrence D.; Wright, Jonathan; and Wustrow, David J., 5,314,896, Cl. 514-332.000.
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  - Borghi, Enzo, 5,314,461, Cl. 607-127.000.
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  - Gunz, Stefan; and Ghisleni, Livio, 5,315,099, Cl. 250-201.100.
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  - Abramov, Igor, 5,315,429, Cl. 359-224.000.
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  - Fuse, Masayoshi; Xie, Cheng T.; and Aoyagi, Takuo, 5,313,940, Cl. 128-633.000.

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  - Conant, George E.; Sherry, Steven H.; and Wasson, Scott G., 5,315,592, Cl. 370-85.130.
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  - Nehorai, Arye; and Paldi, Eytan, 5,315,308, Cl. 342-448.000.
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- Yamada, Shuhei, to Seiko Epson Corporation. Tolan derivatives, liquid crystal compositions including same, liquid crystal display devices including the compositions and method of preparation. 5,314,640, Cl. 252-299.600.
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  - Kirino, Fumiyoshi; Nakamura, Junko; Suzuki, Ryo; Yoshihiro, Masafumi; Yamada, Yukinori; and Ohta, Norio, 5,315,577, Cl. 369-116.000.
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- Yamaguchi, Goichi: *See—*
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  - Hidaka, Kensuke; Tanaka, Kanichi; Kohira, Yoshio; Yamaguchi, Hideshi; Suzuki, Yoshinao; Nakagawa, Masahiro; Fuwa, Yoshio; Mori, Kazuhiko; Ito, Yoshihiko; and Taguchi, Atsushi, 5,314,659, Cl. 420-428.000.
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  - Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Shigeru; Nakamura, Kazunari; Okada, Yoshihiro; Saito, Katsuyuki; and Yamaguchi, Seiji, 5,315,383, Cl. 348-68.000.
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  - Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; and Matsudai, Tomoko, 5,315,134, Cl. 257-138.000.
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  - Furukawa, Masamichi, 5,315,578, Cl. 369-275.300.
  - Okamoto, Tetsuo; and Usa, Satoshi, 5,315,058, Cl. 84-626.000.
  - Takayama, Akira; Yoshida, Mitsuo; and Matsui, Shinichi, 5,315,640, Cl. 379-93.000.
  - Terada, Norishige; and Irisa, Shinsuke, 5,313,867, Cl. 84-404.000.
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- Yamamoto, Akihiro: *See—*
  - Izumi, Yasuo; Matsumura, Nobuya; Yamamoto, Akihiro; and Makino, Yutaka, 5,314,175, Cl. 269-224.000.
- Yamamoto, Akio: *See—*
  - Nakao, Mitsuya; Tanaka, Keiichiro; Ichikawa, Kousyu; Yamamoto, Akio; and Matsubara, Tadakazu, 5,315,395, Cl. 348-789.000.
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  - Shinjo, Teruya; Yamamoto, Hidefumi; and Takada, Toshio, 5,315,282, Cl. 338-32.00R.
- Yamamoto, Hiroshi: *See—*
  - Yasui, Takatoshi; Kudo, Chiaki; Nakao, Ichiro; Fujii, Toyokazu; Terai, Yuka; Imai, Shinichi; Yamamoto, Hiroshi; and Naito, Yasushi, 5,314,848, Cl. 437-248.000.
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  - Asanuma, Tadashi; and Yamamoto, Kazuhiko, 5,314,957, Cl. 515-245.000.
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  - Maruyama, Kazumasa; Yamamoto, Kazuyuki; Nagura, Sigehiro; and Homma, Taira, 5,315,003, Cl. 536-124.000.
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- Yamamoto, Minoru: *See—*
  - Nakamura, Satoshi; Yamamoto, Minoru; Ito, Nobuei; and Hattori, Tadasi, 5,314,540, Cl. 118-723.0DC.
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  - Ando, Masatoshi; Mochizuki, Hiromine; and Yamamoto, Mitsuo, 5,314,132, Cl. 242-56.00R.
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- Yamamoto, Shoji: *See—*
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- Yamamoto, Yoshimi, to Fuji Kiko Company, Ltd. Structure of universal joint. 5,314,380, Cl. 464-11.000.
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  - Abe, Nobuo; Horie, Tatsuo; Yamanaka, Toshio; and Simada, Atsui, 5,314,317, Cl. 418-55.200.
- Yamano, Koichi: *See—*
  - Kishimoto, Yoshinori; and Yamano, Koichi, 5,315,710, Cl. 395-700.000.
- Yamasaki, Tetsuo: *See—*
  - Omae, Yoshihiro; Watanabe, Haruo; Sonoki, Susumu; Kanemasa, Yoichi; Sagara, Kazuo; Yoshimune, Takashi; and Yamasaki, Tetsuo, 5,314,168, Cl. 266-92.000.
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- Yamashita, Keitaro: *See—*
  - Fukumoto, Kenji; Okamoto, Ichiro; and Yamashita, Keitaro, 5,315,445, Cl. 360-19.100.
- Yamashita, Yoshiharu: *See—*
  - Takeda, Hidekazu; Iwakura, Masao; Masuoka, Nobuo; Itou, Tetsuo; Nishida, Ikuo; Yamashita, Yoshiharu; Ohmori, Motonori; and Iyota, Koji, 5,315,460, Cl. 360-85.000.
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  - Kobayashi, Akira; Kawai, Takeshi; and Sasaki, Hiroshi, 5,315,100, Cl. 250-208.100.
- Yamato Mishin Seizo Kabushiki Kaisha: *See—*
  - Fujii, Hisao, 5,313,901, Cl. 112-320.000.
- Yamauchi, Katsuhisa: *See—*
  - Misao, Hitoshi; Yamauchi, Katsuhisa; Inoue, Tadashi; and Okita, Tomoyoshi, 5,314,549, Cl. 148-325.000.
- Yamauchi, Shigekazu; Kanagawa, Shinji; and Sekine, Hisao, to Stanley Electric Company Limited. Method of manufacturing color-filter-fitted board for liquid crystal display. 5,314,771, Cl. 430-7.000.
- Yamauchi, Shingo: *See—*
  - Ishiguro, Mamoru; Yokota, Masato; and Yamauchi, Shingo, 5,315,444, Cl. 360-15.000.
- Yamauchi, Yasuji; and Okamoto, Yuji, to Sharp Kabushiki Kaisha. Copying machine for copying a one-side subject copy on both sides of a copying sheet. 5,315,360, Cl. 355-319.000.
- Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Insulated gate field effect transistor. 5,315,132, Cl. 257-66.000.
- Yanagi, Junichirou: *See—*
  - Nakano, Yukio; Takase, Akihiko; Takatori, Masahiro; and Yanagi, Junichirou, 5,315,581, Cl. 370-16.000.
- Yanagida, Toshiharu, to Sony Corporation. Etching method and apparatus. 5,314,575, Cl. 156-651.000.
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  - Shimizu, Noburu; and Yanagisawa, Kiyoshi, 5,314,320, Cl. 418-201.100.
- Yanazawa, Masakatu: *See—*
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- Yano, Hajime: *See—*
  - Fujino, Toyomi; and Yano, Hajime, 5,315,470, Cl. 360-133.000.
- Yao, Raymond C.: *See—*
  - Hamill, Robert L.; and Yao, Raymond C., 5,314,875, Cl. 514-25.000.
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  - Flynn, Michael R.; Arseneault, Wayne J.; Boutet, John C.; Yaskow, Jeffrey J.; and Baker, Thomas D., 5,315,632, Cl. 378-167.000.
- Yasuda, Minoru: *See—*
  - Isono, Haruo; and Yasuda, Minoru, 5,315,377, Cl. 348-51.000.
- Yasuhara, Norio: *See—*
  - Ogura, Tsuneo; Watanabe, Kiminori; Nakagawa, Akio; Yamaguchi, Yoshihiro; Yasuhara, Norio; and Matsudai, Tomoko, 5,315,134, Cl. 257-138.000.
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- Yasumoto, Ryouichi: *See—*
  - Yoshikawa, Masaaki; Yokoyama, Keiichi; Hasegawa, Masayasu; Yasumoto, Ryouichi; and Fujita, Hiroyuki, 5,314,807, Cl. 435-68.100.
- Yasunobe, Toru: *See—*
  - Ohashi, Hirotaka; and Yasunobe, Toru, 5,314,291, Cl. 414-719.000.
- Yates, Jan B.; Procknow, David W.; Peterson, Brett J.; and Goplen, Gary D., to Gas Research Institute. Exhaust gas recuperator. 5,314,009, Cl. 165-72.000.
- Yates, Peter: *See—*
  - Herguth, William R.; and Yates, Peter, 5,313,824, Cl. 73-53.050.
- Yatsuzuka, Youtaro: *See—*
  - Iizuka, Shigeru; and Yatsuzuka, Youtaro, 5,315,585, Cl. 370-32.100.
- Yazaki Corporation: *See—*
  - Nomura, Fumihiko; Maeda, Yuji; and Kamiyama, Tomotoshi, 5,314,354, Cl. 439-621.000.
  - Yamamoto, Masaya, 5,314,351, Cl. 439-407.000.
- Yazawa, Shigehiko: *See—*
  - Kajiwara, Yasuhiro; and Yazawa, Shigehiko, 5,315,588, Cl. 370-60.100.
- Yeager, David A.: *See—*
  - Rao, Vemulapalli D. N.; Kabat, Daniel M.; and Yeager, David A., 5,313,919, Cl. 123-193.400.
- Yen, Yung-Tsai. Capture layer and method for delayed entrapment of contaminant particles. 5,314,728, Cl. 428-14.000.
- Yesair, David W. Mixed lipid-bicarbonate colloidal particles. 5,314,921, Cl. 514-784.000.
- Yock, Paul G., to Cardiovascular Imaging Systems Incorporated. Method and apparatus for intravascular two-dimensional ultrasonography. 5,313,949, Cl. 128-662.060.
- Yokokawa, Kenetsu: *See—*
  - Mizutani, Tatsumi; Yunogami, Takashi; Yokokawa, Kenetsu; and Kobayashi, Nobuyoshi, 5,314,839, Cl. 437-173.000.
- Yokota, Masato: *See—*
  - Ishiguro, Mamoru; Yokota, Masato; and Yamauchi, Shingo, 5,315,444, Cl. 360-15.000.
- Yokota, Seiji: *See—*
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- Yokote, Timothy A.; and Gritzmacher, Thomas J., to TRW Inc. Radiation-hardened memory storage device for space applications. 5,315,544, Cl. 365-154.000.
- Yokoya, Yuji: *See—*
  - Kato, Shinji; Takagi, Soya; Sato, Akio; Sugiyama, Mizuho; and Yokoya, Yuji, 5,314,036, Cl. 180-147.000.
- Yokoyama, Keiichi: *See—*
  - Yoshikawa, Masaaki; Yokoyama, Keiichi; Hasegawa, Masayasu; Yasumoto, Ryouichi; and Fujita, Hiroyuki, 5,314,807, Cl. 435-68.100.
- Yokoyama, Masako: *See—*
  - Sawada, Shigeru; Kasai, Shinichi; Tsujimoto, Jun; and Yokoyama, Masako, 5,315,361, Cl. 355-323.000.
- Yomtov, Barry M.; and Kreyenhagen, Paul E., to InControl, Inc. Implantable cardiac patient monitor. 5,313,953, Cl. 128-696.000.
- Yoneda, Hideki, to Kawasaki Steel Corporation. Memory module, method for control thereof and method for setting fault bit table for use therewith. 5,315,552, Cl. 365-200.000.
- Yoneda, Takashige; Wakabayashi, Tsuneo; and Takano, Yukiko, to Asahi Glass Company Ltd. Surface-treated substrate. 5,314,731, Cl. 428-429.000.
- Yonekawa, Motoki: *See—*
  - Kawakura, Akio; Yonekawa, Motoki; Sakashita, Eiji; and Kamogawa, Hiroshi, 5,314,624, Cl. 210-645.000.
- Yonemoto, Katsuyuki; Miyake, Hidehiko; and Enoki, Kazumasa, to Takisawa Machine Tool Co., Ltd. Machine tool for non-circular and other machining. 5,313,694, Cl. 29-27.00R.
- Yoon, Sei-Seung: *See—*
  - Kim, Moon-Gone; and Yoon, Sei-Seung, 5,315,557, Cl. 365-222.000.
- Yooo, Kwong M.: *See—*
  - Alfano, Robert R.; and Yooo, Kwong M., 5,315,437, Cl. 359-588.000.
- York, Billie M.; and Kyba, Evan P., to Alcon Laboratories, Inc. B_2 adrenegic agonists and use thereof in the treatment of glaucoma. 5,314,916, Cl. 514-542.000.
- Yoshida, Akihiko: *See—*
  - Mizuno, Yasuo; Sugai, Masakatsu; Ikeda, Masaki; and Yoshida, Akihiko, 5,315,434, Cl. 359-355.000.
- Yoshida, Atsushi, to NEC Corporation. Apparatus and method of canceling periodic carrier phase jitter. 5,315,618, Cl. 375-94.000.
- Yoshida, Fumio; and Nakasugi, Mikio, to Canon Kabushiki Kaisha. Shaft with grooves for dynamic pressure generation and motor employing the same. 5,315,196, Cl. 310-90.000.
- Yoshida, Kazuaki: *See—*
  - Yagi, Takeshi; Satoh, Tsuguo; Koinuma, Yoshiaki; and Yoshida, Kazuaki, 5,314,520, Cl. 65-3.110.
- Yoshida, Kobun, to Teac Corporation. Head actuator pivoting around stationary shaft and dish having such head actuator. 5,315,467, Cl. 360-106.000.
- Yoshida Kogyo K.K.: *See—*
  - Takimoto, Akiyoshi; Tanaka, Tamotsu; and Yoshida, Yukio, 5,315,220, Cl. 318-282.000.
- Yoshida, Masashi; Umishio, Kenichi; Uehara, Keiichi; and Nanba, Tomiyuki, to Shiseido Company Ltd. Silicone type cinnamic acid derivative, preparation method thereof, UV-ray absorber, and external skin treatment agent. 5,315,022, Cl. 556-437.000.
- Yoshida, Mitsuo: *See—*
  - Takayama, Akira; Yoshida, Mitsuo; and Matsui, Shinichi, 5,315,640, Cl. 379-93.000.
- Yoshida, Ryoichi: *See—*
  - Hiramatsu, Koji; and Yoshida, Ryoichi, 5,313,690, Cl. 24-641.000.
- Yoshida, Shigeo: *See—*
  - Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, 5,315,397, Cl. 358-296.000.
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- Yoshida, Takehiro; and Sakakibara, Kenzo, to Canon Kabushiki Kaisha. Communication system and data communication method. 5,315,643, Cl. 379-100.000.
- Yoshida, Tetsuo: *See—*
  - Ohno, Tomeji; Yoshida, Tetsuo; and Fuda, Yoshiaki, 5,315,205, Cl. 310-357.000.
- Yoshida, Yoshihiro, to Ricoh Company, Ltd. Electron emission elements integrated substrate. 5,315,206, Cl. 313-306.000.
- Yoshida, Yukio: *See—*
  - Takimoto, Akiyoshi; Tanaka, Tamotsu; and Yoshida, Yukio, 5,315,220, Cl. 318-282.000.
- Yoshidome, Hitoshi: *See—*
  - Tanaka, Akira; Shinohara, Hiroichi; Yamada, Kazuji; Ohba, Takao; Yamagiwa, Akira; Yoshidome, Hitoshi; Shirai, Yuji; Hatada, Toshio; Kishimoto, Munehisa; and Honda, Michiharu, 5,315,482, Cl. 361-707.000.
- Yoshihiro, Masafumi: *See—*
  - Kirino, Fumiyoshi; Nakamura, Junko; Suzuki, Ryo; Yoshihiro, Masafumi; Yamada, Yukinori; and Ohta, Norio, 5,315,577, Cl. 369-116.000.
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  - Morikiyo, Akira; Kanbe, Toshio; Shinbo, Shuichi; Yoshikawa, Shigeru; Shimodaira, Yoshikazu; Ohminami, Kazuya; and Komuro, Hitoshi, 5,314,078, Cl. 211-59.200.
- Yoshimune, Takashi: *See—*
  - Omae, Yoshihiro; Watanabe, Haruo; Sonoki, Susumu; Kanemasa, Yoichi; Sagara, Kazuo; Yoshimune, Takashi; and Yamasaki, Tetsuo, 5,314,168, Cl. 266-92.000.
- Yoshimura, Tamotsu, to Rohm Co., Ltd. Structure for variable electronic component. 5,315,283, Cl. 338-162.000.
- Yoshinari, Satoshi: *See—*
  - Nakazato, Hiroshi; Nakamura, Gen; and Yoshinari, Satoshi, 5,314,068, Cl. 206-454.000.
- Yoshioka, Mamoru; Nakata, Kunihiko; Kotani, Akira; and Makino, Makoto, to Toyota Jidosha Kabushiki Kaisha. Charging control apparatus for an internal combustion engine with a dual turbocharger system. 5,313,798, Cl. 60-600.000.
- Yoshioka, Yasuhiro; Shimura, Yoshio; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material containing at least one acylacetamide yellow dye-forming coupler. 5,314,797, Cl. 430-546.000.
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- Yoshiyama, Tsugihito: *See—*
  - Matsushiro, Moriyoshi; Toyoshi, Naoki; and Yoshiyama, Tsugihito, 5,315,351, Cl. 355-246.000.
- Yoshizumi, Keiichi, to Matsushita Electric Industrial Co., Ltd. Three-dimensional measuring apparatus. 5,315,374, Cl. 356-376.000.

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  Yamada, Kazunori; Ochini, Masanori; Yotsumoto, Yoshihisa; Morimoto, Yuuki; and Teranishi, Yutaka, 5,314,819, Cl. 435-231.000.
Young Jerry D.: *See*—
  Kester, Jeffrey J.; Elsen, Joseph J.; Wehmeier, Thomas J.; and Young Jerry D., 5,314,707, Cl. 426-611.000.
Young, Julian T.: *See*—
  Dew, Graham N.; Hearn, Anthony R.; Sebborn, David J.; and Young, Julian T., 5,315,463, Cl. 360-98.080.
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  Nichting, Roger A.; Nicholas, Norman H.; and Young, Kenneth P., 5,313,815, Cl. 72-364.000.
Young, Michael R. Carrier for golf clubs or the like. 5,314,079, Cl. 211-70.200.
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  Huinkes, Hendrik W. J.; Ypma, Franciscus A. M.; and Jaspers, Pierre J. T. M., 5,314,494, Cl. 623-23.000.
Yu, Chris C.; Sandhu, Gurtej S.; and Doan, Trung T., to Micron Technology, Inc. Integrated circuit polishing method. 5,314,843, Cl. 437-225.000.
Yuasa, Hitoshi: *See*—
  Yamasita, Yukio; Sato, Haruyoshi; Nakamura, Toru; Yuasa, Hitoshi; and Otsuki, Yutaka, 5,314,769, Cl. 430-7.000.
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  Wada, Akio; Watanabe, Mitsuo; Yuki, Yoshikazu; Ebisawa, Kazunori; Nishimoto, Masashi; Hayashi, Kazuhisa; Kutsuna, Kiyoharu; and Mizutani, Takehito, 5,315,376, Cl. 356-432.000.
Yunogami, Takashi: *See*—
  Mizutani, Tatsumi; Yunogami, Takashi; Yokokawa, Kenetsu; and Kobayashi, Nobuyoshi, 5,314,839, Cl. 437-173.000.
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  Masuda, Akihiro; Maeda, Ikuo; Yuri, Hideaki; and Suzuki, Yoichi, 5,315,431, Cl. 359-281.000.
Yusa, Terukazu: *See*—
  Sakashita, Kazuhiro; Yusa, Terukazu; Takimoto, Isao; Hashizume, Takeshi; and Komoike, Tatsunori, 5,315,182, Cl. 307-482.100.
Zadgorska, Zdravka; and Nickel, Hubertus, to Forschungszentrum Julich GmbH. Method of and apparatus for feeding a sample to a plasma of an inductively coupled plasma atomic emission spectrometer. 5,315,369, Cl. 356-316.000.
Zagar, Paul S.; and Douglas, Kurt P., to Micron Semiconductor, Inc. One time programmable fully-testable programmable logic device with zero power and anti-fuse cell architecture. 5,315,177, Cl. 307-465.000.
Zahrte, Donald K., Sr.: *See*—
  Stich, Frederick A.; Zahrte, Donald K., Sr.; Baxter, Richard V., Jr.; Folts, Douglas C.; Hubert, Thomas G.; Medina, Juan M.; Hazen, William J.; and Beistle, Edward G., 5,315,533, Cl. 364-480.000.
Zamanzadeh, Mehrooz: *See*—
  Carey, Jay F., II; and Zamanzadeh, Mehrooz, 5,314,758, Cl. 428-641.000.
Zambon Group S.p.A.: *See*—
  Giordano, Claudio; Tentorio, Dario; and Russo, Laura, 5,315,005, Cl. 540-491.000.
Zang, Kerry; and Huebner, Randall J., to MicroAire Surgical Instruments, Inc. Non-constrained total joint system. 5,314,486, Cl. 623-21.000.
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  Stephan, Craig H.; and Zanini-Fisher, Margherita, 5,313,832, Cl. 73-204.260.
Zapka, Manfred J., to Pacific Marine Supply Co., Ltd. Small waterplane twin hull vessel. 5,313,906, Cl. 114-274.000.
Zarnack, Uwe J.; Weintritt, Volker; and Konig, Christian, to Bayer Aktiengesellschaft. Process for recovering polyisocyanates from the distillation residues obtained in the production of tolylene diisocyanate. 5,314,588, Cl. 203-38.000.
Zarriello, Gerald E. Triangular sanding appliance. 5,313,746, Cl. 51-358.000.
Zauner, Erwin: *See*—
  Althaus, Rolf; Chyou, Yau-Pin; and Zauner, Erwin, 5,313,785, Cl. 60-39.450.
Zazzetta, Alessandro: *See*—
  Custro, Sergio; and Zazzetta, Alessandro, 5,314,951, Cl. 525-88.000.
Zdrojkowski, Ronald J., to Respironics Inc. Leak compensation method and apparatus for a breathing system. 5,313,937, Cl. 128-202.220.
Zelko, William E.: *See*—
  Ney, Reuben E.; Markle, Kenneth E.; and Zelko, William E., 5,314,361, Cl. 439-874.000.
Zellman, Per, to Emotron Aktiebolag. Method and an arrangement for starting an electrical machine having varying reluctance. 5,315,224, Cl. 318-701.000.
Zenith Electronics Corp.: *See*—
  Mudra, Robert E.; and Scholten, Mark A., 5,315,263, Cl. 130-156.000.
Zerbs, Stephen T.: *See*—
  Bleich, Larry L.; Nutt, Wendell G.; and Zerbs, Stephen T., 5,314,712, Cl. 427-118.000.
Zhao, Shi. Device and a method to measure the infrared radiation of the human body. 5,313,951, Cl. 128-664.000.
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  Schechter, David S.; Zhou, Dengen; and Orr, Franklin M., Jr., 5,314,017, Cl. 166-252.000.
Zhukov, Alexandr I.: *See*—
  Pavljuk, Vitaly G.; Tsvetaev, Krarm P.; Dolgopolov, Jury Y.; and Zhukov, Alexandr I., 5,314,117, Cl. 239-102.100.
Zilog, Inc.: *See*—
  Benhamida, Boubekeur, 5,315,184, Cl. 307-518.000.
Zimmer, Inc.: *See*—
  Thongpreda, Nisra; and Kline, Fred, 5,314,491, Cl. 623-22.000.
Zimmer, Maik: *See*—
  Hoffmann, Wolfgang; Korner, Andre ; and Zimmer, Maik, 5,315,275, Cl. 335-86.000.
Zimmermann, Gerd: *See*—
  Frey, Gunter; and Zimmermann, Gerd, 5,315,035, Cl. 562-16.000.
Zini, Aldo: *See*—
  McDonald, Sean C.; McDonald, Robert H.; Lunak, Richard R.; and Zini, Aldo, 5,314,243, Cl. 312-215.000.
Zircon Corporation: *See*—
  Heger, Charles E.; and Kook, Donald D., 5,313,713, Cl. 33-366.000.
Zollner, Werner: *See*—
  Heims, Jan; Geyer, Gotz; Wanek, Erich; Zollner, Werner; and Gasser, Oswald, 5,314,474, Cl. 623-16.000.
Zoltner, John D., to Xerox Corporation. Apparatus for applying hard and soft covers to bound or unbound documents. 5,314,283, Cl. 412-34.000.
Zorzi, Claudio: *See*—
  De Bortoli, Giuseppe; Zorzi, Claudio; and Gallina, Luca, 5,313,720, Cl. 36-117.000.
Zurn Industries, Inc.: *See*—
  Saadi, Robert E.; Ball, Christopher J.; and Kodaira, Makoto, 5,313,673, Cl. 4-313.000.
Zussman, Melvin P.: *See*—
  Kirayoglu, Birol; Sillivan, William J.; and Zussman, Melvin P., 5,314,742, Cl. 428-285.000.
Zydzik, George J.: *See*—
  Hunt, Neil E. J.; Schubert, Erdmann F.; and Zydzik, George J., 5,315,128, Cl. 257-16.000.
729819 Ontario Limited: *See*—
  Rieger, Heinz H.; and Adamson, Colin, 5,313,932, Cl. 126-531.000.
814405 Ontario Ltd.: *See*—
  Kadlicko, George, 5,313,875, Cl. 92-157.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF MAY, 1994

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aruga, Masayoshi: *See*—
  Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, Re. 34,618, Cl. 514-356.000.
Bender, Walter W.; and Gaustad, Charles A., to Blount, Inc. Indexing reloader of cartridges. Re. 34,612, Cl. 86-27.000.
Blount, Inc.: *See*—
  Bender, Walter W.; and Gaustad, Charles A., Re. 34,612, Cl. 86-27.000.
Bytzek, Klaus K.: *See*—
  Komorowskip, Jacek S.; and Bytzek, Klaus K., Re. 34,616, Cl. 474-135.000.
Freeman, Gary T., to MPM Corporation. Video probe aligning of object to be acted upon. Re. 34,615, Cl. 348-95.000.
Fulcher, John, to Recot, Inc. Synthetic cooking oils containing dicarboxylic acid esters. Re. 34,619, Cl. 560-201.000.
Gaustad, Charles A.: *See*—
  Bender, Walter W.; and Gaustad, Charles A., Re. 34,612, Cl. 86-27.000.
Gentiluomo, Joseph A. Bowling ball. Re. 34,614, Cl. 473-126.000.
Hanulik, Jozef, to Recytec SA. Process for decontaminating radioactively contaminated metal or cement-containing materials. Re. 34,613, Cl. 252-628.000.
Jandacek, Ronald J.; Mattson, Fred H.; and Taylor, Harry M., to Procter & Gamble Company, The. Vitaminized compositions for treating hypercholesterolemia. Re. 34,617, Cl. 514-23.000.
Komorowskip, Jacek S.; and Bytzek, Klaus K., to Litens Automotive Partnership. Belt tensioner with spring actuated band brake damping. Re. 34,616, Cl. 474-135.000.
Litens Automotive Partnership: *See*—
  Komorowskip, Jacek S.; and Bytzek, Klaus K., Re. 34,616, Cl. 474-135.000.
Mattson, Fred H.: *See*—
  Jandacek, Ronald J.; Mattson, Fred H.; and Taylor, Harry M., Re. 34,617, Cl. 514-23.000.
MPM Corporation: *See*—
  Freeman, Gary T., Re. 34,615, Cl. 348-95.000.
Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, to Yamanouchi Pharmaceutical Co., Ltd. Injection of nicardinpine hydrochloride and process for the production thereof. Re. 34,618, Cl. 514-356.000.
Ohtani, Go: *See*—
  Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, Re. 34,618, Cl. 514-356.000.
Procter & Gamble Company, The: *See*—
  Jandacek, Ronald J.; Mattson, Fred H.; and Taylor, Harry M., Re. 34,617, Cl. 514-23.000.
Recot, Inc.: *See*—
  Fulcher, John, Re. 34,619, Cl. 560-201.000.
Recytec SA: *See*—
  Hanulik, Jozef, Re. 34,613, Cl. 252-628.000.
Taylor, Harry M.: *See*—
  Jandacek, Ronald J.; Mattson, Fred H.; and Taylor, Harry M., Re. 34,617, Cl. 514-23.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
  Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, Re. 34,618, Cl. 514-356.000.
Yokota, Shoji: *See*—
  Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, Re. 34,618, Cl. 514-356.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Paoletti, Luciano, to SPIDEM S.r.l. Emulsifier unit particularly for emulsifying steam and milk to prepare cappuccinos and the like beverages. B1 4,715,274, 5-24-94, Cl. 99-454.000.
SPIDEM S.r.l.: *See*—
  Paoletti, Luciano, B1 4,715,274, Cl. 99-454.000.

LIST OF DESIGN PATENTEES

AbleNet, Inc.: *See*—
  Hallgren, Leander, 347,160, Cl. D8-355.000.
Adams, Fiona J., to Reebok International Ltd. Portion of a shoe upper. 347,107, 5-24-94, Cl. D2-969.000.
ADC Telecommunications, Inc.: *See*—
  Henneberger, Roy, 347,209, Cl. D13-155.000.
Adelman, Mark, to Johnson, Douglas, a georgia general partnership; and Adelman, Mark. Nail clipper with nail clippings receptacle. 347,296, 5-24-94, Cl. D28-60.000.
Aida, Chieko: *See*—
  Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
Alternative Pioneering Systems, Inc.: *See*—
  Dornbush, David A.; and Worrell, Robert, 347,140, Cl. D7-350.000.
American Allsafe Company: *See*—
  Hewitt, Charles D.; and Hewitt, Charles D., 347,233, Cl. D21-112.000.
American National Can Company: *See*—
  Heynen, Thomas W.; Halasz, Andrew; and Caliendo, Christopher L., 347,172, Cl. D9-520.000.
Ancona, Bruce. Carafe. 347,138, 5-24-94, Cl. D7-302.000.
Ancona, Bruce; and Ancona, Jane. Kettle. 347,139, 5-24-94, Cl. D7-302.000.
Ancona, Jane: *See*—
  Ancona, Bruce; and Ancona, Jane, 347,139, Cl. D7-302.000.
Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., to Chrysler Corporation. Automobile body. 347,200, 5-24-94, Cl. D12-92.000.
Ann's House of Nuts, Inc.: *See*—
  Zinke, Lenora A.; Zinke, Ernest E.; Robertson, Jerry W.; and Dunn, Henry L., 347,129, Cl. D6-468.000.
Apple Computer, Inc.: *See*—
  Riley, Raymond W., 347,212, Cl. D14-100.000.
Artz, Lawrence, to Starmark, Inc. Inflatable infant vehicle seat/bed. 347,120, 5-24-94, Cl. D6-333.000.
Avar, Eric P., to Nike, Inc. Shoe upper. 347,109, 5-24-94, Cl. D2-970.000.
Awyong, Soen T. Poultry roasting dish. 347,143, 5-24-94, Cl. D7-403.000.
Babcock Industries Inc.: *See*—
  Simonsen, Robert J., 347,162, Cl. D8-375.000.

Badley, William G.: *See*—
  Neshat, Mike A.; and Badley, William G., 347,145, Cl. D7-646.000.
Baker, Ronnie J. Baker's release glove. 347,101, 5-24-94, Cl. D2-616.000.
Ball, Edwin L., to Lexington Furniture Industries, Inc. Dresser. 347,127, 5-24-94, Cl. D6-445.000.
Ball, Edwin L., to Lexington Furniture Industries, Inc. Chest. 347,128, 5-24-94, Cl. D6-445.000.
Bancroft, Joseph C. Upper vent head. 347,286, 5-24-94, Cl. D25-124.000.
Bang & Olufsen A/S: *See*—
  Lowy, Lone L.; and Lowy, Gideon L., 347,225, Cl. D14-211.000.
Barbara Thomas Enterprises, Inc.: *See*—
  Thomas-Cote, Nancy; and Curbun, Charles, 347,243, Cl. D19-69.000.
Bareiss, Raymond E. Combined bottle and cap. 347,174, 5-24-94, Cl. D9-529.000.
Barnstead Thermolyne Corporation: *See*—
  Fenske, Lawrence J., 347,258, Cl. D23-209.000.
Bauer, Larry J.: *See*—
  Bogstad, David A.; and Bauer, Larry J., 347,173, Cl. D9-528.000.
Ben-Zur, Gilad, to Unitrol Amcor Ltd. Shower head. 347,260, 5-24-94, Cl. D23-213.000.
Berfield, Robert C.; and Seasholtz, Craig A., to Shop-Vac Corporation. Pressure washer. 347,261, 5-24-94, Cl. D23-225.000.
Berry, Andrew C. Hip pad. 347,103, 5-24-94, Cl. D2-860.000.
Bezzerides Company: *See*—
  Bezzerides, George A.; and Maki, James Y., 347,169, Cl. D9-414.000.
Bezzerides, George A.; and Maki, James Y., to Bezzerides Company. Display box. 347,169, 5-24-94, Cl. D9-414.000.
Bianco, James W., to Control Module Inc. Slot card reader. 347,213, 5-24-94, Cl. D21-38.000.
Black, David; Wedemyer, Timothy A.; and Shufelt, Mark, to Hydrokinetic design, Inc. Adjustable unit for a dual headed shower fixture. 347,262, 5-24-94, Cl. D23-230.000.
Blair Security Products Limited: *See*—
  Brown, Clive A., 347,157, Cl. D8-333.000.
Bogstad, David A.; and Bauer, Larry J., to Jennico, Inc. Container. 347,173, 5-24-94, Cl. D9-528.000.
Bornhorst, James M.; Dangerfield, Edwin B.; Maddux, James, III; Stacy, Timothy D.; and Terleski, Timothy W., to Vari-Lite, Inc. Storage and transportation trunk. 347,113, 5-24-94, Cl. D3-272.000.
Boyd, Alvin; and Foster, Nancy. Armillary sphere. 347,196, 5-24-94, Cl. D11-157.000.
Bradshaw, Bill T. Induction bender. 347,231, 5-24-94, Cl. D15-122.000.
Brady, Martin, to Hamilton Beach/Proctor - Silex, Inc. Container for blender. 347,144, 5-24-94, Cl. D7-413.000.
Braun, Morris. Bottle. 347,176, 5-24-94, Cl. D9-558.000.
Breedlove, Jacqueline. Package wrapping accessories caddy. 347,115, 5-24-94, Cl. D3-315.000.
Brigden, Garry, to CMB Manufacturing Limited. Gate for use in supermarkets. 347,284, 5-24-94, Cl. D25-50.000.
Brown, Clive A., to Blair Security Products Limited. Security seal assembly. 347,157, 5-24-94, Cl. D8-333.000.
Bruggeman, Homer F. Bag holder. 347,134, 5-24-94, Cl. D6-515.000.
Brunel, Jean, to Les Induaries Amisco LTEE. Bed on wheels. 347,125, 5-24-94, Cl. D6-388.000.
Bryant, John W.; Kellett, Alan G.; Lees, Richard A.; Japuntich, Daniel A.; and Byram, David C., to Minnesota Mining and Manufacturing Company. Valve cover. 347,299, 5-24-94, Cl. D29-7.000.
BTM Corporation: *See*—
  Sawdon, Edwin G., 347,151, Cl. D8-72.000.
Buyze, Allan W.; and Cammorata, Donald T., to Toyota Jidosha Kabushiki Kaisha. Wheel for road vehicle. 347,203, 5-24-94, Cl. D12-211.000.
Bynum, Dennis E.: *See*—
  Ross, Richard; and Bynum, Dennis E., 347,166, Cl. D9-305.000.
  Ross, Richard; and Bynum, Dennis E., 347,167, Cl. D9-305.000.
Byram, David C.: *See*—
  Bryant, John W.; Kellett, Alan G.; Lees, Richard A.; Japuntich, Daniel A.; and Byram, David C., 347,299, Cl. D29-7.000.
  Japuntich, Daniel A.; Byram, David C.; and Steffen, James E., 347,298, Cl. D29-7.000.
Caliendo, Christopher L.: *See*—
  Heynen, Thomas W.; Halasz, Andrew; and Caliendo, Christopher L., 347,172, Cl. D9-520.000.
Cammorata, Donald T.: *See*—
  Buyze, Allan W.; and Cammorata, Donald T., 347,203, Cl. D12-211.000.
Carroll, William G., to Maxim, Inc. Combination vial and card holder. 347,195, 5-24-94, Cl. D11-144.000.
Caval, Gina: *See*—
  Caval, Puiu; and Caval, Gina, 347,186, Cl. D25-38.000.
Caval, Puiu; and Caval, Gina. Concrete fence. 347,186, 5-24-94, Cl. D25-38.000.
Cecchetti, Claudio. Soccer table. 347,245, 5-24-94, Cl. D21-11.000.
Center, John L.: *See*—
  Specht, James D.; Center, John L.; and Swift, David R., 347,171, Cl. D9-434.000.
Chibuka, Shinri: *See*—
  Kaku, Daiya; Chibuka, Shinri; Sked, Gordon G.; Upex, Geoffrey; and Woolley, Richard, 347,201, Cl. D12-92.000.
Chicago Faucet Company: *See*—
  Paul, Stanley M., 347,268, Cl. D23-252.000.
Chou, Shu-Hui. Electric test pen. 347,187, 5-24-94, Cl. D10-78.000.
Chrysler Corporation: *See*—
  Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., 347,200, Cl. D12-92.000.
Ciccone, David C., to Ciccone, David C. Combined ergonomic keyboard pad and wrist rest. 347,216, 5-24-94, Cl. D14-114.000.
CMB Manufacturing Limited: *See*—
  Brigden, Garry, 347,284, Cl. D25-50.000.
Cohen, Gary M. Therapeutic pad for alleviation of headaches and related pain. 347,281, 5-24-94, Cl. D24-206.000.
Colgate-Palmolive Company: *See*—
  Segati, Umberto D. I., 347,175, Cl. D9-531.000.
Conaway, Brian J.; and Keyes, Tyrone M., to Rubbermaid Incorporated. Caster plug. 347,161, 5-24-94, Cl. D8-375.000.
Control Module Inc.: *See*—
  Bianco, James W., 347,213, Cl. D21-38.000.
Cook, Raymon W. Golf putter head. 347,253, 5-24-94, Cl. D21-219.000.
Costa, Richard, to Pharma Design, Inc. Liquid soap dispenser. 347,136, 5-24-94, Cl. D6-546.000.
Cox, Daryl R. Telephone dual earpiece. 347,228, 5-24-94, Cl. D14-243.000.
Crichton, James E.; and Munneke, Gorden R. Releasable small game carrier. 347,117, 5-24-94, Cl. D3-221.000.
Crocker, Courtenay, III; and Sekulski, Stephen J., to Paneloc Corporation. Latch mechanism. 347,159, 5-24-94, Cl. D8-339.000.
Cull, Steven J. Water filled riding toy. 347,249, 5-24-94, Cl. D21-77.000.
Curbun, Charles: *See*—
  Thomas-Cote, Nancy; and Curbun, Charles, 347,243, Cl. D19-69.000.
Daiwa Golf Co., Ltd.: *See*—
  Iinuma, Kanji, 347,254, Cl. D21-220.000.
Dangerfield, Edwin B.: *See*—
  Bornhorst, James M.; Dangerfield, Edwin B.; Maddux, James, III; Stacy, Timothy D.; and Terleski, Timothy W., 347,113, Cl. D3-272.000.
Davidson, Dan: *See*—
  Ernst, Kevin; and Davidson, Dan, 347,227, Cl. D14-239.000.
Dean, Mark D. Diskette holder. 347,130, 5-24-94, Cl. D6-630.000.
Dickens, James W., to Square D Company. Illuminated indicator wall switch. 347,211, 5-24-94, Cl. D13-171.000.
Dipper Industrial Ltd.: *See*—
  Lam, Thomas Y., 347,290, Cl. D26-63.000.
Donaghu, Michael T.: *See*—
  Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,106, Cl. D2-961.000.
Dornbush, David A.; and Worrell, Robert, to Alternative Pioneering Systems, Inc. Countertop air oven. 347,140, 5-24-94, Cl. D7-350.000.
Douglas, David S.: *See*—
  Dreibelbis, John S.; Rydquist, Daniel R.; and Douglas, David S., 347,251, Cl. D21-195.000.
Dreibelbis, John S.; Rydquist, Daniel R.; and Douglas, David S., to NordicTrack, Inc. Strength training bench. 347,251, 5-24-94, Cl. D21-195.000.
Due, Graham R.; Turnbull, Robert A.; and Gryst, Leigh, to Gro-Guard Australia Pty. Ltd. Plant guard. 347,170, 5-24-94, Cl. D9-430.000.
Dunn, Henry L.: *See*—
  Zinke, Lenora A.; Zinke, Ernest E.; Robertson, Jerry W.; and Dunn, Henry L., 347,129, Cl. D6-468.000.
Emhart Inc.: *See*—
  Yost, Hollis K., 347,267, Cl. D23-250.000.
  Yost, Hollis K., 347,269, Cl. D23-252.000.
  Yost, Hollis K., 347,270, Cl. D23-252.000.
Ernst, Kevin; and Davidson, Dan. Cover for a VCR tape slot. 347,227, 5-24-94, Cl. D14-239.000.
Esselte Meto International Produktions GmbH: *See*—
  Patzak, Peter, 347,238, Cl. D18-19.000.
Eutech Enterprise Co., Ltd.: *See*—
  Wang, Allen Y. L., 347,276, Cl. D23-366.000.
Extrusion Technology, Inc.: *See*—
  Sharpe, James M., 347,210, Cl. D13-162.000.
Fass, Charles, to U.S. Music Corporation. Cabinet for amplifier or audio components. 347,224, 5-24-94, Cl. D14-193.000.
Falconbridge, Mark. Cutting blade for rotating cutters. 347,150, 5-24-94, Cl. D8-8.000.
Falvo, Joseph S. Pan lid. 347,142, 5-24-94, Cl. D7-391.000.
Foer, David L.; and Mast, Rex R., to Rubbermaid Incorporated. Food shredder. 347,149, 5-24-94, Cl. D7-678.000.
Fendi, Paola, to Fendi Paola & Sorelle S.P.S. Textile. 347,119, 5-24-94, Cl. D5-52.000.
Fendi Paola & Sorelle S.P.S.: *See*—
  Fendi, Paola, 347,119, Cl. D5-52.000.
Fenske, Lawrence J., to Barnstead Thermolyne Corporation. Front panel for a water purifier. 347,258, 5-24-94, Cl. D23-209.000.
Ferrara, Herman A., to Ferrara, Herman A. Wood lattice basket. 347,118, 5-24-94, Cl. D3-306.000.
Ferris, Ronald G.; and Scholl, Robert C. Utility trunk pump. 347,230, 5-24-94, Cl. D15-9.000.
Fewell, Joe: *See*—
  Fewell, Mavis; and Fewell, Joe, 347,259, Cl. D23-214.000.
Fewell, Mavis; and Fewell, Joe. Sprinkler head protector. 347,259, 5-24-94, Cl. D23-214.000.
Fisher-Price, Inc.: *See*—
  Robjent, Frederick B.; and Spielberger, Lee, 347,237, Cl. D21-126.000.
  Shuler, Eric T., 347,218, Cl. D14-137.000.

Foster, David W.; and von Conta, Peter A., to Rockport Company, Inc., The. Shoe upper. 347,108, 5-24-94, Cl. D2-970.000.
Foster, Nancy: *See*—
  Boyd, Alvin; and Foster, Nancy, 347,196, Cl. D11-157.000.
Franzman, Marshall D. Inflated riding toy. 347,248, 5-24-94, Cl. D21-71.000.
Freese, T. Brent: *See*—
  Harper, Marjorie G.; and Freese, T. Brent, 347,121, Cl. D6-333.000.
Friedrich Grohe Aktiengesellschaft: *See*—
  Gottwald, Adolf, 347,264, Cl. D23-238.000.
  Gottwald, Adolf, 347,265, Cl. D23-239.000.
Fuji Photo Film Co., Ltd.: *See*—
  Okamoto, Eiichi; and Kojima, Kenji, 347,239, Cl. D18-53.000.
Fussell, David A. Christmas treetop ornament rotator. 347,207, 5-24-94, Cl. D13-112.000.
General Plastics, Inc.: *See*—
  Inda, John P.; and Inda, Joseph J., 347,271, Cl. D23-263.000.
Gentes, James J., to Giro Sport Design, Inc. Ventilated bicycle helmet. 347,300, 5-24-94, Cl. D29-12.000.
Gerry Baby Products Company: *See*—
  Harper, Marjorie G.; and Freese, T. Brent, 347,121, Cl. D6-333.000.
Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., to Johnson Service Company. Environmental control module. 347,266, 5-24-94, Cl. D23-245.000.
Giro Sport Design, Inc.: *See*—
  Gentes, James J., 347,300, Cl. D29-12.000.
Glyned Engineering, Ltd.: *See*—
  Smith, Richard H., 347,206, Cl. D12-215.000.
Godinger, Arnold, to Godinger Silver Art Co., Ltd. Clock. 347,181, 5-24-94, Cl. D10-28.000.
Godinger Silver Art Co., Ltd.: *See*—
  Godinger, Arnold, 347,181, Cl. D10-28.000.
Gottwald, Adolf, to Friedrich Grohe Aktiengesellschaft. Shower faucet. 347,264, 5-24-94, Cl. D23-238.000.
Gottwald, Adolf, to Friedrich Grohe Aktiengesellschaft. Combined bathtub faucet and hand shower. 347,265, 5-24-94, Cl. D23-239.000.
Greene, Jennifer L. Belt buckle. 347,197, 5-24-94, Cl. D11-231.000.
Greene, Timothy. Bowling glove. 347,100, 5-24-94, Cl. D2-610.000.
Grimes, Guy W., to Rapitest, Inc. Soil test kit. 347,188, 5-24-94, Cl. D10-81.000.
Gro-Guard Australia Pty. Ltd.: *See*—
  Due, Graham R.; Turnbull, Robert A.; and Gryst, Leigh, 347,170, Cl. D9-430.000.
Gryst, Leigh: *See*—
  Due, Graham R.; Turnbull, Robert A.; and Gryst, Leigh, 347,170, Cl. D9-430.000.
Guzman, Arthur G. Watchband for attachment to a belt. 347,116, 5-24-94, Cl. D3-215.000.
Halasz, Andrew: *See*—
  Heynen, Thomas W.; Halasz, Andrew; and Caliendo, Christopher L., 347,172, Cl. D9-520.000.
Hallgren, Leander, to AbleNet, Inc. Adjustable mounting system for holding an object in a desired spatial position. 347,160, 5-24-94, Cl. D8-355.000.
Ham, Byung I. Mini-fluorescent light. 347,288, 5-24-94, Cl. D26-26.000.
Hamilton Beach/Proctor - Silex, Inc.: *See*—
  Brady, Martin, 347,144, Cl. D7-413.000.
Handlbauer, Peter: *See*—
  Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, 347,189, Cl. D10-91.000.
Harper, Marjorie G.; and Freese, T. Brent, to Gerry Baby Products Company. Infant bouncer. 347,121, 5-24-94, Cl. D6-333.000.
Harrison, Susan, to Zooth, Inc. Handle for flatware and toothbrushes. 347,146, 5-24-94, Cl. D7-656.000.
Harrison, Susan, to Zooth, Inc. Handle for flatware and toothbrushes. 347,147, 5-24-94, Cl. D7-656.000.
Harrison, Susan, to Zooth, Inc. Handle for flatware and toothbrushes. 347,148, 5-24-94, Cl. D7-656.000.
Hasegawa, Shigeru: *See*—
  Ito, Masafumi; Hasegawa, Shigeru; and Takashima, Katsuhiro, 347,223, Cl. D14-164.000.
Hatfield, Tinker A.: *See*—
  Hoeft, David W.; Hatfield, Tinker A.; and Johnson, Bradford A., 347,110, Cl. D2-977.000.
Hellem, Anna A. Animal litter container enclosure. 347,304, 5-24-94, Cl. D30-161.000.
Henderson, Kirk P.: *See*—
  Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., 347,266, Cl. D23-245.000.
Henneberger, Roy, to ADC Telecommunications, Inc. Fiber trough coupling. 347,209, 5-24-94, Cl. D13-155.000.
Herrington, Eldridge P.; and Spielberg, Richard, to Miles Inc. Phlebotomist protector. 347,280, 5-24-94, Cl. D24-130.000.
Hewitt, Charles D.; and Hewitt, Charles D., to American Allsafe Company. Safety goggles. 347,233, 5-24-94, Cl. D21-112.000.
Hewitt, Charles D.: *See*—
  Hewitt, Charles D.; and Hewitt, Charles D., 347,233, Cl. D21-112.000.
Heynen, Thomas W.; Halasz, Andrew; and Caliendo, Christopher L., to American National Can Company. Fluted container. 347,172, 5-24-94, Cl. D9-520.000.
Higa, Angela M. Nursing pad. 347,278, 5-24-94, Cl. D24-124.000.
Hino, Ichiroh; and Shundoh, Tomoyuki, to Sony Corporation. Relay machine for cordless telephone. 347,222, 5-24-94, Cl. D14-149.000.
Ho, Patrick T.-M., to STD Electronic International Ltd. Hand-held electronic game housing. 347,247, 5-24-94, Cl. D21-13.000.
Hocheng Pottery Mfg. Co. Ltd.: *See*—
  Wei, Rambo, 347,273, Cl. D23-294.000.
Hoeft, David W.; Hatfield, Tinker A.; and Johnson, Bradford A., to Nike, Inc. Shoe midsole. 347,110, 5-24-94, Cl. D2-977.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
  Kaku, Daiya; Chibuka, Shinri; Sked, Gordon G.; Upex, Geoffrey; and Woolley, Richard, 347,201, Cl. D12-92.000.
Honegger, Fulvio: *See*—
  Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, 347,189, Cl. D10-91.000.
Hori, Masao, to Ohtsu Tire & Rubber Co., Ltd., The. Anti-skid tire traction unit. 347,204, 5-24-94, Cl. D12-154.000.
Huisman, George. Automotive light bar. 347,205, 5-24-94, Cl. D1-222.000.
Hydrokinetic design, Inc.: *See*—
  Black, David; Wedemyer, Timothy A.; and Shufelt, Mark, 347,262, Cl. D23-230.000.
Iinuma, Kanji, to Daiwa Golf Co., Ltd. Golf club head. 347,254, 5-24-94, Cl. D21-220.000.
Ikenaga, Takashi, to Sony Corporation. Optical disc cartridge. 347,215, 5-24-94, Cl. D14-114.000.
Inda, John P.; and Inda, Joseph J., to General Plastics, Inc. Pipe fitting. 347,271, 5-24-94, Cl. D23-263.000.
Inda, Joseph J.: *See*—
  Inda, John P.; and Inda, Joseph J., 347,271, Cl. D23-263.000.
Inora, Yasuo, to Seikosha Co., Ltd. Clock. 347,183, 5-24-94, Cl. D10-28.000.
Issa, Darrell E. Vehicle alarm transmitter. 347,190, 5-24-94, Cl. D10-106.000.
Issard, Gerard, to Wichard. U bolt assembly. 347,163, 5-24-94, Cl. D8-387.000.
Ito, Masafumi; Hasegawa, Shigeru; and Takashima, Katsuhiro, to TEAC Corporation. Digital audio tape recorder. 347,223, 5-24-94, Cl. D14-164.000.
Ives Ideas Inc.: *See*—
  Ives, Ray C., 347,234, Cl. D16-124.000.
Ives, Ray C., to Ives Ideas Inc. Contact lens tray. 347,234, 5-24-94, Cl. D16-124.000.
Jackson, Barbara K. Portable shampoo cart. 347,294, 5-24-94, Cl. D28-20.000.
Jacquet, Remy C.: *See*—
  Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, 347,189, Cl. D10-91.000.
Jafra Cosmetics, Inc.: *See*—
  Schneider, Peter, 347,165, Cl. D9-300.000.
Janosko, Robert J.: *See*—
  Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., 347,200, Cl. D12-92.000.
Japuntich, Daniel A.; Byram, David C.; and Steffen, James E., to Minnesota Mining and Manufacturing company. Valve cover. 347,298, 5-24-94, Cl. D29-7.000.
Japuntich, Daniel A.: *See*—
  Bryant, John W.; Kellett, Alan G.; Lees, Richard A.; Japuntich, Daniel A.; and Byram, David C., 347,299, Cl. D29-7.000.
Jennico, Inc.: *See*—
  Bogstad, David A.; and Bauer, Larry J., 347,173, Cl. D9-528.000.
Johnson, Bradford A., to Nike, Inc. Shoe sole. 347,105, 5-24-94, Cl. D2-952.000.
Johnson, Bradford A.: *See*—
  Hoeft, David W.; Hatfield, Tinker A.; and Johnson, Bradford A., 347,110, Cl. D2-977.000.
Johnson, Douglas: *See*—
  Adelman, Mark, 347,296, Cl. D28-60.000.
Johnson Service Company: *See*—
  Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., 347,266, Cl. D23-245.000.
Juno Lighting, Inc.: *See*—
  Roos, Scott L.; and Von Kluck, Kevin, 347,292, Cl. D26-118.000.
  Roos, Scott L.; and Von Kluck, Kevin, 347,293, Cl. D26-118.000.
Kaku, Daiya; Chibuka, Shinri; Sked, Gordon G.; Upex, Geoffrey; and Woolley, Richard, to Honda Giken Kogyo Kabushiki Kaisha. Automobile. 347,201, 5-24-94, Cl. D12-92.000.
Kameda, Takanobu: *See*—
  Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
Kano, Machiko: *See*—
  Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
Kar Bow Industrial Co., Ltd.: *See*—
  Von Winckler, Cyril, 347,283, Cl. D24-214.000.
Karl, Richard B. Table leg. 347,132, 5-24-94, Cl. D6-499.000.
Karl, Richard B. Table leg. 347,133, 5-24-94, Cl. D6-499.000.
Kasper, Gary A.: *See*—
  Rohn, Dean R.; Kasper, Gary A.; and Laramie, Daniel M., 347,305, Cl. D32-32.000.

- Katoh, Kazue, to Sony Corporation. Cordless telephone. 347,220, 5-24-94, Cl. D14-138.000.
- Kautz, Thomas O.: *See—*
  - Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., 347,266, Cl. D23-245.000.
- Kawashima, Tsunemi, to Seikosha Co., Ltd. Clock. 347,184, 5-24-94, Cl. D10-28.000.
- Kellett, Alan G.: *See—*
  - Bryant, John W.; Kellett, Alan G.; Lees, Richard A.; Japuntich, Daniel A.; and Byram, David C., 347,299, Cl. D29-7.000.
- Kennametal Inc.: *See—*
  - Massa, Ted R.; and Prizzi, John J., 347,232, Cl. D15-139.000.
- Kenney, Raymond W., to Sandco, Inc. Pawl and ratchet for aligning continuous feed paper in a printer and embosser. 347,240, 5-24-94, Cl. D18-56.000.
- Kerr, Macauley D.; and McCormick, Gary D. Multipurpose golfer's tool. 347,255, 5-24-94, Cl. D21-234.000.
- Keyes, Tyrone M.: *See—*
  - Conaway, Brian J.; and Keyes, Tyrone M., 347,161, Cl. D8-375.000.
- Keyser, Ricky G. Security lockbox with visual inspection window for temperature controls on swimming pool and spa heaters. 347,193, 5-24-94, Cl. D10-49.000.
- Kierstead, Bruce E.: *See—*
  - Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., 347,266, Cl. D23-245.000.
- King Jim Co., Ltd.: *See—*
  - Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
- Kinney, Todd A.; and Wynkoop, Kenneth J. Indicator flag buoy for divers. 347,191, 5-24-94, Cl. D10-107.000.
- Kohler Co.: *See—*
  - Reid, Mary J., 347,272, Cl. D23-292.000.
- Kohler, William: *See—*
  - Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, 347,189, Cl. D10-91.000.
- Kojima, Kenji: *See—*
  - Okamoto, Eiichi; and Kojima, Kenji, 347,239, Cl. D18-53.000.
- Kolberg, Justus, to Tecno S.P.A. Mobilie Forniture Per Arredamento. Folding chair. 347,122, 5-24-94, Cl. D6-368.000.
- Kong, Richard C.: *See—*
  - Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., 347,200, Cl. D12-92.000.
- Konichek, William G. Moose rattler. 347,192, 5-24-94, Cl. D10-116.000.
- Kramer, Barry L. Multi-shade arc boom lamp. 347,291, 5-24-94, Cl. D26-102.000.
- Krape, Paul E.: *See—*
  - Schlack, Richard E.; and Krape, Paul E., 347,155, Cl. D8-331.000.
- Kugler, Erich O.: *See—*
  - Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., 347,200, Cl. D12-92.000.
- Kurokawa, Seiji: *See—*
  - Ooi, Hiroshi; and Kurokawa, Seiji, 347,235, Cl. D16-202.000.
  - Ooi, Hiroshi; and Kurokawa, Seiji, 347,236, Cl. D16-202.000.
- Lam, Thomas Y., to Dipper Industrial Ltd. Adjustable table lamp. 347,290, 5-24-94, Cl. D26-63.000.
- Laramie, Daniel M.: *See—*
  - Rohn, Dean R.; Kasper, Gary A.; and Laramie, Daniel M., 347,305, Cl. D32-32.000.
- Lees, Richard A.: *See—*
  - Bryant, John W.; Kellett, Alan G.; Lees, Richard A.; Japuntich, Daniel A.; and Byram, David C., 347,299, Cl. D29-7.000.
- Les Induaries Amisco LTEE: *See—*
  - Brunel, Jean, 347,125, Cl. D6-388.000.
- Leu, Carl W., to Poli-Auto, Inc. Imitation car phone antenna. 347,226, 5-24-94, Cl. D14-234.000.
- Levine, Norman D. Protective knee pad for use by snowboarders, roller bladers, skaters, etc. 347,301, 5-24-94, Cl. D29-20.000.
- Lexington Furniture Industries, Inc.: *See—*
  - Ball, Edwin L., 347,127, Cl. D6-445.000.
  - Ball, Edwin L., 347,128, Cl. D6-445.000.
- Lovell, Russell G. Combined dryer and defogger for a bathroom mirror. 347,275, 5-24-94, Cl. D23-355.000.
- Lowsky, Bernie. Chair. 347,123, 5-24-94, Cl. D6-369.000.
- Lowsky, Bernie. Chair. 347,124, 5-24-94, Cl. D6-373.000.
- Lowy, Gideon L.: *See—*
  - Lowy, Lone L.; and Lowy, Gideon L., 347,225, Cl. D14-211.000.
- Lowy, Lone L.; and Lowy, Gideon L., to Bang & Olufsen A/S. Loudspeaker. 347,225, 5-24-94, Cl. D14-211.000.
- Lucas, Robert J.: *See—*
  - Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,106, Cl. D2-961.000.
- Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, to Mettler-Toledo AG. Weighing scale with windscreen housing. 347,189, 5-24-94, Cl. D10-91.000.
- Lyden, Robert M.: *See—*
  - Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,106, Cl. D2-961.000.
- Maddux, James, III: *See—*
  - Bornhorst, James M.; Dangerfield, Edwin B.; Maddux, James, III; Stacy, Timothy D.; and Terleski, Timothy W., 347,113, Cl. D3-272.000.
- Maillard, Philippe, to Tefal S.A. Cooking pan. 347,141, 5-24-94, Cl. D7-361.000.
- Maki, James Y.: *See—*
  - Bezzerides, George A.; and Maki, James Y., 347,169, Cl. D9-414.000.
- Maki, John J. Combined school bus warning light and remote control therefor. 347,289, 5-24-94, Cl. D26-28.000.
- Makita Corporation: *See—*
  - Uneyama, Tsunehito, 347,153, Cl. D8-62.000.
- Mann, Fred W. Compartmented animal feeder. 347,303, 5-24-94, Cl. D30-130.000.
- Maple, Wade A. F., to Rubbermaid Incorporated. Bird house. 347,302, 5-24-94, Cl. D30-110.000.
- Marino, Jasper: *See—*
  - Mohawk, Michael L.; Marino, Mario; and Marino, Jasper, 347,152, Cl. D8-40.000.
- Marino, Mario: *See—*
  - Mohawk, Michael L.; Marino, Mario; and Marino, Jasper, 347,152, Cl. D8-40.000.
- Marmier, Yves: *See—*
  - Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, 347,189, Cl. D10-91.000.
- Martin, Edward A.; and Mendicino, Michael S., to Mueller Electric Co. Shielded double banana plug. 347,208, 5-24-94, Cl. D13-133.000.
- Massa, Ted R.; and Prizzi, John J., to Kennametal Inc. Tip with lobes. 347,232, 5-24-94, Cl. D15-139.000.
- Mast, Rex R.: *See—*
  - Feer, David L.; and Mast, Rex R., 347,149, Cl. D7-678.000.
- Maxim, Inc.: *See—*
  - Carroll, William G., 347,195, Cl. D11-144.000.
- Mayer, David. Molded roof tile. 347,287, 5-24-94, Cl. D25-140.000.
- McCabe, David J.; and McCabe, Karen. Hair pin. 347,295, 5-24-94, Cl. D28-39.000.
- McCabe, Karen: *See—*
  - McCabe, David J.; and McCabe, Karen, 347,295, Cl. D28-39.000.
- McCormick, Gary D.: *See—*
  - Kerr, Macauley D.; and McCormick, Gary D., 347,255, Cl. D21-234.000.
- McGreevy, William T., to Recoton Corporation. Low power transmitter and receiver. 347,219, 5-24-94, Cl. D14-137.000.
- McGrew, Henry E., Jr. Septic tank for holding sewerage. 347,257, 5-24-94, Cl. D23-202.000.
- McLachlan, Scott D., to U.S. Philips Corporation. Television receiver. 347,217, 5-24-94, Cl. D14-126.000.
- McWhirter, Andrew W. Stick-on condom holder/dispenser. 347,137, 5-24-94, Cl. D6-567.000.
- Mendicino, Michael S.: *See—*
  - Martin, Edward A.; and Mendicino, Michael S., 347,208, Cl. D13-133.000.
- Mettler-Toledo AG: *See—*
  - Luechinger, Paul; Handlbauer, Peter; Jacquet, Remy C.; Marmier, Yves; Kohler, William; and Honegger, Fulvio, 347,189, Cl. D10-91.000.
- Miles Inc.: *See—*
  - Herrington, Eldridge P.; and Spielberg, Richard, 347,280, Cl. D24-130.000.
- Ming-Chang, Chen. Bicycle handlebar grip. 347,154, 5-24-94, Cl. D8-303.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Bryant, John W.; Kellett, Alan G.; Lees, Richard A.; Japuntich, Daniel A.; and Byram, David C., 347,299, Cl. D29-7.000.
  - Japuntich, Daniel A.; Byram, David C.; and Steffen, James E., 347,298, Cl. D29-7.000.
  - Wodka, Michael A., 347,164, Cl. D8-395.000.
- Mohawk, Michael L.; Marino, Mario; and Marino, Jasper. Ring bottle opener. 347,152, 5-24-94, Cl. D8-40.000.
- Monadnock Lifetime Products, Inc.: *See—*
  - Starrett, Paul D.; and Pelkey, Gary, 347,156, Cl. D8-333.000.
- Monica, Francis E., Jr. Fan. 347,112, 5-24-94, Cl. D3-4.000.
- Morand, Michel, to Wyant & Company Limited. Paper towel dispenser housing. 347,135, 5-24-94, Cl. D6-522.000.
- Motorola, Inc.: *See—*
  - Siddoway, Craig F., 347,221, Cl. D14-138.000.
- Mueller Electric Co.: *See—*
  - Martin, Edward A.; and Mendicino, Michael S., 347,208, Cl. D13-133.000.
- Mukoyama, Masumi, to Seikosha Co., Ltd. Clock. 347,180, 5-24-94, Cl. D10-26.000.
- Munneke, Gorden R.: *See—*
  - Crichton, James E.; and Munneke, Gorden R., 347,117, Cl. D3-221.000.
- Myles, Dennis: *See—*
  - Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., 347,200, Cl. D12-92.000.
- Nelson, Brenda. High heeled shoe. 347,099, 5-24-94, Cl. D2-935.000.
- Neshat, Mike A.; and Badley, William G., to Scott Fetzer Company, The. Electric knife handle. 347,145, 5-24-94, Cl. D7-646.000.
- Nike, Inc.: *See—*
  - Avar, Eric P., 347,109, Cl. D2-970.000.

  - Hoeft, David W.; Hatfield, Tinker A.; and Johnson, Bradford A., 347,110, Cl. D2-977.000.
  - Johnson, Bradford A., 347,105, Cl. D2-952.000.
  - Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,106, Cl. D2-961.000.
- Nissan Motor Co., Ltd.: *See—*
  - Semple, Thomas H., 347,198, Cl. D12-91.000.
- NordicTrack, Inc.: *See—*
  - Dreibelbis, John S.; Rydquist, Daniel R.; and Douglas, David S., 347,251, Cl. D21-195.000.
- Ohtsu Tire & Rubber Co., Ltd., The: *See—*
  - Hori, Masao, 347,204, Cl. D12-154.000.
- Oka, Kengo, to Sumitomo Rubber Industries, Ltd. Golf ball. 347,252, 5-24-94, Cl. D21-205.000.
- Okamoto, Eiichi; and Kojima, Kenji, to Fuji Photo Film Co., Ltd. Ink jet printer. 347,239, 5-24-94, Cl. D18-53.000.
- Ooi, Hiroshi; and Kurokawa, Seiji, to Sharp Kabushiki Kaisha. Combined video tape recorder and camera. 347,235, 5-24-94, Cl. D16-202.000.
- Ooi, Hiroshi; and Kurokawa, Seiji, to Sharp Kabushiki Kaisha. Combined video tape recorder and camera. 347,236, 5-24-94, Cl. D16-202.000.
- Oyanagi, Tsuyoshi, to Seikosha Co., Ltd. Clock. 347,179, 5-24-94, Cl. D10-25.000.
- Paneloc Corporation: *See—*
  - Crocker, Courtenay, III; and Sekulski, Stephen J., 347,159, Cl. D8-339.000.
- Patzak, Peter, to Esselte Meto International Produktions GmbH. Hand held labeling gun. 347,238, 5-24-94, Cl. D18-19.000.
- Paul, Stanley M., to Chicago Faucet Company. Faucet handle. 347,268, 5-24-94, Cl. D23-252.000.
- Peersmann, Richard F. M., to Pollyflame International B.V. Clock with alarm. 347,177, 5-24-94, Cl. D10-6.000.
- Pelkey, Gary: *See—*
  - Starrett, Paul D.; and Pelkey, Gary, 347,156, Cl. D8-333.000.
- Perkins, Sarah D. Diaper. 347,279, 5-24-94, Cl. D24-126.000.
- Pharma Design, Inc.: *See—*
  - Costa, Richard, 347,136, Cl. D6-546.000.
- Phillips, Matthew, to Reebok International Ltd. Combined cover and connector for use with an inflation mechanism for athletic equipment. 347,263, 5-24-94, Cl. D23-231.000.
- Poli-Auto, Inc.: *See—*
  - Leu, Carl W., 347,226, Cl. D14-234.000.
- Pollyflame International B.V.: *See—*
  - Peersmann, Richard F. M., 347,177, Cl. D10-6.000.
- Prevost, Rene, to Societe Elm Leblanc. Water heater. 347,274, 5-24-94, Cl. D23-318.000.
- Prizzi, John J.: *See—*
  - Massa, Ted R.; and Prizzi, John J., 347,232, Cl. D15-139.000.
- Rapitest, Inc.: *See—*
  - Grimes, Guy W., 347,188, Cl. D10-81.000.
- Recot, Inc.: *See—*
  - Specht, James D.; Center, John L.; and Swift, David R., 347,171, Cl. D9-434.000.
- Recoton Corporation: *See—*
  - McGreevy, William T., 347,219, Cl. D14-137.000.
- Reebok International Ltd.: *See—*
  - Adams, Fiona J., 347,107, Cl. D2-969.000.
  - Phillips, Matthew, 347,263, Cl. D23-231.000.
- Regency Merchandise, Inc.: *See—*
  - Yu, Jack, 347,250, Cl. D21-147.000.
- Reid, Mary J., to Kohler Co. Pedestal lavatory. 347,272, 5-24-94, Cl. D23-292.000.
- Rexair, Inc.: *See—*
  - Rohn, Dean R.; Kasper, Gary A.; and Laramie, Daniel M., 347,305, Cl. D32-32.000.
- Riley, Raymond W., to Apple Computer, Inc. Enclosure for a computer. 347,212, 5-24-94, Cl. D14-100.000.
- Robertson, Jerry W.: *See—*
  - Zinke, Lenora A.; Zinke, Ernest E.; Robertson, Jerry W.; and Dunn, Henry L., 347,129, Cl. D6-468.000.
- Robjent, Frederick B.; and Spielberger, Lee, to Fisher-Price, Inc. Roller skate. 347,237, 5-24-94, Cl. D21-226.000.
- Rockport Company, Inc., The: *See—*
  - Foster, David W.; and von Conta, Peter A., 347,108, Cl. D2-970.000.
- Rogers, John D.; and Webb, Donald J. Extension ladder paint tray. 347,306, 5-24-94, Cl. D32-53.100.
- Rohn, Dean R.; Kasper, Gary A.; and Laramie, Daniel M., to Rexair, Inc. Vacuum cleaner nozzle. 347,305, 5-24-94, Cl. D32-32.000.
- Roos, Scott L.; and Von Kluck, Kevin, to Juno Lighting, Inc. Recessed lighting fixture baffle with integral stepped collar. 347,292, 5-24-94, Cl. D26-118.000.
- Roos, Scott L.; and Von Kluck, Kevin, to Juno Lighting, Inc. Recessed lighting fixture trim having a decorative portion with a translucent band. 347,293, 5-24-94, Cl. D26-118.000.
- Roser, John L., Jr., to Williams, Vaughan Bassett. Chest. 347,126, 5-24-94, Cl. D6-439.000.
- Ross, Richard; and Bynum, Dennis E., to Bynum, Dennis E. Bag. 347,166, 5-24-94, Cl. D9-305.000.
- Ross, Richard; and Bynum, Dennis E., to Bynum, Dennis E. Bag. 347,167, 5-24-94, Cl. D9-305.000.
- Rubbermaid Incorporated: *See—*
  - Conaway, Brian J.; and Keyes, Tyrone M., 347,161, Cl. D8-375.000.
  - Feer, David L.; and Mast, Rex R., 347,149, Cl. D7-678.000.
  - Maple, Wade A. F., 347,302, Cl. D30-110.000.
  - Wolff, Stacy L., 347,131, Cl. D6-479.000.
- Rydquist, Daniel R.: *See—*
  - Dreibelbis, John S.; Rydquist, Daniel R.; and Douglas, David S., 347,251, Cl. D21-195.000.
- St. Louis Retaining Wall Co., Inc.: *See—*
  - Woolbright, Mark A., 347,285, Cl. D25-113.000.
- Sandco, Inc.: *See—*
  - Kenney, Raymond W., 347,240, Cl. D18-56.000.
- Sawdon, Edwin G., to BTM Corporation. Plastic toggle clamp. 347,151, 5-24-94, Cl. D8-72.000.
- Schlack, Richard E.; and Krape, Paul E., to Southco, Inc. Slam latch. 347,155, 5-24-94, Cl. D8-331.000.
- Schneider, Peter, to Jafra Cosmetics, Inc. Combined dispenser and cap. 347,165, 5-24-94, Cl. D9-300.000.
- Scholl, Robert C.: *See—*
  - Ferris, Ronald G.; and Scholl, Robert C., 347,230, Cl. D15-9.000.
- Schultz, Bruce R.: *See—*
  - Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., 347,266, Cl. D23-245.000.
- Scott Fetzer Company, The: *See—*
  - Neshat, Mike A.; and Badley, William G., 347,145, Cl. D7-646.000.
- Seasholtz, Craig A.: *See—*
  - Berfield, Robert C.; and Seasholtz, Craig A., 347,261, Cl. D23-225.000.
- Segati, Umberto D. I., to Colgate-Palmolive Company. Combined bottle and cap. 347,175, 5-24-94, Cl. D9-531.000.
- Seikosha Co., Ltd.: *See—*
  - Inora, Yasuo, 347,183, Cl. D10-28.000.
  - Kawashima, Tsunemi, 347,184, Cl. D10-28.000.
  - Mukoyama, Masumi, 347,180, Cl. D10-26.000.
  - Oyanagi, Tsuyoshi, 347,179, Cl. D10-25.000.
  - Shimamura, Katsumi, 347,185, Cl. D10-28.000.
  - Wada, Mitsuo, 347,182, Cl. D10-28.000.
- Sekulski, Stephen J.: *See—*
  - Crocker, Courtenay, III; and Sekulski, Stephen J., 347,159, Cl. D8-339.000.
- Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., to Nike, Inc. Bladder element for a shoe sole. 347,106, 5-24-94, Cl. D2-961.000.
- Semple, Thomas H., to Nissan Motor Co., Ltd. Automobile. 347,198, 5-24-94, Cl. D12-91.000.
- Shaffer, Robin D.: *See—*
  - Giese, Robert D.; Kierstead, Bruce E.; Kautz, Thomas O.; Shaffer, Robin D.; Henderson, Kirk P.; and Schultz, Bruce R., 347,266, Cl. D23-245.000.
- Sharp Kabushiki Kaisha: *See—*
  - Ooi, Hiroshi; and Kurokawa, Seiji, 347,235, Cl. D16-202.000.
  - Ooi, Hiroshi; and Kurokawa, Seiji, 347,236, Cl. D16-202.000.
- Sharpe, James M., to Extrusion Technology, Inc. Enclosure for electrical equipment. 347,210, 5-24-94, Cl. D13-162.000.
- Shen, Alice. Lock for an automatic gear shift lever. 347,158, 5-24-94, Cl. D8-333.000.
- Shimamura, Katsumi, to Seikosha Co., Ltd. Clock. 347,185, 5-24-94, Cl. D10-28.000.
- Shop-Vac Corporation: *See—*
  - Berfield, Robert C.; and Seasholtz, Craig A., 347,261, Cl. D23-225.000.
- Shufelt, Mark: *See—*
  - Black, David; Wedemyer, Timothy A.; and Shufelt, Mark, 347,262, Cl. D23-230.000.
- Shuler, Eric T., to Fisher-Price, Inc. Monitor transmitter. 347,218, 5-24-94, Cl. D14-137.000.
- Shundoh, Tomoyuki: *See—*
  - Hino, Ichiroh; and Shundoh, Tomoyuki, 347,222, Cl. D14-149.000.
- Siddoway, Craig F., to Motorola, Inc. Portable communication device. 347,221, 5-24-94, Cl. D14-138.000.
- Simonsen, Robert J., to Babcock Industries Inc. Shock absorbing caster. 347,162, 5-24-94, Cl. D8-375.000.
- Sims, Daniel J.: *See—*
  - Anness, Timothy W.; Myles, Dennis; Janosko, Robert J.; Sims, Daniel J.; Kong, Richard C.; and Kugler, Erich O., 347,200, Cl. D12-92.000.
- Sked, Gordon G.: *See—*
  - Kaku, Daiya; Chibuka, Shinri; Sked, Gordon G.; Upex, Geoffrey; and Woolley, Richard, 347,201, Cl. D12-92.000.
- Skinner, Mark E. Novelty plaque. 347,194, 5-24-94, Cl. D11-133.000.
- Smith, Richard H., to Glyned Engineering, Ltd. Anchor (bower and mooring). 347,206, 5-24-94, Cl. D12-215.000.
- Smith, Robert C., to Unette Corporation. Dispensing container. 347,168, 5-24-94, Cl. D9-306.000.
- Smith, Thomas J., to TII Industries, Inc. Telephone network interface module. 347,229, 5-24-94, Cl. D14-240.000.
- Snedden, John. Pre-measured dispensing ampule. 347,277, 5-24-94, Cl. D24-115.000.
- Societe Elm Leblanc: *See—*
  - Prevost, Rene, 347,274, Cl. D23-318.000.
- Sony Corporation: *See—*
  - Hino, Ichiroh; and Shundoh, Tomoyuki, 347,222, Cl. D14-149.000.
  - Ikenaga, Takashi, 347,215, Cl. D14-114.000.
  - Katoh, Kazue, 347,220, Cl. D14-138.000.
- Southco, Inc.: *See—*
  - Schlack, Richard E.; and Krape, Paul E., 347,155, Cl. D8-331.000.
- Specht, James D.; Center, John L.; and Swift, David R., to Recot, Inc. Bag clip. 347,171, 5-24-94, Cl. D9-434.000.

- Spielberg, Richard: *See—*
  - Herrington, Eldridge P.; and Spielberg, Richard, 347,280, Cl. D24-130.000.
- Spielberger, Lee: *See—*
  - Robjent, Frederick B.; and Spielberger, Lee, 347,237, Cl. D21-226.000.
- Square D Company: *See—*
  - Dickens, James W., 347,211, Cl. D13-171.000.
- Stacy, Timothy D.: *See—*
  - Bornhorst, James M.; Dangerfield, Edwin B.; Maddux, James, III; Stacy, Timothy D.; and Terleski, Timothy W., 347,113, Cl. D3-272.000.
- Starmark, Inc.: *See—*
  - Artz, Lawrence, 347,120, Cl. D6-333.000.
- Starrett, Paul D.; and Pelkey, Gary, to Monadnock Lifetime Products, Inc. Handcuffs. 347,156, 5-24-94, Cl. D8-333.000.
- STD Electronic International Ltd.: *See—*
  - Ho, Patrick T.-M., 347,247, Cl. D21-13.000.
- Steffen, James E.: *See—*
  - Japuntich, Daniel A.; Byram, David C.; and Steffen, James E., 347,298, Cl. D29-7.000.
- Strasser, Gay L. Teddy belt. 347,102, 5-24-94, Cl. D2-627.000.
- Strayer, Sandy L.; and Tripp, Virgil P. Combined grip and trigger guard for a handgun. 347,256, 5-24-94, Cl. D22-108.000.
- Sumitomo Rubber Industries, Ltd.: *See—*
  - Oka, Kengo, 347,252, Cl. D21-205.000.
- Sunrex Technology Corp.: *See—*
  - You-Chi, Liu, 347,214, Cl. D14-106.000.
- Suzuki, Takeyasu: *See—*
  - Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
- Swift, David R.: *See—*
  - Specht, James D.; Center, John L.; and Swift, David R., 347,171, Cl. D9-434.000.
- Takashima, Katsuhiro: *See—*
  - Ito, Masafumi; Hasegawa, Shigeru; and Takashima, Katsuhiro, 347,223, Cl. D14-164.000.
- Taniguchi, Yuichiro: *See—*
  - Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
- Taphorn, Warren K. Clock for a calendar. 347,178, 5-24-94, Cl. D10-24.000.
- TEAC Corporation: *See—*
  - Ito, Masafumi; Hasegawa, Shigeru; and Takashima, Katsuhiro, 347,223, Cl. D14-164.000.
- Tecno S.P.A. Mobilie Forniture Per Arredamento: *See—*
  - Kolberg, Justus, 347,122, Cl. D6-368.000.
- Tefal S.A.: *See—*
  - Maillard, Philippe, 347,141, Cl. D7-361.000.
- Tengvall, Henri A. Case for holding hand tools. 347,114, 5-24-94, Cl. D3-281.000.
- Terleski, Timothy W.: *See—*
  - Bornhorst, James M.; Dangerfield, Edwin B.; Maddux, James, III; Stacy, Timothy D.; and Terleski, Timothy W., 347,113, Cl. D3-272.000.
- Thomas-Cote, Nancy; and Curbun, Charles, to Barbara Thomas Enterprises, Inc. Label dispenser. 347,243, 5-24-94, Cl. D19-69.000.
- TII Industries, Inc.: *See—*
  - Smith, Thomas J., 347,229, Cl. D14-240.000.
- Toyota Jidosha Kabushiki Kaisha: *See—*
  - Buyze, Allan W.; and Cammorata, Donald T., 347,203, Cl. D12-211.000.
- Tripp, Virgil P.: *See—*
  - Strayer, Sandy L.; and Tripp, Virgil P., 347,256, Cl. D22-108.000.
- Tsun, Lin Y. Bicycle. 347,202, 5-24-94, Cl. D12-108.000.
- Turnbull, Robert A.: *See—*
  - Due, Graham R.; Turnbull, Robert A.; and Gryst, Leigh, 347,170, Cl. D9-430.000.
- Unette Corporation: *See—*
  - Smith, Robert C., 347,168, Cl. D9-306.000.
- Uneyama, Tsunehito, to Makita Corporation. Portable electric grinder. 347,153, 5-24-94, Cl. D8-62.000.
- U.S. Music Corporation: *See—*
  - Fass, Charles, 347,224, Cl. D14-193.000.
- U.S. Philips Corporation: *See—*
  - McLachlan, Scott D., 347,217, Cl. D14-126.000.
- Unitrol Amcor Ltd.: *See—*
  - Ben-Zur, Gilad, 347,260, Cl. D23-213.000.
- Upex, Geoffrey: *See—*
  - Kaku, Daiya; Chibuka, Shinri; Sked, Gordon G.; Upex, Geoffrey; and Woolley, Richard, 347,201, Cl. D12-92.000.
- Vari-Lite, Inc.: *See—*
  - Bornhorst, James M.; Dangerfield, Edwin B.; Maddux, James, III; Stacy, Timothy D.; and Terleski, Timothy W., 347,113, Cl. D3-272.000.
- Vesco, Rene, to Vesco, Rene. Lipstick caddy. 347,297, 5-24-94, Cl. D28-77.000.
- von Conta, Peter A.: *See—*
  - Foster, David W.; and von Conta, Peter A., 347,108, Cl. D2-770.000.
- Von Kluck, Kevin: *See—*
  - Roos, Scott L.; and Von Kluck, Kevin, 347,292, Cl. D26-118.000.
  - Roos, Scott L.; and Von Kluck, Kevin, 347,293, Cl. D26-118.000.
- Von Winckler, Cyril, to Kar Bow Industrial Co., Ltd. Rechargeable ifraderm. 347,283, 5-24-94, Cl. D24-214.000.
- Vossler, Roy L. Hat. 347,104, 5-24-94, Cl. D2-887.000.
- Wada, Mitsuo, to Seikosha Co., Ltd. Clock. 347,182, 5-24-94, Cl. D10-28.000.
- Wang, Allen Y. L., to Eutech Enterprise Co., Ltd. Air freshener. 347,276, 5-24-94, Cl. D23-366.000.
- Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, to King Jim Co., Ltd. Tape cartridge for tape writing machine. 347,241, 5-24-94, Cl. D18-56.000.
- Webb, Donald J.: *See—*
  - Rogers, John D.; and Webb, Donald J., 347,306, Cl. D32-53.100.
- Wedemyer, Timothy A.: *See—*
  - Black, David; Wedemyer, Timothy A.; and Shufelt, Mark, 347,262, Cl. D23-230.000.
- Wei, Rambo, to Hocheng Pottery Mfg. Co. Ltd. Lavatory. 347,273, 5-24-94, Cl. D23-294.000.
- Weinstein, James D. Vehicle. 347,199, 5-24-94, Cl. D12-92.000.
- Wen, M. C. Computer game unit. 347,246, 5-24-94, Cl. D21-13.000.
- Wheeler, Patrice E. Hand fan. 347,111, 5-24-94, Cl. D3-1.000.
- Whitmire, Betty A. Sign holder. 347,244, 5-24-94, Cl. D20-41.000.
- Wichard: *See—*
  - Issard, Gerard, 347,163, Cl. D8-387.000.
- Williams, Vaughan Bassett: *See—*
  - Roser, John L., Jr., 347,126, Cl. D6-439.000.
- Wodka, Michael A., to Minnesota Mining and Manufacturing Company. Pole clip for wires or tubing. 347,164, 5-24-94, Cl. D8-395.000.
- Wolff, Stacy L., to Rubbermaid Incorporated. Bookcase. 347,131, 5-24-94, Cl. D6-479.000.
- Woolbright, Mark A., to St. Louis Retaining Wall Co., Inc. Retaining wall building block. 347,285, 5-24-94, Cl. D25-113.000.
- Woolley, Richard: *See—*
  - Kaku, Daiya; Chibuka, Shinri; Sked, Gordon G.; Upex, Geoffrey; and Woolley, Richard, 347,201, Cl. D12-92.000.
- Worrell, Robert: *See—*
  - Dornbush, David A.; and Worrell, Robert, 347,140, Cl. D7-350.000.
- Wyant & Company Limited: *See—*
  - Morand, Michel, 347,135, Cl. D6-522.000.
- Wynkoop, Kenneth J.: *See—*
  - Kinney, Todd A.; and Wynkoop, Kenneth J., 347,191, Cl. D10-107.000.
- Yamaguchi, Atsuko: *See—*
  - Watanabe, Kenji; Kameda, Takanobu; Suzuki, Takeyasu; Taniguchi, Yuichiro; Yamaguchi, Atsuko; Kano, Machiko; and Aida, Chieko, 347,241, Cl. D18-56.000.
- Yarnmunilert, Udom. Greeting card. 347,242, 5-24-94, Cl. D19-6.000.
- Yoo, Tae W. Acupressure stimulator. 347,282, 5-24-94, Cl. D24-211.000.
- Yost, Hollis K., to Emhart Inc. Lavatory faucet knob. 347,267, 5-24-94, Cl. D23-250.000.
- Yost, Hollis K., to Emhart Inc. Faucet handle. 347,269, 5-24-94, Cl. D23-252.000.
- Yost, Hollis K., to Emhart Inc. Faucet handle. 347,270, 5-24-94, Cl. D23-252.000.
- You-Chi, Liu, to Sunrex Technology Corp. Notebook computer. 347,214, 5-24-94, Cl. D14-106.000.
- Yu, Jack, to Regency Merchandise, Inc. Toy water gun. 347,250, 5-24-94, Cl. D21-147.000.
- Zinke, Ernest E.: *See—*
  - Zinke, Lenora A.; Zinke, Ernest E.; Robertson, Jerry W.; and Dunn, Henry L., 347,129, Cl. D6-468.000.
- Zinke, Lenora A.; Zinke, Ernest E.; Robertson, Jerry W.; and Dunn, Henry L., to Ann's House of Nuts, Inc. Display rack. 347,129, 5-24-94, Cl. D6-468.000.
- Zooth, Inc.: *See—*
  - Harrison, Susan, 347,146, Cl. D7-656.000.
  - Harrison, Susan, 347,147, Cl. D7-656.000.
  - Harrison, Susan, 347,148, Cl. D7-656.000.

LIST OF PLANT PATENTEES

- Amorao, Amado Q.: *See—*
  - Sjulin, Thomas M.; Amorao, Amado Q.; and Espejo, Joseph I., Jr., 8,745, Cl. 48.000.
- Bartels, G. B. H., to Bartels, G. B. H. Aster plant named White Master. 8,749, 5-24-94, Cl. 68.100.
- Bear Creek Gardens, Inc.: *See—*
  - Evers, Hans, 8,743, Cl. 28.000.
  - Laver, Keith G., 8,742, Cl. 8.100.
  - Warriner, William A., deceased, 8,741, Cl. 6.000.
- Driscoll Strawberry Associates, Inc.: *See—*
  - Sjulin, Thomas M.; Amorao, Amado Q.; and Espejo, Joseph I., Jr., 8,745, Cl. 48.000.
- Espejo, Joseph I., Jr.: *See—*
  - Sjulin, Thomas M.; Amorao, Amado Q.; and Espejo, Joseph I., Jr., 8,745, Cl. 48.000.
- Evers, Hans, to Bear Creek Gardens, Inc. Floribunda rose plant named 'Tanravens' . 8,743, 5-24-94, Cl. 28.000.
- Goldsmith Seeds, Inc.: *See—*
  - Hanes, Mitchell, 8,750, Cl. 87.120.
  - Hanes, Mitchell, 8,751, Cl. 87.120.
  - Hanes, Mitchell, 8,752, Cl. 87.120.
- Hanes, Mitchell, to Goldsmith Seeds, Inc. Geranium named Americana Violet. 8,750, 5-24-94, Cl. 87.120.
- Hanes, Mitchell, to Goldsmith Seeds, Inc. Geranium named Eclipse White. 8,751, 5-24-94, Cl. 87.120.
- Hanes, Mitchell, to Goldsmith Seeds, Inc. Geranium named Americana Red. 8,752, 5-24-94, Cl. 87.120.
- Izhar, Shamay; and Izsak, Eva, to Volcani Center, State of Israel, Ministry of Agriculture, The. Strawberry plant Ofra. 8,746, 5-24-94, Cl. 49.000.
- Izhar, Shamay; and Izsak, Eva, to Volcani Center, State of Israel, Ministry of Agriculture, The. Strawberry plant Nama. 8,747, 5-24-94, Cl. 49.000.
- Izhar, Shamay; and Izsak, Eva, to Volcani Center, State of Israel, Ministry of Agriculture, The. Strawberry plant Virginia. 8,748, 5-24-94, Cl. 49.000.
- Izsak, Eva: *See—*
  - Izhar, Shamay; and Izsak, Eva, 8,746, Cl. 49.000.
  - Izhar, Shamay; and Izsak, Eva, 8,747, Cl. 49.000.
  - Izhar, Shamay; and Izsak, Eva, 8,748, Cl. 49.000.
- Laver, Keith G., to Bear Creek Gardens, Inc. Rose plant Lavaway. 8,742, 5-24-94, Cl. 8.100.
- Sjulin, Thomas M.; Amorao, Amado Q.; and Espejo, Joseph I., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant called 'Avila'. 8,745, 5-24-94, Cl. 48.000.
- Thiara, Sarbjit. Peach tree, "Thiara". 8,744, 5-24-94, Cl. 43.100.
- Volcani Center, State of Israel, Ministry of Agriculture, The: *See—*
  - Izhar, Shamay; and Izsak, Eva, 8,746, Cl. 49.000.
  - Izhar, Shamay; and Izsak, Eva, 8,747, Cl. 49.000.
  - Izhar, Shamay; and Izsak, Eva, 8,748, Cl. 49.000.
- Warriner, Alene Beatrice, legal representative: *See—*
  - Warriner, William A., deceased, 8,741, Cl. 6.000.
- Warriner, William A., deceased (by Warriner, Alene Beatrice, legal representative), to Bear Creek Gardens, Inc. Climbing rose plant named 'JACsat'. 8,741, 5-24-94, Cl. 6.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 24, 1994

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
8	5,313,665
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CLASS 5	
639	5,313,678
659	5,313,679
CLASS 7	
138	5,313,680
CLASS 8	
115.56	5,314,504
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CLASS 14	
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CLASS 15	
29	5,313,682
117	5,313,683
167.1	5,313,684
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323	5,313,686
394	5,313,687
CLASS 19	
107	5,313,688
293	5,313,689
CLASS 23	
295 R	5,314,506
CLASS 24	
69 J	5,313,691
641	5,313,690
CLASS 28	
187	5,313,692
CLASS 29	
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CLASS 36	
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59 C	5,313,718
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CLASS 40	
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CLASS 42	
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CLASS 43	
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CLASS 51	
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CLASS 57	
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CLASS 60	
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CLASS 63	
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CLASS 68	
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CLASS 70	
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CLASS 72	
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CLASS 73	
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866.5	5,313,849
CLASS 74	
5.9	5,313,850
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89.15	5,313,852
473 P	5,313,853
479 BF	5,313,854
CLASS 75	
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742	5,314,527
CLASS 81	
3.31	5,313,857
3.55	5,313,858
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437	5,313,860
CLASS 82	
1.11	5,313,861
CLASS 83	
156	5,313,862
171	5,313,863
349	5,313,864
635	5,313,865
CLASS 84	
327	5,313,866
404	5,313,867
601	5,315,057
626	5,315,058
656	5,315,059
726	5,315,060
CLASS 86	
25	5,313,869
27	Re.34,612
CLASS 89	
1.13	5,313,868
1.701	5,313,870
CLASS 91	
361	5,313,871
407	5,313,872
429	5,313,873
459	5,313,874
CLASS 92	
157	5,313,875
CLASS 95	
2	5,315,704
55	5,314,528
CLASS 96	
108	5,314,529
CLASS 99	
330	5,313,876
446	5,313,877
454	B1 4,715,274
475	5,313,878
504	5,313,879
537	5,313,880
CLASS 101	
4	5,313,881
126	5,313,882
247	5,313,883
348	5,313,884
405	5,313,885
486	5,313,886
CLASS 102	
331	5,313,887
334	5,313,888
439	5,313,889
496	5,313,890
CLASS 106	
1	5,314,530
22 F	5,314,531
253	5,314,532
287.13	5,314,533
287.19	5,314,534
311	5,314,535
712	5,314,536
CLASS 108	
108	5,313,891
147	5,313,892
152	5,313,893
CLASS 110	
235	5,313,894
346	5,313,895
CLASS 112	
121.12	5,313,896
121.14	5,313,897
141	5,313,898
316	5,313,900
320	5,313,901
454	5,313,902
CLASS 114	
65 R	5,313,903
99	5,313,904
140	5,313,905
274	5,313,906
290	5,313,907
354	5,313,908
CLASS 116	
208	5,313,909
CLASS 117	
60	5,314,571
75	5,314,569
103	5,314,570
213	5,314,667
CLASS 118	
30	5,314,537
651	5,315,061
715	5,314,538
718	5,314,539
723 DC	5,314,540
725	5,314,541
CLASS 119	
57.9	5,313,910
231	5,313,911
	5,314,542
246	5,313,912
CLASS 122	
4 D	5,313,913
136 R	5,313,914
CLASS 123	
23	5,313,915
90.39	5,313,916
90.67	5,313,917
149 D	5,313,918
193.4	5,313,919
295	5,313,920
310	5,313,921
333	5,313,922
456	5,313,924
497	5,313,923
520	5,313,925
587	5,313,926
634	5,313,927
CLASS 126	
38	5,313,928
39 B	5,313,929
116 R	5,313,930
401	5,313,931
531	5,313,932
674	5,313,933
CLASS 128	
4	5,313,934
	5,313,935
6	5,313,936
202.22	5,313,937
205.16	5,313,938
207.14	5,313,939
633	5,313,940
	5,313,941
639	5,313,942
642	5,313,943
644	5,313,952
653.1	5,313,944
653.2	5,313,945
660.02	5,313,946
661.09	5,313,947
662.02	5,313,948
662.06	5,313,949
	5,313,950
664	5,313,951
696	5,313,953
702	5,313,954
725	5,313,955
741	5,313,956
748	5,313,957
754	5,313,958
759	5,313,959
764	5,313,969
772	5,313,967
782	5,313,968
842	5,314,447
848	5,313,960
897	5,313,961
898	5,313,962
CLASS 132	
54	5,313,963
CLASS 134	
1	5,314,543
5	5,314,544
22.11	5,314,545
42	5,314,546
57 D	5,313,964
61	5,313,965
76	5,313,966
CLASS 135	
15.1	5,313,970
68	5,313,971
88	5,313,972
CLASS 137	
3	5,313,973
12	5,313,974
14	5,313,975
15	5,313,976
43	5,313,977
	5,313,978
390	5,313,979
557	5,313,980
595	5,313,981
597	5,313,982
625.48	5,313,984
625.6	5,313,983
884	5,313,985
CLASS 138	
99	5,313,986
137	5,313,987
CLASS 139	
1 E	5,313,988
384 B	5,313,989
CLASS 141	
6	5,313,990
86	5,313,991
104	5,313,992
364	5,313,993
CLASS 148	
33.1	5,314,547
101	5,314,548
325	5,314,549
CLASS 152	
209 R	5,314,551
323	5,313,994
416	5,313,995
427	5,313,996
	5,313,997
CLASS 156	
73.3	5,314,552
153	5,314,553
154	5,314,554
170	5,314,555
177	5,314,556
229	5,314,557
238	5,314,560
244.11	5,314,561
251	5,314,558
314	5,314,562
356	5,314,559
358	5,314,563
384	5,314,564
392	5,314,565
441.5	5,314,566
	5,314,567
504	5,314,568
643	5,314,572
	5,314,573
646	5,314,574
651	5,314,575
655	5,314,576
659.1	5,314,577
662	5,314,578
CLASS 159	
47.1	5,314,579
CLASS 160	
84.1 D	5,313,998

121.1	5,313,999
CLASS 162	
5	5,314,580
9	5,314,582
25	5,314,583
109	5,314,584
263	5,314,581
274	5,314,585
CLASS 164	
4.1	5,314,000
125	5,314,001
305	5,314,002
494	5,314,003
CLASS 165	
2	5,314,004
10	5,314,005
	5,314,006
43	5,314,007
47	5,314,008
72	5,314,009
104.26	5,314,010
	5,314,011
111	5,314,012
153	5,314,021
176	5,314,013
CLASS 166	
124	5,314,014
184	5,314,015
250	5,314,016
252	5,314,017
265	5,314,018
270	5,314,019
281	5,314,020
293	5,314,022
295	5,314,023
347	5,314,024
369	5,314,025
386	5,314,026
CLASS 169	
50	5,314,027
CLASS 172	
219	5,314,028
699	5,314,029
CLASS 174	
40 TD	5,315,064
52.1	5,315,062
78	5,315,063
84 C	5,315,065
87	5,315,066
138 F	5,315,068
250	5,315,069
	5,315,070
254	5,315,071
262	5,315,072
CLASS 175	
26	5,314,030
61	5,314,031
74	5,314,032
431	5,314,033
CLASS 177	
212	5,315,073
CLASS 179	
109.6	5,314,550
CLASS 180	
21	5,314,034
119	5,314,035
147	5,314,036
169	5,314,037
214	5,314,038
268	5,314,039
287	5,314,040
CLASS 181	
0.5	5,315,074
240	5,315,075
CLASS 182	
181	5,314,041
187	5,314,042
CLASS 187	
51	5,314,043
CLASS 188	
77 R	5,314,044
322.21	5,314,045
CLASS 190	
105	5,314,046
CLASS 191	
12 R	5,314,047
CLASS 192	
3.29	5,314,048
4 A	5,314,049
41 S	5,314,053
89.22	5,314,051
107 C	5,314,052
CLASS 198	
347.1	5,314,054
395	5,314,055
396	5,314,056
483.1	5,314,057
753	5,314,058
860.1	5,314,059
CLASS 200	
5 EB	5,315,076
11 R	5,315,077
11 TC	5,315,078
16 D	5,315,079
47	5,315,080
144 B	5,315,081
506	5,315,082
CLASS 202	
177	5,314,586
CLASS 203	
1	5,314,587
38	5,314,588
CLASS 204	
128	5,314,589
131	5,314,590
157.2	5,314,592
180.1	5,314,593
181.4	5,314,594
182.1	5,314,595
192.13	5,314,597
192.2	5,314,596
224 M	5,314,598
241 R	5,314,599
257	5,314,591
290 R	5,314,601
294.11	5,314,603
299 R	5,314,602
410	5,314,604
415	5,314,605
CLASS 205	
128	5,314,606
139	5,314,607
238	5,314,608
CLASS 206	
216	5,314,060
220	5,314,061
268	5,314,062
315.7	5,314,063
340	5,314,064
	5,314,065
389	5,314,066
430	5,314,067
454	5,314,068
524.1	5,314,069
570	5,314,070
CLASS 208	
41	5,314,609
80	5,314,610
113	5,314,611
120	5,314,612
184	5,314,613
262.1	5,314,614
370	5,314,615
CLASS 209	
4	5,314,071
44.1	5,314,072
166	5,314,073
208	5,314,074
680	5,314,075
CLASS 210	
130	5,314,616
205	5,314,076
242.3	5,314,617
	5,314,618
606	5,314,619
611	5,314,620
618	5,314,621
629	5,314,622
638	5,314,623
645	5,314,624
695	5,314,625
698	5,314,626
734	5,314,627
754	5,314,628
	5,314,629
794	5,314,630
CLASS 211	
40	5,314,077
59.2	5,314,078
70.2	5,314,079
181	5,314,080
184	5,314,081
CLASS 212	
147	5,314,082
213	5,314,083
CLASS 215	
249	5,314,084
252	5,314,085
CLASS 219	
50	5,315,085
99.12	5,315,087
	5,315,088
137 PS	5,315,089
213	5,315,090
388	5,315,091
497	5,315,092
689	5,315,084
734	5,315,083
753	5,315,086
CLASS 220	
400	5,314,086
430	5,314,087
465	5,314,088
510	5,314,089
CLASS 222	
1	5,314,090
129.1	5,314,091
137	5,314,092
153	5,314,093
195	5,314,094
218	5,314,095
401	5,314,096
402.1	5,314,097
463	5,314,098
606	5,314,099
626	5,314,100
CLASS 224	
42.03 A	5,314,101
151	5,314,102
282	5,314,103
321	5,314,104
CLASS 228	
102	5,314,105
114.5	5,314,106
116	5,314,107
144	5,314,108
262.42	5,314,109
CLASS 229	
92.1	5,314,110
110	5,314,111
117.01	5,314,112
117.12	5,314,113
225	5,314,114
CLASS 235	
381	5,315,093
385	5,315,094
462	5,315,095
	5,315,096
467	5,314,631
472	5,315,097
494	5,315,098
CLASS 238	
30	5,314,115
CLASS 239	
99	5,314,116
102.1	5,314,117
102.2	5,314,118
220	5,314,119
310	5,314,120
553.3	5,314,121
585.1	5,314,122
708	5,314,123
CLASS 241	
201	5,314,124
175	5,314,125
189.1	5,314,126
222	5,314,127
CLASS 242	
7.09	5,314,129
54 R	5,314,130
55.3	5,314,131
56 R	5,314,132
57	5,314,128
67.3 R	5,314,133
71.1	5,314,134
72.1	5,314,135
75.4	5,314,136
107	5,314,137
107.2	5,314,138
131	5,314,139
192	5,314,140
199	5,314,141
CLASS 244	
35 A	5,314,142
118.1	5,314,143
132	5,314,144
134 A	5,314,145
158 R	5,314,146
182	5,314,147
CLASS 248	
27.3	5,314,148
56	5,314,149
98	5,314,150
100	5,314,151
186	5,314,152
229	5,314,153
231.9	5,314,154
301	5,314,155
317	5,314,156
354.1	5,314,157
429	5,314,158
476	5,314,159
547	5,314,160
548	5,314,161
553	5,314,162
CLASS 250	
201.1	5,315,099
208.1	5,315,100
	5,315,101
	5,315,102
214 LS	5,315,105
214 VT	5,315,103
214.1	5,315,104
215	5,315,106
222.2	5,315,107
223 B	5,315,108
227.27	5,315,110
235	5,315,111
	5,315,112
251	5,315,109
305	5,315,113
332	5,315,114
338.1	5,315,115
352	5,315,116
356.1	5,315,117
396 ML	5,315,118
396 R	5,315,120
398	5,315,119
423 R	5,315,121
461.2	5,315,122
492.2	5,315,123
497.1	5,315,124
504 R	5,315,125
CLASS 251	
129.07	5,314,163
129.17	5,314,164
305	5,314,165
CLASS 252	
18	5,314,632
46.7	5,314,633
56 R	5,314,634
102	5,314,635
139	5,314,636
174.12	5,314,637
184	5,314,638
186.23	5,314,639
299.6	5,314,640
301.4 P	5,314,641
309	5,314,642
389.23	5,314,643
828	Re.34,613
CLASS 254	
371	5,314,166
CLASS 256	
89	5,314,167
CLASS 257	
10	5,315,126
11	5,315,127
16	5,315,128
21	5,315,129
48	5,315,130
57	5,315,131
66	5,315,132
102	5,315,133
138	5,315,134
198	5,315,135
208	5,315,136
221	5,315,137
298	5,315,138
306	5,315,140
308	5,315,141
316	5,315,142
351	5,315,143
	5,315,144
379	5,315,145
390	5,315,146
409	5,315,139
442	5,315,147
458	5,315,148
536	5,315,149
588	5,315,150
592	5,315,151
677	5,315,152
701	5,315,153
707	5,315,154
711	5,315,155
728	5,315,156
734	5,315,157
CLASS 261	
84	5,314,644
94	5,314,645
CLASS 264	
6	5,314,646
25	5,314,647
40.5	5,314,648
45.9	5,314,649
56	5,314,650
65	5,314,651
81	5,314,652
301	5,314,653
517	5,314,654
CLASS 266	
92	5,314,168
105	5,314,169
156	5,314,170
173	5,314,171
CLASS 267	
119	5,314,172
140.14	5,314,173
CLASS 269	
75	5,314,174
224	5,314,175
CLASS 270	
1.1	5,314,176
CLASS 271	
3.1	5,314,177
18.3	5,314,178
145	5,314,179
CLASS 273	
73 F	5,314,180
109	5,314,181
140	5,314,182
157 R	5,314,183
164.1	5,314,184
167 A	5,314,185
187 R	5,314,186
235 R	5,314,187
251	5,314,188
260	5,314,189
272	5,314,190
	5,314,191
282.3	5,314,192
292	5,314,193
	5,314,194
371	5,314,195
416	5,314,196
430	5,314,197
CLASS 279	
133	5,314,198
CLASS 280	
7.13	5,314,199
400	5,314,200
407.1	5,314,201
511	5,314,202
728 A	5,314,203
777	5,314,204
783	5,314,205
801.1	5,314,206
828	5,314,207
CLASS 283	
116	5,314,208
CLASS 285	
45	5,314,209
93	5,314,210
110	5,314,211
197	5,314,212
231	5,314,213
233	5,314,214
283	5,314,215
319	5,314,216
CLASS 289	
17	5,314,217
CLASS 290	
1 R	5,315,158
55	5,315,159
CLASS 292	
256.5	5,314,218
320	5,314,219
CLASS 294	
10	5,314,220
19.1	5,314,221
64.1	5,314,222
	5,314,223
87.2	5,314,224
CLASS 296	
10	5,314,225
97.7	5,314,226
97.8	5,314,227
106.6	5,314,228
188	5,314,229
203	5,314,230
CLASS 297	
159	5,314,231
191	5,314,232
217	5,314,233
248	5,314,234
284.3	5,314,235
284.8	5,314,236
318	5,314,237
325	5,314,238
352	5,314,239
452.15	5,314,240
CLASS 301	
111	5,314,241
CLASS 307	
41	5,315,160
66	5,315,161
201	5,315,162
	5,315,163
265	5,315,164
296.1	5,315,165
296.2	5,315,166
296.6	5,315,167
351	5,315,168
353	5,315,169
	5,315,170
355	5,315,171
443	5,315,172
	5,315,173
	5,315,174
	5,315,175
455	5,315,176
463	5,315,177
	5,315,178
475	5,315,179
480	5,315,180
	5,315,181
482.1	5,315,182
511	5,315,183
518	5,315,184
520	5,315,185
527	5,315,186
542.1	5,315,187
574	5,315,188
CLASS 310	
12	5,315,189
	5,315,190
20	5,315,202
40 MM	5,315,191
49 R	5,315,192
50	5,315,193
68 R	5,315,194
89	5,315,195
90	5,315,196
90.5	5,315,197
162	5,315,198
239	5,315,199
258	5,315,200
326	5,315,203
339	5,315,204
357	5,315,205
CLASS 312	
9.45	5,314,242
215	5,314,243
330.1	5,314,244
CLASS 313	
306	5,315,206
407	5,315,208
444	5,315,207
478	5,315,209
CLASS 315	
5.39	5,315,210
50	5,315,211
111.51	5,315,212
169.1	5,315,213
209 R	5,315,214
219	5,315,215
370	5,315,216
382	5,315,217
CLASS 318	
54	5,315,218
254	5,315,219
282	5,315,220
434	5,315,221
568.11	5,315,222
701	5,315,224
712	5,315,225
715	5,315,226
CLASS 320	
2	5,315,227
31	5,315,228
CLASS 322	
18	5,315,229
CLASS 323	
313	5,315,230
315	5,315,231
CLASS 324	
72	5,315,232
	5,315,233

116	5,315,235
157	5,315,236
158 F	5,315,237
	5,315,238
	5,315,239
	5,315,240
158 R	5,315,241
	5,315,242
204	5,315,243
207.21	5,315,244
	5,315,245
228	5,315,246
242	5,315,234
244	5,315,247
306	5,315,248
309	5,315,249
	5,315,250
318	5,315,251
403	5,315,252
429	5,315,253
452	5,315,254
457	5,315,255
511	5,315,256
627	5,315,257
640	5,315,258
690	5,315,259
CLASS 328	
28	5,315,260
168	5,315,261
CLASS 329	
302	5,315,262
CLASS 330	
156	5,315,263
253	5,315,264
275	5,315,267
277	5,315,265
294	5,315,266
298	5,315,268
CLASS 331	
1 A	5,315,269
	5,315,270
25	5,315,271
107 T	5,315,272
CLASS 333	
81 R	5,315,273
219.1	5,315,274
CLASS 335	
86	5,315,275
216	5,315,276
	5,315,277
282	5,315,278
CLASS 336	
178	5,315,279
192	5,315,280
CLASS 337	
319	5,315,281
CLASS 338	
32 R	5,315,282
162	5,315,283
CLASS 340	
146.2	5,315,284
426	5,315,285
	5,315,286
455	5,315,287
463	5,315,288
532	5,315,289
568	5,315,290
605	5,315,291
628	5,315,292
664	5,315,293
679	5,315,294
936	5,315,295
946	5,315,296
968	5,315,297
995	5,315,298
CLASS 341	
53	5,315,299
55	5,315,300
94	5,315,301
CLASS 342	
20	5,315,302
27	5,315,303
165	5,315,304
185	5,315,305
192	5,315,306
444	5,315,307
448	5,315,308
CLASS 343	
705	5,315,309
CLASS 345	
14	5,315,310
76	5,315,311
107	5,315,312
145	5,315,313
186	5,315,314
208	5,315,315
CLASS 346	
1.1	5,315,316
	5,315,317
76 PH	5,315,318
	5,315,319
107 R	5,315,320
108	5,315,321
	5,315,322
159	5,315,323
	5,315,324
160.1	5,315,325
CLASS 348	
16	5,315,633
51	5,315,377
88	5,315,383
93	5,315,384
95	Re.34,615
229	5,315,394
268	5,315,393
415	5,315,326
439	5,315,327
441	5,315,385
521	5,315,387
553	5,315,391
569	5,315,386
570	5,315,392
584	5,315,390
655	5,315,378
672	5,315,389
713	5,315,379
718	5,315,388
789	5,315,395
792	5,315,396
CLASS 351	
121	5,315,328
206	5,315,329
CLASS 353	
31	5,315,330
CLASS 354	
94	5,315,331
149.11	5,315,332
202	5,315,333
219	5,315,334
252	5,315,335
285	5,315,336
298	5,315,337
320	5,315,338
400	5,315,339
	5,315,340
402	5,315,341
403	5,315,342
436	5,315,344
484	5,315,345
CLASS 355	
1	5,315,346
50	5,315,348
53	5,315,349
043	5,315,347
208	5,315,350
248	5,315,351
	5,315,352
251	5,315,353
260	5,315,354
277	5,315,355
289	5,315,356
298	5,315,357
302	5,315,358
315	5,315,359
319	5,315,360
323	5,315,361
326 R	5,315,362
CLASS 356	
4	5,315,363
32	5,315,364
73.1	5,315,365
238	5,315,366
	5,315,367
251	5,315,368
316	5,315,369
345	5,315,370
355	5,315,371
358	5,315,372
373	5,315,373
376	5,315,374
417	5,315,375
432	5,315,376
CLASS 358	
296	5,315,397
304	5,315,398
335	5,315,399
	5,315,400
337	5,315,401
342	5,315,402
404	5,315,403
433	5,315,404
445	5,315,405
456	5,315,406
	5,315,407
458	5,315,408
	5,315,409
471	5,315,410
482	5,315,411
500	5,315,380
	5,315,381
512	5,315,412
	5,315,413
	5,315,414
515	5,315,415
523	5,315,382
537	5,315,416
CLASS 359	
3	5,315,417
41	5,315,418
46	5,315,419
53	5,315,420
76	5,315,421
107	5,315,422
124	5,315,423
152	5,315,424
153	5,315,425
180	5,315,426
216	5,315,427
	5,315,428
224	5,315,429
248	5,315,430
281	5,315,431
326	5,315,432
328	5,315,433
355	5,315,434
524	5,315,435
569	5,315,436
588	5,315,437
612	5,315,440
687	5,315,438
689	5,315,439
753	5,315,441
877	5,315,442
885	5,315,443
CLASS 360	
15	5,315,444
19.1	5,315,445
48	5,315,446
49	5,315,447
60	5,315,448
61	5,315,449
65	5,315,450
72.2	5,315,451
73.07	5,315,452
75	5,315,453
	5,315,454
	5,315,455
77.08	5,315,456
77.14	5,315,457
78.08	5,315,458
85	5,315,459
	5,315,460
90	5,315,461
96.5	5,315,462
98.08	5,315,463
99.08	5,315,464
106	5,315,465
	5,315,466
	5,315,467
113	5,315,468
119	5,315,469
133	5,315,470
CLASS 361	
160	5,315,471
212	5,315,472
234	5,315,473
534	5,315,474
643	5,315,475
652	5,315,476
678	5,315,477
684	5,315,478
690	5,315,479
705	5,315,480
707	5,315,481
	5,315,482
752	5,315,483
765	5,315,484
767	5,315,485
795	5,315,486
796	5,315,487
	5,315,488
801	5,315,489
CLASS 362	
32	5,315,490
84	5,315,491
122	5,315,492
202	5,315,493
207	5,315,494
373	5,315,495
CLASS 363	
21	5,315,496
34	5,315,497
98	5,315,498
CLASS 364	
140	5,315,499
152	5,315,501
181	5,315,500
184	5,315,502
192	5,315,503
224.01	5,315,539
400	5,315,504
401	5,315,508
	5,315,509
405	5,315,510
408	5,315,511
413.01	5,315,505
413.19	5,315,506
413.23	5,315,507
413.25	5,315,512
420	5,315,513
424.01	5,315,515
	5,315,516
424.02	5,315,517
424.1	5,315,514
426.02	5,315,518
	5,315,519
426.05	5,315,520
468	5,315,521
474.07	5,315,522
474.22	5,315,523
474.25	5,315,524
474.26	5,315,525
474.28	5,315,526
480	5,315,533
483	5,315,527
490	5,315,534
	5,315,535
498	5,315,528
509	5,315,529
510	5,315,530
550	5,315,531
553	5,315,532
569	5,315,536
570	5,315,537
574	5,315,538
764	5,315,540
CLASS 365	
63	5,315,541
72	5,315,542
149	5,315,543
154	5,315,544
156	5,315,545
185	5,315,546
	5,315,547
189.01	5,315,548
189.09	5,315,549
194	5,315,550
200	5,315,551
	5,315,552
201	5,315,553
	5,315,554
207	5,315,555
208	5,315,556
222	5,315,557
230.01	5,315,558
233.5	5,315,559
238.5	5,315,560
CLASS 366	
79	5,314,245
	5,314,246
CLASS 367	
1	5,315,561
89	5,315,562
99	5,315,563
140	5,315,564
	5,315,565
CLASS 368	
46	5,315,566
CLASS 369	
32	5,315,567
	5,315,568
44.32	5,315,569
48	5,315,570
50	5,315,571
54	5,315,572
100	5,315,573
109	5,315,574
112	5,315,575
	5,315,576
116	5,315,577
275.3	5,315,578
290	5,315,579
CLASS 370	
13	5,315,580
16	5,315,581
	5,315,582
18	5,315,583
	5,315,584
32.1	5,315,585
60	5,315,586
	5,315,587
60.1	5,315,588
62	5,315,589
79	5,315,590
85.13	5,315,592
85.8	5,315,591
94.3	5,315,593
110.1	5,315,594
	5,315,595
112	5,315,596
CLASS 371	
18.1	5,315,597
21.1	5,315,598
25.1	5,315,599
37.6	5,315,600
39.1	5,315,601
40.4	5,315,602
188	5,315,663
CLASS 372	
21	5,315,603
25	5,315,604
34	5,315,605
38	5,315,606
	5,315,607
41	5,315,608
43	5,315,609
55	5,315,610
56	5,315,611
69	5,315,612
	5,315,613
101	5,315,614
CLASS 374	
29	5,314,247
124	5,314,248
128	5,314,249
CLASS 375	
1	5,315,615
	5,315,616
39	5,315,617
94	5,315,618
	5,315,619
102	5,315,620
103	5,315,621
106	5,315,622
120	5,315,623
CLASS 376	
261	5,315,624
280	5,315,625
306	5,315,626
CLASS 377	
20	5,315,627
CLASS 378	
	5,315,628
34	5,315,629
65	5,315,630
98.8	5,315,631
167	5,315,632
CLASS 379	
57	5,315,634
	5,315,635
58	5,315,636
	5,315,637
	5,315,638
86	5,315,639
93	5,315,640
94	5,315,641
96	5,315,642
100	5,315,643
103	5,315,644
164	5,315,645
201	5,315,646
265	5,315,647
355	5,315,649
399	5,315,650
412	5,315,651
413	5,315,652
	5,315,653
438	5,315,648
	5,315,654
CLASS 380	
4	5,315,655
23	5,315,656
25	5,315,657
30	5,315,658
CLASS 381	
13	5,315,660
71	5,315,661
107	5,315,662
CLASS 382	
1	5,315,664
6	5,315,665
8	5,315,666
13	5,315,667
14	5,315,668
50	5,315,669
56	5,315,670
57	5,315,671
CLASS 383	
3	5,314,250
106	5,314,251
126	5,314,252
CLASS 384	
19	5,314,253
49	5,314,254
536	5,314,255
CLASS 388	
12	5,315,672
	5,315,673
15	5,315,674
32	5,315,675
37	5,315,676
	5,315,677
59	5,315,678
76	5,315,679
88	5,315,680
89	5,315,681
92	5,315,682
136	5,315,683
139	5,315,684
142	5,315,685
CLASS 392	
480	5,315,686
CLASS 395	
2.28	5,315,687
2.42	5,315,688
2.47	5,315,689
104	5,315,690
109	5,315,691
119	5,315,692
128	5,315,693
131	5,315,694
132	5,315,695
133	5,315,696
155	5,315,697
162	5,315,698
	5,315,699
163	5,315,700
	5,315,701
164	5,315,702
	5,315,703
200	5,315,705
	5,315,706
250	5,315,707
	5,315,708
275	5,315,711
600	5,315,709
700	5,315,710
CLASS 4.1	
279	5,314,600
CLASS 400	
61	5,314,256
199	5,314,257
202.4	5,314,258
216.2	5,314,259
CLASS 401	
7	5,314,260
CLASS 404	
6	5,314,261
CLASS 405	
1	5,314,263
128	5,314,264
	5,314,265
129	5,314,266
134	5,314,267
259.5	5,314,268
CLASS 407	
42	5,314,269
CLASS 408	
1 R	5,314,270
87	5,314,271
224	5,314,272
233	5,314,273
CLASS 409	
81	5,314,274
CLASS 410	
26	5,314,275
139	5,314,276
CLASS 411	
55	5,314,277
61	5,314,278
134	5,314,279
182	5,314,280
361	5,314,281
426	5,314,282
CLASS 412	
34	5,314,283
CLASS 414	
137.1	5,314,262
234	5,314,284
236	5,314,285
416	5,314,286
427	5,314,287
463	5,314,288

CLASSIFICATION OF PATENTS

494	5,314,289
509	5,314,290
719	5,314,291
724	5,314,292
744.5	5,314,293
744.6	5,314,294
746.4	5,314,295
788	5,314,296
796.5	5,314,297
797.9	5,314,298

CLASS 415

30	5,314,299
119	5,314,300
160	5,314,301
169.1	5,314,302
173.1	5,314,303
173.4	5,314,304
202	5,314,305
213.1	5,314,306

CLASS 416

2	5,314,307
91	5,314,308
201 A	5,314,310
226	5,314,309

CLASS 417

16	5,314,312
50	5,314,311
63	5,314,313
364	5,314,314
540	5,314,315

CLASS 418

55.1	5,314,316
55.2	5,314,317
60	5,314,318
170	5,314,319
178	5,314,321
201.1	5,314,320

CLASS 419

3	5,314,655
13	5,314,656
15	5,314,657
33	5,314,658

CLASS 420

428	5,314,659

CLASS 422

15	5,314,660
57	5,314,661
62	5,314,662
67	5,314,663
78	5,314,664
180	5,314,665
191	5,314,666
292	5,314,668
305	5,314,669

CLASS 423

22	5,314,670
220	5,314,671
228	5,314,672
239.1	5,314,673
328.2	5,314,674
344	5,314,675
644	5,314,676

CLASS 424

1.25	5,314,678
6.3	5,314,683
9	5,314,679
	5,314,680
	5,314,681
45	5,314,682
71	5,314,684
88	5,314,690
93 Q	5,314,691
94.2	5,314,692
196.1	5,314,693
401	5,314,685
	5,314,686
405	5,314,687
423	5,314,688
433	5,314,689
448	5,314,694
450	5,314,695
453	5,314,696
480	5,314,697
538	5,314,698
660	5,314,699
684	5,314,700

CLASS 425

142	5,314,322
186	5,314,323
299	5,314,324
384	5,314,325
573	5,314,326
589	5,314,327

CLASS 426

103	5,314,701
128	5,314,702
231	5,314,703

514	5,314,704
574	5,314,705
605	5,314,706
611	5,314,707
660	5,314,708

CLASS 427

82	5,314,714
96	5,314,709
	5,314,710
97	5,314,711
118	5,314,712
152	5,314,713
240	5,314,715
248.1	5,314,716
282	5,314,717
385.5	5,314,719
386	5,314,720
	5,314,721
394	5,314,718
425	5,314,722
476	5,314,723
489	5,314,724
553	5,314,725
577	5,314,726
584	5,314,727

CLASS 428

14	5,314,728
15	5,314,729
24	5,314,730
35.3	5,314,732
36.6	5,314,733
64	5,314,734
116	5,314,735
143	5,314,736
156	5,314,737
182	5,314,738
195	5,314,739
209	5,314,740
215	5,314,741
285	5,314,742
297	5,314,743
326	5,314,744
336	5,314,745
338	5,314,746
341	5,314,747
345	5,314,748
349	5,314,749
402	5,314,750
412	5,314,751
424.2	5,314,752
429	5,314,731
511	5,314,753
532	5,314,754
540	5,314,755
548	5,314,756
627	5,314,757
648	5,314,758
688	5,314,759

CLASS 429

12	5,314,760
17	5,314,761
37	5,314,762
97	5,314,763
121	5,314,764
194	5,314,765
227	5,314,766

CLASS 430

1	5,314,767
5	5,314,768
7	5,314,769
	5,314,770
	5,314,771
14	5,314,772
45	5,314,773
47	5,314,774
59	5,314,775
65	5,314,776
106	5,314,777
111	5,314,778
127	5,314,779
128	5,314,780
150	5,314,781
165	5,314,782
191	5,314,783
254	5,314,784
269	5,314,785
270	5,314,786
302	5,314,787
313	5,314,788
325	5,314,789
356	5,314,790
393	5,314,791
505	5,314,792
506	5,314,793
	5,314,794
517	5,314,795
522	5,314,796
546	5,314,797
567	5,314,798
569	5,314,799

CLASS 431

66	5,314,328

259	5,314,329

CLASS 432

128	5,314,330

CLASS 433

21	5,314,331
66	5,314,332
170	5,314,333
206	5,314,334
223	5,314,335

CLASS 434

189	5,314,336
227	5,314,337
259	5,314,338
267	5,314,339
327	5,314,340

CLASS 435

4	5,314,800
6	5,314,801
7.1	5,314,802
7.4	5,314,803
12	5,314,804
29	5,314,805
41	5,314,806
68.1	5,314,807
69.3	5,314,808
91.2	5,314,809
97	5,314,810
101	5,314,811
134	5,314,812
172.3	5,314,813
177	5,314,814
184	5,314,815
188	5,314,816
188.3	5,314,817
226	5,314,818
232	5,314,819
252.1	5,314,820
	5,314,821
253.4	5,314,822
294	5,314,823

CLASS 436

10	5,314,824
43	5,314,825
89	5,314,826
106	5,314,827
118	5,314,828
165	5,314,829
524	5,314,830

CLASS 437

8	5,314,831
27	5,314,832
41	5,314,833
43	5,314,834
52	5,314,835
53	5,314,836
89	5,314,837
105	5,314,838
173	5,314,839
194	5,314,840
203	5,314,841
211	5,314,842
225	5,314,843
226	5,314,844
238	5,314,845
	5,314,846
239	5,314,847
248	5,314,848

CLASS 439

15	5,314,341
66	5,314,342
108	5,314,343
164	5,314,344
188	5,314,345
189	5,314,346
350	5,314,347
356	5,314,348
394	5,314,349
404	5,314,350
407	5,314,351
609	5,314,352
517	5,314,353
621	5,314,354
638	5,314,355
681	5,314,356
701	5,314,357
741	5,314,358
766	5,314,359
811	5,314,360
874	5,314,361

CLASS 440

86	5,314,362

CLASS 445

14	5,314,363
51	5,314,364

CLASS 446

133	5,314,365
168	5,314,367
179	5,314,368

247	5,314,369
391	5,314,370
397	5,314,371
408	5,314,372
481	5,314,373

CLASS 452

136	5,314,374
157	5,314,375

CLASS 454

186	5,314,376
187	5,314,377

CLASS 462

6	5,314,379

CLASS 464

11	5,314,380
30	5,314,381
111	5,314,382

CLASS 472

45	5,314,383

CLASS 473

55	5,314,384
126	Re.34,614

CLASS 474

28	5,314,385
84	5,314,386
110	5,314,388
135	Re.34,616
152	5,314,366

CLASS 475

74	5,314,387
150	5,314,378

CLASS 477

80	5,313,856
111	5,313,855
171	5,314,050

CLASS 482

3	5,314,389
8	5,314,390
7	5,314,391
57	5,314,392
82	5,314,393
104	5,314,394
111	5,314,395
126	5,314,396

CLASS 483

30	5,314,397

CLASS 492

121	5,314,398

CLASS 494

54	5,314,399

CLASS 501

96	5,314,850

CLASS 502

12	5,314,851
60	5,314,852
66	5,314,853
	5,314,854
86	5,314,855
167	5,314,856
258	5,314,857
330	5,314,858

CLASS 503

207	5,314,859
227	5,314,860
	5,314,861
	5,314,862

CLASS 504

100	5,314,863
225	5,314,864
244	5,314,865

CLASS 505

166	5,314,868
238	5,314,871
430	5,314,867
447	5,314,866
452	5,314,869
476	5,314,870

CLASS 514

12	5,314,872
21	5,314,873
	5,314,874
23	Re.34,617
25	5,314,875
56	5,314,876
58	5,314,877
59	5,314,878
63	5,314,879
80	5,314,880
99	5,314,881
170	5,314,882

236.5	5,314,883
252	5,314,884
	5,314,885
	5,314,886
	5,314,887
	5,314,888
253	5,314,889
263	5,314,890
269	5,314,891
	5,314,892
274	5,314,893
313	5,314,894
318	5,314,895
332	5,314,896
	5,314,897
338	5,314,898
339	5,314,899
	5,314,900
356	Re.34,618
357	5,314,901
	5,314,902
388	5,314,903
394	5,314,904
410	5,314,905
411	5,314,906
414	5,314,907
415	5,314,908
420	5,314,909
443	5,314,910
451	5,314,911
473	5,314,913
520	5,314,914
535	5,314,915
542	5,314,916
556	5,314,917
570	5,314,918
574	5,314,919
618	5,314,920
784	5,314,921

CLASS 515

245	5,314,957

CLASS 521

33	5,314,922
64	5,314,923
79	5,314,924
92	5,314,925
98	5,314,926
159	5,314,927
	5,314,928

CLASS 522

31	5,314,929
34	5,314,930
127	5,314,931

CLASS 523

122	5,314,932
176	5,314,933

CLASS 524

53	5,314,934
84	5,314,935
82	5,314,936
100	5,314,937
	5,314,938
241	5,314,939
271	5,314,940
425	5,314,941
457	5,314,942
558	5,314,912
501	5,314,943
	5,314,944
507	5,314,945
513	5,314,946
780	5,314,947

CLASS 525

64	5,314,948
87	5,314,949
73	5,314,950
88	5,314,951
119	5,314,952
123	5,314,953
132	5,314,954
139	5,314,955
240	5,314,956
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537	5,314,972

CLASS 526

126	5,314,973
206	5,314,974

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256	5,314,976
286	5,314,977

CLASS 528

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486	5,314,990

CLASS 530

350	5,314,991
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CLASS 534

577	5,314,997
701	5,314,998

CLASS 536

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23.6	5,315,001
122	5,315,002
124	5,315,003

CLASS 540

202	5,315,004
491	5,315,005

CLASS 546

43	5,315,006
116	5,315,007

CLASS 548

182	5,315,008
209	5,315,009
360.1	5,315,012
376.1	5,315,013
520	5,315,010
521	5,315,011

CLASS 549

43	5,315,014
223	5,315,015
298	5,315,016
408	5,315,017
445	5,315,018
507	5,315,019

CLASS 554

184	5,315,020
190	5,315,021

CLASS 556

437	5,315,022

CLASS 558

148	5,315,023
423	5,315,024

CLASS 560

60	5,315,025
105	5,315,026
	5,315,027
	5,315,028
	5,315,029
	5,315,030
154	5,315,031
157	5,315,032
190	5,315,033
201	Re.34,619
338	5,315,034

CLASS 562

16	5,315,035
58	5,315,036
545	5,315,037
587	5,315,038

CLASS 564

2	5,315,039
422	5,315,040
506	5,315,041

CLASS 568

727	5,315,042
932	5,315,043

CLASS 570

123	5,315,044
153	5,315,045
167	5,315,046
168	5,315,047
176	5,315,048
210	5,315,049

CLASSIFICATION OF PATENTS

234	5,315,050
245	5,315,051
247	5,315,052

CLASS 585

7	5,315,053
14	5,315,054
241	5,315,055
659	5,315,056

CLASS 600

9	5,314,400
14	5,314,401
20	5,314,402

CLASS 601

148	5,314,403

CLASS 602

17	5,314,404

CLASS 604

8	5,314,405
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	5,314,408
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191	5,314,412
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198	5,314,414
218	5,314,415
219	5,314,416
264	5,314,417
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403	5,314,421

CLASS 606

5	5,314,422
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157	5,314,437
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174	5,314,440
182	5,314,441
	5,314,442

192	5,314,443
195	5,314,444
208	5,314,445
231	5,314,446

CLASS 607

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32	5,314,450
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127	5,314,461

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132	5,314,464
138	5,314,465
156	5,314,466

CLASS 623

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	5,314,473
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	5,314,493
	5,314,494
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CLASSIFICATION OF DESIGNS

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	935	347,099
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	969	347,107
	970	347,108
		347,109
	977	347,110
D3—	1	347,111
	4	347,112
	215	347,116
	221	347,117
	272	347,113
	281	347,114
	306	347,118
	315	347,115
D5—	52	347,119
D6—	333	347,120
		347,121
	368	347,122
	369	347,123
	373	347,124
	388	347,125
	439	347,126
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	470	347,131
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	515	347,134
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	546	347,136
	567	347,137
	630	347,130
D7—	302	347,138
		347,139
	350	347,140
	361	347,141
	391	347,142
	403	347,143
	413	347,144
	646	347,145
	656	347,146
		347,147
		347,148
	678	347,149
D8—	8	347,150
	40	347,152
	62	347,153
	72	347,151
	303	347,154
	331	347,155
	333	347,156
		347,157
		347,158
	339	347,159
	355	347 160
	375	347,161
		347,162
	387	347,163
	395	347,164
D9—	300	347,165
	305	347,166
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	306	347,168
	414	347,169
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	434	347,171
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	531	347,175
	558	347,176
D10—	6	347,177
	24	347,178
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	28	347,181
		347,182
		347,183
		347,184
		347,185
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	106	347,190
	107	347,191
	116	347,192
D11—	133	347,194
	144	347,195
	157	347,196
	231	347,197
D12—	91	347,198
	92	347,199
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	108	347,202
	154	347,204
	211	347,203
	215	347,206
D13—	112	347,207
	133	347,208
	155	347,209
	162	347,210
	171	347,211
D14—	100	347,212
	106	347,214
	114	347,215
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	126	347,217
	137	347,218
		347,219
	138	347,220
		347,221
	149	347,222
	164	347,223
	193	347,224
	211	347,225
	234	347,226
	239	347,227
	240	347,229
	243	347,228
D15—	9	347,230
	122	347,231
	139	347,232
D16—	124	347,234
	202	347,235
		347,236
D18—	19	347,238
	53	347,239
	56	347,240
		347,241
D19—	6	347,242
	69	347,243
D20—	41	347,244
D21—	11	347,245
	13	347,246
		347,247
	38	347,213
	71	347,248
	77	347,249
	112	347,233
	147	347,250
	193	347,251
	205	347,252
	219	347,253
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	226	347,237
	234	347,255
D22—	108	347,256
D23—	202	347,257
	209	347,258
	213	347,260
	214	347,259
	225	347,261
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	231	347,263
	238	347,264
	239	347,265
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	250	347,267
	252	347,268
		347,269
		347,270
	263	347,271
	292	347,272
	294	347,273
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	355	347,275
	366	347,276
D24—	115	347,277
	124	347,278
	126	347,279
	130	347,280
	206	347,281
	211	347,282
	214	347,283
D25—	38	347,186
	50	347,284
	113	347,285
	124	347,286
	140	347,287
D26—	26	347,288
	28	347,289
	63	347,290
	102	347,291
	118	347,292
		347,293
D28—	20	347,294
	39	347,295
	60	347,296
	77	347,297
D29—	7	347,298
		347,299
	12	347,300
	20	347,301
D30—	110	347,302
	130	347,303
	161	347,304
D32—	32	347,305
	53.1	347,306

CLASSIFICATION OF PLANTS

P.—	6	8,741
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	28	8,743
	43.1	8,744
	48	8,745
	49	8,746
		8,747
		8,748
	66.1	8,749
	87.12	8,750
		8,751
		8,752

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,314,101
5,314,297
5,314,500
5,315,042
02 : 5,314,182
5,314,617
04 : 5,313,823
5,313,835
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5,314,107
5,314,146
5,314,151
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06 : Re.34,612
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5,313,943
5,313,944
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5,314,186
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5,315,538
5,315,541
5,315,544
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5,315,590
5,315,607
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5,315,707
5,315,708
08 : 5,313,815
5,313,858
5,313,859
5,313,888
5,313,912
5,313,947
5,313,998
5,313,999
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5,314,124
5,314,201
5,314,342
5,314,571
5,314,589
5,314,826
5,314,910
5,315,168
5,315,181
5,315,230
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09 : 5,313,700
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5,313,786
5,313,916
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5,314,005
5,314,066
5,314,130
5,314,136
5,314,147
5,314,174
5,314,250
5,314,257
5,314,271
5,314,313
5,314,323
5,314,370
5,314,424
5,314,435
5,314,552
5,314,566
5,314,684
5,314,704
5,314,752
5,314,917
5,314,950
5,314,964
5,314,989
5,315,004
5,315,063
5,315,155
5,315,308
5,315,325
5,315,440
5,315,475
5,315,477
5,315,491
5,315,645
5,315,690
10 : 5,314,504
5,314,742
5,314,887
5,314,960
5,314,961
5,315,013
5,315,043
11 : 5,314,899
12 : 5,313,667
5,313,736
5,313,753
5,313,778
5,313,799
5,313,914
5,313,934
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5,313,974
5,313,996
5,314,035
5,314,126
5,314,153
5,314,212
5,314,263
5,314,304
5,314,339

5,314,366
5,314,371
5,314,374
5,314,406
5,314,413
5,314,423
5,314,456
5,314,497
5,314,542
5,314,581
5,314,763
5,314,851
5,315,144
5,315,161
5,315,186
5,315,277
5,315,300
5,315,305
5,315,483
5,315,527
5,315,635
5,315,637
5,315,648
5,315,654
13 : 5,313,891
5,314,057
5,314,091
5,314,131
5,314,224
5,314,275
5,314,519
5,314,618
5,314,699
5,314,737
5,315,509
15 : 5,313,687
5,313,747
5,313,906
16 : 5,313,671
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5,314,289
5,314,578
5,314,774
5,314,843
5,315,177
5,315,184
5,315,255
5,315,288
5,315,456
17 : 5,313,675
5,313,712
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5,313,884
5,313,972
5,313,985
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5,314,092
5,314,097
5,314,154
5,314,176
5,314,183
5,314,188
5,314,207
5,314,211
5,314,218
5,314,280
5,314,309
5,314,331
5,314,347
5,314,358
5,314,387
5,314,398
5,314,420
5,314,421
5,314,444
5,314,454
5,314,471
5,314,535
5,314,611
5,314,614
5,314,626
5,314,627
5,314,690
5,314,854
5,314,886
5,314,895
5,314,920
5,315,010
5,315,076
5,315,079
5,315,087
5,315,094
5,315,259
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5,315,639
5,315,650
5,315,673
5,315,688
18 : 5,313,796
5,313,930
5,314,058

5,314,067
5,314,090
5,314,252
5,314,491
5,314,548
5,314,629
5,314,682
5,314,688
5,314,696
5,314,804
5,314,875
5,314,926
5,315,195
5,315,239
5,315,393
5,315,660
5,315,686
19 : 5,313,826
5,314,764
5,315,253
5,315,499
20 : 5,313,676
5,313,723
5,314,079
5,315,050
5,315,064
21 : 5,314,059
5,315,190
22 : 5,313,807
5,313,821
5,313,876
5,314,023
5,314,612
5,314,700
5,315,026
5,315,027
5,315,028
5,315,029
5,315,030
5,315,052
23 : 5,313,933
5,315,235
24 : 5,313,722
5,313,842
5,313,889
5,313,945
5,313,959
5,313,963
5,314,189
5,314,544
5,314,642
5,314,815
5,314,940
5,315,286
5,315,497
5,315,589
5,315,661
5,315,681
25 : Re.34,615
5,313,680
5,313,717
5,313,718
5,313,727
5,313,742
5,313,751
5,313,797
5,313,808
5,313,809
5,313,846
5,313,848
5,313,882
5,313,907
5,313,909
5,314,030
5,314,055
5,314,144
5,314,388
5,314,391
5,314,394
5,314,433
5,314,447
5,314,489
5,314,492
5,314,524
5,314,572
5,314,584
5,314,596
5,314,651
5,314,652
5,314,679
5,314,723
5,314,789
5,314,837
5,314,888
5,314,921
5,314,942
5,314,988
5,314,993
5,315,065
5,315,240
5,315,344
5,315,380
5,315,480
5,315,513
5,315,561
5,315,592

5,315,597
5,315,602
5,315,608
5,315,615
5,315,616
5,315,658
5,315,672
5,315,709
26 : 5,313,703
5,313,716
5,313,726
5,313,767
5,313,791
5,313,793
5,313,832
5,313,853
5,313,854
5,313,864
5,313,919
5,313,924
5,313,961
5,313,977
5,313,995
5,314,044
5,314,048
5,314,049
5,314,050
5,314,080
5,314,114
5,314,156
5,314,172
5,314,196
5,314,204
5,314,214
5,314,227
5,314,232
5,314,237
5,314,238
5,314,244
5,314,279
5,314,314
5,314,324
5,314,397
5,314,404
5,314,458
5,314,526
5,314,545
5,314,547
5,314,594
5,314,616
5,314,623
5,314,662
5,314,686
5,314,716
5,314,766
5,314,767
5,314,781
5,314,896
5,315,083
5,315,091
5,315,200
5,315,202
5,315,218
5,315,245
5,315,348
5,315,492
5,315,506
5,315,514
5,315,515
5,315,518
5,315,519
5,315,633
27 : 5,313,737
5,313,746
5,313,866
5,313,910
5,313,952
5,313,957
5,313,983
5,314,004
5,314,199
5,314,200
5,314,346
5,314,405
5,314,438
5,314,448
5,314,450
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5,314,462
5,314,464
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5,314,719
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5,314,998
5,315,006
5,315,113
5,315,579
5,315,711
28 : 5,313,817
5,313,825
29 : 5,313,666
5,313,708
5,313,749
5,313,820
5,313,968
5,314,064
5,314,094
5,314,239
5,314,270
5,314,300
5,314,416
5,314,678
5,314,680
5,314,902
30 : 5,313,754
31 : 5,314,205
5,314,414
5,314,712
32 : 5,313,707
5,313,851
5,314,264
33 : 5,313,834
5,314,110
5,314,152
5,314,164
5,314,292
5,314,330
5,314,345
5,314,992
5,315,291
5,315,696
5,315,698
34 : 5,313,840
5,314,008
5,314,041
5,314,072
5,314,219
5,314,226
5,314,334
5,314,395
5,314,431
5,314,441
5,314,443
5,314,446
5,314,455
5,314,476
5,314,506
5,314,560
5,314,567
5,314,568
5,314,582
5,314,610
5,314,633
5,314,683
5,314,697
5,314,784
5,314,838
5,314,893
5,314,898
5,314,918
5,314,924
5,314,930
5,314,945
5,314,953
5,314,972
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5,315,012
5,315,015
5,315,020
5,315,056
5,315,128
5,315,436
5,315,495
5,315,617
5,315,619
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5,315,646
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35 : 5,313,810
5,314,830
5,315,011
5,315,120
5,315,364
5,315,375
5,315,430
5,315,537
5,315,603
36 : Re.34,614
5,313,738
5,313,744
5,313,800
5,313,847
5,313,852
5,313,931
5,313,964
5,313,993
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5,314,343
5,314,355
5,314,379
5,314,415
5,314,425
5,314,428
5,314,436
5,314,505
5,314,515
5,314,517
5,314,585
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5,315,093
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5,315,142
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5,315,167
5,315,227
5,315,256
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5,315,338
5,315,341
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5,315,358
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5,315,370
5,315,411
5,315,414
5,315,437
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5,315,498
5,315,512
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5,315,539
5,315,540
5,315,604
5,315,620
5,315,632
5,315,667
5,315,679
5,315,684
5,315,701
37 : 5,313,773
5,313,805
5,313,877
5,314,167
5,314,208
5,314,801
5,314,855
5,314,932
5,315,007
5,315,109
5,315,221
5,315,471
5,315,485
5,315,594
38 : 5,314,673
39 : Re.34,617
5,313,725
5,313,761
5,313,780
5,313,788
5,313,822
5,313,827
5,313,839
5,313,874
5,313,997
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5,314,098
5,314,119
5,314,135
5,314,145
5,314,149

5,314,169
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5,314,595
5,314,601
5,314,645
5,314,658
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5,314,741
5,314,746
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5,315,089
5,315,234
5,315,244
5,315,281
5,315,307
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5,315,508
5,315,520
5,315,668
40 : 5,313,991
5,313,994
5,314,014
5,314,015
5,314,042
5,314,543
5,315,033
5,315,465
41 : 5,313,739
5,313,768
5,313,872
5,314,056
5,314,258
5,314,369
5,314,403
5,314,805
5,315,164
5,315,316
5,315,384
42 : 5,313,669
5,313,673
5,313,686
5,313,750
5,313,801
5,313,802
5,313,831
5,313,881
5,313,915
5,313,937
5,313,939
5,314,029
5,314,084
5,314,127
5,314,221
5,314,223
5,314,243
5,314,268
5,314,276
5,314,290
5,314,325
5,314,357
5,314,361
5,314,377
5,314,511
5,314,525
5,314,537
5,314,546
5,314,609
5,314,622
5,314,630
5,314,811
5,314,822
5,314,885
5,314,913
5,314,915
5,314,955
5,314,977
5,315,066
5,315,107
5,315,156
5,315,204
5,315,225
5,315,229
5,315,270
5,315,289
5,315,522
5,315,531
5,315,670
43 : 5,313,709
5,314,160
5,314,824
44 : 5,313,759
5,315,476

45 : 5,314,128
5,314,185
5,314,198
5,314,718
5,314,735
5,314,744
5,314,749
5,315,199
47 : 5,313,702
5,313,811
5,313,892
5,314,063
5,314,073
5,314,178
5,314,187
5,314,225
5,314,234
5,314,481
5,314,487
5,314,496
5,314,765
5,314,821
5,315,254
5,315,368
48 : Re.34,619
5,313,719
5,313,745

5,313,763
5,313,769
5,313,771
5,313,787
5,313,818
5,313,819
5,313,829
5,313,837
5,313,971
5,313,975
5,313,976
5,314,003
5,314,016
5,314,018
5,314,019
5,314,020
5,314,022
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5,314,025
5,314,026
5,314,031
5,314,032
5,314,040
5,314,060
5,314,165
5,314,209
5,314,265

5,314,315
5,314,340
5,314,350
5,314,353
5,314,375
5,314,401
5,314,479
5,314,532
5,314,587
5,314,625
5,314,643
5,314,672
5,314,703
5,314,732
5,314,834
5,314,857
5,314,858
5,314,869
5,314,916
5,314,973
5,315,014
5,315,019
5,315,053
5,315,068
5,315,069
5,315,074
5,315,110

5,315,114
5,315,117
5,315,179
5,315,228
5,315,276
5,315,505
5,315,549
5,315,553
5,315,598
5,315,636
5,315,649
5,315,706
49 : 5,313,865
5,314,033
5,314,202
5,314,203
5,314,220
5,314,359
5,314,427
5,314,429
50 : 5,315,563
51 : 5,313,733
5,313,903
5,313,908
5,314,087
5,314,228

5,314,266
5,314,308
5,314,363
5,314,409
5,314,554
5,314,559
5,314,565
5,314,644
5,314,802
5,314,841
5,314,866
5,314,908
5,314,996
5,315,115
5,315,126
5,315,278
5,315,363
5,315,406
5,315,641
53 : 5,313,885
5,313,953
5,314,407
5,314,430
5,314,499
5,314,529
5,314,825

5,314,995
5,315,054
5,315,700
54 : 5,314,758
55 : 5,313,711
5,313,795
5,313,869
5,313,917
5,314,002
5,314,038
5,314,082
5,314,093
5,314,230
5,314,233
5,314,385
5,314,386
5,314,432
5,314,453
5,314,457
5,314,469
5,314,654
5,314,743
5,314,987
5,315,252
5,315,479
5,315,533

DESIGN PATENTS

02 : 347,192
04 : 347,137
347,230
347,304
05 : 347,145
06 : 347,102
347,115
347,116
347,130
347,169
347,190
347,198
347,200
347,203
347,212
347,216
347,243
347,259
347,267
347,269
347,270
347,275
347,280
347,287
347,288

347,291
347,300
08 : 347,121
347,306
09 : 347,120
347,159
347,191
347,213
347,268
12 : 347,123
347,124
347,193
347,197
347,221
347,226
347,244
347,262
347,281
347,301
13 : 347,207
347,296
15 : 347,099
347,278
16 : 347,186
347,277

17 : 347,132
347,133
347,142
347,152
347,172
347,176
347,178
347,242
347,292
347,293
18 : 347,162
20 : 347,303
21 : 347,211
347,249
22 : 347,257
24 : 347,129
347,155
25 : 347,107
347,149
347,210
347,263
26 : 347,151
347,164
347,205
347,305

27 : 347,134
347,140
347,160
347,209
347,248
347,251
347,298
28 : 347,286
29 : 347,285
30 : 347,255
32 : 347,228
347,297
33 : 347,156
34 : 347,136
347,168
347,283
36 : 347,100
347,112
347,138
347,139
347,181
347,218
347,219
347,229
347,233

347,237
347,250
347,279
347,295
37 : 347,101
347,126
347,127
347,128
39 : 347,118
347,131
347,161
347,208
347,231
347,302
40 : 347,240
347,271
41 : 347,105
347,106
347,109
347,110
347,174
42 : 347,232
347,261
45 : 347,103

347,294
46 : 347,117
48 : 347,111
347,113
347,146
347,147
347,148
347,171
347,196
347,234
347,253
347,256
49 : 347,195
50 : 347,166
347,167
51 : 347,144
347,194
53 : 347,289
54 : 347,199
55 : 347,173
347,224
347,258
347,266
347,272

PLANT PATENTS

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8,744
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8,751
8,752

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May 31, 1994 Volume 1162 Number 5

CONTENTS

Page

Patent and Trademark Office Notices

Patent Cooperation Treaty (PCT) Information 1162 OG 93
Status of Appeal Cases 1162 OG 93
Notice of Maintenance Fees Payable 1162 OG 94
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees 1162 OG 94
Reissue Applications Filed 1162 OG 100
Requests for Reexaminations Filed 1162 OG 100
Notification of Expiration of Trademark Registrations Due to Failure to Renew 1162 OG 100
Service by Publication 1162 OG 103
Service by Publication 1162 OG 104
Registration To Practice 1162 OG 104
Errata 1162 OG 104
Errata 1162 OG 104
Closing of Patent and Trademark Office on April 27, 1994 1162 OG 104
Response Requested to 1993 Patent Examiner's Action Survey 1162 OG 105
Disclaimers and Dedications 1162 OG 105
Disclaimers 1162 OG 105
Patent Certificates of Correction 1162 OG 106
Special Boxes for Mail 1162 OG 107
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries 1162 OG 108
Patent Examining Corps 1162 OG 110
Condition of Trademark Applications 1162 OG 111
Reexaminations 2949
Reissue Patents Granted (34,620) 2951
Plant Patents Granted (8,753) 2955

Patents Granted

General and Mechanical (5,315,712) 2957
Chemical (5,316,551) 3251
Electrical (5,317,104) 3427
Design Patents Granted (347,307) 3663
Index of Patentees PI 1
Indices of Reissue, Reexaminations, Design and Plant Patents PI 90

Classification of

Patents (Including Reissues and Reexaminations) PI 97
Designs and Plants Applications PI 101

Geographical Index of Residence of Inventors

Patents (Including Reissues and Reexaminations) PI 103
Designs and Plant Applications PI 105
Change of Address Form PI 107
Subscription Order Form PI 109

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1160 O.G. 93, on Mar. 29, 1994.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1993, due to changes in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1154 O.G. 25 on Sept. 14, 1993.

International fees were changed effective on May 1, 1993, due to a changes in the exchange rate of the U. S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1148 O.G. 20, on Mar. 9, 1993.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The schedule of PCT fees (in U.S. dollars) effective Oct. 1, 1993 is as follows:

International Applications (PCT Chapter I) fees:	
Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1415.00
International fees	
Basic fee	530.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
For the first 10 national or regional offices designated	128.00
For each designation fee in excess of 10 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation (PCT Rule 15.5)	
Designation fee	128.00
Confirmation fee	64.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	450.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	670.00
—Additional examination fee, per additional invention (payable only upon invitation)	230.00

U.S. National Stage Fees	Small Entity	Regular
Basic National Fee		
USPTO was IPEA		
All claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA		
Filed without a search report from the European Patent Office or the Japanese Patent Office	475.00	950.00
Filed with a search report from the European Patent Office or the Japanese Patent Office	415.00	830.00
Other National Fees		
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

March 8, 1994

BRUCE A. LEHMAN,
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignments to Panel for A Decision Without a Hearing as of April 29, 1994

Chemical Discipline -	July 6, 1992
Mechanical Discipline -	September 7, 1993
Electrical Discipline -	April 30, 1993

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting the Setting of Hearing Date as of April 29, 1994

Chemical Discipline -	December 4, 1991
Mechanical Discipline -	July 22, 1992
Electrical Discipline -	January 30, 1992

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of April, 1994

Affirmed	95
Affirmed-in-Part	21

Reversed	65
Total Decided	181

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3,7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 28,1991 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,018,220 through 5,020,155
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 26, 1987 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,667,343 through 4,669,124
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 24, 1983 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,384,369 through 4,385,402
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e)For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f))	$465.00
By other than a small entity	$930.00

(f)For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f))	$935.00
By other than a small entity	1,870.00

(g)For maintaining an original or reissue patent except a design or plant patent,based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f))	$1,410.00
By other than a small entity	$2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h)Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9(f))	$65.00
By other than a small entity	$130.00

(i)Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1)unavoidable	$620.00
(2)unintentional	$1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED
DUE TO FAILURE TO PAY MAINTENANCE FEES
March 23, 1994

Patent Number	Serial Number	Issue Date
Re. 32,581	06/634,472	01/19/88
(4,321,268)	(06/222,679)	(03/23/82)
Re. 33,096	07/171,370	10/17/89
(4,576,851)	(06/723,708)	(03/18/86)
Re. 34,442	07/851,302	11/16/93
(4,909,858)	(07/221,417)	(03/20/90)
4,320,539	06/232,976	03/23/82
4,320,568	06/227,359	03/23/82
4,320,627	06/225,955	03/23/82
4,320,648	06/219,831	03/23/82
4,320,727	06/219,462	03/23/82
4,320,851	06/236,314	03/23/82
4,321,054	06/244,494	03/23/82
4,321,062	06/224,413	03/23/82
4,321,081	06/250,724	03/23/82
4,321,099	06/225,501	03/23/82
4,321,102	06/259,901	03/23/82
4,321,112	06/257,404	03/23/82
4,321,127	06/240,903	03/23/82
4,321,185	06/255,878	03/23/82
4,321,199	06/216,059	03/23/82
4,321,200	06/224,369	03/23/82
4,321,252	06/217,400	03/23/82
4,321,285	06/217,704	03/23/82
4,321,347	06/220,447	03/23/82
4,321,375	06/219,208	03/23/82
4,321,379	06/229,043	03/23/82
4,321,384	06/238,911	03/23/82
4,321,393	06/224,780	03/23/82
4,321,398	06/261,419	03/23/82
4,321,411	06/243,112	03/23/82
4,321,413	06/229,821	03/23/82
4,321,440	06/235,369	03/23/82

Patent Number	Serial Number	Issue Date
4,321,458	06/235,756	03/23/82
4,321,496	06/239,294	03/23/82
4,575,871	06/487,106	03/18/86
4,575,874	06/702,787	03/18/86
4,575,878	06/494,364	03/18/86
4,575,880	06/575,563	03/18/86
4,575,881	06/687,457	03/18/86
4,575,882	06/692,827	03/18/86
4,575,887	06/645,909	03/18/86
4,575,889	06/695,282	03/18/86
4,575,890	06/617,529	03/18/86
4,575,896	06/480,645	03/18/86
4,575,899	06/612,825	03/18/86
4,575,903	06/552,978	03/18/86
4,575,905	06/553,303	03/18/86
4,575,909	06/587,269	03/18/86
4,575,915	06/529,810	03/18/86
4,575,916	06/701,658	03/18/86
4,575,917	06/706,954	03/18/86
4,575,918	06/626,225	03/18/86
4,575,925	06/675,613	03/18/86
4,575,926	06/571,937	03/18/86
4,575,929	06/573,690	03/18/86
4,575,931	06/589,736	03/18/86
4,575,935	06/505,915	03/18/86
4,575,939	06/628,620	03/18/86
4,575,944	06/746,410	03/18/86
4,575,945	06/717,717	03/18/86
4,575,947	06/587,971	03/18/86
4,575,949	06/671,225	03/18/86
4,575,951	06/596,727	03/18/86
4,575,958	06/635,900	03/18/86
4,575,962	06/590,011	03/18/86
4,575,964	06/603,773	03/18/86
4,575,965	06/684,380	03/18/86
4,575,972	06/577,248	03/18/86
4,575,975	06/719,510	03/18/86
4,575,977	06/725,758	03/18/86
4,575,980	06/670,343	03/18/86
4,575,983	06/697,148	03/18/86
4,575,997	06/585,543	03/18/86
4,575,999	06/513,412	03/18/86
4,576,000	06/626,931	03/18/86
4,576,005	06/689,151	03/18/86
4,576,012	06/593,706	03/18/86
4,576,015	06/484,878	03/18/86
4,576,019	06/639,795	03/18/86
4,576,020	06/693,457	03/18/86
4,576,022	06/645,179	03/18/86
4,576,025	06/562,713	03/18/86
4,576,026	06/653,913	03/18/86
4,576,028	06/646,018	03/18/86
4,576,031	06/688,068	03/18/86
4,576,036	06/606,789	03/18/86
4,576,041	06/619,441	03/18/86
4,576,042	06/686,514	03/18/86
4,576,043	06/611,455	03/18/86
4,576,049	06/599,394	03/18/86
4,576,056	06/398,873	03/18/86
4,576,061	06/561,719	03/18/86
4,576,063	06/465,762	03/18/86
4,576,064	06/628,880	03/18/86
4,576,068	06/576,646	03/18/86
4,576,069	06/576,320	03/18/86
4,576,076	06/661,392	03/18/86
4,576,077	06/647,142	03/18/86
4,576,081	06/627,670	03/18/86
4,576,082	06/453,687	03/18/86
4,576,084	06/630,080	03/18/86
4,576,088	06/558,032	03/18/86
4,576,089	06/667,321	03/18/86
4,576,096	06/639,695	03/18/86
4,576,098	06/498,254	03/18/86
4,576,099	06/637,538	03/18/86
4,576,102	06/757,813	03/18/86
4,576,103	06/755,064	03/18/86
4,576,107	06/611,279	03/18/86
4,576,114	06/644,154	03/18/86
4,576,116	06/699,012	03/18/86
4,576,119	06/515,268	03/18/86
4,576,120	06/645,718	03/18/86
4,576,121	06/540,232	03/18/86
4,576,125	06/586,008	03/18/86
4,576,126	06/590,416	03/18/86
4,576,129	06/573,802	03/18/86
4,576,130	06/680,970	03/18/86
4,576,132	06/666,038	03/18/86
4,576,133	06/688,516	03/18/86
4,576,135	06/603,492	03/18/86
4,576,136	06/716,942	03/18/86
4,576,151	06/591,502	03/18/86
4,576,155	06/549,880	03/18/86
4,576,157	06/544,777	03/18/86
4,576,158	06/569,558	03/18/86
4,576,162	06/651,438	03/18/86
4,576,163	06/521,334	03/18/86
4,576,172	06/495,619	03/18/86
4,576,176	06/672,497	03/18/86
4,576,180	06/521,148	03/18/86
4,576,182	06/256,689	03/18/86
4,576,187	06/663,681	03/18/86
4,576,188	06/582,902	03/18/86
4,576,190	06/451,978	03/18/86
4,576,193	06/711,128	03/18/86
4,576,195	06/711,295	03/18/86
4,576,196	06/704,606	03/18/86
4,576,197	06/426,905	03/18/86
4,576,199	06/588,533	03/18/86
4,576,205	06/601,713	03/18/86
4,576,206	06/636,077	03/18/86
4,576,209	06/698,810	03/18/86
4,576,211	06/607,502	03/18/86
4,576,213	06/617,302	03/18/86
4,576,216	06/669,295	03/18/86
4,576,224	06/651,466	03/18/86
4,576,225	06/639,994	03/18/86
4,576,226	06/486,073	03/18/86
4,576,229	06/632,811	03/18/86
4,576,231	06/650,140	03/18/86
4,576,243	06/604,764	03/18/86
4,576,244	06/582,892	03/18/86
4,576,245	06/584,997	03/18/86
4,576,248	06/725,008	03/18/86
4,576,252	06/598,534	03/18/86
4,576,261	06/741,203	03/18/86
4,576,264	06/556,852	03/18/86
4,576,268	06/446,399	03/18/86
4,576,269	06/457,355	03/18/86
4,576,273	06/619,609	03/18/86
4,576,274	06/498,589	03/18/86
4,576,276	06/618,842	03/18/86
4,576,281	06/645,208	03/18/86
4,576,283	06/573,668	03/18/86
4,576,286	06/508,121	03/18/86
4,576,289	06/554,565	03/18/86
4,576,290	06/579,194	03/18/86
4,576,296	06/719,119	03/18/86
4,576,300	06/627,377	03/18/86
4,576,301	06/537,680	03/18/86
4,576,306	06/699,243	03/18/86
4,576,308	06/732,671	03/18/86
4,576,311	06/527,793	03/18/86
4,576,312	06/591,000	03/18/86
4,576,323	06/558,529	03/18/86
4,576,329	06/604,011	03/18/86
4,576,333	06/289,401	03/18/86
4,576,340	06/556,627	03/18/86
4,576,342	06/616,675	03/18/86
4,576,356	06/665,564	03/18/86
4,576,360	06/685,753	03/18/86
4,576,364	06/584,853	03/18/86
4,576,369	06/517,993	03/18/86
4,576,370	06/685,712	03/18/86
4,576,375	06/575,464	03/18/86
4,576,377	06/765,717	03/18/86
4,576,379	06/604,372	03/18/86

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4,576,390	06/531,675	03/18/86
4,576,392	06/679,166	03/18/86
4,576,397	06/573,643	03/18/86
4,576,398	06/642,490	03/18/86
4,576,402	06/477,164	03/18/86
4,576,406	06/607,881	03/18/86
4,576,408	06/561,834	03/18/86
4,576,409	06/561,051	03/18/86
4,576,411	06/576,482	03/18/86
4,576,413	06/583,031	03/18/86
4,576,416	06/676,606	03/18/86
4,576,429	06/542,844	03/18/86
4,576,430	06/615,287	03/18/86
4,576,432	06/640,510	03/18/86
4,576,433	06/628,294	03/18/86
4,576,434	06/652,034	03/18/86
4,576,440	06/690,631	03/18/86
4,576,444	06/609,357	03/18/86
4,576,447	06/535,404	03/18/86
4,576,449	06/640,610	03/18/86
4,576,452	06/500,462	03/18/86
4,576,467	06/618,188	03/18/86
4,576,476	06/489,994	03/18/86
4,576,478	06/410,949	03/18/86
4,576,487	06/573,047	03/18/86
4,576,489	06/621,643	03/18/86
4,576,491	06/622,848	03/18/86
4,576,493	06/534,128	03/18/86
4,576,494	06/726,916	03/18/86
4,576,500	06/564,433	03/18/86
4,576,507	06/675,556	03/18/86
4,576,509	06/651,328	03/18/86
4,576,511	06/517,012	03/18/86
4,576,512	06/625,477	03/18/86
4,576,514	06/459,694	03/18/86
4,576,517	06/663,055	03/18/86
4,576,518	06/582,257	03/18/86
4,576,519	06/497,389	03/18/86
4,576,520	06/659,601	03/18/86
4,576,523	06/555,228	03/18/86
4,576,524	06/599,563	03/18/86
4,576,526	06/693,220	03/18/86
4,576,529	06/588,042	03/18/86
4,576,530	06/586,425	03/18/86
4,576,531	06/731,144	03/18/86
4,576,537	06/714,345	03/18/86
4,576,538	06/523,125	03/18/86
4,576,540	06/589,837	03/18/86
4,576,542	06/603,153	03/18/86
4,576,543	06/549,065	03/18/86
4,576,545	06/503,142	03/18/86
4,576,551	06/389,519	03/18/86
4,576,552	06/730,428	03/18/86
4,576,560	06/671,767	03/18/86
4,576,561	06/467,830	03/18/86
4,576,565	06/673,140	03/18/86
4,576,566	06/697,415	03/18/86
4,576,568	06/705,130	03/18/86
4,576,569	06/676,373	03/18/86
4,576,571	06/648,252	03/18/86
4,576,572	06/736,429	03/18/86
4,576,576	06/703,757	03/18/86
4,576,577	06/488,426	03/18/86
4,576,578	06/480,989	03/18/86
4,576,579	06/633,578	03/18/86
4,576,580	06/639,313	03/18/86
4,576,587	06/579,970	03/18/86
4,576,588	06/657,250	03/18/86
4,576,593	06/577,967	03/18/86
4,576,594	06/634,838	03/18/86
4,576,599	06/609,651	03/18/86
4,576,600	06/713,336	03/18/86
4,576,602	06/578,161	03/18/86
4,576,607	06/630,695	03/18/86
4,576,615	06/642,308	03/18/86
4,576,617	06/618,261	03/18/86
4,576,620	06/677,728	03/18/86
4,576,622	06/555,484	03/18/86
4,576,624	06/275,238	03/18/86
4,576,625	06/622,282	03/18/86
4,576,630	06/617,929	03/18/86
4,576,631	06/624,066	03/18/86
4,576,633	06/697,375	03/18/86
4,576,634	06/765,758	03/18/86
4,576,637	06/651,849	03/18/86
4,576,638	06/684,324	03/18/86
4,576,641	06/414,167	03/18/86
4,576,642	06/632,385	03/18/86
4,576,643	06/625,498	03/18/86
4,576,644	06/551,677	03/18/86
4,576,660	06/702,204	03/18/86
4,576,661	06/599,519	03/18/86
4,576,667	06/656,566	03/18/86
4,576,673	06/632,587	03/18/86
4,576,674	06/621,545	03/18/86
4,576,676	06/497,620	03/18/86
4,576,679	06/668,681	03/18/86
4,576,681	06/634,689	03/18/86
4,576,687	06/634,565	03/18/86
4,576,688	06/439,005	03/18/86
4,576,689	06/243,929	03/18/86
4,576,690	06/723,452	03/18/86
4,576,701	06/625,088	03/18/86
4,576,707	06/686,609	03/18/86
4,576,708	06/638,123	03/18/86
4,576,719	06/584,454	03/18/86
4,576,721	06/736,510	03/18/86
4,576,726	06/571,957	03/18/86
4,576,731	06/458,424	03/18/86
4,576,737	06/620,813	03/18/86
4,576,738	06/684,653	03/18/86
4,576,740	06/671,329	03/18/86
4,576,744	06/602,575	03/18/86
4,576,748	06/651,029	03/18/86
4,576,750	06/725,884	03/18/86
4,576,752	06/399,281	03/18/86
4,576,756	06/668,621	03/18/86
4,576,758	06/616,456	03/18/86
4,576,759	06/622,745	03/18/86
4,576,765	06/656,337	03/18/86
4,576,766	06/530,160	03/18/86
4,576,770	06/543,277	03/18/86
4,576,774	06/615,808	03/18/86
4,576,776	06/639,846	03/18/86
4,576,780	06/486,313	03/18/86
4,576,781	06/394,879	03/18/86
4,576,782	06/543,599	03/18/86
4,576,785	06/504,248	03/18/86
4,576,786	06/564,049	03/18/86
4,576,788	06/569,074	03/18/86
4,576,790	06/695,814	03/18/86
4,576,792	06/650,847	03/18/86
4,576,797	06/527,667	03/18/86
4,576,799	06/518,033	03/18/86
4,576,800	06/650,085	03/18/86
4,576,806	06/718,004	03/18/86
4,576,807	06/638,246	03/18/86
4,576,812	06/619,874	03/18/86
4,576,818	06/638,558	03/18/86
4,576,823	06/666,939	03/18/86
4,576,824	06/646,625	03/18/86
4,576,828	06/611,474	03/18/86
4,576,833	06/663,605	03/18/86
4,576,841	06/439,196	03/18/86
4,576,843	06/646,672	03/18/86
4,576,846	06/647,801	03/18/86
4,576,847	06/670,896	03/18/86
4,576,849	06/666,589	03/18/86
4,576,853	06/626,468	03/18/86
4,576,855	06/504,736	03/18/86
4,576,859	06/663,657	03/18/86
4,576,878	06/748,536	03/18/86
4,576,881	06/667,872	03/18/86
4,576,882	06/706,811	03/18/86
4,576,883	06/729,643	03/18/86
4,576,884	06/620,510	03/18/86

Patent Number	Serial Number	Issue Date
4,576,885	06/571,018	03/18/86
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4,576,889	06/647,902	03/18/86
4,576,892	06/710,827	03/18/86
4,576,896	06/663,946	03/18/86
4,576,898	06/658,463	03/18/86
4,576,902	06/678,050	03/18/86
4,576,903	06/685,085	03/18/86
4,576,904	06/749,854	03/18/86
4,576,905	06/660,155	03/18/86
4,576,907	06/645,275	03/18/86
4,576,909	06/657,686	03/18/86
4,576,911	06/646,960	03/18/86
4,576,914	06/542,861	03/18/86
4,576,915	06/542,217	03/18/86
4,576,916	06/629,641	03/18/86
4,576,919	06/667,702	03/18/86
4,576,921	06/522,695	03/18/86
4,576,923	06/598,912	03/18/86
4,576,925	06/701,563	03/18/86
4,576,926	06/602,901	03/18/86
4,576,931	06/719,286	03/18/86
4,576,934	06/654,473	03/18/86
4,576,940	06/639,292	03/18/86
4,576,946	06/405,169	03/18/86
4,576,949	06/607,500	03/18/86
4,576,954	06/582,043	03/18/86
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Patent Number	Serial Number	Issue Date
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4,910,334	06/682,667	03/20/90
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4,910,337	07/302,250	03/20/90
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4,910,344	07/304,688	03/20/90
4,910,348	07/104,023	03/20/90
4,910,352	07/255,600	03/20/90
4,910,358	07/279,781	03/20/90
4,910,361	07/329,927	03/20/90
4,910,365	07/345,775	03/20/90
4,910,367	07/164,527	03/20/90
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4,910,410	07/254,102	03/20/90
4,910,412	07/339,063	03/20/90
4,910,437	06/793,528	03/20/90
4,910,439	07/134,498	03/20/90
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4,910,444	07/205,227	03/20/90
4,910,446	07/148,509	03/20/90
4,910,456	07/288,591	03/20/90
4,910,458	07/029,835	03/20/90
4,910,460	07/280,144	03/20/90
4,910,464	07/216,229	03/20/90
4,910,471	07/311,936	03/20/90
4,910,493	07/279,954	03/20/90
4,910,496	07/142,208	03/20/90
4,910,497	07/217,619	03/20/90
4,910,498	07/196,026	03/20/90
4,910,501	07/233,018	03/20/90
4,910,502	07/259,172	03/20/90
4,910,503	07/062,553	03/20/90
4,910,514	07/277,534	03/20/90
4,910,524	07/077,855	03/20/90
4,910,537	07/314,131	03/20/90
4,910,539	07/289,733	03/20/90
4,910,541	07/277,774	03/20/90
4,910,560	07/163,102	03/20/90
4,910,583	07/201,734	03/20/90
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4,910,608	07/282,112	03/20/90
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4,910,649	07/168,903	03/20/90
4,910,654	07/295,965	03/20/90
4,910,688	07/177,488	03/20/90
4,910,699	07/233,610	03/20/90
4,910,700	07/358,277	03/20/90
4,910,705	07/230,560	03/20/90
4,910,712	07/157,632	03/20/90
4,910,716	07/304,547	03/20/90
4,910,719	07/184,095	03/20/90
4,910,737	07/195,638	03/20/90
4,910,742	07/191,582	03/20/90
4,910,750	07/282,105	03/20/90
4,910,755	07/310,825	03/20/90
4,910,759	07/189,525	03/20/90
4,910,768	07/228,017	03/20/90
4,910,769	07/314,901	03/20/90
4,910,774	07/216,644	03/20/90
4,910,795	07/061,141	03/20/90
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Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,987,841, Re. S.N. 07/952,433, Filed Sept. 28, 1992, Cl. 111/121, COULTER WHEEL ASSEMBLY INCLUDING APPLYING DRY OR LIQUID FERTILIZER, Ray Rawson, et. al., Owner of Record: *Unverferth Manufacturing Co. Inc., Kalida, Ohio*, Attorney or Agent: H. Robert Henderson, Ex. Gp.: 3301

5,045,883, Re. S.N. 08/117,585, Filed Sept. 3, 1993, Cl. 330/51, AMPLIFICATION CIRCUIT WITH A DETERMINED INPUT IMPEDANCE AND VARIOUS TRANSCONDUTANCE VALVES, Phillip Perroud, et. al., Owner of Record: *Positron Corporation, Houston, Tex.*, Attorney or Agent: Robert Groover, Ex. Gp.: 2502

5,084,318, Re. S.N. 08/190,799, Filed Jan. 28, 1994, Cl. 428/60, STRUCTURE FOR RESURFACING BOWLING LANES, Michael F. Stirling, et. al., Owner of Record: *Brunswick Bowling and Billards Corp.*, Attorney or Agent: William A. Van Santen, Ex. Gp.: 1508

5,092,866, Re. S.N. 08/203,000, Filed Feb. 28, 1994, Cl. 606/61, FLEXIBLE INTER-VERTEBRAL STABILIZER, Francis H. Breard, et. al., Owner of Record: *Inventors*, Attorney or Agent: Edward R. Freedman, Ex. Gp.: 3309

5,096,809, Re. S.N. 08/210,544, Filed Mar. 17, 1994, Cl. 435/7.9, WHOLE BLOOD ASSAYS USING POROUS MEMBRANE SUPPORT DEVICES, Fon-Chiu M. Chen, et. al., Owner of Record: *Pacific Biotech, Inc., San Diego, Calif.*, Attorney or Agent: Ned A. Israelsen, Ex. Gp.: 1802

5,151,190, Re. S.N. 08/217,853, Filed Mar. 25, 1994, Cl. 210/640, METHOD FOR SEPARATING A LIQUID MIXTURE, Furuto Seiryo, *Mitsubishi Kasei Engineering Co., Tokyo, Japan*,Attorney or Agent: Norman F. Oblon, Ex. Gp.: 1306

5,207,902, Re. S.N. 08/217,858, Filed Mar. 25, 1994, Cl. 210/195.2, METHOD FOR SEPARATING A LIQUID MIXTURE, Furito Seiryo, Owner of Record: *Mitsubishi Kasei Engineering Co., Tokyo, Japan*,Attorney or Agent: Norman F. Oblon, Ex. Gp.: 1308

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,990,134, Reexam. No. 90/003,351, Mar. 7, 1994, Cl. 604/022, TRANSLUMINAL MICRODISSECTION DEVICE, David C. Auth, Owner of Record:*Heart Technology, Inc., Redmond, Wash.*,Attorney or Agent: William H. Dippert, Kane, Dalsimer, Sullivan, Kurucz, Levy, Eisele & Richard, New York, N.Y., Ex. Gp.: 3306, Requester: David L. Moseley, Houston, Tex.

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
APRIL 11, 1994
DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
92,428	71/069,101	07/08/1913
92,447	71/060,379	07/08/1913
92,465	71/069,300	07/08/1913
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576,882	71/531,452	07/07/1953
576,889	71/565,046	07/07/1953
576,893	71/576,595	07/07/1953
576,896	71/586,035	07/07/1953
576,915	71/607,550	07/07/1953
576,916	71/609,192	07/07/1953
576,918	71/610,248	07/07/1953
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577,029	71/632,507	07/07/1953
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577,040	71/633,170	07/07/1953
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577,050	71/634,755	07/07/1953
577,051	71/634,757	07/07/1953
577,058	71/635,365	07/07/1953
577,063	71/635,596	07/07/1953
577,068	71/635,972	07/07/1953
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962,359	72/398,501	07/03/1973
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962,366	72/386,309	07/03/1973
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962,370	72/411,778	07/03/1973
962,373	72/421,029	07/03/1973
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962,378	72/421,825	07/03/1973
962,379	72/421,837	07/03/1973
962,380	72/422,642	07/03/1973
962,382	72/427,173	07/03/1973
962,383	72/428,068	07/03/1973
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962,395	72/431,662	07/03/1973
962,398	72/432,046	07/03/1973
962,401	72/399,599	07/03/1973
962,404	72/426,928	07/03/1973
962,405	72/420,922	07/03/1973
962,409	72/398,903	07/03/1973
962,410	72/400,077	07/03/1973
962,412	72/400,987	07/03/1973
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962,415	72/405,872	07/03/1973
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962,419	72/406,491	07/03/1973
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962,454	72/421,652	07/03/1973
962,455	72/430,044	07/03/1973
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962,498	72/423,054	07/03/1973
962,499	72/423,750	07/03/1973
962,504	72/424,614	07/03/1973
962,506	72/424,691	07/03/1973
962,508	72/424,900	07/03/1973
962,511	72/425,073	07/03/1973
962,512	72/425,153	07/03/1973
962,517	72/425,921	07/03/1973
962,518	72/426,055	07/03/1973
962,520	72/426,121	07/03/1973
962,523	72/426,514	07/03/1973
962,524	72/426,517	07/03/1973
962,534	72/390,720	07/03/1973
962,537	72/393,834	07/03/1973
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962,542	72/405,734	07/03/1973
962,543	72/408,174	07/03/1973
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962,579	72/416,769	07/03/1973
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962,582	72/417,424	07/03/1973
962,583	72/419,131	07/03/1973
962,584	72/419,240	07/03/1973
962,587	72/425,902	07/03/1973
962,592	72/399,114	07/03/1973
962,593	72/399,116	07/03/1973
962,597	72/405,718	07/03/1973
962,600	72/412,125	07/03/1973
962,601	72/412,440	07/03/1973
962,604	72/416,133	07/03/1973
962,609	72/420,485	07/03/1973
962,612	72/421,403	07/03/1973
962,613	72/433,078	07/03/1973
962,616	72/433,306	07/03/1973
962,632	72/425,650	07/03/1973
962,634	72/427,373	07/03/1973
962,635	72/427,374	07/03/1973
962,644	72/429,307	07/03/1973
962,646	72/431,823	07/03/1973
962,647	72/431,995	07/03/1973
962,653	72/432,260	07/03/1973
962,654	72/432,415	07/03/1973
962,655	72/432,423	07/03/1973
962,656	72/432,424	07/03/1973
962,657	72/432,646	07/03/1973
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962,669	72/401,286	07/03/1973
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962,679	72/410,114	07/03/1973
962,681	72/412,919	07/03/1973
962,685	72/415,830	07/03/1973
962,687	72/416,731	07/03/1973
962,698	72/430,602	07/03/1973
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962,711	72/396,903	07/03/1973
962,714	72/403,949	07/03/1973
962,716	72/406,248	07/03/1973
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962,721	72/413,068	07/03/1973
962,723	72/413,503	07/03/1973
962,725	72/414,400	07/03/1973
962,726	72/414,478	07/03/1973
962,730	72/417,354	07/03/1973
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962,757	72/418,412	07/03/1973
962,759	72/427,815	07/03/1973
962,762	72/384,711	07/03/1973
962,763	72/409,402	07/03/1973
962,764	72/396,621	07/03/1973
962,765	72/418,207	07/03/1973
962,767	72/424,135	07/03/1973
962,769	72/425,286	07/03/1973
962,770	72/427,593	07/03/1973
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962,772	72/428,581	07/03/1973
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962,776	72/420,422	07/03/1973
962,777	72/379,325	07/03/1973
962,780	72/407,180	07/03/1973
962,782	72/309,153	07/03/1973
962,785	72/410,491	07/03/1973
962,788	72/416,417	07/03/1973
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962,794	72/427,149	07/03/1973
962,797	72/401,451	07/03/1973
962,803	72/410,823	07/03/1973
962,809	72/419,074	07/03/1973
962,810	72/421,402	07/03/1973
962,814	72/423,650	07/03/1973
962,815	72/424,207	07/03/1973
962,821	72/425,700	07/03/1973
962,822	72/426,921	07/03/1973
962,823	72/427,076	07/03/1973
962,832	72/402,958	07/03/1973
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962,842	72/415,238	07/03/1973
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962,890	72/429,097	07/03/1973
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962,894	72/393,396	07/03/1973
962,895	72/395,398	07/03/1973
962,897	72/405,509	07/03/1973
962,898	72/409,172	07/03/1973
962,915	72/422,600	07/03/1973
962,919	72/356,216	07/03/1973
962,921	72/380,472	07/03/1973
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962,947	72/410,739	07/03/1973
962,955	72/416,821	07/03/1973
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962,961	72/418,003	07/03/1973
962,962	72/418,687	07/03/1973
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963,010	72/430,295	07/03/1973
963,012	72/430,496	07/03/1973
963,013	72/430,687	07/03/1973
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963,023	72/432,026	07/03/1973

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963,027	72/432,410	07/03/1973
963,029	72/432,579	07/03/1973
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963,075	72/412,140	07/03/1973
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963,263	72/420,366	07/03/1973
963,265	72/399,894	07/03/1973
963,267	72/380,561	07/03/1973
963,272	72/359,695	07/03/1973
963,276	72/425,880	07/03/1973
963,279	72/407,441	07/03/1973

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Gene Bates, Inc., Hawthorne, Calif., Reg. No. 1,108,409 for the mark "BIG RED", Canc. No. 20,603.

Suffolk Oil Mill, Incorporated, Suffolk, Va., Reg. No. 628,790 for the mark "EZY-POP", Canc. No. 21,115.

Sarah Coventry, Incorporated, Newark, N.Y., Reg. No. 1,074,514 for the mark "CAROLINE", Canc. No. 21,122.

Apollo Motor Homes, Inc., Downey, Calif., Reg. No. 980,267 for the mark "RING OF STEEL", Canc. No. 21,457.

Jako, Inc., Bellevue, Wash., Reg. No. 1,561,113 for the mark "YO (STYLIZED)", Canc. No. 21,514.

J.P. Stevens Enterprises, Inc., Wilmington, Del., Reg. No. 583,108 for the mark "STRETCH-TEX", Canc. No. 21,657.

Valmor Products Co., Chicago, Ill., Reg. No. 600,137 for the mark "TRUE LOVE", Canc. No. 21,669.

Deborah Kern, Woodland Hills, Calif., Reg. No. 1,290,214 for the mark "DOODLE-DUD", Canc. No. 21,689.

Angionni, Inc., Tupelo, Miss., Reg. No. 1,499,644 for the mark "UGLY CLOTHES AND DESIGN", Canc. No. 21,732.

Hansen Manufacturing of Southwest Florida, Inc., Cape Coral, Fla., Reg. No. 1,060,697 for the mark "LIGHT FANTASY AND DESIGN", Canc. No. 21,901.

Heron Communications, Inc., New York, N.Y., Reg. No. 1,481,435 for the mark "HI-TOPS VIDEO AND DESIGN", Canc. No. 21,902.

Marlenn Corporation, Trevose, Pa., Reg. No. 969,474 for the mark "HOLIDAY", Canc. No. 21,903.

Handy Dan Home Improvement Centers, Inc., Commerce, Calif., Reg. No. 997,731 for the mark "ANGELS AND DESIGN", Canc. No. 21,924.

Knowledge Transfer International Corporation, Dallas, Tex., Reg. No. 1,712,308 for the mark "KNOWLEDGE TRANSFER INTERNATIONAL AND DESIGN", Canc. No. 21,936.

Genesis Marketing Corporation, New York, N.Y., Reg. No. 1,132,275 for the mark "GENESIS", Canc. No. 21,947.

Automation Industries, Inc., dba Vitro Laboratories, Los Angeles, Calif., Reg. No. 1,043,731 for the mark "FOTO-DRAFT", Canc. No. 21,948.

Popsicle Industries, Inc., Englewood, N.J., Reg. No. 657,234 for the mark "MISSILE", Canc. No. 22,116.

Smith's Transfer Corporation, Staunton, Va., Reg. No. 1,054,493 for the mark "ST DESIGN", Canc. No. 22,263.

Information Engineering, Inc., d/b/a Information Engineering Institute, Falls Church, Va., Reg. No. 1,595,733 for the mark "MACINSTITUTE (STYLIZED)", Canc. No. 22,288.

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For Robert M. Anderson
Acting Assistant Commissioner
for Trademarks

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of each proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Prime Time Leasing, Inc., York, Pa., Reg. No. 1,463,925, for the mark "DRIVERS CHOICE", Canc. No. 21,558.

WOW Sub Corp., Williamsville, N.Y., Reg. No. 1,487,535, for the mark "LAZER TAG", Canc. No. 21,881.

Ginghams, Inc., Milford, Conn., Reg. No. 1,514,078, for the mark "GINGHAMS" and design, Canc. No. 21,892.

Prime Time Leasing, Inc., York, Pa., Reg. No. 1,463,925 for the mark "DRIVERS CHOICE", Canc. No. 22,158.

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For ROBERT M. ANDERSON
Acting Assistant Commissioner
for Trademarks

Registration To Practice

The following list contains the names of persons who successfully passed the registration examination that was held Oct. 13, 1993. Final approval for registration is subjected to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any inforamtion tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds shoud be furnished to the Director, Office of Enrollment and Discipline on or before July 15, 1994.

April 29, 1994 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Berretta, Fredrick S., 13285 Denara Rd., San Diego, Calif. 92130
Blackwood, James D., 318 Terrace Ave., #3, Cincinnati, Ohio 45220
Broitman, Joshua S., 85th St., #407, New York, N.Y. 10028
Brown, Gregory P., 1547 Kirtland Dr., Ann Arbor, Mich. 48103
Cassidy, Timothy A., 60 Jamestowne Commons, Greenville, S.C. 29687
Cohen, Isaac David, 2077 E. 22nd St., Brooklyn, N.Y. 11229
Cohen, Joshua Louis, 201 W. Evergreen Ave., #312, Philadelphia, Pa. 19118
Dichiara, Peter M., 24 Lantern Ln., Sharon, Mass. 02067
Eckert, Inger Hansen, 1235 Northcliff Ct., Fairborn, Ohio 45324
Elson, Vera M., 601 Bryson Ave., Palo Alto, Calif. 94306
Esser, William F., 37590 Dale Dr., #102, Westland, Mich. 48185
Finneran, Thomas Robert, 17 Indian Run Rd., Princeton Jct., N.J. 08550
Gervasio, Joseph P., Jr., 14 Harvard Court, Rockville, Md. 20850
Gluck, Peter J., 387 Fifth St., #1, Brooklyn, N.Y. 11215
Hall, Phillip Earl, 10573 E. Terra Dr., Scottsdale, Ariz. 85258
Jaquez, Martin Joseph, 7133 Caminito Quintana, San Diego, Calif. 92122-4367
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Klicpera, Michael Edward, 11603 La Colina Rd., San Diego, Calif. 92131
Kuta, Christine M., 7 Fairview Ave., Cambridge, Mass. 02138
Loberman, Laura, 1452 Beryl St., San Diego, Calif. 92109
Madison, Rita A., 5418 Nurmi Dr., Midland, Mich. 48640
Maliszewski, Gerald William, 14653 Thebes, San Diego, Calif. 92129
McLaughlin, James Francis, 4 Victory S., Shelton Conn. 06484
Michel, Walter A., 433 Hillside Dr., Highland Park, Ill. 60035
Mierzwa, Kevin G., 8466 Smethwick, Sterling Hgts., Mich. 48312
Miller, William D., 7216 Lensfield Ct., Alexandria, Va. 22310
Mullins, Burton S., 3861 N. Chesterbrook Rd., Arlington, Va. 22207
O'Connell, Thomas P., 33 Peach Orchard Rd., Burlington, Mass. 01803
Parrish, Debra M., 26 Academy Ave., #B1, Pittsburgh, Pa. 15228
Pierce, Gary D.E., 863 N. Pheasantbrook Cir., Centerville, Utah 84014
Pollard, Albert C., P.O. Box 266, Irvington, Va. 22480
Reber, William Louis, Jr., 1029 Buccaneer Dr., #6, Schaumbur, Ill. 60173
Schoneman, William A., 40-50 E. 10th St., #5B, New York, N.Y. 10003
Schultz, Earl Robert, 3436 Tedmar Ave., St. Louis, Mo. 63139
Shroyer, Gary S., 751 S. Pearl St., Columbus, Ohio 43206
Swope, Michael James, 7114 Pennsylvania Ave., Upper Darby, Pa. 19082
Warner, Richard W., 456 Burgees Dr., White Lake, Mich. 48386
Wright, Bradley C., 10368 Latney Rd., Fairfax, Va 22032

Errata

"All reference to Patent No. 5,306,268 to Kenneth M. Enloe of Wisconsin for 'DIAPERS WITH ELASTCIZED SIDE POCKETS' appearing in the *Official Gazette* of April 26, 1994 should be deleted since no patent was granted."

Errata

"All reference to Patent No. 5,307,090 to Paul F. Sullivan of Massachusetts for 'LIGHT BEAM POSITION DETECTION AND CONTROL APPARATUS EMPLOYING DIFFRACTION PATTERNS' appearing in the *Official Gazette* of April 26, 1994 should be deleted since no patent was granted."

Closing of Patent and Trademark Office on Wednesday, April 27, 1994

In view of the fact that Federal government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, were officially closed on April 27, 1994, the day proclaimed by President Clinton as a National Day of Mourning, the Patent and Trademark Office will consider April 27, 1994 a "holiday within the District of Columbia" under 35 U.S.C.§21. Any action or fee due that day will be considered

as timely for the purposes of e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on April 28, 1994.

May 2, 1994 BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Response Requested to 1993 Patent Examiner's Action Survey

As part of the continuing quality reinforcement efforts of the Patent and Trademark Office, the Office has sent out a Patent Action Survey For with each Patent Examiner's Office action mailed during a period of several weeks during December, 1993-January, 1994. If you have received one or more of these forms, please complete each one, no later than the time of response to the Office action being surveyed.

The survey is intended to determine whether Office actions are perceived to be clear and complete on certain specific and important items related to patent examining practices and procedures. The results of the survey will be used in the development of Office training programs. The survey is a follow-up to the Patent Action Surveys conducted in 1991 and 1992. Where training is provided to address identified deficiencies in performance, follow-up surveys are intended to be conducted in the future to determine whether the training was effective enough to improve performance in the measured areas.

The Survey Form is brief and easy to complete and does not permit identification of the respondent or of the particular application involved. The Survey Form may be completed at the time of response to the Office Action. It is possible that a practitioner may receive many Office Actions containing a Survey Form during the survey period. To have results that are meaningful, the Office needs a high response rate. Therefore, it is important that patent practitioners complete each survey form no later than the time of response to the Office action being surveyed. To assure that this form is completed and mailed back to the address indicated on the Survey Form, it would be desirable for patent practitioners to have their office managers/docketing personnel take appropriate steps to keep the form and Office action together for the practitioner's benefit.

Your cooperation in completing the Survey Form is appreciated.

Nov. 16, 1993 STEPHEN G. KUNIN
Acting Assistant Commissioner

Disclaimers and Dedications

4,882,981—Carlos Bacigalupe, The Colony; Michael J. Dobie, Plano, Both of Tex. CONTINUOUS PROOF AND BAKE APPARATUS HAVING IMROVED CONVEYOR SYSTEM. Patent dated Nov. 28, 1989. Disclaimer and Dedication filed Mar. 31, 1994, by the assignee, Stewart Systems, Inc.

Hereby disclaims and dedicates to the Public claim 1 of said patent.

5,087,394—Peter T. Keith, Edina, Minn. METHOD FOR FORMING AN INFLATABLE BALLOON FOR USE IN A CATHETER. Patent dated Feb. 11, 1992. Disclaimer and Dedication filed Mar. 21, 1994, by the assignee, SciMed Life Systems, Inc.

Hereby disclaims and dedicates to the Public the entire term of said patent.

5,162,795—Norihisa Shirota, Kanagawa, Japan. CODING AND DECODING APPARATUS OF VARIABLE LENGTH DATA. Patent dated Nov. 10, 1992. Disclaimer and Dedication filed April 18, 1994, by the assignee, Sony Corp.

Hereby disclaims and dedicates to the Public claim 1 of said patent.

5,237,978—John M. Bailey, Dunlap, Ill., APPARATUS FOR MULTI-FUEL SYSTEM OF AN ENGINE. Patent dated Aug. 24, 1993. Disclaimer and Dedication filed Feb. 7, 1994, by the assignee, Caterpillar Inc.

Hereby disclaims and dedicates to the Public the entire term of said patent.

Disclaimers

5,013,743—Tomoyuki Iwahi; Hiroshi Satoh, both of Suita, Japan. SELECTIVE ANTIBACTERIAL AGENT AGAINST CAMPYTOBACTER. Patent dated May 7, 1991. Disclaimer filed Mar. 24, 1994, by the assignee, Takeda Chemical Industries, Ltd.

Hereby enters the disclaimer to claims 1 and 15 of said patent.

5,117,714—William T. Pagac; Frank Mikic; Thomas S. Severson, all of Kenosha; Douglas M. Sorbie, Salem, all of Wis. ONE-PIECE, OPEN-END WRENCHING HEAD WITH SERRATED JAWS. Patent dated June 2, 1992. Disclaimer filed Mar. 30, 1994, by the assignee, Snap-on Tools Corp.

Hereby enters this disclaimer to claims 1, 2, 5, 7, 35 and 38 of said patent.

5,148,726—David A. Huebschen; William T. Pagac; Frank Mikic, all of Kenosha, Wis.; Thomas S. Severson, Auburn Hills, Mich.; Douglas M. Sorbie, Salem, Wis. ONE-PIECE, OPEN-END WRENCHING HEAD WITH ROUGHENED JAWS. Patent dated Sept. 22, 1992. Disclaimer filed Mar. 30, 1994, by the assignee, Snap-on Tools Corp.

Hereby enters this disclaimer to claims 24, 25 and 27 of said patent.

5,171,671—Ronald M. Evans, La Jolla; Estelita S. Ong; Prudimar S. Segui, both of San Diego; Catherine C. Thompson, La Jolla; Kazuhiko Uemsono, San Diego, all of Calif.; Vincent Giguere, Etobicoke, Canada. RETINOIC ACID RECEPTOR COMPOSITION. Patent dated Dec. 15, 1992. Disclaimer filed Dec. 14, 1993, by the assignee, The Silk Institute for Biological Studies.

Hereby enters this disclaimer to claims 3, 6, 9, 11, 12, 13 and 14 of said patent.

5,205,914—Leonid A. Rozov, Fair Lawn; Chialang Huang, Edison; Gerald G. Vernice, Nutley, all of N.J. SYNTHESIS OF DESFLURANE. Patent dated April 27, 1993. Disclaimer filed Mar. 31, 1994, by the assignee, Ohmeda Pharmaceutical Products Inc.

Hereby enters this disclaimer to all claims of said patent.

5,247,899—Sara L. Bosser, Juneau, Ak. RAMP AND PLATFORM HARBOR ACCESS SYSTEM. Patent dated Sept. 28, 1993. Disclaimer filed Feb. 22, 1994, by the inventor.

Hereby enters this disclaimer to claims 1-3, 7-10, 14 and 15 of said patent.

5,280,022—Takashi Sohda, Takatsuki; Shigehisa Taketomi, Ikeda, both of Japan. BISPHOSPHONIC ACID DERIVATIVES, THEIR PRODUCTION AND USE. Patent dated Jan. 18, 1994. Disclaimer filed April 15, 1994, by the assignee, Takeda Chemical Industries, Ltd

Hereby enters this disclaimer to claim 5 of said patent.

Certificates of Correction
Issue of May 31, 1994

D. 323,818
D. 332,708
D. 339,704
D. 342,110
D. 344,433
D. 345,282
Re. 34,464
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	Milwaukee Public Library	(414) 278-3247
Wyoming	Casper: Natrona County Public Library	Not Yet Operational

PATENT EXAMINING CORPS

BRUCE LEHMAN, Commissioner
STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/14/93
ORGANIC CHEMISTRY, GROUP 1200—JOHN F. TERAPANE, JR., Director	308-1235	04/08/93
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	08/23/93
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—J.O. THOMAS, Director	308-2351	06/20/93
BIOTECHNOLOGY, GROUP 1800—BARRY S. RICHMOND, Director	308-0196	07/30/93
ELECTRICAL EXAMINING GROUPS		
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SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	11/02/92
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—GERALD GOLDBERG, Director	305-9600	05/11/92
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DESIGN, GROUP 2900—ROBERT E. GARRETT, Director	308-0511	08/18/92
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—N. GODICI, Director	308-1148	05/03/93
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300—J.J. LOVE, Director	308-0858	06/10/93
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	12/18/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	06/17/93

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during April 1994 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 4,015,294 to 4,020,506 inclusive
Plant Patents	4,032 to 4,045

TRADEMARK OPERATION

Bruce Lehman, Commissioner
Robert M. Anderson, Acting Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Operation
Condition of Trademark Applications as of April 1, 1994

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 3—Kathryn A. Dobbs, Managing Attorney, (703) 308–9103 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/12/93	12/10/93
Law Office 4—Sharon Marsh, Managing Attorney, (703) 308–9104 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21, Services—Int. Classes 35, 36, 37, 38, 40, 41, 42	11/22/93	02/14/94
Law Office 5—Mary Sparrow, Managing Atttorney, (703) 308–9105 Cosmetics, Cleaning Preparations, Paper Products and Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/18/93	01/06/94
Law Office 6—Myra Kurzbard, Managing Attorney, (703) 308–9106 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/18/93	01/18/94
Law Office 7—David Shallant, Managing Attorney, (703) 308–9107 Lubricants, Fuels, Industrial Equipment & Materials—Int. Classes 4, 6, 11, 14, 19 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/28/93	12/10/93
Law Office 8—Thomas Lamone, Managing Attorney, (703) 308–9108 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/18/93	01/18/94
Law Office 9—Sidney Moskowitz, Managing Attorney, (703) 308–9109 Lubricants, Industrial Equipment, Materials & Musical Instruments—Int. Classes 4, 6, 7, 8, 12, 13, 15, 16, 17, 18, 19, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/21/93	01/03/94
Law Office 10, Jean Logan, Managing Attorney, (703) 308–9110 Cordage, Fibers, Yarns, Threads, Fabrics, Clothing & Floor Covering–Int. Classes 22, 23, 24, 25, 26, 27 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/22/93	02/22/94
Law Office 11—Thomas Howell, Managing Attorney, (703) 308–9111 Paints, Pharmaceuticals & Medical Apparatus—Int. Classes 2, 5, 10 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/12/93	12/29/93
Law Office 12—Deborah Cohn, Managing Attorney, (703) 308–9112 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/15/93	03/03/94
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Law Office 14, Ron Williams, Managing Attorney, (703) 308–9114 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/29/93	01/25/94
Law Office 15—Paul Fahrenkopf, Managing Attorney, (703) 308–9115 Rubber, Leather Goods & Clothing—17, 18, 25 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/17/93	09/07/93
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Jodi Rush, Director (703) 308–9000		
Post Registration Section—Jaqueline Cole, Managing Attorney, (703) 308–9500		
Affidavits Under Sections 8 & 15 (All Classes)	11/15/93	—0—
Renewals (All Classes)	12/06/93	—0—
Section 12(C) Publications (All Classes)	—0—	—0—

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REEXAMINATIONS

MAY 31, 1994

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,254,403 (2305th)

SYSTEMS FOR TRANSMITTING INFORMATION IN AN ALTERNATING CURRENT ELECTRICITY SUPPLY SYSTEM

Leonardo Perez-Cavero, Media, Pa.; Michael W. A. Cross, Bristol, England; Geoffrey Fielding, and Frederick M. Gray, both of Stafford, England, assignors to General Electric Comp., Ltd., London, England

Reexamination Request No. 90/003,211, Oct. 4, 1993.

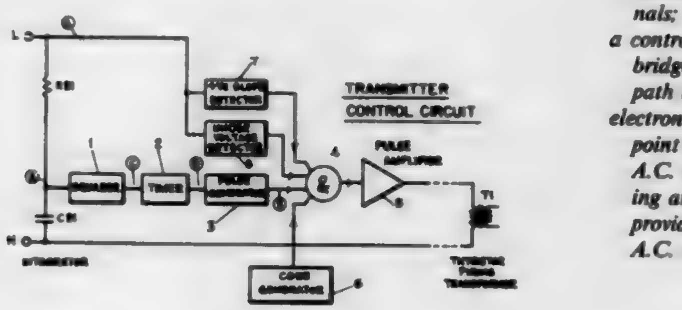
Reexamination Certificate for Patent No. 4,254,403, issued Mar. 3, 1981, Ser. No. 63,965, Aug. 6, 1979.

Continuation of Ser. No. 786,578, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 596,443, Jul. 18, 1975, abandoned

Claims priority, application United Kingdom, Jul. 18, 1974, 31964/74

Int. Cl.^{5} H04B *3/54*

U.S. Cl. 340—310 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–10 is confirmed.

1. In a system for transmitting information in an A.C. electricity supply system by reducing the instantaneous value of the A.C. supply voltage during the same small fractional part of each of a selection of cycles of the supply voltage waveform, said part including a time of voltage zero, a transmitter comprising: controllable switch means connected across said supply system in an effective zero impedance path so as to effectively short-circuit said supply system throughout the whole of any period that the switch means is closed and thereby draw from said system throughout the whole of any period that said switch means is closed a current of sufficient magnitude to reduce the instantaneous value of the A.C. supply voltage during the time that said switch means is closed and conducting; and switch control means for closing said switch means for a said small fractional part of any selected single cycle of the supply voltage waveform.

B1 4,352,045 (2306th)

ENERGY CONSERVATION SYSTEM USING CURRENT CONTROL

Don F. Widmayer, Bethesda, Md., assignor to Flexiwatt Corporation, Rockville, Md.

Reexamination Request No. 90/000,523, Mar. 8, 1984.

Reexamination Certificate for Patent No. 4,352,045, issued Sep. 28, 1982, Ser. No. 284,590, Jul. 17, 1981.

Int. Cl.^{5} H05B *37/02, 41/392*

U.S. Cl. 315—291

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–4, 10, 11, 15–20** are cancelled.

Claims **5, 12** are determined to be patentable as amended.

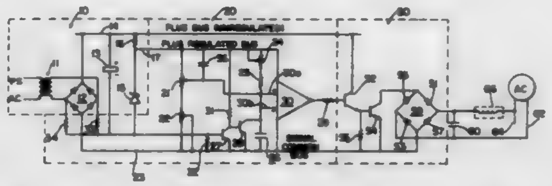
Claims **6–9, 13, 14**, dependent on an amended claim, are determined to be patentable.

5. [An electrical control system as claimed in claim **4**] *An electrical control system for controlling the current flow from the A.C. supply terminals of an A.C. voltage supply to an electrical load device comprising an inductive ballast and at least one fluorescent lamp having heated cathodes so as to provide dimming control for said at least one lamp, said control system comprising:*

a full wave A.C. bridge rectifier circuit having A.C. terminals and D.C. terminals, one of said A.C. terminals of said rectifier circuit being connected to one of said A.C. supply terminals;

a control transistor connected to said load through said A.C. bridge rectifier circuit so as to provide a controlled current path to the load;

electronic switching means for switching on said transistor at a point in time at least close to the zero crossover point of the A.C. supply voltage and maintaining said transistor on during an initial portion of the A.C. supply voltage halfwave to provide for the application of substantially the entire available A.C. supply voltage to the load during the initial portion of the A.C. supply voltage half wave and for switching off said transistor at a variable point in time after said initial portion during said A.C. supply voltage half wave and for maintaining said transistor switched off during the remainder of the half wave so as to control current flow through the at least one lamp and thereby control the amount of dimming provided by said at least one lamp;



a substantially non-resistive means, comprising at least one capacitor, connected across the A.C. terminals of said A.C. bridge rectifier circuit and being of a capacitance value sufficient to provide an alternative current path for substantial current flow to the load when said transistor is switched off by said electronic switching means and thereby provide continuous current flow from the A.C. supply terminals of said A.C. source to the load when said transistor is switched off by said electronic switching means during the remainder of the A.C. supply voltage halfwave so as to maintain current flow through said at least one lamp, over the entire dimming range of the system;

wherein said electronic switching means comprises a transistor, and control means for turning said transistor full-on during said initial portion of the A.C. supply voltage half wave and for turning said transistor off at a said variable point in time;

wherein said control means includes an operational amplifier including first and second inputs and means applying a ramp function to one of said inputs for controlling switching of the output signal of said operational amplifier from a first level to a second level at a variable point in time in said A.C. voltage

half wave, corresponding to the said point in time that turning off of said transistor takes place;
wherein said control means further comprises means for controlling the slope of said ramp function and thereby controlling the point in time at which said transistor is turned off; and wherein said means for controlling the slope of said ramp function comprises a variable resistance device.

B1 4,393,203 (2307th)

PROCESS OF PREPARING ALKYLPOLSACCHARIDES

Mark H. K. Mao, Cincinnati; Larry E. Miller, Madeira, and John M. Weeman, Cincinnati, all of Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio
Reexamination Request Nos. 90/002,939, Jan. 28, 1993 and 90/002,718, May 7, 1992.
Reexamination Certificate for Patent No. 4,393,203, issued Apr. 26, 1982, Ser. No. 371,693, Jul. 12, 1983.
Int. Cl.^{5} C07G *3/00;* **C07H** *1/00;* **C08B** *37/00*
U.S. Cl. 536—124

PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

1. In the process of removing fatty alcohol containing from about 12 to 18 carbon atoms from a mixture of said alcohol with **[**an**]** *a C_{12} to C_{18}* alkyl polysaccharide wherein saccharide chain length is greater than one on the average and less than about 20 *saccharide moieties, and wherein said mixture contains no C_1 to C_5 short chain alcohols or auxiliary solvents,* the improvement **[**of**]** *which comprises* heating the mixture under *a* vacuum *of from about 0.1 to about 20 mm of mercury* in a thin film evaporator **[**wherein the thin film evaporator**]** *which* provides, in operation, a Reynolds number of at least about 20,000 **[**and**]** a film thickness of less than about 10 mm and **[**the**]** *a film* temperature **[**is**]** *of* from about **[**120° C.**]** *140° C.* to about 200° C. **[**and the vacuum is from about 0.1 to about 20 mm of mercury so**]** , *wherein fatty alcohol removable is continued under the aforesaid conditions so as to avoid decomposition of, and any appreciable change in the color of, said alkylpolysaccharide and continued to the extent* that no more than about 2% of said fatty alcohol remains *in said mixture.*

B1 5,136,852 (2308th)

CONTROL REGULATOR AND DELIVERY SYSTEM FOR A CRYOGENIC VESSEL

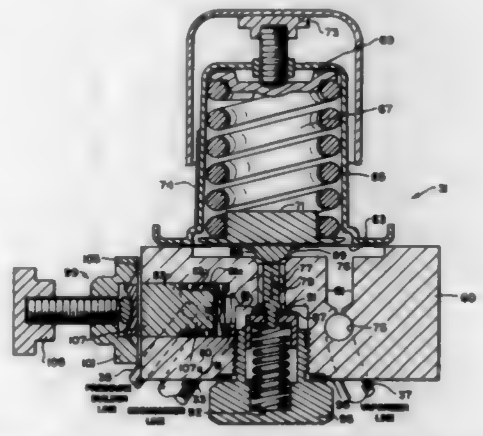
Timothy A. Neeser, Savage, and Peter L. Bliss, Prior Lake, both of Minn., assignors to Minnesota Valley Engineering, Inc.
Reexamination Request No. 90/003,041, Apr. 30, 1993.
Reexamination Certificate for Patent No. 5,136,852, issued Aug. 11, 1992, Ser. No. 683,267, Apr. 10, 1991.
Int. Cl.^{5} F17C *9/04*
U.S. Cl. 62—50.4

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1-15** are cancelled.

New claim **16** is added and determined to be patentable.

16. A cryogenic liquid delivery system, comprising:
a) an insulated storage tank containing a liquid body and a gas head;
b) a regulator for controlling the delivery of fluid from said storage tank to a gas use device;
c) a gas use line for delivering gas to a gas use device;
d) an economizer line connecting the gas head with a first port of the regulator;
e) a vaporizer line connecting the gas use line with a second port of the regulator;
f) a dip tube connecting the liquid body to the vaporizer line;
g) a pressure building line connecting the liquid body with a third port of the regulator;



g) said regulator including a valve means movable between a first portion where the economizer line communicates with the vaporizer line and said third port is closed and gas is delivered to the gas use line for the gas head and a second position where the economizer line communicates with the pressure building line and the second port is closed and gas is delivered to the use line from the liquid body through the dip tube and the vaporizer line and the pressure in the tank is rebuilt through the pressure building line and the economizer line;
i) said valve means including a member exposed to the gas in said economizer line for moving the valve means to the first position when the pressure in the tank exceeds a predetermined value; and
g) means for isolating said third port and said pressure builder line from both of said first and second ports, said means for isolating including a member located in said regulator that is manually movable to a position where fluid cannot flow through said regulator to said third port from either said first or second ports.

REISSUES

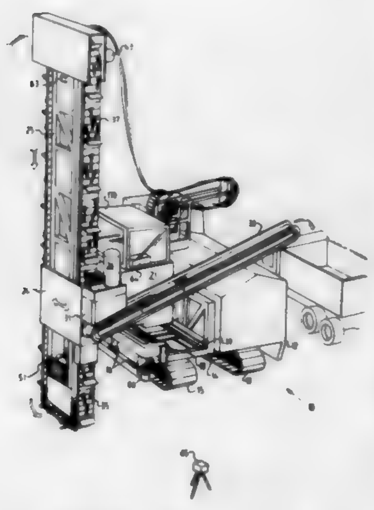
MAY 31, 1994

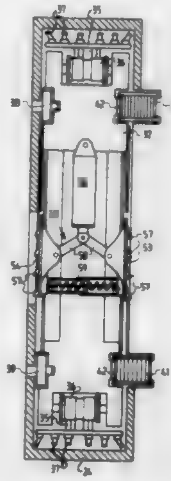
Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,620

TRENCHING APPARATUS AND METHODS OF FORMING INGROUND RETAINING WALLS

Paul A. Camilleri, Gold Coast, Australia, assignor to Foundation Technology Limited, Australia
Original No. 4,843,742, dated Jul. 4, 1989, Ser. No. 59,745, Jun. 8, 1987. Application for reissue Jul. 1, 1991, Ser. No. 724,202
Claims priority, application Australia, Jun. 13, 1986, PH6409
The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.
Int. Cl.^{5} E02F *5/08*
U.S. Cl. 37—362 **14 Claims**





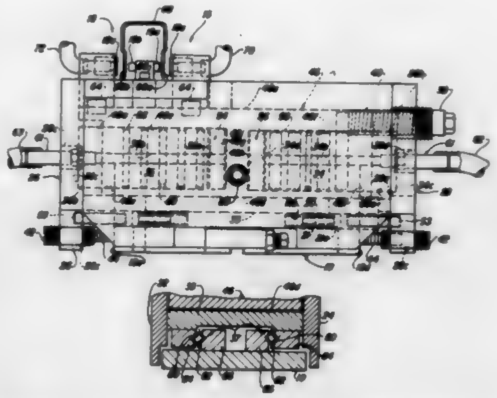
14. A trenching method, comprising:
digging substantially vertically downwardly from ground level to a desired trench depth using a digger mechanism associated with a trenching arm assembly so that a lower end of said trenching arm assembly is located below ground;
excavating a trench by propelling an upper end of said trenching arm assembly along a desired trench line with an above ground propulsion unit, and by propelling said lower end of said trenching arm assembly along said desired trench line with a below ground propulsion unit which is separate from said digger mechanism.

Re. 34,621

SELF EQUALIZING PIERCING MACHINE

Edward J. Waltonen, Southfield, and Robert E. Obrecht, Bloomfield Hills, both of Mich., assignors to Lamb Robo, Inc., Bloomfield, Mich.
Original No. 4,763,550, dated Aug. 16, 1988, Ser. No. 859,016, May 2, 1986. Continuation of Ser. No. 495,480, Mar. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 427,048, Sep. 29, 1982, Pat. No. 4,716,803. Application for reissue Mar. 5, 1991, Ser. No. 664,493
Int. Cl.^{5} B21D *5/12*
U.S. Cl. 83—191 **22 Claims**

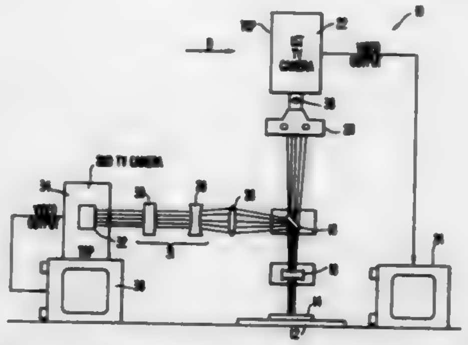
14. An apparatus for performing a work operation on a workpiece comprising:
a yoke defining an axially extending bore and a pair of laterally spaced, axially extending flat elongated bearing surfaces;
a ram mounted for reciprocal axial movement in said bore;
power means for moving said ram member axially within said bore;
a first fabricating tool on said yoke;
a second fabricating tool on said ram operative to coact with said first fabricating tool to perform the work operation on the workpiece;
an axially extending base defining a pair of laterally spaced, axially extending flat elongated bearing surfaces, each arranged in confronting relation to a respective one of said flat elongated yoke bearing surfaces and coacting with the respective yoke bearing surface to define a pair of laterally spaced elongated bearing ways between said base and said yoke; and
elongated bearing means disposed in each elongated bearing way in rolling contact with said flat bearing surfaces to allow low friction axial movement of said yoke on said base.



Re. 34,622

SPLIT-IMAGE, MULTI-POWER MICROSCOPIC IMAGE DISPLAY SYSTEM AND METHOD

Robert S. Ledley, Silver Spring, Md., assignor to National Biomedical Research Foundation, Washington, D.C.
Original No. 4,651,200, dated Mar. 17, 1987, Ser. No. 784,615, Oct. 4, 1985. Continuation-in-part of Ser. No. 697,930, Feb. 4, 1985, Pat. No. 4,673,973. Application for reissue Mar. 16, 1989, Ser. No. 324,779
Int. Cl.^{5} H04N *7/18*
U.S. Cl. 348—79 **49 Claims**



1. A method for displayjng magnified images of an object having respective first and second magnifications, comprising:
providing an objective, characterized by the first magnification, through which the image of the object passes to produce an objective optical output having the first magnification;
splitting the objective optical output into first and second optical outputs for passage through respective first and second optical paths;
providing at least one optical element in the first optical path for increasing the magnification of the first optical output in

said first optical path to produce a third optical output characterized by the second magnification;

providing the third optical output to a first camera which produces a first video output characterized by the second magnification;

[bending] *providing* the second optical output to [direct it toward] a second camera which produces a second video output characterized by the first magnification; and

processing said first and second video outputs to display first and second images, respectively, of the object magnified in accordance with the second and first magnifications, respectively.

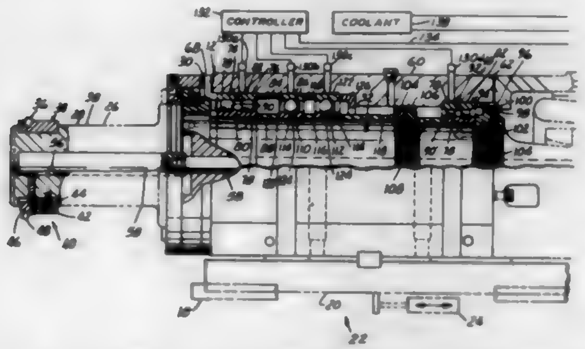
Re. 34,623
HIGH SPEED SPINDLE WITH ADJUSTABLE TOOL

Godfrey T. Briggs, Tecumseh, Canada, assignor to Colonial Tool Operations Div. of Textron Canada Ltd., Windsor, Canada

Original No. 4,867,619, dated Sep. 19, 1989, Ser. No. 254,980, Oct. 7, 1988. Application for reissue Apr. 4, 1991, Ser. No. 680,384

Int. Cl.^{5} B23B *41/16, 39/00*

U.S. Cl. 408—158 **6 Claims**



6. In a machine tool assembly having first housing means, a spindle shaft directed therethrough and an actuating shaft directed through the spindle shaft for adjusting the position of a cutting tool mounted on the output end of the spindle shaft the improvement comprising:

first bearing means supported on said first housing means for rotatably supporting said spindle shaft;

electric motor means within said first housing means for driving said spindle shaft;

said electric motor means including stator means and rotor means connected to said spindle shaft for rotating said spindle shaft with respect to said first housing means;

second bearing means supporting said spindle shaft on said first housing means near one end of said first housing means;

adjusting means for controlling the stroke of said actuating shaft and for controlling the amount of radial cut by the cutting tool, said adjusting means including a driven member for adjusting the axial position of said actuating shaft with respect to said spindle shaft to control the radial location of the cutting tool with respect to a workpiece bore for controlling the amount of material removed from the workpiece bore by the cutting tool during spindle rotation;

a second housing means for said adjusting means; said second housing means including bearing means for rotatably supporting said actuating shaft;

and pilot means on said second housing means directly rigidly connecting said adjusting means housing on said one end of first said housing means thereby to prevent excess lateral loading of said last mentioned bearing means during rotation of said spindle shaft as material is cut from a bore by the cutting tool.

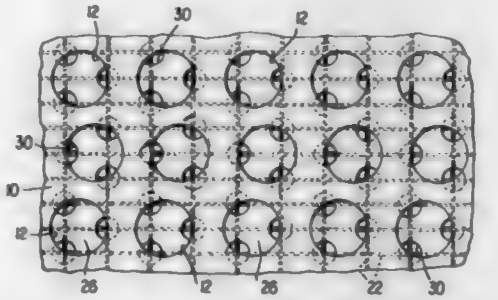
Re. 34,624
EXTRUSION DIE FOR FORMING THIN WALLED HONEYCOMB STRUCTURES

George M. Cunningham, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Original No. 4,731,010, dated Mar. 15, 1988, Ser. No. 52,875, May 22, 1987. Application for reissue Nov. 4, 1992, Ser. No. 971,418

Int. Cl.^{5} B29C *47/12*

U.S. Cl. 425—461 **10 Claims**



1. An extrusion die for extruding and forming a thin-walled honeycomb structure, said die including a body plate and a face plate each having an inlet surface, [and] an outlet surface, *and an outlet portion* the outlet surface of said body plate being in facing, abutting contact with the inlet surface of said face plate, said body plate having a plurality of parallel, elongated, primary feed holes each having a longitudinal axis, said primary feed holes extending from the inlet to the outlet surface of said body plate, [the inlet surface of said face plate having a plurality of recesses to thereby define a plurality of feed reservoirs, an outlet end of each of said primary feed holes communicating with a respective feed reservoir,] said face plate [also] having a plurality of parallel, secondary feed holes, the outlet [surface] *portion* of said face plate having a plurality of intersecting slot segments defining a plurality of *rectangular* pins *having a pair of opposite longer sides*, each pin bordered and defined by a plurality of slot segments, an outlet end of each of said secondary feed holes communicating with an associated, respective, intersection of said slot segments, [each feed reservoir communicating with inlet ends of an associated plurality of said secondary feed holes, said primary feed holes being arranged in horizontal rows and being substantially uniformly spaced from each other in any horizontal row, and wherein corresponding primary feed holes of adjacent horizontal rows are horizontally displaced from each other to thereby define columnwise staggered primary feed holes,] whereby material to be extruded passes from an inlet to the outlet end of each primary feed hole, [thence to a respective feed reservoir,] thence to the inlet end of each of a plurality of associated secondary feed holes, thence to the outlet end of each said secondary feed hole, thence to an associated slot segment intersection, thence both horizontally and downwardly from each associated slot intersection, to thereby form a honeycomb extrudate having continuous and interconnected parallel channels therein[.] *the extrusion die being further characterized in that the inlet surface of said face plate has a plurality of recesses to thereby define a plurality of feed reservoirs, an outlet end of each of said primary feed holes communicating with a respective feed reservoir, each feed reservoir communicating with inlet ends of an associated plurality of said secondary feed holes, and in that said primary feed holes are arranged in rows parallel to the longer sides of the rectangular pins, the primary feed holes being uniformly spaced from each other in any said row, corresponding primary feed holes of adjacent said rows being displaced from each other lengthwise of the rows so that the primary feed holes form staggered columns running transverse to the rows.*

Re. 34,625
SINTERED BODY FOR CHIP FORMING MACHINING

Leif A. E. Akesson, Älvsjö, and Marian Mikus, Skärholmen, both of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Original No. 4,843,039, dated Jun. 27, 1989, Ser. No. 48,775, May 12, 1987. Application for reissue May 17, 1991, Ser. No. 702,025

Claims priority, application Sweden, May 12, 1986, 8602147-4

The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.^{5} C04B *35/56;* **C22C** *29/00*

U.S. Cl. 501—87 **22 Claims**

1. Sintered body for chip forming machining comprising at least one hard constituent comprising a carbide, nitride and/or carbonitride of a metal of group IVB, VB or VIB of the periodical system and a binder metal based on Co, Ni and/or Fe, said sintered body comprising (i) a core containing at least one of (a) etaphase and (b) an intermediate phase being esentially free of carbon and/or nitrogen, said core being surrounded by (ii) a hard constituent-and binder phase-containing surface zone free of said eta-phase or said intermediate phase.

Re. 34,626
ISOMERIZATION OF BISPHENOLS

Udo Rudolph, and Claus Wulff, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

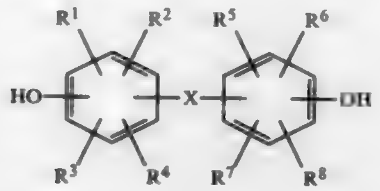
Original No. 5,015,784, dated May 14, 1991, Ser. No. 389,354, Aug. 3, 1989. Application for reissue Feb. 1, 1993, Ser. No. 27,734

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827643

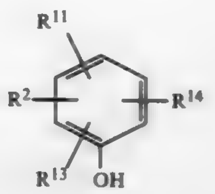
Int. Cl.^{5} C07C *37/14, 39/16*

U.S. Cl. 568—722 **3 Claims**

1. In the process for isomerization of bisphenols in the presence of phenols and catalyst, the improvement comprises contacting a bisphenol of the formula



with a phenol of the formula



and a catalyst selected from the group consisting of protonic acids, Lewis acids and acid ion exchange resins,

wherein

R^1 to R^8 are the same or different and each is, independent of the others, hydrogen or alkyl having 1–12 carbon atoms,

X is alkylidene having 1–12 carbon atoms or cycloalkylidene having 3–12 carbon atoms, with X in the ortho or para position to the —OH,

R^{11} to R^{14} are the same or different and each is, independent of the others, *hydrogen*, alkyl having 1–12 carbon atoms, halogen, aryl having 6–24 carbon atoms, alkoxy having 1–12 carbon atoms or cycloalkyl having 5–30 carbon atoms.

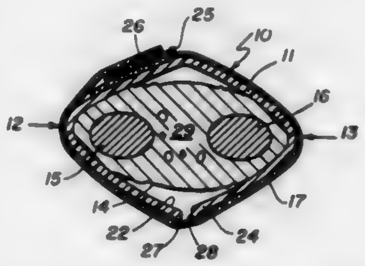
Re. 34,627
SPLINT SYSTEM

Mark A. Davini, 382 Boston Turnpike, Suite 101, Shrewsbury, Mass. 01545

Original No. 4,966,137, dated Oct. 30, 1990, Ser. No. 410,360, Sep. 19, 1989. Application for reissue Oct. 28, 1992, Ser. No. 967,993

Int. Cl.^{5} A61F *5/00, 13/00;* **A41D** *19/02*

U.S. Cl. 602—5 **10 Claims**



1. Splint system for the treatment of carpal tunnel syndrome in *the wrist of* a patient comprising:

(a) a clamp [formed from] *comprising* a generally rectangular sheet of semi-rigid material [and formed into] *providing* a generally tubular shape having four generally planar panels, a first two of the panels occupying the ends of the rectangular sheet, and the other two panels being located between the first two panels to give a cross-section of a diamond-shaped conformation for embracing the wrist of a patient with opposite corners embracing the wrist exteriorly of the radius and ulna bones to press [them together] *said bones towards one another*, and

(b) a bandage surrounding the clamp to regulate the pressure of the clamp on the wrist.

PLANT PATENTS

GRANTED MAY 31, 1994

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,753

JENNIFER CONRAD ROSE BUSH

Jean Conrad, 1780 Marston Pl., Tallahassee, Fla. 32312

Filed Aug. 17, 1992, Ser. No. 929,901

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—5 **1 Claim**

1. A new and distinct variety of climbing shrub rose plant characterized by the following combination of characteristics:

(a) abundantly and continuously forms attractive long lasting double deep pink flowers with creamy yellow center and opens flat,
(b) exhibits vigorous vegetation,
(c) exhibits excellent resistance to frost, and
(d) is particularly well suited for growing in the landscape,

substantially as herein shown and described.

8,754

HYBRID TEA ROSE PLANT NAMED 'MEILOSCOR'

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 11, 1993, Ser. No. 61,068

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms elongated buds,
(b) forms in abundance attractive long-lasting very double blossoms which are dark Currant Red suffused with Cardinal Red on the upper side, and dark Cardinal Red on the under side,
(c) forms very long straight and rigid stems,
(d) forms somewhat small foliage,
(e) exhibits vigorous vegetation,
(f) exhibits an upright growth habit,
(g) is particularly well suited for cut flower production, and
(h) is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

8,755

CHUCK HAYES GARDENIA

Charles J. Hayes, deceased, late of Kitty Hawk, N.C.; Charles J. Hayes, Jr. (executor), P.O. Box 229, Kitty Hawk, N.C. 27949

Filed Jan. 11, 1993, Ser. No. 3,097

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—67.6 **1 Claim**

1. A new and distinct cultivar of *Gardenia jasminoides* named Chuck Hayes Gardenia, substantially as shown and described herein and characterized by:

(a) a resistance to cold temperatures as low as −5° F.;
(b) a tolerance of evening temperatures as high as 70° F. during blooming periods;
(c) a more compact appearance and growth habit than *Gardenia jasminoides* "Mystery"; and
(d) longer and more floriferous blooming cycles in June and September as compared to *Gardenia jasminoides* "Mystery".

8,756

CHRYSANTHEMUM PLANT NAMED MEGAN

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers Inc., Barberton, Ohio

Filed Jan. 21, 1992, Ser. No. 822,700

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—74.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named Megan, as described and illustrated.

8,757

CHRYSANTHEMUM PLANT NAMED YELLOW NICOLE

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 25, 1992, Ser. No. 981,220

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Yellow Nicole, as described and illustrated.

8,758

CHRYSANTHEMUM PLANT NAMED CREAM NICOLE

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 30, 1992, Ser. No. 982,951

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Cream Nicole, as described and illustrated.

8,759

CHRYSANTHEMUM PLANT NAMED YELLOW SANDY

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 30, 1992, Ser. No. 983,135

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—82.2 **1 Claim**

1. A new and distinct Chrysanthemum plant named Yellow Sandy, as described and illustrated.

8,760

GERANIUM PLANT NAMED FISGRAND

Ingeborg Schumann, Albstadt, Fed. Rep. of Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Jul. 21, 1993, Ser. No. 94,683

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Fisgrand, as illustrated and described.

8,761

GERANIUM PLANT NAMED FISDINO

Ingeborg Schumann, Albstadt, and Angelika Utecht, Montabaur, both of Fed. Rep. of Germany, assignors to Florfis AG, Binningen, Switzerland

Filed Jul. 27, 1993, Ser. No. 96,970

Int. Cl.⁵ A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Fisdino, as illustrated and described.

8,762

LILY PLANT LILIUM 'YELLOW FASHION'

Judith F. McRae, Boring, Oreg., assignor to Mt. Hood Lilies, Inc., Sandy, Oreg.

Filed Jul. 30, 1993, Ser. No. 99,826

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinctive variety of *Lilium longiflorum-*/Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its tolerance of virus; its vigorous growth and rapid natural propagation; the excellence of its flower form, size, and substance; its versatility both as a garden plant and as a cut-flower/pot plant produced from pre-cooled bulbs forced under glass out of season; and in particular by its unique fragrant yellow "open bell" flowers, a combination unique among hybrid lilies suited to forcing and to mass commercial cultivation.

8,763

LILY PLANT LILIUM "GRANDVIEW"

Homme Mantel, 15361 SE. Bluff Rd., Sandy, Oreg. 97055

Filed Jul. 30, 1993, Ser. No. 99,827

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease, its tolerance of virus; its vigorous growth and rapid natural propagation; the excellence of its flower form, size, and substance; its versatility both as a garden plant and as a cut-flower produced from pre-cooled bulbs forced under glass out of season; and in particular by its unique upfacing, pastel orange pollen-free, starry flowers with tepals all approximately the same width, a combination unique among hybrid lilies suited to forcing and to mass commercial cultivation.

8,764

LILY PLANT LILIUM 'RED DWARF'

Homme Mantel, 15361 SE. Bluff Rd., Sandy, Oreg. 97055

Filed Jul. 30, 1993, Ser. No. 100,480

Int. Cl.^{5} A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its tolerance of virus; its vigorous growth and rapid natural propagation; the excellence of its flower form, size, and substance; its versatility both as a garden plant and as a pot plant produced from pre-cooled bulbs forced under glass out of season; and in particular by its unique short, sturdy stems with scarlet red buds and semi-upfacing crimson red flowers with clawed tepals, a combination unique among Asiatic hybrid lilies suited to forcing and to mass commercial cultivation.

PATENTS

GRANTED MAY 31, 1994

ERRATA

For CLASS	See PATENT NO.
005-618	5,315,726
024-115	5,315,736
024-274	5,315,737
042-101	5,315,781
477-098	5,315,897
475-300	5,315,898
477-119	5,315,899
477-165	5,315,900
192-003	5,315,901
123-090	5,315,961
123-190	5,315,962
123-190	5,315,963
601-004	5,315,986
607-101	5,315,994
477-181	5,316,116
194-206	5,316,124
220-461	5,316,135
223-077	5,316,188
223-113	5,316,189
224-042	5,316,190
224-042	5,316,191
224-324	5,316,192
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117-095	5,316,615
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521-079	5,317,033
521-108	5,317,034
521-143	5,317,035
523-223	5,317,036
523-128	5,317,037
523-219	5,317,038
424-001	5,317,091
219-716	5,317,115
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ERRATA—CONTINUED

330-109	5,317,277
345-118	5,317,306
355-319	5,317,377
348-006	5,317,391
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348-058	5,317,393
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348-164	5,317,395
348-390	5,317,396
348-416	5,317,397
348-570	5,317,398
348-571	5,317,399
348-679	5,317,400
348-678	5,317,401
348-705	5,317,402
348-731	5,317,403
348-020	5,317,405
348-307	5,317,406
340-306	5,317,407
348-315	5,317,408
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348-638	5,317,410

PATENTS

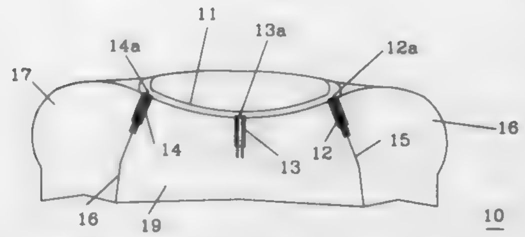
GRANTED MAY 31, 1994

GENERAL AND MECHANICAL

5,315,712
ADJUSTABLE NECKLINE BLOUSE

Nancy B. McTaggart, Richardson, Tex., assignor to Lee C. Plaster, Richardson, Tex.

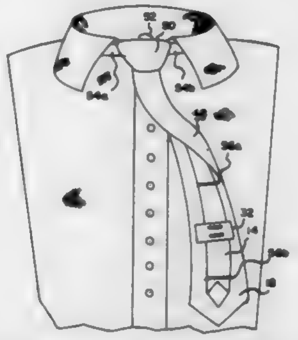
Filed Jun. 10, 1992, Ser. No. 896,679
Int. Cl.^{5} A41D *1/18*
U.S. Cl. 2—106 **11 Claims**



1. An adjustable neckline garment, having an inside worn next to the wearer's body and an outside, comprising
a blouse including a body portion and two sleeves attached to the body portion, and as elasticized neckline; and
first, second and third neckline adjustment devices, one adjustable device adjacent each of said two sleeves, and a third neckline adjustment device on said body portion equidistant between said first and second neckline adjustment devices, each adjustment device sewn inside said garment and having an end sewn adjacent to the stretchable neckline;
said neckline adjustment devices adjustable to stretch and change the shape of the neckline to at least one of round, sweetheart, V and square configurations.

5,315,713
APPARATUS FOR RESTRAINING A VARIETY OF NECKTIES

Vincent J. Pileggi, 1847 Dillon Rd., Maple Glen, Pa. 19002
Continuation-in-part of Ser. No. 818,081, Jan. 8, 1992, which is a continuation-in-part of Ser. No. 774,796, Oct. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 724,835, Jul. 2, 1991. This application Oct. 27, 1992, Ser. No. 967,224
Int. Cl.^{5} A41D *25/00, 27/00*
U.S. Cl. 2—145 **4 Claims**

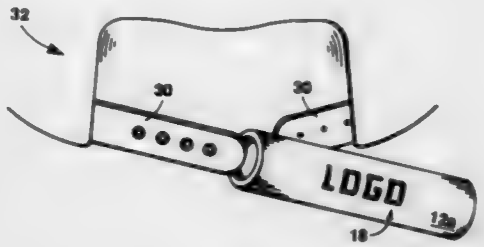


1. An apparatus for restraining a pre-tied necktie to a shirt having a collar and a buttons down its front, said necktie including an apron, with a front and back, and a tail section, which comprises:
means to anchor said tail section to the back of said apron at two positions intermediate the ends of said apron, said anchoring means including sewing the tail section to the back of the apron at said two positions;
a horizontal member adapted to be slidably mounted to the tail between said two positions, said horizontal member including an opening of sufficient dimensions to secure a button on the front of the shirt within the opening;
wherein once the necktie is adorned, the horizontal member is slid into a position along the tail section to align the opening with a button on the shirt, and the button is secured to the horizontal member so to maintain a correct placement of the apron and tail section of the tie relative to the shirt.

5,315,714
PROTECTIVE SHEATH

Alexander C. Peters, 560 W. 43rd St., #36B, New York, N.Y. 10036, and Robert E. Peters, 1326 Miller Dr., Los Angeles, Calif. 90069

Filed Sep. 30, 1992, Ser. No. 954,746
Int. Cl.^{5} A42C *5/00*
U.S. Cl. 2—181.4 **7 Claims**



1. A piece of headwear consisting of:
a cap having a normally frontal portion and a posterior portion, a top and a bottom and wherein said posterior portion is provided having a generally inverted U shaped opening extending toward said bottom of said cap;
a first interconnecting strap attached to said cap adjacent to the said opening at the bottom of said cap and extending generally across said opening, said first interconnecting strap having a first engagement region;
an engagement member having an engagement region, said engagement member attached to said cap adjacent the opening at the bottom of said cap and opposite said first interconnecting strap, said first interconnecting strap coupled to said engagement member at the engagement region of said engagement member;
a generally tubular seamless sheath of compressive, deformable material having a predetermined length extending from a first end to a second end and having an inner sheath surface and an outer sheath surface, said inner sheath surface defining a cavity having dimensions selected to permit said sheath to be disposed over at least a portion of the first engagement region of said first interconnecting strap wherein said sheath is disposed over at least a portion of said first interconnecting strap;
wherein said compressive, deformable material is neoprene;
wherein said inner sheath surface is continuous; and
wherein said sheath outer surface includes predetermined indicia thereon.

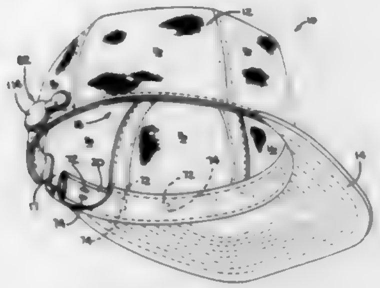
5,315,715
HEADWEAR PIECE WITH DEFORMABLE CUSHION LAYER

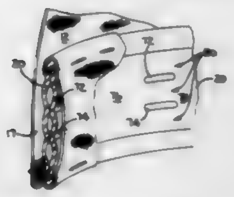
Robert A. Kronenberger, Buffalo Grove, Ill., assignor to American Needle, Buffalo Grove, Ill.

Filed Aug. 18, 1992, Ser. No. 931,879

Int. Cl.⁵ A42B *1/22*

U.S. Cl. 2—183 **39 Claims**





1. A headwear piece comprising:

a crown having a surface defining an opening for receiving the head of a wearer;

a bladder having first and second overlying layers defining a space therebetween for containing a displaceable fluid, said space having a top and bottom;

first means for connecting the first and second layers to each other between the top and bottom of said space to divide the bladder space into first and second chambers,

there being a communication path through said bladder space between the first and second chambers; and

second means for connecting the bladder to the crown so that the bladder defines a deformable cushion layer to conform to the head of a wearer.

5,315,716
EASILY REMOVABLE AND DONNABLE PANTS

Gregory H. Baum, 92 Greenridge Ct., Lake Oswego, Oreg. 97035

Filed Nov. 30, 1992, Ser. No. 983,377

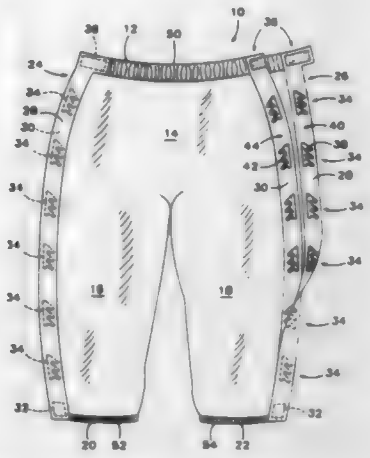
Int. Cl.⁵ A41D *1/06*

U.S. Cl. 2—227 **12 Claims**

1. Easily removable and donnable pants having a waist and two legs, comprising:

(a) pants having a releasable seam extending upwardly from the bottom end of each pant leg along the outside thereof, each said seam having two opposing, overlapping parts; and

(b) a plurality of hook and loop fastener segments disposed along each said seam, the hook portion of each said fastener segment being disposed on one part of each said seam and the loop portion of each said fastener segment being disposed on the other part of each said seam to fasten said one part to said other part, wherein the lowest of said fasteners on each leg is constructed so as to require less force to release than one or more fasteners disposed higher on the same seam.



5,315,717
MULTI-LAYER MOISTURE MANAGEMENT FABRIC AND GARMENTS INCORPORATING A MOISTURE MANAGEMENT PANEL

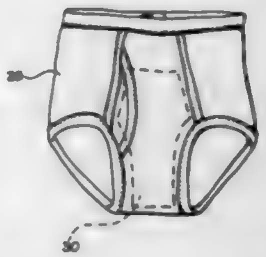
Herbert L. Moretz, 20205 Lola Cir., Davidson, N.C. 28036, and Daniel L. Brier, 1645 Lake Shore Dr., Denver, N.C. 28037

Division of Ser. No. 791,066, Nov. 12, 1991, Pat. No. 5,217,782. This application Dec. 21, 1992, Ser. No. 994,114

The portion of the term of this patent subsequent to Jun. 8, 2010, has been disclaimed.

Int. Cl.⁵ A41B *9/00*

U.S. Cl. 2—400 **7 Claims**



1. A reusable, launderable garment, said garment including a multi-layer moisture management fabric incorporated therein, said moisture management fabric comprising:

(a) a relatively thick knitted or woven inner moisture permeable hydrophobic fabric layer for being positioned next to the skin of the wearer of the garment;

(b) a first, relatively thin knitted or woven intermediate hydrophilic fabric layer positioned adjacent the hydrophobic fabric layer on the side thereof away from the skin of the wearer; and

(c) a second, relatively thick knitted or woven outer hydrophilic moisture permeable fabric layer positioned adjacent the first hydrophilic fabric layer on the opposite side thereof from the hydrophobic fabric layer.

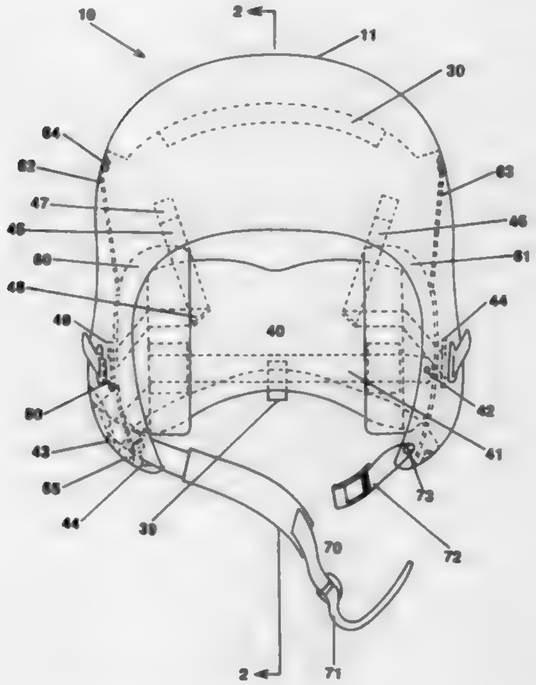
5,315,718
PROTECTIVE HELMET AND RETENTION SYSTEM THEREFOR

John V. Barson, Fort Rucker, Ala., and Roger J. Croft, Farnborough, United Kingdom, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1992, Ser. No. 876,537

Int. Cl.⁵ A42B *1/22*

U.S. Cl. 2—418 **8 Claims**



1. A protective helmet comprising:

(a) a helmet shell having a slot on either side to permit passage through it of a strap;

(b) one releasable strap tensioning means on either side of the helmet shell;

(c) two ear cups, each suspended on opposite sides of the helmet shell from an elastic strip placed substantially vertically and attached to the inside surface of the helmet shell at upper and lower fixing points;

(d) a chin strap assembly; and

(e) an energy-attenuating liner for the helmet shell which includes a brow pad; at least one crown pad comprising a layered composite of expanded polyethylene and open cell foam in substantially rectangular shape which extends from the anterior cranial region to the posterior cranial region of a wearer's head, having major curvature in the saggital plane and lesser curvature in the coronal plane, and having a maximum width that permits air flow around the sides of a wearer's head for ventilation; and a floating occipital pusher plate suspended from the inside rear aspect of the helmet shell on adjustable strap means, said floating occipital pusher plate being operable to urge a wearer's head towards the front of the helmet on tensioning the adjustable strap means; wherein said adjustable strap means comprises an arrangement of two substantially horizontal straps on either side of the helmet shell consisting of an upper and a lower strap, the lower strap on either side being part of the chin strap assembly and the upper strap on each side being routed to the exterior of the helmet through its respective slot in the helmet shell where it is coupled to the releasable strap tensioning means.

5,315,719
WATER CLOSET FLUSHING APPARATUS

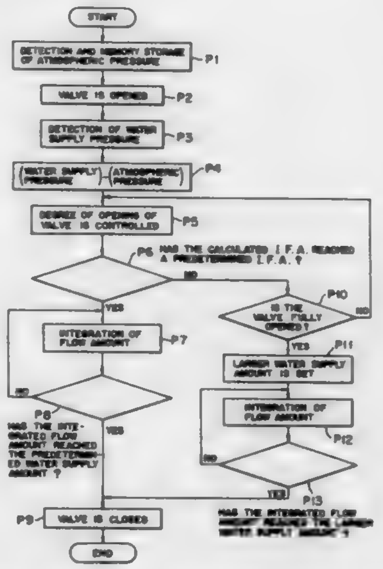
Osamu Tsutsui; Atsuo Makita; Hirofumi Takeuchi; Shinji Shibata, and Noboru Shinbara, all of Chigasaki, Japan, assignors to Toto Ltd., Fukuoka, Japan

Division of Ser. No. 576,261, Aug. 31, 1990, Pat. No. 5,155,870. This application Jul. 31, 1992, Ser. No. 923,215

Claims priority, application Japan, Sep. 1, 1989, 1-228007; Sep. 1, 1989, 1-228009; Sep. 1, 1989, 1-228010; Sep. 1, 1989, 1-228031; Sep. 1, 1989, 1-228032; Sep. 1, 1989, 1-228033; Sep. 1, 1989, 1-228035; Sep. 1, 1989, 1-228036; Sep. 1, 1989, 1-228037; Sep. 1, 1989, 1-228045; Sep. 1, 1989, 1-228049

Int. Cl.⁵ E03D *1/00*

U.S. Cl. 4—300 **6 Claims**


START
DETECTION AND MEMORY STORAGE OF ATMOSPHERIC PRESSURE
P1
VALVE IS OPENED
P2
DETECTION OF WATER SUPPLY PRESSURE
P3
(WATER SUPPLY PRESSURE)-(ATMOSPHERIC PRESSURE)
P4
DEGREE OF OPENING OF VALVE IS CONTROLLED
P5
P6
HAS THE CALCULATED I.F.A. REACHED A PREDETERMINED I.F.A. ?
NO
YES
P10
IS THE VALVE FULLY OPENED ?
NO
YES
P11
LARGER WATER SUPPLY AMOUNT IS SET
INTEGRATION OF FLOW AMOUNT
P7
NO
P8
HAS THE INTEGRATED FLOW AMOUNT REACHED THE PREDETERMINED WATER SUPPLY AMOUNT ?
YES
INTEGRATION OF FLOW AMOUNT
P12
NO
YES
P13
HAS THE INTEGRATED FLOW AMOUNT REACHED THE LARGER WATER SUPPLY AMOUNT ?
P9
VALVE IS CLOSED
END

1. A flushing water supply method for a water closet, comprising the steps of: detecting a pressure of flushing water for a water closet along a water supply passage, controlling the opening of said water supply passage for adjusting the instantaneous rate of water flow through said passage on the basis of the detected pressure so that a predetermined water supply amount is supplied to a water closet, and wherein the controlling step includes calculating an instantaneous flow amount of flushing water in the water supply passage on the basis of the detected pressure, comparing said calculated instantaneous flow amount with a predetermined instantaneous flow amount and determining their difference, calculating a necessary degree of opening of the water supply passage on the basis of the difference in said calculated and predetermined instantaneous flow amounts for causing water flow at said pre determined instantaneous flow amount, and opening the water supply passage for a predetermined opening time while maintaining the calculated degree of opening and then closing the water supply passage.

5,315,720
HIGH FLOW, LOW TURBULANCE SWIM-IN-PLACE POOL

David Lior, 1 Mohliver Street, Herzelia 46328, Israel

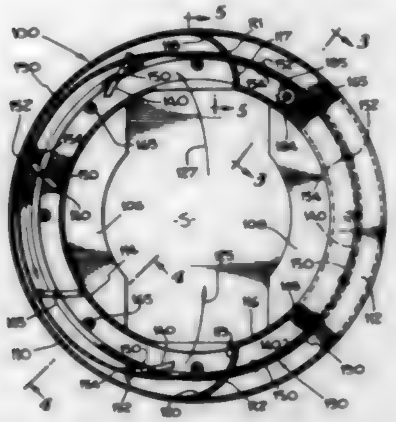
Filed Mar. 3, 1993, Ser. No. 25,836

Int. Cl.⁵ E04H *3/18*

U.S. Cl. 4—488 **6 Claims**

1. In a fluid pump in which a plurality of blades arranged in sequence are propelled around a closed-loop path for drawing fluid into the path at an entrance location and then expelling it from the path at an exit location, each of said blades being pivotally mounted on a vertical axis, the improvment comprising:

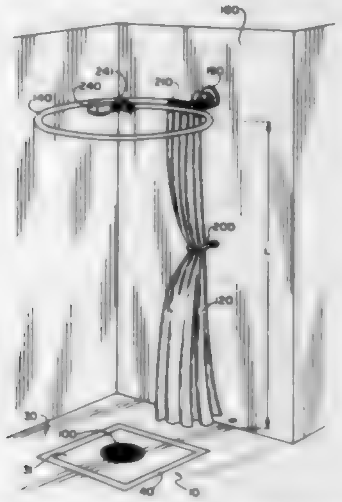
means supporting each of said blades in a transversely extended position prior to its approach to said exit location, a smoothly curved diverter wall positioned at said exit location and extending transversely across said path so that each approaching blade propels fluid forwardly along said path and then directs it along said diverter wall so as to expel it from the exit,



a vertical slot formed in said diverter wall near the lateral center of said path, and

said supporting means also being operable for rotating each of said blades as it approaches said diverter wall into a position longitudinally aligned with said path so as to permit it to pass through said vertical slot.

5,315,721
COLLAPSIBLE SHOWER STALL
Milton R. Okun, 168 Neponset St. Apt. 6, Canton, Mass. 02021
Filed Jan. 7, 1993, Ser. No. 1,445
Int. Cl.⁵ A47K *3/23*
U.S. Cl. 4—599 **22 Claims**

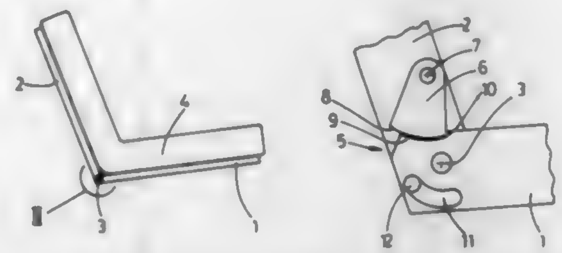


1. A collapsible shower apparatus adapted to be mounted in a room having a water drain in a floor, the apparatus comprising

a unitary bellows base unit collapsible into a space-compact position and expandable into a first water-containment enclosure surrounding the drain in the floor and extending from the floor upwardly to a predetermined height above the floor; and

an upper unit mounted above the base unit, the upper unit being collapsible into a space-compact position and expandable into a second water-containment enclosure mounted directly above the first enclosure, said upper unit further comprising a spiral rod and a water-impervious curtain slidably hung on the rod, the curtain having two terminal longitudinal ends and the rod being spirally configured such that the two ends of the curtain are slidable past each other.

5,315,722
PIECE OF FURNITURE CONVERTIBLE FROM A SEAT INTO A BED
Eric J. Djie, Amsterdam, Netherlands, assignor to Sedac-Meco-bel, Wevelgem, Belgium
Filed Feb. 4, 1993, Ser. No. 13,316
Claims priority, application Netherlands, Aug. 6, 1991, 9101352
Int. Cl.⁵ A47C *17/16*
U.S. Cl. 5—37.1 **7 Claims**



1. A piece of furniture convertible from a seat into a bed and comprising a seat portion, an adjoining back portion which is connected thereto by a hinge for enabling the seat portion and the back portion to rotate with respect to one another between an automatically stabilized seat position of the piece of furniture, wherein the angle between both of said portions is minimal, and a flat position of the piece of furniture, wherein the angle between both of said portions is maximal, leg means for supporting the seat portion in the seat position and the seat portion and the back portion in the flat position of the piece of furniture, and a locking device located between the back portion and the seat portion for locking the seat portion and the back portion with respect to one another in the seat position, which locking device automatically unlocks under the influence of gravity by canting the piece of furniture backwards with the back portion being directed towards the flat position and to be locked back automatically rotating the back portion back from the flat position towards the seat position, said locking device comprising a locking element attached movably to the back portion and a contra-element attached fixedly to the seat portion, as well as abutments formed in the seat portion and the back portion for limiting the angle of rotation of the back portion with respect to the seat portion between the seat position and the flat position of the furniture.

5,315,723
PORTABLE PATIENT TURNING AND LIFTING APPARATUS
Gene A. Smith, Shallotte, N.C., assignor to Ary Lift, Inc., Shallotte, N.C.
Continuation-in-part of Ser. No. 801,641, Dec. 2, 1991, Pat. No. 5,161,267, which is a division of Ser. No. 718,971, Jun. 21, 1991, Pat. No. 5,068,931, and a continuation-in-part of Ser. No. 801,642, Dec. 2, 1991, Pat. No. 5,235,712, which is a continuation-in-part of Ser. No. 718,971, Jun. 21, 1991, Pat. No. 5,068,931. This application Sep. 9, 1992, Ser. No. 942,307
Int. Cl.⁵ A61G *7/10, 7/14*
U.S. Cl. 5—85.1 **8 Claims**

1. A portable invalid patient lifting and turning apparatus (10) comprising, an open framework for being positioned above a bed for lifting and lowering a patient, said framework comprising:

(a) a first pair of upright standard (19, 20) mounted on rolling means;

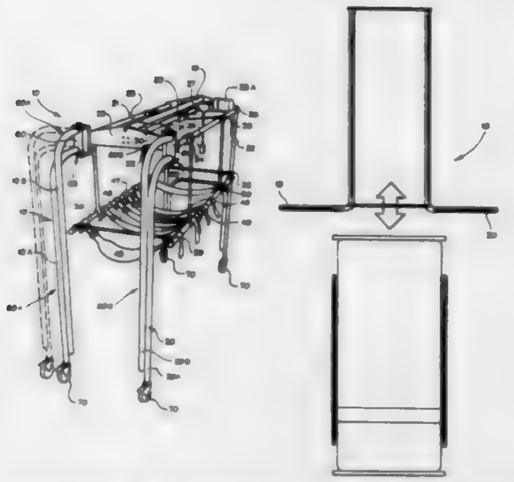
(b) a second pair of standards (21, 22) mounted on rolling means and spaced apart from the first pair of standards;

(c) interconnecting frame members defining a lengthwise dimension of the apparatus, and connected to said first and second pairs of upright standards (19, 20), (21, 22) by opposite ends of said frame members;

(d) said first pair of standards (19, 20) being mounted for pivotal movement about a vertical axis and moveable between a:

(i) first position wherein said first pair of standards (19, 20) is positioned substantially in alignment with the length of the framework to define a space of a dimension sufficient to permit the framework to be moved laterally over a bed; and

(ii) a second position wherein said first pair of standards (19, 20) is positioned in outwardly extending relation substantially perpendicular to the length of the bed for permitting the framework to be moved along is lengthwise axis over a bed, whereby the apparatus can be conveniently moved into position either from the side or the end of patient beds and moved out of position for patient transport or for movement to another patient location;

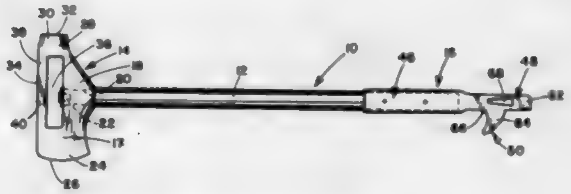


(e) elevator means supported by the open framework;

(f) patient support means being positioned on a mattress of the bed underneath patient; and

(g) connecting means for connecting the patient support means and the elevator means thereby permitting the patient support means to lift the patient above the mattress surface for cleaning and bed-linen changing.

5,315,724
COMBINATION FIRE TOOL
Mark Trujillo, 4691 W. Tufts, Denver, Colo. 80236, and Robert Terry, 27637 S. Whirlaway, Evergreen, Colo. 80439
Filed Jul. 29, 1992, Ser. No. 922,175
Int. Cl.⁵ B25D *1/04*
U.S. Cl. 7—145 **12 Claims**



1. A combination fire tool comprising:

an elongated handle;

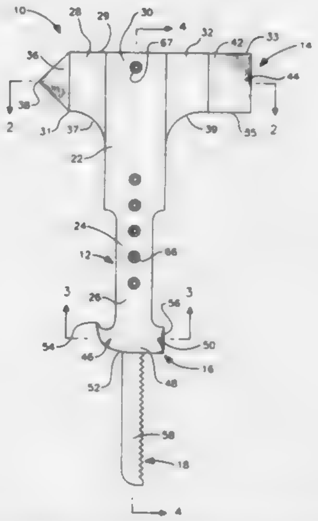
a head member disposed at one end of said handle and a pike member disposed at the opposite end of said handle;

said head member including a base portion secured to said handle, a cutting portion having a convex edge disposed on one side of said base portion, an enlarged end portion in the form of a sledge hammer disposed on a second side of said base portion, an elongated substantially flat top portion forming a ram, and grip means defined in said head member for operation and use of said pike member;

said pike member including a base portion secured to said handle, a substantially wedge-shaped pike end portion, and a hook member extending transversely outwardly from said pike member and defining a nesting area to provide an operator rotation point when swinging said head member; and

said fire tool being approximately 36" to 42" in length with said tool being approximately 12–13 lbs. in weight.

5,315,725
MULTIPURPOSE TOOL
Martin K. Vanden Heuvel, R.R. #2, 207 Highway No. 5, Dundas, Ontario, Canada L9H 5E2
Filed Apr. 21, 1993, Ser. No. 49,317
Int. Cl.⁵ B25D *1/04*
U.S. Cl. 7—145 **11 Claims**



1. A new and improved multipurpose hand-held tool, comprising:

a handle including an upper handle portion, a middle handle portion, and a lower handle portion, said middle handle portion for being grasped by a hand;

a head including a first head end, a middle head portion, and a second head end, said middle head portion connected to said upper handle portion, said first head end and said second head end having a respective top side and a bottom side;

a foot including a first foot end, a middle foot portion, a second foot end, and a bottom side, said middle foot portion connected to said lower handle portion;

a hammer head connected to either said head or said foot of said multipurpose tool;

a pyramidal shaped cutter connected to said foot of said multipurpose tool if said hammer head is connected to said head of said multipurpose tool, or said pyramidal shaped cutter connected to said head of said multipurpose tool if said hammer head is connected to said foot of said multipurpose tool;

a saw blade including a sawing portion and a connecting portion, said saw blade sawing portion projecting from said foot bottom side, and said saw blade connecting portion passing through said foot bottom side and connected to said handle, and

means, passing through said handle, for securing said saw blade connecting portion to said handle.

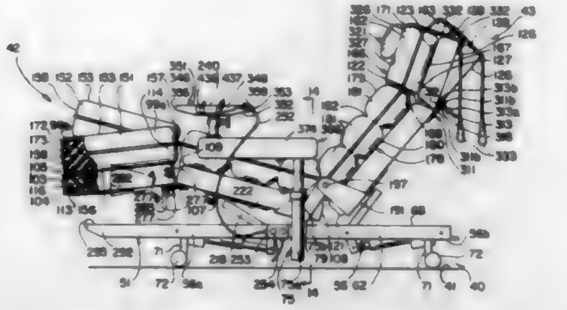
5,315,726
MULTIPURPOSE CONVERTIBLE FURNITURE ASSEMBLY

Martin Borenstein, Park Bellevue Tower, 565 Bellevue Tower, Ste. 2506, Oakland, Calif. 94610

Filed Sep. 15, 1992, Ser. No. 945,152

Int. Cl.^{5} A61G *7/05;* **A47C** *1/00, 20/00*

U.S. Cl. 5—618 **59 Claims**



1. A furniture assembly for use on a support surface by a human comprising a framework adapted to rest upon the support surface, seat and back support sections overlying the framework and having adjacent proximal and spaced-apart distal end portions, an elongated cushion disposed simultaneously on both the support sections and having a thickness, hinge means supported by the framework forming a pivot axis interconnecting the adjacent end portions of said seat and back support sections, said pivot axis being disposed above the framework and said support sections such that it extends transversely through the cushion in a position which is within the thickness of the cushion at all times so as to be generally aligned with the hip joint of the human, and means mounted on the framework for raising and lowering the distal end portions of the seat and back support sections independent of each other about the pivot axis of the hinge means.

5,315,727
TUB COVER HAVING A CONDENSER OF A WASHING MACHINE

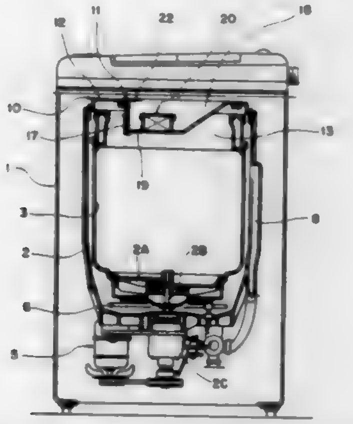
Kyu C. Lee, Suweon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon-City, Rep. of Korea

Filed May 18, 1992, Ser. No. 884,196

Claims priority, application Rep. of Korea, Jun. 11, 1991, 91-8573[U]

Int. Cl.^{5} D06F *39/00*

U.S. Cl. 8—159 **18 Claims**



1. A method of washing clothes in a machine having a tub with an electrical heater, and a tub cover, comprising the steps of:

boiling wash water in said tub to generate steam which rises until interrupted by said cover, said steam rising until said tub cover interrupts said rising, and

discharging a portion of said steam through a condenser rotated on said tub cover, said condenser having a plurality of heat exchanger plates and water-containing members, causing condensation of said steam.

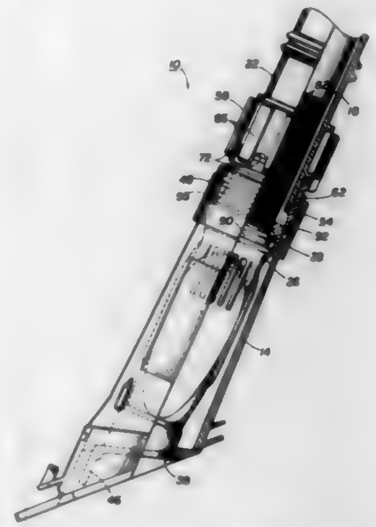
5,315,728
SWIMMING POOL CLEANER COMPONENTS

David S. Atkins, Broederstroom, South Africa, assignor to Zarina Holding C.V., Amsterdam, Netherlands

Continuation of Ser. No. 879,772, May 6, 1992, abandoned. This application Aug. 31, 1993, Ser. No. 115,394

Int. Cl.^{5} E04H *4/16*

U.S. Cl. 15—1.7 **11 Claims**



1. An assembly for permitting fluid flow comprising:

a. a body defining an inlet, an outlet, and a passage between the inlet and the outlet for fluid to flow herethrough;

b. means, comprising a valve removably positioned within the passage, for periodically interrupting the flow of fluid through the passage;

c. a first tube attached to the valve; and

d. means, received by the outlet and comprising a ring having a canted surface engaging a portion of said first tube and circumscribing a portion of the first tube, for resisting but not precluding movement of the first tube relative to the body.

5,315,729
CUP WASHING MACHINE

Jack Yang, No. 7, 39th Str., Lane 399, Sec. 3, Chungshan Rd., Tan Tzu Hsiang, Taichung Hsien, Taiwan

Filed Feb. 23, 1993, Ser. No. 21,110

Int. Cl.^{5} A47L *15/37;* **A46B** *13/04*

U.S. Cl. 15—75 **3 Claims**

1. A cup washing machine comprising an upper housing covering a lower housing, a motor enclosed within the upper and lower housings, a first transmission mechanism coupled to said motor, a second transmission mechanism coupled to said first transmission mechanism, a first cylinder brush and a second cylinder brush respectively coupled to said first and second transmission mechanisms and positioned to wash cups;

said lower housing includes a transverse groove and a plurality of screw holes on a bottom surface thereof for mounting the machine;

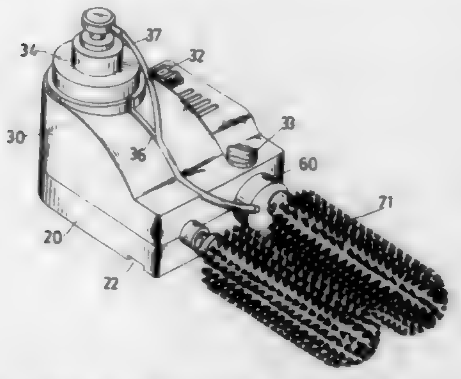
said upper housing includes a trough at the top for receiving a detergent dispenser, a longitudinal groove extending from said trough to a border of the upper housing for receiving a dispensing tube from said detergent dispenser, a power switch for controlling the operation of said motor, and a lock control knob;

said motor includes a plurality of spaced screw holes, a motor housing, a pin hole on a front wall of the motor housing for mounting said first transmission mechanism, and an output shaft coupled to said first transmission mechanism;

said transmission mechanism includes a casing, a first driving gear and two first driven gears disposed inside the casing, and a first transmission shaft and a second transmission shaft inserted through a pair of respective holes on the casing and coupled to said driven gears, the driving gear of said first transmission mechanism being coupled to the output shaft of said motor, the casing of said transmission mechanism having a plurality of mounting tabs and a pin corresponding, respectively, to the plurality of spaced screw holes and the pin hole on said motor housing for mounting said casing on said motor housing;

said second transmission mechanism includes a peripherally toothed cylindrical casing and a second driving gear disposed inside the peripherally toothed cylindrical casing and coupled to said second transmission shaft of said first transmission mechanism, a third transmission shaft inserted through an eccentric hole on said peripherally toothed cylindrical casing, a second driven gear coupled to said third transmission shaft and meshed with said second driving gear, said peripherally toothed cylindrical casing being rotatably mounted on the casing of said first transmission mechanism and releasably locked by a toothed lock block, said toothed lock block being controlled by said lock control knob to engage with or disengage from said peripherally toothed cylindrical casing of said second transmission mechanism; and

said first cylinder brush and said second cylinder brush are respectively coupled to said first transmission shaft and said third transmission shaft, wherein the pitch between said first cylinder brush and said second cylinder brush being adjustable by releasing said toothed lock block from said peripherally toothed cylindrical casing and rotating said peripherally toothed cylindrical casing on the casing of said first transmission mechanism.



5,315,730
TOOTHBRUSH DEVICE

Il Pyung Kim, and Hyung C. Kim, both of 1023 N. Charles St., Baltimore, Md. 21201

Continuation of Ser. No. 581,880, Sep. 13, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 758,729

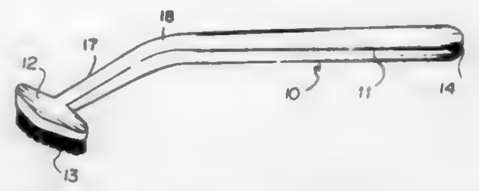
Int. Cl.^{5} A46B *9/04*

U.S. Cl. 15—167.1 **3 Claims**

1. A tooth brush device comprising:

a brush head and a handle member, said brush head having a diamond shaped configuration for easily cleaning the teeth located at deep recesses of the mouth and a plurality of bristles arranged on said brush head, and

said handle member including an arm portion and a bent handle portion, said arm portion extending upward from said brush head at an angle of about 3° to 7° and said arm portion forming an angle with said bent portion of 150° to 160° at a point of about one-fourth the distance of said handle member from said brush head, whereby upon applying the toothbrush to the teeth, any interference occurring because of the hand holding the toothbrush, the chin and the nose are avoided so as to perfectly clean the teeth without causing any inconvenience with respect to brushing teeth between the lips and in the mouth.



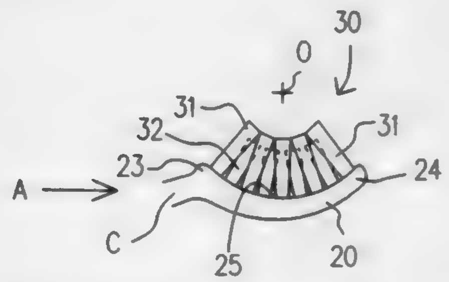
5,315,731
INDIVIDUAL TOOTH TOOTHBRUSH

George D. Millar, 2221 Cromwell Hills Dr., Cromwell, Conn. 06416

Filed Feb. 5, 1992, Ser. No. 831,455

Int. Cl.^{5} A46B *9/04*

U.S. Cl. 15—167.1 **20 Claims**



1. A toothbrush comprising:

an elongated handle portion extending in a longitudinal direction;

a head portion connected to the handle portion, the head portion having a first end and a second end, wherein the second end is spaced from the first end in the longitudinal direction, wherein a bent surface is provided on the head portion between the first end and the second end, and wherein the bent surface bends as it extends in the longitudinal direction;

a fist plurality of bristle tufts secured to the head portion and extending from the bent surface, the first plurality o bristle tufts being arranged in a first plurality of rows oriented transverse to the longitudinal direction; and

a second plurality of bristle tufts secured to the head portion and extending from the bent surface, the second plurality of bristle tufts being arranged in a second plurality of rows oriented transverse to the longitudinal direction,

wherein each of the first plurality of bristle tufts comprise relatively long bristles, and each of the second plurality of bristle tufts comprise relatively short bristles, and

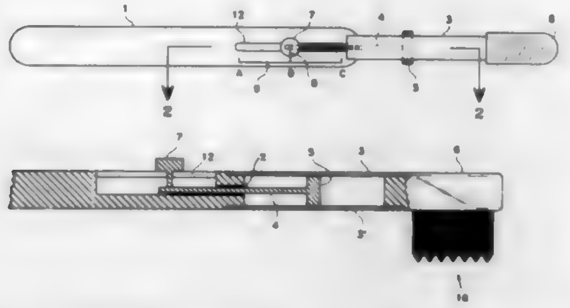
wherein all of the bristles of the first plurality of bristle tufts extend substantially an equal distance from the bent surface, and wherein all of the bristles of the second plurality of bristle tufts extend substantially an equal distance from the bent surface.

5,315,732

TOOTHBRUSH HAVING ADJUSTABLE BRUSHING PRESSURE

Norman F. Huefner, 11 Lindall St., Laguna Niguel, Calif. 92677, and Frank J. Burrell, Jr., 22504 Warmside Ave., Torrance, Calif. 90505

Filed May 20, 1993, Ser. No. 63,769
Int. Cl.⁵ A46B *9/04*
U.S. Cl. 15—167.1 **4 Claims**



1. A toothbrush comprising:
(a) an elongated, hollow handle having first and second end portions which define first and second ends respectively, said elongated handle defining a longitudinal axis, said first end portion defining a grasping area for holding the toothbrush and said second end portion having a longitudinal slot therein which communicates with an opening in the second end, said hollow handle slidably supports an elongated actuating rod therein, said rod having first and second ends, said rod extending through said opening to its first end;
(b) a bristle holding head joined to said second end of the handle by a pair of latterly-curved, elongated, linear springs so as to permit limited perpendicular motion of the head with respect to the longitudinal axis;
(c) a piston attached to said first end of the actuating rod, the piston being placed between and having sliding contact with said linear springs;
(d) a slidable control button is attached to the second end of the actuating rod and extends from said handle through said slot, said slot providing a path along which the button can be made to slide such that movement of the button will position the piston at any desired point lengthwise between the linear springs;
(e) marks on the handle along the path of the slidable control button are provided to facilitate locating of the piston at any desired point between said linear springs.

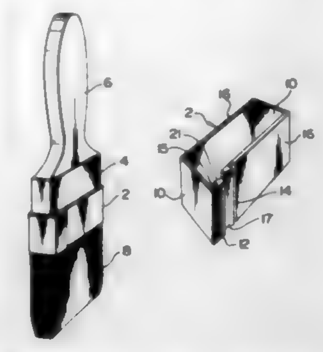
5,315,733

PAINT BRUSH BRISTLE CLAMP

Blake A. Ledingham, 501 - 1200 West Pender Street, Vancouver, B.C., Canada V6E 2S9

Filed Oct. 30, 1992, Ser. No. 968,659
Int. Cl.⁵ A46B *9/08*
U.S. Cl. 15—168 **1 Claim**

1. A paint brush bristle clamp comprising:
a pair of opposed end walls;
a first and second side walls, the first side wall having two ends attached to different end walls and the second side wall having one end attached to one of the end walls and having a free end so that the end walls and side walls form a substantially rectangular clamp;
said free end of the second side wall having a free end lip formed thereon, the lip comprising an inclined surface portion and a recess formed on the second side wall;
an end wall lip formed on one end of the end wall opposed to the end wall attached to the second side wall, said end wall lip having an inclined surface portion and a groove formed therein so that the inclined surface portion of the free end lip matchingly fits inside the groove and the inclined surface portion of the end wall lip matchingly fits inside the recess when the clamp is in a closed position.



5,315,734

MOP HEAD COMPRISING A HOLDER INSERTION AID

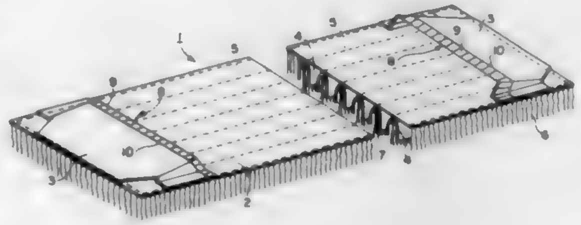
Franz Kresse, Hilden; Rainer Osberghaus, Duesseldorf, and Bernfrid Scheller, Pulheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP91/01462, § 371 Date Feb. 21, 1993, § 102(e) Date Feb. 21, 1993, PCT Pub. No. WO92/03083, PCT Pub. Date Mar. 5, 1992

PCT Filed Aug. 3, 1991, Ser. No. 969,189

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1990, 4925646

Int. Cl.⁵ A47L *13/20*
U.S. Cl. 15—229.4 **18 Claims**



1. A mop head (1) having a top-side, two ends and an underneath for the wet or damp cleaning of floors comprising an elongate textile support layer (2) with holder insertion pockets (3) with an inside and an outside, having openings with an edge, (8), facing each other, arranged on the top-side and at each end thereof and material (4,6,7) arranged underneath in the form of at least one member selected from the group consisting of tufts, fringes, loops, and sponge cloth strips for taking up dirt and moisture, wherein each holder insertion pocket (3) comprises a 0.5 to 10 mm thick strip (9) of a water-absorbing, swellable and elastic material in the region of the pocket openings (8) whereby the pocket openings are maintained in an open condition when the mop head is wetted.

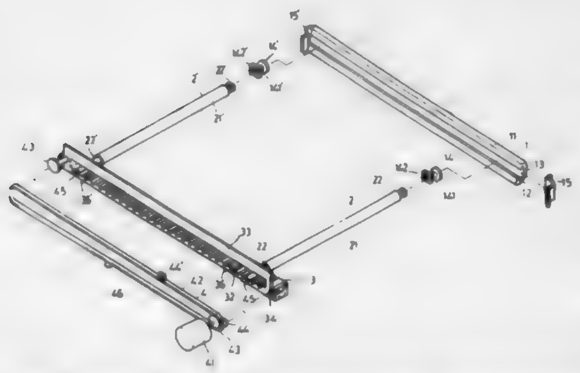
5,315,735

OPPOSED ROLLER-TYPE MOTOR VEHICLE WINDSHIELD WIPER

Chiu I-Shin, F. 10, No. 86, Sec. 1, Hsin Hai Road, Taipei, Taiwan

Filed Dec. 15, 1992, Ser. No. 991,023
Int. Cl.⁵ B60S *1/44, 1/20*
U.S. Cl. 15—250.22 **1 Claim**

1. A motor vehicle wiper for a windshield having a top, a bottom and opposed sides comprising:
a top rail fastened to a motor vehicle by two curved end plates and extending across the top of the windshield having a downward U-channel along its length;
a transmission gear assembly having an elongated rectangular frame and a rack fastened thereto extending across the bottom of the windshield;
two elongated wiping rollers movably fastened between said top rail and said transmission gear assembly, each wiping roller comprising a hollow tube covered with a rubber covering and revolvably sleeved on a steel axle, each wiping roller having one end coupled with a mobile bearing slidably mounted in said downward U-channel of said top rail and an opposite end coupled with a gear meshed with said rack and each said roller provided with an electromagnet on said opposite end;
a belt drive assembly having an endless belt mounted around two spaced apart belt rollers each rotatably fastened to said elongated rectangular frame at opposite ends thereof, said belt having upper and lower parallel sections, and a servo motor coupled to and driving said belt, two spaced metal blocks coupled to said belt on the upper section and a direction control block coupled to said belt on the lower section, the distance between said two spaced metal blocks being approximately equal to one third of the distance between said two belt rollers;
two electromagnetic switches mounted on opposite ends of said frame and electrically coupled with said servo motor and said electromagnets, said switches respectively controlled by said metal blocks of said belt drive assembly to trigger the electromagnet on either wiping roller to enable said wiping rollers to be respectively attracted to and thereby carried by said metal blocks to move said rollers over the windshield as said servo motor rotates; and
two limit switches electrically coupled to said servo motor and fastened to said rack at opposite ends thereof, said switches alternatively triggered by said direction control block to change the revolving direction of said servo motor to provide leftward and rightward wiping of the windshield by the rollers.



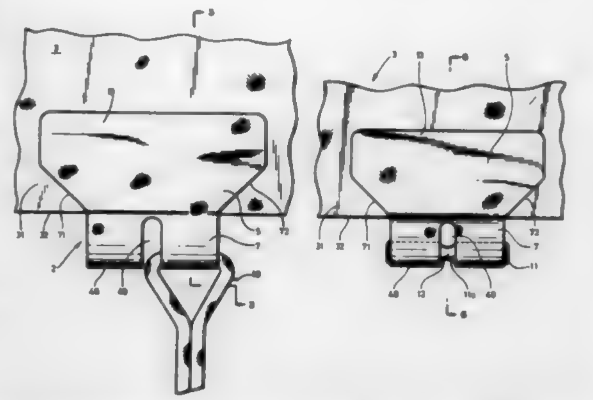
5,315,736

CONNECTION FOR AN ANCHOR LINE TO A TARPAULIN WHICH RUPTURES BEFORE THE TARPAULIN TEARS

Ivan Nilsson, Frälsevägen, Sweden, assignor to Plast Och Textil Ivan Nilsson, Furulund, Sweden

Filed Jan. 19, 1993, Ser. No. 6,257
Claims priority, application Sweden, Jan. 20, 1992, 9200143-7
Int. Cl.⁵ F16G *11/00;* **E04H** *15/00*
U.S. Cl. 24—115 K **15 Claims**

1. A device for attachment to a tarpaulin to transmit tensile force from a line to the tarpaulin, said device comprising a blank in the form of a sheet of foldable material which is folded on a fold line to form two opposed portions which sandwich and secure an edge portion of a tarpaulin therebetween in a position in which parts of said opposed portions at said fold line extend beyond said edge portion of the tarpaulin, said blank being relatively small compared to said tarpaulin in order to be applied to the edge of said tarpaulin in a selected, restricted region thereof, said sheet of foldable material being provided with a narrow slot therein extending across said fold line to divide said parts which extend beyond said edge portion of the tarpaulin into two sections of loop form having respective channels extending substantially parallel to an edge of said edge portion of the tarpaulin, said channels being separated by said slot and having a length in a direction parallel to the edge of the tarpaulin which is greater than the length of said slot as measured in said direction.

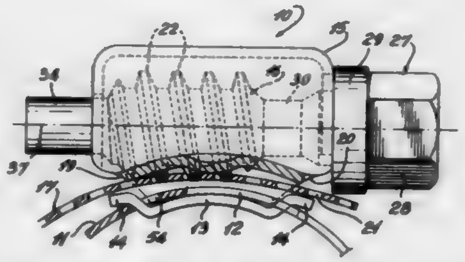


5,315,737

WORM DRIVE CLAMP WITH BAND GUIDE CHANNELS

Serge Ouimet, 342 Daniel Johnson, Ile Bizard, Quebec, Canada H9C IE3

Filed Jun. 29, 1992, Ser. No. 905,680
Int. Cl.⁵ F16L *33/08*
U.S. Cl. 24—274 R **4 Claims**



1. A worm drive clamp comprising a flexible metal clamping band having a housing secured to a securing end thereof, said band having a plurality of spaced apart engageable openings in at least a free end portion thereof, said housing having a screw retention portion and a lower band receiving portion, said band receiving portion having opposed guide channels through which opposed edge portions of said free end portion of said band is caused to pass to position said free end portion for engagement and disengagement with a displaceable axially rotatable tightening screw located thereabove in said screw retention portion; said screw having a screw thread portion, a pivoting end portion, an engageable head at an opposed end to said pivoting end portion, and an annular groove intermediate said engageable head and said thread portion; said screw retention portion of said housing having an end wall with a retention opening for receiving said screw pivoting end portion captive therein but providing longitudinal axial displacement and pivotal displacement thereof, said screw retention portion of said housing having an opposed end wall with a head receiving slot; said head receiving slot having a first portion with opposed arcuate side walls disposed about a center point which lies on a central axis of said retention opening, said first portion accommodating the passage of said head therein, and a second portion which is a U-shape slot disposed above said head receiving slot for receiving said annular groove closely spaced

therein but preventing the passage of said head when said screw is displaced outwardly to a disengaged angular position; said opposed arcuate side walls providing a frictional abutment for said head to retain said screw thread portion in an engageable position with said spaced apart openings in said band free end portion, said band free end portion remaining substantially in a fixed arcuate plane by said opposed guide channels during engagement and disengagement thereof from said housing, said guide channels being formed integrally with said housing and extending outwardly from opposed side walls of said screw retention portion of said housing to define wing portions, said guide channels further being of rectangular cross-section and arcuately extending and further having a top and bottom arcuate wall and an outer interconnecting side wall, an arcuate tab is punched in said arcuate top wall to define a restricted throat section in said arcuate channels at mid-length thereof to maintain said band free portion in said fixed arcuate plane spaced from said tightening screw a predetermined distance.

5,315,738
MULTIPLE BALE OPENER HAVING INCLINED, ADJUSTABLE TRACKS

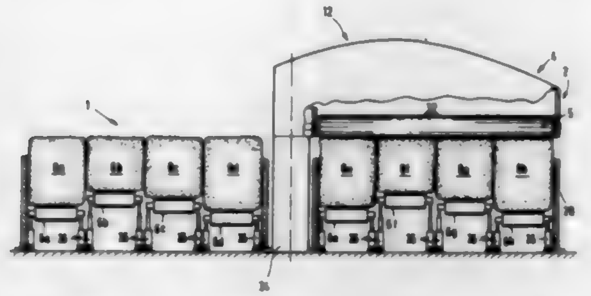
Akiva Pinto, Duesseldorf-Wittlaer; Guenter Lucassen, Haltern, and Reinhard Schmidt, Gescher, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Filed May 22, 1992, Ser. No. 847,052

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1989, 8915583[U]; Aug. 16, 1990, 4025908

Int. Cl.⁵ D01G *13/00*

U.S. Cl. 19—145.5 **20 Claims**



1. A multiple bale opener for receiving a plurality of adjacently arranged rows of fiber bales, comprising:
transport means for continuously supplying the plurality of adjacently arranged rows of fiber bales, said transport means defining a supply end and a plane of supply for supplying the bales; said transport means including a plurality of transport tracks, each said transport track being configured for transporting a rows of fiber bales;
reduction means for reducing the fiber bales supplied by said transport means, said reduction means including at least one milling head for milling and thereby reducing the fiber bales, said milling head being movable about a substantially horizontal plane of action wherein milling occurs, said plane of supply extending at an incline handle with respect to said plane of action;
transport adjustment means connected to each of said transport tracks for individually adjusting the incline angle of said transport tracks with respect to one another to allow for substantially uniform reduction of fiber bales of differing heights; and
said at least one milling head being provided adjacent to said supply end of said transport means and rotatable about an axis extending substantially perpendicular to said plane of action.

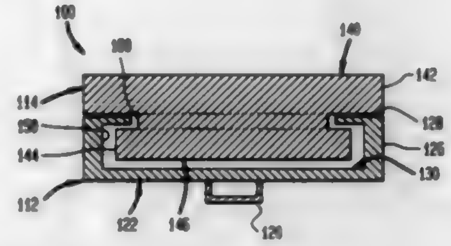
5,315,739
DECORATIVE MULTI-PART ORNAMENTATIONS AND THE FABRICATION THEREOF

Michael Herman, Huntington, N.Y., assignor to Herman Pearl Button Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 843,457, Feb. 28, 1992, Pat. No. 5,255,417, which is a continuation-in-part of Ser. No. 737,066, Jul. 29, 1991, abandoned, and a continuation-in-part of Ser. No. 805,322, Dec. 10, 1991, abandoned. This application Apr. 7, 1993, Ser. No. 44,263

Int. Cl.⁵ A44B *1/04*

U.S. Cl. 24—113 MP **22 Claims**



1. A button assembly comprising
(a) button base means having
(i) top and bottom surfaces joined by a peripheral side wall, which wall is in a plane substantially perpendicular to the bottom surface, and
(ii) means for attaching said button assembly to an article;
(b) cap means comprising a cup-shaped member having a top surface, at least a portion of the top surface having been removed to permit viewing therethrough; a wall around the periphery of the top surface, which wall, together with the top surface defines a hollow center capable of receiving the button base means, said cap means being capable of co-action with and mounting to said button base means;
(c) at least one of said button base means and said cap means carrying securing means in the form of at least one protrusion extending outwardly from a wall of either the cap means or the button base means, each of said button base means, cap means and protrusion being comprised of materials providing a means capable of engaging and locking said button base means and cap means by snapping them together into a button assembly in the absence of supplied heat, which securing means permanently and non-removably secure said button base means and cap means together and prevents separation of the button base means and the cap means by a snap together engagement.

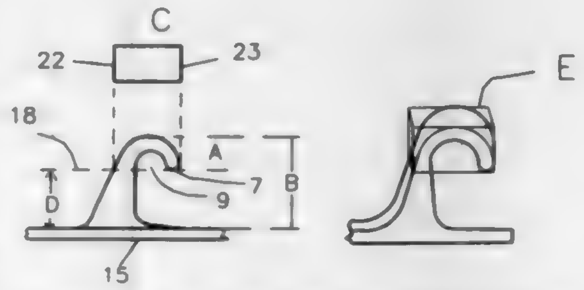
5,315,740
HOOK FOR HOOK AND LOOP FASTENERS

George A. Provost, Litchfield, N.H., assignor to Velcro Industries, B.V., Amsterdam, Netherlands

Filed Aug. 20, 1992, Ser. No. 932,633

Int. Cl.⁵ A44B *18/00*

U.S. Cl. 24—452 **15 Claims**



1. A hook for a hook and loop fastening system comprising:

a base;
a stem connected at its lower end to the base, the stem having an outer side and an inner side;
a crook having a first end and a hook tip, the first end connected to the stem, the crook projecting upwards from the stem and then downwards towards the base in a substantially smooth curve ending at the hook tip;
the hook having a width, a height, and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane orientated parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the crook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip;
wherein the displacement volume of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-5} cc).

5,315,741
SNAP FASTENER FOR SECURING SHOE LACES

Markus Dubberke, Mögglingen, Fed. Rep. of Germany, assignor to Nicole Dürr GmbH, München, Fed. Rep. of Germany

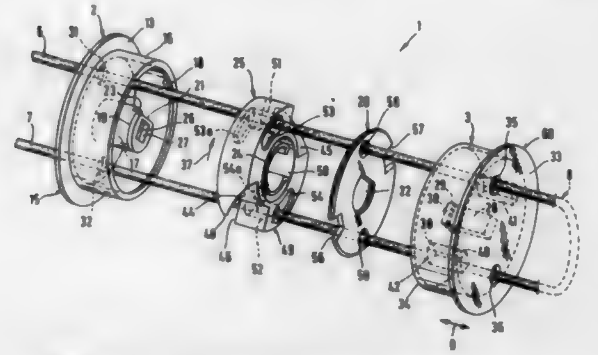
PCT No. PCT/EP93/00715, § 371 Date Sep. 2, 1993, § 102(e) Date Sep. 2, 1993, PCT Pub. No. WO93/18678, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 24, 1993, Ser. No. 90,215

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1992, 4209425

Int. Cl.⁵ A43C *7/00*

U.S. Cl. 24—712.1 **36 Claims**



1. A fastener for securing shoelaces, comprising:
first and second sleeve members movable toward and away from one another between locking and unlocking positions, said sleeve members together defining first and second passageways through which are insertable first and second end sections, respectively, of a shoelace when said sleeve members are in said unlocking position;
shoelace deflecting means disposed within an internal space formed by said sleeve members, said deflecting means being displaceable relative to said sleeve members in a locking direction in response to movement of said sleeve members to said locking position, such that first and second shoelace deflecting surfaces of said deflecting means are displaceable generally laterally across said first and second passageways, respectively; and
actuating means disposed within said internal space and operably connected to one of said sleeves for displacing said deflecting means in said locking direction in response to movement of said sleeve members to said locking position so that said locking surfaces deflect portions of respective shoelace end sections out of alignment with said passageways to resist withdrawal of said shoelace end sections from said passageways.

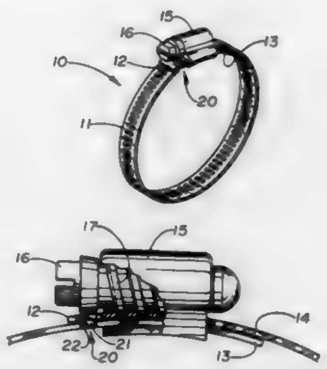
5,315,742
HOSE CLAMP WITH OPEN DIAMETER LOCK

Robert F. Fay, York, Pa., assignor to Murray Corporation, Cockeysville, Md.

Filed Jan. 13, 1993, Ser. No. 3,639

Int. Cl.⁵ F16L *33/08*

U.S. Cl. 24—274 R **10 Claims**



1. In a clamp of the type having a band with opposite ends drawn upon themselves to form a circle, and a gear mechanism for selectively constricting and expanding the circular band for clamping hoses and pipes, an open diameter lock comprising:
a lanced tab means near one end of said band; and
a notch formed in the band near the other end of said band;
wherein operation of the gear mechanism in one direction expands said band such that said tab means engages said notch to impose a positive resistance before said clamp opens beyond a "full-open" diameter, and operation of the gear mechanism in the other direction constricts said band such that said tab means disengages said notch during further tightening of said clamp.

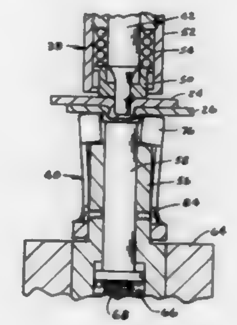
5,315,743
APPARATUS FOR FORMING A CLINCH JOINT

Louis C. Schleicher, Warren, Mich., assignor to Tech-Line Engineering Co., Warren, Mich.

Continuation of Ser. No. 526,066, May 18, 1990, abandoned. This application Dec. 11, 1992, Ser. No. 989,982

Int. Cl.⁵ B23P *11/00*

U.S. Cl. 29—243.5 **13 Claims**



1. A die assembly for cooperation with a die base and a punch to form a clinch joint in overlapping sheets of material, said die assembly comprising:
an elongated mandrel having first and second ends aligned along a die axis;
an anvil projecting axially from the mandrel first end, providing an anvil face generally perpendicular to the die axis, for cooperation with said punch to deform the overlapping sheets of material therebetween when forming the

joint, said mandrel first end being larger than the anvil to define a shoulder about the anvil generally perpendicular to the die axis;

means to affix the mandrel second end to a die base; and

a unitary expandable die button coaxially aligned and telescopically received on the mandrel, said die button having a base ring encircling the mandrel, and a plurality of die segments each having a radially outwardly yieldable leaf portion cantileverly extending axially from the base ring toward the mandrel first end and an enlarged head portion at the free end of the leaf extending radially inwardly adjacent the anvil, said head portions having a face surface which collectively provide a load bearing die face immediately surrounding the anvil for supporting the sheet material and defining a central recess which is sized to cooperate with and receive the punch and the material forming the joint, each of said head portions having a land generally parallel to and bearing upon the mandrel shoulder to transmit the axial loads exerted thereon into the mandrel, said die segment leaf portions normally radially inwardly biasing the head portions into adjacent relationship with the anvil while yieldably allowing the head portions to expand radially outwardly when the punch is forming the joint, whereby the head portions of said die button are supported by the anvil and the shoulder of the mandrel while the punch is drawing the material into the central recess without transmitting significant axial loads to said leaf portions.

5,315,744
METHOD AND APPARATUS FOR PULL-THROUGH BLIND INSTALLATION OF A TUBULAR MEMBER

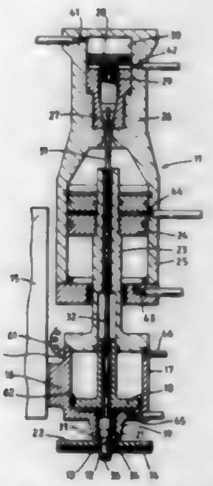
Keith Denham, Welwyn Garden City, and Michael Miles, Stevenage, both of United Kingdom, assignors to Avdel Systems Limited, Welwyn Garden City, United Kingdom

Continuation of Ser. No. 493,797, Mar. 15, 1990, abandoned. This application Jan. 3, 1992, Ser. No. 818,456

Claims priority, application United Kingdom, Mar. 17, 1989, 8906231

Int. Cl.^{5} B23P *11/00*

U.S. Cl. 29—243.53 **7 Claims**



1. An apparatus for the pull-through blind installation of a tubular member, in a hole in a workpiece which has a nearer face into which the hole opens, said installation of the tubular member being at a position along the hole spaced away from said nearer face of the workpiece, which apparatus comprises:

cylinder means having a reciprocating piston therein, said reciprocating piston having a portion extending forwardly towards the workpiece with a bore extending through said piston and forwardly extending portion, said forwardly extending portion of the piston having an annular anvil with an aperture of a fixed predetermined size which is aligned with the bore of the piston and the forwardly extending portion of the piston, said annular anvil abutting against an end surface of a tubular member positioned inside the workpiece hole for supporting said tubular member inside said workpiece hole;

a mandrel having an enlarged head positioned beyond a bore of the tubular member, and a stem extending from the enlarged head through the bore of the tubular member, through the anvil aperture, and through the bore of the piston and forwardly extending portion of the piston, the mandrel head having a fixed size which is greater than the predetermined size of the anvil aperture such that the mandrel head cannot pass through the anvil aperture;

retraction means comprising means for grabbing an end portion of said mandrel stem and applying a retraction force for retracting the stem in a direction away from the anvil aperture to thereby apply a withdrawal load to the enlarged head of the mandrel so as to draw the mandrel head into the bore of the tubular member while the annular anvil and reciprocating piston are abutting against and supporting the tubular member inside the workpiece hole, to thereby enlarge at least part of the tubular member more remote from the anvil into engagement with the workpiece; and

means for withdrawing the annular anvil away from the tubular member to allow the mandrel head to be withdrawn completely through and out of the remainder of the bore of the tubular member.

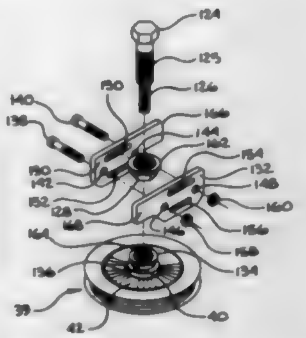
5,315,745
HUB REMOVING TOOL

Gill Cantwell, Los Angeles, and Gary Ramage, Chatsworth, both of Calif., assignors to Paxton Products Inc., Camarillo, Calif.

Filed May 13, 1993, Ser. No. 62,419

Int. Cl.^{5} B23P *19/02*

U.S. Cl. 29—260 **10 Claims**



1. Apparatus for removing a hub from a shaft wherein said hub has a flange and said shaft has an axially drilled hole, comprising:

a first screw,

a first nut housing threads for engaging said first screw,

a first plate abutting said hub and said nut including first slot means for locationally engaging said flange on said hub and second slot means for locationally engaging said nut,

a second plate abutting said hub and said nut including third slot means for locationally engaging said flange on said hub and fourth slot means for locationally engaging said nut,

clamping means for holding said first plate and said second plate in contact with said hub and said nut,

a pin axially abutting said screw, said pin also axially abutting the end of said axially drilled hole in said shaft.

5,315,746
ELASTIC RING MOUNTING METHOD

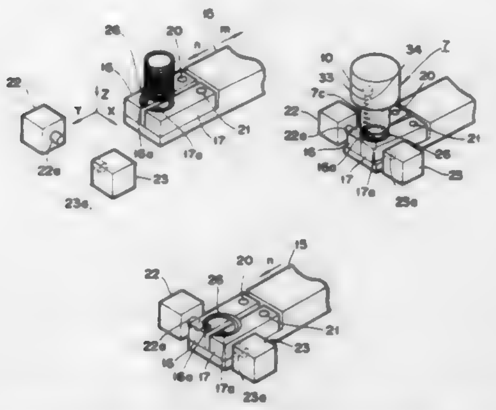
Masaki Machino, and Shojiro Danmoto, both of Ushiku, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 47,012, Apr. 14, 1993, abandoned, which is a continuation of Ser. No. 676,530, Mar. 28, 1991, abandoned. This application Sep. 28, 1993, Ser. No. 127,472

Claims priority, application Japan, Mar. 29, 1990, 2-78691; Mar. 29, 1990, 2-78692; Mar. 29, 1990, 2-78693; Mar. 29, 1990, 2-78696; Mar. 20, 1991, 3-080438; Mar. 20, 1991, 3-080593

Int. Cl.^{5} B23P *11/02, 19/04*

U.S. Cl. 29—451 **5 Claims**



5. A method for engaging an elastic ring having a peripheral opening with a workpiece using a device comprising a two-part ring receiving member, with each part having an engaging portion for receiving and engaging an elastic ring, an actuator for operating the ring receiving member to alter the diameter of an elastic ring positioned in the engaging portions, and a finger member for receiving a diametrally altered elastic ring, said method comprising the steps of:

supplying an elastic ring to a supplying position;

engaging the elastic ring in the ring engaging portions at the supplying position;

actuating the actuator to move the ring engaging portions to alter the diameter of the elastic ring;

transferring the diametrally altered elastic ring from the ring receiving member to the finger member;

holding the elastic ring in a biased state with the finger member;

aligning the elastic ring with the workpiece while maintaining the diameter of the ring in a biased state; and

releasing the elastic ring from the diametrally biased state at a predetermined position of the member to engage the elastic ring therewith.

5,315,747
METHOD OF PREPARING A BALLOON DILATATION CATHETER

Ronald J. Solar, San Diego, Calif., assignor to Pameda N.V., Curacao, Netherlands Antilles

Filed Oct. 30, 1992, Ser. No. 969,946

Int. Cl.^{5} B23P *11/02*

U.S. Cl. 29- -447 **10 Claims**

1. A method of preparing a balloon dilatation catheter which comprises the steps of:

(a) blowing a length of multiple lumen tubing to produce a double lumen catheter piece having distal and proximal ends and having a first lumen and a second lumen;

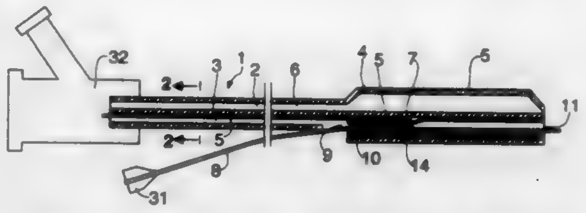
(b) cutting an opening in the second lumen proximal to the distal end of the catheter piece;

(c) inserting a pushing wire having distal and proximal ends into the second lumen through the proximal end of the catheter piece until the distal end of the pushing wire extends distally across the opening;

(d) inserting a piece of lubricious tubing having proximal and distal ends proximally into the second lumen through the distal end of the catheter piece so that the proximal end of the lubricious tubing overlaps the distal end of the pushing wire;

(e) sealing the distal end of the first lumen;

(f) heating the distal portion of the catheter piece to cause the distal portion of the second lumen to shrink slightly to cause the lubricious tubing to fixedly engage the distal end of the pushing wire, while the first lumen is pressurized to prevent shrinkage of the distal portion thereof; and



(g) heating the remaining portion of the catheter piece to cause the second lumen to shrink around the pushing wire and the first lumen to shrink to define a balloon at the distal end thereof.

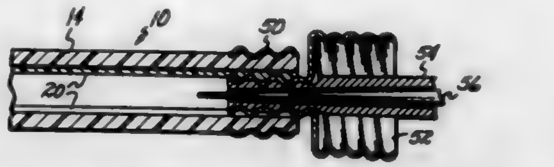
5,315,748
MAKING A KINK IMPEDING HOSE

Peter H. Seckel, Montclair, N.J., assignor to Plastic Specialties and Technologies, Inc., Ridgefield, N.J.

Continuation of Ser. No. 742,455, Aug. 5, 1991, abandoned, which is a continuation of Ser. No. 610,338, Nov. 19, 1990, abandoned, which is a continuation of Ser. No. 542,790, Jun. 25, 1990, abandoned, which is a continuation of Ser. No. 277,881, Nov. 30, 1988, abandoned, which is a division of Ser. No. 228,993, Aug. 5, 1988, Pat. No. 4,867,485. This application May 12, 1992, Ser. No. 883,887

Int. Cl.^{5} B21D *39/00*

U.S. Cl. 29—507 **6 Claims**



1. A method for attaching a coupling to a hose, comprising the steps of:

providing one of a flexible plastic and rubber water hose having a wall defined by inner and outer circumferential surfaces, and circumferentially spaced ribs integrally molded with said wall extending from said inner circumferential surface and extending longitudinally to the hose between open ends thereof;

providing an annular coupling comprising a ferrule and a connector;

inserting a portion of said connector into said hose and placing said ferrule around said outer circumferential surface of said hose, thereby radially aligning the portion of said connector with said ferrule and said ribs, with said ribs existing between said portion and said ferrule; and

deforming said ribs with circumferential corrugations of said portion by forcing said corrugations into said ribs, and thereby absorbing said ribs into the wall and sealing said hose against water leakage from between said connector and said wall;

wherein said providing a hose step includes providing a hose having ribs of a size, number and hardness all limited to what the hose wall thickness and softness can absorb for sealing against said leakage.

5,315,749

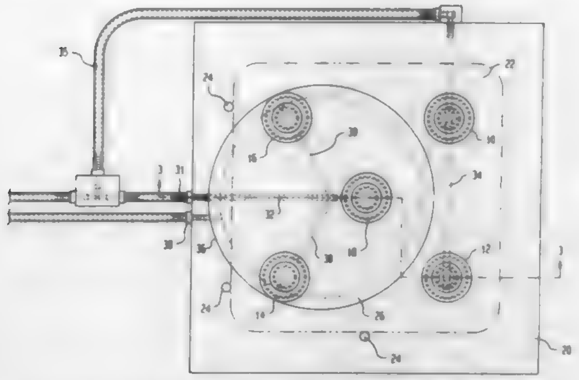
METHOD FOR HOLDING SUBSTRATES

Anton Nenadic, Red Hook; Kenneth Furman, Hyde Park, and Robert W. Pasco, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 897,182, Jun. 10, 1992, Pat. No. 5,226,636. This application Sep. 28, 1992, Ser. No. 951,919

Int. Cl.^{5} B25B *11/00*

U.S. Cl. 29—559 **3 Claims**



1. A method for holding and supporting a flexible substrate with a flat lower surface, comprising the steps of:

placing the substrate in the proximity of an arrangement of five support members, two of said support members being attache to a frame and the other three of said support members forming a rigid triangle, the plane of said triangle being movable with respect to said frame; and

adjusting said plane of said triangle until all five of said support members are in contact with said lower surface of the substrate.

5,315,750

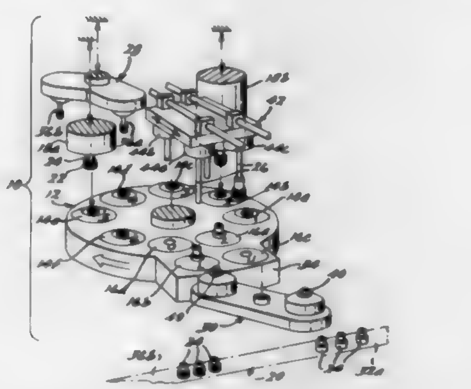
LOADING/UNLOADING SYSTEM FOR BROACHING MACHINE

Robert E. Roseliep, Grosse Pointe, Mich., assignor to Utica Enterprises, Inc., Shelby Township, Utica County, Mich.

Filed Jan. 5, 1993, Ser. No. 625

Int. Cl.^{5} B23Q *7/02;* B23D *41/00*

U.S. Cl. 29—563 **21 Claims**



1. An apparatus for performing work on a plurality of workpieces during a single operation, said apparatus comprising:

a table having receptacles for receiving said plurality of workpieces, said table having at least one machining element;

first and second fixturing members positioned in proximity to said table, said first and second fixturing members each having means for securing thereto a respective one of said plurality of workpieces, said first and second fixturing members being movable relative to said at least one machining element on said table so as to perform work on said respective one of said plurality of workpieces;

means associated with said table for transporting each of said plurality of workpieces to said first and second fixturing members; and

means associated with said table for repositioning a second workpiece of said plurality of workpieces on said table after a first workpiece of said plurality of workpieces has been secured to said first fixturing member, said second workpiece being repositioned on said table so as to be aligned to encounter said second fixturing member;

whereby at least two workpieces of said plurality of workpieces can be secured in said first and second fixturing members during the operation of said apparatus.

5,315,751

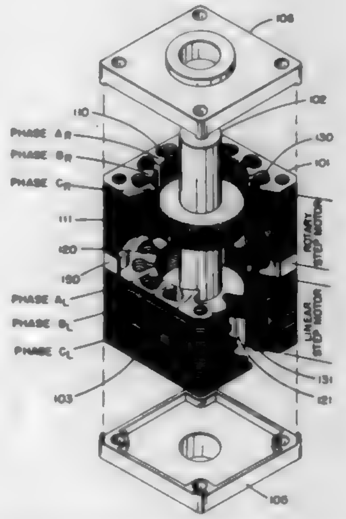
METHOD OF FABRICATING A COMBINED LINEAR-ROTARY DIRECT DRIVE STEP MOTOR

Robert Hammer, Brookfield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 602,562, Oct. 24, 1990, Pat. No. 5,093,596. This application Nov. 8, 1991, Ser. No. 790,903

Int. Cl.^{5} H02K *15/02*

U.S. Cl. 29—598 **10 Claims**



1. A method for fabricating a linear-rotary direct drive step motor, including a linear portion and a rotary portion enclosed within a single housing, comprising the steps of:

(a) fabricating the linear and rotary portions of said motor from laminations of thin magnetic sheet material;

(b) inserting a common shaft between said linear and rotary portions of said motor; and

(c) winding separate coils around the stator poles in each of said linear and rotary portions of said motor whereby the linear and rotary portions of said motor are capable of being independently operated.

5,315,752

METHOD FOR PRESS FITTING OF A PRESS FITTING BODY AND A PRESS FITTING APPARATUS HAVING A LINEAR GAUGE FOR THE PRESS FITTING BODY

Masami Ohta, Isesaki; Masami Shimizu, Kiryu; Kazuo Niijima, Oota, and Yasushi Kawakami, Kiryu, all of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Filed Jan. 26, 1993, Ser. No. 9,124

Claims priority, application Japan, Feb. 3, 1992, 4-17911

Int. Cl.^{5} H02K *15/02*

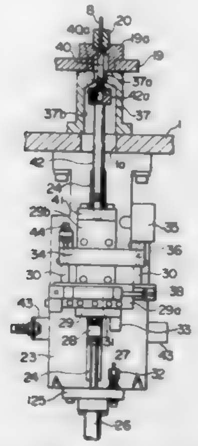
U.S. Cl. 29—598 **4 Claims**

1. A press fitting method comprising the steps of:

(a) temporarily press fitting a press fitting body, from the top of a press fitted part of a press fitted member located at a prespecified height with respect to the press fitted part, such that a ball screw shaft, of a ball screw, is moved downward by means of a servo motor so that the press fitting body is press fitted to the press fitted part at a prespecified length;

(b) executing a zero adjustment of a linear gauge and a load cell, wherein the linear gauge is composed such that a measuring member is in contact with the top end of a measured member which moves together with the press fitting body, and the load cell is composed so as to measure a press fitting force of the press fitting body;

(c) constant size press fitting, which is also executed to the press fitted member of the press fitting body at a prespecified length;



(d) differential press fitting, executed in the case where the measured results of the linear gauge and those of the load cell, at the time when the constant size press fitting process is terminated, are within prespecified ranges, wherein the press fitting body is press fitted to the press fitted member according to a difference between the measured results and a specified press fitting length, so that consequently the specified press fitting length of the press fitting body with respect to the press fitted member can be attained; and

(e) determining, whether or not the press fitted length, set by the differential press fitting step, equals the specified press fitting length.

5,315,753

METHOD OF MANUFACTURE OF HIGH DIELECTRIC ANTENNA STRUCTURE

Paul C. Jensen, Broomfield, and David W. Paananen, Lafayette, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Continuation-in-part of Ser. No. 799,264, Nov. 27, 1991, which is a continuation of Ser. No. 551,206, Jul. 11, 1990, abandoned. This application Feb. 4, 1993, Ser. No. 13,590

Int. Cl.^{5} H01P *11/06*

U.S. Cl. 29—600 **19 Claims**

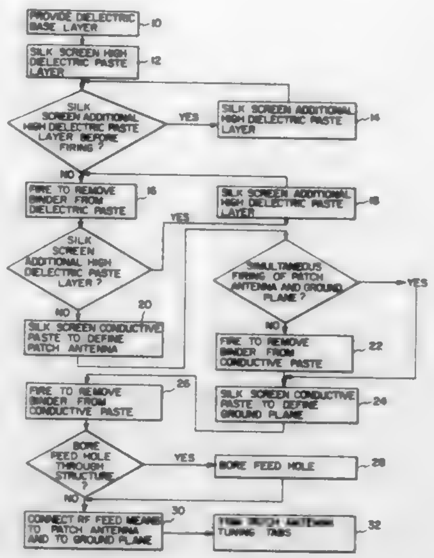
1. A method for manufacturing an antenna structure, comprising the steps of:

providing a first dielectric base layer having a first dielectric constant

silk-screening at least a first dielectric film layer on said first dielectric base layer to form a first dielectric structure, wherein said at least first dielectric film layer has a second dielectric constant that is greater than said first dielectric constant;

positioning a first patch antenna element on said first dielectric structure;

supplying a ground plane below said first dielectric structure; and



PROVIDE DIELECTRIC BASE LAYER
10
SILK SCREEN HIGH DIELECTRIC PASTE LAYER
12
SILK SCREEN ADDITIONAL HIGH DIELECTRIC PASTE LAYER BEFORE FIRING ?
YES
SILK SCREEN ADDITIONAL HIGH DIELECTRIC PASTE LAYER
14
NO
FIRE TO REMOVE BINDER FROM DIELECTRIC PASTE
16
SILK SCREEN ADDITIONAL HIGH DIELECTRIC PASTE LAYER
18
YES
SILK SCREEN ADDITIONAL HIGH DIELECTRIC PASTE LAYER ?
SIMULTANEOUS FIRING OF PATCH ANTENNA AND GROUND PLANE ?
YES
NO
20
SILK SCREEN CONDUCTIVE PASTE TO DEFINE PATCH ANTENNA
NO
FIRE TO REMOVE BINDER FROM CONDUCTIVE PASTE
22
FIRE TO REMOVE BINDER FROM CONDUCTIVE PASTE
26
SILK SCREEN CONDUCTIVE PASTE TO DEFINE GROUND PLANE
24
BORE FEED HOLE THROUGH STRUCTURE ?
YES
BORE FEED HOLE
28
NO
CONNECT RF FEED MEANS TO PATCH ANTENNA AND TO GROUND PLANE
30
TRIM PATCH ANTENNA TUNING TABS
32

interconnecting RF feed means to the first antenna patch element and to the ground plane.

5,315,754

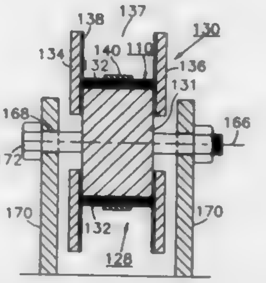
METHOD OF MAKING A TRANSFORMER CORE COMPRISING STRIPS OF AMORPHOUS STEEL WRAPPED AROUND THE CORE WINDOW

Willi Klappert, Hickory, N.C., and William K. Houser, Greeneville, Tenn., assignors to General Electric Company, Malvern, Pa.

Continuation of Ser. No. 623,265, Dec. 6, 1990, Pat. No. 5,175,924, which is a continuation of Ser. No. 535,538, Jun. 11, 1990, abandoned. This application Oct. 28, 1992, Ser. No. 967,913

Int. Cl.^{5} H01F *41/02*

U.S. Cl. 29—609 **28 Claims**



1. A method of making a transformer core comprising strips of amorphous steel wrapped about a window of the core, comprising the steps of:

(a) providing a plurality of spools of amorphous metal strip in each of which the strip is wound in single-layer thickness,

(b) simultaneously unwinding the single-layer thickness strips from said plurality of spools and combining the single-layer thickness strips to form a strip of multiple-layer thickness,

(c) winding said multiple-layer thickness strip onto a plurality of master reels in each of which the strip is wound in multiple-layer thickness,

(d) unwinding the multiple-layer thickness strips from said master reels and combining said multiple-layer thickness strips into a composite strip that has a thickness in strip layers equal to the sum of the combined multiple-layer thickness strips,

(e) cutting said composite strip into a plurality of sections of composite strip,

(f) forming from said sections of composite strip groups of strips, each group comprising one or more sections of composite strip, the strips in each group having substantially aligned longitudinally-extending edges and substantially aligned transversely-extending edges at opposite ends of the group,

(g) forming from said groups a plurality of packets, each packet comprising a plurality of groups, the groups in each packet having longitudinally-extending edges that are substantially aligned and transversely-extending edges at the ends of the packet that are staggered with respect to each other longitudinally of the packet, and

(h) feeding said packets in succession into a belt nester that comprises (i) a rotatable arbor and (ii) wrapping means comprising a belt extending about said arbor for wrapping said packets in superposed relationship about said arbor as the arbor is rotated, thereby building up a core form about said arbor.

5,315,755

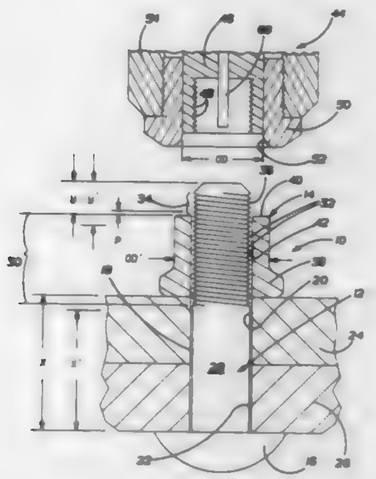
FASTENER SYSTEM INCLUDING A SWAGE FASTENER AND A TOOL FOR INSTALLING SAME

David J. Fulbright and Walter J. Smith, both of Waco, Tex., assignors to Huck Patents, Inc., Wilmington, Del.

Continuation of Ser. No. 654,412, Feb. 11, 1991, which is a continuation of Ser. No. 359,482, May 31, 1989. This application Sep. 24, 1991, Ser. No. 765,399

Int. Cl.^{5} F16B *19/08*

U.S. Cl. 29—715 **12 Claims**



1. A fastening system for securing a plurality of workpieces with a multi-piece swage type fastener through aligned openings in the workpieces, said fastening system comprising:

a fastener adapted to be set by a relative axial force, an installation tool having a threaded gripping member and a swage anvil and adapted to apply the relative axial force to said fastener, said installation tool having a first operative condition for applying a first predetermined magnitude of relative axial force to set the fastener and a second operative condition for applying a relative axial force of a magnitude less than said first predetermined magnitude of relative axial force,

said fastener comprising a pin member and a tubular collar,

said pin member having an enlarged head and an elongated pin shank,

said pin member having a locking groove portion on said pin shank comprising a plurality of generally circumferentially extending locking grooves,

said pin shank adapted to extend through the aligned openings,

said pin member having a pull portion comprising a first pull groove portion and a second pull portion with each having a plurality of generally circumferentially extending pull grooves,

said pull portion located at the terminal end of said pin shank with said pull grooves of said first and second pull groove portions defined by a thread form,

said tubular collar adapted to be located on said pin shank over said locking grooves with said pull grooves being accessible at the outer end of said collar,

said pull grooves of said first and second pull groove portions adapted to be progressively threadably engaged generally one at a time by said gripping member of said installation tool with said first pull groove portion being of a greater axial length than said second pull groove portion,

said first pull groove portion adapted to be threadably engaged by said gripping member with said installation tool in said first operative condition,

said second pull groove portion adapted to be threadably engaged by said gripping member with said installation tool in said second operative condition,

said collar adapted to be engaged by said swage anvil when said first pull groove portion is threadably engaged by said gripping member and be radially overengaged by said swage anvil whereby said collar is swaged into said locking grooves in response to the relative axial force of said first magnitude applied between said pin member and said collar by said gripping member and said swage anvil,

said collar adapted to be engaged by said swage anvil when said second pull groove portion is threadably engaged by said gripping member whereby said collar and said pin member can pull the workpieces together in response to the relative axial force of said second magnitude applied between said pin member and said collar by said gripping member and said swage anvil,

connecting means integrally connecting said pull portion with said locking groove portion and having a preselected strength to prevent severing of said pull portion from said locking groove portion at said first magnitude of relative axial force,

said second pull groove portion adapted to permit engagement of said first pull groove portion by said gripping member after operation of said installation tool in said second operative condition pulling the workpieces together and while said gripping member is in engagement with said second pull groove portion,

said second pull groove portion being a part of said first pull groove portion and being engageable by said gripping member during operation of said installation tool in said first operative condition to swage said collar into said locking grooves,

detecting means operatively associated with said installation tool for detecting the extent of relative threaded engagement between said pull grooves in said second pull groove portion and said gripping member,

actuating means operatively associated with said installation tool and responsive to said detecting means for preventing said installation tool from operating in said second operative condition unless a preselected magnitude of relative threaded engagement of said pull grooves of said second pull groove portion by said gripping member is detected by said detecting means.

5,315,756

INSERTION MODULE FOR A WIRE ASSEMBLY DEVICE

Ivan Jurjevic; Kasriel Melamed, and Joachim Wendt, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

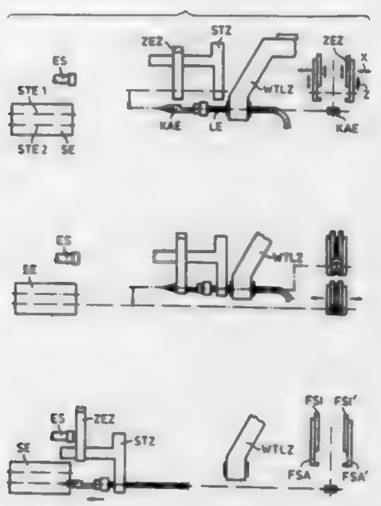
PCT No. PCT/DE91/00141, § 371 Date Nov. 9, 1992, § 102(e) Date Nov. 9, 1992, PCT Pub. No. WO91/15043, PCT Pub. Date Oct. 3, 1991

PCT Filed Feb. 19, 1991, Ser. No. 927,483

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1990, 4010349

Int. Cl.^{5} B23P *19/04;* H01R *43/00*

U.S. Cl. 29—748 **2 Claims**



1. An insertion module for a wire-assembly device for gripping, positioning, and joining a contact-connector element disposed at the end of an electric lead to a connector device, said insertion module comprising:

a centering gripper for gripping the contact-connector element with a positive fit, said centering gripper having inner positive-locking parts and outer positive-locking parts that are movable relative to each other in a direction along a common longitudinal axis of the locking parts, said locking parts are adapted to conform to the configuration of the contact-connector element, said inner and outer positive-locking parts being together movable in an opening or closing direction;

an insertion gripper for engaging a lead end disposed outside the contact-connector element;

an adjustment limit stop denoting a final insertion position of the contact-connector element in the connector device, said contact connector element being locked in said connector device when in said final insertion position, whereby said insertion gripper approaches the adjustment limit stop and after said final insertion position is reached is movable with an adjustable tensile force in a direction opposite to the insertion direction to test for a proper lock.

5,315,757

APPARATUS FOR FITTING OF GROMMETS TO ELECTRICAL CABLES

Max Koch, Meggen, and Peter Imgrut, Buchrain, both of Switzerland, assignors to Komax Holding AG, Meggen, Switzerland

Filed Sep. 25, 1992, Ser. No. 951,112

Claims priority, application Switzerland, Sep. 25, 1991, 2838/91

Int. Cl.^{5} B23P *19/04*

U.S. Cl. 29—754 **16 Claims**

1. An apparatus for fitting of grommets to electrical cables, said apparatus comprising:

at least one drum having an interior with an open end face for receiving grommets into the interior, said drum being drivable about an axis inclined to horizontal axis and including scoops arranged in the interior of the drum;

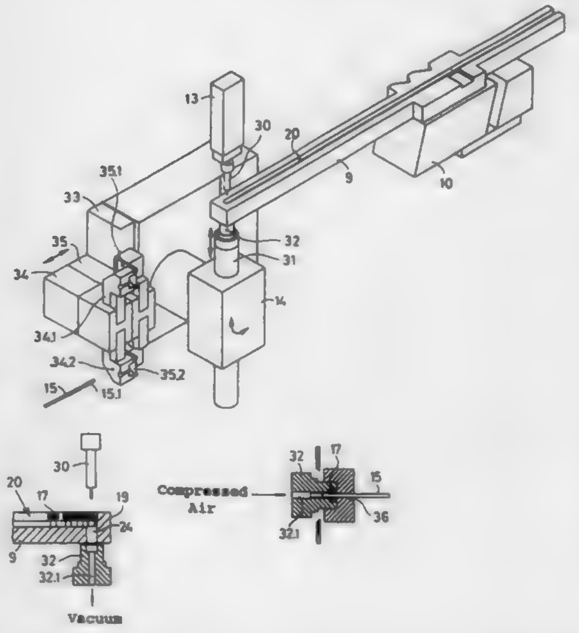
conveying rail, said conveying rail having an upstream end portion and a downstream end portion, said upstream end portion projecting into said drum whereby, while said drum rotates, the grommets are transferred by means of said scoops to said conveying rail for further process, said conveying rail further comprising:

a buffer for storing grommets having been received from said drum having been brought into a predetermined correct position; and

a vertical bore is provided in the conveying rail at said downstream end portion below a position in which a first, most downstream, grommet is stored in said buffer;

a singling cylinder having a punch that is mounted for vertical reciprocal movement above the conveying rail and extends substantially along an axis of said vertical bore of said conveying rail;

a pivotable cylinder with a grommet-receiving part positioned on a piston rod, said pivotable cylinder being arranged beneath said conveying rail and extending substantially along the axis of said vertical bore of said conveying rail, whereby each successive grommet positioned at said downstream end portion is pushed through said vertical bore of said conveying rail into said grommet-receiving part of said pivotable cylinder by means of said punch of said singling cylinder, after which said pivotable cylinder pivots into a substantially horizontal position; and



a first gripper device comprising pivotable gripper elements for gripping said grommet-receiving part of said pivotable cylinder upon pivotal movement to surround said grommet-receiving part, said pivotable gripper elements forming a further bore as said gripper elements surround said grommet-receiving part, said further bore extending substantially concentrically with said grommet bore, wherein said first gripper device and said piston rod of said pivotable cylinder and the electrical cable to be fitted with a grommet are adapted to be moved one relative to the other while the grommet is pushed onto the electrical cable, the electrical cable being centered by the further bore, until the grommet is moved to a predetermined position on the electrical cable.

5,315,758

METHOD FOR MANUFACTURING SLIDE ELECTRICAL CONTACT

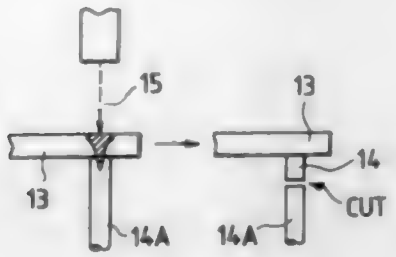
Yasuichi Ono; Akito Miura, and Hirofumi Okumura, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 779,708, Oct. 21, 1991, abandoned. This application May 19, 1993, Ser. No. 64,299

Claims priority, application Japan, Oct. 31, 1990, 2-291791

Int. Cl.⁵ H01R *43/20*

U.S. Cl. 29—878 **4 Claims**



1. A method for manufacturing a sliding electrical contact comprising the steps of:

machining a resilient plate-like metallic material to provide a base material;

mounting a precious metal contact on a flat surface of said base; and

directing a laser beam at a second surface opposite to the first surface of said base to connect said precious metal contact to said base;

wherein a section of a wire forms the precious metal contact.

5,315,759

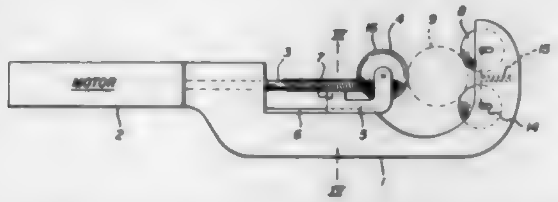
POWER-DRIVEN PIPE CUTTING DEVICE

Moshe Mashata, 9761 NW. 33 Manor, Sunrise, Fla. 33351

Filed Jul. 1, 1993, Ser. No. 86,537

Int. Cl.⁵ B23D *21/08;* **B26D** *3/16*

U.S. Cl. 30—97 **8 Claims**



8. A device for cutting tubing and other cylindrical objects, comprising a body; first and second jaw portions attached to said body and defining a cutting space therebetween for receiving tubing to be cut; said first jaw portion being rigidly connected to said body and said second jaw portion being slidingly supported on said body opposite said first jaw portion; a cutting roller rotatably supported in said first jaw portion; a power-driven roller rotatably supported in said second jaw portion; means for sliding said second jaw portion in a direction towards said first jaw portion for narrowing the cutting space during a cutting operation; and power means disposed in said body for driving said power-driven roller.

5,315,760

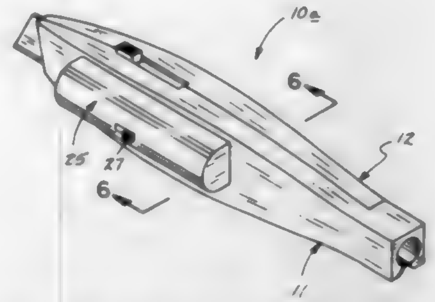
RAZOR KNIFE WITH BUILT-IN PENCIL SHARPENER

Stephen W. Emerson, 7004 Clovernook Ave., Floor 1, Cincinnati, Ohio 45231

Filed May 17, 1993, Ser. No. 61,260

Int. Cl.⁵ D25F *3/00*

U.S. Cl. 30—123 **3 Claims**



1. A razor knife with built-in pencil sharpener, comprising,

a first housing and a second housing, the first housing arranged in adjacency to the second housing in contiguous communication, with the first housing having a first housing first end and the second housing having a second housing first end, with the first housing first end and the second housing first end arranged in a coplanar relationship to one another, and a slide member mounted in sliding relationship to the first housing and the second housing in operative communication with a cutting blade, with the cutting blade arranged for sliding projection through the first housing first end and the second housing first end,

and

the first housing including a first housing second end, with the first housing second end including a conical bore, and the first housing further including a slot, the slot intersecting the conical bore extending to the first housing second end, the slot having a trapezoidal cross-sectional configuration, and including a slot first side wall spaced from a slot second side wall, with the slot first side wall including a side wall cutting blade, with the side wall cutting blade projecting into the conical bore, and

the second housing includes a second housing second end, the housing second end is arranged in a spaced relationship relative to the first housing second end,

and

an illumination housing mounted to the first housing, the illumination housing including a battery, with a switch directed through the illumination housing and an illumination bulb mounted within the illumination housing, the illumination housing including an illumination housing front wall spaced from an illumination housing rear wall, the illumination housing front wall arranged in adjacency to the illumination bulb, whereupon actuation of the switch effects illumination of the illumination bulb, with the illumination housing front wall arranged in a spaced parallel relationship relative to the first housing first end.

5,315,761

SHEATH WITH ADJUSTABLE LATCHING ASSEMBLY

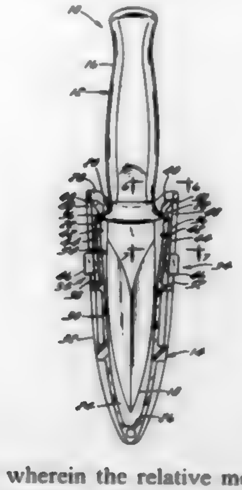
Donald C. Norton, Beaverton, and George C. Sessions, Milwaukie, both of Oreg., assignors to Fiskars Inc., Wausau, Wis.

Filed Jul. 27, 1993, Ser. No. 98,459

Int. Cl.⁵ B26B *3/06, 79/02*

U.S. Cl. 30—162 **20 Claims**

1. A sheath and tool combination comprising a tool having a handle and a blade extending therefrom along a longitudinal axis, and a sheath having a complementary configuration for receiving at least said blade through an opening in said sheath, said sheath including a biased latching assembly for retaining said tool therein by establishing a retaining-effective force generally normal to said axis which resists but may be overcome by a withdrawal force applied axially by a user to remove said tool from said sheath, said latching assembly being comprised of a first biasing element engageable with a second biasing element, wherein the relative movement of said elements by a user changes said retaining-effective force within a range from a minimum to a maximum force.



5,315,762

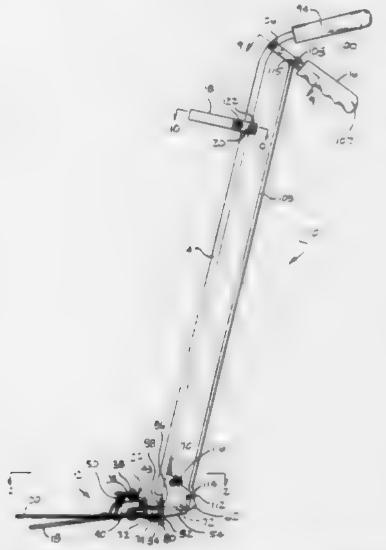
GRASS TRIMMING SHEARS

Timothy C. Dearman, 13015 Stone Rd., Pearland, Tex. 77581

Filed Feb. 5, 1993, Ser. No. 14,317

Int. Cl.⁵ B26B *13/00*

U.S. Cl. 30—231 **10 Claims**



1. A manually operated tool assembly for trimming grass and weeds, said assembly comprising:

a base member;

a stationary blade operatively coupled to said base member and including a cutting edge;

a movable blade having a cooperating cutting edge and being pivotally coupled to said stationary blade so that said cutting edges are supported in sliding point contact with one another during pivotal movement of said blades to effectuate shearing action of the blades;

a first lever pivotally coupled to said base member;

a first linkage extending between and operatively interconnecting said movable blade and said lever;

a support handle spaced from said base member;

an elongate extension arm extending between and interconnecting said handle and said base member;

a remote actuating lever spaced from said first lever adjacent said handle and supported for pivotal movement with respect to said handle;

a second linkage extending between and interconnecting said remote actuating lever and said first lever, thereby enabling a user of said assembly to trim grass and other vegetation near ground level while standing in an upright position by grasping said handle and remote lever with one hand and squeezing said remote lever pivotally toward said handle to cause corresponding pivotal movement of said first lever and shearing action of said blades; and

a supplemental handle mounted on said extension arm at a level spaced from said support handle for grasping by the other hand of the user, said supplemental handle having a pair of spaced apart leg portions straddling said extension arm, said leg portions having two paris of apertures aligned on opposing front and back sides of said extension arm, and a pair of fastener members extending through said pairs of aligned apertures and forcibly urging said leg portions against said extension arm to secure said supplemental handle against movement along said extension arm.

5,315,763

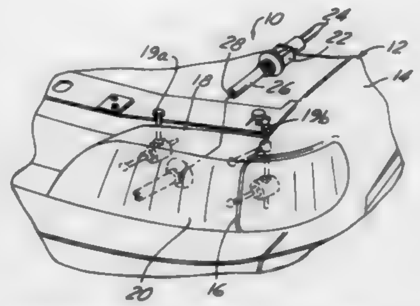
HEADLIGHT AIMING DEVICE AND METHOD

Philip A. Wing, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 22, 1993, Ser. No. 7,209

Int. Cl.⁵ G01B *11/27*

U.S. Cl. 33—288 **10 Claims**



1. A method of aiming a headlight for a vehicle, comprising:

removing a bulb from a headlight;

installing a laser aiming device in the headlight in place of the bulb;

connecting the aiming device to a source of power to produce a laser beam;

locating the laser beam on an aiming screen placed in front of the vehicle; and

adjusting the position of the headlight, if necessary, to locate the laser beam at a predetermined position on the aiming screen.

5,315,764

METHOD AND APPARATUS FOR APPLYING ALPHANUMERIC CHARACTERS TO THE SIDWALL OF A TIRE

Jimmy H. Robbins, R-7 B-897, Haleyville, Ala. 35565

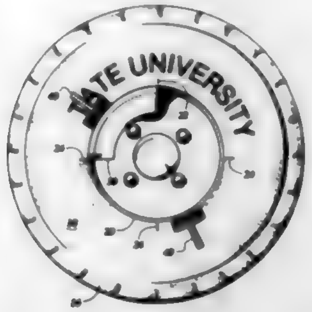
Filed Dec. 7, 1992, Ser. No. 986,559

Int. Cl.⁵ B60C *13/00*

U.S. Cl. 33—613 **5 Claims**

1. An apparatus for ensuring proper application of a personalized series of alphanumeric characters and the like which are applied to the sidewall of a pneumatic tire or the like, comprising:

referencing means including a centering gauge having a measuring plate for measuring at least one 90° interval of the tire, said measuring plate having an arcuate outer edge, said outer edge designed to fit adjacent the rim of a plurality of different sized tires for dividing the sidewall of the tire into quadrants so they can be marked with reference points; and



spacing means for accurately spacing the alphanumeric characters relative to each other and relative to the rim of the tire.

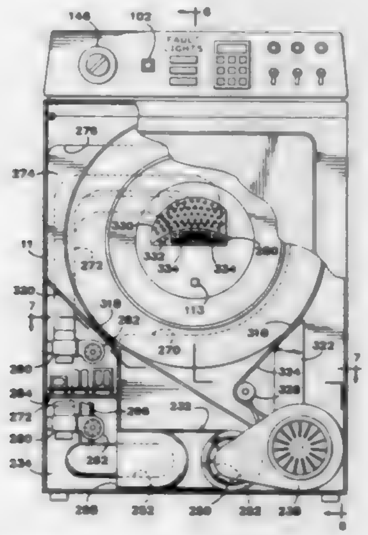
5,315,765
HIGH-EFFICIENCY FABRIC DRYER

Melvin Holst, 215 SW. 14th St., Gresham, Oreg. 97080, and Paul S. Payne, Portland, Oreg., assignors to Melvin Holst, Gresham, Oreg.

Filed Apr. 27, 1992, Ser. No. 874,519

Int. Cl.⁵ F26B *3/34*

U.S. Cl. 34—260 22 Claims



1. A fabric dryer comprising:

(a) a drying chamber for receiving fabric laden with moisture;

(b) an air intake duct for conducting air from the atmosphere into said drying chamber;

(c) an air exhaust duct for conducting said air and moisture from said drying chamber into the atmosphere;

(d) a source of heat for heating said moisture in said drying chamber;

(e) an intake air capability sensor for sensing the drying capability of air from the atmosphere which enters said air intake duct; and

(f) control means for controlling said source of heat variably in response to variations in the drying capability sensed by said intake air capability sensor, said control means including means for scheduling, in response to said sensor, a plurality of variable predetermined stages of said source of heat, to occur after said sensing of said drying capability, for providing progressively greater heating of said moisture by said source of heat in response to progressively lower drying capability sensed by said intake air sensor.

5,315,766
VAPOR DEVICE AND METHOD FOR DRYING ARTICLES SUCH AS SEMICONDUCTOR WAFERS WITH SUBSTANCES SUCH AS ISOPROPYL ALCOHOL

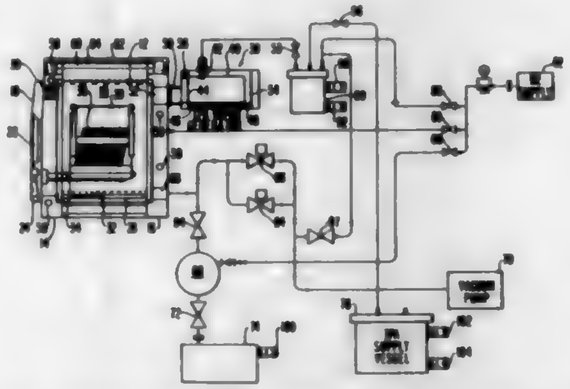
Glenn A. Roberson, Jr., Hollister, and Robert B. Eglinton, Montery, both of Calif., assignors to Semifab Incorporated, Hollister, Calif.

Continuation of Ser. No. 588,169, Sep. 26, 1990, Pat. No. 5,115,576, which is a continuation of Ser. No. 427,512, Oct. 27, 1989, Pat. No. 4,977,688. This application May 22, 1992, Ser. No. 888,477

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.⁵ F26B *5/04*

U.S. Cl. 34—409 20 Claims



10. A method for drying articles in a process chamber after the articles have been washed in a liquid, the method comprising the steps of:

evacuating air from the process chamber;

supplying vapor of a volatile low vapor pressure liquid substance to said process chamber from a source external to said process chamber; and

evacuating liquid from the process chamber.

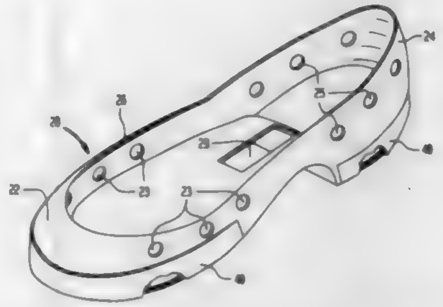
5,315,767
SHOE SOLE SAVER

Frank M. Bradbury, 485 Penguin Dr., Satellite Beach, Fla. 32937

Continuation-in-part of Ser. No. 404,352, Sep. 7, 1989, abandoned. This application Dec. 7, 1990, Ser. No. 624,886

Int. Cl.⁵ A43B *3/16, 3/18*

U.S. Cl. 36—7.1 R 4 Claims



1. A composite shoe having a substitute sole attachment for use in a sporting activity on a hard playing surface including:

an inner shoe having a sole and upper portion adapted for wear while engaging in sporting activities; and

means for attaching a substitute sole for sports play, said attaching means comprising:

a stretch outer shoe which is removably attached to said inner sole by stretching the outer shoe over the entire sole and an adjacent upper portion of a periphery of the inner shoe, said outer shoe extending upwardly from the shoe sole and maintaining a snug fit with said shoe due to elastic properties of said outer shoe; and

said outer shoe having an auxiliary sole for athletic play on a hard playing surface, said sole being constructed, at its toe and heel portions, of a material different from that of other portions of the sole of said outer shoe, said material having a greater resistance to wear-through at said toe and heel portions than at said other portions of the auxiliary sole of said outer shoe; and wherein

the toe and heel portions of the outer shoe include two separate members made of said material and individually attached by a flexible bonding agent to an outer surface area of the respective toe and heel portions of the outer shoe and separated by an arch portion that has greater stretchability than the toe portion or the heel portion with said separate members.

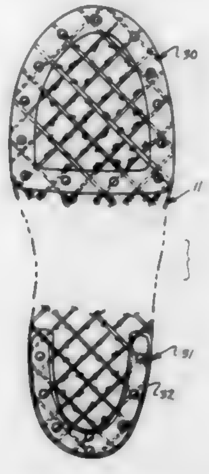
5,315,768
SHOE TRACTION ATTACHMENT

Durate S. Pacheco, 10 Second St., Portsmouth, R.I. 02871

Filed May 17, 1993, Ser. No. 61,259

Int. Cl.⁵ A43B *3/16, 3/18, 15/00*

U.S. Cl. 36—7.1 R 2 Claims



1. A shoe traction attachment arranged in combination with a shoe member, wherein the shoe member includes a shoe upper, with a shoe sole and a shoe heel, and an elastomeric mesh bag member having intersecting elastomeric strands defining openings between the strands, with the bag member having a bag member entrance opening to receive the shoe therewithin, with the bag member including first strand portions in contiguous communication to the sole and second strand portions arranged in adjacency to the heel, and

a heel opening directed through the bag member to direct the shoe heel therethrough,

and

the first elastomeric strands and the second elastomeric strands include a plurality of spaced rigid tooth members imbedded therewithin for enhanced traction,

and

a traction annular disc, wherein the annular disc includes a disc periphery, and the disc periphery includes a plurality of bendable tabs, wherein the bendable tabs are located about the periphery of said disc such that when bent, said tabs receive a plurality of the first elastomeric strands therethrough in adjacency to a toe portion of the shoe, with the disc having a plurality of disc spikes orthogonally and threadedly received within the disc, with the disc spikes of a first length.

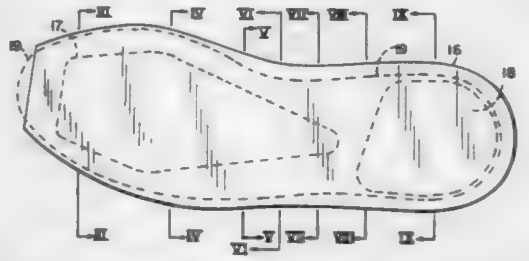
5,315,769
TEARDROP PROPULSION PLATE FOOTWEAR

Daniel T. Barry, 1413 Granger Ave., Ann Arbor, Mich. 48104; Raymond M. Fredericksen, 2346 Graystone; Robert W. Soutas-Little, 2402 Sullett Rd., both of Okemos, Mich. 48864, and Ruk R. Peterson, 55 Mayfair, NE., Grand Rapids, Mich. 49351

Continuation of Ser. No. 742,435, Aug. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 510,671, Apr. 18, 1990, Pat. No. 5,052,130, which is a continuation-in-part of Ser. No. 131,309, Dec. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 942,245, Dec. 15, 1986, abandoned. This application Jul. 12, 1993, Ser. No. 91,540

Int. Cl.⁵ A43B *13/18, 19/00, 13/12*

U.S. Cl. 36—114 9 Claims



1. An athletic shoe having a forefoot portion including a metatarsal head area, an arch portion and a rear foot portion, comprising:

an upper subassembly;

a sole subassembly comprising a midsole and an outsole;

a teardrop configurated, laminated spring plate in said sole subassembly, formed of layers of elongated fibers embedded in polymer;

said spring plate having its greatest width in said metatarsal head area of the shoe for extending beneath the metatarsal heads of the foot;

said plate having side edges tapering toward each other forwardly from said metatarsal head area, and tapering rearwardly toward each other from said metatarsal head area and converging in a rounded apex at said arch portion;

said midsole having a cavity in said rear foot portion; and

a viscous fluid pad in said cavity, said pad being rearwardly of said apex and being arranged in combination with said spring plate such that ground reaction forces generated by impact of a wearer's foot are redirected upwardly and forwardly toward the metatarsal head area, comprising:

a bladder having an upper wall, a lower wall spaced from said upper wall and peripheral wall joining said upper and lower walls, including a medial side wall and a lateral side wall connected by a front wall and merging into a curvilinear rear wall, said walls defining a sealed space therebetween;

an interior control wall between said upper and lower walls and extending diagonally generally toward said medial and lateral sidewalls, dividing said space into a front heel chamber and a rear heel chamber;

a viscous liquid and gas mixture filling said chambers; at least one of said lower wall and said upper wall being flexible to allow front heel chamber volume expansion under pressure to a volume greater than the at-rest volume thereof;

said interior control wall having restrictive gate means allowing controlled dynamic flow of said viscous liquid between said chambers for controlled flow from said rear heel chamber to said front heel chamber during initial heel strike and to also cause front chamber volume expansion for impact attenuation and cushioning during heel strike, and for return flow from said expanded front heel chamber to said rear heel chamber during foot roll.

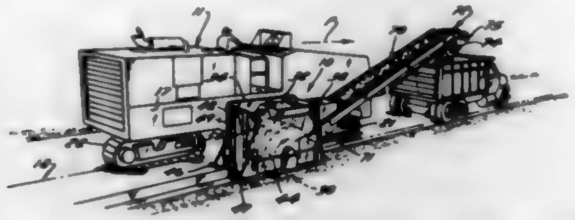
5,315,770
ROADWAY TRENCHING APPARATUS

Thomas R. Campbell, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Dec. 15, 1992, Ser. No. 991,372

Int. Cl.⁵ E02F *5/08*

U.S. Cl. 37—96 **29 Claims**



1. A self propelled apparatus for digging a shallow trench and removing the soil therefrom during movement of the apparatus along the ground surface, and comprising

a chassis defining front and rear ends, and opposite sides, and further defining a longitudinal centerline extending between said front and rear ends,

a plurality of wheel assemblies mounted to said chassis for permitting movement along the ground surface,

a cutter drum mounted to said chassis for rotation about a generally horizontal axis and so as to be adapted to engage and dig into the ground surface and form a trench as the apparatus moves forwardly along the ground surface,

prime mover means mounted to said chassis for advancing the apparatus in a forward direction and for rotating said cutter drum so that the lowermost portion thereof moves in a rearward direction,

conveyor means having an inlet end positioned immediately forwardly of said cutter drum and an elevated outlet end positioned beyond the said front end of the chassis, and

enclosure means enclosing said cutter drum so that the soil which is loosened and removed by the rotating cutter drum is guided about said cutter drum and deposited onto said inlet end of said conveyor means and discharged at said outlet end thereof.

5,315,771
DISCHARGE CHUTE ASSEMBLY FOR SNOWTHROWER

Donald M. White, III, Chanhassen; Thomas K. Bricko, Lakeville, and Richard A. Thorud, Bloomington, all of Minn., assignors to The Toro Company, Bloomington, Minn.

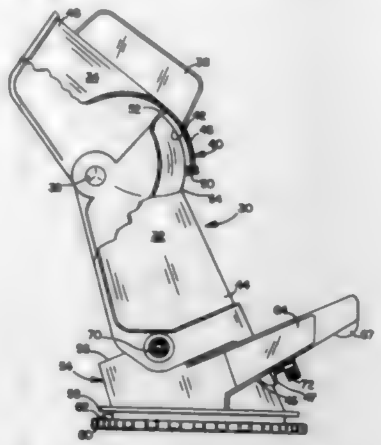
Division of Ser. No. 699,876, May 14, 1991, Pat. No. 5,177,888.

This application Dec. 11, 1992, Ser. No. 989,411

Int. Cl.⁵ E01H *5/08*

U.S. Cl. 37—260 **2 Claims**

1. A discharge chute assembly for a single stage snowthrower of the type having a rotatable impeller mounted within a housing, and having a pair of transversely spaced ground engaging wheels which rotate about an axis, the chute assembly being pivotable about a generally upright axis to adjust the snow throwing direction, and the chute assembly having an upper end and a lower end, wherein the discharge chute assembly comprises a handle located toward the lower end of the discharge chute assembly extending generally upwardly from the lower end of the discharge chute assembly and in a direction opposite from the snow throwing direction, and wherein the handle can be grasped to selectively pivot the discharge chute assembly or lift the snowthrower; the handle comprising (a) a pair of elongate, parallel, transversely spaced side portions each having a fixed end and a free end, the fixed ends of the side portions being connected to the lower end of the discharged chute assembly, wherein the side portions extend in a direction generally opposite from the snow throwing direction, and (b) a transverse portion connected to and extending between the free ends of the handle side portions; wherein: (i) the transverse portion of the handle has a generally inverted U-shaped cross-section having an upper wall spanning between and over a front wall and a rear wall, and the transverse portion walls are interconnected by a tab which underlies the upper wall and spans between the front and rear walls, the tab serving to reduce the weight and increase the rigidity of the handle; and (ii) the transverse portion of the handle is located just forward of an imaginary vertical plane passing through the axis of the snowthrower wheels.



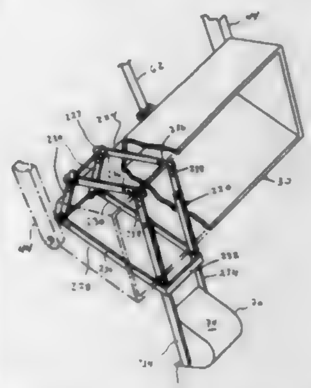
5,315,772
FARM TRACTOR WITH BACKHOE BUCKET

Nelson Lalonde, S.S. #3, Site 10, Comp. 11, Penetanguishene, Ontario, Canada L0K 1P0

Filed Dec. 16, 1992, Ser. No. 991,004

Int. Cl.⁵ E02F *5/02*

U.S. Cl. 37—379 **22 Claims**



11. A tractor having a front-end loader of the type being pivotable about an axis extending transversely across the front of the tractor and capable of being raised and lowered with respect to the tractor, the front-end loader having a back wall and a forward-facing opening defined by at least a bottom wall with a peripheral bottom edge and a top wall with a peripheral top edge, the peripheral bottom edge and the peripheral top edge having a distance therebetween, the tractor further comprising a backhoe apparatus secured to the front-end loader, the backhoe apparatus comprising: (i) a backhoe bucket with an opening for excavating and receiving materials; (ii) an elongate rigid support means having a length greater than the distance between the peripheral top edge and the peripheral bottom edge of the front-end loader, the support means having an end attached to the backhoe bucket; and (iii) means for releasably securing the support means to the front-end loader without modifying the front-end loader, with the support means bearing directly against the top and bottom peripheral edges of the front-end loader, and with the backhoe bucket opening facing rearwardly of the opening of the front-end loader and extending below the bottom wall of the front-end loader the securing means comprising a plurality of rigid rail members joined end to end and having two free ends, the rail members extending about the top, back and bottom walls of the front-end loader, the first free end connected to the support means near the top peripheral edge of the front-end loader and the second free end connected to the support means near the bottom peripheral edge of the front-end loader, to secure the support means to the front-end loader.

5,315,773
IRON RETRACTABLE IN STAND INCLUDING POWER AND WATER REGULATION THEREBETWEEN

Kenichi Iwami, Kobe; Kazuhisa Kawasaki, Kyoto, and Seiichi Nakada, Sanda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

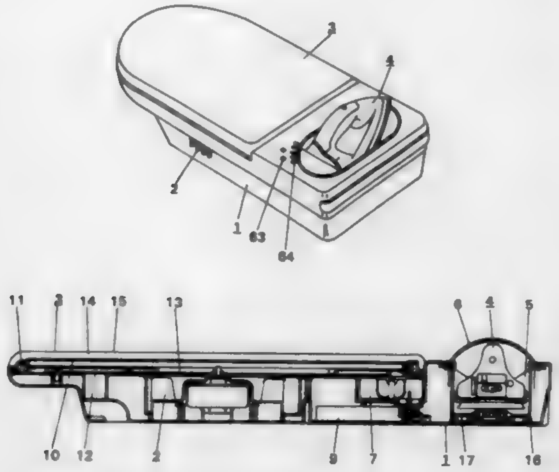
Continuation of Ser. No. 809,904, Dec. 18, 1991, abandoned.

This application Mar. 22, 1993, Ser. No. 34,632

Claims priority, application Japan, Dec. 26, 1990, 2-406508; Jun. 3, 1991, 3-131364; Aug. 20, 1991, 3-207863

Int. Cl.⁵ D06F *75/12, 75/28;* **H04B** *3/06*

U.S. Cl. 38—77.6 **19 Claims**



1. An ironing apparatus, comprising:

an ironing head,

an ironing head rest for placement of the ironing head thereon,

an electrical connection for supplying an electric current to the ironing head when said ironing head is placed on the ironing head rest,

a main tank for containing water,

a water supply unit for supplying water from the main tank to the ironing head,

a control means for controlling the water supply unit,

a load detection means for detecting the placement of the ironing head on the ironing head rest, wherein the control means causes the water supply unit to supply water to the ironing head when said load detection means detects the placement of the ironing head on the ironing head rest, and

wherein the ironing head comprises:

a sub-tank for holding the water supplied to the ironing head,

a water volume detection means for detecting an amount of the water in the sub-tank, and

said control means comprising means for deactivating said water supply unit in response to an output provided from the water volume detection means when the sub-tank is filled with a predetermined amount of the water.

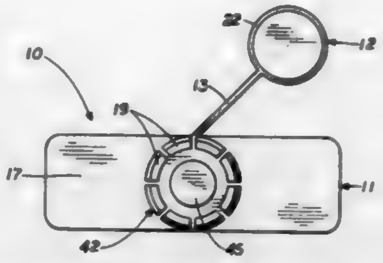
5,315,774
INFORMATION NOTATOR FOR WIRE, CABLE AND CABLE TIES

Conrad L. Chompff, 5524 Sepulveda Ct., Concord, Calif. 94521

Filed Apr. 5, 1991, Ser. No. 680,849

Int. Cl.⁵ G09F *3/16*

U.S. Cl. 40—316 **15 Claims**



10. A notator device for the receipt of information concerning the item or substrate, to which the notator device is attached, which device is both adapted to be mounted directly on wire and cable, and indirectly on wire and cable via cable ties;

wherein said device comprises a first indicia receiving portion comprising a planar member having an upper smooth surface and an engaging section on its lower surface; and a second retainer portion matingly engageable with the engaging section for mounting the device on a substrate and

wherein the retainer portion comprises a cup-like section having a circular base and a pair of spaced mirror image opposed vertical arcuate segments upstanding from said base, each of which arcuate segments includes a detent, and said detent is pentagonally configured and disposed along the upper periphery of the segment.

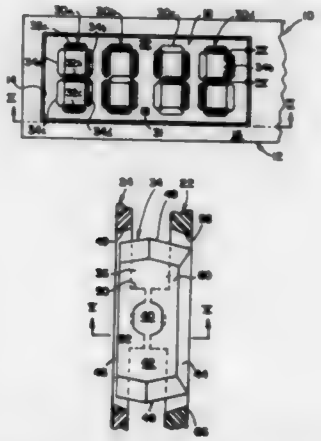
5,315,775
DIGITAL SIGN

Thomas F. Parker, Grand Haven; Daniel J. Yenglin, Spring Lake, and Bruce A. Anderson, Grand Haven, all of Mich., assignors to Thomas F. Parker & Associates, Inc., Grand Haven, Mich.

Filed Apr. 6, 1992, Ser. No. 864,359

Int. Cl.⁵ G09F *9/00*

U.S. Cl. 40—450 **22 Claims**



9. A sign for displaying a plurality of characters, each of said characters formed of a plurality of line segments, each of said line segments comprising a character element pivotably carried on a panel assembly having a front viewable surface, each character element having a first surface of an appearance contrasting with an appearance of said front viewable surface and a second surface of an appearance noncontrasting with the

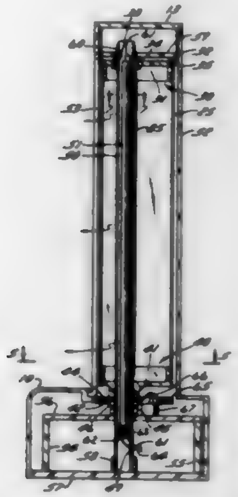
appearance of said front viewable surface, wherein said panel comprises a front panel and a rear panel, said front panel having a plurality of openings formed therethrough, each of said character elements disposed in correspondence with one of said openings and viewable therethrough, said character elements journalled to said front and rear panels to pivot within said openings, whereby said character elements are selectably and individually pivoted to expose either said first surface or said second surface to form said characters.

5,315,776
MULTIPLE-DISPLAY SIGN DEVICE

Jon P. Strawbridge, Glendale, and Mark A. Fredricks, Elm Grove, both of Wis., assignors to Everbrite, Inc., Greenfield, Wis.

Filed Oct. 7, 1992, Ser. No. 957,719
Int. Cl.⁵ G09F *11/02*

U.S. Cl. 40—505 **11 Claims**



1. A device for displaying a plurality of scenes in sequence, comprising:

a first horizontally disposed plate member having a row of equally spaced apart openings, and one end of a tube made out of a light transmitting material releasably inserted in each of the openings such that the tubes are correspondingly spaced apart, having parallel axes and all axes lie in the same vertical plane,

an elongated light source in each said tube,

display units for rotating on the respective tubes, each of the display units comprising three thin transparency panels constituting a triangular prism having opposite open ends, a pair of adapter elements each having three corresponding sides arranged in triangular configuration for fitting into said opposite open ends of the triangular prism, the adapter elements having an opening to provide for the display units to rotate on the respective tubes, each of the transparency panels in a display unit comprising a portion of one of three available scenes,

means for maintaining said transparency panels that represent portions of the same scene in each said triangular prism in fixed rotational angular relationship such that when said panels of the triangular prisms representing portions of the same scene are rotated to contiguous coplanar relationship said scene is composed for visualization,

a second horizontally disposed plate member having openings for fitting, respectively, onto the other ends of said tubes for stabilizing the tubes, and means for supporting the second plate member,

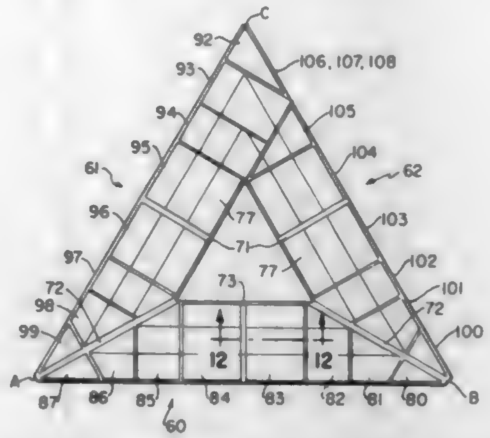
an electric motor and means for coupling said motor to said display units for driving said display units rotationally in synchronism.

5,315,777
HIGHWAY EMERGENCY SAFETY SIGN

John A. Fogelman, West Nyack, N.Y., assignor to The Wise Child Inc., West Nyack, N.Y.

Continuation of Ser. No. 844,722, Mar. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 693,558, Apr. 30, 1991, Pat. No. 5,263,272. This application Jun. 7, 1993, Ser. No. 73,283
Int. Cl.⁵ G09F *21/04*

U.S. Cl. 40—591 **12 Claims**



12. A contourable collapsible triangular highway emergency sign for attachment to a surface of a vehicle, said sign comprising

a first arm, comprising a plurality of spaced apart first arm slats,

a second arm comprising a plurality of spaced apart second arm slats, said second arm being permanently flexibly interconnected with said first arm at one end of said second arm and with a third arm at the other end of said second arm, and

the third arm comprising a plurality of spaced apart third arm slats, said third arm being permanently flexibly interconnected with said second arm at one end of said third arm and removably connected to said first arm at the other end of said third arm to form a triangle,

each of said arms comprising spaced apart triangular shaped slats, rectangular shaped slats and a plurality of quadrilateral slats, at least one of said quadrilateral slats in each of said arms comprising a trapezoid, and

each of said rectangular slats having at least one straight edge generally perpendicular to a second edge of said slat,

at least one flexible hinge on at least one of the straight edges of each of said rectangular slats, said hinge on said straight edge being connected to the straight edge of an adjacent slat and folding along a first axis, with at least one rectangular slat in each of said arms having a flexible hinge on two opposed straight edges of said rectangular slat,

the majority of said slats having a light reflective material on at least one surface,

at least one of said triangular slats in each arm having one hinges on each of at least two different edges of said triangular slat, and each of said trapezoidal slats having hinges on three of the four edges of said trapezoidal slat,

means for attaching said sign to a surface of said vehicle, said means being located on at least one side of at least one of said slats,

said slats and hinges being arranged such that said sign may be folded concurrently on said flexible hinges along multiple axes, with said triangle being collapsible by folding of said arms onto an adjacent one of said arms, and

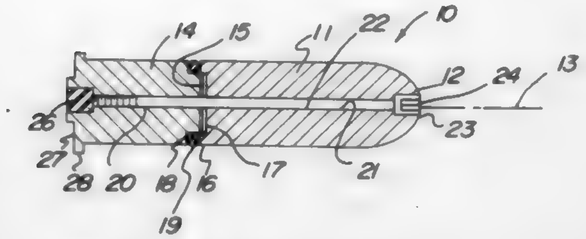
the flexibility of said hinges causing said sign to generally conform to the contours of said surface.

5,315,778
FIREARM CHAMBER PLUG

Craig F. Wolford, Rt. 1, Box 178, Pine Wood, S.C. 29125

Filed Jun. 14, 1993, Ser. No. 75,610
Int. Cl.⁵ F41A *17/44*

U.S. Cl. 42—70.11 **2 Claims**



1. A firearm chamber plug, comprising,

an elongate forward chamber cylinder coaxially aligned with a rear chamber cylinder, wherein the forward chamber cylinder and the rear chamber cylinder are oriented about a predetermined axis, the forward chamber cylinder including a forward cylinder rear face having an annular flange projecting axially beyond the forward cylinder rear face peripherally about the forward cylinder rear face, and

the rear chamber cylinder having a forward hub aligned along said predetermined axis, with an annular seat oriented peripherally about the forward hub, with the annular seat aligned with the annular flange, and

an "O" ring positioned between the annular seat and the annular flange, with the annular flange recessed relative to the forward hub, and

a fastener directed through the forward chamber cylinder and threadedly received within the rear chamber cylinder, having a fastener head oriented within the forward cylinder forward end and the fastener having a fastener shank integral with the fastener head, wherein the fastener shank is directed through the forward cylinder and threadedly received within the rear chamber cylinder, said fastener shank being aligned along said predetermined axis, whereupon rotation of the fastener shank relative to the forward chamber cylinder and rear chamber cylinder effects projecting the rear cylinder forward hub within the annular flange with resultant squeezing of the "O" ring laterally beyond the side walls of the forward chamber cylinder and the rear chamber cylinder for engagement with a firearm chamber, and

the rear chamber cylinder includes a rear cylinder rear face orthogonally oriented relative to the predetermined axis, and a semi-annular lip extending laterally beyond the rear cylinder rear face coplanar therewith, whereupon rotation of the rear chamber cylinder permits engagement of the semi-annular lip with an extractor lever within a gun chamber, with the rear chamber cylinder rear face arranged for positioning in adjacency to a firearm bolt member.

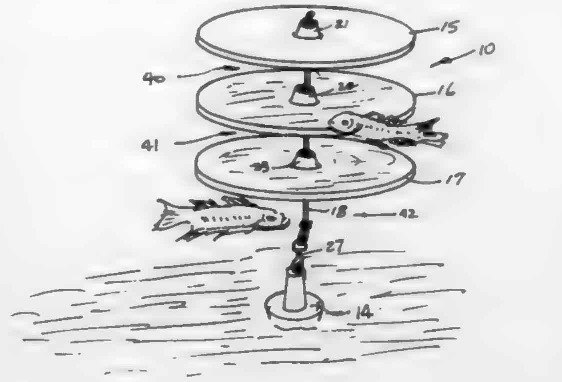
5,315,779
FISH HABITAT

Don L. Fussell, 6209 Windfern, Houston, Tex. 77040

Filed Mar. 11, 1993, Ser. No. 29,537
Int. Cl.⁵ A01K *61/00, 97/00*

U.S. Cl. 43—4 **10 Claims**

1. An artificial aquatic life habitat, comprising: at least one generally circular disc member having a specific gravity of less than one, said member having an aperture in the center thereof and an upper surface surrounding said aperture; a block member arranged to engage a symmetrical portion of said upper surface adjacent said aperture, said block member having a bore formed in the upper end thereof and an opening which is in axial alignment with said aperture in said disc member; a flexible stress member extending through said aperture, said opening and said bore, said stress member having close-fitting relation with said opening and said aperture; and stop means positioned in said bore for preventing upward movement of said block member and said disc member along said stress member, so that flotation forces on said disc underwater cause it to remain in a horizontal position when said stress member is anchored to the bottom of a body of water.

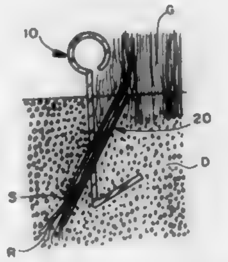


5,315,780
LAWN EDGING MATERIAL ANCHORING ARRANGEMENT

James E. Thomas, 2344 W. Harrison St., Chicago, Ill. 60612

Filed Jul. 21, 1992, Ser. No. 916,280
Int. Cl.⁵ A01G *1/00*

U.S. Cl. 47—33 **20 Claims**



1. An anchoring arrangement, for molded plastic lawn edging material, of the type commonly used for defining borders of lawns and gardens, that is adapted to hold plant seeds, so that when such plants mature their roots will extend into the ground and help anchor the edging material, said arrangement comprising, in combination:

(a) a relatively thin, flat, vertically disposed wall member having an upper portion, including an integral reinforcing rail adapted to be positioned above ground level, and having a lower portion adapted to be positioned below ground level;

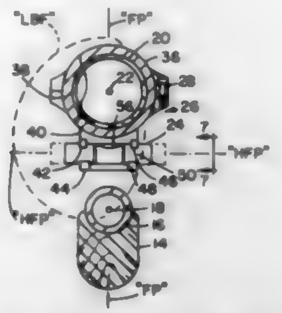
(b) a relatively thin, flat, flange member formed integrally with said wall member lower portion and disposed to project laterally outward from said wall member;

(c) a plurality of longitudinally spaced, elongated, hollow, plant seed holding tubes disposed to extend in a generally vertical direction through at least one of said members;

(d) each of said seed holding tubes having:
  (i) an open upper end adapted to be positioned above ground level to receive plant seeds inserted therein;
  (ii) an open lower end adapted to be positioned below ground level to allow roots of plants to pass from the tube into the ground, as the seeds germanate and the plants mature, whereby plant roots serve to anchor the edging material in the ground.

5,315,781
ATTITUDE ORIENTATION DEVICE FOR SCOPE CARRYING FIREARMS

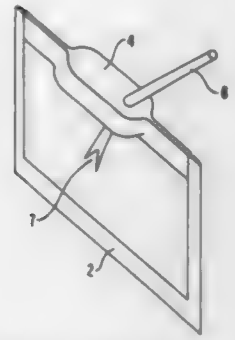
David A. Beisner, 3903 Courtland Cir., Alexandria, Va. 22305
Filed May 5, 1992, Ser. No. 878,457
Int. Cl.^{5} F41G *1/387*
U.S. Cl. 42—101 **11 Claims**



1. A firearm having attitude indicator means, said firearm comprising barrel means having a shooting axis, and scope means positioned above said barrel means and having a sighting axis, said scope means having an eyepiece, said shooting axis and said sighting axis lying in a common plane constituting a firearm plane of said firearm, the arrangement of said shooting axis and sighting axis within said firearm plane providing a binocular field extending below and laterally to each side of said scope means, said binocular field being viewable only with the eye not being used for sighting through the eyepiece of said scope means, and wherein, for proper sighting, said firearm plane must be substantially vertically oriented, said attitude indicator means comprising bubble level means adapted to indicate the attitude of said firearm plane with respect to the horizontal, support means for said level means, and attachment means for mounting said support means on said scope means with said level means lying exteriorly to said scope means and forwardly of said eyepiece thereof and within said binocular field.

5,315,782
SUPPORT DEVICE FOR SUPPORTING PLANTS

William M. Barclay, R.D. 3 Drury, Auckland, and Peter W. F. Stenhouse, 103 Portland Road, Remuera, Auckland, both of New Zealand
Continuation of Ser. No. 766,971, Sep. 26, 1991, abandoned, which is a continuation of Ser. No. 434,560, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 97,642, Sep. 16, 1987, abandoned. This application Oct. 16, 1992, Ser. No. 962,050
Claims priority, application New Zealand, Sep. 16, 1983, 217595
Int. Cl.^{5} A47G *7/07;* **A01G** *5/06*
U.S. Cl. 47—41.12 **8 Claims**



1. A support device for plants, comprising:

a pouch forming a space and having two wall portions, said wall portions being made of a flexible material and disposed so as to face each other, each said wall portion having a periphery along which said wall portion is adhered to the other said wall portion such that said wall portions together define said space of said pouch therebetween;

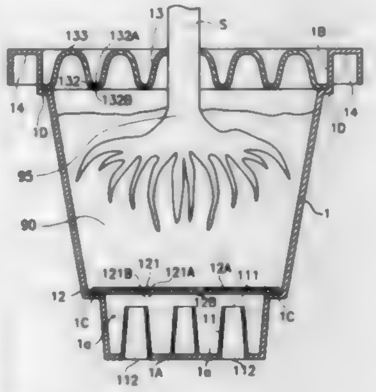
a plant medium contained within said space of said pouch; and

a panel that is rigid relative to said flexible material of said two wall portions and is made of a cellular foam material, said panel being disposed between said two wall portions and adhered to said two wall portions on opposite sides thereof, such that said space between said two wall portions containing said plant medium is enclosed and separated and substantially sealed from the external environment by said panel, said panel being made of a material that is puncturable to form a puncture, yet that enables a plant material inserted through the puncture formed to substantially seal said space in said pouch from the external environment about the plant material;

wherein said pouch, being formed by said two wall portions made of a flexible material, is collapsible so as to collapse as said plant medium is taken up by a plant material.

5,315,783
FLOWERPOT WITH WATER/SOIL SEPARATIVE PLANTING SYSTEM

Luke S. Peng, No. 8-4, Sec. 1, Tai-Shing W. Rd., Tao-Yuan, Taiwan
Filed Jul. 29, 1992, Ser. No. 921,552
Int. Cl.^{5} A01G *25/00*
U.S. Cl. 47—66 **3 Claims**



1. A flowerpot, comprising:

(a) a pot body having an open top, a bottom, and a water reservoir, said water reservoir having an overflow water escape facility, having a water inlet hole at the top of said water reservoir, for allowing any excessive water in said water reservoir to escape therethrough;

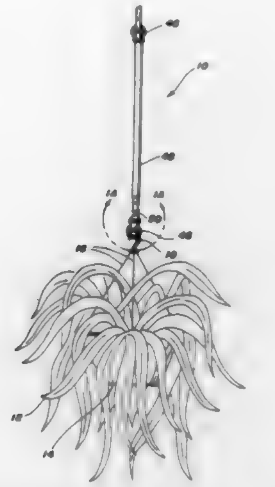
(b) a soil holding section above said water inlet hole of said water reservoir;

(c) a water/soil separation board, which constitutes the bottom of said soil holding section, disposed above said water inlet hole, said water/soil separation board being capable of holding soil thereon but capable of passing water or moisture therethrough; and

(d) a pot cover disposed in the proximity of said open top, said pot cover having a step opening for allowing a stem of a plant to extend therethrough, said pot cover being capable of passing water or moisture therethrough, said pot cover further having a plurality of arcuate protrusions, the lowest points of said pot cover being located between said protrusions, and a plurality of water dropping holes at the lowest points for dropping therethrough any water accumulated on said pot cover into said pot body.

5,315,784
DEVICE FOR ROTATING HANGING PLANT AND INDICATING DRYNESS

William M. Henehan, 2233 Village Green Pkwy., Chesterfield, Mo. 63017
Filed Nov. 9, 1992, Ser. No. 973,623
Int. Cl.^{5} A01G *9/02;* **A47G** *7/02*
U.S. Cl. 47—67 **7 Claims**



1. A device for rotating a hanging plant comprising a first tension spring formed of a tightly twisted resilient cord with a longitudinal coil axis and having a fixed end and a free end that rotates about the coil axis when the first spring is axially loaded, said fixed end attached to a first support for suspension from a ceiling and said free end attached to a second support for suspension of a hanging plant,

a second tension spring formed of a resilient tube counteracting the first spring and coaxial with the first spring but of opposite hand, said first end of the second spring attached to the first support and said second end of the second spring attached to the second support, said first spring and said second spring formed of material such that the second spring is twisted around the coil axis by the first spring when the springs are axially loaded and said first spring is twisted about the coil axis in an opposite direction by the second spring when the springs are axially unloaded thereby rotating the second support.

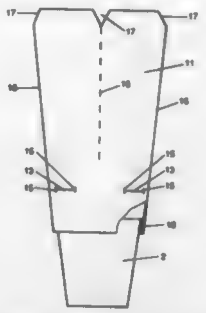
5,315,785
WRAPPING FOR PLANTS OR FLOWERS PLACED IN A POT LIKE CONTAINER

Bernardus J. M. M. Avôt, Puccinistraat 57, 2551 LK Den Haag, and Anna P. M. van der Meer-van der Helm, Osdorperweg 951 A, 1067 SW Amsterdam, both of Netherlands
Filed Nov. 26, 1991, Ser. No. 798,315
Claims priority, application Netherlands, Nov. 26, 1990, 9002569
Int. Cl.^{5} B65D *85/52*
U.S. Cl. 47—72 **14 Claims**

1. A wrapping for plants or flowers placed in a pot like container having an upper edge, said wrapping being made from a resilient material of natural rigidity and comprising:

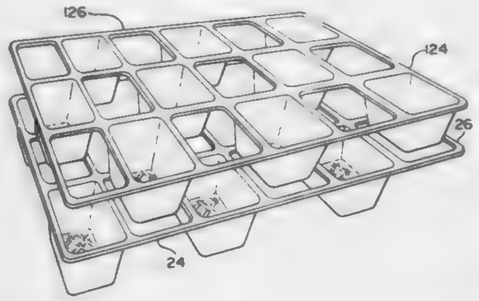
a frustoconical tubular element having a central axis, an open tube end of smaller diameter and an open tube end of larger diameter, said tube end of smaller diameter having a terminal portion; and

retaining means on said terminal portion for said pot like container comprising at least one local cut extending in a substantially circumferential direction along a part of said tubular element and disposed in a plane substantially perpendicular to said central axis, edges on said tubular element on sides of said at least one local cut acing each other, and a stop shoulder on an edge at a side of said at least one local cut closer to said larger diameter tube end, said stop shoulder defining a free internal passage in said tubular element smaller than a free internal passage defined by an adjacent portion of said tubular element on a side of said at least one local cut closer to said smaller diameter tube end so that said stop shoulder is engageable with said upper edge of said pot like container when said container is inserted in said wrapping in use.



5,315,786
PLANTING TRAY

Thomas Smith, 1015 Indian Trail, Carleton, Mich. 48117, and John P. Darin, 3905 La Playa La., Orchard Lake, Mich. 48234
Filed May 14, 1992, Ser. No. 882,913
Int. Cl.^{5} A01G *23/02*
U.S. Cl. 47—74 **10 Claims**



1. A tray for germinating seeds and starting young plants, the tray and plants being directly plantable in the ground, the tray comprising:

(a) a flat member having a plurality of openings formed therein, the openings being formed in a matrix having a first coordinate and a second coordinate; and

(b) a plurality of baskets having at least one side wall and a bottom cooperating to define an open interior, the baskets being formed with the flat member such that one opening of the flat member is in communication with the interior of one basket, each basket having a plurality of perforations formed therein to allow roots of the plant to grow therethrough, the baskets being formed to the flat member such that no two baskets are formed in communication with two openings adjacent in either coordinate of the matrix.

5,315,787
APPARATUS FOR AUTOMATIC FEEDING OF CONTAINER PLANTS

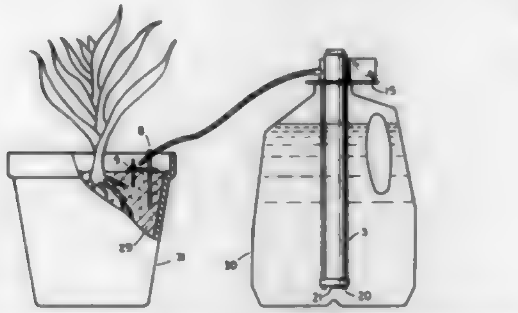
Israel D. Schleicher, 10901 Bahia Ct., Bakersfield, Calif. 93311, and Yaacov Schleicher, 2701 S. Fairview St. #P-3, Santa Ana, Calif. 92704
Filed Aug. 3, 1992, Ser. No. 924,158
Int. Cl.^{5} A01G *25/00*
U.S. Cl. 47—79 **2 Claims**

1. An add-on apparatus for automatically feeding plants in a

plant container filled with growing medium, with liquid nutrient from a nutrient container, said apparatus comprising: an electric motor coupled to a pump by an elongated drive shaft, said pump and drive shaft adapted for immersion in a nutrient container with said motor adapted to be mounted on said container above the nutrient level of said container,

a flexible tube coupled to said pump and adapted to extend from said pump to a plant container provided at a location remote from said nutrient container, said flexible tube including an anti-siphon valve adapted to be positioned above the nutrient level of said container,

an electronic control circuit, said circuit including a first sensor adapted to be at least partially buried in said growing medium and capable of generating a signal indicative of the need for feeding, said circuit capable of activating said pump for a predetermined time period responsive to a signal from said first sensor, said time period being adjustable for different sized plant containers by an adjustment means in said electronic control circuit.



5,315,788

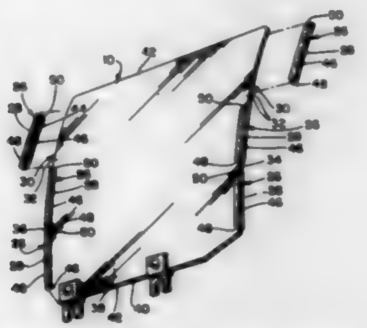
LOW FRICTION TAPE FOR MOVABLE VEHICLE GLASS

Kenneth Bensinger, Mt. Clemens, and Edward Rycamber, Milford, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 16, 1993, Ser. No. 77,141

Int. Cl.⁵ E05D *15/06;* E06B *3/00*

U.S. Cl. 49—404 **5 Claims**



1. In a vehicle door having a stationary frame portion for supporting and guiding a movable vehicle door glass with said frame portion having a housing, a glass run channel being housed in said housing, and said movable vehicle door glass slidably engaging said glass run channel within said frame portion, an improvement comprising:

a low friction tape being adhesively connected to portions of said movable vehicle door glass to isolate said movable vehicle door glass from said glass run channel and provide a low friction surface for engaging said glass run channel to prohibit the generation of glass chatter and noise created by the sliding engagement of said movable vehicle door glass within said glass run channel.

5,315,789

NUMERICALLY CONTROLLED MACHINE TOOL AND METHOD OF CONTROLLING GRINDING OPERATION THEREOF

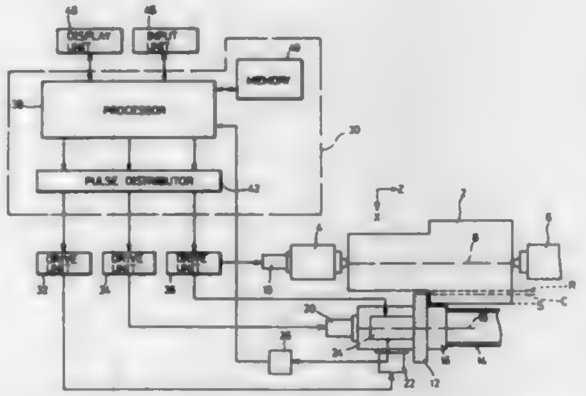
Kunugi Takashi, Numazu, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 235,223, Aug. 23, 1988, abandoned. This application Oct. 2, 1991, Ser. No. 769,346

Claims priority, application Japan, Aug. 24, 1987, 62-210652; Aug. 24, 1987, 62-210653; Sep. 22, 1987, 62-239778; Sep. 22, 1987, 62-239779; Sep. 22, 1987, 62-239780; Sep. 22, 1987, 62-239781; Sep. 22, 1987, 62-239782; Sep. 24, 1987, 62-241996

Int. Cl.⁵ B24B *49/00*

U.S. Cl. 51—165.71 **11 Claims**



1. A numerically controlled machine tool for grinding a workpiece into a desired shape by rotating the workpiece about its own axis at a prescribed speed, and moving a grinding tool in radial and axial directions of the workpiece, said machine tool comprising:

first drive means for moving the grinding tool in the radial direction of the workpiece;

second drive means for moving the grinding tool in the axial direction of the workpiece;

input means for inputting roll shape data, wherein said roll shape data includes (i) a roll number for identifying said roll shape data; (ii) a roll shape composed of a plurality of parameter curves; and (iii) parameters for said curves;

point group data calculating means for calculating point group data for said curves according to prescribed formulas;

memory means for storing said roll shape data for a plurality of desired shapes and their corresponding point group data;

control means, responsive to a selection of a desired shape for controlling the operation of said first and second drive means in accordance with said point group data of said selected desire shape to grind the workpiece to the desired shape.

5,315,790

GEAR TOOTH TOPOLOGICAL MODIFICATION

Jules G. Kish, Milford, and Charles Isabelle, Winsted, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 30, 1992, Ser. No. 998,483

Int. Cl.⁵ B24B *1/00;* B23F *19/05;* F16H *1/06*

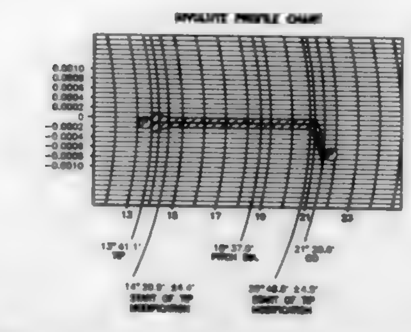
U.S. Cl. 51—165.71 **11 Claims**

6. A method for forming a topologically modified parallel axis gear, said method comprising the steps of:

a) performing a finite element analysis of a gear train which includes said gear, said analysis being performed at a predetermined gear train operating load to calculate tangential and radial load-induced gear tooth deflections which produce gear tooth deviations from theoretical true involute under said predetermined operating load;

b) producing a topological map of the gear tooth surfaces under load from the results of said finite element analysis;

c) determining a gear tooth grinding wheel path of motion which will produce a gear tooth topology on said gear that is equal and opposite to said topological map; and



d) grinding said gear by moving a grinding wheel along said path of motion whereby the resultant gear will possess a tooth topology which is equal and opposite to said topological map so that the gear teeth will assume the theoretical true involute configuration when the gear is subjected to said predetermined operating load.

5,315,791

STEEL BALL MACHINING APPARATUS CAPABLE OF ELIMINATING FOREIGN MATTER

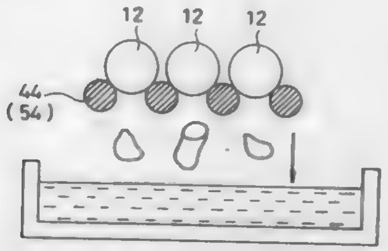
Tatsuo Iwai, and Isao Fujiwara, both of Nara, Japan, assignors to Tsubakimoto Precision Products Co., Ltd., Osaka, Japan

Filed Jun. 16, 1992, Ser. No. 899,542

Claims priority, application Japan, Jun. 18, 1991, 3-171852

Int. Cl.⁵ B24B *11/04*

U.S. Cl. 51—215 M **2 Claims**



1. A steel ball machining apparatus comprising:

a machining mechanism having a pair of machining plates which are adapted to oppose and rotate relative to each other, the machining plates being spaced from each other by a distance such that they are able to effect machining of steel balls of a particular diameter;

a steel ball storing vessel for supplying to and receiving from said machining mechanism steel balls;

a steel ball supply path provided between said machining mechanism and said steel ball storing vessel;

a steel ball discharge path provided between said machining mechanism and said steel ball storing vessel adapted to discharge said steel balls to said vessel; and

means for separating foreign matter from the balls and preventing foreign matter from being circulated with the balls to the machining mechanism, said separating means comprising a set of parallel bars provided in at least one of said steel ball supply path and steel ball discharge path, each of the parallel bars in said set being spaced from each adjacent parallel bar in the set by a distance slightly smaller than said diameter of the balls, whereby foreign matter associated with the machined balls will fall downwardly between the bars as the balls roll on the bars.

5,315,792

METHOD FOR PRODUCING SEALING FACES ON VALVES

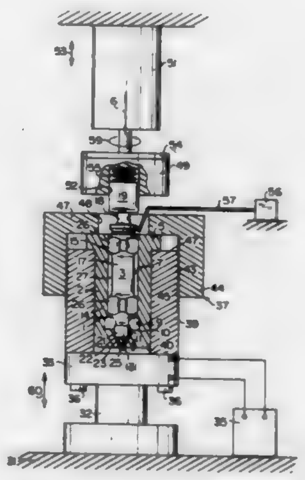
Siegfried Schweizer, Bamberg, and Werner Sefz, Oberaurach-Trossenfurt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 394,035, Aug. 15, 1989, abandoned. This application Sep. 28, 1992, Ser. No. 952,199

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3828987; Jul. 28, 1989, 3925043

Int. Cl.⁵ B24B *15/04*

U.S. Cl. 51—317 **7 Claims**



1. A method for producing sealing faces of high surface quality on complementary valve seats and valve faces to be used together in a fuel injection valve for internal combustion engines, having at least one sealing seat provided on at least one movable valve element and having at least one complementary valve seat face embodied on at least one valve seat body, which comprises directing said at least one sealing seat of said at least one movable valve element into contact with said at least one valve seat face, placing said at least one valve seat body into a holder unit (37) for receiving and fixedly holding said at least one valve seat body, setting one of said at least one movable valve element and said at least one valve seat body into a constant rotational motion in only one direction relative to one another about an axis of rotation (6), delivering a slurried, fine-grained lapping medium to said at least one valve seat face, connecting a high frequency generator (35) electrically to a vibration generator which engages said holder unit (37) to produce an ultrasonic range high frequency vibrational motion (60) which acts parallel to the axis of rotation (6) and which is transmitted via said holder unit (37) to said at least one valve seat body (2) and to said at least one movable valve element (3) via said at least one valve seat body.

5,315,793

SYSTEM FOR PRECISION CLEANING BY JET SPRAY

Ronald V. Peterson, Thousand Oaks, and Wilfried Krone-Schmidt, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 1, 1991, Ser. No. 769,894

Int. Cl.⁵ B24C *3/12, 1/00*

U.S. Cl. 51—415 **17 Claims**

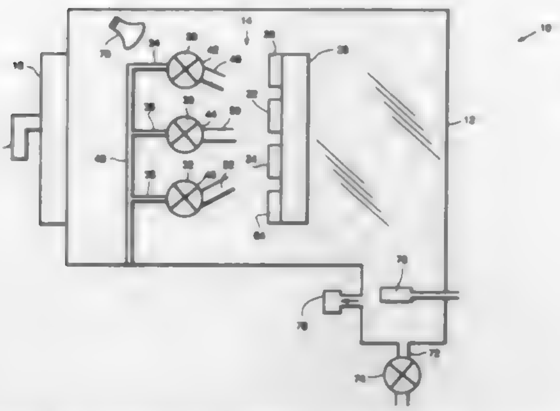
1. A system for precision cleaning of contaminants from a surface of a substrate comprising:

a cleaning container having walls which define an enclosed cleaning zone;

at least one jet spray device located within said enclosed cleaning zone and having an inlet and an outlet;

means for producing a stream of cleaning snow comprising a stream of gas entraining ice particles of said gas, wherein

said stream is emitted from the outlet of said jet spray device;
a stage located within said enclosed cleaning zone, for holding said substrate during precision cleaning thereof;
means for directing said stream of snow from said outlet of said jet spray device onto said surface of said substrate to remove said contaminants from said surface;



means for removing contaminants and cleaning snow from said cleaning zone; and
means for monitoring the extent of cleaning of contaminants from said surface during said cleaning process, said means for monitoring comprising means for detecting the amount of said contaminants exiting said cleaning zone.

5,315,794

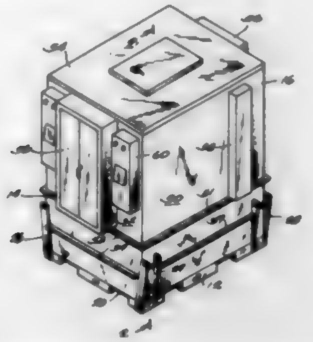
ENCLOSURE FOR TELECOMMUNICATIONS EQUIPMENT

Gordon I. Pearson, Hernando, Fla., assignor to Professional Systems, Inc., Waukesha, Wis.

Filed Oct. 30, 1992, Ser. No. 969,110

Int. Cl.^{5} E04H *1/00*

U.S. Cl. 52—79.1 **6 Claims**



1. A modular structure for housing communication equipment comprising
a lower framework having four sides and a bottom for placement in an excavation in the earth, said framework having four sides and a bottom for placement in an excavation in the earth, said framework having a plurality of upright frame members affixed to opposite sides thereof,
said upright members being provided with means for engagement with a means for lifting said framework, whereby said framework can be lifted off of the ground,
a basement module dimensioned for placement in a nesting relationship on said framework and between said upright frame members to form a lower enclosure, and,
a mating upper module having at least one door therein for access to the interior thereof and having means at its lower perimeter for engagement with the top said basement module,
said upper and basement modules being adapted, when interconnected, to provide a weatherproof enclosure.

5,315,795

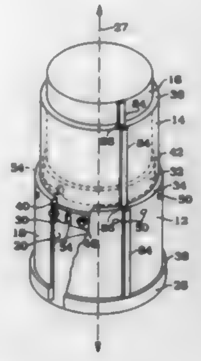
DEPLOYABLE/RETRACTABLE TELESCOPING MAST ASSEMBLY AND METHOD

Daniel S. H. Chae, Goleta; David J. Rohweller, Ojai, and Mark W. Thomson, Ventura, all of Calif., assignors to Astro Aerospace Corporation, Carpinteria, Calif.

Filed Apr. 1, 1992, Ser. No. 862,009

Int. Cl.^{5} B66C *23/06*

U.S. Cl. 52—113 **29 Claims**



1. A mast assembly comprising:
a plurality of tubular sections of mutually different outer diameters arrangeable one inside another and sequentially movable in a telescoping manner between a retracted state and a deployed state, each tubular section having first and second ends, the tubular sections defining a variable mast length from the first end of the smallest diameter tubular section to the second end of the largest end of the tubular section, the mast length being greater in the deployed state than in the retracted state;
at least one guide member provided on one of the tubular sections;
at least one guide slot provided on another one of said tubular sections and arranged to engage the at least one guide member on said one tubular section as the tubular sections are moved between retracted and deployed states; and
at least one retractable member having a retracted state and an extended state, the at least one retractable member being coupled to at least one tubular section;
wherein at least one tubular section adjacent each tubular section having the at least one retractable member coupled thereto is provided with at least one receptacle for receiving a portion of the retractable member, the at least one receptacle having a dimension suitable for receiving the retractable member when the retractable member is in its extended state;
wherein each receptacle receives an extended retractable member upon the tubular sections being arranged in the deployed state.

5,315,796

PROTECTIVE SLEEVE FOR POSTS IN POST FRAME CONSTRUCTION

David Gruhlke, 26740 Hwy. 169, Zimmerman, Minn. 55398

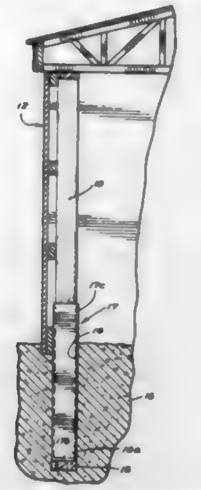
Filed May 21, 1993, Ser. No. 64,210

Int. Cl.^{5} E02D *31/02, 31/06*

U.S. Cl. 52—170 **1 Claim**

1. A barrier against the adverse effects of ground contact on the ground insert portion of a sheltered post to support a frame structure comprising,
a sleeve receiving therein the lower ground insert portion of a sheltered post,
a bottom wall of said sleeve retaining said post therein,

said sleeve being formed of a dense synthetic material impervious to the adverse effects resulting from ground contact,
said material having a long lasting serviceable existence,
said sleeve having a rectangular cross-sectional dimension compatible with that of a post extended therein providing a close contact sliding fit its full height with the walls of the post therein,



a vent v-shaped in cross section extending the full height of said sleeve being open at the top thereof to provide transverse expansion to accommodate a snug fitting post and to provide for the escape of air underlying the bottom of said post, and
said sleeve having a uniform side wall and thickness throughout the full extent thereof.

5,315,797

CONVECTIVE GAS-FLOW INHIBITORS

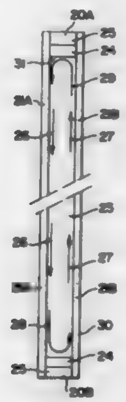
Michael Glover, and Gerhard Reichert, both of Ottawa, Canada, assignors to Lauren Manufacturing Company, New Philadelphia, Ohio

Continuation-in-part of Ser. No. 515,080, Apr. 26, 1990, Pat. No. 5,119,608. This application Oct. 15, 1991, Ser. No. 791,736

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.^{5} E06B *3/24*

U.S. Cl. 52—171.3 **18 Claims**



1. In a sealed, multiple-pane glazing unit having top and bottom edges and two sides and comprising at least two parallel glazing sheets enclosing at least one vertical cavity, the improvement comprising at least one convective-flow barrier positioned spaced above the bottom edge of the glazing unit within the cavity and separating a minor part at the cavity lower end from the remainder of the cavity to effectively prevent gas flow therebetween, said barrier comprising a strip, the edges of which are in substantial sealing contact at cold temperature conditions with both glazing sheets, said strip having flexing means to provide for changes in its effective width whereby to permit said strip to accommodate variations in the width of said vertical cavity while maintaining an effective seal between the sheets, throughout the length of said barrier.

5,315,798

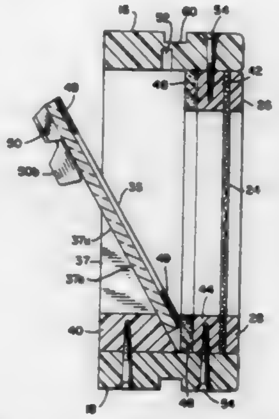
COMBINED WINDOW AND VENT UNIT

Daniel W. Zarwell, 1296 N. 64th St., Wauwatosa, Wis. 53213

Filed Jan. 5, 1993, Ser. No. 849

Int. Cl.^{5} E06B *3/32;* **E05D** *1/06*

U.S. Cl. 52—202 **7 Claims**



1. A combined window and vent unit comprising:
a first frame structure including top and bottom wall and side wall portions;
a second frame structure positioned inside the first frame;
combined angular guide and support surfaces positioned adjacent the side wall portions and sloping downwardly toward the bottom wall, said guide surfaces terminating in a preselected distance from the second frame;
a window panel member freely carried by the first frame structure and between the angular guide surfaces and the second frame structure; and
insulative means connected to at least one of the panel member and the second frame structure;
whereby the angular guide surfaces provide support for the panel member when in a venting position and a compressive hinging action between the insulative means of the panel member and the second frame structure when in a closed position.

5,315,799

MUTLI-PANEL MOLDING ASSEMBLY FOR A BUILDING

James E. Cullinan, 2737 Welsford Rd., Columbus, Ohio 43221

Filed Dec. 8, 1992, Ser. No. 986,722

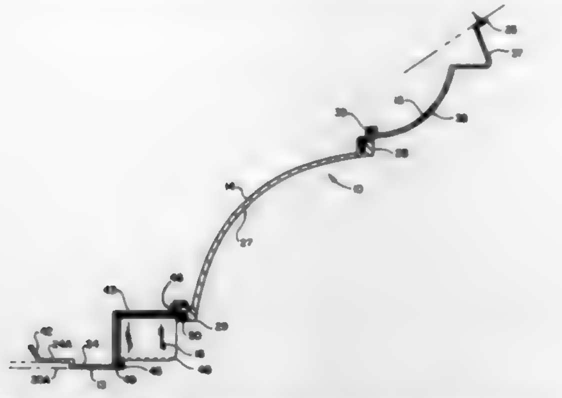
Int. Cl.^{5} E04B *1/00, 5/00, 7/00*

U.S. Cl. 52—288.1 **10 Claims**

1. An axially elongated molding assembly exposed to view and adapted to be mounted on at least one supporting member disposed on a building, said molding assembly comprising:
(a) at least two axially extending unitary panels, one of said panels being adapted to be mounted on the supporting member and having (i) an axially extending marginal portion formed with a first coupling member and (ii) a first axially extending insert-receiving opening spaced from the first coupling member, the other of said panels having (i) an axially extending marginal portion formed with a second coupling member, and (ii) a transverse web portion;
(b) means for securing the first coupling member of said one

panel to the second coupling member of said other panel, with the transverse web portion of said other panel projecting away from said one panel; and

(c) an axially elongated decorative insert having an axially extending panel-engaging portion adapted to be mounted in the first axially extending insert-receiving opening on said one panel, said decorative insert being disposed in overlying relation to at least said one panel, said transverse web portion of said other panel being exposed to view.



5,315,800

ANCHORING ROD FOR ANCHORING AN ARTICLE TO A BASE USING A SYNTHETIC RESIN

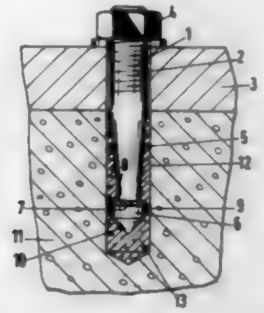
Wilfried Weber, Schopfloch-Unteriflingen; Rainer Mallee, Waldachtal 3/Tumlingen; Bernd Hein, Schönmünzach; Burkhard Mayer, Herrenberg-Gülstein; Harald Güth, Waldachtal, and Manfred Haage, Dornstetten-Aach, all of Fed. Rep. of Germany, assignors to fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Jun. 29, 1992, Ser. No. 905,905

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1991, 4121620

Int. Cl.⁵ F16B *13/14;* **E04B** *1/38*

U.S. Cl. 52—309.1 **11 Claims**



1. An anchoring rod for anchoring an article to a base using a compounded mass including a synthetic resin, the anchoring rod having a rear end and a front end and comprising a threaded portion at the rear end thereof for fixing the article; a head at the front end, the head having a shoulder facing toward the rear end; a conical portion connecting the head and the threaded portion and tapering toward the head; and a resilient annular washer bearing on the shoulder of the head.

5,315,801

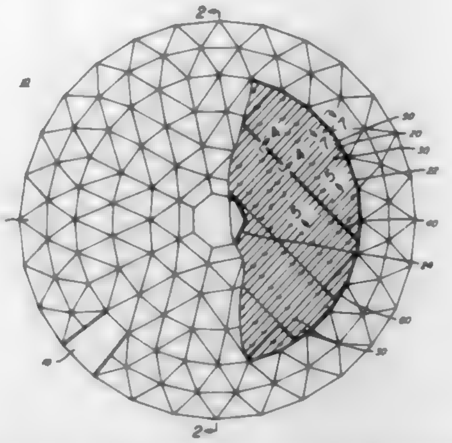
TRIANGULATED FRAME SUPPORTED FLAT COVER

Richard F. Anderson, Houston, Tex.; Robert L. Ferry, Hillsborough, and John R. Kissell, Durham, both of N.C., assignors to Conservatek Industries, Inc., Conroe, Tex.

Continuation-in-part of Ser. No. 591,395, Oct. 1, 1990, Pat. No. 5,079,887. This application Jun. 4, 1991, Ser. No. 710,159

Int. Cl.⁵ E04B *9/18*

U.S. Cl. 52—63 **9 Claims**



1. An apparatus to be used over a vessel for containing the volume within the vessel into which gases may permeate, comprising:

a self-supporting, open air framework connected to and clear-spanning the vessel;

a cover for sealing over the vessel to contain the volume of the vessel comprising a deck supported over the vessel and edge sealing means connected to an edge of said deck and to an adjacent structure for sealing off an area located between the edge of said deck and the adjacent structure comprising a non-permeable flexible fabric having one end sealingly fixed to the edge of said deck and another end sealingly fixed to the adjacent structure; and

a means for suspending said cover from said framework.

5,315,802

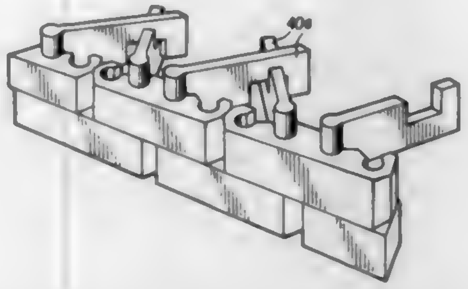
MODULAR WALL SYSTEM

Thomas W. Hart, Hickory, N.C., assignor to Solite Corporation, Richmond, Va.

Filed Mar. 25, 1992, Ser. No. 857,268

Int. Cl.⁵ E04B *5/04*

U.S. Cl. 52—607 **22 Claims**



1. A masonry construction block assembly unit comprising a block member having an outer face, upper and lower substantially parallel planar bearing surfaces, end walls and a rear wall, said block member having a plurality of spaced bores extending vertically therethrough, each of said bores having an access opening through said rear wall, the diameter of each bore exceeding the width of its access opening, each said bore having a lateral axis substantially parallel to the plane of the bearing surfaces of the block member and extending centrally of the bore and its access opening, said block member having first and second bores and access openings at its remote ends whose respective lateral axes converge generally toward each other, said block member having third and fourth intermediate bores in spaced relation and adjacent to said first and second bores, respectively, the lateral axes of said third and fourth bores diverging generally away from the center of the block member, and said first second, third and fourth bores including portions lying substantially in a common vertical plane.

5,315,803

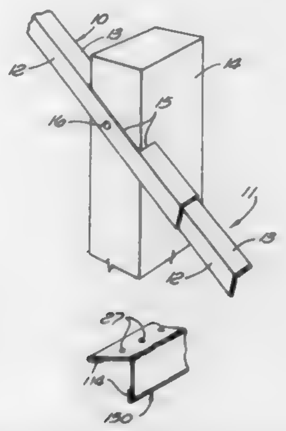
FRAME BRACE

Arthur R. Turner, Terranora, Australia, assignor to Saf-T Corp., Pasadena, Calif.

Continuation-in-part of Ser. No. 479,198, Feb. 13, 1990, which is a continuation of Ser. No. 021,921, Mar. 5, 1987. This application Aug. 30, 1990, Ser. No. 575,225

Int. Cl.⁵ E04C *3/292*

U.S. Cl. 52—720 **45 Claims**



1. A wood frame construction brace comprising:

an elongated rigid strip having first and second sections that are bent about a longitudinal axis of said strip such that said first and second sections are at an angle with respect to each other, each section terminating in a folded portion which is folded through an angle of approximately 180 degrees so as to be adjacent an adjacent unfolded portion of said strip, at least the edge of said folded portion being immediately adjacent to said unfolded portion along the entire length of said strip so as to reduce the chance of cutting a person coming into contact with the frame brace because of the absence of exposed sharp edges along its length, said strip having a thickness such that a nail may be easily driven through said strip, said brace having a plurality of nail access locations in said unfolded portion of said brace that is not in contact with said folded portion of said brace.

5,315,804

METAL FRAMING MEMBER

Anthony P. Attalla, Amherst, N.H., assignor to Hexa-Port International Ltd., Bedford, N.H.

Filed Sep. 18, 1992, Ser. No. 947,495

Int. Cl.⁵ E04C *3/16*

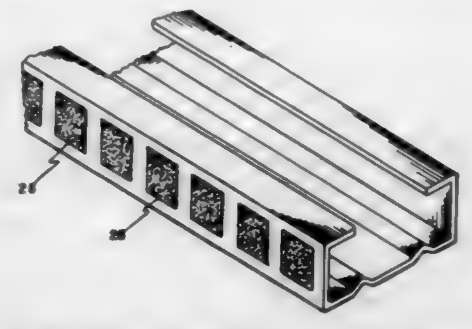
U.S. Cl. 52—731.1 **6 Claims**

1. A metal framing member for use with self-tapping fasteners comprising:

a rectangular bottom section having an outside surface and having left and right substantially parallel radiused edges along the length of said section;

left and right rectangular side sections, each having a thickness and substantially perpendicular to said bottom section, and having an outside surface and having radiused edges along their respective top and bottom lengths, with the bottom of the left side section attached to the left edge of said bottom section and with the bottom of the right side section attached to the right edge of said bottom section;

left and right rectangular return sections, substantially perpendicular to said side sections, each said return section having a radiused edge along one length and a safety edge along the other length sufficiently rounded to remove any sharpness capable of cutting a user's hand, with the radiused edge of the left return section attached to the top edge of the left side section and with right return section attached to the top edge of the right side section;



left and right embossed sections respectively disposed on the outside surface of said left and right side sections, said embossed sections covering a substantial portion of said sections, said embossed sections comprising a plurality of random spaced indentations having random depths substantially less than the thickness of said left and right side sections, with the depth and density of said indentations adapted to prevent the tips of the self-tapping fasteners from slipping during insertion; and

a plurality of stiffener sections, longitudinally placed on said bottom section, substantially parallel to the edges of said bottom section.

5,315,805

DEVICE FOR ERECTING WALLS OR CEILINGS, ESPECIALLY IN EXHIBITION CONSTRUCTIONS

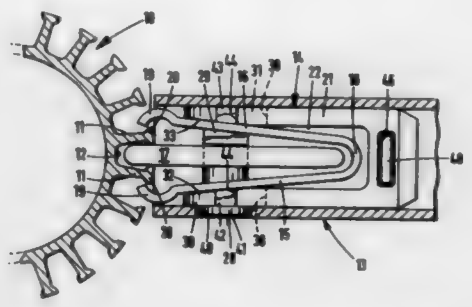
Gerald Harsch, Bismarckstrasse, Fed. Rep. of Germany, assignor to Wilhelm Von Der Dellen, Pfeiferstrasse 83, Fed. Rep. of Germany

Filed Mar. 3, 1993, Ser. No. 25,520

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1991, 4132447

Int. Cl.⁵ E04B *1/343*

U.S. Cl. 52—775 **12 Claims**



1. A device for erecting walls and/or ceilings especially for exhibition purposes as at fairs and to be used as exhibition pavilions, free-standing structures, single- or multistory lobby booths and the like, comprising:

a) a support shaped-section for securing to a hollow beam for a wall and/or ceiling segment, wherein said hollow beam is detachably affixed to approximately cross-sectionally T-shaped webs of said support shaped-section;

b) clamping lock detachably affixed to the inside of the beam;
c) said clamping lock comprising a central retaining element and two spring-steel lateral retaining elements arranged symmetrically relative to said central retaining element;
d) said central and lateral retaining elements in an assembly position of said device entering undercut channels defined by the webs of the support shaped-section;
e) rotationally driven tightening system passing through mutually flush boreholes in said central and lateral elements for tightening said central and lateral elements against two adjacent webs of the support shaped-section, said clamping lock being simultaneously affixed inside the beam by said tightening system;
f) said lateral retaining elements being integrally joined at their rear ends away from the support shaped-section;
g) a clamping-lock housing receiving said central and lateral retaining elements and said rotatable tightening system;
h) said tightening system comprising a central cylindrical part crossing said lateral and central retaining elements through said mutually flush boreholes and further comprising two external washers located at the ends of said central cylindrical part and enclosing between them said lateral retaining elements; and
i) said external washers having inner surfaces each comprising an actuation slanting surface corresponding to the plane subtended by the associated retaining element.

5,315,806

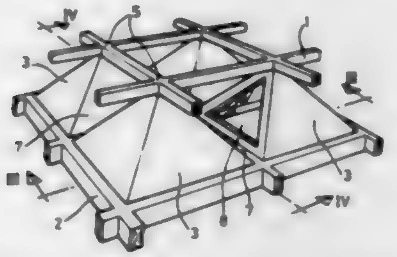
STRUCTURE FOR CONCRETE FRAMEWORKS AND MEANS AND PROCEDURES FOR ITS MAKING

Alejandro Da Casta Trias de Bes, Aribau 326, 08006 Barcelona, Spain

Filed Jul. 16, 1992, Ser. No. 915,099

Int. Cl.⁵ E04C *2/32;* **B28B** *1/00*

U.S. Cl. 52—81.1 **10 Claims**



1. A structure for concrete frameworks comprising:
upper and lower parallel horizontal frames, each constituted by an individual grillage, said upper frame having nodes of intersection and said lower frame defining spaces having centers, said nodes of intersection of said upper frame being situated above said centers of the spaces of said lower frame;
pyramidal caps having upper vertices and bases, each of said pyramidal caps comprising a substantially solid element having a single continuous strut or shell configuration including at least one solid wall, said upper vertices of said pyramidal caps being integrally connected to said nodes of intersection of said upper frame, said bases of said pyramidal caps being integrally bonded to said lower frame, thereby linking said upper frame to said lower frame to form a single integral framework structure.

5,315,807

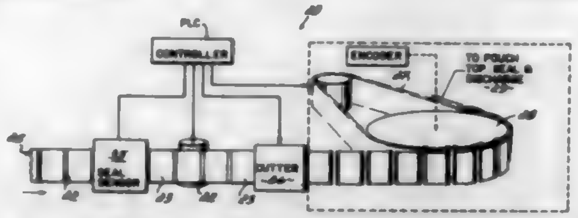
INTERMITTENT SEAL SENSING APPARATUS AND METHODS FOR POUCH WEBS

Randall C. Restle, Crestview Hills, and Walter Munch, Fort Thomas, both of Ky., assignors to R.A. Jones & Co. Inc., Covington, Ky.

Filed Oct. 30, 1992, Ser. No. 968,728

Int. Cl.⁵ B65B *57/02, 61/06*

U.S. Cl. 53—51 **28 Claims**



23. A method of sensing intermittent seal areas in a train of pouches defined between transverse pouch wall seal areas and moving longitudinally including the steps of:
drawing unsealed pouch walls apart by applying fluid suction to each moving wall through opposed suction ports on opposite sides of said train forming a gap therebetween;
uncovering one of said ports as a seal area moves through said gap; and
detecting a change in suction pressure downstream of said port as a function of the presence of a seal area in said gap.

5,315,808

FORMING STRETCH STRAPPING AND BINDING AN ARTICLE THEREWITH

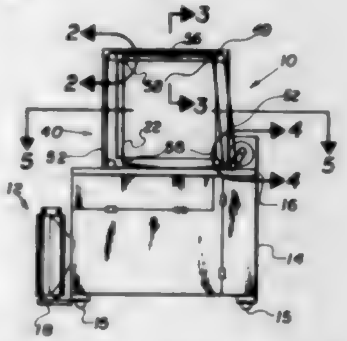
Michael MacIvor, Miami, Fla., and Celeste B. MacIvor, legal representative, 8201 SW. 188th St., Miami, Fla. 33157

Filed Feb. 6, 1991, Ser. No. 651,123

The portion of the term of this patent subsequent to Sep. 5, 2008, has been disclaimed.

Int. Cl.⁵ B65B *13/08*

U.S. Cl. 53—399 **20 Claims**



15. A method of forming a stretchable strapping and binding an article therewith, said method comprising the steps of:
a. supplying a continuous length of stretchable material film in a sheet configuration,
b. shaping and reducing the width of the material from a sheet configuration into an elongated continuous length of strap,
c. stretching the strap subsequent to shaping continuously along a segment of a flow path traveled by the strap,
d. gripping a free end of the strap at a location downstream of the stretching thereof along the flow path and extending a pulling force thereon,
e. positioning the strap along a predetermined path of travel defined by a substantially surrounding relation to the article being bound by exertion of the pulling force thereof,
f. binding a single strand of the strap into surrounding engagement with an exterior surface of the article subsequent to positioning the strap along substantially the entire length of the path of travel,
g. connecting a leading length of the strap onto itself to define a substantially continuous, closed configuration, and into binding engagement with the article being bound, and
h. separating a remainder of the strap from the leading length bound to the article.

5,315,809

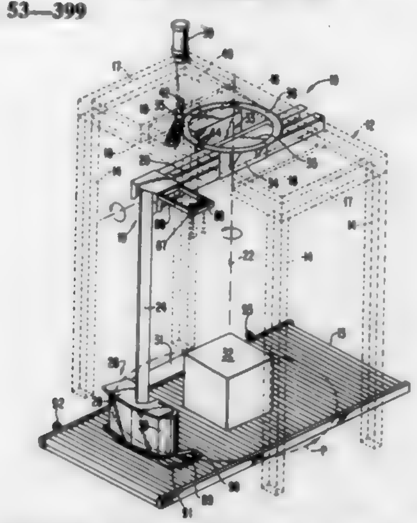
STRETCH WRAPPING EMERGENCY STOP

Yoram Gordon; John Fain; William F. Davis, and William G. Lancaster, all of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Filed Sep. 11, 1992, Ser. No. 943,235

Int. Cl.⁵ B65B *13/04*

U.S. Cl. 53—399 **26 Claims**



1. An apparatus for stretch wrapping a load with a web of packaging material, the apparatus comprising:
a fixed support;
a web dispenser;
a rotatable support for providing relative rotation between the web dispenser and the load to enable wrapping of the web of packaging material around the load;
cooperating engagement members configured to be selectively and postively engageable with each other throughout rotation of the rotatable support for stopping the rotation of the rotatable support when the engagement members are positively engaged and for permitting rotation of the rotatable support when the engagement members are disengaged, one of the engagement members mounted on the rotatable support and the other engagement member mounted on the fixed support;
an actuator for selectively engaging the engagement members with each other; and

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5,315,810

METHOD FOR FILLING SEED TRAYS

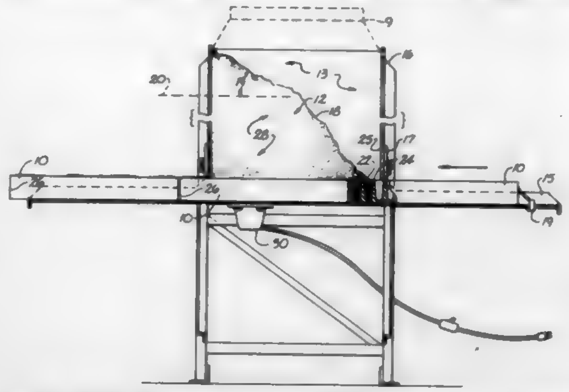
Jay S. Eaton, Rte. 2, Buladean, Bakersville, N.C. 28705

Filed Jun. 11, 1992, Ser. No. 897,242

Int. Cl.⁵ B65B *01/22*

U.S. Cl. 53—473 **14 Claims**

11. A method for increasing the germination rate of tobacco seeds deposited in individual pockets of a tobacco seed tray by minimizing dry pockets in filler material deposited into the tobacco seed tray, the method comprising:
depositing the filler material into a loading hopper having a front side;
establishing a leading edge of filler material within the loading hopper set back a distance from the front side of the hopper; and
conveying the seed tray below the hopper so that the individual pockets of the seed tray pass below the leading edge of the filler material and are generally completely filled with the filler material before the pockets passes beyond the leading edge of the filler material, the pockets being filled from the bottom up by filler material falling from the leading edge of the filler material into the pockets.



5,315,811

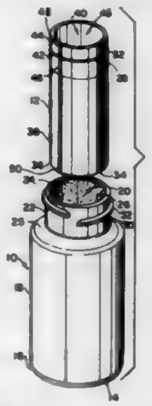
METHOD OF PACKAGING WITH AN OUTER CONTAINER HAVING A CONTAINER INSERT FOR HOLDING A PREDETERMINED VOLUME OF MATERIAL

Lisa B. Biesecker, Boyertown; Glenn J. Forte, Coatesville; Justin P. Boyle, Audobon, and Norris W. Matthews, Stowe, all of Pa., assignors to Drug Plastics & Glass Company, Inc., Boyertown, Pa.

Continuation of Ser. No. 756,409, Sep. 9, 1991, abandoned, which is a division of Ser. No. 707,489, May 30, 1991, Pat. No. 5,197,602. This application Oct. 13, 1992, Ser. No. 959,513

Int. Cl.⁵ B65B *5/00*

U.S. Cl. 53—474 **1 Claim**



1. A method of packaging a predetermined volume of material comprising the steps of:
providing a plurality of substantially uniformly shaped and sized outer containers, each outer container comprising a container bottom having a periphery and a container wall extending generally upwardly from said periphery, said container bottom and said container wall defining an interior container portion having a first volume, said first volume being substantially uniform for each of said plurality of outer containers, said interior container portion being sized to accommodate a container insert, said container wall comprising a mouth defining an opening, said mouth having an interior surface including means for preventing removal of said insert;
providing a plurality of rigid first container inserts, each first container insert for being positioned within an interior container portion of one of said plurality of outer containers, each first container insert comprising a bottom having a periphery and a wall extending generally upwardly from said periphery, said bottom and said wall of each first insert defining an interior portion having a second volume, said second volume being less than said first volume,

said wall of said first insert comprising an upper portion spaced apart from said bottom, said upper portion having an exterior surface dimensioned for complementary engagement with said interior surface of said mouth;

positioning one of said first container inserts within the interior container portion of one of said outer containers while venting gas from the interior container portion of said one outer container to atmosphere through a vent in one of said outer container and first container insert such that said interior container portion is entirely filled with a gas between said outer container and said first container insert and said gas can pass to and from said interior container portion through said vent;

providing a plurality of rigid second container inserts, each second container insert for being positioned within an interior container portion of one of said plurality of outer containers, each second container insert comprising a bottom having a periphery and a wall extending generally upwardly from said periphery, said bottom and said wall of each second insert defining an interior portion having a third volume, said third volume being less than said second volume, said wall of said second insert comprising an upper portion spaced apart from said bottom, said upper portion having an exterior surface dimensioned for complementary engagement with said interior surface of said mouth;

positioning one of said second container inserts within the interior container portion of one of said outer containers while venting gas from the interior container portion of said one outer container to atmosphere through a vent in one of said outer container and second container insert such that said interior container portion is entirely filled with a gas between said outer container and said second container insert and said gas can pass to and from said interior container portion through said vent;

selecting a first volume of material to be packaged which corresponds to said second volume;

inserting said first volume of material into said interior portion of one of said first container inserts positioned within one of said outer containers;

selecting a second volume of material to be packaged which corresponds to said third volume; and

inserting said second volume of material into said interior portion of one of said second container inserts positioned within one of said outer containers.

5,315,812

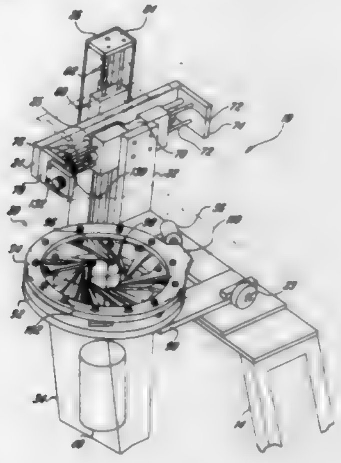
METHOD AND APPARATUS FOR BAGGING OBJECTS

Gary G. Germunson, Yakima, Wash., assignor to Yakima Wire Works, Yakima, Wash.

Filed Apr. 23, 1992, Ser. No. 873,427

Int. Cl.^{5} B65B *5/04, 39/02, 43/34, 43/16*

U.S. Cl. 53—573 **8 Claims**



1. An apparatus for opening the open end of a flexible bag having a permanently closed end and an open end for placing an object of generally a similar shape as the shape of the fully opened open end into the bag, comprising:

means for partially opening the open end of the bag; and

finger means for inserting into the partially opened open end and expanding the open end substantially uniformly in all directions by pivoting the fingers simultaneously with a radial component after insertion thereinto to further open the partially opened open end into an object receiving condition, and means for delivering the object through the opened open end to contain the object within the bag,

wherein the finger means comprises a first annular ring having a center aperture having a central axis and a plurality of arms pivotally attached to said first annular ring, each arm having one of the fingers attached thereto and means for causing each of the arms to pivot, each of the fingers extending into said center aperture of the first annular ring and being substantially parallel to said central axis, and wherein said means for causing said arms to pivot includes each said arm also having a second pivot, and wherein said second pivot of each arm is simultaneously moved in a circle around said central axis to cause said arms to pivot.

5,315,813

METHOD AND APPARATUS FOR MANUFACTURING OPTICAL FIBER CABLE

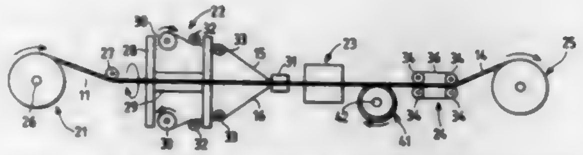
Yasushi Ito, and Nobumasa Nirasawa, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 2, 1992, Ser. No. 907,647

Claims priority, application Japan, Jul. 5, 1991, 3-164915

Int. Cl.^{5} D02G *3/36*

U.S. Cl. 57—6 **5 Claims**



1. A method of manufacturing an optical fiber cable stranding comprising the steps of:

drawing, under a predetermined tension, a slotted rod having grooves formed longitudinally on an outer circumferential surface thereon by a drawing device;

inserting optical fibers into said grooves;

applying a pressing winding onto said outer circumferential surface of said drawn slotted rod, thereby forming said optical fiber cable arrangement;

winding said optical fiber cable arrangement around a guide wheel in order to maintain said predetermined tension, said guide wheel being passively rotatable about an axis perpendicular to said slotted rod;

receiving said optical fiber arrangement into said drawing device from said guide wheel; and

winding said optical fiber cable arrangement received from said drawing device onto a winding drum, wherein said drawing device is disposed between said guide wheel and said winding drum.

5,315,814

COMPOUND YARN PRODUCTION APPARATUS

Shin-Chuan Yao, Taipei, Taiwan, assignor to China Textile T&R Institute, Taipei, Taiwan

Filed Oct. 26, 1992, Ser. No. 966,437

Int. Cl.^{5} D01H *1/02, 13/04*

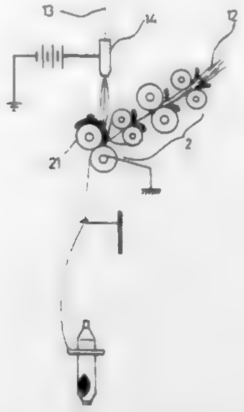
U.S. Cl. 57—75 **1 Claim**

1. A compound yard producing apparatus for spinning multifilament yarn and slivers into compound yarn including a ring spinning machine having a plurality of sliver cans, comprising:

(a) a first set of rollers for drawing said slivers therebetween from said plurality of sliver cans;

(b) a D.C. electrode having said multifilament yarn passing therethrough for separating said multifilament yarn into individual multifilament yarn strands; and,

(c) a second set of rollers for combining said individual multifilament yarn strands and said drawn slivers exiting said first set of rollers and forming said combined multifilament yarn strands and drawn slivers into said compound yarn for winding on a bobbin, one of said second set of rollers being grounded whereby said compound yarn is formed without said slivers having a roving process applied thereto.



5,315,815

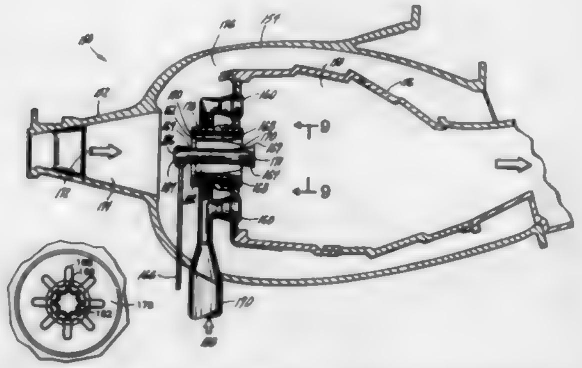
MECHANISM FOR CONTROLLING THE RATE OF MIXING IN COMBUSTING FLOWS

John B. McVey, Glastonbury, and Jan B. Kennedy, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 632,861, Dec. 24, 1990, Pat. No. 5,235,813. This application Apr. 12, 1993, Ser. No. 45,959

Int. Cl.^{5} F02C *7/042*

U.S. Cl. 60—39.06 **9 Claims**



1. A method for mixing a first fluid and a second fluid using a mixing device having a conduit means defining at least two concentric flow passages having a common longitudinal axis, said conduit means including a plurality of outlet ends, each outlet end disposed in proximity with each other outlet end and relatively movable with respect thereto, at least two convolution means, each disposed on one of the outlet ends, for generating adjacent pairs of counter-rotating large scale vortices,

wherein the method comprises the steps of:

flowing a first fluid through one of the two flow passages;

flowing a second fluid through the other of the two flow passages;

discharging the first and second fluids from the flow passages at the outlet ends of the conduit means having convolution means disposed thereon;

mixing the first and second fluids downstream of the outlet ends; and

modulating the rate of mixing by moving at least one of the outlet ends having convolution means disposed thereon relative to another outlet end having convolution means disposed thereon.

5,315,816

METHOD AND DEVICE FOR TEMPERATURE CONTROL IN A COMBUSTION PLANT

Leif Kemmer, Lotorp, Sweden; Dilip Mukherjee, Fislisbach, Switzerland, and Göran Tjellander, Finspong, Sweden, assignors to ABB Stal AB, Sweden

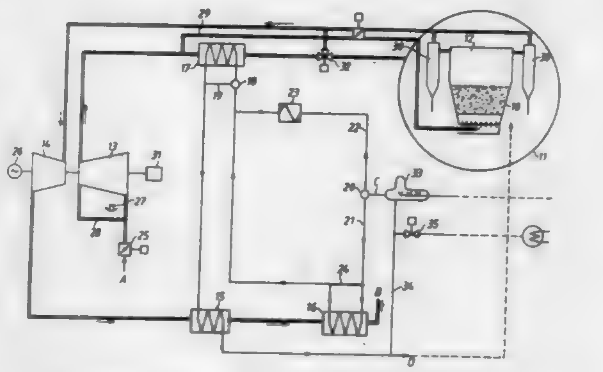
PCT No. PCT/SE91/00337, § 371 Date Jan. 8, 1993, § 102(e) Date Jan. 8, 1993, PCT Pub. No. WO91/17389, PCT Pub. Date Nov. 14, 1991

PCT Filed May 8, 1991, Ser. No. 946,479

Claims priority, application Sweden, May 10, 1990, 9001688

Int. Cl.^{5} F02C *3/26*

U.S. Cl. 60—39.02 **14 Claims**



1. A method for cooling and eliminating temperature variations in a power plant for combustion of a fuel in a pressurized fluidized bed, said method comprising the steps of:

pressuring air in a compressor;

supplying the pressurized air to the pressurized fluidized bed through air paths;

cooling the pressurized air and substantially eliminating temperature variations in the pressurized air prior to supplying the pressurized air into the pressurized fluidized bed in at least one heat transfer surface provided in the air paths;

connecting said at least one heat transfer surface with a high temperature section of a feedwater/steam section for utilizing energy extracted in said heat transfer surface;

eliminating the temperature variations of the pressurized air supplied to the pressurized fluidized bed by controlling the feedwater/steam flow through said heat transfer surface based on the deviations between a desired temperature of the air to be delivered to the fluidized bed and a measured temperature of the pressurized air from the compressor.

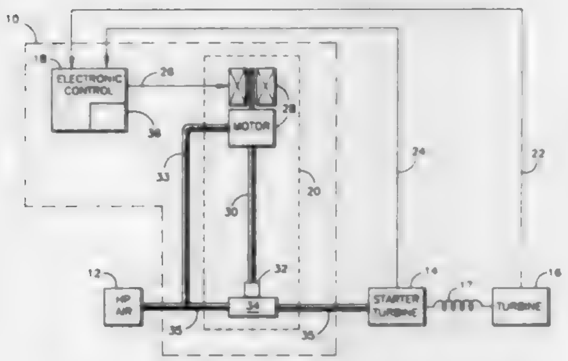
5,315,817
CONTROL SYSTEM FOR PREVENTING CRASH ENGAGEMENT OF A RATCHET AND PAWL CLUTCH DURING RESTART OF A TURBINE ENGINE

Robert M. Vannini, Longmeadow; Joseph Koe, Holyoke, both of Mass.; James E. Neville, Broad Brook, and Robert D. Shangraw, East Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 17, 1992, Ser. No. 931,166

Int. Cl.^{5} F02G *3/00*

U.S. Cl. 60—39.091 **4 Claims**



1. An electronic control system for preventing crash engagement between a clutch ratchet member mounted on a starter turbine, and clutch pawls mounted on a turbine engine, said control system comprising:

a) means for sensing actual rotational speed of the turbine engine;

b) valve means for controlling high pressure air flow from a source of high pressure air to said starter turbine; and

c) valve control means functionally connected to said means for sensing, said valve control means being operable to regulate said valve means to selectively modulate high pressure air flow to said starter turbine in response to signals from said means for sensing, said valve control means being operable to:

i) regulate said valve means to create a predetermined high pressure air stream flow rate which will accelerate said starter turbine from a standstill state to a steady holding speed, all in response to a first signal from said means for sensing, which first signal is indicative of a flame out-induced deceleration of said turbine engine; said holding speed being less than the sensed speed of the turbine engine, and less than a predetermined decelerated all pawl-engaging turbine engine speed wherein all of said clutch pawls are known to be deployed for interlocking engagement with associated teeth on said ratchet member;

ii) maintain said predetermined high pressure air stream flow rate until receipt of a second signal from said means for sensing, which second signal is indicative of a turbine engine speed which is less than said holding speed and which signifies engagement of the clutch pawls and ratchet member during holding speed of said starter turbine and decelerating speed of said turbine engine; and

iii) after receipt of said second signal, regulate said valve means to increase the high pressure air stream to a maximum flow rate so as to accelerate said starter turbine to speeds above said holding speed.

5,315,818
FUEL CONTROL SYSTEM

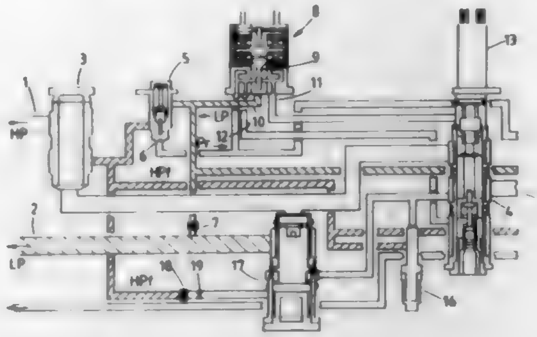
Trevor S. Smith, West Midlands, England, assignor to Lucas Industries public limited company, Solihull, England

Filed Feb. 4, 1993, Ser. No. 13,463

Claims priority, application United Kingdom, Feb. 21, 1992, 9203770

Int. Cl.^{5} F02C *7/232, 9/26*

U.S. Cl. 60—39.281 **13 Claims**



1. A fuel control system, comprising:

a first cylinder and a first piston within said cylinder and a combined inlet/outlet for providing fluid communication with a variable volume enclosed by said first piston and said first cylinder;

a shut-off valve having an inlet, an outlet, and a first valve body movable between a first position for preventing fuel flow to said outlet and a second position for permitting fuel flow to said outlet said first valve body being connected to said first piston;

biasing means for biasing said first valve body towards the first position; and

valve means for selectively connecting said combined inlet/-outlet to one of a first source of fuel arranged to supply fuel at a first pressure and at first rate of flow, a second source of fuel arranged to supply fuel at a second pressure and at a second rate of flow which is lower than the first rate of flow, and a fuel sink at a third pressure which is less than the first and second pressures.

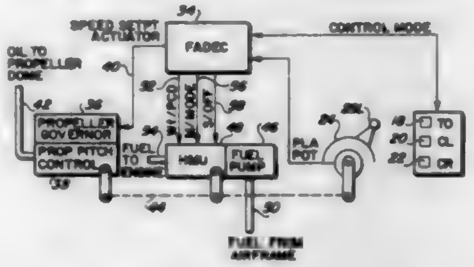
5,315,819
POWER MANAGEMENT SYSTEM FOR TURBINE ENGINES

George W. Page, Gilbert; Glen T. High, Phoenix; David L. Looper, Chandler; James S. Frew; Larry C. Prevallet, both of Phoenix, and Joseph W. Free, Mesa, all of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 17, 1991, Ser. No. 762,322

Int. Cl.^{5} F02C *9/28*

U.S. Cl. 60—39.282 **28 Claims**



1. A power management system for at least one turbine engine, comprising:

indicating means for providing a mode signal indicating a selected one of a plurality of modes of operation; and

at least one engine control means for providing torque and speed commands to a corresponding turbine engine, each said engine control means including:

torque command means, responsive to said mode signal, for generating said torque commands; and

speed command means, responsive to said mode signal, for selecting said speed commands from a plurality of apriori values of engine speeds, each said value corresponding to a mode of operation.

5,315,820
COMPOSITE STRUCTURAL COMPONENT

Michael J. Arnold, Bangor, Northern Ireland, assignor to Short Brothers PLC, Belfast, Northern Ireland

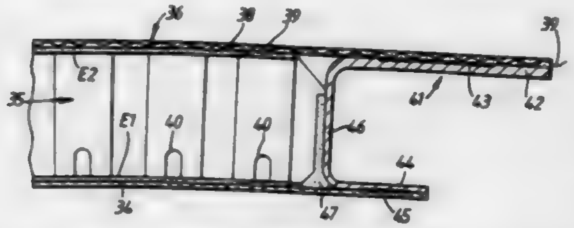
PCT No. PCT/GB91/01042, § 371 Date Feb. 28, 1992, § 102(e) Date Feb. 28, 1992, PCT Pub. No. WO92/00183, PCT Pub. Date Jan. 9, 1992

PCT Filed Jun. 27, 1991, Ser. No. 836,005

Claims priority, application United Kingdom, Jun. 28, 1990, 9014381

Int. Cl.^{5} F02K *3/02*

U.S. Cl. 60—226.1 **32 Claims**



1. A structural component having a front face for exposure to fatigue generating energy, the component including a composite frontal region which includes the front face and which comprises a resin matrix and a high fatigue-strength metal or metal alloy mesh at least partially embedded in it at the front face, wherein the resin matrix is of an open-celled structure.

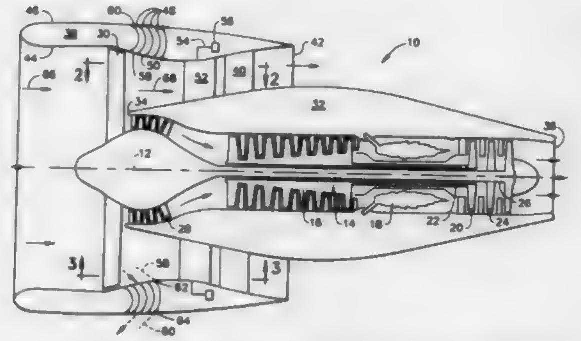
5,315,821
AIRCRAFT BYPASS TURBOFAN ENGINE THRUST REVERSER

Donald K. Dunbar, Sharonville, and Bobby R. Delaney, Loveland, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 5, 1993, Ser. No. 14,017

Int. Cl.^{5} F02K *3/02*

U.S. Cl. 60—226.1 **9 Claims**



1. An aircraft bypass turbofan engine subassembly comprising:

(a) a generally longitudinally extending axis extending forward and aft;

(b) a longitudinally aft-most row of generally radially outwardly extending fan rotor blades;

(c) a core nacelle disposed longitudinally aft of said blades and having a longitudinally forward end defining a flow splitter;

(d) a fan nacelle circumferentially surrounding said blades and at least a portion of said core nacelle and having:

  (1) a longitudinally aft end defining a fan nozzle,

  (2) an inner exterior surface facing generally radially inward,

  (3) an outer exterior surface facing generally radially outward, and

  (4) a through passageway connecting said surfaces and having a terminus disposed on said inner exterior surface longitudinally aft of said blades;

(e) a row of pivotable fan outlet guide vanes radially disposed between said fan and core nacelles and longitudinally disposed aft of said flow splitter and said passageway terminus;

(f) means for pivoting said vanes such that for ground deceleration said vanes generally block airflow therethrough; and

(g) means for opening said passageway for ground deceleration and for closing said passageway.

5,315,822
GAS TURBINE ELEMENTS REARING COKE INHIBITING COATINGS OF TITANIUM COMPOUNDS

William H. Edwards, III, Port St. Lucie, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1991, Ser. No. 812,255

Int. Cl.^{5} F02K *3/10*

U.S. Cl. 60—261 **17 Claims**

1. A fuel contacting element of a gas turbine engine, said element selected from the group consisting of fuel nozzles, fuel lines, and augmentor spray manifolds, and comprising a material selected from the group consisting of titanium, titanium alloys, aluminum, stainless steel, and nickel base superalloys, wherein the improvement comprises the presence of a coke inhibiting layer thereupon selected from the group consisting of titanium carbide, titanium nitride, titanium boride, and mixtures thereof.

5,315,823
CONTROL APPARATUS FOR SPEEDILY WARMING UP CATALYST IN INTERNAL COMBUSTION ENGINE

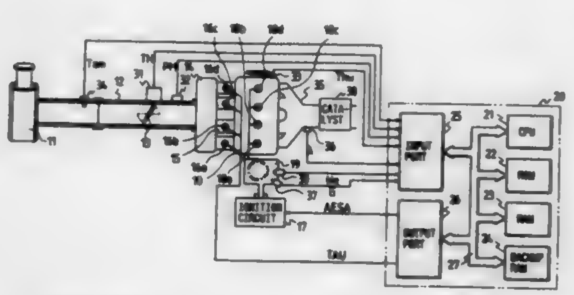
Seiithirou Nishikawa; Toshiaki Kikuchi, and Masumi Kinugawa, all of Okazaki, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 833,651, Feb. 11, 1992. This application Jul. 31, 1992, Ser. No. 922,103

Claims priority, application Japan, Feb. 12, 1991, 3-018695; Jun. 21, 1991, 3-150640; Jul. 31, 1991, 3-192353; Dec. 24, 1991, 3-341259

Int. Cl.^{5} F01N *3/00*

U.S. Cl. 60—286 **12 Claims**



1. A control apparatus for an internal combustion engine having a catalyst provided in an exhaust pipe thereof for purifying emissions from said engine, comprising:

means for generating an operating parameter representing an operating condition of said engine;

means for determining when said catalyst is warming-up and outputting a temperature signal indicative thereof;

means for determining an amount of fuel provided to said engine based on said operating parameter; and

means for correcting said fuel amount, in accordance with said temperature signal, to alternately provide to said engine, when said temperature signal indicates that said catalyst is warming-up, a rich amount of fuel to achieve a rich air-fuel ratio and a lean amount of fuel to achieve a lean air-fuel ratio.

5,315,824

COLD HC ADSORPTION AND REMOVAL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

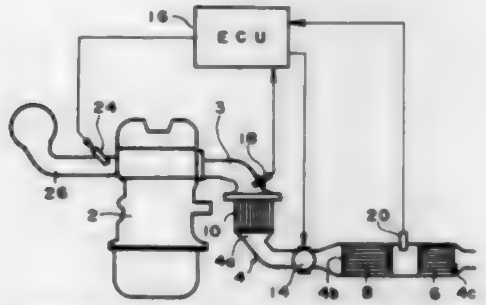
Shinichi Takeshima, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 28, 1992, Ser. No. 936,966

Claims priority, application Japan, Aug. 29, 1991, 3-242460

Int. Cl.⁵ F01N *3/28*

U.S. Cl. 60—297 **14 Claims**



1. A cold HC adsorption and removal apparatus for an internal combustion engine comprising:

an internal combustion engine having an exhaust manifold and an exhaust conduit connected to the exhaust manifold, the exhaust conduit including an upstream portion, an intermediate portion, and a downstream portion arranged in series in that order, wherein the intermediate portion includes a first passage and a second passage arranged in parallel to each other and wherein a switching valve is installed in the intermediate portion for switching exhaust gas flow from the upstream portion between the first passage and the second passage;

a first catalyst installed in the downstream portion for oxidizing hydrocarbons included in exhaust gas from the internal combustion engine, the first catalyst having a first temperature for activation;

an HC adsorbent installed in the first passage for adsorbing and releasing the hydrocarbons included in the exhaust gas, the HC adsorbent having a second temperature for beginning to release the hydrocarbons adsorbed by the HC adsorbent, wherein the second temperature is lower than the first temperature, the HC adsorbent adsorbing the hydrocarbons included in the exhaust gas when a temperature of the HC adsorbent is lower than the second temperature and releasing the adsorbed hydrocarbons when the temperature of the HC adsorbent is equal to or higher than the second temperature;

switching valve control means for operating the switching valve so as to cause the exhaust gas to flow through the first passage when the temperature of the HC adsorbent is lower than the second temperature and to cause the exhaust gas to flow through the second passage when the temperature is equal to or higher than the second temperature, wherein the switching valve control means is adapted to further operate the switching valve so as to cause the exhaust gas to flow through the first passage only for a predetermined time period after the temperature of the first catalyst has reached the first temperature; and

a second catalyst installed in the upstream portion for oxidizing hydrocarbons included in the exhaust gas, the second catalyst having a temperature for activation substantially equal to the first temperature.

5,315,825

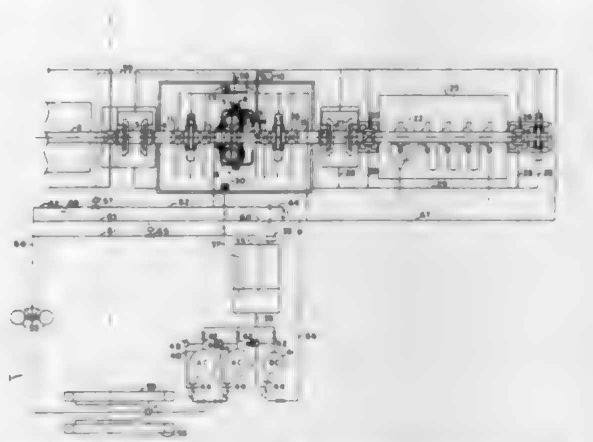
OIL SYSTEM FOR CONSTANT INPUT SPEED FLUID DRIVE

Melbourne F. Giberson, 5 Spring Mill La., Haverford, Pa. 19041

Filed Dec. 31, 1992, Ser. No. 998,959

Int. Cl.⁵ F16D *31/02*

U.S. Cl. 60—336 **19 Claims**



1. In a system for supplying oil to a fluid drive between an input shaft and an output shaft, wherein means are provided for driving said input shaft, said driving means driving said input shaft at a constant speed, said input shaft is connected to an impeller of the fluid drive, said output shaft is connected to a runner of said fluid drive, said impeller and runner comprising a fluid drive element, and the impeller and runner are fluidically coupled by oil between them, the speed of rotation of the output shaft being varied by the degree of coupling between the impeller and the runner, the degree of coupling being determined by the radial thickness of a vortex of oil between said impeller and said runner, bearings are provided in which said input and output shafts are journaled, pump means are provided for supplying circuit oil to said fluid drive element, and means are provided for removing oil from said fluid drive element, the improvement comprising temperature responsive means positioned adjacent said fluid drive element for sensing the temperature of circuit oil as it is discharged from said fluid drive element and for generating a signal in response to said sensed temperature, and control means, located in a line between said pump means and said fluid drive element, operatively connected to said temperature responsive means and responsive to said signal from said temperature responsive means, for controlling the flow of oil to said fluid drive element.

5,315,826

HYDRAULIC DRIVE SYSTEM AND DIRECTIONAL CONTROL VALVE

Toichi Hirata, Ushiku, and Genroku Sugiyama, Ibaraki, both of Japan, assignors to Hitachi Construction Machinery Co., Inc., Tokyo, Japan

PCT No. PCT/JP91/01621, § 371 Date Jul. 13, 1992, § 102(e) Date Jul. 13, 1992, PCT Pub. No. WO92/09809, PCT Pub. Date Jun. 11, 1992

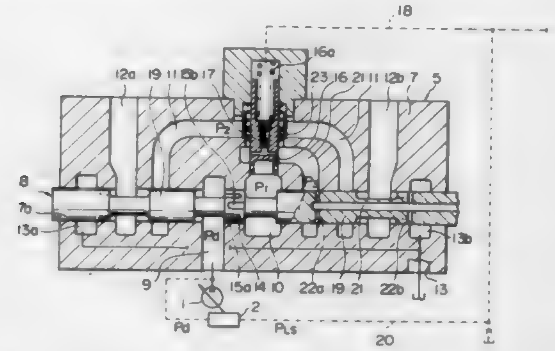
PCT Filed Nov. 26, 1991, Ser. No. 890,590

Claims priority, application Japan, Nov. 26, 1990, 2-318059

Int. Cl.⁵ F16D *31/02*

U.S. Cl. 60—422 **12 Claims**

1. A hydraulic drive system for a construction machine comprising hydraulic pressure supply means; a plurality of actuators driven by a hydraulic fluid supplied from said hydraulic pressure supply means; and a plurality of directional control valves respectively disposed between said hydraulic pressure supply means and said plurality of actuators, and each comprising a pump port, a pressure chamber capable of communicating with said pump port, a feeder passage capable of communicating with said pressure chamber, actuator ports capable of communicating with said feeder passage, a reservoir port capable of communicating with said actuator ports, first meter-in variable restrictors disposed between said pump port and said pressure chamber, and a pressure compensating valve disposed between said pressure chamber and said feeder passage and having a pair of opposite ends, one of which is subjected to a pressure in said pressure chamber and the other of which is subjected to a maximum load pressure among said plurality of actuators, said hydraulic pressure supply means having a hydraulic pump and pump flow control means for controlling a delivery rate of said hydraulic pump so that a delivery pressure of said hydraulic pump is held higher by a predetermined value than the maximum pressure obtained, as a load sensing pressure, from load pressures of said plurality of actuators, wherein:



at least one of said plurality of directional control valves has a bleed passage for communicating between said feeder passage and said reservoir port, and second variable restrictors disposed in said bleed passage and moved in conjunction with said first meter-in variable restrictors and being kept open after displacement of the corresponding directional control valve from a substantially neutral position and after said first meter-in variable restrictors are opened.

5,315,827

APPARATUS FOR SWITCHING FLOW RATE FOR ATTACHMENT

Hiroshi Imai, Kyoto, Japan, and Daigiro Ito, Hixon, Tenn., assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP91/00047, § 371 Date Jul. 17, 1992, § 102(e) Date Jul. 17, 1992, PCT Pub. No. WO91/10785, PCT Pub. Date Jul. 25, 1991

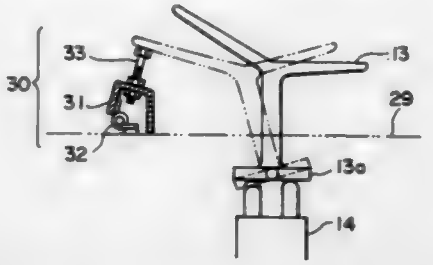
PCT Filed Jan. 18, 1991, Ser. No. 915,833

Claims priority, application Japan, Jan. 18, 1990, 2-9763

Int. Cl.⁵ F16D *31/02*

U.S. Cl. 60—426 **16 Claims**

1. An apparatus for switching flow rate for exchangeable attachments requiring different flow rates, comprising a hydraulic circuit having a plurality of directional control valves connected in parallel to variable capacity type hydraulic pumps, and a plurality of actuators respectively controlled by said directional control valves, one of said directional control valves being an attachment directional control valve for controlling one of said exchangeable attachments, said hydraulic circuit incorporating pressure compensating valves disposed at outlet ports of each of said directional control valves, load sensing valves for controlling discharges from said variable capacity type hydraulic pumps, and circuits for feeding back the maximum value P_L of load pressure between each actuator and the associated directional control valve via a shuttle valve to each of said pressure compensating valves to vary the flow rate to the respective actuator and to said load sensing valves to control the flow rate of each of said variable capacity type hydraulic pumps by said load sensing valves so as to make constant the difference between discharge pressure P_P of said



variable capacity type hydraulic pumps and said maximum value P_L of said load pressure, and restricting means for restricting an opening area of a spool of said attachment directional control valve, wherein said restricting means comprises an actuatable attachment control lever movable through a stroke, and means for selectively restricting the quantity of said stroke of said actuatable attachment control lever.

5,315,828

VALVE ASSEMBLY FOR LOAD INDEPENDENT CONTROL OF MULTIPLE HYDRAULIC LOADS

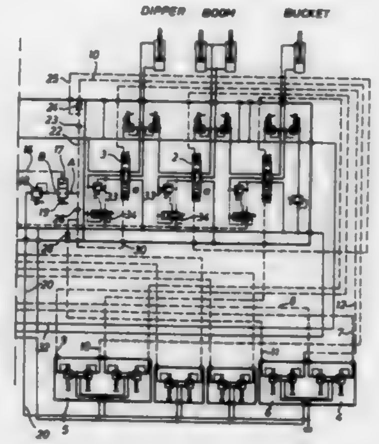
Armin Stellwagen, Lohr, Fed. Rep. of Germany, and Walter Scandella, Osio Sotto, Italy, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Oct. 30, 1992, Ser. No. 969,737

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1991, 4135836; Nov. 19, 1991, 4137963

Int. Cl.⁵ F16D *31/02*

U.S. Cl. 60—426 **9 Claims**



1. A valve assembly for load independent control of a plurality of hydraulic users, comprising:

a source of pressurized fluid providing a load pressure to the hydraulic users;

a plurality of pressure control valves (**4**, **5**, **6**);

a plurality of hydraulically controlled control valves (**1**, **2**, **3**) adapted to be controlled by said plurality of pressure control valves (**4**, **5**, **6**) for providing a control pressure;

at least one of said hydraulically controlled control valves (**1**, **2**, **3**) controlling a high priority user by providing a first control pressure; and

at least another of said hydraulically controlled control valves (**1**, **2**, **3**) controlling a low priority user by providing a second control pressure having a maximum value;

wherein

said valve assembly further comprises

- a valve means (17, 18) adapted to be controlled by said first control pressure, said valve means (17, 18) selectively effecting a decrease in said maximum value of said second control pressure, and
- said source of pressurized fluid being a variable displacement pump that it adjustable independently of the load pressure of the hydraulic users.

5,315,829

HYDRAULIC SYSTEM FOR HYDRAULIC OPERATORS

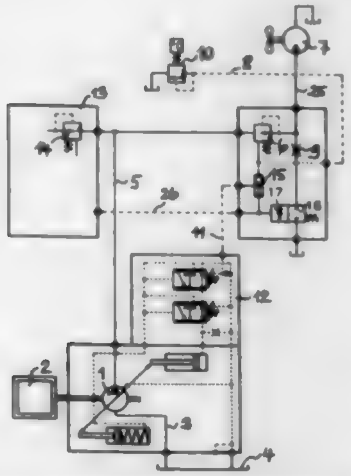
Helmut Fischer, Gründau/Liebios, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Dec. 14, 1992, Ser. No. 990,119

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1991, 4141492

Int. Cl.^{5} F16D *31/02*

U.S. Cl. 60—456 **6 Claims**



1. A hydraulic system for hydraulic operating machinery for delivering pressurized fluid to a blower drive means and to a hydraulic operator circuit, comprising a variable displacement pump an-d control valves connecting said pump to said operator circuit and to said blower drive means, further comprising a temperature responsive pressure valve which is arranged in a control pressure line extending between the blower drive means and the respective control valve, said pressure valve setting a control pressure therein proportional to the temperature, wherein the control pressure line is connected to the blower drive means control valve in a sense to open it, characterized in that a control pressure valve is arranged between the control pressure line and a reservoir which control pressure valve is switched from a blocking position into a throttling position by a load pressure of the operator circuit when the operator circuit is actuated, in which throttling position the control pressure is diminished to a value for adjusting the blower drive means control valve such that a minimum speed of the blower drive means is set independent of the operator load, and comprising a regulator for the variable displacement pump which regulator receives through a load sensing line the higher of said load pressure or said control pressure.

5,315,830

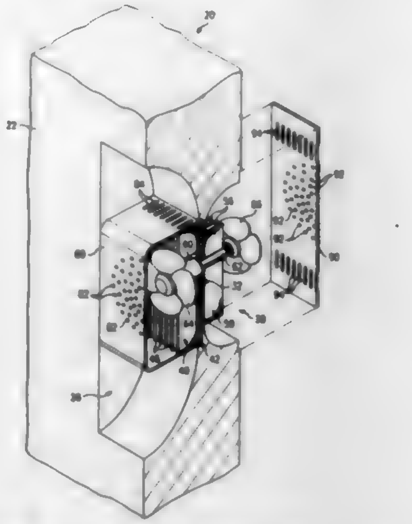
MODULAR THERMOELECTRIC ASSEMBLY

Michael J. Doke, Dallas; Richard A. Howarth, Allen, and Leonard J. Recine, Sr., Plano, all of Tex., assignors to Marlow Industries, Inc., Dallas, Tex.

Filed Apr. 14, 1993, Ser. No. 47,695

Int. Cl.^{5} F25B *21/02*

U.S. Cl. 62—3.2 **21 Claims**



18. A thermoelectric assembly comprising:

- a thermoelectric device for controlling temperature;
- the thermoelectric device having a hot side and a cold side heat transfer surfaces;
- a first heat sink with a first heat transfer surface attached to the hot side and a second heat sink with a second heat transfer surface attached to the cold side;
- a layer of insulating material disposed between the first heat sink and the second heat sink with the thermoelectric device contained within the insulating material; and
- an air circulation device simultaneously directing air to circulate in a first flow path directly impinging upon the first heat transfer surface and a second flow path directly impinging upon the second heat transfer surface.

5,315,831

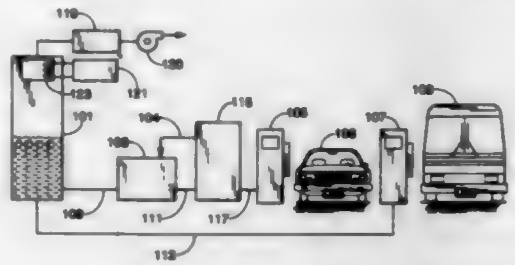
LIQUID NATURAL GAS AND COMPRESSED NATURAL GAS TOTAL FUELING SYSTEM

John E. Goode; Michael D. Hoyle, both of Arlington, and Raymond E. Lance, Fort Worth, all of Tex., assignors to Hydra-Rig, Incorporated, Ft. Worth, Tex.

Filed Jan. 22, 1993, Ser. No. 9,210

Int. Cl.^{5} F25B *19/00*

U.S. Cl. 62—7 **23 Claims**



1. A natural gas fueling station apparatus for dispensing both liquid natural gas and compressed natural gas to natural gas vehicles or other suitable containers comprising:

- a first storage tank for storing liquid natural gas from which to supply the natural gas filling station with natural gas;
- a first dispenser for dispensing liquid natural gas;
- means for producing, from liquid natural gas, compressed natural gas;
- a second dispenser for dispensing compressed natural gas; and,
- the first dispenser and the means for producing being supplied with liquid natural gas from the first storage tank by a liquid natural gas conduit, the second dispenser being supplied with compressed natural gas from the means for producing by a means for supplying compressed natural gas.

5,315,832

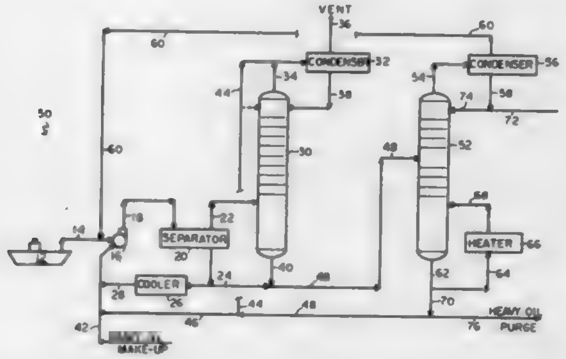
PROCESS FOR THE RECOVERY OF A LIGHT HYDROCARBON FRACTION FROM MARINE LOADING OPERATIONS

Richard B. Hopewell, Medfield, Mass., assignor to Process System International, Inc., Westborough, Mass.

Filed Feb. 12, 1993, Ser. No. 17,695

Int. Cl.^{5} F25J *3/00*

U.S. Cl. 62—20 **17 Claims**



1. A process for the recovery of light hydrocarbon fractions from off-gases derived from the transfer of petroleum materials which process comprises:

- a) introducing off-gases containing light hydrocarbon fractions derived from the transfer of petroleum materials into a liquid-ring compressor employing a heavy hydrocarbon fraction as the motive fluid in the liquid ring compressor to seal the compressor and to absorb a light hydrocarbon fraction;
- b) withdrawing a vapor-liquid effluent mixture from the liquid ring compressor;
- c) separating the vapor from the liquid effluent of the vapor-liquid effluent mixture, the vapor reduced in the light hydrocarbon fraction to be recovered;
- d) recirculating a portion of the separated liquid effluent to the liquid-ring compressor;
- e) introducing the separated vapor with the reduced light hydrocarbon fractions into a lower portion of a refrigerated absorber column containing mass transfer devices;
- f) introducing a heavy hydrocarbon fraction into an overhead condenser or the upper portion of the refrigerated absorber column for the absorption of the light hydrocarbon fractions from said separated vapor;
- g) discharging from said refrigerated absorber column an overhead vapor stream which is reduced in total hydrocarbon content and substantially environmentally acceptable for atmospheric discharge; and
- h) withdrawing from said refrigerated absorber column a bottoms stream which comprises the heavy hydrocarbon fraction and the recovered light hydrocarbon fractions.

5,315,833

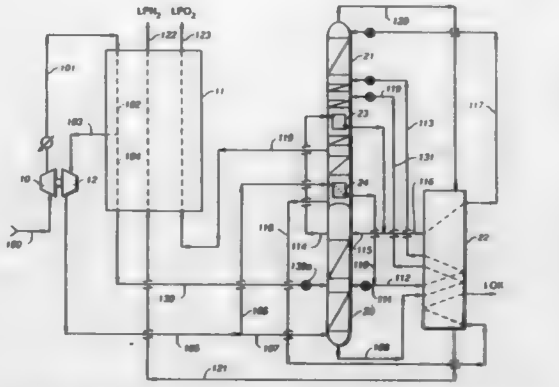
PROCESS FOR THE MIXED PRODUCTION OF HIGH AND LOW PURITY OXYGEN

Bao Ha, Vacaville, Calif., and Catherine Garnier, Paris, France, assignors to Liquid Air Engineering Corporation, Montreal, Canada

Filed Oct. 15, 1991, Ser. No. 775,453

Int. Cl.^{5} F25J *3/00*

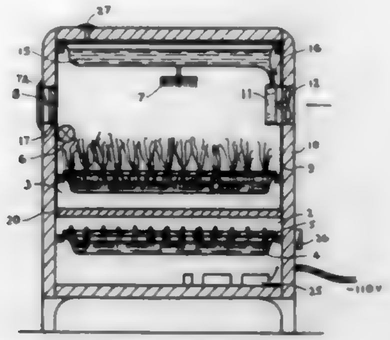
U.S. Cl. 62—38 **6 Claims**



1. A process for simultaneously providing both high and low purity oxygen from a double column, double reboiler apparatus, the double columns being high and low pressure columns, said low pressure column having a lower and upper reboiler, which process comprises:

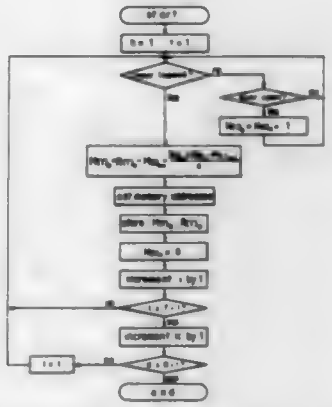
- a) passing a compressed and cooled feed stream containing at least oxygen and nitrogen to a main exchanger, wherein the compressed and cooled feed stream is divided into a first fraction and a second fraction;
- b) expanding the first fraction in an expander and dividing the same into a third and fourth fraction;
- c) further cooling the second fraction in the main exchanger and expanding at least a fraction of this stream by an expansion valve into a high pressure column as liquid feed stream;
- d) introducing the third fraction into a lower reboiler located at a bottom portion of the low pressure distillation column, whereby the third fraction of the feed stream condenses in the reboiler providing a first reboil for distillation;
- e) feeding at least a fraction of a resulting liquefied feed stream through either a high or lower pressure column as feed;
- f) introducing the fourth fraction to the bottom of a high pressure column as gaseous feed, whereby a bottom oxygen-rich liquid stream and an overhead nitrogen-rich gaseous stream are formed;
- g) passing the oxygen-rich liquid stream to the low pressure column as feed;
- h) condensing the nitrogen-rich gaseous stream against a boiling liquid in an upper reboiler of the low pressure column, located at an intermediate stage, thereby serving as a second reboil for distillation;
- i) returning a portion of the condensed nitrogen-rich stream to the high pressure column as reflux, and passing at least a fraction of the remaining portion of the nitrogen-rich stream to a top portion of the lower pressure column as reflux, whereby the low pressure column separates its feed into bottom stream oxygen products and top stream rich in nitrogen;
- j) recovering the bottom stream oxygen product as high purity liquid oxygen;
- k) drawing from a tray or a stage between the two reboilers of the low pressure column, the stream-oxygen product, as low purity oxygen; and
- l) warming in the main exchanger the low purity oxygen stream, and the nitrogen-rich stream.

5,315,834
ROOM AIR ENVIRONMENT CONDITIONER
Feliks Garunts, 1422 N. Tamarind Ave., Apt. #8, Los Angeles, Calif. 90028, and Robert Darbinyan, D17ur. Sundukyana #87, Yerevan 375012, Armenia, U.S.S.R.
Filed Aug. 14, 1992, Ser. No. 930,379
Int. Cl.^{5} F24F *3/16*
U.S. Cl. 62—78 **3 Claims**



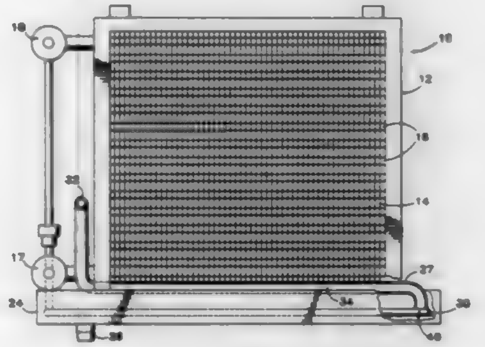
1. A room air environment conditioner which comprises:
a closable container;
air movement means to move air through said container with an inlet and outlet at opposite sides of said container;
a tank within said container filled with water;
a filter wetted from the water in said tank and mounted at the air inlet of the container for cooling said air by evaporation;
means for growing plants within said container for absorption of carbon dioxide and photosynthesis of oxygen;
a negative ion source acting within the container when closed being exposed to the air therewithin, thereby causing emission of said ions into the air;
and a holder containing chemicals in the form of powders selected for their beneficial effects on human health which are placed where the air exits through said container.

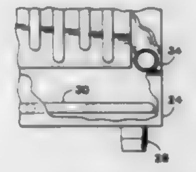
5,315,835
METHOD OF LEARNING A REFRIGERATOR USE PATTERN FOR CONTROLLING A DEFROSTING OPERATION OF THE REFRIGERATOR
Seong S. Park, Kyungsangnam-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 21, 1992, Ser. No. 993,609
Claims priority, application Rep. of Korea, Dec. 21, 1991, 23804/1991
Int. Cl.^{5} F25D *21/06;* **F25B** *47/02*
U.S. Cl. 62—80 **12 Claims**



1. A method of learning a use pattern for controlling a defrosting operation of a refrigerator, comprising the steps of:
(a) dividing a day into a plurality of time intervals and counting a number of door openings for each of the plurality of time intervals;
(b) calculating an arithmetic average value of the number of door opening times for each of the plurality of time intervals;
(c) repeating steps (b) and (c) for predetermined days, to calculate the arithmetic average values of the number of door opening times for each of the plurality of time intervals for the predetermined days and storing the calculated arithmetic average values for the predetermined days in a memory; and
(d) performing a defrosting operation in ones of the plurality of time intervals when a door of the refrigerator is not opened, based on the stored calculated arithmetic averages.

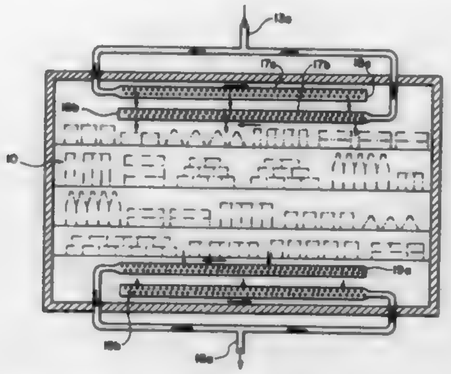
5,315,836
AIR COOLING UNIT HAVING A HOT GAS DEFROST CIRCUIT
Thomas B. Ressler, West Linn, Oreg., assignor to McCormack Manufacturing Co., Inc., Lake Oswego, Oreg.
Filed Jan. 15, 1993, Ser. No. 5,021
Int. Cl.^{5} F25B *41/00*
U.S. Cl. 62—81 **14 Claims**





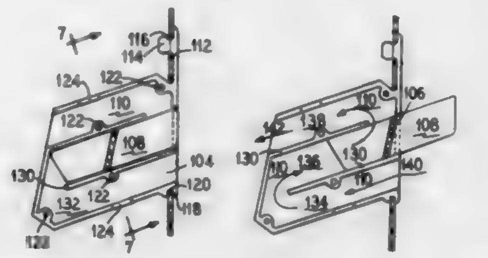
8. A method of operating an air cooling unit having an air cooling coil assembly including a lower edge, a condensate pan below the air cooling coil assembly, and which includes a condensate drain, a hot gas defrosting coil disposed below the air cooling coil assembly proximate the condensate pan, means for periodically conducting a flow of a heated defrosting gas through the hot gas defrosting coil, the method comprising:
providing an anti-bridging pipe disposed in the path of a stream of air between the air cooling coil assembly lower edge and over a front edge of the drain pan; and
periodically conducting a portion of the heated defrosting gas through the air cooling coil assembly defrosting pipe.

5,315,837
PROCESS FOR SUPPLYING COLD TO AN OPEN REFRIGERATED ENCLOSURE FOR DISPLAY AND SALE OF FRESH PRODUCTS IN A SUPERMARKET
Francois Lego, Ste Luce Sur Lorie, France, assignor to M. C. International, Velizy, France
Filed Feb. 3, 1993, Ser. No. 12,925
Claims priority, application France, Feb. 4, 1992, 9201225
Int. Cl.^{5} A47F *3/04*
U.S. Cl. 62—89 **17 Claims**



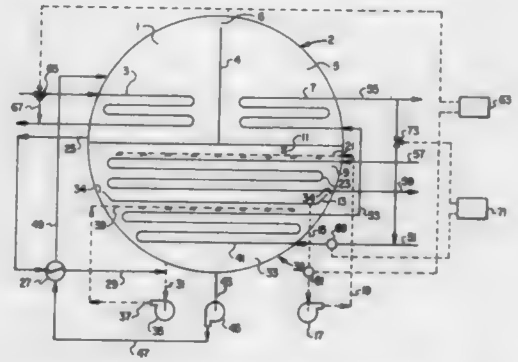
1. A process for supplying cold to at least one refrigerated enclosure, which comprises the steps of:
(a) supplying a coolant, wherein said coolant is selected from the group consisting of cold-transfer fluid and refrigerant from a refrigerating unit, to at least one air cooling plant in order to produce cold air;
(b) thereafter, entraining by forced circulation the cold air from the air cooling plant to at least one cold-air dispensing nozzle each of which is positioned in the refrigerated enclosure which is in an area away from the air cooling plant;
(c) thereafter, passing the air throughout the refrigerated enclosure;
(d) thereafter, recovering the air in an even number of twinned recovery nozzles, each nozzle terminating in a cul-de-sac, each nozzle comprising a reversed direction of circulation;
(e) thereafter, passing the air by forced circulation to the air cooling plant.

5,315,838
AIR CONDITIONER FILTER MONITOR
Christopher M. Thompson, Nashville, Tenn., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Aug. 16, 1993, Ser. No. 106,683
Int. Cl.^{5} F25B *49/00*
U.S. Cl. 62—129 **23 Claims**



16. A filter condition indicator for a room air conditioner that includes an air conditioner housing, an air inlet on the front of said housing, an air filter inside said housing from said inlet, a heat exchange coil for removing heat from said inlet air, an air outlet on the front of said housing, and a fan for pulling air into said housing through said inlet, said filter, and said heat exchange coil, and expelling cooled air out of said housing through said outlet, wherein a clogged air filter creates a negative air pressure differential between the interior of said air conditioner housing and the room ambient air pressure, said indicator operating in response to said air pressure differential to signal that said air filter is clogged, said indicator comprising:
a closed shell mounted in an aperture in said housing, said shell comprising a plurality of outer walls, including an exterior end wall disposed outside of said housing, and an interior end wall disposed in said housing interior between said filter and said fan, and a first air aperture through said exterior end wall in communication with the ambient room air pressure, a second air aperture through said interior end wall in communication with the internal housing air pressure between said filter and said fan, and an indicator aperture through said exterior end wall;
a serpentine air pressure equalization passage formed inside said shell and terminating at a first end at said first air aperture, and terminating at a second end at said second air aperture, with a portion of said passage formed as a track, said track portion having an interior end adjacent to said interior end wall, and an exterior end adjacent to said indicator aperture in said exterior end wall;
an indicator element disposed in said track portion of said passage, said indicator element comprising an air reaction surface and a flag portion, said indicator element being freely slideable between a retracted position in which said air reaction surface is adjacent to said interior end of said track with said air reaction surface substantially blocking said air passage and said flag disposed entirely inside said shell, and an extended position in which said air reaction surface is adjacent to said exterior end of said track and said air passage is not blocked by said air reaction surface and said flag is extended through said indicator aperture outside of said shell so that said flag is visible from the front of said air conditioner housing; and
wherein the occurrence of a negative air pressure differential due to a clogged air filter induces air flow through said air pressure equalization passage from said first air aperture to said second air aperture, creating sufficient force against said air reaction surface to slide said indicator element to said extended position.

5,315,839
CONTROL SYSTEM FOR ABSORPTION HEAT TRANSFER PLANTS
Donald V. Nicol, Plano; Russell A. Kilbourn, and Mark J. Lane, both of Richardson, all of Tex., assignors to Gas Research Institute, Chicago, Ill.
Filed Dec. 22, 1992, Ser. No. 995,069
Int. Cl.^{5} F25B *27/00*
U.S. Cl. 62—148 **8 Claims**



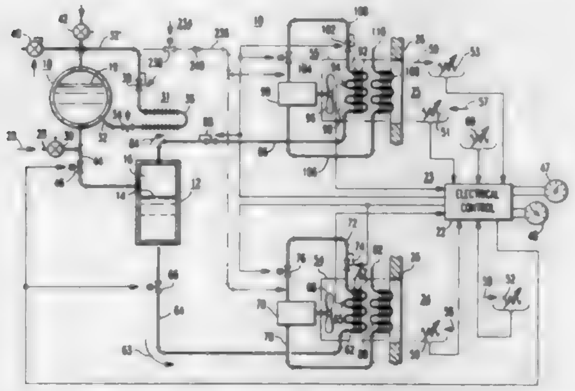
1. An absorption heat transfer plant comprising:
a concentrator, a condenser, an evaporator, and an absorber, all connected in a closed, continuous-cycle circuit, said circuit containing an absorbent and a refrigerant;
a heat exchanger disposed in said concentrator, said heat

exchanger including an input and an output for connection to an external source of heating fluid;
a bypass path connected between said input and said output, said bypass path including an adjustable control valve; and
a control system which adjusts said control valve, thereby controlling the quantity of said heating fluid which flows through said bypass path, said control system being responsive to an evaporator liquid refrigerant temperature.

5,315,840
AIR CONDITIONING AND REFRIGERATION METHODS AND APPARATUS UTILIZING A CRYOGEN

Herman H. Viegas, Bloomington, Minn., and Roland L. Roehrich, Pittsburgh, Pa., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Nov. 27, 1992, Ser. No. 982,329
Int. Cl.⁵ F25D *25/00*
U.S. Cl. 62—167 **60 Claims**



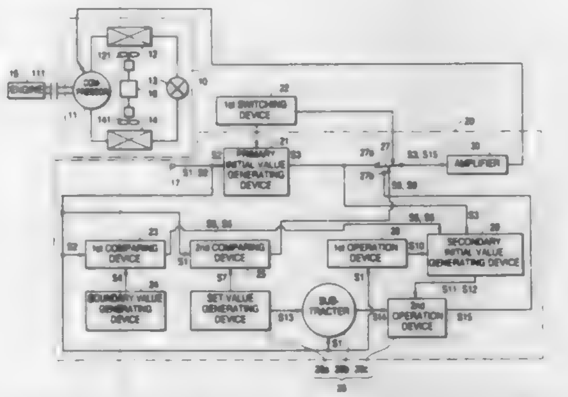
1. A method for controlling the air temperature of a conditioned space to a predetermined set point temperature, comprising the steps of:
providing a supply of cryogen which includes cryogen in liquid and vapor states,
providing first and second separate, independent cryogen flow paths for the liquid and vapor states of the cryogen, respectively,
providing a cooling mode,
said cooling mode including the steps of cooling the air of the conditioned space via first and second heat exchanger means respectively disposed in said first and second flow paths,
and moving air from the conditioned space in heat exchange relation with the first and second heat exchanger means to condition the air of the conditioned space.

5,315,841
CONTROL APPARATUS FOR USE IN AUTOMOTIVE AIR CONDITIONING SYSTEM

Atsuo Inoue, Gunma, Japan, assignor to Sanden Corporation, Isesaki, Japan

Filed Jan. 8, 1993, Ser. No. 2,019
Int. Cl.⁵ F25B *49/02*
U.S. Cl. 62—228.3 **5 Claims**

1. An automotive air conditioning system comprising:
a refrigerant circuit comprising a refrigerant compressor with an externally controlled variable capacity control mechanism and an evaporator connected to a suction chamber of said refrigerant compressor;
air moving means for moving air through an exterior surface of said evaporator, and a control mechanism controlling operation of at least said refrigerant circuit, said control mechanism comprising:
sensing means for sensing air temperature immediately downstream from said evaporator;
first pressure determining means for determining a first pressure value of a pressure control point in said suction chamber of said compressor according to the air temperature immediately downstream from said evaporator at a time immediately before initiation of operation of said refrigerant circuit;
comparing means for comparing air temperature immediately downstream from said evaporator during operation of said refrigerant circuit to a predetermined temperature higher than a set temperature to determine whether air temperature is higher than the predetermined temperature;

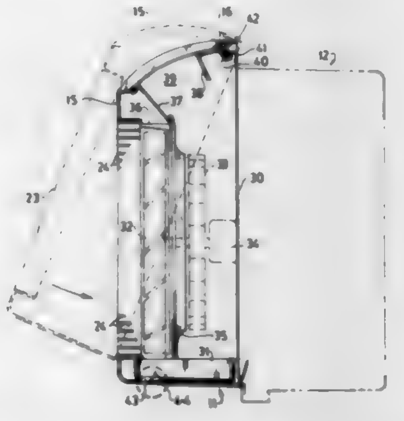

1st SWITCHING DEVICE
PRIMARY INITIAL VALUE GENERATING DEVICE
AMPLIFIER
1st COMPARING DEVICE
2nd COMPARING DEVICE
1st OPERATION DEVICE
SECONDARY INITIAL VALUE GENERATING DEVICE
BOUNDARY VALUE GENERATING DEVICE
SET VALUE GENERATING DEVICE
SUB-TRACTER
2nd OPERATION DEVICE

second pressure determining means for determining a second pressure value of the pressure control point in said suction chamber of said compressor according to a predetermined thermal gradient when the air temperature immediately downstream from the evaporator approaches the predetermined temperature from a value higher than the predetermined temperature; and
pressure adjusting means responsive to said first and second pressure determining means for adjusting from a first pressure condition in which the pressure control point in said suction chamber of said compressor is at the first pressure value to a second pressure condition in which the pressure control point is adjusted to vary proportionally when the air temperature immediately downstream from said evaporator is equal to or lower than the predetermined temperature.

5,315,842
GRILLE MOUNT FOR ROOM AIR CONDITIONER

Theodore S. Bolton, Liverpool, and Stephen Stopyra, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 5, 1993, Ser. No. 27,029
Int. Cl.⁵ F25D *23/12*
U.S. Cl. 62—262 **11 Claims**

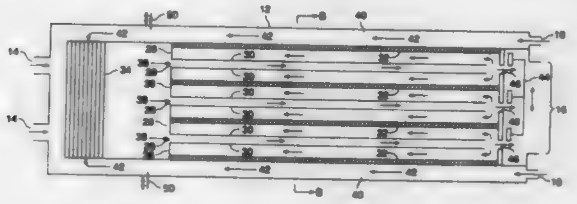


1. An indoor side grille for a window air conditioner unit that includes on its indoor portion a base pan extending generally horizontally at a base of the unit and a discharge deck disposed at an upper side of the unit indoor portion and having a lateral recess extending therealong; the grille comprising a top wall having a flange extending along a distal portion of the top wall to engage the lateral recess of the discharge deck; a front wall depending from a proximal edge of the top wall, the front wall having a return air opening formed therein to admit intake air into said unit indoor portion; and a bottom wall portion that extends distally beneath said base pan from a lower edge of said front wall, said bottom wall portion including releasable snap engagement means for releasably latching onto corresponding means provided on said base pan, such that said grille is installed on said unit indoor portion without additional fasteners by engaging said flange in said recess, and swinging said grille into place until the snap engagement means on said bottom wall portion latch onto the corresponding means on said base pan, wherein said top wall is provided with a discharge deck opening which fits around the discharge deck, the flange defining a back wall of said discharge deck opening.

5,315,843
EVAPORATIVE AIR CONDITIONER UNIT

Victor A. Morozov; Serguei P. Kanachine; Louri I. Krasnochtchekov; Alexandre I. Makienko; Valentine A. Matveev; Valeri G. Khriachtchev, all of Moscow, U.S.S.R., and Poi-Sik Tan, Singapore, Singapore, assignors to ACMA Limited, Singapore, Singapore

Filed Aug. 13, 1992, Ser. No. 929,248
Int. Cl.⁵ F28D *9/02*
U.S. Cl. 62—309 **8 Claims**



1. A self-contained air conditioner unit comprising:
an enclosure, said enclosure including a first intake aperture oriented to communicate with outside ambient air and first outlet aperture positioned to communicate with a habitable space in which said air conditioner is placed, and a second intake aperture positioned to communicate with a habitable space and a second outlet aperture positioned to communicate with ambient air outside of said habitable space;
a water reservoir disposed at the bottom of said enclosure;
a premixing chamber for premixing air from said first and said second intake apertures;
a heat exchanger disposed in said cabinet over said water reservoir, said heat exchanger comprising a plurality of vertically disposed, alternating wet air channels and dry air channels each having intake and outlet ends, said intake ends of said wet channels being located proximate to said exhaust ends of said dry channels, and said outlet ends of said wet channels being located proximate to said intake ends of said dry channels, said alternating wet air channels and dry air channels defined by substantially parallel and planar opposing heat-exchanging surfaces, each of said dry channels communicating with said premixing chamber at said intake ends thereof, and each of said wet channels communicating said second outlet aperture at said outlet ends thereof;
diverting means disposed at said outlet ends of each of said dry channels for diverting a primary stream portion of air from each of said dry channels to said first outlet aperture and a secondary stream portion of air from each of said dry channels to each of said wet channels at said intake ends thereof such that air flowing through said wet channels and said dry channels is in a counterflow relationship;
a wet partition comprising a capillary porous material disposed in each of said wet channels, each wet partition disposed in a plane substantially parallel to said opposing heat-exchanging surfaces and positioned so as to substantially bisect the volume of said wet channel in which it is disposed, each of said wet partitions extending into said water reservoir and immersed in a volume of water contained therein;
air moving means for forcing a volume of air from said first and second intake apertures, through said premixing chamber and said dry channels, to said diverting means, and from said intake ends of said wet channels to said second outlet aperture;
wherein the cross sectional areas of the wet and dry channels and the air moving means are selected so as to provide air flow velocities which promote laminar air flow and to substantially eliminate turbulent air flow.

5,315,844
LOW PROFILE CONCENTRIC HEAT PUMP WITH REVERSIBLE AIR FLOW

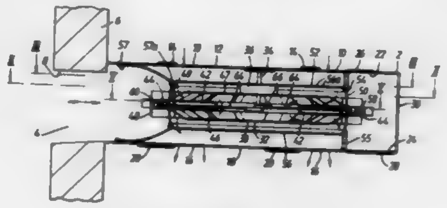
Laurits Hansen, 13 Ioanni Tsimiski Str. P.O. Box 4180, Limassol, Cyprus, Denmark

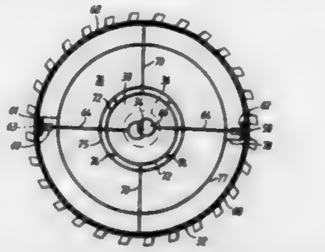
PCT No. PCT/EP91/00454, § 371 Date Oct. 29, 1992, § 102(e) Date Oct. 29, 1992, PCT Pub. No. WO91/14140, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 11, 1991, Ser. No. 923,799

Claims priority, application United Kingdom, Mar. 15, 1990, 9005664

Int. Cl.⁵ F25B *29/00*
U.S. Cl. 62—325 **11 Claims**





1. A heating or cooling apparatus including a heat pump comprising a compressor, a radiator portion, an expansion valve and a cooling portion, the heat pump being constructed in the form of a rotatable member wherein the cooling portion forms a radially inner portion of the member and the radiator portion forms a radially outer portion of the member, the member having a plurality of fins which, when the member rotates, drive streams of air over the cooling portion and the radiator portion, and a housing enclosing the member and having means for separating the streams of air and directing them in desired directions, the rotatable member being formed as a wheel which rotates about an axis of rotation, with the radiator portion, the expansion valve, the cooling portion and the compressor lying substantially in a plane orthogonal to said axis of rotation.

5,315,845
COOLING WATER STORAGE TANK OF A REFRIGERATOR

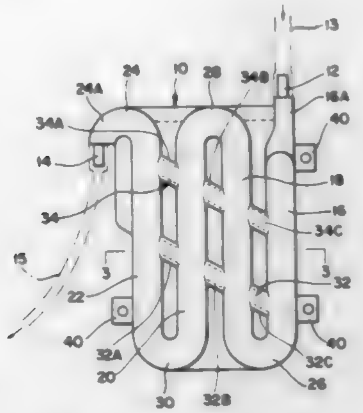
Chang B. Lee, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 27, 1992, Ser. No. 859,050

Claims priority, application Rep. of Korea, Apr. 17, 1991, 91-5320

Int. Cl.⁵ F25D *23/12*

U.S. Cl. 62—338 **14 Claims**



1. A water storage tank for a refrigerator, comprising a body integrally molded as one unit; said body forming a serpentine water conduit having opposite ends defining an inlet and an outlet, respectively; said water conduit including:

at least three fluidly interconnected upright passageways, a pair of said upright passageways being fluidly interconnected at their upper ends; and

a water circulation passage fluidly interconnecting said pair of upright passageways at a level below said upper ends thereof to promote an internal circulation of stored water within said tank.

5,315,846
COOL AIR CIRCULATING APPARATUS FOR A REFRIGERATOR

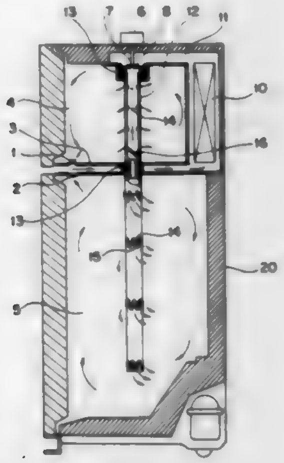
Jae-Seung Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 2, 1993, Ser. No. 12,392

Claims priority, application Rep. of Korea, Feb. 24, 1992, 92-2764

Int. Cl.⁵ F25D *17/08*

U.S. Cl. 62—419 **7 Claims**



1. A refrigerator comprising:

a freezing chamber;

a refrigerating chamber;

means for producing cool air;

circulating means for circulating the cool air in said freezing and refrigerating chambers, comprising:

a hollow rotary duct extending substantially vertically through said freezing and refrigerating chambers and being rotatable about its longitudinal axis, said duct communicating with said cool air producing means and including a plurality of longitudinally spaced discharge holes for discharging the cool air into said freezing and refrigerating chambers, and

means for producing rotation of said duct about said longitudinal axis, comprising guide fins arranged at respective discharge holes such that the discharged cool air impinges against said guide fins to cause said duct to rotate.

5,315,847
WASHING MACHINE

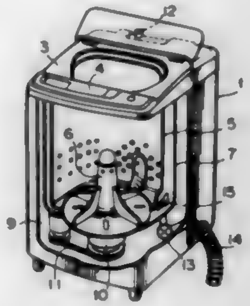
Yoshiaki Takeda, Hitachi; Katuyosi Miwano, Ibaraki, and Noboru Fujita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1992, Ser. No. 859,885

Claims priority, application Japan, Mar. 29, 1991, 3-066013; Mar. 29, 1991, 3-066014

Int. Cl.⁵ D06F *33/02*

U.S. Cl. 68—12.02 **14 Claims**



1. A washing machine comprising a water storage tank, a washing/dehydrating tank rotatably provided in the water storage tank, an agitation blade arranged in the washing/dehydrating tank, a motor for driving the washing/dehydrating tank and the agitation blade for rotation, and a sensor for detecting an electric conductivity of washing water to control an operation of the washing machine, wherein said sensor is provided with a pair of electrodes and is attached to said water storage tank in such a manner that opposite surfaces of said electrodes are exposed to the washing water within said water storage tank, and wherein said water storage tank is provided with a portion outwardly recessed, and said sensor is mounted in said recessed portion such that the opposing surfaces of said electrodes are faced inwardly of said recessed portion.

5,315,848
WHEEL LOCK

Terrance L. Beyer, 1603 Barlow, Traverse City, Mich. 49684

Filed Jan. 19, 1993, Ser. No. 5,599

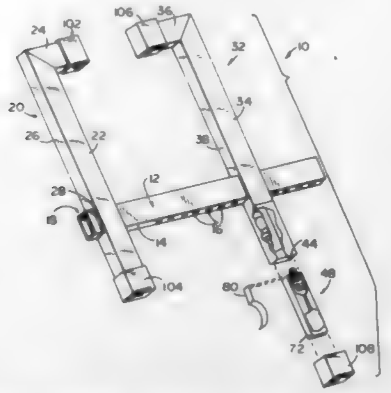
Int. Cl.⁵ B60R *25/00*

U.S. Cl. 70—18 **20 Claims**

1. A vehicle wheel lock, comprising:

an elongated, tubular slide, said slide defining a stop at one end thereof;

a pair of elongated, tubular clamps, each clamp having sidewalls defining aligned apertures, said slide extending through said clamps at said apertures, one of said clamps being positioned against said stop and the other of said clamps being moveable towards and away from said stop so that said clamps may be positioned about a wheel; and



lock means operatively engaging said slide and said other of said clamps for locking said other of said clamps to said slide.

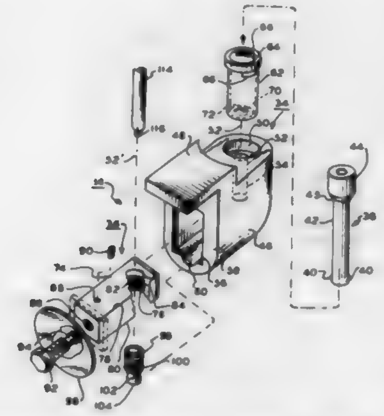
5,315,849
BOX LOCK CONSTRUCTION

George Georgopoulos, Pine Brook, N.J., assignor to E. J. Brooks, Newark, N.J.

Filed Mar. 8, 1993, Ser. No. 27,385

Int. Cl.⁵ E05B *67/36*

U.S. Cl. 70—34 **23 Claims**



1. A lock construction for locking a box with a utility lock of the type including a head, a shaft and expansible locking means secured to the shaft and spaced from the head a given, predetermined distance, said box including a bottom, a rear wall, a front wall, opposing sidewalls and a lid secured to the rear wall and having open and closed lid conditions, said construction for locking the lid closed and comprising:

a male member adapted to be secured to and project from one of said side and front walls, said member having a first utility lock receiving opening lying on a first axis;

a female member having a male member receiving opening and including a flange portion dimensioned to be juxtaposed with at least a portion of said lid in the closed lid condition when said male member is received in said male member receiving opening, said female member having a second lock receiving opening along a second axis said first and second lock receiving openings being coaxially aligned when the male and female members are engaged for receiving said utility lock along said axes; and

adjustment means including means for releaseably receiving said utility lock locking means, said adjustment means being disposed along said axes and adjustably secured to one of said male and female members for adjusting the relative positions of said male member to said female member along said axis when locked by said utility lock.

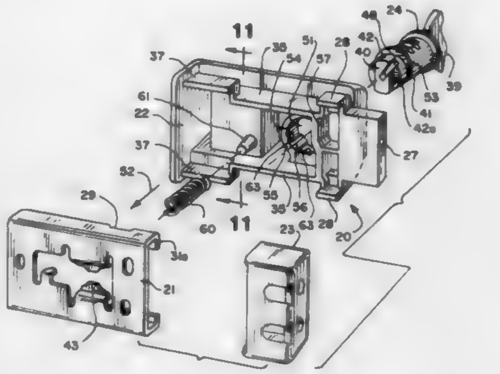
5,315,850
SURFACE MOUNTED SLIDE BOLT

James A. Edeus, Rock Falls, and Timothy J. Powell, Sterling, both of Ill., assignors to National Manufacturing Company, Sterling, Ill.

Filed Mar. 22, 1993, Ser. No. 35,977

Int. Cl.⁵ E05B *9/04*

U.S. Cl. 70—129 **17 Claims**



1. A surface mounted slide bolt comprising

a relatively elongated base and a strike adapted to be mounted on door means,

said base being generally C-shaped and having a bight portion integral with longitudinally extending L-shaped flanges, said flanges being equipped with notches at transversely aligned positions, said bight having upset tab portions for cooperating with plug means,

a relatively elongated bolt removably mounted on said base and having slot means engaging said L-shaped flanges and tongue means being received in said notches, said bolt being equipped with a passage intermediate the ends thereof and having a strike engager at the end thereof proximal to said strike,

plug means removably mounted in said bolt passage and having a surface to cooperate with said bight upset tab portions for placing said bolt in three positions relative to said base wherein a fully retracted position aligns said tongue means and notches for assembly or disassembly of said bolt and base, a fully extended position wherein said engager is received within said strike, and an intermediate position wherein said engager is retracted from said strike.

5,315,851
STEERING LOCK DEVICE FOR VEHICLE

Shigenori Kuroki, 800-1, Minamikubo, Ohshima-cho, Miyazaki-shi, Miyazaki-ken, Japan

Filed Nov. 19, 1991, Ser. No. 794,434

Claims priority, application Japan, Nov. 20, 1990, 2-317067

Int. Cl.⁵ B60R *25/02*

U.S. Cl. 70—252 **8 Claims**

1. A steering lock device for locking a steering shaft of a vehicle comprising:

an outer cylinder;

an inner cylinder rotatably mounted in said outer cylinder;

a keyhole in said inner cylinder;

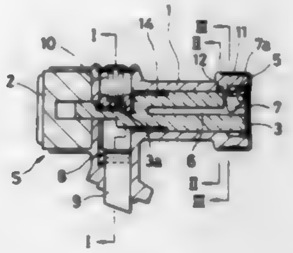
means for permitting rotation of said inner cylinder between first and second rotation positions in response to insertion and actuation of a key;

means for permitting axial movement of said inner cylinder between first and second axial positions;

means for resiliently urging said inner cylinder to said first axial position;

a lock member in said outer cylinder;

said lock member including a slider linked with said inner cylinder and a lock pin connected to said slider;
said lock member having lock and release operating positions to lock and unlock said steering shaft, respectively;
means for urging said lock member to said release position in response to said inner cylinder being in said second rotation position;
a regulating member to prevent said inner cylinder from moving directly from said second rotation position to said first rotation position unless said inner cylinder is urged into said second axial position after said inner cylinder has moved to said second rotation position;
a block member provided to said inner cylinder;
said block member including means for keeping said lock member in said release position when said inner cylinder moves from said first axial position to said second axial position and rotates from said second rotation position to said first rotation position; and
an engaging member disposed in said inner cylinder;
said engaging member including a key lever, said key lever having an engaging protrusion in a top end thereof;
said key lever swingably pivoted in said inner cylinder;
said engaging protrusion of said key lever protruding out of said inner cylinder and engaging an engaging portion in said outer cylinder to hold said inner cylinder at said second axial position when said key is present in said keyhole; and
said engaging protrusion of said key lever moving into said inner cylinder and disengaging said engaging protrusion from said engaging portion in said outer cylinder, to allow said inner cylinder to move to said first axial position when said key is withdrawn, thereby permitting said lock member to lock said steering shaft.



5,315,852

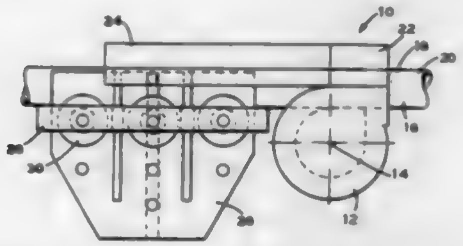
ROTARY DRAW BENDING APPARATUS AND METHOD

Laroul J. Talley, Brookston, and Gary L. English, Paris, both of Tex., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 2, 1993, Ser. No. 84,909

Int. Cl.⁵ B21D *7/04*

U.S. Cl. 72—149 **2 Claims**



1. A method for bending a pipe using a rotary draw bending technique and comprising:
engaging an inner surface of the pipe with a bend die mounted for rotation about a bending axis;
engaging an outer surface of the pipe with a clamp die for clamping the pipe to the bend die;
directing a pressure die against the outer surface of the pipe at a location spaced from the clamp and bend dies;
engaging a reverse die having a plurality of rollers with the inner surface of the pipe at a location opposite the pressure die; and
rotating the clamp die and the bend die for bending the pipe.

5,315,853

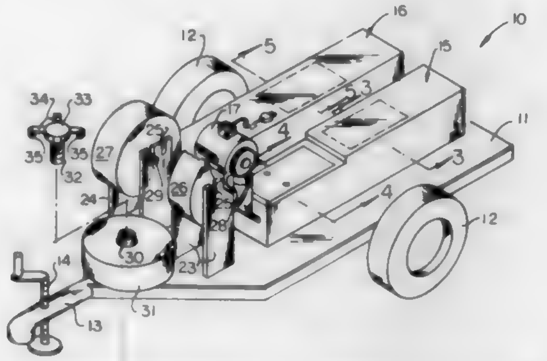
PORTABLE CONSTRUCTION FRAME FORMING APPARATUS

Brian L. Scheiterle, 5379 Hammond Rd., Cuba, N.Y. 14727

Filed Oct. 13, 1992, Ser. No. 959,656

Int. Cl.⁵ B21D *5/08*

U.S. Cl. 72—178 **1 Claim**



1. A portable construction frame forming apparatus, comprising,
a platform, the platform having rotatably mounted wheels on opposed sides of the platform, with the platform further including a trailer tongue extending forwardly of the platform medially of the wheels, and
the platform further having a first roller housing and a second roller housing fixedly mounted onto the platform between the wheels, and
the first roller housing including at least one roller set therewithin, the second roller housing including a further roller set therewithin, and the roller set and the further roller set including drive means to effect simultaneous actuation of the roller set and the further roller set, and
first support plate mounted in adjacency to the first roller housing, and second support plates mounted in adjacency to the second roller housing, with the first support plates rotatably mounting a first supply roll, and the second support plates mounting a second supply roll, wherein the first supply roll and the second supply roll are arranged to feed sheet web therefrom into the respective first roller housing and the second roller housing, and
the first support plates includes a pair of first plate members, and the second support plates include a pair of second plate members, the first plate members are arranged in a parallel coextensive relationship, and the second plate members are arranged in a parallel coextensive relationship, and the first plate members mount a first roll axle directed through the first supply roll, and the second support plates mount a second roll axle directed through the second supply roll, and
further including an internally threaded support tube fixedly mounted to the platform in an orthogonal relationship between the trailer tongue and the first support plates and the second support plates, and the internally threaded support tube arranged for receiving a spare supply roll thereabout, and an externally threaded clamp rod threadedly received within the internally threaded support tube, the clamp rod having a clamp rod head, and the clamp rod head including a plurality of "J" shaped spring plates extending radially and projecting exteriorly of the clamp rod head, where each of the "J" shaped spring plates includes a finger member directed downwardly relative to a respective spring plate along the support tube for impinging upon the spare supply roll to maintain the spare work roll in a fixed and vibrationless relationship relative to the platform.

5,315,854

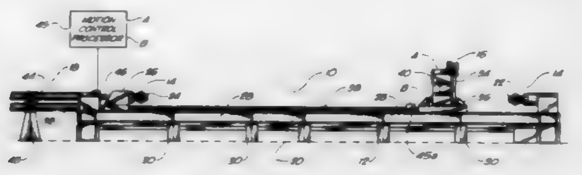
TUBE TAPERING APPARATUS HAVING A VARIABLE ORIFICE DIE

Harry C. Ledebur, Canfield, Ohio, assignor to KW Industries, Inc., Sugar Land, Tex.

Continuation-in-part of Ser. No. 472,254, Jan. 30, 1990, abandoned. This application Jun. 11, 1992, Ser. No. 897,010

Int. Cl.⁵ B21D *7/00, 11/08, 37/14*

U.S. Cl. 72—297 **13 Claims**



1. An apparatus for tapering a tube comprising:
a frame;
tube receiving means connected to said frame, said tube receiving means for fixing a tube in position relative to said frame;
variable-orifice die means movable relative to and along said frame, said variable-orifice die means for reducing the diameter of a tube, said variable-orifice die means comprising:
- a variable-orifice die stand comprising:
  - a housing;
  - a plurality of die segments arranged within said housing, each of said die segments having a periphery containing a circular groove of varying radius with cross-sections taken at spaced points along the length of said groove so as to define said varying radius, said grooves of the plurality of die segments defining a trumpet-shaped orifice having an entry plane and an exit plane, each of said die segments being rotatable about an axis of rotation, said axes of rotation of said die segments lying in a plane, said entry plane and said exit plane offset from and parallel to said plane of axes of rotation of said die segments, said orifice being truly round in said exit plane; and
  - die carrier means connected to said die segments for rotating said die segments in a controlled manner;
- a draw carriage rollably connected to said frame, said draw carriage supporting said variable-orifice die stand, said draw carriage having means thereon for moving said draw carriage along said frame; and

axial tension means connected to said tube receiving means, said axial tension means for applying tension forces to a tube fixed within said tube receiving means.

5,315,855

CAM OPERATED HEMMING APPARATUS

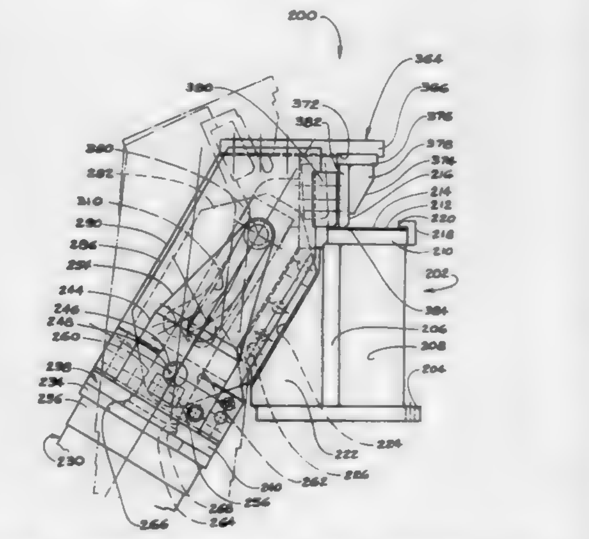
Donald T. Jackson, 1159 Ashley, Troy, Mich. 48098

Continuation-in-part of Ser. No. 784,381, Oct. 29, 1991, abandoned, which is a division of Ser. No. 730,582, Jul. 15, 1991, Pat. No. 5,085,480. This application Feb. 19, 1993, Ser. No. 20,195

Int. Cl.⁵ B21D *39/02*

U.S. Cl. 72—315 **14 Claims**

1. An apparatus for hemming an upstanding flange on a lower workpiece of a stack of at least two workpieces over the edge and into substantial proximity with an overlaying workpiece in the stack, the apparatus comprising:
first guide means having first and second opposed ends, with a first cam means formed in and extending between the first and second ends thereof;
second guide means having first and second opposed ends and a second cam means formed in and extending between the first and second ends thereof;
third guide means having first and second opposed ends and a third cam means formed in and extending between the first and second ends thereof;
a base for supporting a stack of workpieces;
the first guide means being fixedly connected to the base so that the first guide means is immovably mounted;
cam follower means slidably mounted in each of the first, second and third cam means, for traversing the first, second and third cam means;
drive means, connected to the cam follower means, for reciprocatingly driving the cam follower means between opposite ends of the first, second and third cam means simultaneously;



means for pivotally connecting the first, second and third guide means together at the first ends thereof so that the second and third guide means are pivotal with respect to the first guide means;
means for fixedly connecting the drive means to the third guide means so that the drive means pivots with the third guide means;
a hem bar fixedly attached to the second end of the second guide means and pivotal therewith between an open position spaced from the stack of workpieces mounted on the base and a workpiece engaged position in which the hem bar engages and bends a flange on a lower workpiece in the stack over and into substantial proximity with a top surface of an upper workpiece; and
a hold down bar connected to the third guide means and movable therewith between and open position spaced from the base and an engaged position to hold the stack of workpieces in a fixed position on the base during the bending of the flange of the lower workpiece over the edge of the upper workpiece.

5,315,856

APPARATUS FOR PROPELLER STRAIGHTENING

James C. Mackey, Bainbridge Island, Wash., assignor to Lips Propellers, Inc., Chesapeake, Va.

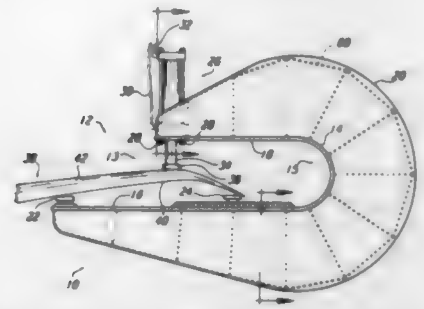
Filed Aug. 7, 1992, Ser. No. 926,835

Int. Cl.⁵ B21D *5/01*

U.S. Cl. 72—389 **19 Claims**

10. An apparatus for straightening a propeller, the apparatus comprising:
an arbor press having first and second opposed surfaces that are interconnected by an interconnecting structure

whereby said arbor press has a generally C-shaped structure, said first and second opposed surfaces being at a sufficient distance apart from each other to allow a blade of the propeller to fit between said first and second opposed surfaces, said arbor press having a depth axis extending along a line parallel to said opposed surfaces and along a line extending generally toward said interconnecting structure and having a depth greater than the distance between said first and second opposed surfaces with said first opposed surface extending beyond said second opposed surface;



first and second pads positioned on said opposed surfaces to provide first and second pressure points against the propeller blade corresponding to the position of said first and second pads, respectively; and

a ram piston positioned on one of said opposed surfaces to provide a third pressure point against the propeller blade, whereby two of said pressure points are applied against a first side of the propeller and the remaining one of said pressure points is applied against a second side of the propeller blade, said ram piston applying pressure to said third pressure point when activated to cause the propeller blade to be straightened between said pressure points.

5,315,857

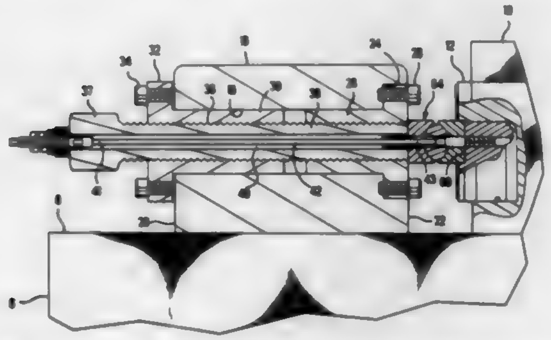
STAMPING AND FORMING MACHINE HAVING IMPROVED COUPLINGS

Johannes C. W. Bakermans, Harrisburg, and Robert B. Gingrich, Elizabethtown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jul. 16, 1992, Ser. No. 915,799

Int. Cl.^{5} B21D *37/04;* B21J *9/18*

U.S. Cl. 72—450 19 Claims



15. A stamping and forming machine comprising a pair of opposed ram blocks which are reciprocable towards and away from each other between forward and retracted positions, strip feeding means for feeding strip material along a strip feed path which extends between the ram blocks, the ram blocks having tooling on their opposed ends for performing operations on the strip material, an actuator for each of the ram blocks comprising a lever which oscillates along an arcuate path, and a coupling between each of the levers and each of the ram blocks, each of the levers being coupled to its associated ram block by a compressive force transmitting means and a tensile force transmitting means, the machine being characterized in that:

the compressive force transmitting means comprises first and second compression blocks and a bearing, the first and second compression blocks being in alignment and in compressive engagement with the ram block and the actuator respectively, the compression blocks having opposed compression block surfaces, the bearing being between the opposed surfaces,

the opposed surfaces being cylindrical and having spaced apart parallel cylinder axes which extend normally of the rectilinear path and normally of the plane of oscillation, the bearing having first and second cylindrical bearing surfaces which are against, and are complementary to, the cylindrical compression block surfaces whereby,

during an operating cycle, in which the lever oscillates along the arcuate path and the ram block reciprocates along the rectilinear path, the first compression block will oscillate about the cylinder axis of its cylindrical surface.

5,315,858

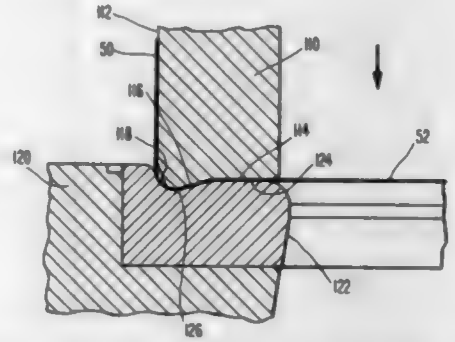
METHODS AND APPARATUS FOR REDRAWING THIN-WALLED CONTAINER BODIES

Dieter K. Naggert, Oak Forest; James J. Tang, Palatine, and Robert J. Gruodis, Palos Hts., all of Ill., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Nov. 20, 1992, Ser. No. 979,279

Int. Cl.^{5} B21D *22/22*

U.S. Cl. 72—350 11 Claims



1. Apparatus for forming a cylindrical, aluminum container body in the shape of a cup with a bottom that has an inside surface by a direct redraw operation, the apparatus comprising:

a direct redraw sleeve comprising an outer cylindrical surface connected to an end surface by a transition surface, wherein the transition surface is displaced from the end surface to define a convoluted surface; and

a direct redraw ring comprising an inner surface connected to a convoluted clamping surface wherein the clamping surface is displaced from a lateral surface wherein the convoluted surface of the end surface and the convoluted clamping surface are substantially parallel and define a convoluted path of a fixed width.

5,315,859

CUSTOM FLOW RESTRICTOR

John Schommer, 2040 Winsome Way, Encinitas, Calif. 92024

Filed Jun. 23, 1992, Ser. No. 902,722

Int. Cl.^{5} F15D *1/00*

U.S. Cl. 73—3 3 Claims

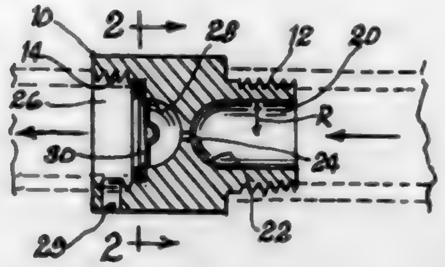
1. For use upstream of a water dispensing fixture, a flow restrictor for insertion in-line in a water line connected to a water dispensing fixture to restrict the water flow through the line, said restrictor comprising:

(a) an in-line restrictor body;

(b) said body having a longitudinal flow passageway and an upstream coupling and a downstream coupling for coupling said body into a water line, said couplings comprising a means to couple the restrictor into a potable water line;

(c) said body defining an upstream water-receiving chamber and a downstream water passing chamber;

(d) an orifice of selectable restrictive diameter between said chambers to limit the flow of water in said passageway; and



(e) each of said chambers being radiused substantially spherically adjacent said orifice with a radius substantially equal to the radius of the respective chambers at cross-sections spaced from the spherical portions, said water-receiving chamber and downstream chamber being substantially identical in volume, and said restrictor being reversible such that said upstream coupling can be coupled in a water lien downstream.

5,315,860

COEFFICIENT-OF-FRICTION MEASURING DEVICE, IN PARTICULAR FOR THE MEASUREMENT OF COEFFICIENTS OF FRICTION DEPENDING ON SPEED

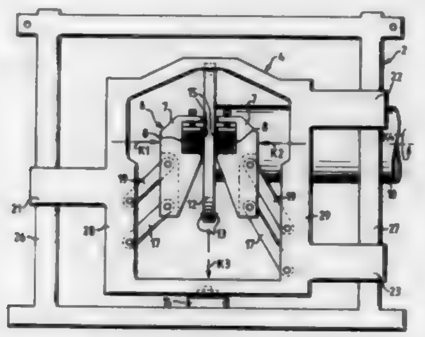
Ludwig Dreilich, Kronberg/Ts; Karl-Friedrich Woersdoerfer, Budenheim; Thomas Egerer, Karben, and Reinhold Worms, Hoexter, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Fed. Rep. of Germany

Filed May 14, 1991, Ser. No. 699,857

Claims priority, application Fed. Rep. of Germany, May 15, 1990, 4015527

Int. Cl.^{5} G01N *19/02*

U.S. Cl. 73—9 16 Claims



1. A device for measuring a characteristic coefficient of friction of a test sample comprising:

guide means;

means defining a friction surface disposed for rotation about an axis;

sample holder means movably supported by said guide means and limited thereby to substantially linear displacement in a vertical plane parallel to said friction surface, said sample holder means operable to selectively displace said sample whereby a face thereof engages said friction surface with a pressing force directed parallel to said axis of rotation, said substantially linear displacement varying as a function of rotational speed of said friction surface at a location offset from said axis to effect a normally directed reaction force; and

means operative to sense said reaction force and generate an output signal in response thereto.

5,315,861

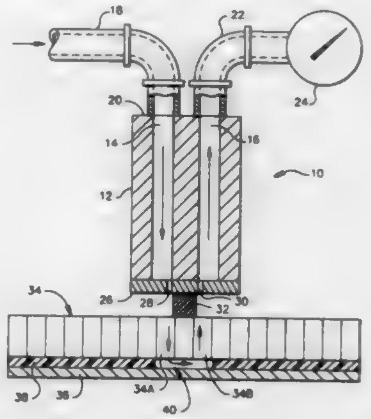
METHOD AND APPARATUS FOR INSPECTION OF OPEN FACE HONEYCOMB STRUCTURES

George P. Egan, Union, Ky.; Karl L. Borneman, Loveland, and Douglas A. Jaeger, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 19, 1992, Ser. No. 963,194

Int. Cl.^{5} G01M *3/26*

U.S. Cl. 73—37 6 Claims



1. A method for detecting defects in a structure formed of a honeycomb matrix bonded to a support, said method comprising the steps of:

providing a probe body including means defining a fluid passage therein, said fluid passage forming a supply port at an exterior surface of said probe body and said probe body further including a receptor port separated from said supply port by a wiper member with a width at least as great as the diameter of one cell of said honeycomb matrix;

connecting a pressurized fluid source to said fluid passage at a location distal from said supply port;

connecting said receptor port to a pressure monitor;

placing said supply port and said receptor port in respective spaced operative relation to a cell and another cell of said honeycomb matrix;

supplying fluid from said compressed fluid source to said cell via said fluid passage; and

monitoring a fluid pressure produced by said compressed fluid at said other cell to detect defects in said structure.

5,315,862

FLOW METER

Detley E. M. Hasselmann, 519 S. Nardo, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 543,355, Jun. 25, 1990, Pat. No. 5,072,621. This application Dec. 5, 1991, Ser. No. 804,233

The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.^{5} G01M *3/08, 3/28*

U.S. Cl. 73—40.5 R 14 Claims

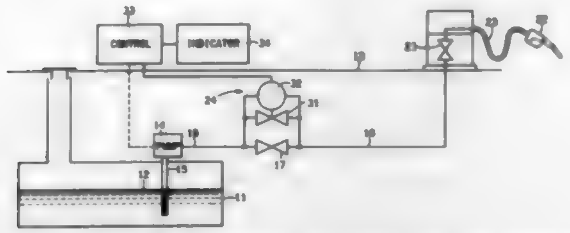
1. A flow meter for sensing low rates of fluid flow in a conduit, said flow meter comprising:

controllable valve means;

a pressure differential sensing device connected in parallel with said controllable valve means;

means for coupling the parallel combination of said controllable valve means and said sensing device to the conduit;

means for operatively coupling said sensing device to said controllable valve means to open and close said controllable valve means in response to fluid pressure changes in the conduit to maintain constant pressure in the conduit; and



indicator means for indicating the fluid flow rate through said controllable valve means.

5,315,863

CONTINUOUS ON-LINE MEASUREMENT OF FLUID OR SLURRY RHEOLOGY

Norman T. Cowper, Northbridge, Australia, assignor to Slurry Systems Pty. Limited, New South Wales, Australia

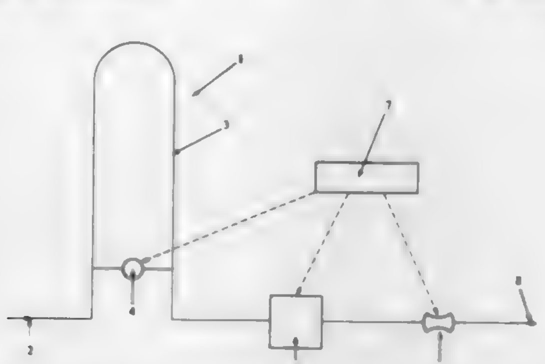
PCT No. PCT/AU91/00096, § 371 Date Sep. 15, 1992, § 102(e) Date Sep. 15, 1992, PCT Pub. No. WO91/14167, PCT Pub. Date Sep. 19, 1991

PCT Filed Aug. 18, 1991, Ser. No. 934,459

Claims priority, application Australia, Mar. 16, 1990, 9165

Int. Cl.^{5} G01N *11/02*

U.S. Cl. 73—54.09 **10 Claims**



1. The combination of an apparatus for on-line measurement of fluid rheology and a fluid flowing therein, said combination comprising:

a non-Newtonian fluid containing entrained air and/or coarse solids, and

an apparatus comprising:

(a) a substantially vertically disposed, inverted U-shaped tube forming an upflowing inlet arm and a downflowing outlet arm,

(b) means for maintaining a constant rate of nonturbulent laminar flow through said tube, and

(c) means for measuring the pressure differential between a point in said inlet arm and a point in said outlet arm of said tube.

5,315,864

START/STOP METHOD TO DETERMINE STATIC GEL STRENGTH

Jim B. Surjaatmadja; Bary J. Nusz, and Gordon A. Turner, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 6, 1993, Ser. No. 43,236

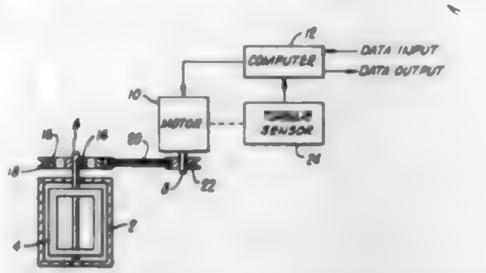
Int. Cl.^{5} G01N *11/14*

U.S. Cl. 73—54.32 **17 Claims**

1. A method of determining static gel strength of a fluid in a container, comprising:

commencing relative movement between the fluid in the container and a member disposed in the fluid in the container so that torque is created;

stopping the relative movement; and



sensing the torque during the time between commencing and stopping the relative movement and detecting the peak torque during such time, wherein the detected peak torque defines the static gel strength of the fluid.

5,315,865

CAPACITIVE TURN ANGLE INDICATOR

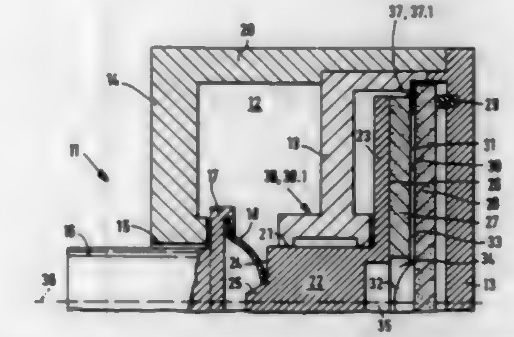
Rudiger Hornfeck, Betzenstein; Klaus Bar; Josef Nagler, both of Lauf, and Manfred Barth, Wildbad/Calmbach, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg and Borg Instruments Verwaltung-GmbH, Remchingen, both of Fed. Rep. of Germany

Filed Jul. 8, 1992, Ser. No. 910,776

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1991, 4124160

Int. Cl.^{5} G01M *19/00*

U.S. Cl. 73—118.1 **12 Claims**



1. Capacitive angular displacement or turn angle indicator, comprising a stationary supporting plate fastened to an apparatus; a movable supporting plate which is rotatable in plan-parallel relationship with said stationary supporting plate being a close spacing therefrom, said plates including oppositely located narrow sector-shaped electrode pattern; a bearing means for the rotatable supporting plate being fastened to the apparatus; and compressively-stressed spacer retainer means in the region of the outer rims of said supporting plates and extending in parallel with the axis of rotation for said movable supporting plate guiding said plates relative to each other.

5,315,866

INDICATING DEVICE, ESPECIALLY FOR INDICATING THE STATE OF PRESSURE OF A TIRE

Nardino Righi, Cologno Monzese, Italy, assignor to Eurafrica Videomatic S.R.L. Societa Per Ricerche, Milan, Italy

Filed Mar. 23, 1993, Ser. No. 35,955

Claims priority, application Italy, Apr. 2, 1992, GE92A000036

Int. Cl.^{5} B60C *23/02*

U.S. Cl. 73—146.5 **29 Claims**

1. An indicating device for indicating a pressure in a tire, which tire is mounted on a rim to form a wheel which has a rotation axis, the device being mounted on the wheel and comprising;

a means for measuring the pressure in the tire;

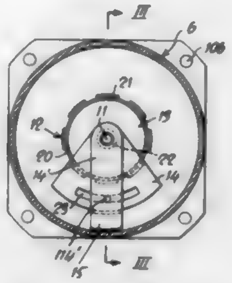
a transducer/transmitter means for converting the measured pressure of the tire to an electrical signal and for transmitting this signal to an electrical unit; and

a source of electrical power for said transducer/transmitter means forming an inductive current generator when the wheel rotates, said source including

  a rotor which is fixed to the wheel coaxially to the axis of the wheel so as to rotate with the wheel,

  a stator which is mounted coaxial with the axis of the wheel so as to be substantially freely rotatable relative to said rotor and about the axis,

  a first counterweight which is fixed relative to said stator such that, as the wheel and said rotor turn together, said first counterweight keeps said stator substantially motionless with respect to said rotor as said first counterweight overcomes a force of magnetic attraction between said stator and said rotor, and



a damping means for damping swinging movement of said first counterweight as the wheel rotates, said damping means including a second counterweight, a mounting means for mounting said second counterweight for free rotation about the axis of the wheel and axially adjacent said first counterweight, and a coupling means for coupling said first counterweight and said second counterweight together to permit only a limited angular displacement about the axis between said first and second counterweights.

5,315,867

APPARATUS FOR MEASURING THE FRACTION OF LIQUID FUEL IN A FUEL TANK

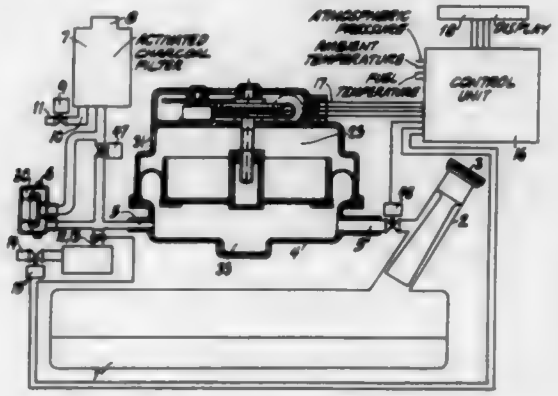
Günter Härtel, Neuss; Karl-Heinrich Lösing, Alpen; Armin Schürfeld, Meerbusch; Johann Blaszczyk, Neuss, and Harald Kerkmann, Düsseldorf, all of Fed. Rep. of Germany, assignors to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Mar. 11, 1992, Ser. No. 850,399

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1991, 4107787; Jun. 27, 1991, 4121185

Int. Cl.^{5} G01F *17/00, 23/14*

U.S. Cl. 73—149 **23 Claims**



1. Apparatus for measuring the quantity of liquid fuel in a fuel tank for an internal combustion engine of a vehicle, said apparatus comprising a cylinder, a membrane in said cylinder dividing the cylinder into first and second chambers, means for connecting the first chamber to the fuel tank, means connecting the second chamber to the atmosphere, drive means acting on said membrane to produce displacement of the membrane in a direction to reduce the size of the first chamber, means for measuring displacement of said membrane from an initial defined position, to a displaced position produced by the drive means, sensor means for measuring gas pressure in a gas space in said fuel tank, means for closing communication of the fuel tank with ambient atmosphere during said measuring, the quantity of fuel in the fuel tank being determined from the pressure and displacement values measured, said drive means comprising an electric drive motor, a step-down transmission connected to said motor to be driven thereby, and a drive spindle mechanism drivingly connected to said transmission to produce displacement of the membrane in response thereto, a vent pipe connected to said fuel tank for venting the fuel tank to ambient atmosphere, said vent pipe including a first section connected to said first chamber and said fuel tank and a second section connected to ambient atmosphere and valve means for controlling communication between said first chamber and said second section of the vent pipe, said valve means comprising a valve member normally closing communication between said first chamber and said second section of said vent pipe, said valve member being openable in response to displacement of said membrane as produced by said spindle mechanism to provide communication between said first and second sections of said vent pipe.

5,315,868

SENSOR FOR DETECTING THE INFLUENCE OF CROSS WIND ON A VEHICLE

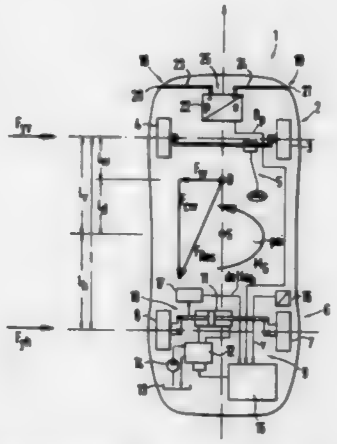
Stefan Jacobi, Sindelfingen, and Volker Berkefeld, Renningen, both of Fed. Rep. of Germany, assignors to Ing. H.C.F. Porsche AG, Fed. Rep. of Germany

Filed Aug. 20, 1992, Ser. No. 933,200

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1991, 4127726

Int. Cl.^{5} G01C *21/00*

U.S. Cl. 73—178 R **26 Claims**



2. Apparatus for detecting the influence of cross wind on the handling of a vehicle having a vehicle body, said apparatus comprising pressure measuring elements arranged on opposite sides of an outer skin of the vehicle body, wherein the pressure measuring elements comprise as bores in the outer skin of the vehicle body, and a differential pressure sensor, which detects a differential pressure between said opposite sides, is arranged centrally between said pressure measuring elements, said differential pressure sensor being connected with said bores by way of lines, which have substantially the same length.

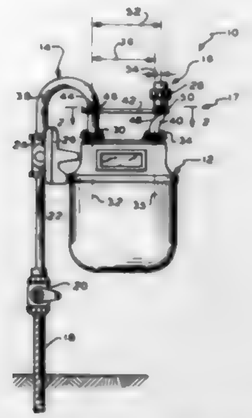
5,315,869
GAS METER ASSEMBLY

Joseph Bier, Warren, and Richard Fox, Cliffside Park, both of N.J., assignors to Richards Manufacturing Company, Sales Inc., Irvington, N.J.

Filed Mar. 10, 1992, Ser. No. 848,859

Int. Cl.⁵ G01F *15/18*

U.S. Cl. 73—201 **4 Claims**



1. A gas meter assembly comprising: a gas meter having inlet and outlet connections, an inlet means, an outlet means, and connector means, said connector means having a U-shaped inlet pipe, a Z-shaped outlet pipe and a strut, said strut having a first hole with a first axis receiving the inlet pipe and having a second hole with a second axis receiving the outlet pipe, said Z-shaped outlet pipe having a first end portion rotatably adjustable about the second axis relative to the strut for rotatably adjusting a third axis of a second end portion about the second axis for adjusting the spacing between the first axis and the third axis to match a spacing between the meter inlet and outlet connections, wherein the strut first hole is a tapped hole for forming a fixed connection to the U-shaped inlet pipe, and the strut second hole is an oversize hole for ease of rotation of the outlet pipe about the second hole axis relative to the strut, wherein the strut is shaped as formed from a first straight section, a second straight section and a third straight section, wherein the first straight section defines a first longitudinal direction, wherein the second section is connected to the first section and disposed at an angle relative to the first section, and wherein the third section is connected to the second section at an angle and is disposed substantially parallel to the first section.

5,315,870
HOUSING FOR AN AIR FLOW RATE METER

Thomas Schwegel, Vaihingen/Enz, and Hans-Peter Stiefel, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

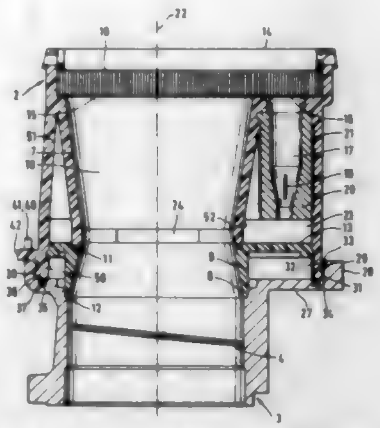
Filed Aug. 28, 1992, Ser. No. 936,962

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1991, 4128448

Int. Cl.⁵ G01F *5/00*

U.S. Cl. 73—202.5 **16 Claims**

1. A housing for an air flow rate meter, comprising an upper housing part with an inner convergent, nozzle-like segment and a lower housing part with an inner divergent, nozzle-like segment, wherein the inner convergent segment and the inner divergent segment form a Venturi nozzle, an air bypass line in which an air flow rate meter is disposed, said air bypass line begins upstream of the inner convergent segment and discharges into the Venturi nozzle, the lower housing part is coupled to a flow conduit body, and the upper housing part (2) is joined to the flow conduit body (3) by means of a detent connection (29, 30, 31).



5,315,871
THERMAL FLOWMETER WITH DETECTING ELEMENT SUPPORTED BY SUPPORTS HAVING ENGAGING PORTIONS

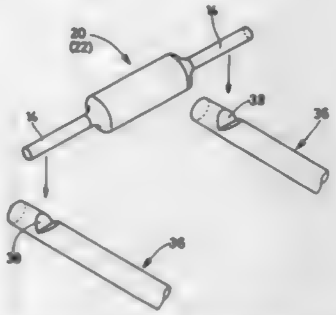
Yasuhito Yajima, Nagoya; Zenji Ishikawa, Anjo, and Syuichi Yamauchi, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 705,651, May 24, 1991, Pat. No. 5,224,378. This application Mar. 26, 1993, Ser. No. 37,447

Claims priority, application Japan, May 31, 1990, 2-58058

Int. Cl.⁵ G01F *1/68*

U.S. Cl. 73—204.25 **4 Claims**



1. A thermal flowmeter for determining a parameter of a fluid flowing through a passage, including a detecting element, and a pair of electrically conductive supports fixed to a wall defining said passage for supporting said detecting element, said detecting element comprising a substrate, an electrically resistive body disposed on said substrate and having an electrical resistance which varies with an ambient temperature, and a pair of electrical conductors provided at opposite ends of said substrate and electrically connected to said electrically resistive body, each of said electrical conductors having a circumferential surface, said electrically conductive supports having respective engaging portions which engage said electrical conductor, respectively, said detecting element being positioned in said passage such that said electrical conductors are secured by welding to said respective engaging portions of said pair of electrically conductive supports, wherein each of said engaging portions has notch means for engaging said circumferential surface of a corresponding one of said electrical conductors to position said detecting element with respect to said wall of said passage and thereby establish a consistent amount of heat flow from said detecting element to said wall of said passage, said notch means of one of said engaging portions being open in the same direction as said notch means of the other of said engaging portions.

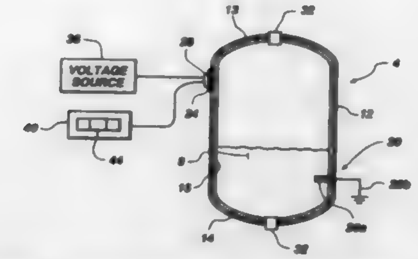
5,315,872
LIQUID LEVEL SENSOR FOR ELECTRICALLY CONDUCTIVE LIQUID

Daniel J. Moser, Magna, Utah, assignor to Edo Corporation, Fiber Science Division, Salt Lake City, Utah

Filed May 11, 1993, Ser. No. 62,909

Int. Cl.⁵ G01F *23/22*

U.S. Cl. 73—304 C **14 Claims**



1. A liquid level sensor for determining the level of an electrically conductive liquid in a receptacle comprising:
electrically conductive, fiber-reinforced composite walls defining the receptacle, and including an outer surface and an inner surface,
a non-conductive liner disposed in the receptacle against the inner surface thereof to define a volume for receiving the electrically conductive liquid,
means for developing an electrical capacitance between the receptacle walls and the liquid contained in the receptacle, said capacitance varying with variation in the level of the liquid, and
means for measuring the capacitance to thereby provide a measure of the level of the liquid.

5,315,873
LIQUID LEVEL DETECTION APPARATUS AND METHOD THEREOF

Dong Z. Jin, Chiba, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

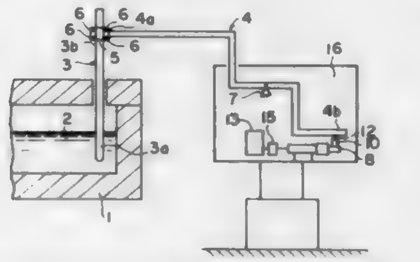
PCT No. PCT/JP91/00270, § 371 Date Oct. 28, 1991, § 102(e) Date Oct. 28, 1991, PCT Pub. No. WO91/13324, PCT Pub. Date Sep. 5, 1991

PCT Filed Feb. 28, 1990, Ser. No. 772,352

Claims priority, application Japan, Feb. 28, 1990, 2-48344; Mar. 7, 1990, 2-55778; Mar. 27, 1990, 2-77216; Mar. 27, 1990, 2-77217; Mar. 27, 1990, 2-77218; Mar. 30, 1990, 2-83462

Int. Cl.⁵ G01F *23/00*

U.S. Cl. 73—309 **44 Claims**



1. A liquid level detection apparatus, comprising:
a probe having a first end inserted into liquid and a second end positioned outside of the liquid, and which first end is provided buoyancy in response to a level of said liquid;
a fulcrum;
an arm coupled to said fulcrum, having a fixed end affixed to said second end of said probe, and a free end opposite to said fixed end, and having a force applied to said free end through said fulcrum in response to the buoyancy of said probe;
force detecting means, provided abutting said free end of said arm, for detecting a force applied to said free end of said arm; and
signal processing means for inputting a detection signal from said force detecting means, suppressing a predetermined frequency component contained in said detection signal, and calculating an insertion depth of said probe into said liquid to determine said level of said liquid.

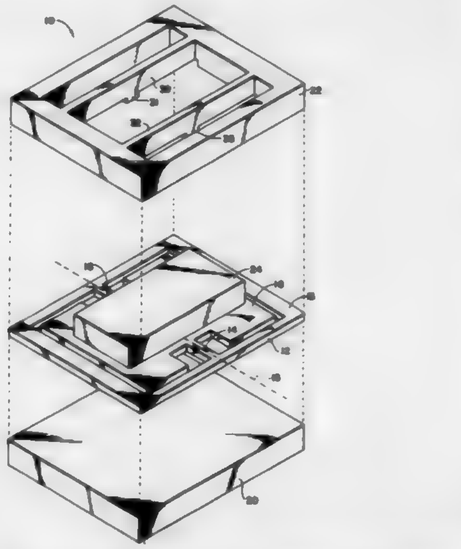
5,315,874
MONOLITHIC QUARTZ RESONATOR ACCELEROMETER

Anthony Petrovich, Tewksbury; Marc S. Weinberg, Needham, and John R. Williams, Lexington, all of Mass., assignors to The Charles Stark Draper Laboratories, Cambridge, Mass.

Filed Feb. 28, 1989, Ser. No. 316,873

Int. Cl.⁵ H01L *21/306, 41/00*

U.S. Cl. 73—493 **21 Claims**



21. A monolithic quartz resonator accelerometer, comprising:
a monolithic quartz sensing structure including:
  a frame;
  a proof mass support structure within said frame; and
  a pair of axially aligned elongated beam resonator structures interconnecting said frame and said support structure;
a proof mass fixed to said support structure;
a first quartz support plate on one side of said sensing structure and a second quartz support plate on the opposite side of said sensing structure for securing said sensing structure, said support plates having the same crystallographic orientation as said sensing structure;
at least one of said support plates having hinge means projecting toward said sensing structure proximate said resonator structures for clamping said resonator structures proximate said support structure;
electrode means on said resonator structures;
means for energizing said electrode means to vibrate said resonator structures at a frequency dependent on the force applied to said resonator structures along said alignment axis;
means, responsive to said means for energizing, for determining the difference in vibration frequency of said resonator structures; and
means, responsive to said means for determining, for establishing the acceleration of said proof mass in the direction of said alignment axis.

5,315,875

PRESSURE SENSOR FOR DETECTING THE PRESSURE IN THE COMBUSTION CHAMBER OF INTERNAL-COMBUSTION ENGINES

Walter Benedikt, Kornwestheim; Manfred Vogel, Ditzingen-Heimerdingen; Werner Herden, Gerlingen; Johann Konrad, Tamm; Wolfgang Schmidt, Vaihingen/Enz; Josef Tosch, Schwieberdingen, and Matthias Kuessel, Korntal-Muenchingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

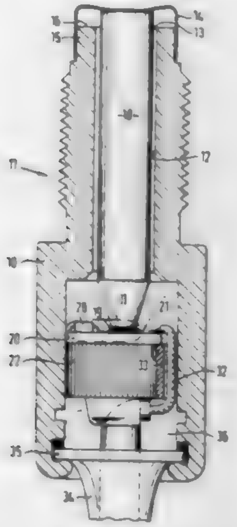
PCT No. PCT/DE91/00526, § 371 Date Mar. 3, 1992, § 102(e) Date Mar. 3, 1992, PCT Pub. No. WO92/01914, PCT Pub. Date Feb. 6, 1992

PCT Filed Jun. 27, 1991, Ser. No. 838,237

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1990, 4022782

Int. Cl.⁵ G01L *7/08, 9/06*

U.S. Cl. 73—706 **15 Claims**



1. A pressure sensor for detecting pressure in a combustion chamber of internal combustion engines, comprising a housing having an opening; a sensor element composed of a piezo-resistive material and arranged in said housing; a diaphragm fixedly mounted on said housing in the region of said opening of said housing so as to close said opening; a punch introducing a pressure to be determined onto said sensor element and located in said housing between said diaphragm and said sensor element, said punch having an end which bears against an inner surface of said diaphragm, said punch also having a counterbearing; a hybrid having a base; and a preprocessing circuit having electronic components, said sensor element, said hybrid with its base and said electronic components of said preprocessing circuit being located on said counterbearing of said punch.

5,315,876

PURGE GAS PRESSURE MONITORING SYSTEM

Eugene A. Glassey, and Ralph A. Loh, both of San Diego, Calif., assignors to Fluid Data Systems, San Diego, Calif.

Filed May 14, 1992, Ser. No. 883,143

Int. Cl.⁵ G01L *9/00, 19/04*

U.S. Cl. 73—708 **9 Claims**

1. A purge gas pressure monitoring system, comprising:

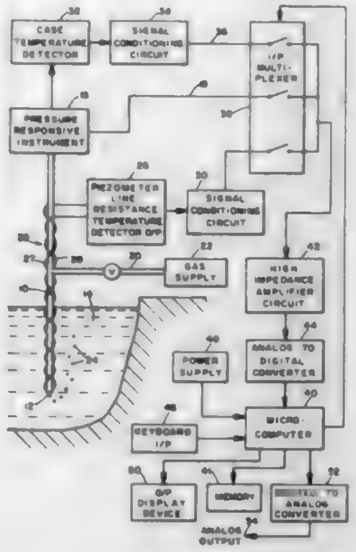
a piezometer line having a first, outlet end for submerging in a medium to be monitored and a second end;

a gas supply connected to the piezometer line for injecting gas into the medium in the form of bubbles from the outlet end of the piezometer line;

a pressure-responsive instrument connected to the second end of the piezometer line for producing a first output signal proportional to the pressure at the second end of the piezometer line;

a temperature detector device extending along the length of the piezometer line for producing a second output signal proportional to the average temperature along the piezometer line;

data processing means connected to monitor said first and second output signals at periodic intervals for producing a corrected output signal after each interval in which said first output signal is corrected for variations in said second output signal from a reference temperature;


CASE TEMPERATURE DETECTOR
SIGNAL CONDITIONING CIRCUIT
I/P MULTI-PLEXER
PRESSURE RESPONSIVE INSTRUMENT
PIEZOMETER LINE RESISTANCE TEMPERATURE DETECTOR O/P
SIGNAL CONDITIONING CIRCUIT
GAS SUPPLY
HIGH IMPEDANCE AMPLIFIER CIRCUIT
ANALOG TO DIGITAL CONVERTER
POWER SUPPLY
KEYBOARD I/P
MICRO-COMPUTER
O/P DISPLAY DEVICE
MEMORY
TO ANALOG CONVERTER
ANALOG OUTPUT

said data processing means including memory means for storing program instructions and data;

display means linked to said data processing means for displaying said corrected output signal to an operator; and

input means linked to said data processing means for operator input of commands and data.

5,315,877

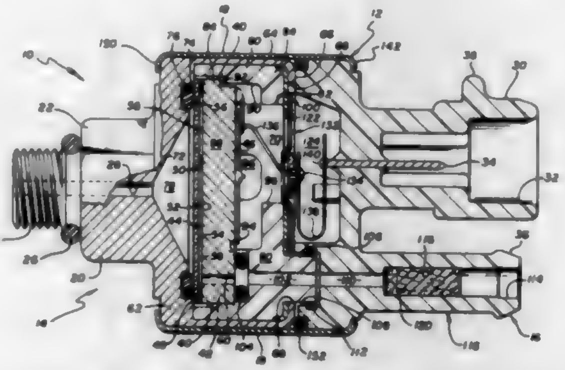
LOW COST VERSATILE PRESSURE TRANSDUCER

Kyong M. Park, Thousand Oaks, and Abrar A. Tirmizi, Simi Valley, both of Calif., assignors to Kavlico Corporation, Moorpark, Calif.

Filed Feb. 19, 1993, Ser. No. 19,595

Int. Cl.⁵ G01L *9/12*

U.S. Cl. 73—724 **18 Claims**



1. A versatile low-cost gauge or differential pressure transducer usable at high pressures, said pressure transducer comprising:

a cup-shaped electrically conductive and high strength high-pressure fitting member having an integral end wall and side wall cooperatively defining a cavity, said side wall defining an axial opening to said cavity, and said end wall outwardly defining an axial boss portion with a nipple for connection of said transducer to a first source of pressurized fluid, inwardly said end wall defining a conical recess circumscribed by a sealing feature for sealing cooperation with a pressure sensor module receivable into said cavity, and a passage communicating said nipple with said conical recess;

a pressure sensor module including a disk-like substrate portion on one side thereof sealingly carrying a disk-like diaphragm portion cooperating with said substrate portion to define an internal chamber, said diaphragm portion outwardly defining an axial pressure-responsive face for said pressure sensor module, said diaphragm portion and said substrate portion each carrying respective conductive coatings in said internal chamber which coatings cooperatively define a variable capacitor varying in capacitance in response to pressurized fluid effective upon said diaphragm portion, said substrate portion on the other side thereof carrying a hybrid integrated circuit electrically responsive to changes in said variable capacitor to provide an output signal indicative of a pressure level of said pressurized fluid effective on said diaphragm portion, said pressure sensor module being received into said cavity and at said pressure-responsive face thereof sealingly cooperating with said sealing feature of said end wall to bound a high-pressure chamber in said recess;

a cup-shaped spacer member received into said cavity and defining a respective cavity axially receiving said pressure sensor module with said pressure-responsive face disposed away from a respective end wall of said spacer member, said cup-shaped spacer member being disposed oppositely to said cup-shaped fitting member to capture said sensor module between the respective end walls of each and to urge said module sealingly into engagement with said sealing feature;

said side wall of said high-pressure fitting member defining a radially inwardly extending lip portion defining said opening to said cavity and forcefully cooperating with said spacer member to urge both the latter toward said end wall and said pressure sensor module into sealing engagement with said sealing feature;

electrically conductive plate means at said opening to said high-pressure fitting member for on the one hand closing said opening and on the other hand for connecting said output signal therethrough externally of said cavity;

an electrical connector member axially juxtaposed with said high-pressure fitting member at said opening thereof and including an axial surface engaging said lip portion, said connector member including electrical connectors for connecting said output signal externally of said transducer;

each of said substrate portion, said spacer member, and said connector member defining respective passages communicating with one another and with said internal chamber of said pressure sensor module, said connector member also defining a port communicating with said passages and opening thereon in a respective nipple for communication of said transducer alternatively with ambient pressure or with a second source of pressurized fluid, a filter assembly disposed in one of said passages for excluding particulates and liquid moisture; and

a tubular member receiving both said high-pressure fitting member and said connector member in axial juxtaposition, said tubular member at each end thereof including a radially inwardly extending lip part engaging a respective one of said connector member and said high-pressure fitting member to forcefully urge these members toward one another;

whereby said high-pressure fitting member and said tubular member cooperatively provide a duality of axial support urging said pressure sensor module into sealing engagement with said sealing feature in opposition to fluid pressures communicating to said high-pressure chamber.

5,315,878

MEASURING HEAD FOR A PRESSURE-MEASURING DEVICE WITH A PRESSURE SENSOR FOR THE SIMULTANEOUS ACTUATION OF A SWITCHING CONTACT

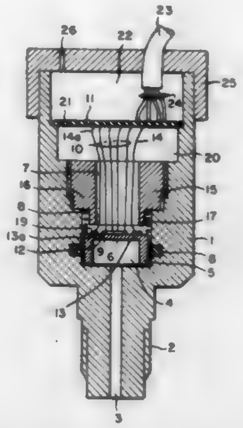
Torsten Birenheide, Krummesse, Fed. Rep. of Germany, assignor to Dragerwerk AG, Lubeck, Fed. Rep. of Germany

Filed Jan. 7, 1993, Ser. No. 1,164

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1992, 4205264

Int. Cl.⁵ G01L *7/08, 9/06*

U.S. Cl. 73—727 **7 Claims**



1. Fluid pressure measuring device measuring head for obtaining a signal proportional to a pressure to be determined, comprising:

a sensor housing with a fluid pressure inlet opening;

a sensor element forming a flat diaphragm separating an interior of said sensor housing into a pressure chamber and a reference chamber, said flat diaphragm undergoing deformation proportional to a pressure value as a consequence of pressure occurring in said pressure chamber, said diaphragm having a contact surface for engagement with an electrical switching contact, said electrical switching contact being positioned stationarily relative to the movement of said diaphragm wherein said contact surface engages said electrical switching contact after said diaphragm has performed a predeterminable deflection, said diaphragm being blocked in a position corresponding to said predeterminable deflection and undergoing deformation under an effect of pressure occurring in said pressure chamber; and

deformation sensing means connected to said diaphragm for generating an electrical signal based on said deformation, as a measured pressure value.

5,315,879

APPARATUS FOR PERFORMING NON-DESTRUCTIVE MEASURMENTS IN REAL TIME ON FRAGILE OBJECTS BEING CONTINUOUSLY DISPLACED

Michel Crochon, Aix-en-Provence, and Véronique F. Bellon, Montpellier, both of France, assignors to Centre National du Machinisme Agricole du Genie Rural des Eaux et des Forets CEMAGREF, Antony, France

Filed Jul. 30, 1992, Ser. No. 922,626

Claims priority, application France, Aug. 1, 1991, 91 10098

Int. Cl.⁵ G01N *3/40*

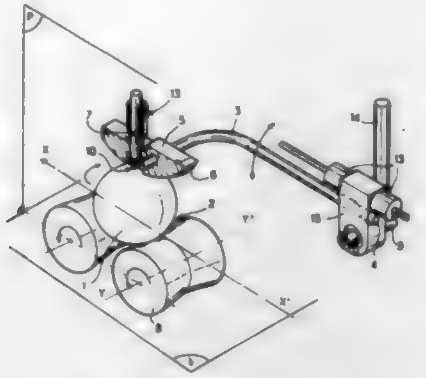
U.S. Cl. 73—818 **10 Claims**

1. Measurement apparatus for performing non-destructive measurements on fragile objects of non-uniform size and shape that are generally in the form of bodies of revolution about at least one axis and that are moving continuously on a conveyor system of the type including object-receiving cells in which said objects are placed and driven one by one along a given directional plane, the measurement apparatus comprising:

at least one support arm which is stationary and hinged at one end;

a shoe secured to the other end of said arm and having a bottom surface in cylinder form, generator lines of which are perpendicular to a directional plane, said shoe extending on either side of said directional plane, whereby said shoe may be situated above a conveyor system that drives objects along said directional plane such that each of said objects lifts the shoe and rolls by relative rotary motion beneath and against said surface; and

at least one sensor at said surface for enabling a non-destructive measurement to be performed of a parameter of each of said objects as it moves past beneath said shoe.



5,315,880

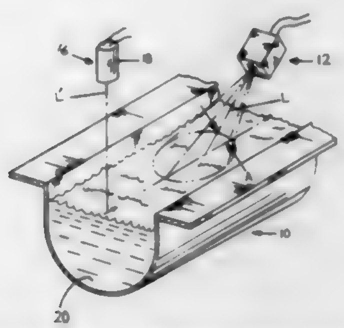
METHOD FOR MEASURING FLUID VELOCITY BY MEASURING THE DOPPLER FREQUENCY SHIFT OR MICROWAVE SIGNALS

Michael R. Bailey, Bowling Green, Ohio, assignor to Henry Filters, Inc., Bowling Green, Ohio

Filed Aug. 13, 1992, Ser. No. 928,710

Int. Cl.^{5} G01F *1/66*

U.S. Cl. 73—861.25 **8 Claims**



1. A non-invasive method for measuring the velocity of a free fluid surface flowing in a predetermined direction in an open channel or flume of a fixed shape comprising the steps of:

generating a microwave frequency electrical signal adapted to reflect from said fluid surface using a means to generate said electrical signal;

spacing the means to generate said electrical signal from said fluid surface;

directing said signal along a line toward the fluid surface and opposite the predetermined direction and at an angle of between 30 and 40 degrees to said fluid surface;

detecting the signal reflected from the fluid surface; and

determining from the directed and reflected signal the Doppler frequency shift therebetween as a measure of the velocity of the fluid surface.

5,315,881

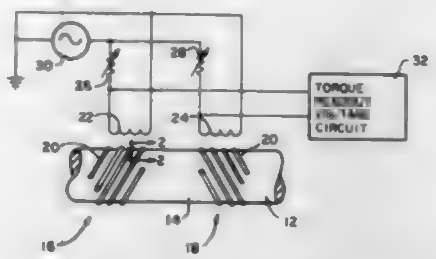
MAGNETOSTRICTIVE TORQUE SENSOR

Howard T. Savage, Greenbelt; Arthur E. Clark, Adelphi; Marilyn Wun-Fogle, Gaithersburg; Lawrence T. Kabacoff, Columbia, all of Md.; Antonio Hernando, Madris, Spain, and Bruce Belhoff, Wauwatosa, Wis., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 374,112, Jun. 21, 1989. This application Oct. 23, 1992, Ser. No. 965,329

Int. Cl.^{5} G01L *3/02*

U.S. Cl. 73—862.333 **9 Claims**



1. In a sensor positioned on a surface of a member for measurement purposes, said sensor having an elongated magnetorestrictive element made of an amorphous magnetic material deformed under stress into fixed relation to the member on a contacting portion of said surface thereof, the improvement residing in said element having a non-planar cross-section establishing a surface-to-volume ratio preselected to minimize said contacting portion of said surface of the member during measurement thereof.

5,315,882

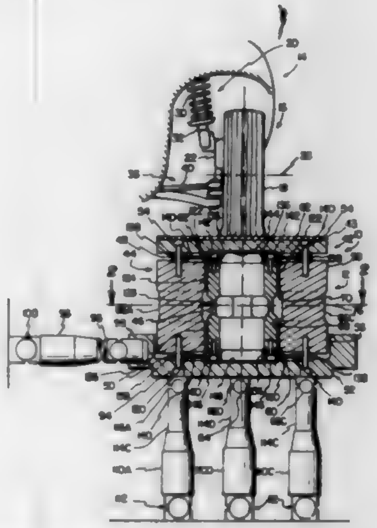
SIX AXIS LOAD CELL

Richard A. Meyer, Carver, and Douglas J. Olson, Plymouth, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Mar. 23, 1992, Ser. No. 856,118

Int. Cl.^{5} G01L *1/00*

U.S. Cl. 73—862.044 **17 Claims**



1. A structural assembly having a first loading member and a second loading member, the structural assembly transmitting selected forces and moments from the first loading member to the second loading member, and isolating the selected forces and moments with respect to a plurality of orthogonal axes as strain in structural elements of the assembly, the assembly comprising:

a support structure having a first end joined to the first loading member and a second end joined to the second loading member, the first end and the second end defining a structure longitudinal axis wherein the support structure is oriented such that the structure longitudinal axis is at a known relationship to a longitudinal axis of the plurality of orthogonal axes, and having connection means connecting the first end with the second end such that the support structure is substantially rigid for forces along the orthogonal axes and for moments about the orthogonal axes other than the longitudinal orthogonal axis, and substantially compliant for moments about the longitudinal orthogonal axis;

a torque cell having a torque cell longitudinal axis concentrically positioned about the support structure such that the torque cell longitudinal axis is substantially parallel to the structure longitudinal axis, the torque cell measuring moments about the structure longitudinal axis; and

flexure means connecting the support structure to the torque cell, the flexure means substantially rigid to transmit moments about the structure longitudinal axis from the support structure to the torque cell and substantially compliant to forces and moments along and about the orthogonal axes other than the moment about the longitudinal orthogonal axis.

5,315,883

LOAD MEASURING DEVICE

Johannes Wirth, Zurich, Switzerland, assignor to Wirth Gallo Messtechnik AG, Zurich, Switzerland

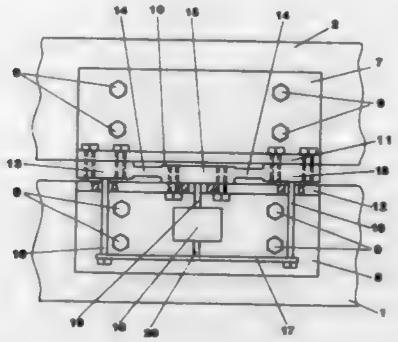
PCT No. PCT/CH91/00207, § 371 Date Jun. 4, 1992, § 102(e) Date Jun. 4, 1992, PCT Pub. No. WO92/06357, PCT Pub. Date Apr. 16, 1992

PCT Filed Oct. 2, 1991, Ser. No. 853,711

Claims priority, application Switzerland, Oct. 8, 1990, 3237/90

Int. Cl.^{5} G01L *1/00*

U.S. Cl. 73—862.59 **16 Claims**



1. Load measuring device for large weighing platforms comprising:

at least three force measuring devices that together bear the load of the body and the weighed material,

said force measuring devices are mounted laterally both on said chassis (1) and said frame (2), wherein said force measuring devices are the only supporting connections between said chassis (1) and said frame (2), said force measuring devices comprising a primary spring that bears the main load and having a first end and a second end, a secondary spring having a first end and a second end, and a force transducer, wherein said first end of said primary spring is connected to said first end of said secondary spring, and wherein said force transducer connects between said second end of said secondary spring and said second end of said primary spring,

wherein said primary spring in each force measuring device comprises at least one flexural spring of the leaf spring type (10, 31, 34), wherein said secondary spring in each force measuring device also comprises at least one flexural spring of the leaf spring type (17, 28, 32), wherein said force transducer (18) having at least one oscillating cord that measures the force flow over the secondary spring, and

wherein said flexural springs of the leaf spring type (10, 31, 34) exhibit flat inertia ellipses.

5,315,884

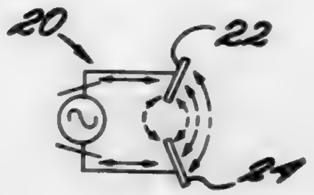
CAPACITIVE PROXIMITY SENSOR

James W. Kronberg, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 461,962, Jan. 8, 1990, Pat. No. 5,046,371. This application Sep. 9, 1991, Ser. No. 756,669

Int. Cl.^{5} G01L *1/16*

U.S. Cl. 73—862.68 **14 Claims**



1. A device for measuring the proximity of an object, said device comprising:

at least one pair of conducting plates, each of said at least one pair having a first plate and a second plate, said first plate spaced apart and disposed with respect to said second plate so that a displacement current is formed therebetween when an electrical voltage is applied between said first and said second plates, said first and second plates disposed at an angle to concentrate said displacement current;

means for generating a voltage signal for each of said at least one pair of conducting plates, each voltage signal having a phase and an amplitude, said phases and amplitudes selected so that the sum of the instantaneous voltage on said at least one pair of conducting plates is constant, and applying each said voltage signal to a pair of said at least one plates,

said at least one pair of plates having an electrical current circulating thereamong when said voltage signals are applied by said generating means, said electrical current circulating at a frequency,

said frequency varying with the proximity of said object; and

means in electrical communication with said at least one pair of plates for determining said frequency,

said generating means further comprising a series of inverting logic gates.

5,315,885

SAMPLE DISPERSING APPARATUS AND METHOD

W. Jay Szinyei, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 828,019, Jan. 30, 1992, Pat. No. 5,241,868. This application Jan. 19, 1993, Ser. No. 6,384

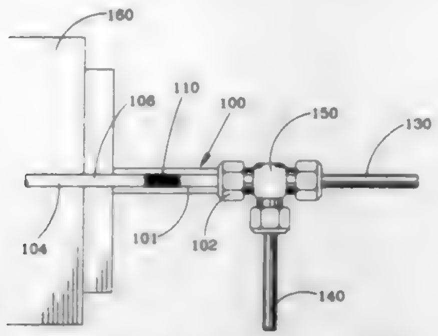
Int. Cl.^{5} G01N *30/68, 31/12*

U.S. Cl. 73—863.71 **7 Claims**

1. An apparatus for dispersing a sample in a fluid carrier to form a sample/carrier mixture for preparing the mixture to engage a pyrolysis furnace or the like, the fluid carrier for sweeping or transporting the sample, the apparatus comprising:

(a) a conduit having an inlet, an outlet and an intermediate section, the inlet for receiving the sample and the carrier, and the outlet for egressing the sample/carrier mixture, such that the mixture is formed in the intermediate section sufficiently remote from the pyrolysis furnace as to avoid decomposition or transformation of the sample/carrier mixture by heat from the furnace during the pendency of the sample/carrier mixture in the intermediate section, and

(b) a dispersing device for uniformly mixing the sample within the fluid carrier regardless of the geometry of the conduit by requiring the sample and carrier to flow through a tortuous path such that said dispersing device is passive and inactive with respect to moving parts whereby the mixing results from the indirect, circuitous flow of the sample and carrier caused by said dispersing device.



5,315,886
APPARATUS FOR DRAWING OFF AND DISPENSING A PREDETERMINED QUANTITY OF A LIQUID

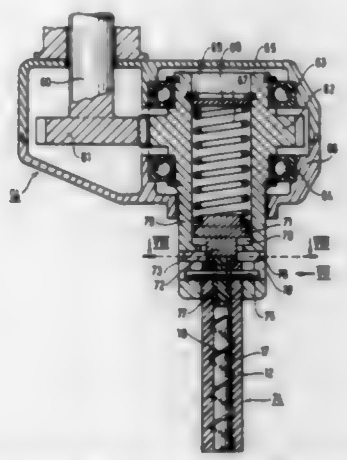
Jean Guigan, 5, rue des Ursulines, 75005 Paris, France

Filed Nov. 1, 1991, Ser. No. 787,087

Claims priority, application France, Jun. 28, 1991, 91 08075

Int. Cl.^{5} B01L *3/02*

U.S. Cl. 73—864.02 **5 Claims**



1. In an apparatus for drawing off and dispensing a predetermined quantity of liquid, said apparatus including a tube designed to contain said predetermined quantity of liquid, said tube having an open end the improvement wherein said tube is closed at an end opposite from said open end via which said liquid is both drawn in and dispensed, an inside volume of said tube corresponds to said predetermined quantity, said tube being rotated about an axis by drive means, said tube being spaced at a sufficient distance from said axis over the complete length of the tube from said closed end to said open end, such that said tube winds around said axis, and when said drive means rotate the tube at high speed in one direction, said tube is fully filled with liquid with said open end immersed in liquid, and when said drive means rotate said tube at high speed in the opposite direction, said tube is fully emptied of the liquid the tube contains.

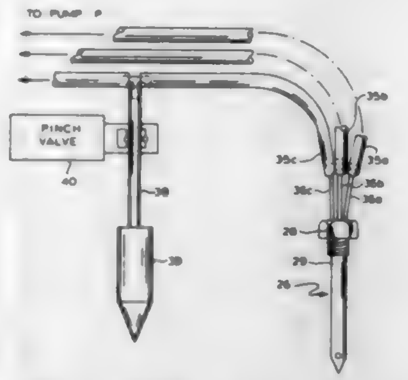
5,315,887
MULTIPORT EQUALIZATION PROBE

Robert G. Heitel, Laguna Beach, Calif., assignor to Baxter Diagnostics Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 376,714, Jul. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 210,695, Jun. 23, 1988, Pat. No. 4,951,512. This application Sep. 9, 1991, Ser. No. 756,735

Int. Cl.^{5} G01N *1/14*

U.S. Cl. 73—864.11 **6 Claims**



1. In a sampling and cleaning apparatus with a pump assembly which includes a pump and a plurality of conduits through which the pump moves material, a cleaning needle for extending into a sealed container through a closure of the container to remove material from the container, said needle including an elongate body having a first and second end, a plurality of lumens in the body, an inlet opening for each lumen, said openings being disposed in a side of the body proximate the first end of the body, and an outlet opening proximate or at the second end of the body for each lumen, said elongate body being closed and sharpened at the first end, said pump assembly conduits being in communication with the lumen outlets, said pump assembly including a conduit for each lumen, each conduit connecting the corresponding lumen to the pump and combining with the corresponding lumen to define a vacuum chamber for removing a predetermined material.

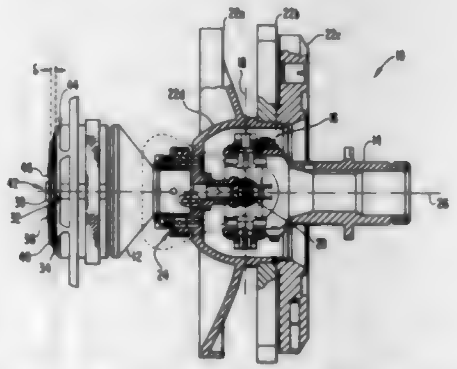
5,315,888
GYRO NUTATION DAMPER

David S. Amberntson, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Dec. 22, 1992, Ser. No. 995,080

Int. Cl.^{5} G01C *19/04*

U.S. Cl. 74—5.5 **13 Claims**



1. An apparatus for damping nutational motion of a body, the body having a rotating portion subject to nutational motion and a non-rotating portion coupled to the rotating portion and responsive to nutational motion, the rotating body portion defining an axis of rotation, the apparatus comprising:

a movable damping body having an exposed surface substantially perpendicular to the axis of rotation and a center on the axis of rotation;

a guide member having a surface contacting said exposed damping body surface,

said guide member being attached to the non-rotating body portion, and

said guide member surface being oriented to constrain the movement of said movable damping body in directions substantially perpendicular to the axis of rotation;

elastic elements operatively connected between the non-rotating body portion and said damping body for restoring said damping body to a rest position on said guide member surface following relative movement of said damping body away from said rest position as a result of nutational, motion-induced forces; and

friction means, responsive to relative movement between said exposed damping body surface and said guide member surface, for providing dissipation of the inertial energy imparted to said damping body and said non-rotating body portion by nutational motion.

5,315,889
IRIS DRIVE MECHANISM

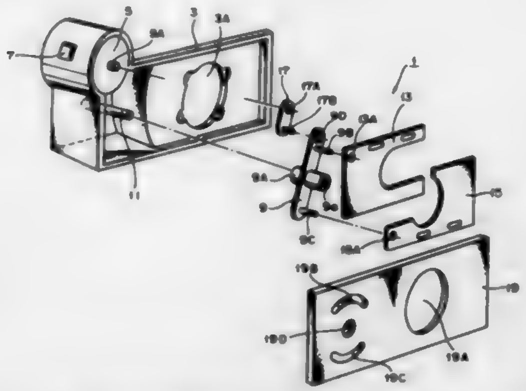
Shuuji Moro; Kanehiro Tada; Yasuo Nishida, all of Tokyo, and Eiji Ohshima, Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Filed Jun. 18, 1992, Ser. No. 900,276

Claims priority, application Japan, Jun. 28, 1991, 3-159087

Int. Cl.^{5} F16H *21/44*

U.S. Cl. 74—105 **3 Claims**



1. An iris drive mechanism having first and second diaphragms which are slidable in first and second opposed directions and which control the size of an aperture, comprising:

a first lever which is pivotally supported on a housing so as to be pivotal about a first axis which passes through essentially the mid-point of said first lever;

first and second pins which are mounted on said first lever proximate first and second ends of said first lever and at essentially equal distances from the first axis, said first and second pins being received in openings formed in said first and second diaphragms, respectively;

an elongate opening formed in said first lever at a location outboard of said first pin;

a motor having a drive shaft;

a second lever which is rigid with said drive shaft, said second lever having a third pin which is received in said elongate opening, said second lever being relatively short as compared to said first lever;

said first and second levers cooperating to define means for displacing said first and second diaphragms:

a) relatively slowly at a first variable rate of displacement through a first initial stage wherein the aperture formed by said first and second diaphragms changes from a minimal opening degree to a first predetermined opening degree,

b) relatively quickly at a second variable rate of displacement a maximum value of which is at least twice a maximum value of said first variable rate, through a second intermediate stage wherein the aperture formed by said first and second diaphragms opens from the first predetermined opening degree to a second larger predetermined opening degree, and

c) relatively slowly essentially at said first variable rate of displacement through a third final stage wherein the aperture formed by said first and second diaphragms changes from said second large predetermined opening degree to a maximum opening degree.

5,315,890
DEVICE FOR GUIDING A TRANSLATION MOVEMENT

Michael Long, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

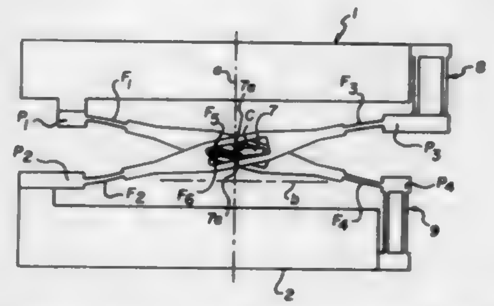
PCT No. PCT/FR91/00193, § 371 Date Sep. 21, 1992, § 102(e) Date Sep. 21, 1992, PCT Pub. No. WO91/14885, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 11, 1991, Ser. No. 924,014

Claims priority, application France, Mar. 19, 1990, 90 03699

Int. Cl.^{5} F16H *21/44;* F16F *1/18*

U.S. Cl. 74—110 **3 Claims**



1. A device for constraining relative movement of first and second members (1, 2), comprising:

a first link (P_1–P_4) having first and second ends;

a second link (P_2–P_3) having first and second ends;

a first flexible pivot portion (F_1) extended between the first end of the first link and the first member to permit rotational movement of the first link in a first direction between the members but restrict movement of the first link in a second direction orthogonal to the axis of the rotation of the first link;

a second flexible pivot portion (F_2) extended between the first end of the second link and the second member to permit rotational movement of the second link in the first direction between the members but restrict movement of the second link in the second direction;

a third flexible pivot portion (F_3) extended from the second end of the second link to permit rotational movement of the second link in the first direction;

a fourth flexible pivot portion (F_4) extended from the second end of the first link to permit rotational movement of the first link in the first direction;

a fifth flexible pivot portion (F_5) extended from a middle part of the first link;

a sixth flexible pivot portion (F_6) extended from a middle part of the second link;

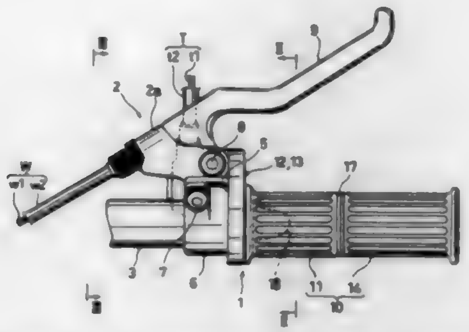
a member (7) joining the fifth and sixth flexible pivot portions to permit rotation in the first direction of the first link relative to the second link about a point (C) along the lengths of the fifth and sixth pivot portions;

a seventh flexible pivot portion (8) extended from the third flexible pivot portion to the first member to permit movement of the second link in the second direction but prohibit movement in the first direction; and

an eighth flexible pivot portion (9) extended from the fourth flexible pivot portion to the second member to permit movement of the first link in the second direction but prohibit movement in the first direction.

5,315,891
BICYCLE SPEED CHANGE OPERATION ASSEMBLY

Koichi Tagawa, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan
PCT No. PCT/JP92/00130, § 371 Date Jul. 15, 1992, § 102(e) Date Jul. 15, 1992, PCT Pub. No. WO92/14645, PCT Pub. Date Sep. 3, 1992
PCT Filed Feb. 10, 1992, Ser. No. 910,169
Claims priority, application Japan, Feb. 13, 1991, 3-42654
Int. Cl.^{5} B62K *23/06*
U.S. Cl. 74—489 **11 Claims**

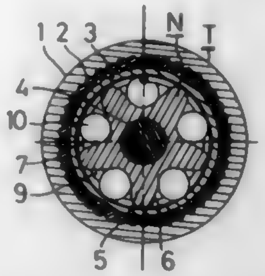


1. A bicycle speed change operation assembly comprising:
a cylindrical operation member rotatably supported around a grip end portion of a handlebar,
a speed change operation mechanism provided in proximity of said grip end portion of said handlebar and capable of winding and unwinding a speed control cable, and
a transmission mechanism provided between said cylindrical operation member and said speed change operation mechanism for driving said speed change operation mechanism in response to the rotation of said cylindrical operation member;
wherein said cylindrical operation member is spring-urged toward a neutral rotational position which provides a commencing point at the time of rotating said cylindrical operation member; and
wherein said speed change operation mechanism functions to wind or unwind said control cable in response to rotational reciprocation of said cylindrical operation member in one direction from a neutral rotational position.

5,315,892
PRECISION LONGITUDINAL MOVEMENT TRANSMISSION CABLE

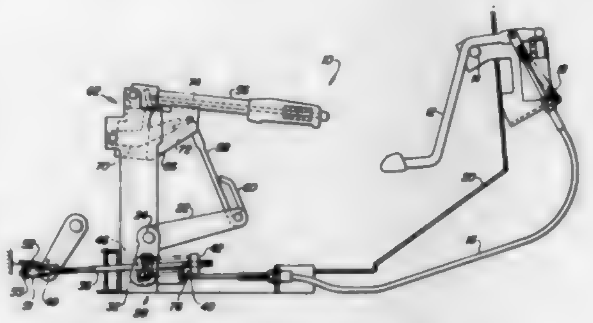
Carlos Gabas, Barcelona, and Agustin Roca, Rubi, both of Spain, assignors to Pujol y Tarrago S.A., Rubi, Spain
PCT No. PCT/ES91/00077, § 371 Date Jul. 10, 1992, § 102(e) Date Jul. 10, 1992, PCT Pub. No. WO92/08904, PCT Pub. Date May 29, 1992
PCT Filed Nov. 14, 1991, Ser. No. 910,175
Claims priority, application Spain, Nov. 19, 1990, P9002923
Int. Cl.^{5} F16C *1/10*
U.S. Cl. 74—502.3 **4 Claims**

1. A precision longitudinal movement transmission cable for transmitting a longitudinal movement, comprising: a tubular casing (T) extending longitudinally and having a casing length; a cylindrical central core (N) having a core length and being contained in the tubular casing (T), said casing length being substantially equal to said core length, said central core (N) having a plurality of longitudinally extending radial projections (5) extending longitudinally over the core length and being provided with a central metal cable (4) for axial reinforcement, said radial projections defining a plurality of longitudinally extending equidistant channel-like grooves (6) in the central core (N) and said radial projections (5) having free ends defining an outside diameter of the cylindrical central core (N) related to an inside diameter of the tubular casing (T) such that the cylindrical central core (N) slides and rotates inside said tubular casing (T); retaining means in each of said channel-like grooves (6) acting as partition walls defining a plurality of compartments (9) of equal compartment length and in longitudinal succession along each of said channel-like grooves (6); and a plurality of balls (10), each of said balls being located in one of said compartments (9) of the channel-like grooves (6) and being dimensions so that said balls move snugly along an inner surface of the tubular casing (T) and in the channel-like groove (6) along the entire compartment length of said compartment (9) when the central core (N) is moved longitudinally, the retaining means on the central core (n) consisting of a metal wire (7) uniformly helical bound about the entire core length of said central core (n), said metal wire being at least partly accommodated in a plurality of grooves (8) provided in the central core (N) in the vicinity of free ends of the radial projections (5) thereof so that the metal wire (7) defined equal-length longitudinally adjacent ones of the compartments (9) in the channel-like grooves (6).



5,315,893
VEHICLE BRAKE MECHANISM

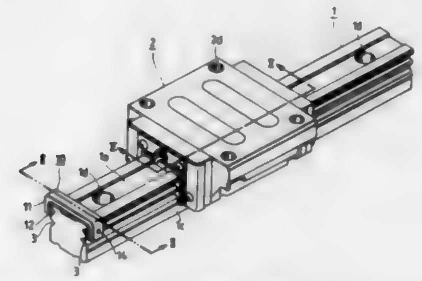
Robert N. Behrens, Beaver Dam, and Jimmy N. Eavenson, Sr., Juneau, both of Wis., assignors to Deere & Company, Moline, Ill.
Filed Nov. 17, 1992, Ser. No. 977,387
Int. Cl.^{5} G05G *11/00*
U.S. Cl. 74—512 **11 Claims**



1. A vehicle brake mechanism, comprising:
a brake control means engagable by the operator,
a generally transversely extending shaft means pivotable in response to the operator engaging the brake control,
respective left and right linkage means coupled between respective vehicle brakes and the transverse shaft, and shiftable generally with the transverse shaft for applying respective vehicle brakes, wherein each linkage means further comprises a rod,
left and right equalizer means coupled between the transverse shaft means and respective linkage means for generally equalizing and balancing the forces applied to each vehicle brake,
wherein each equalizer means further comprises
at least one lever extending from the transverse shaft means for pivotal motion therewith,
a spacer means slidably carried on the rod and abutable with the lever as the lever pivots with the transverse shaft means,
a compression spring abutable with the spacer means,
a first washer means coupled with the rod, said compression spring being compressed between the spacer means and said first washer means,
a second washer means coupled with the rod and abutable with the spacer means when the lever has not pivoted from a brake disengaged position.

5,315,894
STOPPER DEVICE FOR LINEAR GUIDE DEVICE

Toru Tsukada, Gunma, Japan, assignor to NSK Ltd., Tokyo, Japan
Filed Mar. 27, 1992, Ser. No. 858,649
Claims priority, application Japan, Apr. 5, 1991, 3-22022
Int. Cl.^{5} G05G *1/04;* **E05D** *13/00*
U.S. Cl. 74—526 **18 Claims**

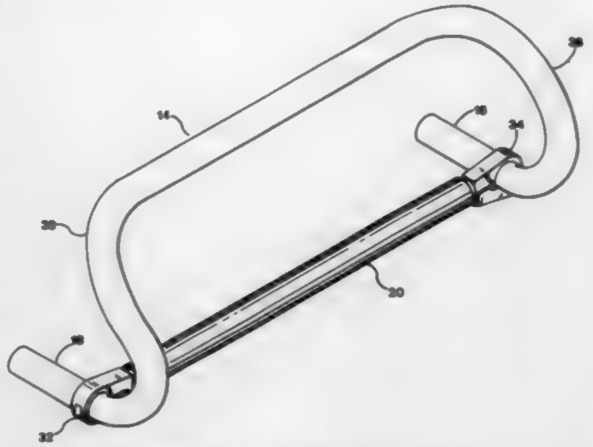


1. A stopper device for a linear guide device, wherein said linear guide device has a guide rail having axial guide rail grooves formed in opposite side surfaces thereof, a slider loosely fitted on said guide rail so as to move along said guide rail, said slider having rolling member grooves formed therein in opposed relation to said guide rail grooves of said guide rail, respectively, said slider and said guide rail being movable relative to each other through the rolling of a plurality rolling members held between said opposed guide rail grooves and rolling member grooves, said stopper device (10) comprising:
a stopper body (11) of a generally U-shaped cross-section mounted astride an upper surface of said guide rail, said stopper body (11) comprising an upper portion and leg portions (13) respectively extending from edge portions of said upper portion;
a covering member (12) made of an elastic material which covers an inner surface of said stopper body and which is disposed in opposed relation to said opposite side surface of said guide rail.

5,315,895
BICYCLE HANDLEBAR CONDUCIVE TO RIDER AERODYANMIC EFFICIENCY

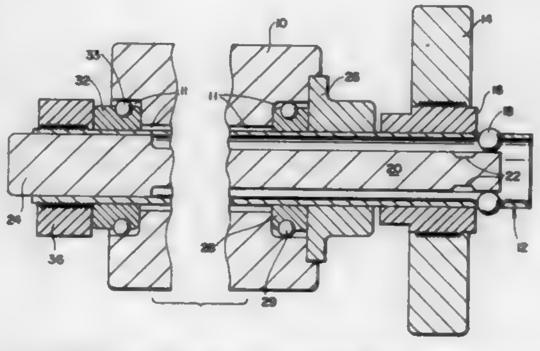
Thomas A. Kattus, and John B. Rice, both of 2838 Cebu Pl., Carlsbad, Calif. 92009
Continuation of Ser. No. 641,910, Mar. 18, 1991, abandoned. This application Aug. 4, 1992, Ser. No. 925,816
Int. Cl.^{5} B62K *21/12*
U.S. Cl. 74—551.8 **2 Claims**

1. A bicycle steering mechanism comprising:
a) a drop-style handlebar having a crossbar with first and second downwardly curving sections perpendicular to said crossbar, said curving sections transitioning into first and second rearwardly curving handgrip portions with said handgrip portions lying in a common plane,
b) a rigid substantially straight cylindrical bar having a first end and a second end, said bar being attached to said drop-style handlebar, and
c) first clamp means comprising a first lower jaw assembly pivotally joined to a first upper jaw assembly slideably joined to said first end of said bar for clamping said first end of said bar to said drop-style handlebar, second clamp means comprising a second lower jaw assembly pivotally joined to a second upper jaw assembly slideably joined t said second end of said bar for clamping said second end of said bar to said drop-style handlebar, wherein said straight cylindrical bar is adjustably positioned on said rearwardly curving handgrip portions to lie in said plane defined by said first and said second rearwardly curving handlebar handgrip portions of said drop-style handlebar, said bar being so constructed, and arranged on said handlebar that a rider of said bicycle has available a range of comfortable hand portions on said bar conducive to decreasing said rider's aerodynamic profile.



5,315,896
QUICK RELEASE BICYCLE PEDAL

Michael V. Stringer, 2211 Heron St., Boise, Id. 83702
Filed Oct. 26, 1992, Ser. No. 966,875
Int. Cl.^{5} G05G *1/14*
U.S. Cl. 74—594.4 **15 Claims**



1. A bicycle pedal assembly, comprising:
a) a bicycle pedal having a hole extending therethrough; and
b) a removable hollow shaft, extending through said hole, said hollow shaft including:
  b1) at least one locking ball, located at one end of said hollow shaft, embedded into said hollow shaft so as to have a portion of said locking ball project out of said shaft; and
  b2) a locking shaft, extending therethrough said hollow shaft, having:
    i) recesses located at one end; and
    ii) a button located at another end, said button extending out of said hollow shaft.

5,315,897

ENGINE SPEED CONTROL SYSTEM WITH CHANGING SHIFT-UP SPEED

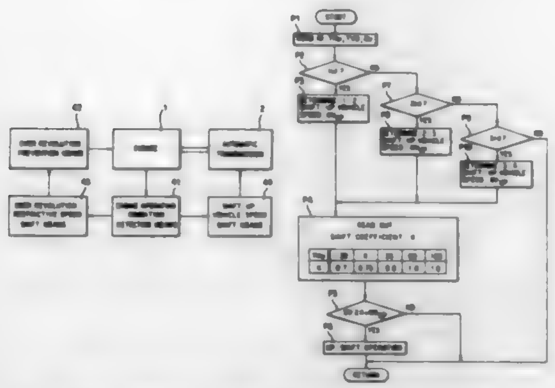
Mitsutoshi Abe, and Seiji Yashiki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 5, 1992, Ser. No. 894,854

Claims priority, application Japan, Jun. 12, 1991, 3-140411

Int. Cl.^{5} F02D *29/02*

U.S. Cl. 477—98 **16 Claims**



1. An engine speed control system for an automobile engine equipped with an automatic transmission, said engine speed control system comprising:

over-revolution prevention means, actuated at a predetermined engine speed so as to decrease engine output, for preventing said engine from being brought into over-revolution while said engine operates under loads;

engine operating condition detecting means for detecting an engine operating condition, including at least a throttle opening of an engine throttle valve;

speed altering means for altering said predetermined engine speed depending upon said engine operating condition detected by said engine operating condition detecting means; and

shift-up vehicle speed shift means for determining a regular shift-up vehicle speed, at which said automatic transmission is shifted up, according to a throttle opening of said engine throttle valve detected by said engine operating condition detecting means, and shifting said regular shift-up vehicle speed in response to an alteration of said predetermined engine speed.

5,315,898

METHOD OF CONTROLLING AUTOMATIC TRANSMISSION

Hideo Koyama, Shinjuku, and Nobuo Takemasa, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1992, Ser. No. 898,986

Claims priority, application Japan, Jun. 14, 1991, 3-169219

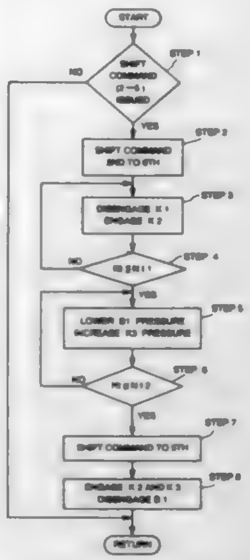
Int. Cl.^{5} F16H *3/66*

U.S. Cl. 475—330 **4 Claims**

1. A method of controlling an automatic transmission having, between input and output shafts, a plurality of power transmitting paths composed of combinations of planetary gear trains, and a plurality of engaging means for selecting one of the power transmitting paths for establishing a desired gear position, to effect an upshift from a present gear position to a target gear position that has a higher speed reduction ratio than a speed reduction ratio of the present gear position through disengagement of two of said engaging means and engagement of two other of said engaging means, said method comprising the steps of:

selecting a controlling intermediate gear position that has a higher speed reduction ratio than the speed reduction ratio of said target gear position and which can be shifted to from said present gear position and said target gear position through disengagement of only one of said engaging means and engagement of another of said engaging means;

starting to shift from said present gear position to said controlling intermediate gear position in response to a command for said upshift;



detecting a rotating condition of said gear trains after the shifting from said present gear position to said controlling intermediate gear position is started; and

shifting from said controlling intermediate gear position to said target gear position when the detected rotating condition reaches a rotating condition which substantially corresponds to a rotating condition of said target gear position.

5,315,899

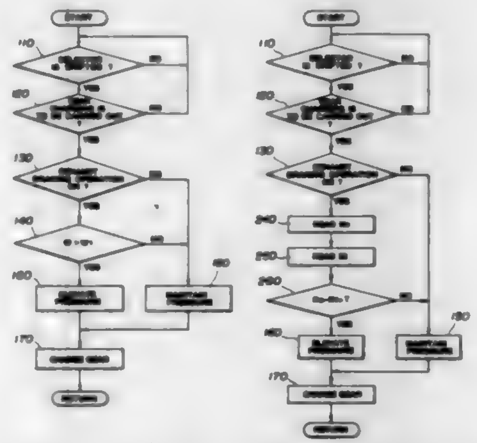
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION OF AUTOMOTIVE VEHICLE WITH EXHAUST BRAKING SYSTEM USING VEHICLE PAYLOAD SENSING MEANS

Hideki Mochizuki, Shizuoka, Japan, assignor to Jatco Corporation, Fuji City, Japan

Filed Nov. 9, 1992, Ser. No. 973,685

Int. Cl.^{5} B60K *41/20*

U.S. Cl. 477—119 **8 Claims**



1. A hydraulic control system for an automatic transmission of an automotive vehicle with an exhaust braking unit comprising:

pressure controlling means for controlling fluid pressure which serves to actuate frictional elements of the automatic transmission;

exhaust braking operation detecting means for detecting exhaust braking operation to provide a signal indicative thereof:

vehicle load determining means for determining load of the vehicle to provide a signal indicative thereof; and

controlling means responsive to the signals from said exhaust braking operation detecting means and said vehicle load determining means for providing a control signal to said pressure controlling means so that the fluid pressure for actuating said frictional elements is elevated to a preselected level during exhaust braking operation when an amount of the load of the vehicle is greater than a preselected value.

5,315,900

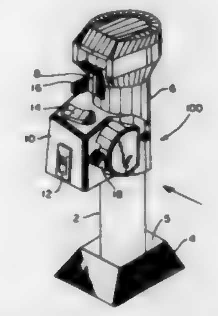
TRANSMISSION CONTROL LEVER HAVING CRUISE AND ENGINE BRAKE CONTROL

Terry E. Teeter, Mattawan, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 17, 1992, Ser. No. 991,937

Int. Cl.^{5} F16H *59/02*

U.S. Cl. 477—165 **3 Claims**



1. In a motor vehicle having an engine and a manually operable transmission control lever, in combination; (i) switch means carried by the lever for operating a cruise control system and, (ii) switch means carried by the lever for controlling a system for braking the engine.

5,315,901

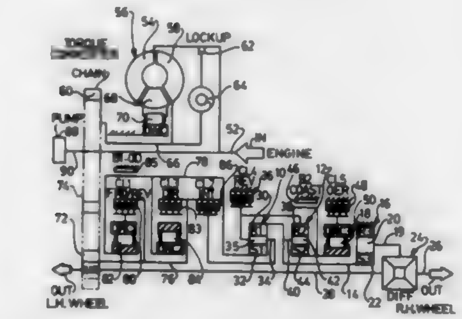
AUTOMATIC TRANSMISSION WITH A MODULATED PRESSURE CONVERTER BYPASS CLUTCH PRIORITY VALVE CIRCUIT

Charles W. Barnes, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 17, 1992, Ser. No. 992,226

Int. Cl.^{5} F16H *61/14*

U.S. Cl. 192—3.3 **7 Claims**



1. A control valve system for an automatic transmission comprising multiple ratio gearing and a hydrokinetic torque converter, said converter having an impeller and a turbine, a torque input shaft connected to said impeller, a torque output shaft connected to torque output elements of said gearing;

a fluid pressure pump, a control valve circuit means for controlling ratio changes in said gearing, a main pressure regulator valve means communicating with said pump for maintaining a desired fluid pressure in said circuit means;

a lubrication fluid pressure circuit means for delivering lubrication fluid to said gearing;

a fluid pressure operated bypass clutch means in said torque converter for establishing a mechanical torque flow path around said turbine and said impeller;

a converter fluid pressure feed passage means communicating with said main pressure regulator valve means and with said torque converter, said regulator valve means including pressure regulator valve portions adapted to maintain a desired pressure level in said torque converter;

a bypass clutch control valve means communicating with said converter fluid pressure feed passage means for controlling distribution of clutch controlling pressure to said bypass clutch means;

said main pressure regulator valve means including portions for distributing lubricating fluid pressure to said lubrication fluid pressure circuit means and for interrupting such distribution upon a transient reduction in pressure in said control valve circuit means whereby priority in pressurized fluid distribution is given to said torque converter.

5,315,902

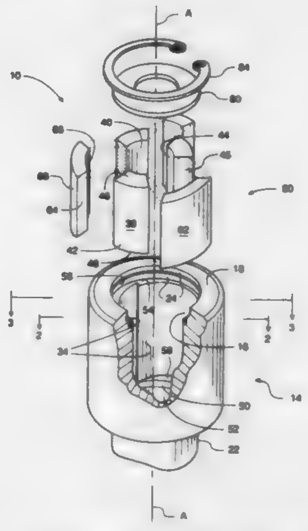
STUD REMOVING TOOL

Larry Ragland, Fort Worth, and Emmitt Morales, Beaumont, both of Tex., assignors to Gripping Tools Technologies, Inc., Fort Worth, Tex.

Filed Nov. 24, 1992, Ser. No. 980,672

Int. Cl.^{5} B25B *13/50*

U.S. Cl. 81—53.2 **16 Claims**



9. A tool for removing a threaded member, comprising:

a socket having an open end and an opposite end with a cavity communicating with said open end for receiving a threaded member to be removed,

said cavity having a central axis extending between said open end and said opposite end and a perimeter wall defining an interior surface extending around said axis,

holding means next to said opposite end of said socket,

a plurality of cams integral with said perimeter wall and spaced apart around said perimeter wall,

support means coupled to said opposite end of said socket for use for rotating said socket,

a cartridge comprising an annular member having a plurality of spaced apart jaws adapted to be located in said cavity with said jaws extending around said axis,

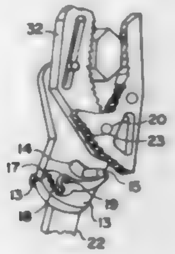
each jaw having an outer bearing surface for engaging one of said cams, an arcuate inner gripping surface for grip-

ping the threaded member to be removed and opposite ends with side walls,
said jaws being spaced apart by a plurality of spacer means each of which comprises resilient means,
each spacer means being secured to a sidewall of one of said jaws and to the closest sidewall of the next jaw of said annular member for holding said jaws together for forming said cartridge, and
retaining means for retaining said cartridge inside said cavity between said open and said holding means.

5,315,903

UNIVERSAL, SELF-BLOCKING VICE KEY

Eugenio Monaco, Via S. Calepodio, 36 00152, Rome, Italy
PCT No. PCT/IT90/00078, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO91/04834, PCT Pub. Date Apr. 18, 1991
PCT Filed Sep. 26, 1990, Ser. No. 688,572
Claims priority, application Italy, Sep. 28, 1989, 48410 A/89
Int. Cl.^{5} B25B *13/28*
U.S. Cl. 81—91.3 **7 Claims**

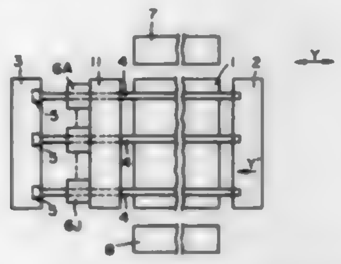


1. A vise assembly, comprising:
a handle;
a fork pivotably attached to said handle;
means for limiting rotation of said handle with respect to said fork;
a pair of jaws which are pivotably interconnected to each other about a first pivot axis, a first jaw of said pair of jaws being pivotably interconnected with said fork about a second pivot axis and a second jaw of said pair of jaws being slidingly interconnected with said fork;
means for locking one of said pair of jaws with respect to said fork; and
means for releasing said locking relationship between said fork and said one of said pair of jaws.

5,315,904

APPARATUS FOR CUTTING INNER CIRCUMFERENTIAL SURFACE OF THICK WALLED SMALL DIAMETER PIPE

Yasuaki Hashimoto, Tagata; Akio Nakane, Mishima, and Tadahiro Uematsu, Numazu, all of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Japan
Filed Nov. 30, 1992, Ser. No. 985,187
Claims priority, application Japan, Dec. 4, 1991, 3-348126
Int. Cl.^{5} B23B *5/08*
U.S. Cl. 82—129 **11 Claims**

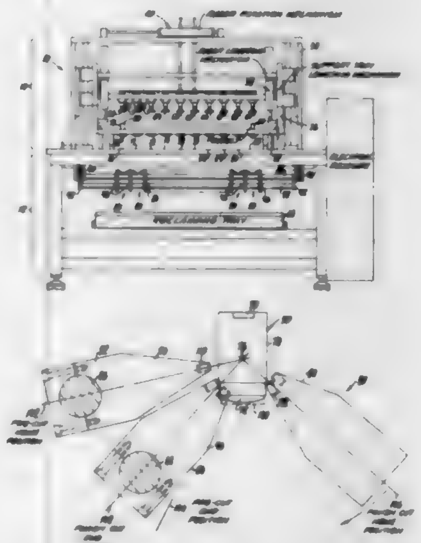


1. A device for cutting at least one thick-walled small diameter pipe having a longitudinal axis and an inner circumferential surface approximately concentric with the longitudinal axis, said device being operative to uniformaly cut away potions of the inner circumferential surface of said pipe despite any eccentricity of the inner circumferential surface relative to the longitudinal axis for removing defects and achieving smoothness in said pipe, said device comprising at least one core bar having opposed first and second ends, a cutting blade on said first end thereof, said core bar being dimensioned to fit in the pipe and being less rigid than the pipe, setting means for selectively holding the first end of the core bar and for inserting the second end of the core bar into the pipe to be processd, a rotating means for rotating said pipe about the axis thereof and relative to said core bar, a feed means for selectively holding the second end of the core bar and for generating relative movement between the core bar and the pipe such that the cutting blade of the core bar follows the inner circumferential surface through the pipe for uniformly cutting away the inner surface of said pipe to be processed with said cutting blade, and a control means for controlling each of said means, including releasing the setting means from the first end of the core bar after the holding of the second end of the core bar by the feed means.

5,315,905

METHOD AND APPARATUS FOR SHAPING ANTIPERSPIRANT STICKS AND SIMILAR PRODUCTS

Jiva R. Karavadra, Edison, N.J., assignor to Bristol-Myers Squibb Company, New York, N.Y.
Continuation of Ser. No. 35,527, Mar. 17, 1993, abandoned, which is a continuation of Ser. No. 173,980, Mar. 28, 1988, abandoned. This application Nov. 29, 1993, Ser. No. 159,075
Int. Cl.^{5} B23D *17/00, 23/02*
U.S. Cl. 83—13 **12 Claims**

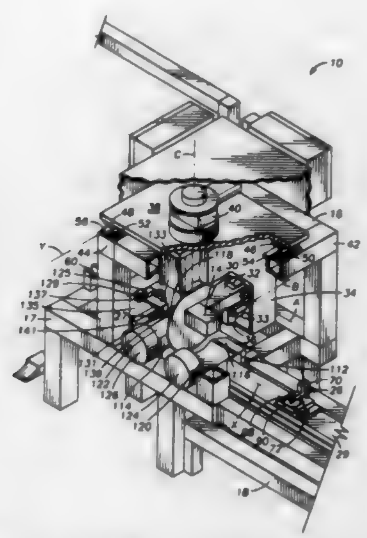


1. A method of shaping one end of a solid antiperspirant-/deodorant product comprising the steps of:
(a) providing a plurality of oval cross-sectional solid antiperspirant/deodorant products to be shaped, each contained within a product container having a screw mechanism to advance the product from the container;
(b) retainably loading said plurality of products in an inverted position on a product-carrying rack of a product shaping apparatus;
(c) movably placing said rack into alignment with a product advancing means of said apparatus;
(d) engaging said product advancing means with the screw mechanism of said containers to advance said one end of each of said plurality of products from said container an amount sufficient to enable shaping to proceed without interference from said container;
(e) cutting through each of said advanced product ends with a knife means in an arcuate path to provide each of said products with a dome-shaped surface; and moving said dome-shaped products to an output area of said apparatus.

5,315,906

AUTOMATED EXTRUSION PROCESSING MACHINE

Laszlo Ferenczi, Irving; Mark A. Turner, and Gregory A. Prince, both of Arlington, all of Tex., assignors to Vought Aircraft Company, Dallas, Tex.
Filed May 15, 1992, Ser. No. 884,118
Int. Cl.^{5} B26D *5/42*
U.S. Cl. 83—27 **37 Claims**



1. A method of processing an elongated workpiece using a processing machine, said processing machine comprising:
a frame;
a first gripping mechanism coupled to said frame and being controllably moveable on said frame along a first predetermined path, said first gripping mechanism having an openable and closeable jaw being positioned to respectively release and grip said workpiece;
a second gripping mechanism coupled to said frame in spaced apart relation to said first gripping mechanism and being controllably moveable on said frame along a second predetermined path, said second gripping mechanism having an openable and closeable jaw being positioned to respectively release and grip said workpiece;
a first vise coupled to said frame, said first vise having an openable and closeable jaw being positioned to respectively release and grip said workpiece;
a second vise coupled to said frame in spaced apart relation to said first vise, said second vise having an openable and closeable jaw being positioned to respectively release and grip said workpiece; and
a processing mechanism coupled to said frame in a predetermined relation to said first vise and said second vise, said method comprising the following steps performed in order;
(a) closing said jaw of said first gripping mechanism about said workpiece to grip said workpiece;
(b) moving said first gripping mechanism along said first predetermined path to position said workpiece at a first predetermined position;
(c) closing said jaw of said first vise about said workpiece to grip said workpiece;
(d) opening said jaw of said first gripping mechanism to release said workpiece;
(e) processing said workpiece using said processing mechanism;
(f) closing said jaw of said second gripping mechanism about said workpiece to grip said workpiece;
(g) opening said jaw of said first vise to release said workpiece;
(h) moving said second gripping mechanism along said second predetermined path to position said workpiece at a second predetermined position;
(i) closing said jaw of said second vise about said workpiece to grip said workpiece;
(j) processing said workpiece using said processing mechanism;
(k) opening said jaw of said second vise to release said workpiece; and
(l) moving said second gripping mechanism along said second predetermined path to expel said workpiece from said machine.

25. A machine for processing an elongated workpiece, said machine comprising:
a frame having a main portion and having an elongated portion extending outwardly from said main portion generally along an X-axis;
a first gripping mechanism coupled to said main portion of said frame and being controllably moveable on said main portion of said frame along said X-axis, said first gripping mechanism having an openable and closeable jaw being positioned to respectively release and grip said workpiece;
a first vise coupled to said main portion of said frame above said first gripping mechanism, said first vise having an openable and closeable jaw being positioned to respectively release and grip said workpiece, said first gripping mechanism being moveable relative to said first vise;
a second gripping mechanism coupled to said elongated portion of said frame in spaced apart relation to said first gripping mechanism and being controllably moveable on said elongated portion of said frame along said X-axis, said second gripping mechanism having an openable and closeable jaw being positioned to respectively release and grip said workpiece;
second vise coupled to said main portion of said frame above said second gripping mechanism, said second vise having an openable and closeable jaw being positioned to respectively release and grip said workpiece, said second gripping mechanism being moveable relative to and under said second vise;
wherein each of said first and second vises comprise:
a stationary jaw portion being rigidly coupled to said frame;
a moveable jaw portion being slidably coupled to said frame opposite said stationary jaw portion; and
a fluidic cylinder having a first end portion and a second end portion and being extendable and retractable, said first end portion of said fluidic cylinder being coupled to said frame and said second end portion of said fluidic cylinder being coupled to said moveable jaw portion, so that extension of said fluidic cylinder slides said moveable jaw portion closer to said stationary jaw portion and retraction of said fluidic cylinder slides said moveable jaw portion farther from said stationary jaw portion; and
a processing mechanism coupled to said main portion of said frame above and in a predetermined relation to said first vise and said second vise and being adapted to process said workpiece.

5,315,907

MACHINE FOR CUTTING LOGS OF WEB MATERIAL

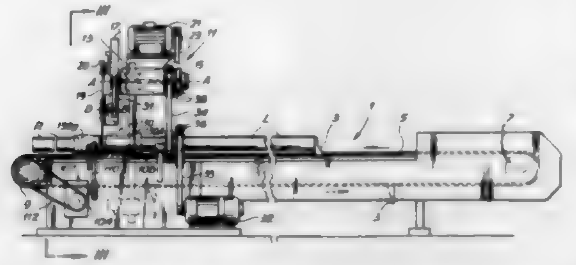
Guglielmo Biagiotti, Capannori, Italy, assignor to Fabio Perini S.p.A., Lucca, Italy

Filed Mar. 24, 1992, Ser. No. 856,449

Claims priority, application Italy, Apr. 3, 1991, FI/91/A 71

Int. Cl.^{5} B26D *1/60*

U.S. Cl. 83—38 **17 Claims**



1. A machine for cutting a log (L) of web material into a plurality of small rolls (R), comprising:
- a unit (17) rotating about an axis (A—A) parallel to the axis of the log (L);
- on said unit a cutting blade (19), rotating at a substantially constant speed about an axis (B—B) parallel to the axis (A—A) of said unit (17) said blade being rotated by a blade drive means and a first shaft, with said first shaft having a splined connection to the drive means so that said cutting blade and said first shaft move axially independently of said drive means;
- means (61, 63) which drive said cutting blade (19) into a reciprocating forward and backward axial motion parallel to the axis of the log (L);
- log feeding means (3, 5, 7, 9) for feeding the log (L) to be cut in a forward direction parallel to the axis of rotation of said blade; wherein said log feeding means moves said log at a lower speed during cutting and at a higher speed between each two sequential cuttings performed on said log, said lower speed being equal to the speed of the axial motion of said cutting blade in the forward direction parallel to the axis of the rotation of said blade, during a cutting operation of said blade; and wherein synchronizing means (94–100, 99–120, 353) are provided for keeping a synchronism between the reciprocating axial motion of the cutting blade and the log feeding means.

5,315,908

ARRANGEMENT IN INSERT HOLDERS

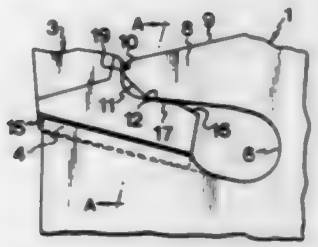
Wlajko Mihic, Tegnervägen 9, S-802 28, Gävle, Sweden

Continuation of Ser. No. 601,729, Oct. 25, 1990, abandoned. This application May 13, 1992, Ser. No. 884,845

Claims priority, application Sweden, Apr. 26, 1988, 8801563

Int. Cl.^{5} B27B *33/12*

U.S. Cl. 83—845 **8 Claims**



1. An arrangement in an insert holder and a cutting insert, said insert (3) being received in a recess (2) in said insert holder (1) and secured therein by clamping between portions of said insert holder which define said recess, said recess for the insert (3) being defined on one side by a portion dimensioned to substantially unyieldably take up occurring stress and formed with a straight guiding portion (4, 5) coacting with a straight edge of the insert, and, on an other side of said recess for the insert (3), by a nose-shaped resilient portion (8) of smaller extent in a longitudinal direction of said recess than the straight guiding portion (4, 5), said nose-shaped resilient portion (8) having an inherent resilience, said insert (3) comprising a shank (14) wherein one side is formed with a guide means (15) adapted to the guiding portion (4,5) of said recess (2) and an opposite side comprises an inclined portion (16), and a free end (10) of said nose-shaped portion (8) being adapted to serve as an end stop for said insert and engage with a substantially transverse surface (19) on the insert, characterized in that the resilient portion (8) forming the other side of the recess is formed with a shallow projection extending towards the one side of the recess and approaching the straight guiding portion (4, 5) at a defined projection top (12) of small extent in the longitudinal direction of said recess; that the inclined portion (16) of the shank (14) passes into a substantially straight planar surface portion (17) of the shank (14) which serves as a sliding and abutment surface for said defined projection top (12), and, in a direction away from said inclined portion (16), said substantially straight planar surface portion (17) converges slightly towards the one side of the shank (14); and that the inclined portion (16) is adapted, during insertion of said insert (3) longitudinally into the recess (2), by engagement with the defined projection top (12) of said shallow projection, to bend the nose-shaped portion (8) against the inherent resilience thereof, and allow, during further insertion, only transverse linear engagement of the defined projection top (12) with said substantially straight planar surface portion (17) with a successive reduction of the bending of said nose-shaped resilient portion (8), said transverse linear engagement being in a direction transverse to the longitudinal direction of said recess (2).

5,315,909

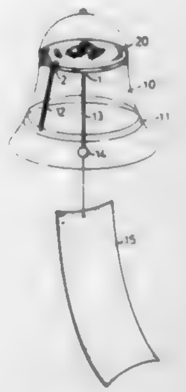
MUSICAL WIND CHIME

Yang-Wen Hsu, 1st Fl., No. 17, Kechiang Rd., Shihlin Dist., Taipei, Taiwan

Filed Oct. 16, 1992, Ser. No. 961,746

Int. Cl.^{5} G10D *13/08*

U.S. Cl. 84—404 **3 Claims**



1. A musical wind chime comprising
- a substantially bell-like wind chime body (10) having an inner wall and defining an inner space therein, a circular conductor (11) attached in the inner wall thereof and around an axis of the inner space thereof;
- a sound control circuit (20) installed in a printed circuit board which is fixed on the inner wall of the wind chime body (10) above said circular conductor (11);
- a rod (13) electrically connected to said sound control circuit (20) and pivotably connected to said circuit board being suspended along the axis of the inner space of said wind chime body (10);
- a conductive ball (14) being engaged at an end of said rod (13) and allowed to contact with said circular conductor (11) when blown by some wind; and
- a wind plate (15) being suspended under the conductive ball (14) by a line for receiving wind force thereby enabling the conductive ball (14) to contact with the circular conductor (11).

5,315,910

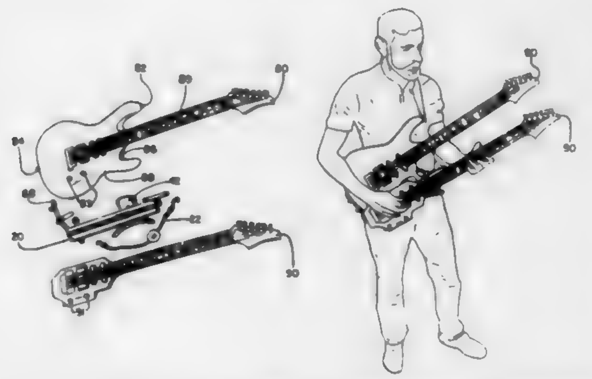
DETACHABLE RETROFIT FOR A GUITAR-TYPE MUSICAL INSTRUMENT

Charles C. Soupios, 93 Arleigh Rd., Great Neck, N.Y. 11021

Filed Mar. 2, 1992, Ser. No. 844,306

Int. Cl.^{5} G10D *1/00*

U.S. Cl. 84—453 **4 Claims**



1. An accessory for mounting a second stringed instrument onto a first stringed instrument; wherein said first stringed instrument comprises a body having a strap-fastening anchor on one end and a horn-shaped cutaway section on an opposite end thereof, comprising:
- a rectangular holding device elongated along an axis;
- means for detachably mounting an locking said second stringed instrument onto said holding device; wherein said mounting and locking means comprises a means for slidably moving the second stringed instrument along the axis;
- means for detachably securing the holding device to the first stringed instrument; wherein said securing means comprises a strap-fastening means for attaching the holding device both to the strap-fastening anchor and the horn-shaped cutaway of said first stringed instrument.

5,315,911

MUSIC SCORE DISPLAY DEVICE

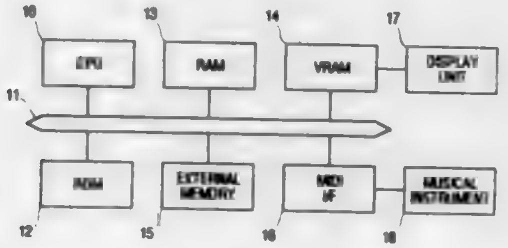
Mitsunori Ochi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jul. 24, 1992, Ser. No. 919,305

Claims priority, application Japan, Jul. 24, 1991, 3-184546

Int. Cl.^{5} G09B *15/02*

U.S. Cl. 84—477 R **13 Claims**



13. A music store display device comprising:
- input means for inputting playing data comprising manual performance data;
- storage means for storing musical playing data;
- display means for displaying musical playing data for each of specified display section;
- comparing means for comparing the displayed musical playing data and the inputted playing data to determine correspondence therebetween; and
- control means for determining a section of the stored musical playing data corresponding to the inputted playing data and controlling the section of the store musical data corresponding to the inputted playing data.

5,315,912

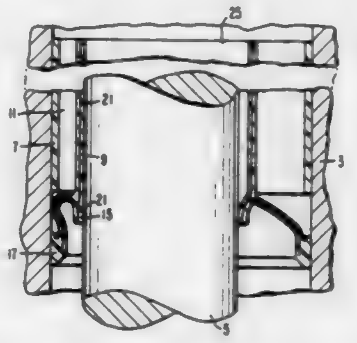
SUSPENDED HOOP SEAL

Michael S. Huber, Milpitas, and Jerry K. Endo, Santa Clara, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1984, Ser. No. 609,377

Int. Cl.^{5} F41F *3/073*

U.S. Cl. 89—1.816 **9 Claims**



1. A seal between a high and low pressure portion of a large annular opening between two cylindrical surfaces comprising:
- a first cylindrical ring attached to one of said cylindrical surfaces;
- a second cylindrical ring spaced annularly with respect to said first cylindrical ring;
- a plurality of struts extending between and attached to said first and second cylindrical rings;
- a generally frustoconically shaped lip extending radially toward the high pressure side of the seal and from the second cylindrical ring;
- a third cylindrical ring attached to said one cylindrical surface and spaced from the first cylindrical ring on the high pressure side thereof;
- a membrane extending from said third cylindrical ring to said lip forming a seal which in conjunction with the hoop strength provided by the second cylindrical ring, prevents lip inversion when the seal is subjected to high pressure differentials and creates good centering characteristics with high and low pressure differentials across the seal.

5,315,913

GUN MECHANISM FOR RAPIDLY FIRING CASED TELESCOPED AMMUNITION

Glenn E. Rossier, Ferrisburgh; Steven R. Duke, Williston; Edward A. Proulx, Burlington, and Stephen A. Jarvis, Colchester, all of Vt., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 21, 1992, Ser. No. 993,559

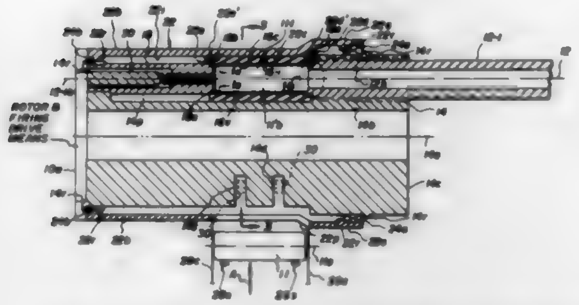
Int. Cl.^{5} F41F *1/10*

U.S. Cl. 89—12 **16 Claims**

1. A Gatling-type gun mechanism, comprising:
- a stationary housing having a camming channel and at least one port;
- a rotor mounted in said housing for rotation about a longitudinal axis;
- a plurality of gun barrels, each fixed to said rotor with a respective barrel axis substantially parallel to said longitudinal axis;

a like plurality of stud assemblies, each having a respective axis aligned with the axis of an associated gun barrel;

a like plurality of cartridge chambers, each interacting with said camming channel, during each rotation of said rotor, for longitudinal reciprocal motion between a rearward location substantially coaxial about the associated stud assembly and a forward location substantially in abutment with the associated gun barrel and enclosing a volume into which a round of ammunition can be placed and removed by radial movement through said at least one port;



each of said stud assemblies having means for firing a round of ammunition within said enclosed volume, when the rotor moves the associated barrel, chamber and stud assembly to a firing location.

5,315,914

METHOD OF REDUCING THE MUZZLE NOISE OF FIREARMS AND FIREARM OF REDUCED MUZZLE NOISE

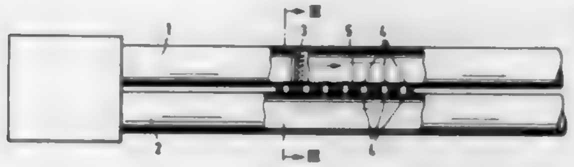
Michael Schumacher, Oberndorf, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Oberndorf/Neckar, Fed. Rep. of Germany

Continuation of Ser. No. 799,823, Nov. 26, 1991, abandoned. This application Aug. 2, 1993, Ser. No. 100,357

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1990, 4039141

Int. Cl.⁵ F41A *21/06, 21/28, 21/32*

U.S. Cl. 89—14.05 **22 Claims**



1. A shotgun, comprising: at least one barrel in which a projectile reaches its final velocity in front of the mouth of the barrel, the barrel including an acceleration section and a subsequent control section, the control section being located where the projectile reaches its final velocity; and a muzzle noise reducer having means formed so as not to alter the muzzle velocity of said shotgun and having means for diverting propellent gas upon reaching the final projectile velocity, said means for diverting propellent gas comprises at least one opening positioned in the control section of said barrel.

5,315,915

PERISCOPE AT THE HATCHWAY OF A COMBAT VEHICLE

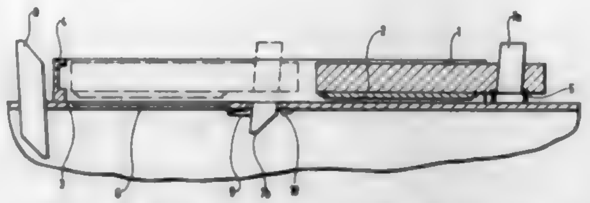
Uwe Sprafke, Schauenburg-Elmshagen, Fed. Rep. of Germany, assignor to Firma Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Jan. 4, 1993, Ser. No. 439

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1992, 4200261

Int. Cl.⁵ F41H *5/22, 5/26*

U.S. Cl. 89—36.14 **4 Claims**



1. In a combat vehicle having a roof with a hatchway, a hatch for closing the hatchway and including a lower component receivable in the hatchway and an upper component for covering an outer edge of the hatchway, means mounting the hatch for sliding movement of the upper component from an open position wherein the hatchway is open to a closed position wherein the upper component is over the hatchway with a gap between a lower surface thereof and the roof and for movement of the lower component towards and away from the hatchway when the upper component is in the closed position and a periscope comprising a lower section, means fastening the lower section to the roof and extending into an interior thereof and an upper section extending through the upper component of the hatch and movable therewith into optical alignment with the lower section when the upper component is in the closed position, the improvement comprising a brush mounted to at least an area on the lower surface of the upper component that directly precedes the upper section in a direction of movement of the upper component in which the upper component moves from the closed position to the open position and wherein the brush has bristles which extend down to the roof perpendicular to the direction of movement of the upper component at least along a circumference of the lower section at the vehicle roof.

5,315,916

SYSTEM OF LINEAR HYDRAULIC MOTORS

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Division of Ser. No. 831,173, Feb. 5, 1992, Pat. No. 5,193,661. This application Nov. 24, 1992, Ser. No. 981,079

Int. Cl.⁵ F01L *15/00*

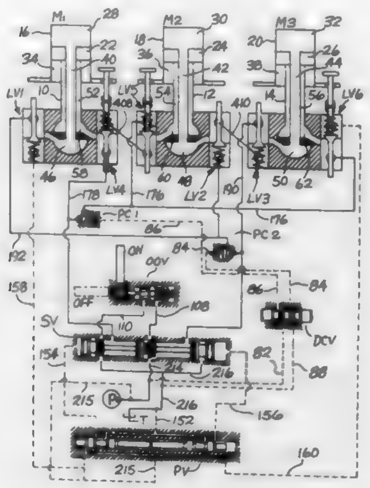
U.S. Cl. 91—178 **5 Claims**

1. In a hydraulic motor system characterized by three linear hydraulic motors, each having a stationary portion and a movable portion, together defining a first working chamber on a first side of a piston head and a second working chamber on the second side of the piston head, and a control system which moves hydraulic fluid pressure into and out from the working chambers, to move ,the movable portions of the motors in unison, in a first direction, and to move them sequentially in the opposite direction,

said control system including a pilot controlled two position switching valve for switching hydraulic pressure and return between a first passageway leading to the first working chambers and a second passageway leading to the second working chambers, said switching valve including a first end, a second end, a first pilot chamber at said first end, and a second pilot chamber at said second end;

a two position pilot valve for switching hydraulic pressure and return between the first and second pilot chambers of the switching valve, said pilot valve having a first end, a first pilot chamber at said first end, a second end and a second pilot chamber at said second end; and

first and second limit valves associated with the linear hydraulic motors, for switching hydraulic pressure and return between the first and second pilot chambers of the pilot valve, said first limit valve being associated with the first linear hydraulic motor to move in sequence, and being mechanically opened when the movable portion of its motor substantially reaches an end-of-movement position, and said second limit valve being associated with the third motor to move in sequence, and being mechanically opened when the third motor substantially reaches an opposite end-of-movement position.



5,315,917

MONOPORT AIRGUN FOR SEISMIC EXPLORATION HAVING DISCHARGE PORT EXTENDING CONTINUOUSLY FOR 360 DEGREE AROUND ITS AXIS

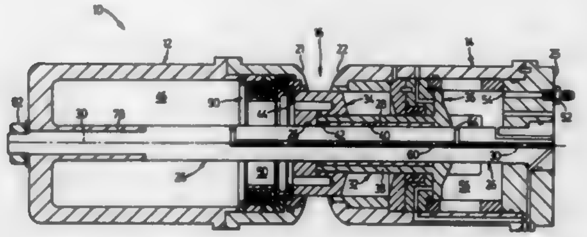
Edward W. Mayzes, 48 White Ave., Bragg Creek, Alberta, Canada T0L 0K0

Filed Nov. 9, 1992, Ser. No. 973,765

Claims priority, application Canada, Nov. 13, 1991, 2055405

Int. Cl.⁵ F15B *11/08;* **H04R** *23/00*

U.S. Cl. 91—418 **18 Claims**



1. An airgun discharging at a monoport for seismic exploration comprising:

an airgun having a longitudinal axis;

a first housing for providing a firing chamber;

a second housing for providing an operating chamber;

said first and second housings being positioned in alignment along said axis;

said first and second housings being spaced apart along said axis for providing a discharge port between said first and second housings;

said discharge port extending continuously 360° around said axis and having an outwardly flaring horn-like configuration with generally exponentially shaped sidewalls;

said first and second housings being interconnected at said discharge port solely by shuttle guide means;

a shuttle encircling said guide means and being slidably mounted on said guide means;

said shuttle being movable along said guide means between closed and open positions;

said shuttle in said closed position closing said firing chamber for enabling pressurized gaseous fluid to be contained in said firing chamber;

said shuttle in said open position opening said firing chamber to said discharge port for allowing pressurized gaseous fluid to be discharged from said firing chamber outwardly through said discharge port extending continuously around said axis; and

said operating chamber for moving said shuttle between said open position and said closed position.

5,315,918

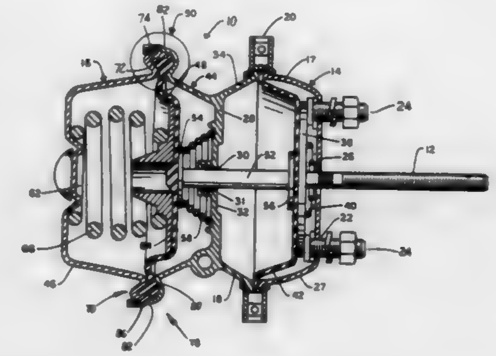
TAMPER-RESISTANT BRAKE ACTUATOR

William C. Pierce, Muskegon, Mich., assignor to Nai Anchorlok, Inc., Muskegon, Mich.

Filed Feb. 19, 1993, Ser. No. 20,152

Int. Cl.⁵ F01B *7/00, 29/00;* **B25G** *3/00*

U.S. Cl. 92—63 **19 Claims**



1. A fluid-operated brake actuator comprising;

a generally cylindrical head having a first radially outwardly extending shoulder and a first annular rim extending axially from the first shoulder,

a flange case having a second radially extending shoulder and a second annular rim extending axially from the second shoulder and in radial overlapping relationship with the head first annular rim,

an elastomeric diaphragm between the flange case and the head and having a circumferential peripheral edge between the first shoulder and the second shoulder; and

a connection for connecting the first annular rim and the second annular rim by rotation of the head with respect to the flange case.

5,315,919

ARRANGEMENT FOR FRYING OR WARMING ARTICLES OF FOOD

Rudolf Hoeberigs, Knokke-Heist, Belgium, assignor to Jean M. M. Hoeberigs, Netherlands

PCT No. PCT/BE91/00054, § 371 Date Feb. 11, 1992, § 102(e) Date Feb. 11, 1992, PCT Pub. No. WO92/02166, PCT Pub. Date Feb. 20, 1992

PCT Filed Aug. 2, 1991, Ser. No. 761,964

Claims priority, application Belgium, Aug. 7, 1990, BE09000773

Int. Cl.⁵ A47J *37/00*

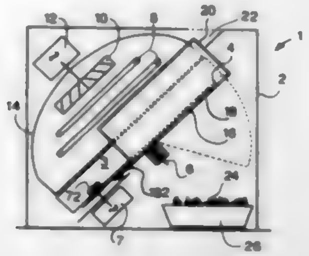
U.S. Cl. 99—357 **6 Claims**

1. An arrangement for frying or warming loose articles of food comprising:

a receptacle for receiving said articles of food, said receptacle having a bottom which is disposed at and rotatable about a central oblique angle;

a heating element for warming or frying the articles of food received by said receptacle, wherein

said bottom includes a number of separate segments, each segment being jointed so as to be pivotal individually under its own weight between a closed condition, wherein the loose articles of food are retained in said receptacle, and an open condition wherein the loose articles of food are allowed to be discharged from said receptacle.



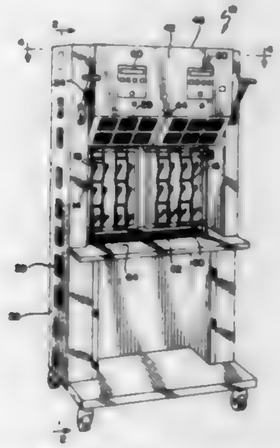
5,315,920
APPARATUS FOR HIGH-SPEED COSMETIC FINISHING OF PRECOOKED FOOD ARTICLES

Benno E. Liebermann, Louisville, Ky., assignor to Beltec International, Aurora, Ill.

Filed Feb. 18, 1992, Ser. No. 837,047

Int. Cl.⁵ A47J *37/00, 37/04*

U.S. Cl. 99—391 **11 Claims**



1. An apparatus for heating processing of food, comprising:
a. a frame;
b. a rack on which said food is held;
c. rack displacement means for reciprocally moving said rack between a food loading position and a heat processing position, wherein said rack displacement means comprises both a lever and a cable and pulley-actuated linkage;
d. a heating cavity into which said rack is moved when said rack is in said heat processing position; and,
e. heating means on at least one side of said heating cavity.

5,315,921
METHOD AND APPARATUS FOR DEHYDRATING WASTE FOOD MATERIAL

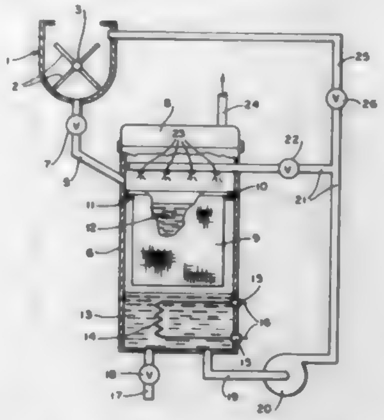
Robert E. Davis, Hinsdale, Ill., assignor to R. E. Davis Chemical Corporation, Oak Brook, Ill.

Filed Dec. 26, 1991, Ser. No. 814,009

Int. Cl.⁵ A47J *37/12*

U.S. Cl. 99—407 **3 Claims**

1. An apparatus for dehydrating waste food material containing moisture, comprising comminuting means for comminuting a food material containing moisture to provide food particles, a vessel having an inlet, a porous support disposed within the vessel and having an opening communicating with said inlet, conduit means connecting said comminuting means and said vessel for conducting comminuted food material from said comminuting means to the inlet of the vessel and into said porous support, circulating conduit means connecting the lower portion of the vessel to the upper portion of the vessel, means for flowing a non-aqueous liquid through said circulating conduit means with the liquid flowing downwardly in contact with the food material in said porous support, heating means for heating the liquid, said heated liquid acting to vaporize the moisture in said food material to provide a dry finely divided product, by-pass conduit means connecting said circulating conduit means with said comminuting means for supplying said liquid to said comminuting means and flushing comminuted food material from said comminuting means, and valve means disposed in said by-pass conduit means for controlling the flow of liquid therein.



5,315,922
TABLE-TOP BAKING OVEN, PARTICULARLY FOR PIZZA, OR THE LIKE

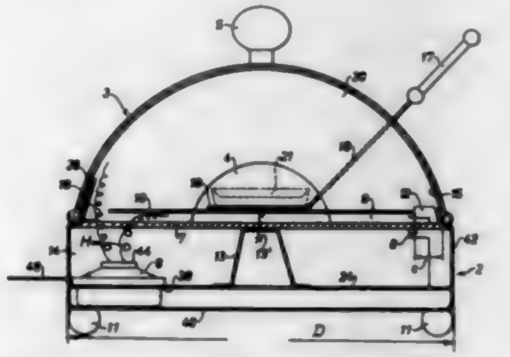
Robert Keller, Zurzach, Switzerland, assignor to Robert Keller AG, Rekingen, Switzerland

Filed Jan. 21, 1993, Ser. No. 7,249

Claims priority, application Switzerland, Feb. 5, 1992, 00305/92; Feb. 5, 1992, 00306/92

Int. Cl.⁵ A21B *1/00, 1/33, 1/52, 5/00*

U.S. Cl. 99—447 **16 Claims**



1. Table-top baking oven having
a bottom part (2, 2'); and
a top part in the shape of a removable cover (3, 3'), said removable cover defining a lower and an upper region when the removable cover is placed on the bottom part, said removable cover further defining a heating space therebeneath,

wherein, in accordance with the invention,
the removable cover (3) comprises an essentially dome-shaped cover element of unglazed heat-resistant stoneware, defining a baking space underneath the cover, said cover being formed with at least two dough insertion openings (4, 4') uniformly positioned along the lower circumference of the cover, and open at the bottom, said cover fitting over the bottom part;
a carrier plate (10) for the goods is provided, positioned at an upper region of the bottom part (2, 2'); and
a heat source (6, 25) is provided, located within the heating space to heat the carrier plate (10) as well as the baking space (20) beneath the dome-shaped cover.

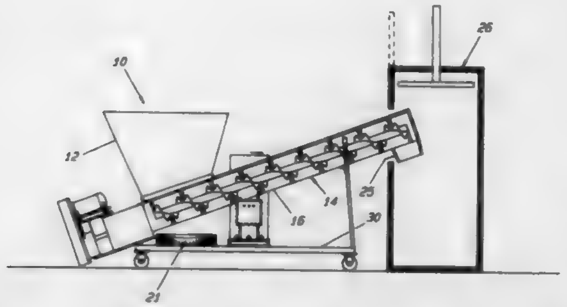
5,315,923
METHOD OF PREPARING PAPERBOARD FOOD AND BEVERAGE CONTAINERS FOR RECYCLING

Michael G. Tokarski, Dublin, and Lester A. Roudabush, Delaware, both of Ohio, assignors to Combibloc, Inc., Columbus, Ohio

Filed Sep. 14, 1992, Ser. No. 944,397

Int. Cl.⁵ B30B *13/00*

U.S. Cl. 100—39 **8 Claims**



1. A method for enhancing the collection of food and beverage paperboard packaging for later recycling, said method comprising the steps of: collecting used and discarded paperboard packages, said packages having at least some moisture associated therewith; introducing said packages into a break open mechanism; adding a moisture absorbent chemical additive onto said packages while said packages are in said break open mechanism; and compressing said opened and moisture reduced packages into a bale suitable for shipment to a recycling center.

5,315,924
WASTE COMPACTOR APPARATUS WITH COMPACTOR AND REMOVABLE SUBJACENT CONTAINER

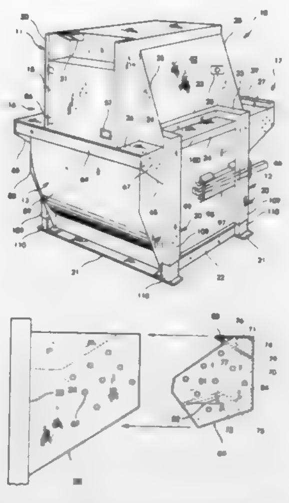
Kent Kruzick, Winamac, Ind., assignor to Galbreath Incorporated, Winamac, Ind.

Filed May 5, 1992, Ser. No. 879,173

Int. Cl.⁵ B30B *15/16, 15/30*

U.S. Cl. 100—53 **17 Claims**

1. A waste compactor apparatus having a front, a back and sides, comprising:
a compactor having a front and defining an opening for receiving waste materials therethrough, the compactor being operable to compress waste materials into a waste container positioned therebelow;
a waste container defining an upwardly facing opening;
a support frame defining a front and a back and a channel open to the front and the back and sized to slidably receive a waste container therein, and wherein said frame supports said compactor above the channel, said support frame including first and second header attachment means at the front and back of said support frame, respectively, for connecting with a stop header; and
a stop header interchangeably attachable to either of said first and second header attachment means to block off one of the front and the back of the channel to define the direction from which said container may be inserted and withdrawn from the channel of said frame relative to the opening of said compactor.



5,315,925
ROUND BALER HAVING IMPROVED BALE CORE STARTING STRUCTURE

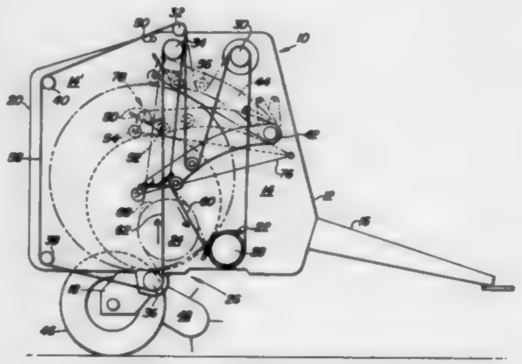
Jean Viaud, Sarreguemines, and Arsene Roth, Walschbronn, both of France, assignors to Deere & Company, Moline, Ill.

Filed May 3, 1993, Ser. No. 56,975

Claims priority, application Fed. Rep. of Germany, May 9, 1992, 4215308

Int. Cl.⁵ B30B *5/06;* **A01D** *39/00*

U.S. Cl. 100—88 **12 Claims**



1. In a baler for forming large cylindrical bales having a main frame and discharge gate each including opposite side walls, a plurality of belts supported on a plurality of rolls, extending transversely between and mounted to the opposite side walls, so as to define a baling chamber having an opening at its bottom, the belts including a first and second span respectively engaging first and second rolls, located at a front and rear location of the opening, with the first and second spans converging upwardly and respectively passing between confronting surfaces of third and fourth rolls mounted to a belt tensioning frame that extends above the baling chamber and is vertically pivotally mounted for movement toward and away from said chamber opening, the improvement comprising: support means connecting the fourth roll to the tensioning frame for pivotal movement toward and away from said third roll; and controlling means coupled to said fourth roll for increasingly moving the fourth roll toward the third roll as a bale grows in the baling chamber and lifts the tensioning frame.

5,315,926

HIGH EFFICIENCY, SWASH PLATE MECHANICAL PRESS

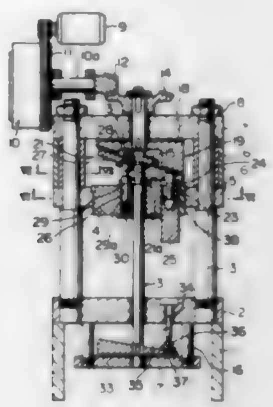
Hisanobu Kanamaru, and Kouji Harada, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 882,869, May 14, 1992, abandoned. This application Aug. 3, 1993, Ser. No. 101,109

Claims priority, application Japan, May 14, 1991, 3-107948

Int. Cl.⁵ B30B *1/26*

U.S. Cl. 100—218 **11 Claims**



1. A mechanical press, comprising spaced supporting portions, a driving shaft operatively disposed between the supporting portions so as to be rotatably supported by said supporting portions, a swash plate coaxially operatively fixed to a part of said driving shaft between the spaced supporting portions for rotation with said driving shaft, a slider, a slider guide connected with at least one of the supporting portions and operatively carrying said slider, and an oscillating plate swingable about said driving shaft, and said swash plate swinging said oscillating plate as said swash plate rotates, said oscillating plate having an integral, semispherical central projecting portion slidably abutted onto a complementary surface of said slider guide, whereby said oscillating plate operatively cooperates with said swash plate for converting a rotational movement of said driving shaft and said swash plate to a reciprocating movement of said slide so as to obtain a pressing force.

5,315,927

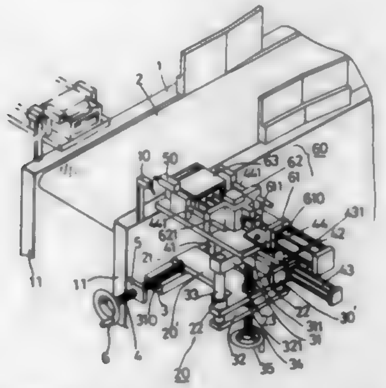
AUTOMATIC PRINTING APPARATUS FOR A PACKING CASE CARRIED ON A CONVEYOR BELT UNIT

Chin-Chen Yeh, No. 6, Lane 129, Min-Tsu Rd., Changhua City, Taiwan

Filed Dec. 4, 1992, Ser. No. 986,002

Int. Cl.⁵ B65B *61/26*

U.S. Cl. 101—35 **1 Claim**



1. An automatic printing apparatus for a packing case carried on a conveyer belt unit, said conveyer belt unit having first and second upright side walls which are located at two sides thereof, said printing apparatus comprising a first printing mechanism disposed on said first upright side wall of said conveyer belt unit, said first printing mechanism including:

a lower support unit disposed movably on said first upright side wall of said conveyer belt unit;

a lengthwise-position adjustment device mounted operatively on said conveyer belt unit and actuatable so as to move said lower support unit along a length of said conveyer belt unit;

an upper support unit mounted movably on said lower support unit;

a height adjustment device mounted operatively on said lower support unit and actuatable so as to move said upper support unit vertically on said lower support unit;

a printer support unit mounted movably on said upper support unit;

a feeding hydraulic cylinder having a cylinder body fixed on said upper support unit, and a piston rod mounted movably in said cylinder body of said feeding cylinder body at one end portion thereof and connected securely to said printer support unit at the other end portion thereof;

a sensor installed on said first upright side wall of said conveyer belt unit so as to activate said feeding hydraulic cylinder to move said printer support unit toward said packing case when said sensor detects that said packing case is at a predetermined position on said conveyer belt unit;

a printing hydraulic cylinder unit including a printing hydraulic cylinder carried on said printer support unit, and a printer member disposed between said printing hydraulic cylinder and said packing case, said printing hydraulic cylinder having a cylinder body fixed on said printer support unit, and a piston rod mounted movably in said cylinder body of said printing hydraulic cylinder at one end portion thereof and connected securely to said printer member at the other end portion thereof; and

a contact switch installed on a front end of said printer support unit and connected functionally to said printing hydraulic cylinder in such a manner that, when said contact switch is moved to contact said packing case, said piston rod of said printing hydraulic cylinder carries said printer member to move toward said packing case so as to print said packing case.

5,315,928

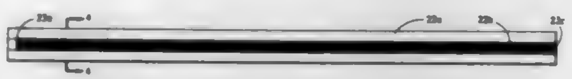
BAND LINE PRINTER WITH GROOVED PLATEN

D. Michael Bocinski, Binghamton; Craig A. Kaufman, Apalachin; Randy J. Kisacky, Johnson City; Barton H. Kunz, Owego, all of N.Y.; Lawrence A. Stone, Cary, N.C.; Jerry Z. Raski, Endicott, N.Y.; David B. Schaefer, Apalachin, N.Y., and Douglas A. Schmidt, Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 664,254, Mar. 4, 1991, Pat. No. 5,168,803. This application Nov. 20, 1992, Ser. No. 979,707

Int. Cl.⁵ B41J *11/08*

U.S. Cl. 101—93.14 **8 Claims**



1. An impact line printer, comprising:

a print band trained around a drive pulley and an idler pulley and positioned along a print line;

said print band being longitudinally movable around the pulleys in the direction leading along said print line;

a plurality of print hammers mounted for selectively impacting with one surface of the print band along said print line; and

a platen having hammer impact surfaces positioned along the print line on an opposite side of the print band from the hammers so that the hammers strike the band against the impact surfaces which become polished as the band slides on the impact surfaces; and including

groove means forming elongated breaks in the hammer impact surfaces, the elongated breaks being narrower than the width of each impact surface and into which the band cannot conform, for reducing adherence of the band to the impact surfaces due to the polishing and thereby reducing the frictional drag on said band.

5,315,929

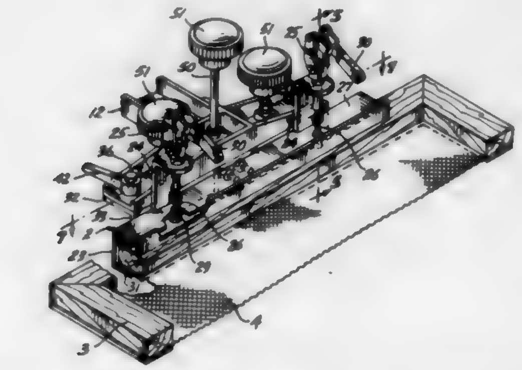
FINE ADJUSTMENT MECHANISM FOR SCREEN PRINTING MACHINES

James W. Sundqvist, 31828 - 112th SE., Auburn, Wash. 98001

Filed Sep. 4, 1992, Ser. No. 941,184

Int. Cl.⁵ B41F *15/36*

U.S. Cl. 101—127.1 **16 Claims**



13. A screen printing machine comprising a printing station, a screen holder, an elongated support arm assembly for supporting said screen holder and for moving said screen holder toward and away from said printing station between positions including a raised position and a lowered printing position, means for adjusting the position of said screen holder relative to said support arm assembly for achieving a desired registration of said screen holder at said printing station, said adjusting means including first adjustment means for swinging said screen holder about an axis extending substantially perpendicular to the length of said elongated support arm assembly without changing the position of said assembly between said raised position and said lowered position, second adjustment means for swinging said screen holder about an axis extending generally parallel to the length of said support arm assembly without changing the position of said assembly and third adjustment means for translating said screen holder relative to said elongated support arm assembly so as to adjust both the longitudinal and transverse position of said screen holder without changing the position of said assembly, said third adjustment means including an adjustment plate interposed between the support arm assembly and the screen holder and means for releasably clamping said adjustment plate to the support arm assembly for allowing movement of said adjustment plate relative to said support arm assembly, said adjustment plate including a generally horizontally extending upper portion, said third adjustment means further including means separate from said clamping means interconnecting said upper portion of said adjustment plate with said support arm assembly, said interconnecting means including a plurality of rotatable cam members having eccentric portions and interfitting means on said upper portion of said adjustment plate to engage with said eccentric positions such that, with said clamping mechanism released, rotation of said cam members translates said adjustment plate relative to the support arm assembly.

5,315,930

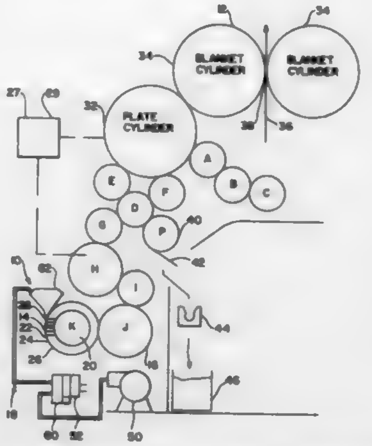
KEYLESS INKING SYSTEM FOR A PRINTING PRESS

Thaddeus A. Niemiro, Lisle, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 800,945, Dec. 2, 1991, abandoned. This application Nov. 30, 1992, Ser. No. 983,029

Int. Cl.⁵ B41F *31/08;* **B41L** *27/10*

U.S. Cl. 101—366 **3 Claims**



1. An inking system for a printing press, comprising:

an ink injector having means for supplying metered ink in an amount proportional to the printing press; and

a fountain roller having an outer brush surface for receiving an distributing ink from the injector;

means for rotating the fountain roller in a specified rotational direction; and

a spreading blade located adjacent and downstream from the injector relative to the fountain roller, and extending laterally along and in contact with the fountain roller, with said spreading blade extending at an angle to the fountain roller in a direction disposed along the direction of rotation of the fountain roller.

5,315,931

BLANKET FIXING AND TENSIONING ASSEMBLY

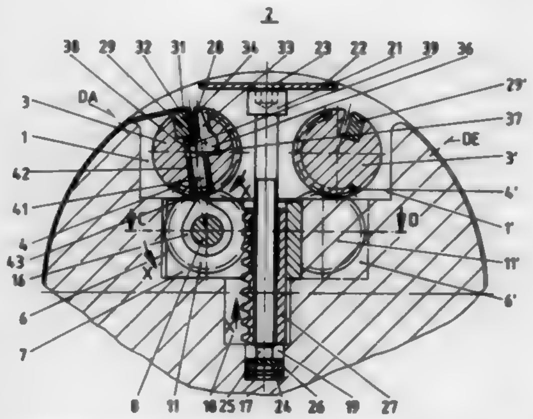
Willi R. L. Doersam, Hoechberg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Aug. 20, 1992, Ser. No. 932,509

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1991, 4127714

Int. Cl.⁵ B41F *1/28*

U.S. Cl. 101—415.1 **10 Claims**



1. A blanket fixing and tensioning assembly usable to secure

and tension a blanket on a blanket cylinder, said blanket fixing and tensioning assembly comprising:

a blanket leading edge tensioning shaft rotatably positioned in a recess in a blanket cylinder;

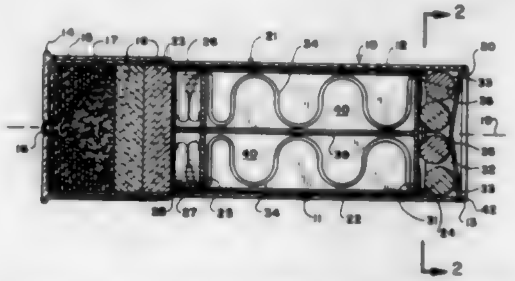
means to attach a leading edge of a blanket to said blanket leading edge tensioning shaft;

means to lock said leading edge of a blanket to said leading edge tensioning shaft including a locking device having an arm, said arm having a blanket leading edge engaging hook at a first, outer end, a bearing piece at a second, inner end, and a generally fork-shaped guide slot intermediate said first and second ends;

a blanket trailing edge tensioning shaft rotatably positioned in said recess in said blanket cylinder; and

means to attach a trailing edge of said blanket to said blanket trailing edge tensioning shaft.

5,315,932
ENSNARING SHOT CARTRIDGE
Charles H. Bertram, P.O. Box 126, Honesdale, Pa. 18431
Filed May 25, 1993, Ser. No. 66,249
Int. Cl.⁵ F42B *7/02*
U.S. Cl. 102—457 **7 Claims**



1. A projectile system incorporated into a shot shell having a cylindrical casing terminating in front and rear extremities, a base disposed at said rear extremity and having an axially centered percussion primer and enclosed charge of propellant, wadding disposed in sealing relationship forwardly of said propellant, and a closure panel associated with said front extremity, said projectile system being housed within said casing between said wadding and closure panel, and comprised of:

a) a receptacle liner of integral construction having a cylindrical sidewall portion configured to closely conform to the interior of said casing, a flat floor panel adapted to abut said wadding, and an open forward extremity,

b) a rear friction fit retainer panel positioned within said liner forwardly adjacent said floor panel and defining therewith a rear storage space,

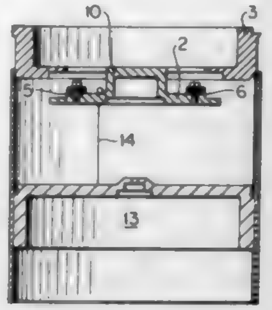
c) a plurality of fish hooks separately stored within said rear storage space,

d) a front friction fit retainer panel positioned within said liner adjacent said front extremity and defining with said closure panel a front storage space,

e) a plurality of buckshot, corresponding to the number of fish hooks, stored within said front storage space, and

f) a plurality of lengths of thin, strong line, each having a distal extremity that attaches to a buckshot, and an opposed proximal extremity, each line engaging a fish hook, all proximal extremities joining at a single site, said lines being confined in compacted state within said liner between said storage spaces.

5,315,933
LAUNCHING SYSTEM
Lars Paulsson, Kirstinehamn, and Lennart Eriksson, Karlskoga, both of Sweden, assignors to Bofors AB, Karlskoga, Sweden
Filed Oct. 22, 1992, Ser. No. 964,963
Claims priority, application Sweden, Oct. 23, 1991, 9103081
Int. Cl.⁵ F42B *12/58*
U.S. Cl. 102—489 **10 Claims**



6. A protective canister, comprising:

a container having a first open end and a second initially closed end;

a separable sub-combat unit, said sub-combat unit being surrounded on al sides but one by said canister;

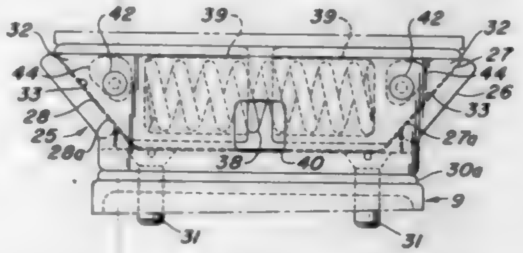
a displaceable driving sabot disposed between said sub-combat unit and the second initially enclosed end of said canister, said sabot abutting against the sub-combat unit;

a gas-generating pyrotechnical charge disposed between the sabot and the second end of the canister; and

arresting means for retarding the displacement of the sabot at a predetermined displacement distance between the sabot and the second end of the canister, said arresting means being interconnected between said sabot and said canister; and

means for causing a division of the protective canister into a plurality of parts and for ensuring a change in at least one of the trajectory and the velocity of the parts of the canister.

5,315,934
CONSTANT CONTACT SIDE BEARINGS WITH SPRING BIASED SLIDING WEDGES
Harold A. List, deceased, late of Baltimore, Md., and by Marie F. List, executrix, Yardley, Pa., assignors to Railway Engineering Associates, Inc., Baltimore, Md.
Filed Dec. 30, 1992, Ser. No. 998,394
Int. Cl.⁵ B61F *5/14*
U.S. Cl. 105—199.3 **18 Claims**



1. In a railroad truck for support of a rail car body, a side bearing assembly comprising:

a bearing support mounted on the truck outboard of the car body center line, said bearing support having fore and aft inclined wall surfaces, said wall surfaces inclining upwardly and away from a centerline extending generally transversely of the bearing support;

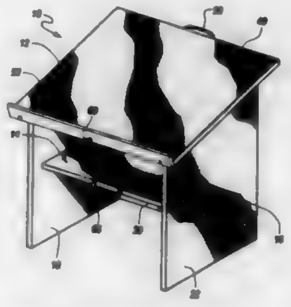
a pair of wedge blocks seated in said bearing support, each of said wedge blocks having an inclined support surface interfacing with one of said inclined wall surfaces and an upwardly facing bearing surface;

said car body having a car body bearing member having a bearing surface in overlying relationship to said wedge blocks;

biasing means acting on said wedge blocks for biasing said interfacing inclined interfacing surfaces together;

the force of said biasing means being of a magnitude sufficient to maintain said wedge blocks in supporting engagement with the bearing surface of said car body bearing member throughout the life of said bearing means.

5,315,935
FOLDING PORTABLE DRAFTING TABLE
Gilbert L. Weisenfels, Rt. 1, Box 144, Scranton, Ark. 72863
Filed Nov. 2, 1992, Ser. No. 973,839
Int. Cl.⁵ A47B *3/00*
U.S. Cl. 108—193 **10 Claims**



1. A folding portable drafting table comprising:

a base having a center panel, a left panel, and a right panel,

said center panel being of elongated rectangular outline with the vertical length being longer than the horizontal width,

said left and right panels being of substantially trapezoidal elongated outline, each having a top and bottom and a front and back edge, said back edge being approximately the same vertical length as said vertical length of said center panel and said front edge being smaller in vertical length than said back edge, and said top edge including a notch,

means for rotatably securing said back edge of said left and right panels to said center panel, said means extending substantially the entire continuous vertical length of said center panel,

means for limiting the angular rotation of said left and right panels with respect to said center panel,

a table top having an elongated rectangular outline and a combination of rails and blocks on the underside of said table top,

said combination of rails and blocks providing for securing said table top to said top edges of said left and right panels and extending substantially the entire length of said top edges of said left and right panels, and said blocks being adapted to be received by said notches in said top edges of said right and left panels.

5,315,936
ERECTABLE DISPLAY STAND
Michael J. Smith, Orangeburg, N.Y., assignor to Arrow Art Finishers, Inc., Bronx, N.Y.
Filed Feb. 22, 1993, Ser. No. 20,347
Int. Cl.⁵ A47B *3/00*
U.S. Cl. 108—165 **12 Claims**

1. A display stand erectable from a collapsed to an erect state, comprising:

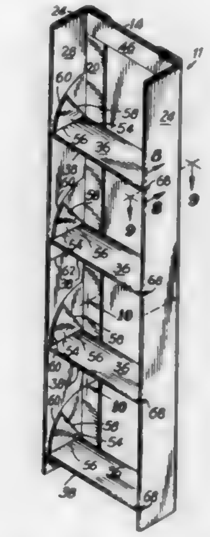
(a) a generally planar rear panel having a top and a bottom spaced apart along a longitudinal direction, and opposite sides spaced apart along a transverse direction generally normal to the longitudinal direction;

(b) a pair of generally planar side panels pivotably connected to the sides of the rear panel for movement between a first position in which the side panels are generally coplanar with the rear panel in the collapsed state, and a second position in which the side panels lie in mutual parallelism in planes generally normal to the rear panel in the erect state, each side panel having a slit;

(c) a generally planar shelf extending between opposite shelf ends along the transverse direction and being pivotably connected to the rear panel for movement between a shelf-up position in which the shelf is generally coplanar with the rear panel in the collapsed state, and a shelf-down position in which the shelf lies generally normal to the rear panel in the erect state;

(d) a pair of shelf supports integral with, and being pivotably connected to, the shelf ends and the side panels, for moving the shelf from the shelf-up to the shelf-down position by moving the side panels from the first to the second position, each shelf support being bounded in part by a respective said slit formed in a respective side panel and being generally coplanar with the respective side panel and the rear panel in the collapsed state; and

(e) holder means on the stand for holding the shelf in the shelf-down position.



5,315,937
WASTE MATERIAL COMBUSTION ASH EJECTION SYSTEM
Robert M. Williams, 16 La Hacienda, St. Louis, Mo. 63124
Filed Aug. 7, 1992, Ser. No. 925,913
Int. Cl.⁵ F23J *1/00*
U.S. Cl. 110—165 A **4 Claims**

1. A waste material combustion ash ejection system for the discharge of the hot ash resulting from combustion, the system comprising:

a) a furnace having a primary elongated ash discharge conduit formed with a discharge end;

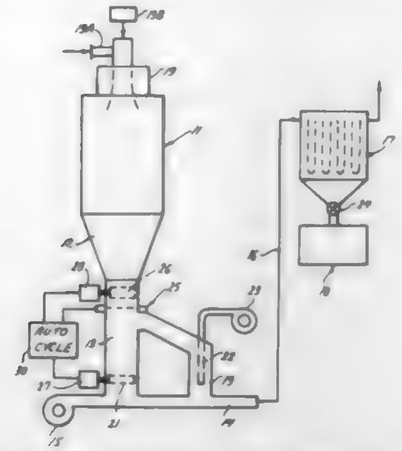
b) air transport means connected to said discharge end of said primary ash discharge conduit;

c) a secondary ash discharge conduit connected into said primary ash discharge conduit at one end and connected into said air transport means at an opposite end;

d) a normally open first gate means operably disposed in said primary ash discharge conduit in advance of said secondary ash discharge conduit connection at said one end;

e) a normally closed second gate means operably disposed in said primary ash discharge conduit adjacent said discharge end connected to said air transport means;

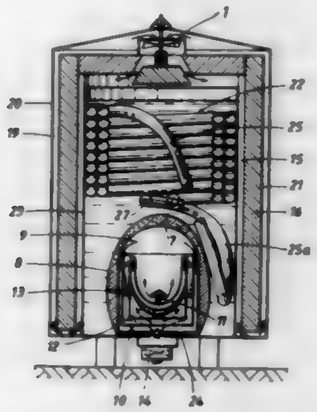
f) an air ejection nozzle mounted in said secondary ash discharge conduit, said nozzle being aimed toward said opposite end of said secondary ash discharge conduit; and



g) a source of air connected to said ejection nozzle for supplying air at a pressure in excess of the pressure in said air transport means for effecting the discharge of ash into said air transport means.

5,315,938
HEAT ACCUMULATOR

Walter Freller, Innerschwant 226, A-5310 Mondsee, Austria
Continuation of Ser. No. 425,187, Sep. 22, 1989, abandoned. This application Oct. 30, 1992, Ser. No. 969,114
Claims priority, application Austria, Mar. 24, 1987, 694/87
Int. Cl.⁵ F23B *7/00*
U.S. Cl. 110—233 **6 Claims**



1. A heat accumulator comprising

(a) a container for a liquid heat transfer medium,

(b) heat insulation surrounding the container and heat-insulating the container from the ambient atmosphere,

(c) a combustion chamber in the container, the chamber receiving combustion air,

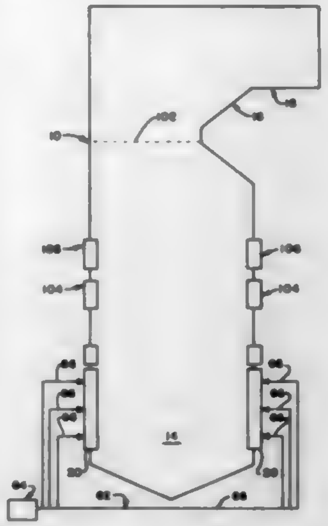
(d) an exhaust ventilator arranged to exhaust gases from the combustion chamber,

(e) a counter-flow heat exchanger surrounding the combustion chamber, the exhaust ventilator being arranged to cause the exhaust gases to flow therethrough for pre-heating the combustion air in the combustion chamber, and

(f) a heat-insulating pad surrounding the combustion chamber for heat-insulating the liquid heat transfer medium from the combustion chamber.

5,315,939
INTEGRATED LOW NO_x TANGENTIAL FIRING SYSTEM

Michael J. Rini, Hebron; Todd D. Hellewell, Windsor; David P. Towle, Simsbury, all of Conn.; Patrick L. Jennings, Granville, Mass.; Richard C. LaFlesh, Suffield, Conn., and David K. Anderson, East Longmeadow, Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed May 13, 1993, Ser. No. 62,634
Int. Cl.⁵ F23D *1/02*
U.S. Cl. 110—264 **25 Claims**



1. An integrated low NO_x tangential firing system for a pulverized solid fuel-fired furnace having a plurality of walls embodying therewithin a burner region containing a multiplicity of combustion zones of differing stoichiometries comprising:

a. a pulverized solid fuel supply means for supplying pulverized solid fuel of a predetermined fineness;

b. a windbox mounted within the burner region of the pulverized solid fuel-fired furnace;

c. a plurality of pulverized solid fuel compartments mounted within said windbox;

d. a flame attachment pulverized solid fuel nozzle tip supported in mounted relation within each of said plurality of pulverized solid fuel compartments, each of said plurality of flame attachment pulverized solid fuel nozzle tips, being connected to said pulverized solid fuel supply means for receiving therefrom pulverized solid fuel of a predetermined fineness, said flame attachment pulverized solid fuel nozzle tips being operative to effect the injection therethrough into the burner region of the pulverized solid fuel-fired furnace of the pulverized solid fuel of a predetermined fineness received thereby from said pulverized solid fuel supply means in such a manner that the ignition point of the injected pulverized solid fuel of a predetermined fineness is located less than two feet from said flame attachment pulverized solid fuel nozzle tips;

e. a plurality of combustion supporting air compartments mounted within said windbox, said plurality of combustion supporting air compartments being operative to inject therethrough into the burner region of the pulverized solid fuel-fired furnace a sufficient quantity of combustion supporting air such that the stoichiometry is between 0.4 and 0.75 in a first combustion zone of the burner region of the pulverized solid fuel-fired furnace;

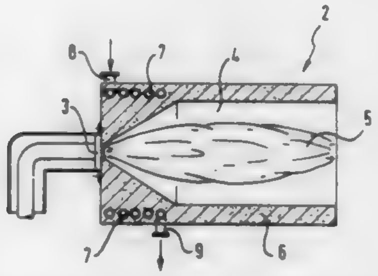
f. at least one close coupled overfire air compartment mounted in said windbox, said at least one close coupled overfire air compartment being operative to inject therethrough into the burner region of the pulverized solid fuel-fired furnace a sufficient quantity of close coupled overfire air such that the stoichiometry is between 0.7 and 0.9 in a second combustion zone of the burner region of the pulverized solid fuel-fired furnace;

g. a low level of separated overfire air located in spaced relation to said windbox within the burner region of the pulverized solid fuel-fired furnace, said low level of separated overfire air being operative to inject into the burner region of the pulverized solid fuel-fired furnace a sufficient quantity of separated overfire air such that the stoichiometry is between 0.9 and 1.02 in a third combustion zone of the burner region of the pulverized solid fuel-fired furnace; and

h. a high level of separated overfire air located in spaced relation to both said low level of separated overfire air and said windbox such that the time that it takes for the gases generated from the combustion of the injected pulverized solid fuel to travel from the top of said windbox to the top of said high level of separated overfire air exceeds 0.3 seconds, said high level of separated overfire air being operative to inject into the burner region of the pulverized solid fuel-fired furnace a sufficient quantity of separated overfire air such that the stoichiometry exceeds 1.07 in a fourth combustion zone of the burner region of the pulverized solid fuel-fired furnace.

5,315,940
PROCESS AND APPARATUS FOR THE TREATMENT OF MOIST GAS-DUST MIXTURES

Klaus Kasseck, Korschenbroich, Fed. Rep. of Germany, assignor to Loesche GmbH, Dusseldorf, Fed. Rep. of Germany
Filed Nov. 8, 1991, Ser. No. 789,263
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1990, 4035730
Int. Cl.⁵ F23J *11/00*
U.S. Cl. 110—345 **9 Claims**



1. A process for the treatment of moist, explosive gas-dust mixtures in mill drying plants during fluid transportation and storage of a resulting dust by means of a flue gas and an inert gas, comprising the steps of:

generating heated flue gas;

drying and conveying a moist gas-dust mixture through a mill drying plant by means of the heated gas;

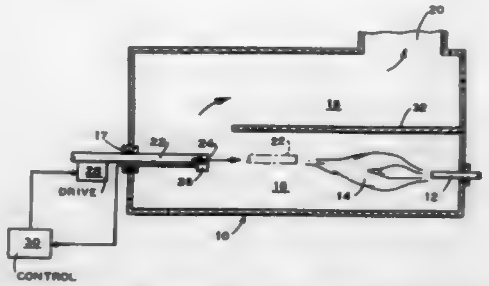
heating inert gas to a temperature above the dew point temperature of residual moisture of said gas-dust mixture;

injecting the heated inert gas at a preselected point during further conveying or storage of said gas-dust mixture; and

controlling the volume flow of said heated inert gas during conveying to prevent condensation of the residual moisture contained in said gas-dust mixture.

5,315,941
METHOD AND APPARATUS FOR INJECTING NOX INHIBITING REAGENT INTO THE FLUE GAS OF A BOILER

Richard C. Vetterick, Akron, and Donald C. Langley, North Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Jun. 7, 1993, Ser. No. 72,257
Int. Cl.⁵ F23J *15/00*
U.S. Cl. 110—345 **6 Claims**



1. An apparatus for injecting NO_x inhibiting reagent into a boiler flue gas, wall means defining a gas passage for the flow of the flue gas, the reagent best inhibiting NO_x formation at a temperature window, the flue gas temperature at the window changing with changing boiler load, the apparatus comprising:

a conduit having a nozzle for injecting NO_x inhibiting reagent into the flue gas;

mounting means for movably mounting the conduit to the wall means for changing nozzle position;

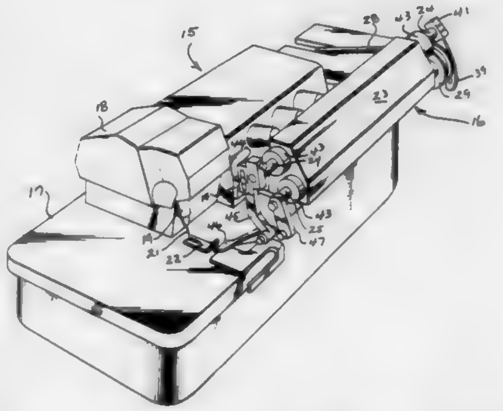
drive means operatively connected to the conduit for moving the conduit along the mounting means;

a temperature sensor for sensing the flue gas temperature to locate the temperature window; and

control means connected between the drive means and the temperature sensor for operating the drive means to move the nozzle to the temperature window.

5,315,942
HIGH SPEED SEWING MACHINE RUFFLER

Frank S. Pantusco, and George E. Wiley, both of 5202-A Brook Hollow Pkwy., Norcross, Ga. 30071
Filed Sep. 29, 1992, Ser. No. 952,966
Int. Cl.⁵ D05B *35/08*
U.S. Cl. 112—134 **5 Claims**



1. A high speed machine ruffler for operation in conjunction with a sewing machine for creating ruffles on dry goods material, wherein the sewing machine has power take-off means, sewing means and dry goods material guide means, the ruffler comprising:

means for mounting the ruffler to the sewing machine,

power means for operating the ruffler wherein the power means comprises a plurality of drive shafts, the plurality of drive shafts comprising a first oscillating shaft and a second rotational shaft, each of said shafts having a proximal and a distal end,

drive means interconnecting the power take-off means of the sewing machine with both the first and second shafts, wherein the said drive means provides rotational motion to the second shaft,

an adjustable length lever, the drive means interconnecting the power take-off means of the sewing machine and the adjustable lever and the first shaft to provide oscillating motion to the first shaft,

the adjustable length lever comprising a proximal end and a distal end, a shaft driven by the drive means having an eccentric output, the proximal end of the adjustable length lever being connected to the eccentric output to provide linear motion to the adjustable length lever, rotation producing means connecting the proximal end of the first shaft to the distal end of the adjustable length lever whereby the linear motion of the lever produces an oscillating rotational motion in the first shaft,

means for receiving power input from the power take-off means of the sewing machine and transferring the power input to the power means for operating the ruffler,

means for creating ruffles on dry goods material, the means for creating ruffles comprising a ruffler-pusher blade for selective contact with the dry goods material to form ruffles therein, motion producing means to cycle the ruffler pusher blade in a linear direction, said motion producing means comprising a ruffler arm interconnected between the pusher blade and the first drive shaft, and

eccentric motion means to effect lifting of the pusher blade from the dry goods material at predetermined periods of the pusher blade motion cycle, said eccentric means to effect lifting of the pusher blade from the dry goods material comprising an eccentrically located pivot connecting point at the distal end of the second shaft, a first linkage means attached to the eccentrically located pivot point, a second linkage means attached to the first linkage means and further interconnecting the first linkage means to the ruffler arm, whereby the pusher-blade is reciprocated linearly by the ruffler arm and is lifted from the dry goods material at predetermined times by the first linkage means.

5,315,943

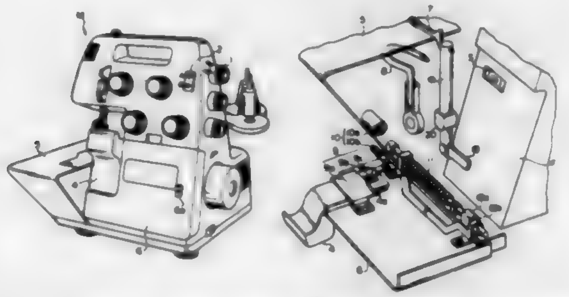
SEWING MACHINE SAFETY DEVICE INCLUDING INTERCHANGEABLE WORK TABLES AND STITCHING

Takahisa Sonoda, Chofu, Japan, assignor to Juki Corporation, Chofu, Japan

Filed Jul. 20, 1992, Ser. No. 916,416

Int. Cl.⁵ B05B *69/36*

U.S. Cl. 112—162 **6 Claims**



1. In a sewing machine having multiple stitch modes, a safety device comprising:

first looper means for manipulating thread;

second looper means for manipulating thread in conjunction with said first looper means;

control means for operating drive and shutdown of said sewing machine;

first signal generating means for generating either a first signal in relation to a first stitch mode or a second signal in relation to a second stitch mode, said first signal generating means comprising change-over means for selecting modes of operation of said sewing machine, wherein said first signal generating means transmits said first signal or said second signal in relation to said selected mode of operation;

mountable table means, said mountable table means being removable during said first stitch mode;

second signal generating means for generating a mounting or a demounting signal to said control means, said signal means being responsive to the presence or absence of said mountable table means; and

circuit means for rendering said sewing machine inactive upon transmission of said mounting signal in conjunction with said first signal from said first signal means, said circuit means rendering said sewing machine inactive irrespective of operation of said control means when said mounting signal and said first signal are transmitted.

5,315,944

MACHINE FOR AUTOMATICALLY CHANGING LOWER-THREAD BOBBINS

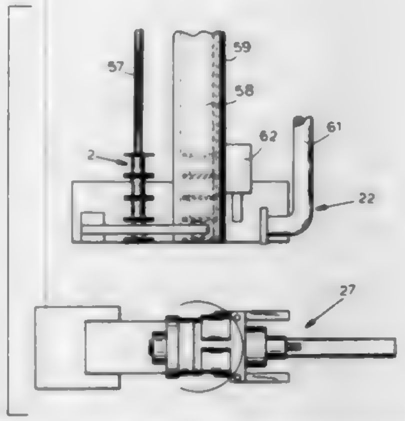
Peter Reinders, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale GmbH, Ochtrup, Fed. Rep. of Germany

Continuation of Ser. No. 777,561, Dec. 8, 1991, abandoned. This application May 25, 1993, Ser. No. 66,626

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920461; Jun. 22, 1989, 3943467

Int. Cl.⁵ D05B *57/26*

U.S. Cl. 112—180 **2 Claims**



1. A bobbin changer for a sewing machine having a lower bobbin and a case cover for said bobbin, said bobbin changer comprising:

first elongated magazine means for storing a plurality of depleted bobbins to be rewound;

second elongated magazine means adjacent said first magazine means and parallel thereto for holding in alignment a plurality of full bobbins;

a carriage movable along a longitudinal axis perpendicular to said first and second magazine means and parallel to an axis of a bobbin and case cover of the sewing machine;

a changing head of said carriage aligned with said bobbin and said case cover in an initial position of said changing head on said carriage;

actuating means for rotating said changing head about a rotation axis perpendicular to said longitudinal axis, thereby swinging said changing head into an orientation at a right angle to said longitudinal axis for alignment with said first magazine means in a first loading position, said carriage being shiftable along said orientation with said second magazine means in a second loading position;

said changing head being provided with

a boss formed with an elastic projection receiving said case

cover and a depleted bobbin from said sewing machine in said initial position,

gripping arms each in the form of a double arm lever,

means including two pneumatic cylinders respectively connected with said levers for selectively operating same, said levers engaging said case cover in said initial position, whereby said depleted bobbin is inserted into said first magazine means in said first loading position and a full bobbin is picked up by said changing head in said loading position.

5,315,945

APPARATUS AND METHOD FOR THREAD SUPPLYING IN A CHAIN STITCH SEWING MACHINE

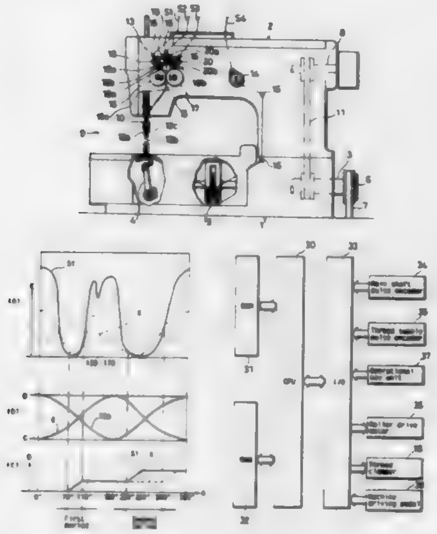
Minoru Nakano, Osaka, Japan, assignor to Pegasus Sewing Maching Mfg. Co., Ltd., Osaka, Japan

Filed Jun. 26, 1992, Ser. No. 903,938

Claims priority, application Japan, Jun. 28, 1991, 3-158114

Int. Cl.⁵ D05B *1/10, 47/04*

U.S. Cl. 112—262.1 **13 Claims**



1. A method for supplying thread in a chain stitch sewing machine which has an apparatus for forcibly supplying a needle with a needle thread for forming a stitch, the method comprising:

reciprocally moving the needle in a sewing cycle form a top end point to a bottom end point and back;

supplying a first predetermined amount of needle thread to the needle in a first period of the sewing cycle before the needle reaches the bottom end point;

stopping the supply of the needle thread when the first predetermined amount has been supplied, so that increased tension is applied to the needle thread by the movement of the needle;

supplying a second predetermined amount of the needle thread to the needle in a second period of the sewing cycle after the needle departs from the bottom end point; and

stopping the supply of the needle thread when the supplying of the second predetermined amount has been completed, before the needle reaches the top end point.

5,315,946

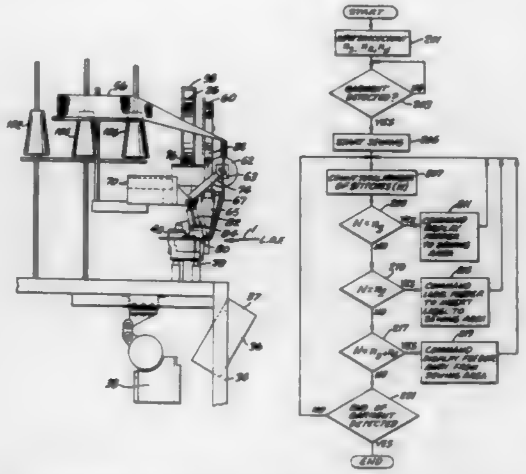
METHOD AND APPARATUS FOR AUTOMATICALLY ATTACHING A COLLARETTE, DISPLAY AND LABEL TO A GARMENT BODY

David C. Howell, Clemmons, and John C. McEwen, Mocksville, both of N.C., assignors to Sara Lee Corporation, Chicago, Ill.

Filed Jun. 6, 1991, Ser. No. 711,659

Int. Cl.⁵ D05B *35/06, 19/00*

U.S. Cl. 112—265.1 **14 Claims**



11. A method for sewing a collarette, a display and a label to a garment body comprising the steps of:

loading said garment body under a sewing machine sewing head;

feeding collarette material under said sewing head and causing said collarette material to be sewn to said garment body;

feeding display material under said sewing head on command and causing said display material to be sewn to said garment body and said collarette material;

cutting a label from a continuous supply of label material, and

feeding said label under said sewing head on command and causing said label to be sewn to said garment body, collarette material, and display.

5,315,947

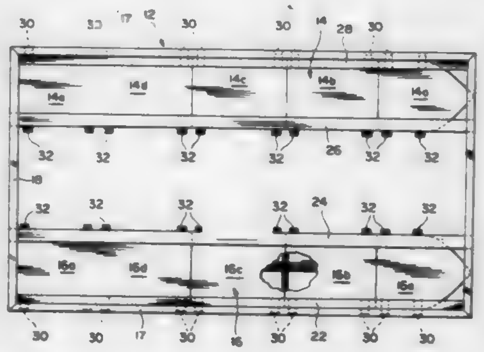
MULTI-SECTION HULL STRUCTURES

Francis Knight, P.O. Box 510, Pineland, Fla. 33945

Filed Aug. 12, 1992, Ser. No. 928,329

Int. Cl.⁵ B63C *13/00*

U.S. Cl. 114—61 **4 Claims**



1. For a water-going vessel, an assembly comprising a deck frame and a hull structure attached to and extending below the deck frame, the hull structure having a row of individual hull sections located end to end lengthwise of the deck frame, connector means pivotally connecting each hull section along an outer edge portion thereof to an outer edge portion of the

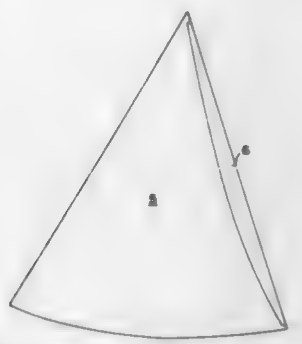
deck frame for enabling the hull section to be swung individually and selectively from a water-going position upwardly and out of the water and releasable attachment means for attaching inner edge portions of the respective hull sections to inboard portions of the deck frame in the water-going position, the assembly further including releasable means for releasably interconnecting and stabilizing the hull sections when the vessel is under way, wherein the hull sections include a foreword hull section, an aft hull section and at least one intermediate hull sections, wherein the releasable means comprises at least one cable, a passage means through the intermediate hull section for the cable and fastener means for releasably securing opposite ends of the cable to end walls of the forward and aft hull sections respectively.

5,315,948
LUFF PAD FOR ROLLER REEFING AND FURLING SAILS

Hayden D. Brown, Marblehead, Mass., assignor to Sail Systems, Inc., Marblehead, Mass.

Filed Oct. 8, 1991, Ser. No. 772,885
Int. Cl.^{5} B63H *9/04*

U.S. Cl. 114—106 **11 Claims**



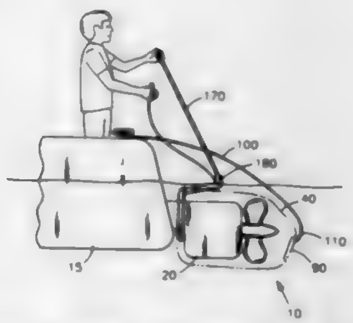
1. A roller reefing and roller furling sail luff construction member adapted to be incorporated into the luff structure of a sail comprising a deformable sandwich laminate having a core of polyurethane foam and at least one face bonded to a facing of a film or fabric, said laminate having a thickness of from about 0.1 to about 2.5 cm, a length substantially equal to the length of the luff of the sail, and a width of from about 10 to about 90 cm.

5,315,949
PROTECTIVE COVER FOR BOAT OUTCROPPING

William A. Bradley, 1636 S. Brookhurst St., Anaheim, Calif. 92804

Filed Dec. 15, 1992, Ser. No. 991,187
Int. Cl.^{5} B63B *59/00*

U.S. Cl. 114—222 **2 Claims**



1. A protective cover for a boat stern drive comprising:

an adjustable collar including a first tubular, fixed U-shaped portion defining an open end of the U-shaped portion, and a second, adjustable, flexible portion, the flexible portion being positioned so as to close the open end of the U-shaped portion, and adapted to be drawn tightly across the U-shaped portion;

a bag made of water impermeable, flexible, opaque, sheet material, the bag having an open top end providing a means for attachment of the bag to the collar, and a closed bottom end in opposition to the top end; and

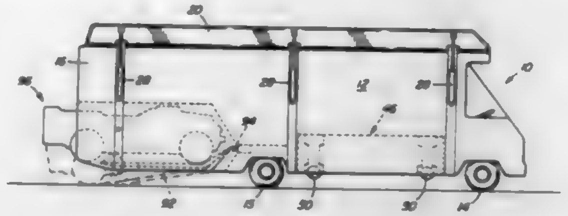
a means for adjusting the collar so that with the bag lowered along a transom around a stern drive, the open end of the bag may be closed around the drive in order to exclude light from the interior of the bag so that water borne creature cannot thrive within the cover.

5,315,950
AMPHIBIOUS VEHICLE

Gunther Abel, 8212 Alpin Way, Whistler, British Columbia, Canada V0N 1B0

Filed Jan. 21, 1993, Ser. No. 6,772
Int. Cl.^{5} B63B *35/00*

U.S. Cl. 114—270 **14 Claims**



1. An amphibious vehicle, comprising:

a vehicle body;

said vehicle body having first ground engagement wheels on which said vehicle can travel along the ground;

buoyancy tanks for supporting the vehicle on water;

means for displacing said buoyancy tanks between raised, inoperative positions and lowered, operative positions;

a propulsion device for propelling said vehicle when said vehicle is floating in the water;

second ground engagement wheels for use on entering and leaving the water;

said second engagement wheels being movable between raised, inoperative positions and lowered, operative positions in which said second ground engagement wheels support said vehicle above the ground so as to allow said buoyancy tanks to be lowered into the operative positions thereof; and

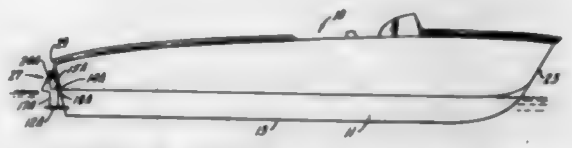
means for displacing said second ground engagement wheels between the lowered and raised positions thereof.

5,315,951
MEANS FOR IMPROVING THE PERFORMANCE OF PLANING-TYPE BOAT HULLS

Anthony W. Finkl, 445 E. Royal Flamingo Dr., Sarasota, Fla. 34236

Filed Jan. 28, 1992, Ser. No. 826,717
Int. Cl.^{5} B63B *1/28*

U.S. Cl. 114—280 **1 Claim**



1. A hydrofoil system with an adjustable angle of attack for a boat with a planing-type hull, the boat further including a transom, a keel and two chines disposed at opposing sides of the transom, the hydrofoil system comprising:

two hydrofoils, each hydrofoil mounted on an opposing side of the transom, near each chine,

each hydrofoil including a foot, a control leg, each control leg being disposed between two mounting brackets, and an attack angle adjustment means,

the foot having a surface area, the foot being fixable and perpendicularly attached to a bottom edge of the control leg, the bottom edge of the control leg being attached to a middle portion of the foot so that substantially one-half of the surface area of the foot is disposed to a right side of the control leg and substantially one-half of the surface area of the foot is disposed to a left side of the control log, the foot being located below each chine,

the control leg and the bottom edge of the control leg being disposed in a vertical plane that is substantially parallel with the keel of the hull, an upper end of the control leg being pivotally attached between the mounting brackets by a pivot bolt, the control leg pivoting about an axis at a substantially right angle to the keel of the hull, the control leg further including an anchor means for accommodating one end of the attack angle adjustment means, the anchor means being disposed on an inboard side of the control leg,

the mounting brackets being fixably attached to the transom, the mounting brackets attached to each other by a friction bolt and the pivot bolt,

the attack angle adjustment means providing adjustment of the angle of attack of the foot, the attack angle adjustment means including a longitudinally adjustable arm with two ends, one end mounted to the transom, the other end mounted to the anchor means of the control leg, the attack angle adjustment means further including a means for mutually controlling the length of the longitudinally adjustable arm, the attack angle adjustment means further being disposed inboard of the control leg and mounting brackets,

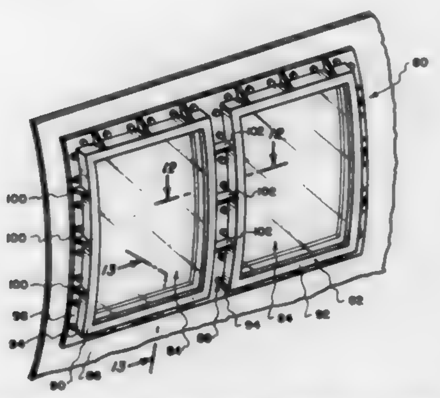
each attack, angle adjustment means providing both negative attack angles of the foot and positive attack angles of the foot.

5,315,952
METHOD OF MAKING AND APPARATUS OF A VIEW WINDOW

Curtiss E. Jackson, Jr., 5514 Ridgeway Ct., Westlake Village, Calif. 91362

Continuation-in-part of Ser. No. 697,221, May 7, 1991, abandoned. This application Oct. 19, 1992, Ser. No. 966,502
Int. Cl.^{5} B63B *19/00*

U.S. Cl. 114—312 **8 Claims**



1. A watertight view window for a ship comprising:

a laminated transparent sheet, said laminated transparent sheet conforming to a portion of said ship and comprising:

a top acrylic layer approximately 0.125 inches thick;

a first urethane layer approximately 0.025 inches thick;

a first polycarbonate layer approximately 0.53 inches thick;

a second urethane layer approximately 0.05 inches thick;

a second polycarbonate layer approximately 0.53 inches thick;

a third urethane layer approximately 0.025 inches thick; and

a second acrylic layer approximately 0.125 inches thick;

a gasket, said gasket being U-shaped defining a pair of spaced apart legs, each said leg having an outside surface and an inside surface, an inside area formed between said inside surfaces of said legs, said gasket encompassing the perimeter of said laminated sheet with said perimeter located within said inside area, said gasket comprising:

compressible rubber or plastic which measures approximately 50–55 shore "A" on a durometer;

two ribs on said outside surface and two ribs on said inside surface of each said leg;

said ribs on a first side of said gasket having a radius of approximately 0.14 inches;

said ribs on second and third sides of said gasket having a radius of approximately 0.156 inches; and

said ribs on a fourth side of said gasket having a radius of approximately 0.203 inches; and

a frame, said frame conforming to a portion of said ship and overlying said gasket and encompassing said transparent sheet, said frame comprising:

ASTM A-36 structural steel or its equivalent;

an inside width of approximately 35.5 inches, an inside length of approximately 59.36 inches, and an overlap of approximately 3 inches;

said frame defining slots to provide flexibility, said slots approximately an eighth of an inch wide and approximately 1.56 inches deep;

an inside radius of curvature of approximately 54.4 inches and an outside radius of curvature of approximately 56.2 inches; and

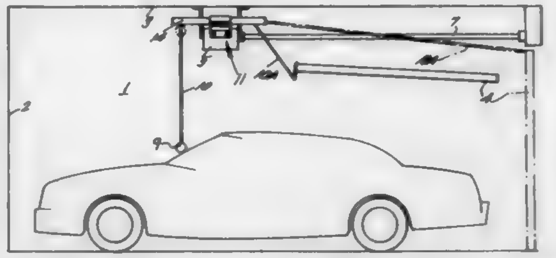
said transparent sheet attached over an opening defined by said ship, whereby a watertight view window is provided.

5,315,953
PARKING AND DOOR STATUS INDICATOR FOR A GARAGE

Lawrence E. Mullarkey, Jr., 235 Q St., Springfield, Oreg. 97477

Filed Apr. 27, 1993, Ser. No. 52,745
Int. Cl.^{5} B60Q *1/48*

U.S. Cl. 116—28 R **7 Claims**



1. An indicator apparatus for installation in a garage structure having a forward end and an overhead door to indicate desired automobile parking locations for a range of different sized automobiles and also to indicate garage door position, said apparatus comprising,

an indicator having a raised position and a lowered position and when in said lowered position being in the field of vision of the automobile driver to provide a reference point,

a support assembly including mounting means for attaching said support assembly to said garage structure and an elongate tubular member carried by said mounting means,

a cord having said indicator at one end thereof and carried by said elongate tubular member, a segment of said cord being of an elastic nature to avoid excessive sagging of the cord when the overhead door is raised, a remaining end of said cord attached to the overhead door, and said cord being tensioned and said segment stretched when the door is in a closed position to elevate the indicator to the raised position out of the field of vision of the driver to indicate the door is closed.

5,315,954
HOT BEARING ALARM

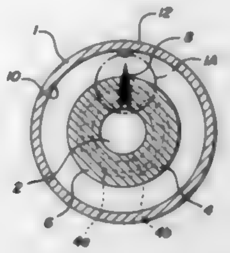
Allan Richmond, Newcastle upon Tyne, United Kingdom, assignor to Huwood Limited, United Kingdom

Filed Dec. 5, 1991, Ser. No. 802,505

Claims priority, application United Kingdom, Dec. 12, 1990, 9027013; Nov. 11, 1991, 9123936

Int. Cl.^{5} F16C *17/24;* **G01K** *1/02*

U.S. Cl. 116—67 R **26 Claims**



1. An alarm system suitable for use in warning of overheating in a rotatable bearing including first and second bearing portions mounted for relative rotation therebetween, said alarm system comprising:

an alarm signal generator having a thermally activated engagement element in mechanical communication with one of said first and second bearing portions and in thermal connection therewith, said engagement element capable of movement from a first primed retracted position into a second deployed extended alarm position; and

an engaging portion in mechanical communication with the other of said first and second bearing portions, said engagement element being operable, upon reaching a predetermined elevated temperature, to move from said first retracted position to said second extended alarm position to make an at least intermittent contact with said engaging portion during relative rotation between said first and second bearing portions without substantially impeding continuing relative rotation therebetween and produce from said contact a distinctive alarm signal which coextends in time with said relative rotation of said bearing portions, thereby indicating that said bearing has exceeded said predetermined temperature.

5,315,955
FLAGPOLE SILENCERS

Jack M. Feliz, 2110 Southridge Dr., Palm Springs, Calif. 92264

Filed Dec. 16, 1992, Ser. No. 991,464

Int. Cl.^{5} G09F *17/00*

U.S. Cl. 116—173 **4 Claims**

1. In a flagpole silencer for a flagpole having a top, a bottom and a flag hoist halyard, the combination of:

(a) a top fender bracket for securing to the top of the flagpole;

(b) said top fender bracket supporting a flag hoist pulley;

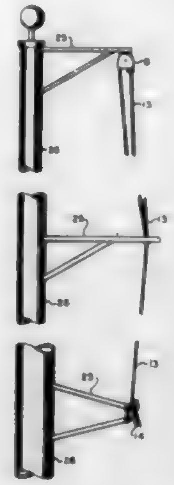
(c) said top fender bracket and attached flag pulley positioned at a suitable distance from the flagpole to prevent the flag hoist halyard from striking the flagpole during windy periods;

(d) a means of securing said top fender bracket to the flagpole;

(e) a middle fender bracket for securing midway between the top and bottom of the flagpole thus preventing the halyard from striking the flagpole;

(f) a bottom fender bracket for securing near the bottom of the flagpole and supporting a cleat for securing the flag halyard in a fixed position;

(g) said bottom fender bracket and attached cleat positioned at a suitable distance from the flagpole to prevent the flag halyard from striking the flagpole during windy periods;



(h) said middle fender bracket maintains the halyard a greater distance from the flagpole than said top and bottom fender brackets thus creating a bow string effect so that the halyard can be pulled taut and secured at said cleat thereby preventing vibration of the halyard on said middle fender bracket and keeping the halyard well clear of the flagpole.

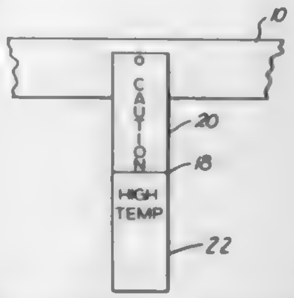
5,315,956
BUS DUCT ABNORMAL TEMPERATURE INDICATOR

Ronald G. Reno, 5053 Williamson, Dearborn, Mich. 48126

Filed Aug. 9, 1993, Ser. No. 103,349

Int. Cl.^{5} G01K *1/02*

U.S. Cl. 116—216 **6 Claims**



1. A combination comprising a bus duct housing a plurality of bus bars having connected ends forming bus bar joints; and a visual indicator mounted on the bus duct to indicate that the bus duct temperature has reached a predetermined level, comprising:

a temperature-sensitive adhesive, and means for mounting the adhesive on the bus duct proximate the location of said joints;

a first indicator element adhesively connected to the adhesive and to said mounting so as to be movable by the force of gravity from a first position when connected by the adhesive, to a second position when released from the adhesive;

wherein the adhesive loses sufficient adhesive properties upon reaching said predetermined temperature so as to release the indicator element; and

said indicator element having indicia on one surface thereof which becomes viewable when the indicator element is in said second position.

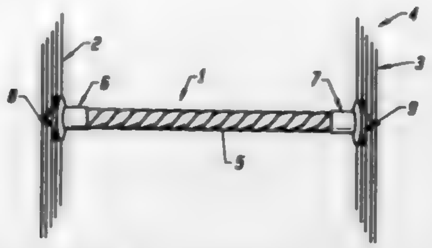
5,315,957
AVIAN PERCH

Robert J. Garay, 455 Fontanelle Dr., San Jose, Calif. 95111, and Bert W. Stewart, 12581 Clayton Rd., San Jose, Calif. 95127

Filed Mar. 23, 1992, Ser. No. 855,525

Int. Cl.^{5} A01K *31/12*

U.S. Cl. 119—26 **12 Claims**



1. An avian perch for mounting in a bird cage having a plurality of bars comprising:

a length of exposed natural fiber non-cotton rope; and

first and second means for attaching respective first and second ends of the rope to the bars of the bird cage wherein each of said first and second attaching means comprises:

a first and a second member for capturing at least one of said plurality of bars therebetween; and

means for tightening said first and said second members together with said one of said plurality of bars being captured therebetween.

5,315,958
METHOD AND DEVICE FOR SUPPLYING ANIMAL FEED INTO A FEED TROUGH

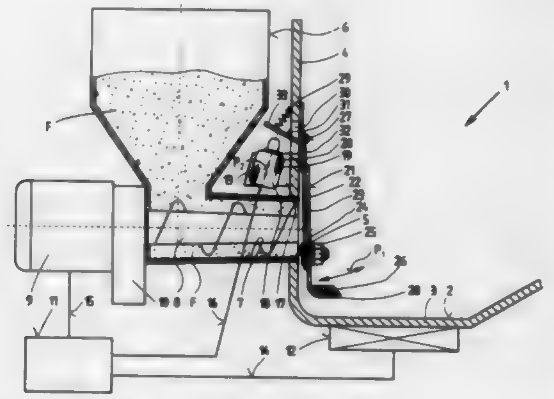
Martin Förster, Gerwigstrasse 27, D-7707 Engen, Fed. Rep. of Germany

Filed Dec. 11, 1992, Ser. No. 989,063

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1991, 4141347

Int. Cl.^{5} A01K *5/00*

U.S. Cl. 119—54 **37 Claims**



1. A device for the controlled supply of animal feed, said device comprising:

a supply container;

a feed trough with a side wall having an inlet;

a conveying device with a drive unit connected between said supply container and said inlet of said feed trough, said conveying device having an outlet opening that is coaxially arranged relative to the axis of said conveying device, said outlet opening directly connected to said inlet of said feed trough;

a control unit connected to said drive unit for switching on and off said drive unit;

a control flap pivotably connected in front of said inlet, said control flap including a control element connected to said control unit and a switch lever connected to said control element;

a spring connected to said switch lever for returning said control flap into an initial closed position; and

said control flap activating said control unit for switching on and off said drive unit depending on an amount of animal feed present in said feed trough behind said control flap.

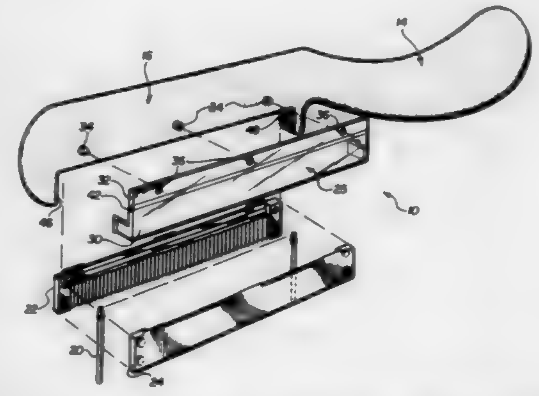
5,315,959
DEBRIS TRAPPING COMB

Gloria J. Podkowa, 4941 N. Normandy, Chicago, Ill. 60656

Filed Sep. 3, 1993, Ser. No. 116,869

Int. Cl.^{5} A45D *24/00*

U.S. Cl. 119—87 **7 Claims**



1. A debris-trapping comb comprising: a handle having an elongated tooth-receiving portion and a gripping portion coupled with said tooth-receiving portion; a plurality of closely spaced teeth mounted along the length of said elongated tooth-receiving portion and projecting outwardly thereof; and an elongated debris-trapping shield member coupled to said handle and having a trapping portion and a mounting portion for mounting said shield member to said handle; said trapping portion projecting from said mounting portion to one side of said teeth and along the length of said tooth-receiving portion and defining a trap area between said teeth and said trapping portion for trapping debris caught by said teeth during combing, and hinge means extending longitudinally across said shield member for hingedly joining said trapping portion to said mounting portion and positioned for permitting said trapping portion to be hingedly retracted away from said teeth to thereby open said trap area to permit removal of debris therefrom.

5,315,960
APPARATUS FOR COLLECTING ANIMAL EXCREMENT

Henry W. Lamp, 1337 21st Ave., Rock Island, Ill. 61201

Continuation of Ser. No. 895,916, Jun. 9, 1992, abandoned. This application Sep. 20, 1993, Ser. No. 124,370

Int. Cl.^{5} A01K *23/00*

U.S. Cl. 119—95 **4 Claims**

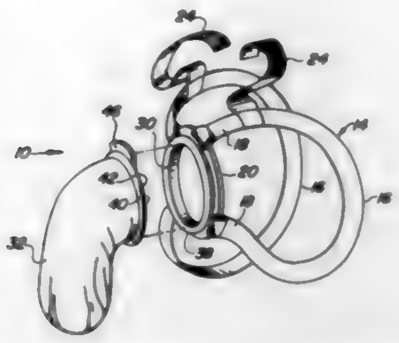
1. An improved apparatus for collecting animal excrement comprising a harness having at least two elastomeric straps;

a deformable outer ring, said deformable outer ring connected to said straps;

a rigid inner ring, including a first radially extending flange connected to said outer ring, a second radially extending flange forming a recess between said first and said second flanges;

said rigid ring encompassed by said deformable ring;

an annular elastomeric receptacle contained by said recess in said rigid ring; and



said straps holding said rings and said receptacle in place about the tail and haunches of said animal.

5,315,961
HYDRAULIC VALVE TAPPET FOR AN INTERNAL-COMBUSTION ENGINE

Donatus Wichelhaus, Börtlingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

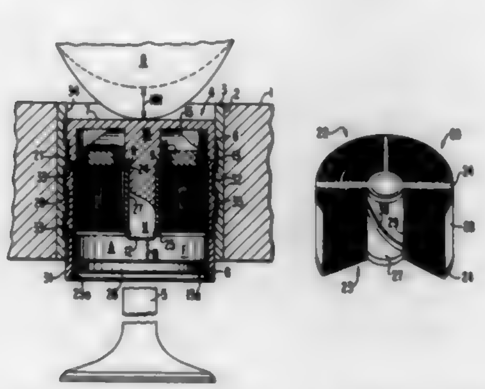
PCT No. PCT/EP91/01554, § 371 Date Feb. 26, 1993, § 102(e) Date Feb. 26, 1993, PCT Pub. No. WO92/04531, PCT Pub. Date Mar. 19, 1992

PCT Filed Aug. 16, 1991, Ser. No. 979,866

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027630

Int. Cl.^{5} F01L *9/02, 9/04, 25/02*

U.S. Cl. 123—90.11 **10 Claims**



1. A hydraulic valve tappet, for an internal combustion engine, having a housing disposed in a receiving device and a piston displaceably guided in the housing, said piston being connected with a charge valve cycle, comprising:

a rigid hydraulic high-pressure valve fastened in the housing;

a variable operating space formed between the high-pressure valve and the piston, said operating space being filled with a fluid having a viscosity; and

wherein the viscosity of the fluid is changed by feeding an electric voltage to it;

a compensating space which is formed between a bottom of said housing and the high-pressure valve and is connected with the operating space; and

a sealing disk, which is acted upon on one side by a spring and is arranged in the compensating space in an axially displaceable manner.

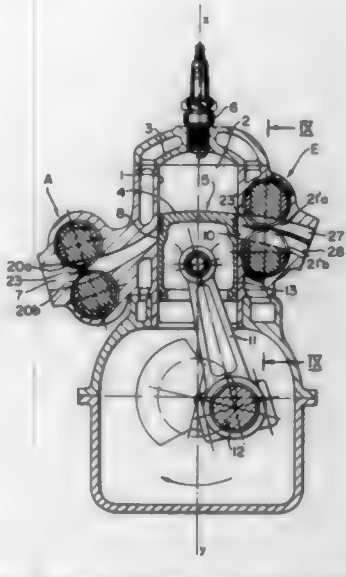
5,315,962
VALVES FOR A DUCT, AND TWO-STROKE COMBUSTION ENGINE INCORPORATING THE VALVES

Bernard A. Renault, 16 rue Nicolas Rayer, 93300 Aubervilliers, and Pierre C. Brunetti, 179 rue du Ménil, 92600 Asnieres, both of France

Filed May 14, 1992, Ser. No. 883,156

Int. Cl.^{5} F01L *7/00*

U.S. Cl. 123—190.11 **18 Claims**



1. A system for rapid closing and rapid opening of a fluid-flow cross-section of a duct, consisting of a pair of two rotating parts turning in opposition about parallel axes, said rotating parts each having a recessed surface of revolution defining a recess and further having a solid surface of revolution, said parts being guided in rotation so that during the rotation of said parts their solid surfaces of revolution achieve tangential pseudocontact which totally closes off said duct, whose flow cross-section is then freed by the continuation of rotation of said parts bringing their said recesses opposite one another, said parallel axes of rotation of the rotating parts being perpendicular to a longitudinal axis of the duct at the level of said tangential pseudocontact, characterized in that each of said rotating parts comprises only a single of the recesses.

5,315,963
SLEEVE-TYPE ROTARY VALVE FOR AN INTERNAL COMBUSTION ENGINE

Donald W. Warf, 104 Melody La., Winchester, Tenn. 37398

Filed Apr. 14, 1993, Ser. No. 45,734

Int. Cl.^{5} F01L *7/02*

U.S. Cl. 123—190.012 **18 Claims**

1. An internal combustion engine comprising:

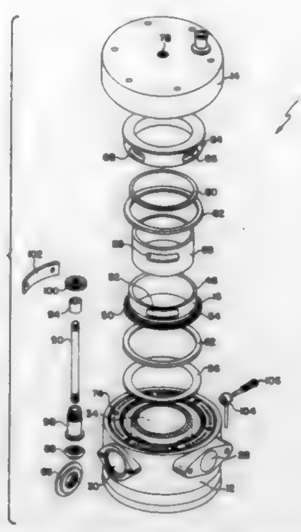
at least one cylinder having at least one inlet port and at least one exhaust port;

a piston mounted in said at least one cylinder for reciprocated movement therein, said piston having a piston rod;

a crankshaft coupled to said piston rod for converting the reciprocating motion of the piston into rotational motion;

a cylindrical sleeve surrounding an outside wall of a portion of said cylinder, said cylindrical sleeve having at least one slot defined therethrough which aligns periodically with said ports of said cylinder upon rotation of said cylindrical sleeve;

means for mounting said cylindrical sleeve for rotation relative to said cylinder, said mounting means including low-friction bearing structure disposed so as (1) to contact both said cylinder and cylindrical sleeve and (2) to prevent contact of said cylindrical sleeve with said cylinder, to minimize friction between said cylinder and said cylindrical sleeve; and



means operatively coupling said cylindrical sleeve to said crankshaft for rotating said cylindrical sleeve upon rotation of said crankshaft.

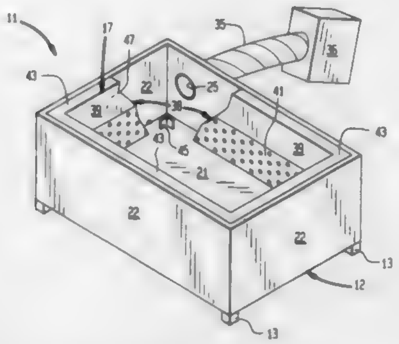
5,315,964
PORTABLE CAT LITTER BOX WITH ELECTRICALLY POWERED VENTILATION

Donald H. Mimms, and Pamala V. Mimms, both of 17 Raymond Way, Ashland, Mass. 01721

Filed May 12, 1993, Ser. No. 59,608

Int. Cl.^{5} A01K *29/00*

U.S. Cl. 119—165 **16 Claims**



1. A litter box for animals and comprising:

base means having a fluid impervious bottom wall, and fluid impervious side walls together defining an open receptacle; and at least one of said side walls having an exhaust opening formed therein;

an insert means disposed at a peripheral portion of said bottom wall and adjacent to a substantial length portion of said side walls, said insert means comprising substantially vertical perforated wall section means separated from said length portion of said side walls by an exhaust channel communicating with said exhaust opening and an upper wall covering said exhaust channel;

a flexible tubulation communicating with said exhaust opening;

a blower for producing air flow from said receptacle into said exhaust channel for discharge through said exhaust opening and said tubulation;

support means for supporting said base means on a surface and including a pressure switch activated from an inactive to an active condition by the presence of a predetermined weight in said receptacle; and

electrical control means including a power cord operatively connected between said blower and said pressure switch, and adapted to energize said blower in response to said active condition of said pressure switch; said electrical control means comprising an electrical timer switch connected between said power cord and said blower, a manually operated on-off switch connected in parallel with said timer switch, and wherein said pressure switch is connected in parallel with said on-off switch and said timer switch.

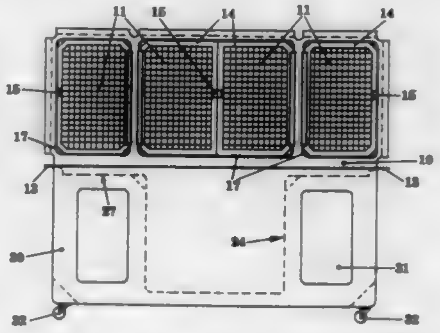
5,315,965
AQUATIC FUR-BEARING MAMMAL AND BIRD VIVARIUM

Randall W. Davis, Dept. Marine Biology, Texas A & M University, P.O. Box 1675, Galveston, Tex. 77553

Filed Jun. 1, 1992, Ser. No. 891,755

Int. Cl.^{5} A01K *1/00, 63/00*

U.S. Cl. 119—201 **29 Claims**



1. A vivarium for rehabilitating aquatic fur-bearing mammals and birds comprising:

a top enclosure having ports on the top and sides thereof, said ports forming windows and doors; a swimming environment and a dry environment formed as a single component detachably connected to said top enclosure, forming a combination;

said combination having means for preventing injury to said fur-bearing aquatic mammal and bird selected from the group consisting of smooth projection-less surfaces, rounded corners, ports that are flared outward, horizontal surfaces having means to reduce and prevent pressure wound injury and damage to fur and feathers, and port openings screened by means of flexible netting; and

a base component supporting said combination.

5,315,966
HAMMERING DEVICE FOR TUBE BOILERS

Serge Gamache, 510 Bellevue, St-Lambert, Canada G0S-2W0 , and Louis-Paul Gauvin, 4832 Du Morillon, St-Augustin, Quebec, Canada G3A 1Z6

Filed Jan. 19, 1993, Ser. No. 5,339

Int. Cl.^{5} F28G *7/00*

U.S. Cl. 122—379 **5 Claims**

1. A precise hammering device for an array of horizontal rods, each rod having a vertical hitting face, said hammering device comprising:

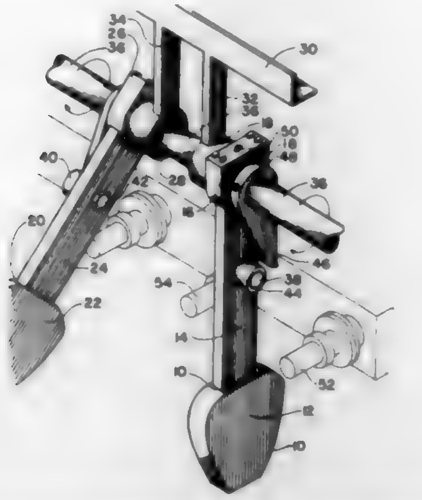
a horizontal shaft disposed perpendicularly with respect to said array of rods and rotatable around its first axis and driving means causing the rotation of said shaft;

a series of hammers freely mounted on said shaft for the vertical rotation about a second axis which is eccentric relative to the axis of said shaft, said hammers when in rest position taking a vertical position suspended from said shaft and each hammer comprising:

a head with a hitting surface and a support shank;

a lug carried by said shank and installed parallel to the hitting surface;

cam means fixed to the shaft and rotating about the shaft for raising the hammers in a first direction about the axis of the shaft through less than a half turn away from said face of said rod, from said rest position, said cam means releasing said hammers causing their fall in the opposite direction by gravity.



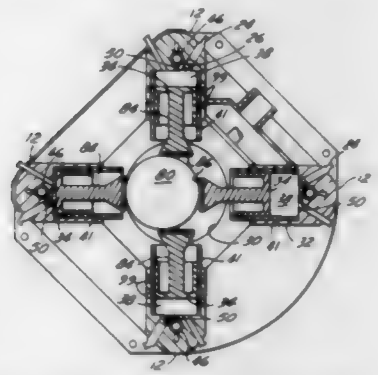
5,315,967
INTERNAL COMBUSTION ROTARY ENGINE HAVING A STACKED ARRANGEMENT OF CYLINDERS

Harry Schoell, 2698 SW. 23rd Ave., Fort Lauderdale, Fla. 33312

Filed Apr. 16, 1993, Ser. No. 48,821

Int. Cl.⁵ F02B *59/00*

U.S. Cl. 123—55 AA **13 Claims**



1. An internal combustion engine comprising:

an engine block having a crankcase bore and one or more cylinders in said block;

said one or more cylinders being positioned radiating from said crankcase bore;

a crankshaft in said crankcase bore having at least one eccentric cam where said crankshaft rotates about a center axis through said crankshaft bore;

a plurality of pistons in each of said one or more cylinders, each of said pistons having a piston rod extending from said piston, said fixed piston rod engaging said at least one eccentric cam;

a plurality of cylinder heads mounted on said engine block to cover said one or more cylinders, each of said cylinder heads having a longitudinal bore with a slot for communication with said one or more cylinders;

a valve mounted in said longitudinal bore, the bore having at least one set of ports for opening and closing off communication with said one or more cylinders;

means for rotating said valve for opening and closing said ports in a timed relationship with reciprocation of said pistons;

means for supplying pressurized air to said valve, the pressurized air applying a force to said piston to move said piston inwardly toward said crankshaft, the means for supplying pressurized air mixing air with fuel in said one or more cylinders;

means for supplying fuel under pressure to said one or more cylinders; and

said means for rotating said valve and said means for supplying pressurized air being connected to said crankshaft.

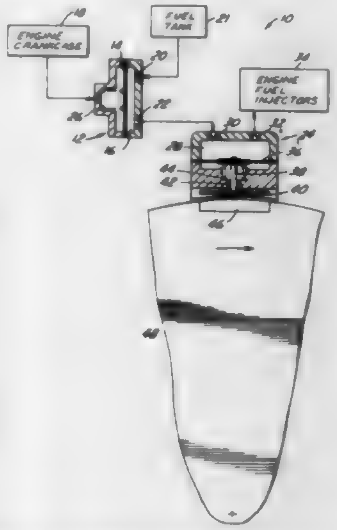
5,315,968
TWO-STAGE FUEL DELIVERY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

John L. Niebrzydoski, Cass City, Mich., assignor to Orbital Walbro Corporation, Cass City, Mich.

Filed Mar. 29, 1993, Ser. No. 38,828

Int. Cl.⁵ F02B *33/04;* F04B *1/04*

U.S. Cl. 123—73 C **2 Claims**



1. A two-stage fuel delivery system for a two-stroke internal combustion engine that comprises:

a first stage pump that includes a first pump chamber having an inlet coupled to a fuel source, an outlet, and means responsive to pressure pulsations from a crankcase of the engine for reciprocation in said chamber to pump fuel from said inlet to said outlet, and

a second stage pump that includes a second pump chamber having an inlet coupled to said outlet of said first chamber, an outlet for delivering fuel under pressure, a permanent magnet for mounting on a flywheel of the engine for rotation in synchronism with operation of the engine, and means disposed in said second chamber adjacent to the engine flywheel and operatively coupled to said magnet for reciprocation in said second chamber responsive to said magnet to pump fuel from said inlet to said outlet of said second chamber.

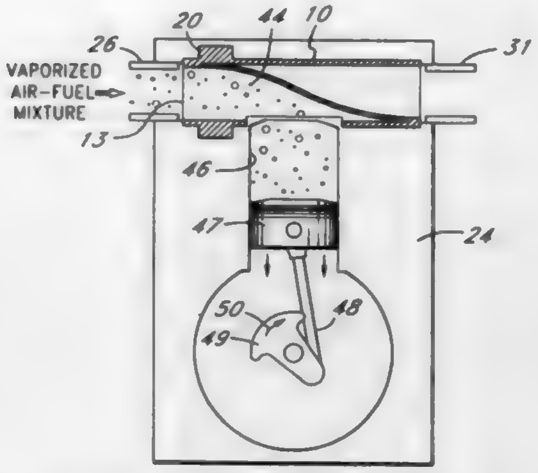
5,315,969
INTERNAL COMBUSTION ENGINE WITH ROTARY VALVES

Kevin M. MacMillan, 1173 Saint George Dr., San Dimas, Calif. 91773

Filed Feb. 1, 1993, Ser. No. 11,876

Int. Cl.⁵ F01L *7/02*

U.S. Cl. 123—190.6 **8 Claims**



1. An improved internal combustion engine with rotary valves of the type having an engine block supporting a crankshaft, connected through connecting rods to a plurality of pistons in a plurality of cylinders, a cylinder head containing at least one spark plug, wherein the improvement comprises:

a single opening located in said cylinder head about centrally positioned above each piston for use as an intake and an exhaust port, said single opening having an inner surface in each said cylinder and an outer surface, said outer surface being arcuate for contact with a rotary valve member;

a rotary valve member having a cylindrical side wall with a central axis and an inner surface and an outer surface, the outer surface of said cylindrical side wall mates with the arcuate outer surface of the single opening and a cylindrical inner wall surrounding an inner volume and having an open intake end and an open exhaust end, an intake port formed through the cylindrical side wall, an exhaust port formed through said sidewall spaced from said intake port, a partition positioned within said cylindrical inner wall dividing the inner volume into an exhaust compartment and an intake compartment and said intake port communicating with said intake compartment and said exhaust port communicating with said exhaust compartment and said intake compartment communication with the open intake end and the exhaust compartment communicating with the open exhaust end and said partition extending about the entire distance from the open intake end to the open exhaust end; and

means for rotating said rotary valve in a timed manner with said crankshaft so that as the piston moves downwardly in an intake stroke the intake port is passing over said single opening permitting an air fuel mixture to be drawn through said intake end of said rotary valve and into a cylinder, when said piston moves upwardly in a compression stroke, the cylindrical side wall is passing over said single opening, when said piston moves downwardly in a power stroke, the cylindrical side wall is passing over said single opening and when said piston is moving upwardly, the exhaust port is passing over said single opening causing the exhaust gasses to flow out of the exhaust end of said rotary valve member.

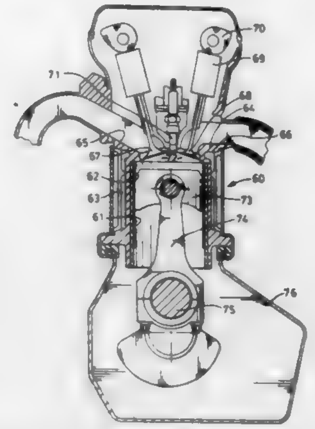
5,315,970
METAL ENCAPSULATED SOLID LUBRICANT COATING SYSTEM

V. Durga N. Rao, Bloomfield Hills; Daniel M. Kabat, Oxford, and Robert A. Rose, Grosse Pointe Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 88,486, Jul. 6, 1993. This application Sep. 24, 1993, Ser. No. 125,719

Int. Cl.⁵ F02B *75/08;* F02F *1/10*

U.S. Cl. 123—193.2 **7 Claims**



1. An engine block having one or more anti-friction coated cylinder bore walls, comprising:

(a) a metal engine block having at least one metal cylinder wall;

(b) a coating of grains fused to said cylinder bore wall, said grains having solid lubricant particles encapsulated within a soft metal shell, said shells being fused together to form a network with the limited porosity, said solid lubricant comprising graphite and MoS_2; and

(c) wet oil lubrication retained within the porosity of said coating.

5,315,971
LUBRICATING OIL SUPPLYING DEVICE FOR ENGINE

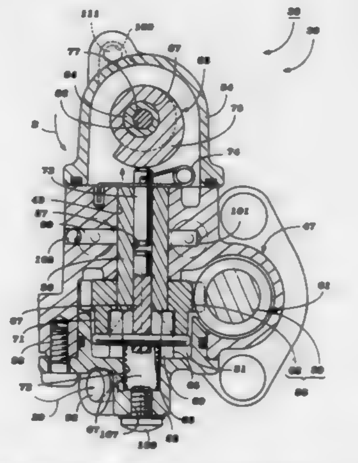
Seiichiro Yamada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 9, 1992, Ser. No. 895,919

Claims priority, application Japan, Jul. 15, 1991, 3-201297

Int. Cl.⁵ F01M *1/16;* F16N *27/00*

U.S. Cl. 123—196 R **50 Claims**



1. A lubricant pump for pumping only lubricant for lubricating a machine, said pump having a cylinder member defining only a single pumping bore, a pumping plunger reciprocally supported within said bore from one end thereof, means for

reciprocating said pumping plunger within said bore, said pumping plunger and said bore defining in part a pumping chamber, means for admitting and discharging fluid from said pumping chamber, and a stop member movably supported within said bore from the opposite end thereof for closing the other end thereof to complete said pumping chamber and for limiting the stroke of said pumping plunger under all engine running conditions to vary the stroke of the pumping plunger and amount of liquid pumped thereby while defining a minimum volume condition between said pumping plunger and said stop member which is the same regardless of the stroke of the pumping plunger set by said stop member.

5,315,972

VEHICLE DIAGNOSTIC CONTROL SYSTEM

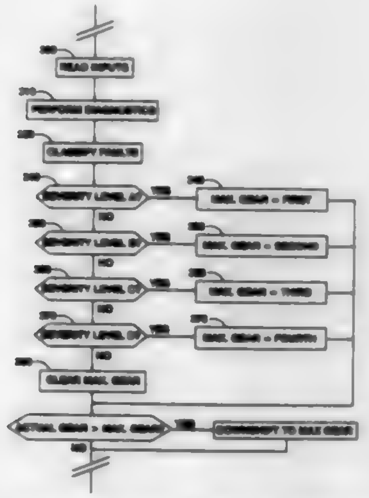
Steven W. Judy, Chillicothe; Vernon R. Smith, and Alan L. Stahl, both of Peoria, all of Ill., assignors to Caterpiller Inc., Peoria, Ill.

PCT No. PCT/US91/09742, § 371 Date Dec. 23, 1991, § 102(e) Date Dec. 23, 1991

PCT Filed Dec. 23, 1991, Ser. No. 838,279

Int. Cl.^{5} F02B *77/00*

U.S. Cl. 123—198 D **38 Claims**



1. A method for controlling a vehicle equipped with a drive system, a controller means for regulating the operating speed of the drive system and a diagnostic means for sensing at least one transmission operating parameter, comprising steps of:

comparing the value of the parameter signal to a fault level value;

classifying the parameter signal within one of a plurality of fault class levels in response to said step of comparing, wherein parameter signals within each fault class level have a similar likelihood that continued operation of the vehicle will result in vehicle damage;

producing a fault level signal corresponding to said fault class level of said parameter signal; and

limiting the maximum speed of the vehicle as a function of the fault class level of the parameter signal.

5,315,973

INTENSIFIER-INJECTOR FOR GASEOUS FUEL FOR POSITIVE DISPLACEMENT ENGINES

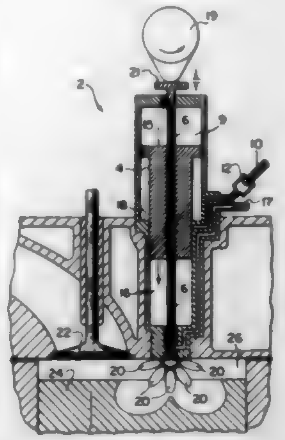
Philip G. Hill, Vancouver, and K. Bruce Hodgins, Delta, both of Canada, assignors to University of British Columbia, Vancouver, Canada

Continuation-in-part of Ser. No. 441,104, Nov. 27, 1989, Pat. No. 5,067,467. This application Nov. 22, 1991, Ser. No. 797,442

Int. Cl.^{5} F02M *21/02, 61/00;* F02B *3/00*

U.S. Cl. 123—304 **9 Claims**

1. A method of supply gaseous fuel directly into a combustion chamber of an internal combustion engine which comprises utilizing mechanical means to drive a pressure intensifier means which compresses the gaseous fuel to an injection pressure which is sufficient to exceed a pressure in the combustion chamber, thereby enabling the gaseous fuel to be rapidly injected into the combustion chamber, wherein a single injector is used for injecting fuel gas and liquid pilot fuel into the combustion chamber and wherein the injection of the fuel gas is conducted at a sufficiently high velocity to atomize the liquid pilot fuel injected with the fuel gas.



5,315,974

INTERNAL COMBUSTION ENGINE WITH COMPRESSOR FUNCTION

Mats Sabelström, Billdal, and Lars Tenglund, Henan, both of Sweden, assignors to AB Volvo, Goteborg, Sweden

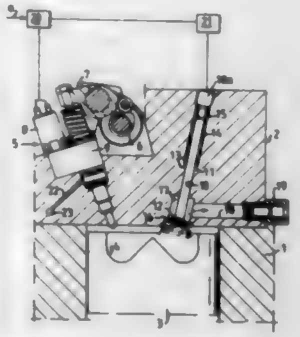
PCT No. PCT/SE91/00791, § 371 Date May 24, 1993, § 102(e) Date Sep. 20, 1993, PCT Pub. No. WO92/09792, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 23, 1990, Ser. No. 64,135

Claims priority, application Sweden, Nov. 23, 1990, 9003735

Int. Cl.^{5} F02D *39/02*

U.S. Cl. 123—320 **3 Claims**



1. Internal combustion engine with compressor function, comprising, in addition to intake and exhaust valves for each cylinder, an extra exhaust valve in at least one cylinder, which extra exhaust valve in its open position puts the cylinder chamber in communication with valve means containing an exhaust duct and disposed to permit exhausting of intake air to a pneumatic system but prevent intake of air to the cylinder chamber via said exhaust duct, characterized in that the engine has a fuel injection system with a unit injector (5) with an electrically operated spill valve (9) for each cylinder and that means (8, 20) are arranged which can keep the spill valve of the cylinder provided with the extra exhaust valve (11, 12) open at the same time as the extra exhaust valve is open.

5,315,975

INTAKE CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

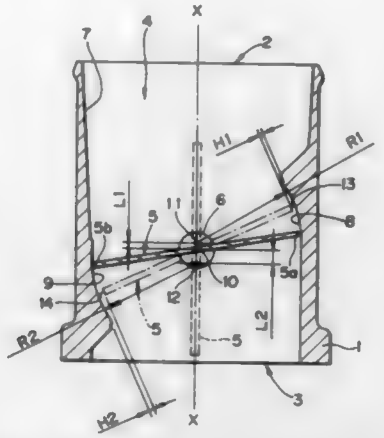
Yasuhiko Hattori, and Kenji Eitoku, both of Oobu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 5, 1993, Ser. No. 43,032

Claims priority, application Japan, Apr. 20, 1992, 4-125355

Int. Cl.^{5} F02D *9/08;* F16K *1/22*

U.S. Cl. 123—337 **4 Claims**



1. An intake control device for an internal combustion engine, comprising

a body member formed in a cylindrical form and having an air inlet opening on an upstream side thereof and an air outlet opening on a downstream side thereof and an air passage connecting said air inlet opening with said air outlet opening;

a plate-like throttle valve disposed within said air passage of said body member, rotatably supported by a throttle shaft on said body member for rotating between a first position in which said air passage is closed and a second position in which said air passage is fully opened, and having a first external circular edge portion which is moved toward the upstream side from said first position and a second external circular edge portion which is moved toward the downstream side from said first position; and

two spherical wall surfaces including an upstream-side spherical wall surface and a downstream-side spherical wall surface protrusively provided on the inner wall surface defining said air passage of said body member, respectively, in which said upstream-side spherical wall surface is formed in a position where said first external circular edge portion faces during rotation of said throttle valve within a range corresponding to a predetermined angle from said first position, and said downstream-side spherical wall surface is formed in a position where said second external circular edge portion faces during rotation of said throttle valve within the range corresponding to said predetermined angle from said first position; characterized in that

said upstream-side spherical wall surface and said downstream-side spherical wall surface formed in said body member are formed in such spherical surfaces that a first clearance formed between said upstream-side spherical wall surface and said first external circular edge portion of said throttle valve and a second clearance formed between said downstream spherical wall surface and said second external circular edge portion of said throttle valve increase with an increase in an angle of rotation of said throttle valve from said first position toward said second position; and said second clearance is larger than said first clearance at least in the vicinity of said first position of said throttle valve.

5,315,976

ERROR-CORRECTED CLOSED-LOOP CONTROL SYSTEM

Manfred Birk, Oberriexingen; Reinhard Fenchel, Calw-Altburg; Norbert Müller, Tamm; Wolf Wessel, Oberriexingen, and Hans-Christian Engelbrecht, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

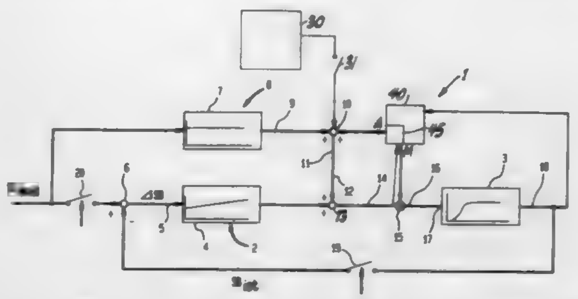
Continuation-in-part of Ser. No. 647,587, Jan. 29, 1991, Pat. No. 5,085,190. This application Sep. 16, 1991, Ser. No. 760,749

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008669

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.^{5} F02D *31/00*

U.S. Cl. 123—357 **15 Claims**



1. A method for operating an closed-loop control system for injecting fuel into an internal combustion engine, with the control system being capable of correcting errors caused by deviations that occur due to operating tolerances of injection system components,. and with a controlling element (7), operating as a precontrol (8), and a controller (2) being operated in parallel in the control system, the method comprising:

determining a first deviation signal value (A) substantially in a middle of a regulating range for fuel injection control;

determining a second deviation signal value (M) substantially near one of the end points of the regulating range for fuel injection control;

storing the first and second deviation signals (A, M) in a non-volatile memory; and

feeding the first and second deviation signals to the control system as correction signals for a fuel injection signal being processed by the control system, with the corrections to the fuel injection signal being contemporaneous with a particular operations point of the controller (2).

5,315,977

FUEL LIMITING METHOD AND APPARATUS FOR AN INTERNAL COMBUSTION VEHICLE

Dwayne Fosseen, 206 May St., P.O. Box 10, Radcliffe, Iowa 50230

Filed Apr. 22, 1991, Ser. No. 688,306

Int. Cl.^{5} F02M *37/04*

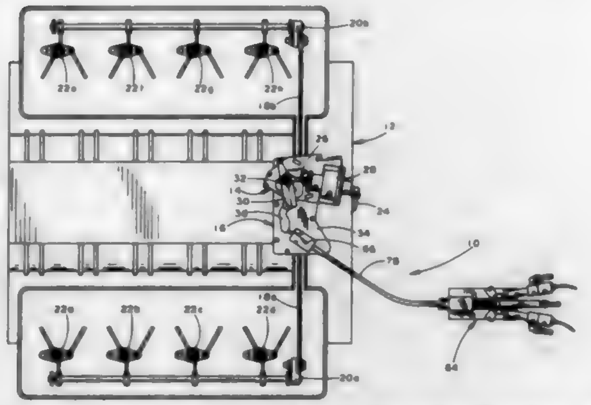
U.S. Cl. 123—357 **5 Claims**

1. Fuel limiting apparatus for an internal combustion engine operably connected to a transmission capable of being operated in a first gear and a second gear, the apparatus including throttle means through which fuel is supplied to the engine controlled by an accelerator, comprising:

a. means for limiting to a first value the maximum fuel flow rate through the throttle means called for by the accelerator to thereby reduce maximum power output of the engine to a first power output, wherein said first power output is less than an unrestricted power output of the engine resulting from an unrestricted fuel flow through the throttle;

b. means for increasing to a second value the maximum fuel flow rate through the throttle means called for by the accelerator to thereby increase said maximum power output of the engine to a second power output, said second power output being greater than said first power output;

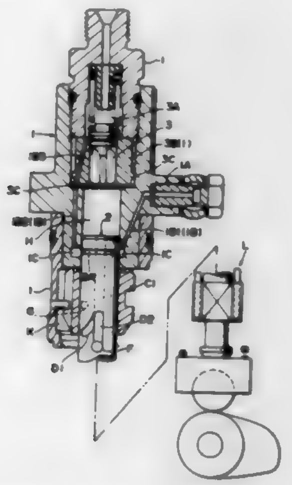
c. wherein said first value limiting means reduces said maximum power output of the engine to said first power output when the transmission is being operated in the first gear; and



d. wherein said second value increasing means increases the maximum power output of the engine to said second power output when the transmission is being operated in the second gear.

5,315,978
FUEL INJECTION SYSTEM

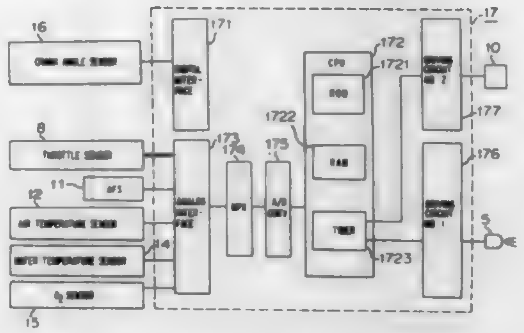
Akio Ishida, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1993, Ser. No. 36,735
Claims priority, application Japan, Mar. 25, 1992, 4-067627
Int. Cl.^{5} F02M *41/00*
U.S. Cl. 123—467 40 Claims



1. A fuel injection system comprising:
a housing;
a pressurization chamber and a delivery valve chamber housed in the housing;
a delivery valve for making the pressurization chamber and the delivery valve chamber in and out of communication with each other, the delivery valve being urged to close by a spring;
a plunger slidably disposed in the housing, the plunger being at its one end in communication with the pressurization chamber and being operated at its other end by a cam driven by an engine;
a fuel chamber housed in the housing so as to surround the plunger;
a control sleeve housed in the fuel chamber and being slidable on an outer surface of the plunger;
a control groove formed on the plunger, the control groove being in communication with the pressurization chamber at one end thereof and having the other end thereof opened on the outer circumferential surface of the plunger;
a control port formed on the control sleeve, and for connecting and disconnecting the fuel chamber and the pressurization chamber in cooperation with the control groove;
a member for controlling the quantity of fuel to be injected, and being supported by the housing;
an injecting timing control member for controlling fuel injection timing and being supported by the housing;
an opening/closing means for opening and closing a fluid passage and being formed on the outer circumferential surface of the plunger with a predetermined space from the control groove;
a fluid feed means having one end communicating with a pressurization pump and the other end thereof communicating with the delivery valve chamber via the opening/-closing means when the plunger is in contact with a base circle of the cam; and
a control unit for controlling the pressurization pump so as to control a residual pressure in the delivery valve chamber.

5,315,979
ELECTRONIC CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

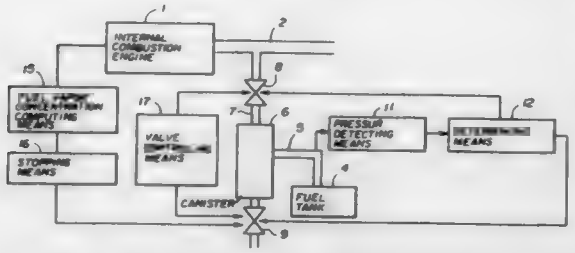
Hajime Kako, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1993, Ser. No. 21,847
Claims priority, application Japan, Mar. 27, 1992, 4-71175
Int. Cl.^{5} F02D *41/02*
U.S. Cl. 123—478 1 Claim



1. An electronic control apparatus for an internal combustion engine which comprises:
a memory means which previously memorizes and sets as a two-dimensional map charging efficiency values or related values of charging efficiency corresponding to degrees of opening of a throttle valve under a reference atmospheric condition and revolution numbers of an internal combustion engine, and which outputs a memorized set value memorized and set in correspondence to a throttle opening degree signal outputted from a throttle sensor for detecting a degree of opening of the throttle valve and a revolution number signal outputted from a revolution number detecting sensor;
a steady operation detecting means for detecting that the operational condition of the internal combustion engine is steady, when at least, a quantity of change of the throttle opening signal within a predetermined time is lower than a predetermined value; and
an arithmetic means which calculates an atmospheric pressure related value including at least an atmospheric pressure value in accordance with a given arithmetic expression which uses the ratio of a value of charging efficiency or a related value of charging efficiency obtained by selectively using an intake air flow rate signal outputted from an air flow rate sensor for detecting an intake air flow rate in the internal combustion engine and said revolution number signal, to the memorized set value outputted from the memory means, and which calculates said atmospheric pressure related value when said steady operation detecting means detects the operational condition of the engine to be a steady operation for a first predetermined period of time, and uses the calculated atmospheric pressure related value in order to control the engine only when said steady operation detecting means detects the engine to be the steady operation for a second predetermined period of time.

5,315,980
MALFUNCTION DETECTION APPARATUS FOR DETECTING MALFUNCTION IN EVAPORATIVE FUEL PURGE SYSTEM

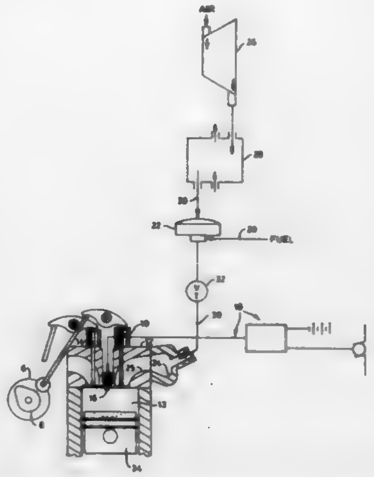
Takayuki Otsuka; Akinori Osanai; Takaaki Itoh; Yoshihiko Hyodo, and Toru Kidokoro, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jan. 15, 1993, Ser. No. 6,113
Claims priority, application Japan, Jan. 17, 1992, 4-6372; Jul. 23, 1992, 4-197220; Aug. 7, 1992, 4-211790; Aug. 10, 1992, 4-212938; Aug. 11, 1992, 4-214384
Int. Cl.^{5} F02M *33/02*
U.S. Cl. 123—520 18 Claims



1. A malfunction detection apparatus for detecting a malfunction in an evaporative fuel purge system having a fuel tank storing an amount of fuel, a vapor passage connecting said fuel tank and said canister, a purge passage through which said fuel vapor stored in the canister is purged into an intake passage of an engine, and a purge control valve provided in said purge passage to allow a purge operation by opening of the purge control valve, the malfunction detection apparatus comprising:
a pressure introducing means for introducing a negative pressure from the intake passage of the engine into said evaporative fuel purge system;
a pressure detecting means for detecting a pressure inside said evaporative fuel purge system when the negative pressure is introduced into the system by said pressure introducing means;
an air-fuel ratio fluctuation suppressing means for suppressing a fluctuation of the air-fuel ratio of mixture gas suctioned into the engine which results from suctioning of the fuel vapor collected in the fuel tank, the suppression being effected by controlling said pressure introducing means when the negative pressure is introduced into said evaporative fuel purge system by said pressure introducing means;
a determining means for determining the existence of a malfunction in said evaporative fuel purge system by monitoring a pressure in said evaporative fuel purge system, said monitoring using values supplied by said pressure detecting means.

5,315,981
METHOD FOR CONVERTING A DIESEL ENGINE TO A NATURAL GAS FUELED ENGINE

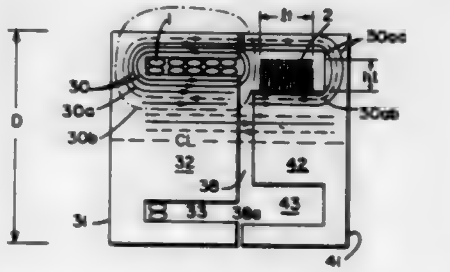
Tze-Ning Chen, Sudbury, Mass., assignor to Tecogen Inc., Waltham, Mass.
Filed Aug. 18, 1992, Ser. No. 931,676
Int. Cl.^{5} F02M *21/02*
U.S. Cl. 123—526 10 Claims



1. A method for converting a four-stroke cycle diesel engine to a natural gas fueled engine, the method comprising the steps of providing new cam profiles on a camshaft portion of said diesel engine, said new cam profiles being operative to close intake valves of cylinder heads of said engine before completion of the diesel engine intake stroke, operative to close exhaust valves of said cylinder heads, and operative no earlier than said exhaust valves closures to open associated intake valves, modifying portions of said cylinder heads to adapt said cylinder heads to accept spark plugs, fixing spark plugs in said cylinder heads, providing means for conveying natural gas fuel to said intake valves, providing a blower for supplying air under pressure to said intake valves, and providing an aftercooler for cooling the air supplied by said blower prior to said air reaching said intake valves.

5,315,982
HIGH EFFICIENCY, HIGH OUTPUT, COMPACT CD IGNITION COIL

Michael A. V. Ward, Lexington, Mass., and Richard Redl, Onnens, Switzerland, assignors to Combustion Electromagnetics, Inc., Arlington, Mass.
PCT No. PCT/US90/02665, § 371 Date Apr. 15, 1992, § 102(e) Date Apr. 15, 1992
PCT Filed May 12, 1990, Ser. No. 640,390
Int. Cl.^{5} F02P *11/00*
U.S. Cl. 123—634 48 Claims



1. An ignition coil system for a capacitive discharge ignition system including at least one discharge capacitor means, at least one switch means, and at least one ignition coil including a primary high current winding means with a principal leakage

inductor of inductance value L_{pe} coupled to at least one secondary high voltage winding by one of a) direct coupling through magnetic flux, or b) indirect coupling through primary winding extensions of said principal leakage winding with said extensions comprising a primary winding portion closely coupled to at least one secondary winding.

said ignition coil system constructed and arranged to perform two functions, a) a high voltage breakdown discharge function whereby a high voltage of about 15 kV to 45 kV is produced between high voltage terminals of said at least one secondary winding means to break down a dielectric across a spark gap, and b) an energy delivery function whereby high spark current of order of magnitude of one amp flows across said spark gap.

and wherein, consistent with the above, said ignition coil system is further constructed and arranged such that the structures controlling each of the open circuit high voltage breakdown discharge function and the high current spark discharge function are specified separately according to 1), 2), and/or 3) below, where:

1) for low saturation ferrite type material, the magnetic core section on which the secondary winding is wound is constructed and arranged such that for the peak of said high voltage the maximum magnetic flux density B_s (at 60 degrees F.) in said core is within 30% of the level given by B_{smax}, where:

$$B_{smax}=[K/UF][V_p/(2f_{oc}N_pA_s)]$$

where k is the coupling coefficient, V_p is the voltage to which the discharge capacitor is charged, f_{oc} is the open circuit high voltage frequency, N_p is the number of primary winding turns, A_s is the area of the core on which the secondary winding is wound, and UF is the unity factor given by $UF=[1+N^2C_s/C_p]$, and

2) for low saturation ferrite type material, the magnetic core section on which the principal leakage inductance winding is wound is constructed and arranged such that for the peak of said high spark discharge current the maximum magnetic flux density B_p (at 60 degrees F) in said core is within 30% of the level given by B_{pmax}, where

$$B_{pmax}=V_p/[2(pi)f_{cc}N_pA_p]$$

where f_{cc} is the short circuit high current spark discharge frequency and A_p is the area of the core on which said principal leakage inductance is wound, pi=3.142, and

3) for core material of high saturation flux density, i.e. non-ferrite type, the magnetic core section on which the secondary winding is wound is constructed and arranged such that at the open circuit frequency f_{oc} the open circuit primary inductance L_{pl} which is directly coupled to said secondary winding is equal to or greater than three times the leakage inductance L_{pe},

whereby the circuit parameters and magnetic material properties and dimensions are enabled to be further selected to produce more optimized operation of said ignition coil system with low electrical losses and minimum sizing of magnetic parts, said magnetic parts comprising materials selected from the class of a) ferrite type materials satisfying one or both of the above relationships 1) and 2), and b) non-ferrite materials of higher magnetic saturation flux density satisfying the above relationship 3).

5,315,983
WOK SUPPORT RING

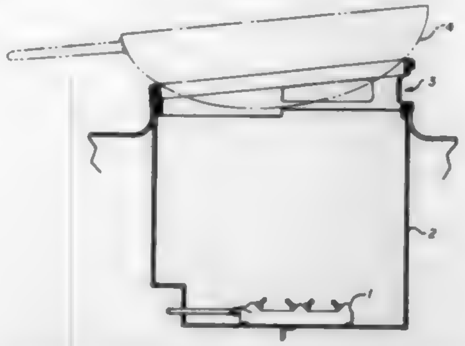
Kam C. Law, 1933 Arriba Dr., Monterey Park, Calif. 91754
Filed Nov. 18, 1992, Ser. No. 977,676
Int. Cl.⁵ F24C *15/10*
U.S. Cl. 126—216 **16 Claims**

1. A support ring structure for supporting a wok cooking vessel on on top of a burner cylinder of a cooking range, the structure comprising:

a top ring having a substantially circular shape and adapted to receive the wok;

a base ring having a substantially circular shape, the base ring comprising:

a first ring;

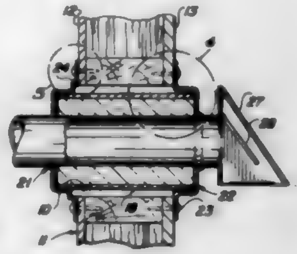


first mating means for removably coupling the base ring to the top ring; and

second mating means for removably coupling the base ring to the burner cylinder.

5,315,984
THROUGH THE WALL INSULATED FLUE

Gerald Bauer, Marshfield, Wis., assignor to FACSA, Inc., Spencer, Wis.
Filed Feb. 8, 1993, Ser. No. 14,555
Int. Cl.⁵ F23J *13/00*
U.S. Cl. 126—317 **4 Claims**



1. An insulated flue assembly for installation in a wall opening and adapted for use with non-solid fuel burning appliances, comprising:

a) an insulating sleeve projected through and extending beyond the wall opening,

b) a sleeve protecting tube of a length equal to said sleeve for embracing said sleeve in the wall opening,

c) a pair of substantially square wall plates adapted to support the opposite ends of said sleeve and said tube in the wall opening,

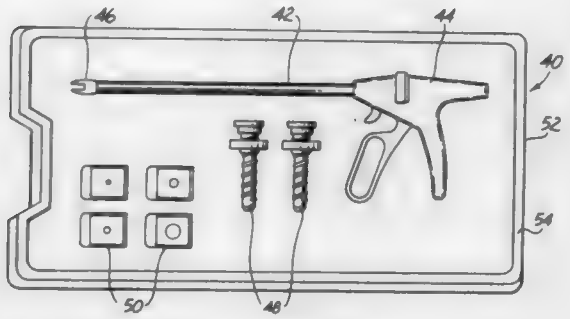
d) collar means provided by confronting surfaces of said wall plates for receiving opposite ends of said protective tube and said insulating sleeve for securing said tube and said sleeve in the wall opening,

e) means in the form of offset crimps formed in each corner of the confronting surface of one of said plates with said crimps providing limited contact of said one of said plates around the wall opening and for spacing said one of said plates from the wall opening to provide a circulating air passage circumscribing said tube and said sleeve, and

f) a vent pipe providing at one end a weather cap and damper and adapted for projection through said insulated sleeve and beyond said wall plates for venting radiant heat therethrough.

5,315,985
ENDOSCOPIÇ INSTRUMENTATION KIT AND PACKAGE THEREFOR

Andre P. Decarie, Royersford, Pa.; David L. Brown, Wallingford, Conn.; Stanley J. Malinowski, Guilford, Conn., and Douglas M. Dunklee, Bridgeport, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Continuation of Ser. No. 673,233, Mar. 21, 1991, Pat. No. 5,144,942. This application Jul. 20, 1992, Ser. No. 916,368
The portion of the term of this patent subsequent to Sep. 9, 2009, has been disclaimed.
Int. Cl.⁵ A61B *1/00*
U.S. Cl. 128—4 **18 Claims**



1. An endoscopic instrumentation kit comprising:

at least one obturator;

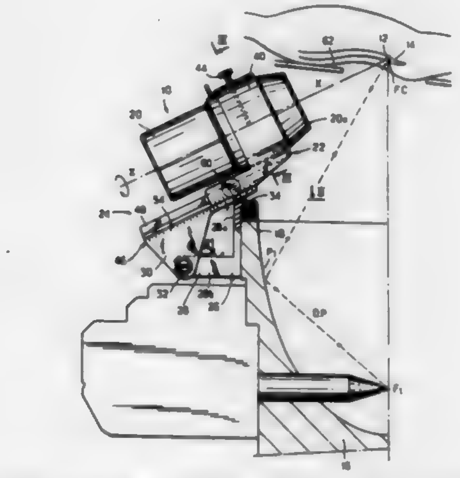
at least one sleeve member for use with said at least one obturator;

at least one tissue gripping sleeve which is adapted to be removably received on said at least one sleeve member for securing said at least one sleeve member in a patient; and

a package including a bottom cover and a top cover, said top and bottom cover forming a package containing said at least one obturator, said at least one sleeve member and said at least one tissue gripping sleeve.

5,315,986
APPARATUS FOR REAL-TIME TRACKING AND IMAGING OF OBJECTS WITHIN THE BODY OF A MAMMAL

Bernard Lacruche, Lyons; Dominique Cathignol, Genas, and Francois Lacoste, Lyons, all of France, assignors to Technomed International and Inserm (Institut National de la Recherche Medicale), both of Paris, France
Continuation-in-part of Ser. No. 405,358, Aug. 28, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 675,509
Claims priority, application France, Aug. 31, 1988, 88 11414
Int. Cl.⁵ A61B *17/22*
U.S. Cl. 69—4 **16 Claims**



1. An apparatus for real-time tracking and imaging of an object present within the body of a mammal, said apparatus comprising:

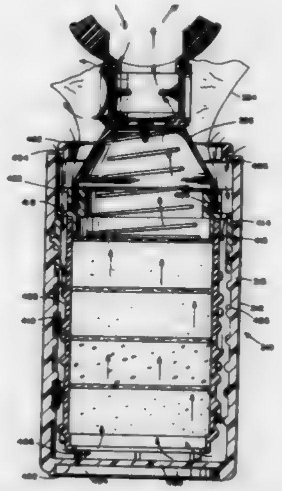
a wave generator generating waves adapted to effect appropriate treatment of said object and directed towards a target-focus zone put into coincidence with said object;

image forming means forming a real-time image of said object for real-time observation of the latter; and

means for connecting said image forming means with said wave generator, said connecting means including means for displacing said image forming means in a displacement plane coinciding with a symmetry plane of said generator including said target-focus zone and including a longitudinal axis of said image forming means, said image forming means being coupled to said displacing means whereby said image forming means is movable in said displacement plane relative to said target-focus zone, wherein said displacing means comprises means for rotating said image forming means within said displacement plane around said target-focus zone, wherein said means for rotating comprise an arcuate member connected to said wave generator and having as a geometrical center said target-focus zone, and a movable member connected to said image forming means and mounted for movement on said arcuate member.

5,315,987
FILTERING CANISTER WITH DEPLOYABLE HOOD AND MOUTHPIECE

Linsey Swann, Vancouver, Canada, assignor to Brookdale International Systems Inc., Vancouver, Canada
Continuation-in-part of Ser. No. 710,812, Jun. 5, 1991, Pat. No. 5,186,165. This application Dec. 2, 1992, Ser. No. 984,529
The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.
Int. Cl.⁵ A62B *17/04, 18/08, 7/10, 19/00*
U.S. Cl. 128—201.28 **27 Claims**



1. A personal emergency breathing system comprising:

a canister having a body with an opening and an ambient air passage within said body in communication with said body opening, a cover removably secured to said canister body for closing said opening;

an air filtration unit disposed within the body of said canister for filtering ambient air received through said passage and opening when said cover is removed from said canister body, said air filtration unit having an air inlet for receiving ambient air and an air outlet, the ambient air passing through said air inlet into said filtration unit where it is filtered and passed through said air outlet;

a mouthpiece carried by said canister for receiving filtered air from the outlet of said filtration unit;

a hood carried by said canister and enveloping said mouthpiece, said mouthpiece and said hood being disposed in a collapsed condition in said canister adjacent said opening and between said cover and said filtration unit whereby, upon removal of said cover, said hood and mouthpiece are deployable from said canister to a location external to said canister, said hood having an opening for receiving an individual's head and neck;

means for connecting said hood and said mouthpiece to said canister in said collapsed condition and when deployed, said connecting means, when said hood and said mouthpiece are deployed, enabling flow of filtered air from said filtration unit air outlet to said mouthpiece and preventing flow of filtered air from said filtration unit air outlet into said hood; and

first and second one-way valves disposed between said mouthpiece and said filtration unit, said first valve enabling flow of filtered air from said filtration unit air outlet into said mouthpiece and preventing backflow of exhaled air into said filtration unit, said second valve enabling air exhaled into said mouthpiece for flow into said hood and preventing backflow of air from said hood through said second valve to said mouthpiece.

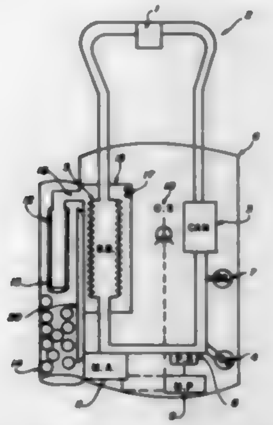
5,315,988
REACTIVE, CLOSED-CIRCUIT UNDERWATER BREATHING APPARATUS

John R. Clarke, Panama, Fla.; Donald D. Joye, Exton, Pa.; Neal A. Carlson, Germantown, and Peter Wechgelaer, Kensington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washingtona, D.C.

Filed Sep. 29, 1992, Ser. No. 953,169

Int. Cl.^{5} B63C *11/24*

U.S. Cl. 128—204.23 14 Claims



1. A reactive underwater breathing apparatus (UBA) adapted to recirculate breathing gas from a diver, absorb CO_2, add make-up oxygen, and provide capacitance through a breathing bag, comprising:

(a) a means for sensing the diver's breathing frequency,

(b) a means for determining elastance of said UBA,

(c) a means for computing resonant frequency of said UBA, and

(d) a means for changing inertance of said UBA,

such that UBA resonant frequency is set to equal the diver's breathing frequency.

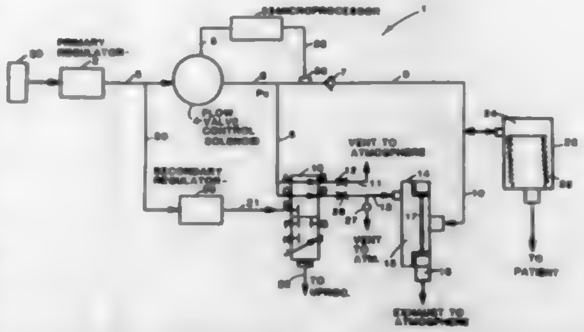
5,315,989
MEDICAL VENTILATOR

Ronald L. Tobia, Aberdeen, N.J., assignor to BOC Health Care, Inc., New Providence, N.J.

Filed Dec. 9, 1991, Ser. No. 803,927

Int. Cl.^{5} A61M *16/00*

U.S. Cl. 128—204.28 7 Claims



1. A medical ventilator for providing anesthesia to a patient, comprising:

(a) a first inspiratory conduit;

(b) inspiratory flow-control means for controlling an inspiratory flow of gas within said first inspiratory conduit;

(c) a second inspiratory conduit, in communication with said first inspiratory conduit, such that said inspiratory flow travels from said first inspiratory conduit into said second inspiratory conduit;

(d) a bellows assembly, in communication with said second inspiratory conduit, such that said inspiratory flow travels from said second inspiratory conduit into said bellows assembly;

(e) an expiratory conduit, in communication with said bellows assembly, such that an expiratory flow of gas travels from said bellows assembly into said expiratory conduit;

(f) means for preventing said expiratory flow from traveling into said first inspiratory conduit; and

(g) pressure-control means for causing the pressure of gas comprising said expiratory flow to vary concomitantly with variations in the pressure of the gas within said first inspiratory conduit.

5,315,990
METHOD FOR DELIVERING INCREMENTAL DOSES OF OXYGEN FOR MAXIMIZING BLOOD OXYGEN SATURATION LEVELS

Adolph J. Moudry, 46340 Concord Dr., Plymouth, Mich. 48170

Continuation-in-part of Ser. No. 814,481, Dec. 30, 1991, abandoned. This application Nov. 25, 1992, Ser. No. 982,389

Int. Cl.^{5} A62B *7/00, 9/02*

U.S. Cl. 128—205.11 3 Claims

1. A method for delivering incremental doses of oxygen to a patient having an obstructive pulmonary disease to maximize the blood oxygen saturation level in the patient, the method comprising:

(a) providing an oxydosimeter system including an electronic control unit (ECU) having memory, a pulse oximeter attached to a patient for measuring the oxygen saturation of the patient, and a plurality of valves controlled by the ECU for delivering oxygen to the patient;

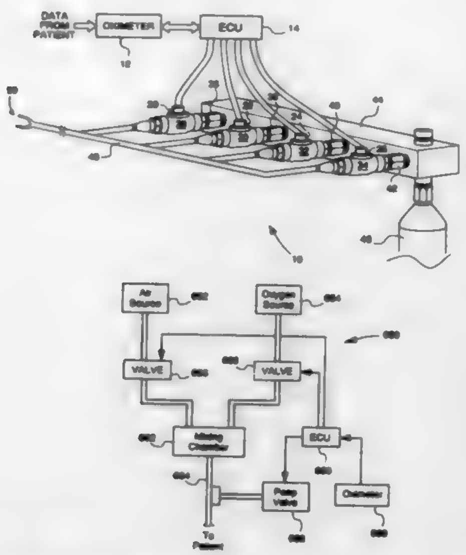
(b) energizing one of the plurality of valves to deliver the incremental doses of oxygen to the patient at a first rate;

(c) measuring an associated average oxygen saturation level of the patient to obtain a first average oxygen saturation signal;

(d) deenergizing the one valve and energizing another valve to deliver the incremental doses of oxygen to the patient at a second rate;

(e) measuring a second average oxygen saturation level of the patient to obtain a second average oxygen saturation signal;

(f) identifying a dominant valve based on the first average oxygen saturation signal and the second average oxygen saturation signal, the dominant valve being the valve associated with the higher average oxygen saturation level in the patient; and



(g) energizing the dominant valve, thereby delivering the incremental doses of oxygen to the patient to maximize the blood oxygen saturation level in the patient.

5,315,991
CONNECTOR FOR ENDOTRACHEAL USES

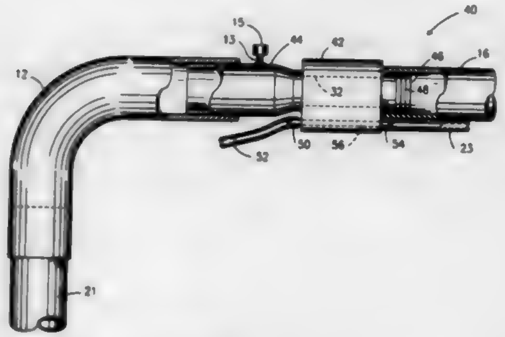
Leonides Y. Teves, Bradenton, Fla., assignor to Advanced Medical Concepts, Inc., Bradenton, Fla.

Continuation-in-part of Ser. No. 896,257, Jun. 10, 1992. This application Aug. 31, 1992, Ser. No. 938,087

The portion of the term of this patent subsequent to May 10, 2111, has been disclaimed.

Int. Cl.^{5} A61M *16/00*

U.S. Cl. 128—207.14 5 Claims



1. A connector, comprising:

a base member of predetermined longitudinal extend having a proximal end and a distal end;

a first tubular projection disposed on said proximal end of said base member;

a second tubular projection disposed on said proximal end of said base member;

a third tubular projection disposed on said distal end of said base member;

a fourth tubular projection disposed on said distal end of said base member;

said first, second, third, and fourth tubular projections being disposed in parallel relation to one another;

a first bore means formed in said base member for providing fluid communication between said first and third tubular projections;

a second bore means formed in said base member for providing fluid communication between said second and fourth tubular projections;

said first and second bore means being disposed in parallel relation to one another and in parallel relation to said first, second, third, and fourth tubular projections;

a distal end of an anesthesia supply tube being releasably connected to said first tubular projection and a proximal end of an endotracheal tube being releasably connected to said third tubular projection so that anesthesia is delivered to the lungs of a patient;

a distal end of an auxiliary tube being releasably connected to said second tubular projection and a proximal end of an auxiliary lumen being releasably connected to said fourth tubular projection so that conditions in the lungs of said patient are monitored by auxiliary equipment; and

whereby a single connector interconnects four tubes and said four tubes are substantially free of bends and constrictions.

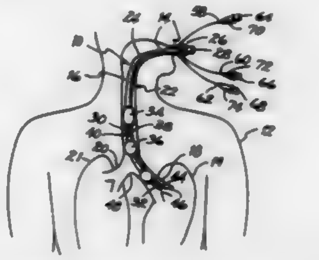
5,315,992
TRIPLE CUFF ENDOBRONCHIAL TUBE WITH SELECTIVE MULTIPLE OUTLETS SERVED BY A SINGLE AIRFLOW PASSAGE

William J. Dalton, 7865 Ivygate La., Cincinnati, Ohio 45242

Filed Mar. 10, 1993, Ser. No. 29,117

Int. Cl.^{5} A61M *16/00, 25/00*

U.S. Cl. 128—207.15 7 Claims



1. An endobronchial tube for selectively delivering air to one or both lungs of a human patient comprising:

a tube with a longitudinal air flow passage for supplying air to ventilate at least one lung of a patient, said air flow passage extending the length of said tube, said tube having a tracheal portion adapted to be positioned within the trachea of a patient, said tube also having a bronchial portion extending from said tracheal portion and adapted to be positioned within one of the bronchi of a patient when said tracheal portion is positioned within the trachea;

selectively inflatable longitudinally spaced first and second sealing means around said tracheal portion for selectively blocking air from flowing between said tracheal portion of said tube and the trachea; said passage having a first air outlet port, said first outlet port being located in said tracheal portion between said first and second sealing means, said first port providing an outlet for air from said said passage also having a second air outlet port, said second outlet port being located adjacent a distal end of said bronchial portion, said second port providing an outlet for air from said passage; and

third sealing means around said bronchial portion between said second sealing means and said second port for selectively blocking air from flowing between said bronchial portion and the bronchus, said third sealing means being so spaced axially on said tube from said second sealing means that in use said third sealing means is positioned in the bronchus and said second sealing means is positioned in the trachea.

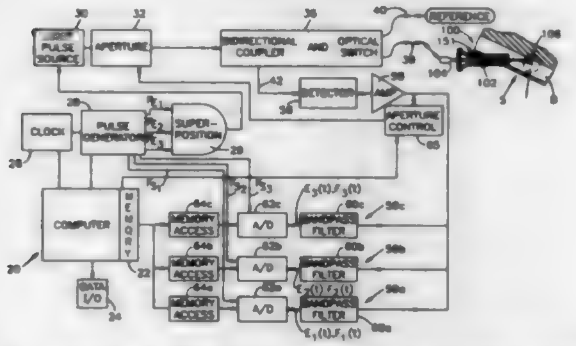
5,315,993
LUMINESCENCE MONITORING WITH MODULATION FREQUENCY MULTIPLEXING

J. Ricardo Alcala, Chatham, N.J., assignor to The Boc Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 481,406, Feb. 16, 1990, Pat. No. 5,151,869, and a continuation-in-part of Ser. No. 481,131, Feb. 16, 1990, Pat. No. 5,127,405. This application Jan. 29, 1992, Ser. No. 827,658

Int. Cl.^{5} A61B *5/00;* **G01N** *21/61*

U.S. Cl. 128—634 **21 Claims**



8. Apparatus for monitoring a plurality of conditions comprising

(a) a light-transmissive member;

(b) luminescent means for emitting response light connected to said member in optical communication therewith, said luminescent means having a plurality of emission modes with different lifetimes, said luminescent means being operative to vary each of said lifetimes in response to one of said conditions to be monitored;

(c) excitation light source means for simultaneously applying a plurality of excitation light components varying cyclically in amplitude at a plurality of modulation frequencies to said luminescent means through said light transmissive member so that said luminescent means emits response light simultaneously incorporating a plurality of response light components each varying cyclically in amplitude at one of said modulation frequencies and so that said response light components cooperatively represent all of said plurality of emission modes of said luminescent means;

(d) transducer means for deriving a multicomponent response signal incorporating components corresponding to a plurality of said modulation frequencies from said response light so that said multicomponent response signal represents a plurality of said emission modes; and

(e) interpretation means for deriving information relating to each said emission mode represented by said multicomponent response signal from said multicomponent response signal.

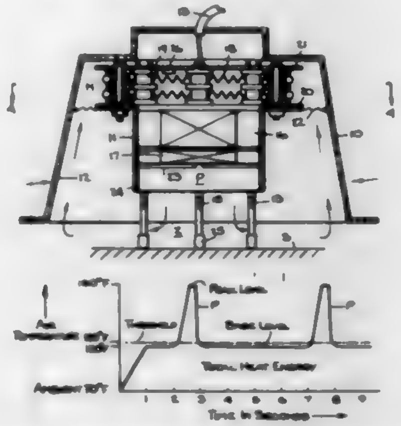
5,315,994
COMBINED THERMOTHERAPY AND ELECTROTHERAPY TECHNIQUE

Raul Guibert, and Bettina Guibert, both of 750 S. Bundy Dr., Apt. 101, Brentwood, Calif. 90049

Continuation-in-part of Ser. No. 829,232, Feb. 3, 1992, Pat. No. 5,190,031, which is a continuation of Ser. No. 667,186, Mar. 11, 1991, Pat. No. 5,107,832. This application Mar. 5, 1993, Ser. No. 26,756

Int. Cl.^{5} A61F *7/00*

U.S. Cl. 607—101 **7 Claims**



1. A combined thermotherapy and electrotherapy technique comprising the steps of:

(a) directing toward the skin surface overlying a problem region in the body of a patient a stream of air whose temperature alternates periodically from a high peak temperature value to a low level temperature value to produce a heat wave having a duty cycle which allows internal heat transfer to take place in the body in the intervals between successive peak values in said wave, whereby the temperature of the problem region is increased above its normal value while that of the skin remains at a tolerable level; and

(b) concurrently directing toward the skin surface electromagnetic energy which penetrates the problem region whose temperature is now increased above its normal value and has a therapeutic effect on the problem region which is enhanced by its increased temperature.

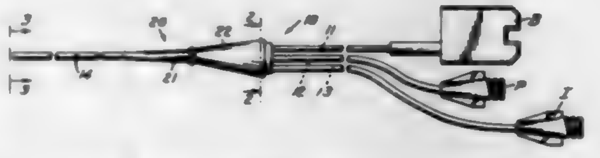
5,315,995
METHOD AND APPARATUS FOR CONTINUOUS MEASUREMENT OF CENTRAL VENOUS OXYGEN SATURATION DURING HUMAN CARDIOPULMONARY RESUSCITATION AND CLINICAL SHOCK

Emanuel P. Rivers, Detroit, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed Mar. 19, 1992, Ser. No. 853,926

Int. Cl.^{5} A61B *5/00*

U.S. Cl. 128—634 **11 Claims**



1. A central venous oxygen saturation catheter for use in treating a patient for human cardiopulmonary resuscitation and shock during and after cardiac arrest comprising:

a body,

a first lumen traversed by a fiber optic bundle of afferent and efferent light-conducting fiber means for sending signals and receiving signals for generating central venous oxygen saturation readings,

said body having a first portion which has a distal end and a diameter enabling insertion into a central venous blood vessel,

said body having a substantially frustoconical second portion adjacent said first portion,

said first portion being capable of flexing during insertion but remaining sufficiently rigid and not flexing during turbulent blood flow,

said first portion of said catheter body having a length that is less than 19 cm.

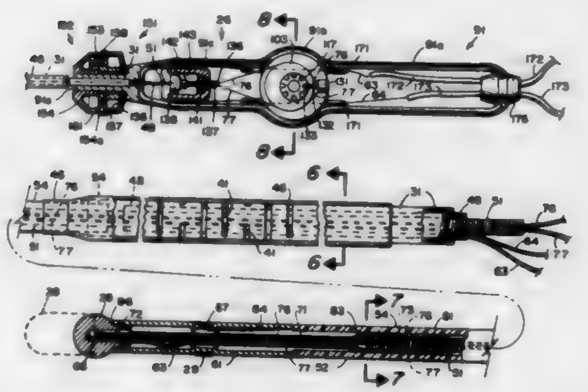
5,315,996
TORQUABLE CATHETER AND METHOD

Ingemar H. Lundquist, 17 Mile Drive at The Dunes, Pebble Beach, Calif. 93953

Continuation of Ser. No. 918,922, Jul. 22, 1992, abandoned, which is a continuation of Ser. No. 657,106, Feb. 15, 1991, abandoned. This application Jan. 19, 1993, Ser. No. 6,207

Int. Cl.^{5} A61B *5/04*

U.S. Cl. 128—642 **32 Claims**



1. A catheter having a high torque capability adapted to be inserted into and through a lumen of a blood vessel comprising a flexible elongate tubular shaft having proximal and distal extremities and a longitudinal axis, said shaft being comprised of a metal torque tube extending substantially through at least a portion of the entire length of the shaft, said metal torque tube having a cylindrical wall with at least one flexible portion therein, said flexible portion being characterized in that at least two longitudinally spaced apart slots are provided in said cylindrical wall subtending an angle of less than 360°, and a flexible non-metallic sleeve of shrink tubing enclosing said metal torque tube and being in contact with the metal torque tube and serving to cover said flexible portion substantially along its entire length and permitting said torque tube to bend in the vicinity of said slots a predetermined amount which is less than that which would create permanent strain in said torque tube, first means on the proximal extremity of the shaft for rotating the shaft about the longitudinal axis by transmitting torque applied to the proximal extremity through the flexible portion and second means on the proximal extremity of the shaft and extending to the distal extremity of the shaft and secured to the distal extremity of the shaft for creating a bending force at the distal extremity to cause bending in the at least one flexible portion.

5,315,997
METHOD OF MAGNETIC RESONANCE IMAGING USING DIAMAGNETIC CONTRAST

Kenneth J. Widder, Del Mar, and James L. Barnhart, Encinitas, both of Calif., assignors to Molecular Biosystems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 540,504, Jun. 19, 1990,. This application Aug. 13, 1992, Ser. No. 929,997

Int. Cl.^{5} A61B *5/055*

U.S. Cl. 128—653.3 **6 Claims**

1. The method of magnetic resonance imaging (MRI), comprising the steps of:

(a) introducing a bolus into a portion of the circulating blood of a mammal prior to or during an MRI examination, said bolus comprising an aqueous medium containing a dispersion of microspheres of diameters of less than 8 microns, said microspheres consisting of gas microbubbles encapsulated by stabilized biocompatible material, said bolus prior to administration having volume of 3.5 to 20 milliliters and a microsphere concentration of greater than 1×10^6 microspheres per milliliter; and

(b) when the administered microspheres have reached the site to be imaged, carrying out magnetic resonance imaging by a fast imaging technique to produce a shortened T2* effect in which the portion of the blood containing the microspheres produces a decrease in signal intensity.

5,315,998
BOOSTER FOR THERAPY OF DISEASES WITH ULTRASOUND AND PHARMACEUTICAL LIQUID COMPOSITION CONTAINING THE SAME

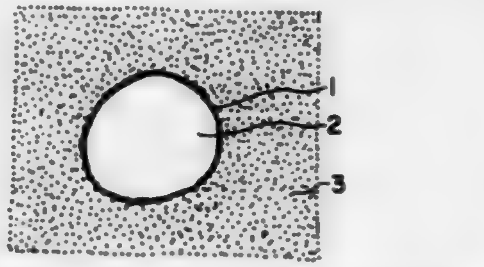
Katsuro Tachibana, and Shunro Tachibana, both of 6-18, Kusagae 1-chome, Chuo-ku, Fukuoka-shi, Fukuoka 810, Japan

Filed Mar. 20, 1992, Ser. No. 855,545

Claims priority, application Japan, Mar. 22, 1991, 3-058970

Int. Cl.^{5} A61B *8/00*

U.S. Cl. 128—660.01 **16 Claims**



1. A booster for enhancing effects of ultrasound in the therapy of diseases, which comprises:

a. a medicament and

b. microbubbles of a gas having a diameter of 0.1 to 100 μm in a liquid.

5,315,999
ULTRASOUND IMAGING SYSTEM HAVING USER PRESET MODES

Rachel M. Kinicki, Acton; Kerry Short, Bradford, both of Mass.; Joseph Kobrenski, Salem, N.H., and Janice Bisson, Methuen, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 21, 1993, Ser. No. 50,951

Int. Cl.^{5} A61B *8/00*

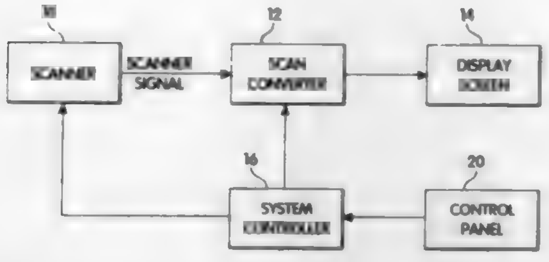
U.S. Cl. 128—660.07 **18 Claims**

1. An ultrasound imaging system comprising:

image generating means for generating an ultrasound image in accordance with preselected imaging parameters;

means for selecting a plurality of imaging parameter values to form a set of imaging parameter values;

means for storing said set of imaging parameter values selected by a user while said image generating means is generating a desired ultrasound image, including means for storing a preset mode value representative of said set of imaging parameter values said set of imaging parameter values defining a preset mode; and



means responsive to subsequent user selection of said preset mode value for automatically controlling said storage means to access said set of imaging parameter values to control image generating means in response to said stored set of imaging parameter values.

5,316,000

USE OF AT LEAST ONE COMPOSITE PIEZOELECTRIC TRANSDUCER IN THE MANUFACTURE OF AN ULTRASONIC THERAPY APPARATUS FOR APPLYING THERAPY, IN A BODY ZONE, IN PARTICULAR TO CONCRETIONS, TO TISSUE, OR TO BONES, OF A LIVING BEING AND METHOD OF ULTRASONIC THERAPY

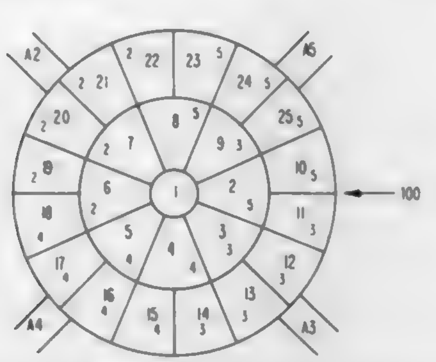
Jean-Yves Chapelon, Villeurbanne; Dominique Cathignol, Genas, and Emmanuel Blanc, St Genis Laval, all of France, assignors to Technomed International (Societe Anonyme) and Institut National de Recherche Meicale (Establissement Public), both of Paris, France

Continuation-in-part of Ser. No. 795,197, Nov. 19, 1991. This application Jan. 21, 1992, Ser. No. 823,306

Claims priority, application France, Mar. 5, 1991, 91 02620; Jul. 19, 1991, 91 09197

Int. Cl.⁵ A61B *8/00*

U.S. Cl. 128—660.03 23 Claims



13. An apparatus for effecting therapeutic treatment of a body zone, comprising:

at least one composite piezoelectric transducer element for emitting ultrasound waves, wherein said composite transducer element comprises piezoelectric ceramic material in combination with a polymer; and

means for applying a current to said composite piezoelectric transducer element for causing said piezoelectric transducer element to emit ultrasound waves having sufficient acoustic energy for effecting said therapeutic treatment of said body zone.

5,316,001

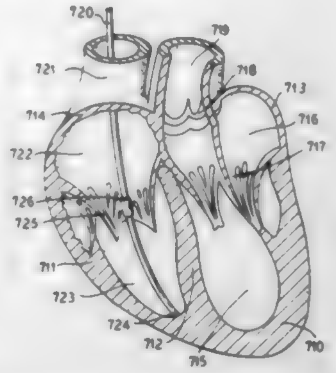
CARDIAC MEASUREMENT SYSTEM FOR MEASURING BLOOD FLOW VELOCITY BY USE OF A SENSOR IMPLANTED INSIDE THE HEART

Bozidar Ferek-Petric, Sovinec 17, and Branko Breyer, Prilaz JNA 79, both of 41000 Zagreb, Yugoslavia

Division of Ser. No. 674,607, Mar. 25, 1991, Pat. No. 5,243,976. This application Feb. 22, 1993, Ser. No. 20,684

Int. Cl.⁵ A61B *5/026*

U.S. Cl. 128—661.08 7 Claims



2. A cardiac detection system, comprising:

a cardiac lead having a sensor means thereon to be implanted inside the heart for measuring blood flow velocity at a predetermined region at a valve between an auricle and a ventricle of a heart; and

first circuit means in communication with the sensor means through the cardiac lead for determining blood flow velocity and second circuit means connected to said first circuit means for detection of cardiac irregularities based on analysis of the blood flow velocity.

5,316,002

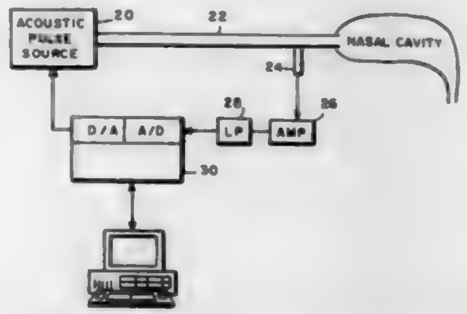
NASOPHARYNGEALOMETRIC APPARATUS AND METHOD

Andrew C. Jackson, Brookline, and Mark Horenstein, Newton, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed Jun. 29, 1993, Ser. No. 84,575

Int. Cl.⁵ A61B *8/12*

U.S. Cl. 128—602.06 13 Claims



1. A method of determining the shape of the nasopharyngeal cavity in a subject using acoustic, broad-spectrum response measurements, said method comprising the steps of:

introducing acoustic signals through conduit means into the input ends of the respective nasal cavities of said subject;

detecting said acoustic signals and acoustic reflections thereof with respect to each one of said nasal cavities at a point in said conduit means;

generating electrical signals proportional to the amplitudes of both said acoustic signals and acoustic reflections thereof;

determining the length of the nasal septum separating said nasal cavities; and

computing the value of the area-distance function of said nasopharyngeal cavity from said electrical signals and said length of the nasal septum.

5,316,003

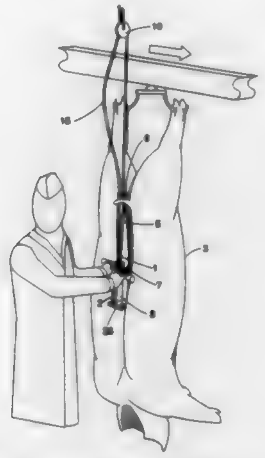
METHOD AND APPARATUS FOR POSITIONING AN ULTRASONIC TRANSDUCER FOR LONGITUDINAL SCANNING OF AN ANIMAL OR CARCASS

James R. Stouffer, Ithaca, N.Y., assignor to Animal Ultrasound Services, Inc., Ithaca, N.Y.

Filed Jul. 24, 1992, Ser. No. 918,979

Int. Cl.⁵ A61B *8/00*

U.S. Cl. 128—662.03 10 Claims



1. A transducer positioning apparatus for positioning an ultrasonic transducer on an animal or carcass to be evaluated by ultrasonic detection equipment, comprising:

a) a support arm with a first and second end;

b) a tail bone pin extending from said first end of said support arm for locating said transducer with respect to a tail region of the animal or carcass;

c) a back position pin extending from said support arm for locating said transducer with respect to a backbone of said animal or carcass; and

d) a transducer support unit at said second end of said elongated support arm for positioning said transducer such that said transducer is parallel to said backbone.

5,316,004

METHOD FOR VASCULAR IMPEDANCE MEASUREMENT

Charles F. Chesney, Sunfish Lake; Stanley M. Finkelstein, St. Louis Park, and Jay N. Cohn, Minneapolis, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 635,278, Dec. 28, 1990, Pat. No. 5,211,177. This application Mar. 26, 1993, Ser. No. 38,357

Int. Cl.⁵ A61B *5/021*

U.S. Cl. 128—672 9 Claims

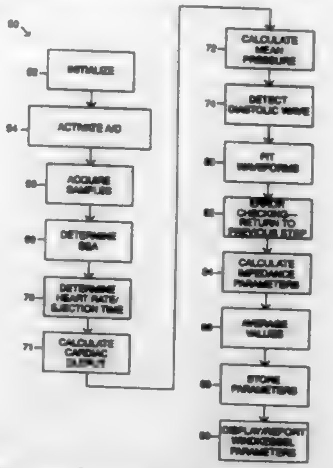
1. A method for measuring vascular impedance properties from the blood pressure waveform of a patient, the waveform containing heart beat signals, comprising the steps of:

measuring and digitizing an arterial blood pressure of a patient to produce a series of digitized data samples representing a waveform of the arterial blood pressure of the patient;

processing a heart beat signal in the digitized blood pressure waveform, marking a segment of the heart beat signal corresponding to systole, and determining an ejection time by measuring the duration of said segment;

processing the same series to determine a mean arterial pressure of the patient;

processing said ejection time and other patient data to determine a cardiac output measurement value for the patient from at least said ejection time and other patient data; and



processing the sample series and the cardiac output value and mean arterial pressure to determine for the patient one or more parameters of a vascular impedance model, the parameters being measures of vascular impedance properties.

5,316,005

APPARATUS FOR DETECTING AND DISPLAYING BLOOD CICULATORY INFORMATION

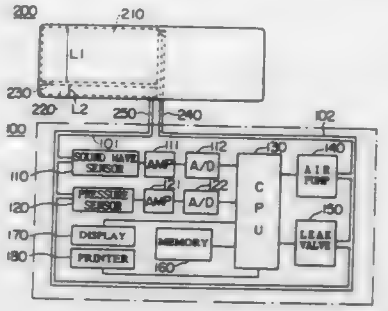
Mitsuei Tomita, 407 Yamanote Villa Porte, 109 Yamanote-Cho, Naka-Ku, Yokohama 231, Japan

PCT No. PCT/JP90/00623, § 371 Date Jan. 13, 1992, § 102(e) Date Jan. 13, 1992, PCT Pub. No. WO91/17699, PCT Pub. Date Nov. 28, 1991

PCT Filed May 17, 1990, Ser. No. 809,499

Int. Cl.⁵ A61B *5/02*

U.S. Cl. 128—680 4 Claims



1. An aortic pulse wave detecting apparatus comprising:

a cuff including a top portion having a blood flow shutting bag for shutting blood flow of an upper arm, and a lower portion including a detection bag for detecting a pulse which has cleared the blood flow shutting bag, wherein both a said bags are located side by side on said cuff for being wound at a position on the upper arm so that the blood flow shutting bag is located at an upstream position and the detection bag is located at a downstream position with respect to an artery;

pressure detecting means for detecting a pressure change in the detection bag generated by a collision of said pulse with said detector bag;

pressure control means for maintaining a reference internal pressure of the blood flow shutting bag and of the detection bag at a set value; and

pulse wave output means for providing an output signal representative of, an aortic pulse wave, a pressure change provided by said pressure detecting means while the reference internal pressure is being maintained.

5,316,006

ELECTRONIC BLOOD PRESSURE METER

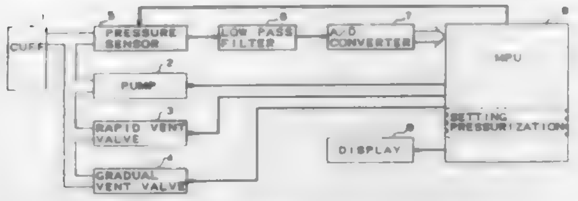
Katuyuki Inage, Osaka; Yumi Saito, Kyoto; Zhang Zhimming, Osaka; Toru Fujii, Kyoto, and Osamu Shirasaki, Hyogo, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Mar. 8, 1993, Ser. No. 27,537

Claims priority, application Japan, Mar. 9, 1992, 4-050105

Int. Cl.^{5} A61B *5/022*

U.S. Cl. 128—681 **3 Claims**



1. An electronic blood pressure meter comprising:
a cuff;
pressurizing means for inflating the cuff;
pressure sensing means for sensing a fluid pressure within the cuff;
pulse wave detecting means for detecting a pulse wave component included in the cuff;
systolic pressure estimating means for estimating a systolic pressure value based on the pulse wave and the cuff pressure detected during inflation by the pressurizing means;
pressurization volume computing means for computing a pressurization volume based on the estimated systolic pressure value;
pressure decreasing means for decreasing the cuff pressure after reaching the pressurization volume;
blood vessel information detecting means for detecting blood vessel information in the pressure decreasing process;
blood pressure value determining means for determining systolic and diastolic pressure values based on the blood vessel information and the cuff pressure;
pulse wave component dispersion degree detecting means for detecting a dispersion degree of the pulse wave components obtained in the pressure decreasing process; and
pressurization volume controlling means for controlling the pressurization volume by said pressurizing means.

5,316,007

Patent Not Issued For This Number

5,316,008

MEASUREMENT OF ELECTROCARDIOGRAPHIC WAVE AND SPHYGMUS

Fusao Suga, Akishima, and Narutoshi Minami, Musashino, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

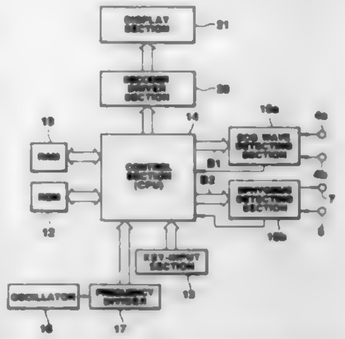
Filed Apr. 3, 1991, Ser. No. 680,239

Claims priority, application Japan, Apr. 6, 1990, 2-36623[U]; Nov. 30, 1990, 2-128045[U]; Nov. 30, 1990, 2-334923; Nov. 30, 1990, 2-334924; Dec. 21, 1990, 2-401398[U]

Int. Cl.^{5} A61B *5/02*

U.S. Cl. 128—700 **28 Claims**

1. A device for measuring an electrocardiographic wave and sphygmus, comprising:
electrocardiographic wave detecting means for detecting an electrocardiographic wave in a human body to generate an electric signal;
first amplifying means for amplifying said electric signal received from said electrocardiographic wave detecting means to generate an electrocardiographic wave signal;
first gain data storing means for storing first gain data to control the gain of said first amplifying means;
sphygmus detecting means for detecting sphygmus in a blood vessel to generate an electric signal;
second amplifying means for amplifying the electric signal received from said sphygmus detecting means to generate a sphygmus signal;
second gain data storing means for storing second gain data to control the gain of said second amplifying means;



judging means for determining whether the electrocardiographic wave signal generated by said first amplifying means and the sphygmus signal generated by said second amplifying means are in correspondence with each other; and
gain control means for changing one of said first and second gain data to control the gain of its associated amplifying means when said judging means determines that said electrocardiographic wave signal and said sphygmus signal are not in correspondence with each other.

5,316,009

APPARATUS FOR MONITORING RESPIRATORY MUSCLE ACTIVITY

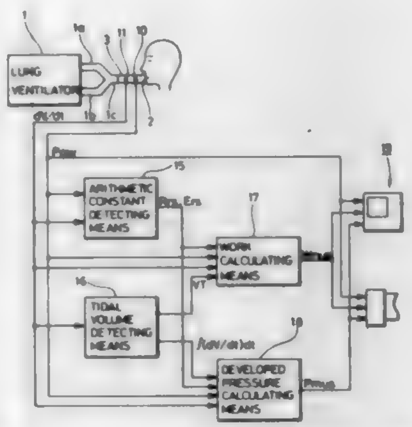
Yoshitsugu Yamada, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Filed Jul. 1, 1992, Ser. No. 907,399

Claims priority, application Japan, Jul. 5, 1991, 3-191205

Int. Cl.^{5} A61B *5/087*

U.S. Cl. 128—716 **9 Claims**



1
1a
3
11
10
LUNG VENTILATOR
dV/dt
1b
1c
2
Paw
15
18
ARITHMETIC CONSTANT DETECTING MEANS
Rrs, Ers
17
WORK CALCULATING MEANS
VT
16
TIDAL VOLUME DETECTING MEANS
∫(dV/dt)dt
19
DEVELOPED PRESSURE CALCULATING MEANS
Pmus

1. An apparatus for monitoring respiratory muscle activity comprising:
a pressure sensor for detecting air pressure in an air passage connecting a lung ventilator and an airway system of a patient and generating a detection signal in response thereto;
a flow rate sensor for detecting flow rate in said air passage and generating a detection signal in response thereto;
arithmetic constant detecting means for detecting resistance Rrs and elastance Ers of a respiratory system of the patient including the airway and thorax beforehand by using the detection signal generated by said pressure sensor and the detection signal generated by said flow rate sensor while said lung ventilator is supplying air to the patient whose spontaneous breathing is temporarily stopped;
developed pressure calculating means for calculating pressure Pmus developed by the respiratory muscles during lung ventilation from the following expression

$$Pmus = -Paw + Rrs(dV/dt) + \int (dV/dt)dt$$

where Paw is airway opening pressure detected by said pressure sensor and dV/dt is flow rate detected by said flow rate sensor; and
output means for outputting the obtained Pmus together with the detection signal generated by said pressure sensor along a common time axis.

5,316,010

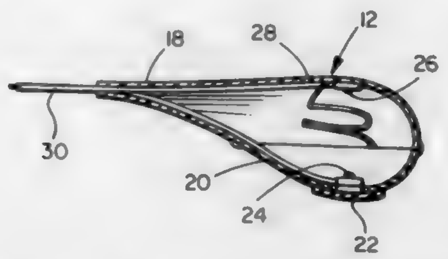
APPARATUS FOR NONINVASIVE MEASURING OF UPPER AIRWAY RESISTANCE IN HUMANS DURING SLEEP

Jesse P. Brown, 708 Westcott St., Syracuse, N.Y. 13210

Filed Apr. 2, 1993, Ser. No. 42,279

Int. Cl.^{5} A61B *5/085*

U.S. Cl. 128—720 **3 Claims**



1. An apparatus for measuring changes in intrathoracic pressure and upper airway resistance in humans during sleep comprising a transducer providing a signal output indicating movement of the skin surface of the suprasternal fossa that is a function of changes in intrathoracic pressure, said transducer including a rigid hollow housing adapted to be mounted stationarily in overlying relation to the suprasternal fossa, a flexible resilient diaphragm connected to and forming a closure and base for said housing in facing relation to the suprasternal fossa, means on said diaphragm for bonding a portion of the diaphragm to the skin surface of the suprasternal fossa, a photodiode mounted on said diaphragm within said housing for movement in response to movement of the skin surface, and a light source mounted stationarily within the housing in facing relation to the photodiode to vary output voltage by the photodiode during movement of the photodiode toward and away from the light source corresponding to the movement of the skin surface of the suprasternal fossa, thereby providing a signal which correlates with changes in intrathoracic pressure and upper airway resistance in humans during sleep.

5,316,011

APPARATUS TO DELIVER PRESSURE-INDUCED SENSATIONS

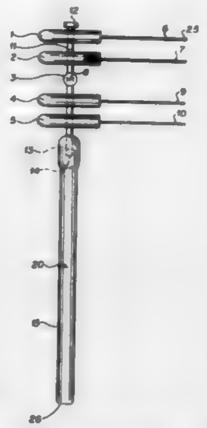
Sidney Weinstein, South Salem, N.Y.; Curt Weinstein, Danbury, and Ronald Drozdenko, Woodbury, both of Conn., assignors to Neurocommunication Research Laboratories, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 860,900, Mar. 31, 1992. This application Nov. 18, 1992, Ser. No. 978,109

Int. Cl.^{5} A61B *19/00*

U.S. Cl. 128—744 **14 Claims**

1. An apparatus for delivering pressure-induced sensations to a subject skin surface, said apparatus comprising:
a handle having a distal portion for applying a stimulus, and a proximal portion grippable by a user;
a plurality of heads coupled to said distal portion of said handle, each of said heads being individually and independently rotatable around a longitudinal axis of said handle relative to the others of said plurality of heads into an operative position; and
a plurality of elongated stimulating monofilaments of varying diameters for contacting the subject skin surface, each



of said stimulating monofilaments being attached to a respective one of said plurality of heads, whereby the rotation of a head into an operative position individually places a respective stimulating monofilament into an operative position,
wherein said plurality of monofilaments are arranged such that the greatest diameter monofilament of said plurality of monofilaments is attached to a head coupled to said handle at a distalmost portion of said distal portion of said handle.

5,316,012

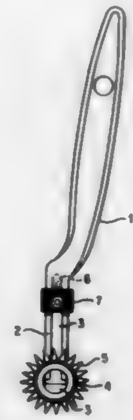
DEVICE FOR TESTING PIN PRICK SENSATION

Tzony Siegal, Gelber St. 16, Jerusalem, Israel

Filed Feb. 10, 1993, Ser. No. 15,905

Int. Cl.^{5} A61B *19/00*

U.S. Cl. 128—744 **4 Claims**



1. A device for testing pin prick sensation comprising:
a handle having an upper end;
a detachable, rotatable wheel having a plurality of pins extending radially from the center of the wheel;
movable holding means located at the upper end of the handle for holding the wheel on said upper end of the handle, said holding means providing an axis upon which the wheel rotates; and
actuating means for moving the holding means such that the

wheel is detached from the holding means whereby the wheel may be disposed of after said testing.

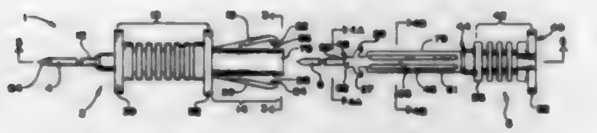
5,316,013
ORIENTED BIOPSY NEEDLE ASSEMBLY

Robert L. Striebel, II, Wyoming; Kenneth E. Chettleburgh, Sparta, and Alan N. Taylor, Rockford, all of Mich., assignors to Hart Enterprises, Inc., Wyoming, Mich.

Filed Aug. 26, 1991, Ser. No. 749,523

Int. Cl.^{5} A61B *10/00*

U.S. Cl. 128—754 **6 Claims**



1. An oriented biopsy needle assembly comprising:

a cannula hub assembly including a cannula hub having a proximal end and a distal end and a cannula extending distally from said cannula hub and having a sharpened distal end;

a sampling stylet having a proximal end, a sharpened distal end and a biopsy sample receiving notch adjacent the distal end and being telescopically received within said cannula and extendable from said distal end of said cannula;

said cannula hub assembly further including a barrel member fixed to said proximal end of said cannula hub, said barrel member and said cannula hub having a longitudinal coaxial bore therethrough axially aligned with and extending to said cannula;

a stylet hub assembly having a proximal end, a stylet hub at said proximal end, a shoulder portion at a distal end of said hub, and a stem portion extending distally from said shoulder portion and terminating at a distal end which is fixedly attached to a proximal end of said sampling stylet, said stem portion fitting non-rotatably into the longitudinal opening in the cannula hub assembly and being longitudinally slidable therein between retracted and extended positions, the distal end of the stylet being extended forwardly from the distal end of the cannula such that the biopsy sample receiving notch is exposed when the stem portion is in its extended position, the stem portion and longitudinal opening being shaped such that the stem portion is constrained to fit into the longitudinal opening at a particular angular orientation with respect to the longitudinal opening, such that the sharpened distal ends of the cannula and sampling stylet are oppositely directed;

latching means on said cannula hub assembly and said stylet hub assembly for releasably retaining said stem portion in its retracted position within the longitudinal opening in said cannula hub assembly, the latching means comprising a pair of cutout slots at a proximal end of the barrel member which extend through the wall of said barrel member and into the longitudinal opening therein and which are aligned laterally opposite each other, said stylet hub assembly having a pair of laterally opposed, radially extending flexible latching flanges on the distal end of the stem portion, said slots and said flanges being constructed and arranged to mate with each other at the retracted position of the stem portion where the flanges snap into said slots, each flexible flange having a forward facing surface that is curved or inclined in an outward and rearward direction such that the flanges are resiliently deflected radially inwardly when the stem portion is moved longitudinally forwardly from its retracted to its extended position, thus facilitating movement of the stem portion in such forward direction, the flanges resiliently flexing in a forward direction when the stem is urged longitudinally in a rearward direction relative to the barrel member from its retracted position, thus restraining the stem from moving rearwardly past its retracted position but permitting at least limited resilient overtravel of the stem rearwardly in the retracted position; and

manually actuatable unlatching means for releasing the latching means so as to permit withdrawal of the sampling stylet from the cannula without removing the cannula from a patient.

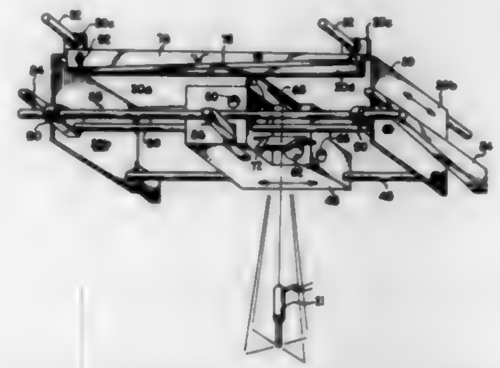
5,316,014
BIOPSY LOCATOR AND GUIDE

Troy W. Livingston, Northbrook, Ill., assignor to Livingston Products, Inc., Wheeling, Ill.

Filed Feb. 7, 1992, Ser. No. 831,215

Int. Cl.^{5} A61B *10/00*

U.S. Cl. 128—754 **12 Claims**



1. A laser device for attachment to an apparatus for providing pictures of a target area in a person, said laser device comprising:

a laser head including a first laser source radiating a focused beam in a first plane and visible as a first line in the target area, a second laser source radiating a focused beam in a second plane and visible as a second line in said target area, said second plane intersecting said first plane at an angle, said focused beams being in an intersecting relationship from said head to said target area;

a moveable carriage in the laser head moveable in a first direction and carrying both the first laser source and the second laser source together for movement in a first direction;

a moveable support means in the carriage for supporting both the first laser source and the second laser source for travel together relative to said carriage in a second direction orthogonal to said first direction;

means for moving the carriage and the support means in the orthogonal directions and thereby moving said first laser source perpendicular to said first line and for moving said second laser source perpendicular to said second line; and

means for directing said focused beams emanating from the laser sources toward the lesion and directing their intersection as a cross line for marking an insertion location for a biopsy needle in said target area and providing an intersecting line from said insertion location to align the needle during insertion to the lesion.

5,316,015
EXTERNALLY CONTROLLED INTESTINAL CONTENT SAMPLER

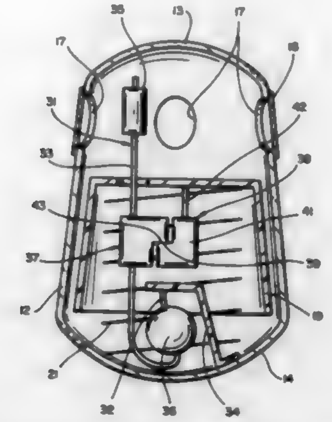
Robert J. Sinaiko, 450 Sutter St., San Francisco, Calif. 94108

Filed Jul. 30, 1992, Ser. No. 922,148

Int. Cl.^{5} A61B *5/00*

U.S. Cl. 128—769 **5 Claims**

1. A sampling device for obtaining a sample from the intestinal tract of a person, comprising: a capsule having an internal chamber and an opening through which a sample can pass to the chamber, means for closing the opening prior to obtaining a sample, a closure member movable between open and closed positions relative to the opening, means urging the closure member toward the closed position, a pendulum which vibrates in response to magnetic stimulation, one end of the pendulum being affixed to the capsule, a counterweight attached to the pendulum toward the one end thereof, and latch members attached to the closure member and to the pendulum, said latch members being engageable with each other to hold the closure member in the open position and being disengagable from each other by vibration of the pendulum to release the closure member for movement toward the closed position in response to an externally applied magnetic stimulation.



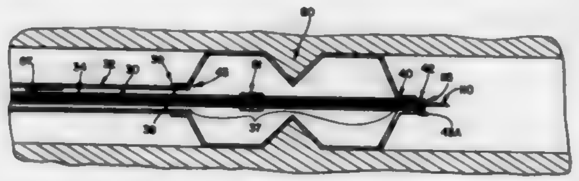
5,316,016
IMAGING BALLOON CATHETER AND METHODS FOR USE AND MANUFACTURE

Daniel O. Adams, Orono; Lixiao Wang, St. Paul; David J. Sogard, Edina, and Gary L. Hendrickson, New Hope, all of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Jul. 7, 1992, *Ser.* **No. 909,772**

Int. Cl.^{5} A61B *5/103*

U.S. Cl. 128—774 **20 Claims**



1. A catheter comprising:

a shaft adapted for insertion into a vascular system, said shaft having a distal portion and a fluid passageway that communicates with said distal portion; and

an expandable tubular element mounted on the distal end of said shaft and in fluid communication with said fluid passageway to conform to the shape of the vessel when said expandable tubular element is inflated at a first pressure,

said expandable tubular element constructed of a material that conforms to the shape of the vessel when said balloon is inflated at a first pressure and maintains the shape of the vessel after said balloon has been deflated and removed from the vascular system and reinflated at a second pressure.

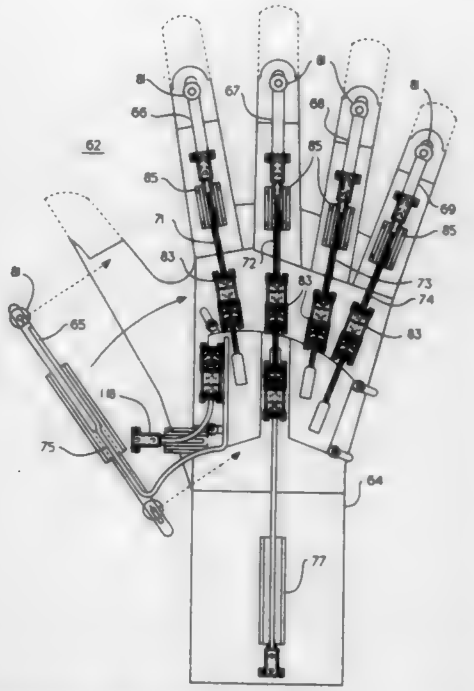
5,316,017
MAN-MACHINE INTERFACE FOR A JOINT MEASUREMENT SYSTEM

Glenn R. Edwards, Palo Alto; Graham Lloyd, Fremont, and Marl L. Oberman, Sunnyvale, all of Calif., assignors to Greenleaf Medical Systems, Inc., Palo Alto, Calif.

Filed Oct. 7, 1992, Ser. No. 957,716

Int. Cl.^{5} A61B *5/00*

U.S. Cl. 128—782 **14 Claims**



1. A man-machine interface comprising:

glove means, sized to fit on a hand, for carrying a plurality of sensors;

a plurality of single axis sensors each having a first end and a second end, each single axis sensor carrying two electrical strain gauge means oriented about each single axis sensor such that each said single axis sensor is responsive to flex in one direction;

a plurality of double axis sensors each having a first end and a second end, each double axis sensor carrying four electrical strain gauge means oriented about each double axis sensor such that each double axis sensor is responsive to flex in two directions;

a plurality of first mounting means for rigidly mounting said first ends of said double axis sensors to said glove means;

a plurality of second mounting means rigidly attached to said glove means;

a plurality of sensor retainer means for slidably mounting said second ends of said double axis sensors to said plurality of second mounting means, said plurality of first and second mounting means positioned on said glove means such that each double axis sensor is positioned over the joint between the metacarpal bone and the proximal phalanx bone of each finger of the hand;

a plurality of third mounting means for rigidly connecting said first ends of said single axis sensors to said glove means; and

wherein said plurality of second mounting means slidably receives said second ends of said single axis sensors, said plurality of second and third mounting means positioned on said glove means such that each single axis sensor is positioned over the joint between the proximal phalanx bone and the middle phalanx bone of each finger of the hand.

5,316,018

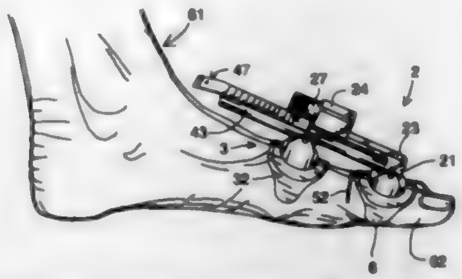
DYNAMIC AMBULATORY METHOD AND APPARATUS FOR ASSESSMENT OF JOINTS OF THE HUMAN BODY

Todd D. O'Brien, 400 E. Remington Dr., Unit B-111, Sunnyvale, Calif. 94087

Filed Apr. 12, 1993, Ser. No. 47,266

Int. Cl.^{5} A61B *5/103*

U.S. Cl. 128—782 **7 Claims**



1. A dynamic ambulatory apparatus for measuring and recording during gait the range of angulation of the first metatarsophalangeal joint of the human body disposed between the relatively angularly articulable first metatarsal and the proximal phalanx of the human foot, comprising:

a) a distal assembly portion of the apparatus adapted for detachable engagement to said angularly articulable proximal phalanx at a location spaced from said first metatarsophalangeal joint;

b) a proximal assembly portion of the apparatus cooperatively related to said distal assembly portion of the apparatus and adapted for detachable engagemnt to said angularly articulable first metatarsal at a location spaced on the opposite side of said first metatarsophalangeal joint from said proximal phalanx; and

c) means disposed between said distal assembly portion and said proximal assembly portion operable when said first metatarsal and said proximal phalanx are angularly articulated during gait to measure and record the extent of angulation therebetween.

5,316,019

CONDOM APPLICATOR

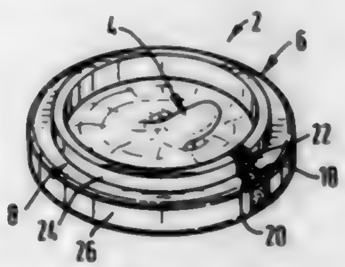
Keith G. Jones, Les Cyclades, 37 Avenue Des Papalins, MC 98000 Monaco, Monaco

Continuation of Ser. No. 843,320, Feb. 28, 1992, abandoned. This application Jun. 23, 1993, Ser. No. 79,979

Claims priority, application United Kingdom, Mar. 5, 1991, 9104574; Nov. 13, 1991, 9124058

Int. Cl.^{5} A61F *6/04*

U.S. Cl. 128—844 **8 Claims**



1. A condom applicator comprising a rolled up condom and a ring member which is of a size such as to hold the rolled up condom in a non-stretched condition and which is for applying the condom by unrolling it over a penis:

the ring member comprising a side wall, a flat portion which extends inwardly from the side wall and substantially perpendicularly with respect to the side wall, a first lip which is provided along an inner part of the flat portion and over which the condom runs when it is being applied by the ring member, and a second lip which extends inwardly from the side wall at a position remote from where the flat portion extends from the side wall, which acts with the flat portion to define a recess and to retain the condom in the recess prior to use, and which extends over the rolled up condom by an amount which is less than half the diameter of a rolled up part of the rolled up condom;

the ring member being a single moulded component comprising first and second ends which are joined together by a frangible joint formed by an adhesive which is located between said ends and which forms the ring member into a complete ring in order to retain the condom in position prior to use of the condom applicator and which breaks during use of the condom applicator in order to allow the ring member to expand radially to accommodate different diameters of penis; and

the side wall being constructed to enable the ring member to expand radially and to control the tendency of the first and the second ends to twist with respect to each other after the frangible joint has been broken and whilst the ring member is being moved along the penis.

5,316,020

SNORING PREVENTION DEVICE

Ernest Truffer, Notre Dame des Marais 1, CH-3960 Sierre, Switzerland

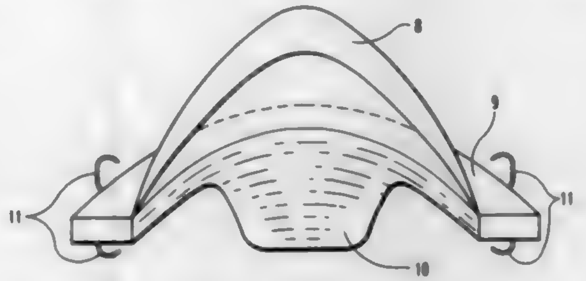
PCT No. PCT/CH91/00204, § 371 Date May 28, 1992, § 102(e) Date May 28, 1992, PCT Pub. No. WO92/05752, PCT Pub. Date Apr. 16, 1992

PCT Filed Sep. 30, 1991, Ser. No. 852,226

Claims priority, application Switzerland, Oct. 3, 1990, 3175/90

Int. Cl.^{5} A61F *5/56;* **A61C** *5/14*

U.S. Cl. 128—848 **1 Claim**



1. A snoring prevention device, comprising:

a one piece mouthpiece without an air aperture, having an upper element configured to rest on the wearer's bony palate, a median element having a lateral protruding edge to receive upper and lower negative impressions of the wearer's upper and lower teeth, and a lower element configured and disposed to force the wearer's lower jaw into a position forward of the wearer's upper jaw; and

retention means for attaching the device within the wearer's mouth and for keeping the wearer's mouth closed when the device is in place, whereby the device prevents any mouth breathing by the wearer when the device is in place.

5,316,021

HAIR CURLER HAVING LINKING ELEMENT WITH CROSSBAR

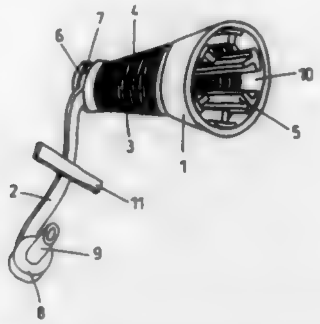
Giuseppe Giordano, 4, av. des Mousquines, CH-1005 Lausanne, Switzerland

PCT No. PCT/CH91/00139, § 371 Date Feb. 27, 1992, § 102(e) Date Feb. 27, 1992, PCT Pub. No. WO92/00024, PCT Pub. Date Jan. 9, 1992

PCT Filed Jun. 25, 1991, Ser. No. 836,318

Int. Cl.^{5} A45D *2/14*

U.S. Cl. 132—248 **7 Claims**



1. A hair curler around which hair is temporarily wound so as to impart a curl to said hair, said hair, when wound around said curler, generating an unwinding torque tending to unwind said curler, said curler comprising:

an elongate body portion, having two ends, around which hair to be curled is wound; and

a transverse linking element means, fixably fastened at one of said two ends of said elongated body portoin and removably fastened to the other of said two ends of said elongate body portion, for retaining hair in place on said elongate body portion when said hair is wound on said elongate body portion, said transverse linking element including means, independent of any other curler, for countering said unwinding torque, said torque countering means comprising at least one lateral projection extending from said transverse linking element.

5,316,022

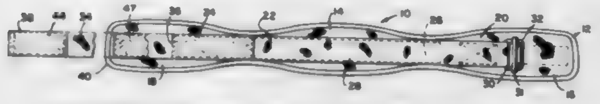
SPORTS BELT WITH CINCHABLE FASTENER SYSTEM

James W. Schiek, Sr., 1020 Winnebago St., Oshkosh, Wis. 54901

Filed Aug. 28, 1992, Ser. No. 937,937

Int. Cl.^{5} A61F *5/37, 5/00;* **A41F** *3/02*

U.S. Cl. 128—876 **7 Claims**



1. A belt with a cinching fastener, the fastener comprising:

a. a first fastening element having a plurality of projecting, closed loops;

b. a second fastening element having a plurality of projecting hooks all of which include outer tips biased in a common direction and adapted to engage the loops of the first fastening element when moved relative to the loops in a first direction and to slide freely relative to the loops when moved in a second, opposite direction, whereby the hooks of the second fastening element and the loops of the first fastening element become locked in engagement when the second fastening element is pressed against the first fastening element and the fastening elements are moved relative to one another in the first direction causing the hooks to enter into the loops and secure the belt in a position; and whereby the hooks of the second fastening elements and the loops of the first fastening element do not become engaged but slide freely relative to each other when the first fastening element and the second fastening element are moved relative to one another in the second opposite direction.

5,316,023

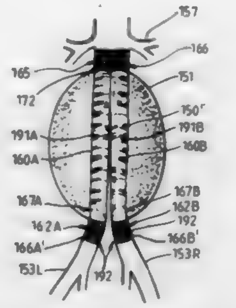
METHOD FOR BILATERAL INTRA-AORTIC BYPASS

Julio C. Palmaz, San Antonio, Tex., and Jean C. LaBorde, Montpellier, France, assignors to Expandable Grafts Partnership, San Antonio, Tex.

Filed Jan. 8, 1992, Ser. No. 818,052

Int. Cl.^{5} A61F *2/06*

U.S. Cl. 128—898 **78 Claims**



53. A method for repairing a body passageway comprising the steps of:

(a) providing a first tube connected to a first expandable and deformable, tubular member;

(b) providing a second tube connected to a second expandable and deformable, tubular member, the second tube being separate from the first tube; and

(c) expanding the expandable and deformable tubular members to expand and deform the tubular members to force the tubular members radially outwardly into contact with the body passageway and each other, to secure the tubular members and at least a portion of each tube within the body passageway, whereby the tubes provide a bilateral fluid passageway through the body passageway.

5,316,024

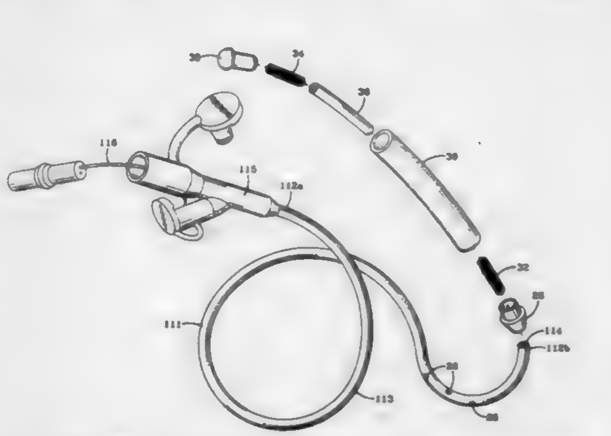
TUBE PLACEMENT VERIFIER SYSTEM

Richard E. Hirschi, Lebanon; James P. Karbowski, Philomath, both of Oreg.; James L. Tiefenthal, Columbus, Ohio, and Ronald M. Isaac, Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 917,259, Jul. 23, 1992. This application Dec. 24, 1992, Ser. No. 996,467

Int. Cl.^{5} A61B *19/00*

U.S. Cl. 128—899 **8 Claims**



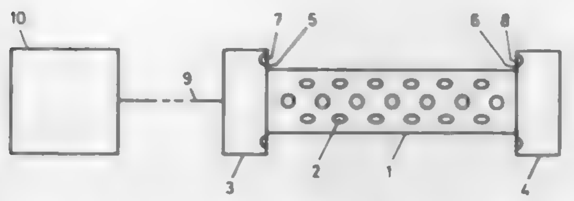
1. A device for insertion into the body of a mammal comprising a tube having a plurality of resonant circuit targets incorporated in the tube, said resonant circuit targets being spaced

apart from one another, and each resonant circuit target having a different resonant frequency.

5,316,025

METHOD OF SET SHAPING HAIR

Jürgen E. Sahm, Baumgarten 21, 8905 Arni, Switzerland
Filed Jan. 27, 1992, Ser. No. 825,962
Claims priority, application Switzerland, Jan. 28, 1991, 245/91
Int. Cl.^{5} A45D *7/02*
U.S. Cl. 132—211 **3 Claims**



1. A method of a set shaping of hair, comprising the steps of

laying the hair into a treatment shape which depends on a desired final shape;

placing a permanent wave agent onto the hair;

aerating the hair by streams of warm air acting at least substantially uniformly onto the hair from the area of the tips of the hair to the area of the base of the hair wherein the hair is aerated during the time span of 5–20 minutes by warm air;

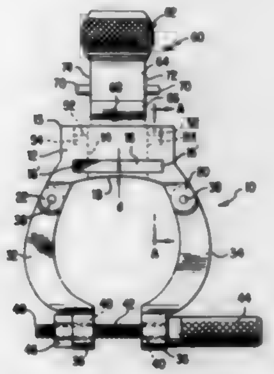
rinsing out the permanent wave agent with water, placing a neutralizing agent onto the hair, drying the hair thereafter, and then releasing the hair to attain the desired, final shape,

wherein the desired, final shape of the hair is a permanent wave, and wherein in order to lay the hair into a treatment shape the hair is rolled strand by strand to the shape of a hollow cylinder, and wherein the aerating is effected by a plurality of air jet streams, of which a first number of said air streams flow from the inner space of the hollow cylinder radially outwards and a second number of said air streams flow in the direction of the generatrix of the cylinder along the outer surface of the hollow cylinder.

5,316,026

METHOD AND APPARATUS FOR APPLYING DECORATION TO NAILS

Nevin Jenkins, Homosassa, Fla., assignor to Fashion Nails, Inc., Miami, Fla.
Continuation-in-part of Ser. No. 830,321, Jan. 31, 1992, abandoned. This application Jun. 18, 1992, Ser. No. 900,446
Int. Cl.^{5} A45D *29/00*
U.S. Cl. 132—285 **8 Claims**



1. Apparatus for making a decorative pattern on a finger or toe nail comprising

resilient screen means for creating a decorative pattern including a tensioned resilient screen allowing resilient deflection under an applied force, said resilient screen defining pervious and impervious areas and adapted to receive and hold thereon a liquid to be applied to a nail without allowing said liquid to penetrate the pervious areas of said screen by gravity,

fixture means for holding said resilient screen means horizontally in juxtaposition relative to a nail with rhe resilient screen spaced a predetermined distance from the nail, and

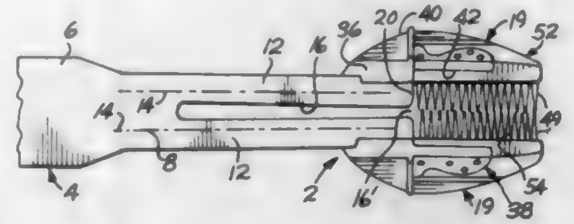
expressing means for expressing liquid through the pervious areas of said resilient screen by resiliently deflecting said screen toward the nail and forcing and expressing liquid held on said resilient screen through the pervious areas of said resiliently deflected screen and onto the nail,

wherein the fixture includes a main body having a bottom surface, a top surface and two opposed side surfaces, a vertical throughbore defined in said main body, a first horizontal slot defined in said main body wider than the throughbore and sapced above the bottom surface by a predetermined amount, second and third slots, one on each side of said throughbore, each have a pair of spaced vertical portions leading from the top surface and an interconnecting horizontal portion spaced above the first slot by a predetermined amount and wherein the expressing means includes a squeegee having a pair of projecting pins to coact with the second and third slots and a blade to coact with the screen as the pins traverse the interconnecting hoirzontal portions of the second and third slots.

5,316,027

STRADDLE TYPE TOOTH BRUSHING DEVICE

Ronald W. Klinkhammer, Seattle, Wash., assignor to Oral Logic, Inc., Seattle, Wash.
Continuation-in-part of Ser. No. 664,487, Mar. 4, 1991, Pat. No. 5,137,039, which is a continuation of Ser. No. 145,771, Jan. 19, 1988, and a continuation-in-part of Ser. No. 499,022, Mar. 26, 1990, Pat. No. 5,171,066. This application Aug. 3, 1992, Ser. No. 924,099
Int. Cl.^{5} A45D *44/18*
U.S. Cl. 132—308 **20 Claims**



1. In a straddle-type tooth brushing device,

means including a pair of elongated arms having brushes on the distal end portions thereof forming a head for straddling about a row of teeth to be cleaned, elongated support means including a handle, for supporting the head adjacent the row of teeth, and biasing means acting on the distal end portions of the arms from within the head to yieldably bias the brushes into engagement with the relatively inside and outside faces of the teeth when the head is straddled about the row thereof,

the arms having longitudinal axes and being rigidly interconnected with the support means so as to form relatively rigid longitudinal extensions thereof, which project from the distal end of the support means in generally spaced parallel relationship to one another, and have an elongated slot in the space therebetween which opens to the outside of the device at the distal end portions of the arms, and has a central plane therein which extends between the longitudinal axes of the arms generally parallel thereto,

the distal end portions of the arms having relatively laterally inwardly directed surfaces thereon which are relatively opposed to one another across the central plane of the slot and extend in planes generally parallel to the longitudinal axes of the arms, with relatively upper, lower and forward edges thereabout at the peripheries thereof, which are disposed relatively remote from, and adjacent to, the gum lines of the respective row of teeth being brushed, and forwardly of the surface, respectively, when the head is straddled about the row of teeth so that the central plane of the slot is aligned with the row of teeth,

the brushes comprising discrete strands of thermoplastic resin material which are 47 or less in durometer on the Shore D Scale, 0.010 inch in diameter or greater at the bases thereof, and relatively upstanding on the relatively laterally inwardly directed surfaces of the distal end portions of the arms at individually spaced apart locations on the surfaces so as to be individually laterally deflectable in relation to one another, yet collectively operable on the respective surfaces to form mutually opposing fields of bristle that are firm enough for tooth brushing purposes but ultra soft to the gingival sulcus at the gum lines of the teeth when the head is straddled about a row of teeth and the brushes are engaged with the faces of the teeth,

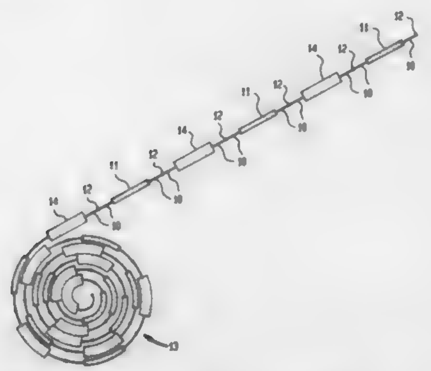
the arms being constructed of a stiff but resiliently flexible material terminating at the relatively upper, lower and forward peripheral edges of the relatively laterally inwardly directed surfaces of the distal end portions thereof, so that the respective arms are independent of one another transverse the central plane of the slot, and

the distal end portions of the arms being so closely spaced apart from one another at the relatively laterally inwardly directed surfaces thereof, and so yieldably biased relatively toward one another by the biasing means, transverse the central plane of the slot in the relaxed state of the arms, that the user must forcibly wedge the teeth between the fields of bristle when inserting the teeth between the brushes to straddle the head about the row of teeth.

5,316,028

DENTAL FLOSS AND A DEVICE FOR DISPENSING

Patricia S. Flemming, 156 Taconic Rd., Greenwich, Conn. 06831
Filed Jun. 24, 1993, Ser. No. 80,530
Int. Cl.^{5} A61C *15/00*
U.S. Cl. 132—329 **6 Claims**



1. An interdental tooth cleaner comprising:

a continuous elongated flexible string of filaments having a continuous length, said elongated string of filaments having a first brush portion and a string portion, said first brush portion having as diameter greater than the diameter of the string portion, and a second brush portion having a diameter greater than each of said first brush portion and said string portion, said first brush portion, second brush portion and said string portion forming a repeating pattern along the continuous length of the elongated flexible string of filaments;

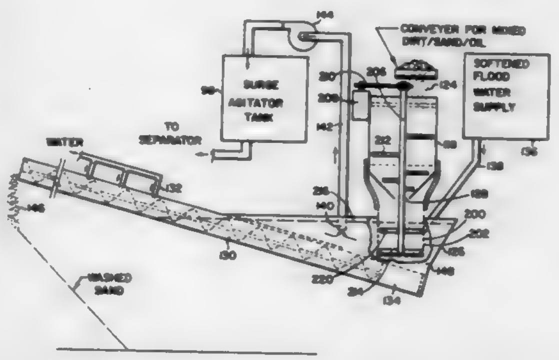
said first and second brush portions being formed of a plurality of textured, commingled filaments that have been permanently deformed and crinkled and the string portion being formed of a plurality of essentially straight filaments that are unitary with textured, commingled filaments of the brush portions; and

a bright mark for cutting being formed on the string portion, said bright mark repeating along the continuous length of the elongated flexible string of filaments and being located at a same portion of said repeating pattern.

5,316,029

OIL SEPARATOR

Willis R. Campbell, Olathe; Forrest L. Robinson, Mission, both of Kans.; Bruce A. Perry, Fenton, Mo., and Dan Schwiefert, Overland Park, Kans., assignors to Separation Oil Services, Inc., Mission, Kans.
Filed May 7, 1992, Ser. No. 880,141
Int. Cl.^{5} B08B *3/04*
U.S. Cl. 134—104.1 **11 Claims**



5. A system for cleaning oil spills at a location of contaminated earth which may include sand which comprises:

conveyor means to convey contaminated earth;

an auger tank;

an auger transport means having a straight portion within said auger tank and a discharge end extending above said auger tank;

a contaminated earth collection tank having an outlet and located to receive the contaminated earth from said conveyor means;

a perforated washing basket positioned below the outlet of said collection tank and positioned to receive contaminated earth therefrom, the bottom of said basket being below the top of said auger tank,

a drive shaft extending from the top of said collection tank down to the bottom of said perforated basket, said drive shaft having agitating rods positioned thereon;

means to rotate said drive shaft;

a fluid water supply including means to discharge said water supply into said auger tank;

a surge/agitator tank;

a fluid withdrawal line extending from within said auger tank to said surge/agitator tank;

a pump within said fluid withdrawal line;

an oil/water separator;

means to connect said surge/agitator tank to said separator; and

means to inject water into the upper portion of said auger.

5,316,030
CONTAINER FLUSHER

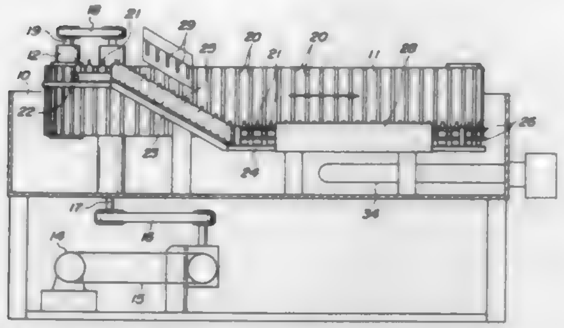
Katsumi Shimizu, Honjo; Kazumi Maruoka, Saitama, and Kiyoshi Yamagishi, Kumagaya, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1992, Ser. No. 947,454

Claims priority, application Japan, Oct. 9, 1991, 3-290835

Int. Cl.^{5} B08B *3/12, 3/10*

U.S. Cl. 134—105 **11 Claims**



1. A container flusher comprising:

a conveyor adapted to convey the container in an upright orientation along a generally circumferential and horizontal path;

guide means extending around said conveyor and disposed so as to frictionally contact a side wall of said container sufficiently as to cause rotation of said container around its vertical axis as said container is conveyed;

a water tank in which the conveyor is at least partially water-immersed; and

ultrasonic vibrators adapted to apply ultrasonic waves to the side wall of the container while the container is being rotated around its vertical axis by cooperation of said conveyor and said guide means within said water tank.

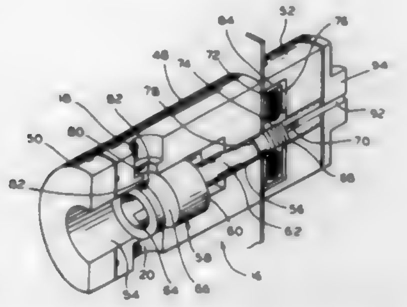
5,316,031
VALVE WITH INDEPENDENT CONTROL OF DISCHARGE THROUGH PLURALITY OF ORIFICES

Carl L. Brazelton, 1290 W. Bourbonnais St., Kankakee, Ill. 60901, and Yong H. Kim, 590 Lakeview Ct., Bourbonnais, Ill. 60914

Division of Ser. No. 691,459, Apr. 25, 1991, Pat. No. 5,135,968, which is a continuation-in-part of Ser. No. 657,829, Feb. 19, 1991, Pat. No. 5,252,635, which is a division of Ser. No. 595,313, Oct. 10, 1990, Pat. No. 5,061,456, which is a division of Ser. No. 89,344, Aug. 25, 1987, abandoned, Ser. No. 691,459, Aug. 25, 1987, which is a continuation-in-part of Ser. No. 382,613, Jul. 19, 1989, Pat. No. 5,018,871, and a continuation-in-part of Ser. No. 370,375, Jun. 22, 1989, Pat. No. 5,164,429, which is a continuation-in-part of Ser. No. 89,344, Aug. 25, 1987, abandoned. This application Jul. 1, 1992, Ser. No. 907,225

Int. Cl.^{5} E03B *1/00;* **F16K** *11/00*

U.S. Cl. 137—1 **5 Claims**



5. A method for controlling the flow of liquid comprising:

a) allowing liquid to flow into a valve through an inlet, said valve including a hollow cylinder having an open end and a closed end, and a radially extending slot intermediate said open end and said closed end;

b) allowing a predetermined amount of the liquid to pass from said cylinder through at least one of a first and second outlet; and

c) controlling the total amount of liquid which passes through said valve, and the proportion of liquid which passes through said first and second outlets, respectively, said total amount and said proportion being controlled independently of each other, with said proportion being controlled by a single adjustment, said proportion controlling being operable for rotating said slot to an angular position whereby said slot fully exposes one of said first and second outlets and partially exposes the other of said first and second outlets.

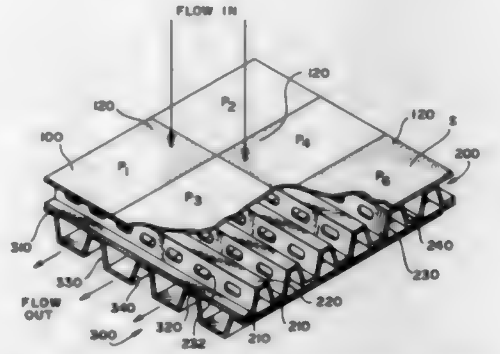
5,316,032
METHOD AND APPARATUS FOR LAMINAR FLOW CONTROL

Steven P. DeCoux, Long Beach, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Continuation of Ser. No. 909,475, Jul. 6, 1992, abandoned. This application Aug. 27, 1993, Ser. No. 113,585

Int. Cl.^{5} F15C *3/00*

U.S. Cl. 137—14 **19 Claims**



1. A method for controlling flow of fluid over a panel of the type typically used for laminar fluid flow control, said system comprising:

providing a plurality of perforations extending over substantially the entire surface of said panel,

arranging a first array of channel members beneath said perforated panel, and providing means in said first array of channel members for fluidly communicating at least a subset of said perforations in said panel with said first array of channel members,

arranging a second array of channel members beneath said first array of channel members, and providing means in said second array of channel members for fluidly communicating said second array of channel members with said first array of channel members, and

applying a source of pressure to one end region of said second array of channel members,

whereby by selecting appropriate locations for said fluidly communicating means, the flow of fluid between said first and second arrays, and consequently between said first array and at least said subset of said perforations in the panel, can be controlled in a predetermined manner.

5,316,033
COUPLING FOR CONNECTING HYDRAULIC LINES

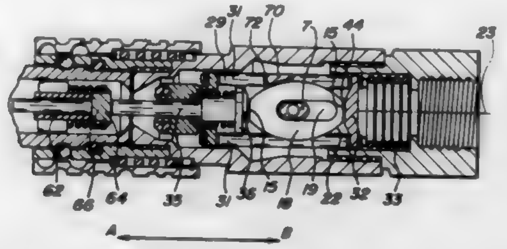
Gustav Schumacher, and Friedrich W. Schumacher, both of Eichelhardt, Fed. Rep. of Germany, assignors to Gustav Schumacher, Eichelhardt, Fed. Rep. of Germany

Filed Jun. 30, 1993, Ser. No. 85,290

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1992, 4222071; Jun. 7, 1993, 4318840

Int. Cl.^{5} F16L *37/28*

U.S. Cl. 137—614 **34 Claims**



1. A coupling for connecting hydraulic lines comprising:

a first coupling part having a first valve received in a housing of the first coupling part, means for receiving a second coupling part associated with said first coupling part, the second coupling part including a second valve adapted to couple with said receiving means, the first valve includes a valve body having a truncated cone shaped which is in a closing position against a cone-shaped sealing surface of the housing of the first coupling part, an actuator axially penetrating said valve body and adjustable relative to it in the direction of the second valve;

an actuating shaft disposed transversely to the first valve axis and penetrating the housing of the first coupling part, said actuating shaft acts upon said valve body of the first valve and valve actuator by way of an actuating surface, and said valve actuator is spring loaded by an opening spring supported at the valve body of the first valve for placement against the actuating surface, said actuating surface is a part of a separate actuating member, which is connected to the actuating shaft in a non-rotatable manner, said actuating shaft including at least two shaft parts, which are firmly but disengageably axially connected to one another, at least one end of the two shaft parts is non-rotatably connected to the actuating member in a form fitting manner, and the two shaft parts can be axially threadedly connected to each other.

5,316,034
VALVE BLOCK ASSEMBLY

Vincent P. Farnsworth, Agoura, and Paul F. Cartier, III, Arcadia, both of Calif., assignors to Porton Instruments, Inc., Tarzana, Calif.

Continuation of Ser. No. 396,684, Aug. 22, 1989, Pat. No. 5,082,788, which is a division of Ser. No. 205,772, Jun. 13, 1988, Pat. No. 4,911,195, which is a continuation-in-part of Ser. No. 901,327, Aug. 27, 1986, Pat. No. 4,773,446. This application Jan. 14, 1992, Ser. No. 820,468

Int. Cl.^{5} B67D *5/54*

U.S. Cl. 137—208 **7 Claims**

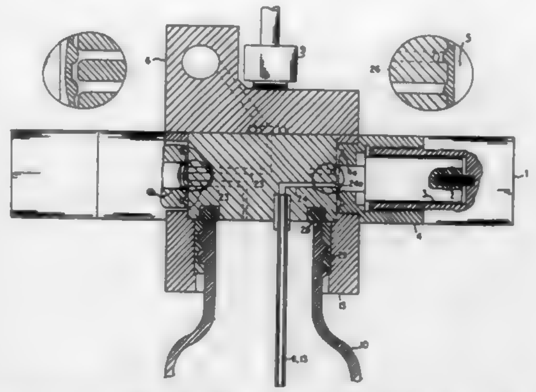
1. A valve block assembly for selectively dispensing reactive fluids comprising:

(a) at least one removable gas-tight, reservoir means capable of holding reactive fluids;

(b) collection means for selectively collecting fluids from said reservoir means;

(c) means for controlling the atmosphere in said reservoir means;

(d) at least one conduit means external to said block by communicating with said channels and said reservoir means, each conduit means being enclosed by said reservoir means and said block means when joined, whereby said conduit means is isolated from the atmosphere outside the reservoir; and



wherein the channels in said collection means are linear and open to the surface of the valve block at both ends.

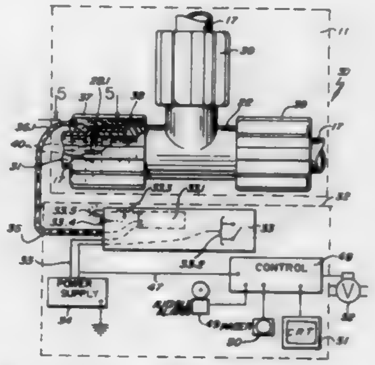
5,316,035
CAPACITIVE PROXIMITY MONITORING DEVICE FOR CORROSIVE ATMOSPHERE ENVIRONMENT

Timothy R. Collins, Cologne; Robert T. Chinnock, Victoria; Robert C. Grant, Eden Prairie, and Dean T. Hamilton, Cologne, all of Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed Feb. 19, 1993, Ser. No. 19,039

Int. Cl.^{5} F16K *23/00*

U.S. Cl. 137—312 **42 Claims**



1. A monitoring device, comprising

a movable target media selected from a class of media including liquids and solid articles, the presence of which is to be determined and monitored,

environmental means creating a corrosive atmosphere environment comprising one or more gaseous materials found in a class of such materials including acids and bases,

confining means creating a target zone within said corrosive atmosphere environment, said target zone confining an ambient media having electrical characteristics, said confining means accepting alternate presence and absence of the target media within said target zone, said target media having electrical characteristics distinguishable from the electrical characteristics of said ambient media,

an electrically conductive plastic sensing element in close proximity with said target zone to be adjacent the target media when present, said conductive plastic sensing element also being embraced by said corrosive atmosphere environment and being resistant to deterioration under the influence of the corrosive atmosphere in said environment,

voltage supply and current sensing means located out of the corrosive atmosphere and environment and remotely from the conductive plastic sensing element, said circuit means responding to a sensed change of current and producing an indication of said change,

and electrical connection means extending between the conductive plastic sensing element and said remotely located circuit means to induce a sensing field in the target zone adjacent said conductive plastic sensing element, said connection means comprising a wire portion extending through said corrosive atmosphere environment and into engagement with the conductive plastic sensing element, and said wire portion being enclosed within an outer protective means resistant to said corrosive atmosphere environment and in hermetically sealed relation to the conductive plastic sensing element, whereby a change of current flow through said conductive plastic sensing element and said connection means is produced alternately by presence and absence of the target media in said target zone and is sensed by said circuit means to produce such an indication which corresponds to the presence and absence of the target media.

5,316,036

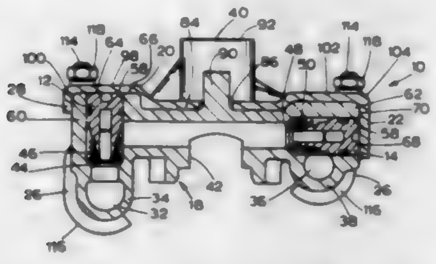
RETAINER PLATE ASSEMBLY FOR PUMP HOUSING

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop Vac Corporation, Williamsport, Pa.

Filed Apr. 9, 1993, Ser. No. 46,214

Int. Cl.^{5} F16K *15/06;* **F04B** *21/02*

U.S. Cl. 137—315 **13 Claims**



1. In a pump of a pressure washer including a pump housing, an input valve and an output valve both of which are disposed in the pump housing, the improvement comprising:

a plate assembly attached to the pump housing adapted to retain both the input and output valves within the pump housing and a plug disposed within an outlet conduit of the pump housing wherein the plate assembly is adapted to retain the plug within the pump housing.

5,316,037

VALVE FOR INSERTION IN A PRESSURIZED FLUID FLOW LINE

Joseph R. Martin, Covington, Ky., assignor to Jomar International, Ltd., Madison Heights, Mich.

Filed Aug. 30, 1993, Ser. No. 113,855

Int. Cl.^{5} F16K *43/00;* **F16L** *55/128*

U.S. Cl. 137—318 **6 Claims**

1. A valve (10) for insertion in a fluid flow line (11) comprising:

(a) a valve body (13) including an upper body portion (14) and a lower body portion (15);

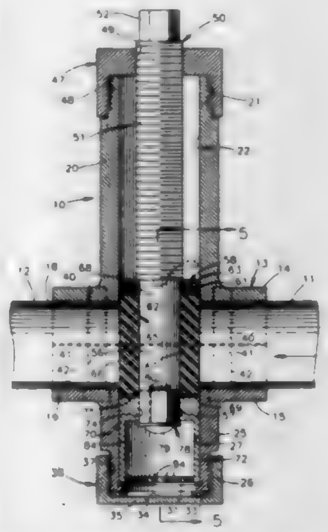
(b) said upper body portion (14) having a longitudinal semicircular bore (18) on the lower side thereof, and said lower body portion (15) having a longitudinal semicircular bore (19) on the upper side thereof which is complementary with the longitudinal semicircular bore (18) on the upper body portion (14) to form a cylindrical line opening for the reception of a cylindrical fluid flow line (11);

(c) means (44) for releasably and sealingly clamping the upper (14) and lower (15) body portions over a fluid flow line (11) mounted in said cylindrical line opening;

(d) said upper body portion (14) being provided with an integral cylindrical extension (20) which extends upwardly from the top of the upper body portion (14), and which has an upper end with external threads (21) formed around the outer periphery thereof, and an axial cylindrical bore (22) that extends therethrough and communicates at the lower end thereof with the semicircular bore (18) in the upper body portion (14) and is perpendicular to said cylindrical line opening;

(e) said lower body portion (15) being provided with an integral cylindrical extension (25) which extends downwardly from the bottom of the lower body portion (15), and which has a lower end with external threads (26) formed around the outer periphery thereof, and a lower end transverse face, and an axial stepped diameter bore (27,29) with a cylindrical wall that extends therethrough and communicates at the upper end thereof with the semicircular bore (19) in the lower body portion (15) and is perpendicular to said cylindrical line opening and in axial alignment with the cylindrical bore (22) in said upper body portion (14);

(f) said axial stepped diameter bore (27,29) in the lower body integral cylindrical extension (25) including an upper portion (27) having a first diameter equal to the diameter of the axial cylindrical bore (22) in the upper integral cylindrical extension (20), and a lower portion (29) having a second diameter of a size smaller than said first diameter so as to form an annular, radially inward extended shoulder (28) at a junction point between said bore upper portion (27) and said bore lower portion (29);



(g) said lower body integral cylindrical extension (25) being provided with an annular groove (30) formed in the wall of the stepped diameter bore upper portion (27) at said junction point, and with the lower side of the annular groove (30) being coplanar with the annular surface of the annular shoulder (28), and having a snap ring stop retainer (31) mounted in said annular groove (30);

(h) said lower body portion (15) being provided with a bottom cap (36) is threadably mounted on the lower end threaded periphery (37) of the lower body portion integral cylindrical extension (25) and having a transverse wall (35) on the inner side of which is mounted a sealing washer ring (33) that sealingly seats against the lower body portion integral cylindrical extension (25) lower end transverse face (32);

(i) said upper body portion (14) being provided with an upper cap (47) threadably mounted on the upper end threaded periphery (21) of the upper body portion integral cylindrical extension (20) and having an axial threaded bore (49) formed therethrough;

(j) an elongated shaft (50) having a threaded upper portion (51) threadably mounted in said axial threaded bore (49) in said upper cap (47) and extending into said axial cylindrical bore (22) in said upper body integral cylindrical extension (20), said elongated shaft threaded upper portion (51) terminating at its lower end with an annular, downwardly facing peripheral shoulder (55) which is formed at the upper end of an integral reduced diameter, smooth surfaced cylindrical lower shaft portion (56), and the lower end of said cylindrical lower shaft portion (56) being integral with the upper end of a driving end (57) which is hexagonal shaped in cross section and which has a threaded axial blind bore (80) extended upwardly therein from the lower end thereof;

(k) a steel washer (63) mounted on the cylindrical lower shaft portion (51) with an upper side thereof seated against the shaft peripheral shoulder (55);

(l) an O-ring seal carrier ring (58) mounted on the cylindrical lower shaft portion (56) below the steel washer (63) with an upper side thereof seated against the steel washer (63) and having an external peripheral O-ring seal (61) mounted in an external peripheral groove (59) formed in the O-ring seal carrier ring (58) and slidably and sealingly engaging the axial cylindrical bore (22) in the upper body portion cylindrical extension (20), and having an internal peripheral O-ring seal (61) mounted in an internal peripheral groove (60) formed in the O-ring seal carrier ring (58) and sealingly engaging the periphery of the cylindrical smooth surfaced lower shaft portion (56);

(m) a tubular elastomeric fluid flow line seal (65) is slidably mounted on the cylindrical lower shaft portion (56) with an upper end (68) seated against the O-ring washer ring (58) and which has a cylindrical outer surface that makes a slip fit within the axial cylindrical bore (22) in the upper body portion cylindrical extension (20);

(n) a steel washer (75) is mounted on the cylindrical lower shaft portion (56) against a lower end (69) of the tubular line steel (65);

(o) an annular hole cutter (70) having a cylindrical head (71) and an integral tubular cylindrical wall (72) extending downwardly from said head (71), and said annular hole cutter (70) being slidably mounted in the axial cylindrical bore (22) in the upper body portion cylindrical extension (20) and being provided with an axially disposed hole (74) formed through said cylindrical head (71) which is hexagonal shaped in cross section and in which is received the hexagonal shaped driving end (57) of the shaft (50) and said annular hole cutter (70) is retained on said shaft (50) in seating engagement against the steel washer (75) mounted on the lower shaft portion (56) by a self-locking screw (78) operatively mounted in the threaded blind bore (80) in the shaft driving end (57);

(p) said annular hole cutter (70) is provided on the lower end of the tubular cylinder wall (72) with a plurality of downwardly extended cutting teeth (94) to provide the cutter (70) with a lower open end and an internal holding chamber for holding a slug cut from the upper wall of a fluid flow line (11) on which is mounted, each of the cutting teeth (94) being provided with a cutting edge which is disposed on a radial line passing through the longitudinal axis of the cutter (70), and the cutting edge of each tooth (94) extends circumferentially forward of the tooth front radial face (95) which angles upwardly from the lower end of the cutter and circumferentially rearwardly at an angle (96) between 4 and 6 degrees, each of the cutting teeth (94) being provided with a circumferential rearwardly extended back angle (103), and each of the cutting teeth (94) being provided at the upper end thereof with a concave gullet;

(q) whereby when the shaft (50) is rotated in one direction to retract the cutter (70) and tubular seal (65) upwardly into the bore 22 in the upper body portion (20) the upper and lower body portions (14,15) may be clamped onto a fluid flow line (11) and when the shaft (50) is rotated in the opposite direction to advance the cutter (70) and tubular seal (65) downwardly, the cutter (70) will cut an opening through the upper wall of the fluid flow line (11) and remove a slug which will pass upwardly into the holding chamber in the cutter (70), and continued advancing movement of the shaft (50) will move the cutter (70) into a cutting engagement with the lower wall of the fluid flow line (11) and cut an opening therethrough, and continued downward movement of the shaft (50) moves the tubular seal (65) into the hole cut through the fluid flow line (11) and the cutter (70) to a stop position against the snap ring (31) to permit the lower end (57) of the shaft (50) to slide downwardly through the opening (74) in the head (71) of the cutter (70), after said cutter (70) has reached said stop position to permit a portion of said shaft (50) above said seal carrier ring (58) to engage said steel washer (63) to force said seal ring carrier (58) into engagement with said tubular seal (65) to create an axial compression on the tubular seal (65) and expand it radially outward against the surrounding surfaces of the holes cut through the upper and lower walls of the fluid flow line (11) to block and seal fluid flow through said line (11), and prior to said cutter (70) reaching said stop position and said compression of said tubular seal (65), said seal carrier ring (58) prevents any fluid leakage that gets around said tubular seal (65) to get beyond said seal carrier ring (58).

5,316,038

FLUID DISTRIBUTION DEVICE

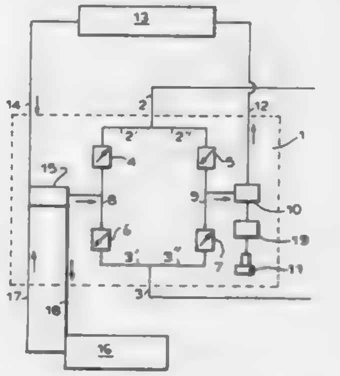
Silvia B. Segura Salvador, and Maria del Mar Segura Salvador, both of Plaza de la Constitucion 2, 04230-Huercalde Almeria, Almeria, Spain

Filed Aug. 26, 1993, Ser. No. 112,566

Claims priority, application Spain, Mar. 26, 1993, 9300623

Int. Cl.^{5} F16K *49/00;* **F16D** *31/02*

U.S. Cl. 137—334 **18 Claims**



1. A fluid distribution device including a circuit comprising:

a circuit inlet, a circuit outlet separated from the circuit inlet; first and second ducts between the inlet and the outlet;

a third duct connected to the first duct between the inlet and the outlet; a fourth duct connected to the second duct between the inlet and the outlet;

a first one-way valve in the first duct between the inlet and the third duct permitting flow through the first duct only away from the inlet toward the third duct; a second one-way valve in the first duct between the third duct and the outlet for permitting flow through the first duct only toward the outlet;

a third one-way valve in the second duct between the inlet and the fourth duct for permitting flow only one way from the inlet toward the fourth duct; a fourth one-way valve in the second duct between the fourth duct and the outlet for permitting flow through the second duct only toward the outlet; the outlet being connected on a return path to the inlet for recycling fluid from the outlet to the inlet;

fluid pressure control means between the inlet and the outlet for maintaining a selected pressure level in the circuit and permitting flow through the circuit in part according to the direction of flow through the third and fourth duct at a particular time.

5,316,039

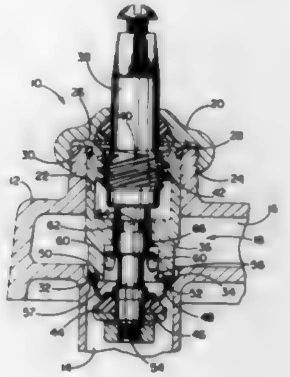
CARTRIDGE-TYPE FAUCET VALVE WITH IMPROVED SEAL

William D. Haag, Hoffman Estates; A. Richard Emmerson, Buffalo Grove, and Daniel J. Laube, Oak Park, all of Ill., assignors to The Chicago Faucet Company, Des Plaines, Ill.

Filed Jan. 6, 1993, Ser. No. 1,257

Int. Cl.5 F16K *27/02*

U.S. Cl. 137—454.6 **9 Claims**



1. A faucet valve cartridge for controlling flow through a valve housing, the latter having an inlet, an outlet and a cartridge seat, the cartridge seat being interposed between the inlet and outlet and for cooperating with a portion of said cartridge to provide sealing between the inlet and outlet, said cartridge comprising a stationary elongated sleeve provided with a flow passage for communicating from the inlet to the outlet; a stem mounted within said sleeve and being longitudinally movable between a closed position and an open position, said stem having mounted thereon a seal piece adapted for engagement with a stationary seating surface adjacent a first end of said sleeve, said seal piece engaged with said seating surface only in said closed position for preventing flow to said passage; a deformable seal for providing a static sealing engagement with the cartridge seat, said seal adapted to be deformed against the cartridge seat when said cartridge is assembled with the valve housing; and a flange portion extending radially from said sleeve and having a surface adapted to be in abutting relation with a portion of the valve housing, wherein said abutment of said flange surface with said portion of the valve housing provides a predetermined amount of deformation of said seal when said cartridge is assembled with the valve housing.

5,316,040

VALVE ALIGNMENT TOOL

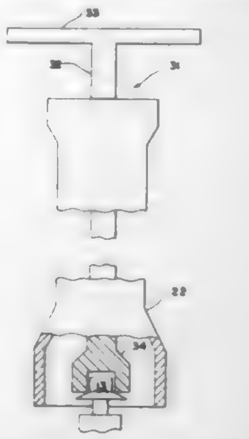
Robert L. Townsend, 11942 Chapel Rd., Clifton, Va. 22024, and Alfred G. Downs, Rte. 2; Box 225 R, Bluemont, Va. 22012

Filed Mar. 26, 1993, Ser. No. 37,437

Int. Cl.5 F16K *37/00;* **F16L** *5/00*

U.S. Cl. 137—556 **3 Claims**

1. An underground water main valve alignment tool for installing a valve box, as the trench is being filled in, above a rotating stem gate valve having a square stem nut, comprising in combination; centering means on said tool cooperating with the square stem nut to place the axis of the valve box above the quare stem nut; aligning means on said tool, co-acting with said centering means, along the longitudinal axis of said tool, cooperating with an interior portion of said valve box to place the longitudinal axis of the valve box in vertical alignment; and, means on said tool to hold the valve box in vertical alignment as the earth is filled into the trench.



5,316,041

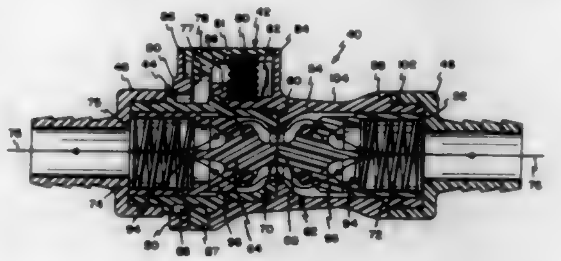
QUICK CONNECTION COUPLING VALVE ASSEMBLY

Patrick J. Ramacier, Jr., St. Paul, and David W. Meyer, Jordan, both of Minn., assignors to Colder Product Company, St. Paul, Minn.

Filed Oct. 27, 1992, Ser. No. 967,157

Int. Cl.5 F16L *37/28*

U.S. Cl. 137—614.04 **10 Claims**



1. A quick connection coupling valve assembly, comprising:

a male coupling member having a front end and a back end, the male coupling member including a housing which reciprocally receives a first poppet member therein and defines a fluid passageway therethrough, the first poppet member being axially movable between an open position and a closed position, the first poppet member having a tip end normally projecting from a front end of the housing when in the closed position, a spring member being compressedly disposed between a back end of the housing and the first poppet member to bias the first poppet member into the closed position, the back end of the male coupling member being connectable to a fluid conduit;

a female coupling member having a front end and a back end, the female coupling member including a housing defining a fluid passageway therethrough having first and second housing portions, the first housing portion reciprocally receiving a second poppet member and the second housing portion receiving the first end of the male coupling member, the second poppet member being axially movable between an open position and a closed position, said second poppet member having a tip end normally projecting from a front end of the first housing portion when in the closed position, a spring member being compressedly disposed between a back end of the first housing portion and the second poppet member to bias the second poppet member into the closed position, the back end of the female coupling member being connectable to a fluid conduit;

the first poppet member and the second poppet member each including a conical member disposed on a back side of the tip end, the conical member tapering axially away from the tip end;

a first o-ring is disposed on an outer surface at a front end of the first poppet member and forms a fluid tight seal between the first poppet member and the male coupling housing when the male coupling member is disengaged from the female coupling member; and a second o-ring is disposed on an outer face at a front end of the second poppet member and forms a fluid tight seal between the second poppet member and the female coupling housing when the male coupling member is disengaged from the female coupling member; the first and second o-rings forming a maximum diameter at the tip end of the first and second poppet members over which fluid flow is guided; and

clip means proximate the front end of the female coupling member for releasably locking the male coupling member in the female coupling member.

5,316,042

MULTI-WAY ROTARY VALVE

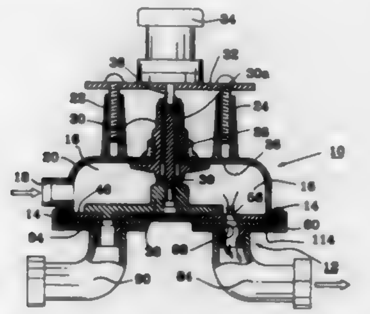
Moo-Seang Lim; Joung-Man Yun, both of Seoul; Chan-Kyu Park, Incheon; Sang-Dae Lee, Incheon; Sun-Chae Ma, Incheon; Seung-Seob Oh, Incheon; Eui-Sik Jeong, Incheon, and Kwang-Sun Paek, Incheon, all of Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 1, 1993, Ser. No. 24,159

Claims priority, application Rep. of Korea, Sep. 4, 1992, 92-16112

Int. Cl.5 F16K *3/00*

U.S. Cl. 137—625.11 **3 Claims**



1. A multi-way rotary valve for use with a machine or system adapted to perform certain operations with the aid of a fluid under pressure, comprising:

an upper casing having an inlet port;

a lower casing combined with the upper casing to form a fluid chamber therebetween, the lower casing having at least three outlet ports arranged in a predetermined angular spacing along a common imaginary circle;

a lower disc-like ceramic valve body fixedly mounted on the bottom of the lower casing, the lower valve body having at least three passage holes which coincide with the corresponding outlet ports of the lower casing;

an upper disc-like ceramic valve body coming into a fluid-tight, frictional contact with the lower valve body for rotational movement with respect thereto, the upper valve body having an arcuate slot which is selectively registered with one or more of the passage holes of the lower valve body to establish a flow path of the pressurized flow;

means for holding the lower valve body in place against any displacement, the holding means including a plurality of spaced posts which extend upward from the bottom of the lower casing and a plurality of through-holes which are formed through the thickness of the lower valve body in a substantially equal spacing to receive the posts of the lower casing;

means for biasing the upper valve body toward the lower casing to ensure a close contact between the upper and the lower valve bodies; and

means for causing the upper valve body to rotate to a selected angular position.

5,316,043

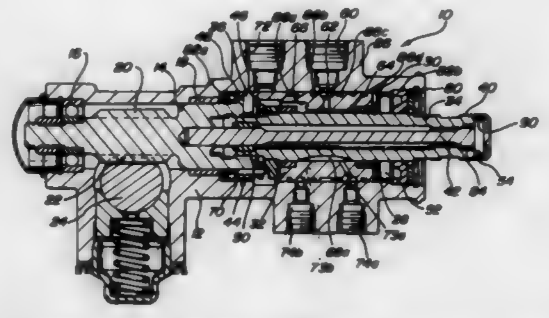
PRELOAD MECHANISM FOR POWER STEERING APPARATUS

Edward H. Phillips, Troy, Mich., assignor to Techco Corporation, Troy, Mich.

Filed Feb. 4, 1992, Ser. No. 828,659

Int. Cl.5 F15B *9/08*

U.S. Cl. 137—625.23 **10 Claims**



1. A rotary control valve comprising:

an input member adapted to receive input torque applied thereto, said input member having a valve spool and a valve sleeve;

an output member; and

a preload mechanism including tension spring means said spring means having a pair of ends, each end of said pair of ends having an elongated slot, said preload mechanism having at least one first pin and at least one second pin, one of said at least one first pin and said at least one second pin being connected to said input member and the other of said first and second pins being connected to said output member, said at least one first pin extending into said elongated slots and acting against an end of each slot to partially compress said spring when said input shaft is in a centered position, said at least one second pin extending into said slots and acting to compress said spring means further when said input shaft is rotated from said center position whereby said valve sleeve is rotated with respect to said valve spool when said spring is compressed in a predetermined amount.

5,316,044

HYDRAULIC CONTROL VALVE HAVING A CENTERING SPRING DEVICE

John F. Szentes; Daniel E. Zimmermann, both of Peoria; David C. Mack, Pontiac, and Eric A. Hutchison, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 7, 1992, Ser. No. 986,317

Int. Cl.5 F15B *13/04*

U.S. Cl. 137—625.69 **6 Claims**

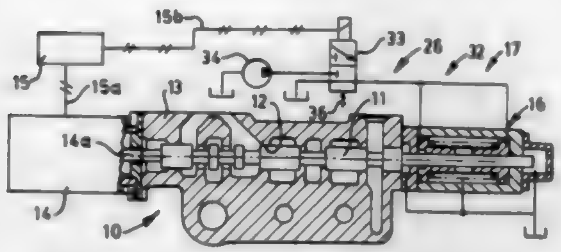
1. A hydraulic control valve comprising:

a body having a bore extending therethrough;

a valve spool slidably disposed in the bore and being movable between a neutral position and at least one operating position;

an actuator connected to the body and to the spool to move the spool between the neutral and operating positions;

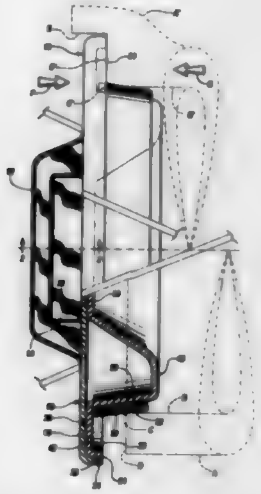
a centering spring device operatively disposed between the body and the spool to resiliently bias the spool to the neutral position, the centering spring device including a housing connected to the body and having a spring chamber therein, a rod connected to the spool, a pair of spring retainers disposed within the spring chamber and slidable on the rod, a spring disposed between the spring retainers and normally urging the retainers into engagement with the housing, a pair of axially spaced abutment members fixed to the rod for abutment with an associated one of the spring retainers; and means for controllably disabling the centering device so that the spool is freely movable between the neutral and operating positions, the disabling means including means for moving the spring retainers axially toward each other so that they are disengaged from both the housing and the abutment members.



5,316,045
STORM DRAINAGE CONDUIT PLUG

James R. Taylor, 6875 Myakka Valley Trail, Sarasota, Fla. 34241

Filed Mar. 15, 1993, Ser. No. 31,609
Int. Cl.^{5} F16L *55/10*
U.S. Cl. 138—89 **4 Claims**



1. A reusable storm drainage conduit plug for temporarily closing an open end of a drainage conduit comprising:

a molded plastic outer panel defining an outer planar perimeter of said plug and having a centrally positioned molded gripping handle;
a molded plastic inner panel coextensive with said outer panel and connected directly against an interior surface of said outer panel;
said inner panel including an integral annular-shaped raised portion defining an outer sealing surface concentric with and smaller than said outer perimeter and extending generally orthogonally from said inner panel;
said sealing surface sized for insertion into, and mating alignment within, the open end of an in situ drainage conduit;
said inner and outer panels having a generally planar ring-shaped outer flange extending radially from said sealing surface to said outer perimeter;
said plug structured to remain undeformed within the end of the in situ drainage conduit in response to being covered with earth, said plug preventing earth from accumulating within the drainage conduit.

5,316,046
POWER STEERING HOSE

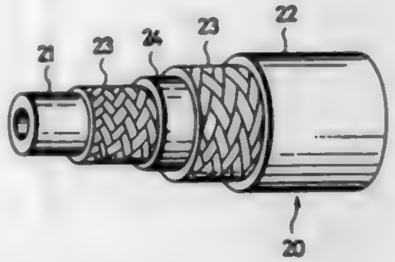
Shigeru Igarashi, and Osamu Ozawa, both of Kanagawa, Japan, assignors to The Yokohama Rubber Co., Ltd., Japan

Continuation of Ser. No. 869,041, Apr. 13, 1992, abandoned, which is a continuation of Ser. No. 758,722, Sep. 9, 1991, abandoned, which is a continuation of Ser. No. 644,422, Jan. 22, 1991, abandoned, which is a continuation of Ser. No. 389,808, Aug. 4, 1989, abandoned, which is a division of Ser. No. 256,178, Oct. 11, 1988, Pat. No. 4,870,995, which is a continuation of Ser. No. 137,615, Dec. 24, 1987, abandoned. This application Sep. 17, 1992, Ser. No. 946,152

Claims priority, application Japan, Dec. 27, 1986, 61-309891; Dec. 27, 1986, 61-309892

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.^{5} F16L *9/14*
U.S. Cl. 138—126 **5 Claims**



1. A hose for use in vehicle power steering units which comprises:

(a) an inner tube;
(b) a reinforcement layer laminated peripherally on said inner tube; and
(c) said inner tube being formed of at least one rubber composition, said rubber composition including a copolymer rubber comprising 10–45 weight percent of units of an unsaturated acrylonitrile, 0–5 weight percent of units of a conjugated diene, and 90–50 weight percent of units of an unsaturated ethylenic monomer other than an unsaturated acrylonitrile and/or units of a conjugated diene hydrogenate.

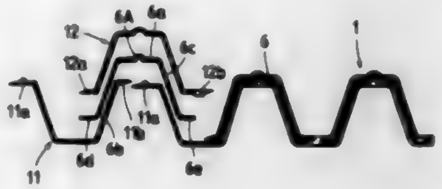
5,316,047
PRESSURE-RESISTANT HELICAL CORRUGATED PIPE

Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan

Continuation of Ser. No. 439,963, Nov. 21, 1989, abandoned. This application Dec. 16, 1991, Ser. No. 807,649

Claims priority, application Japan, Dec. 27, 1988, 63-333131

Int. Cl.^{5} F16L *9/16, 11/11*
U.S. Cl. 138—173 **8 Claims**



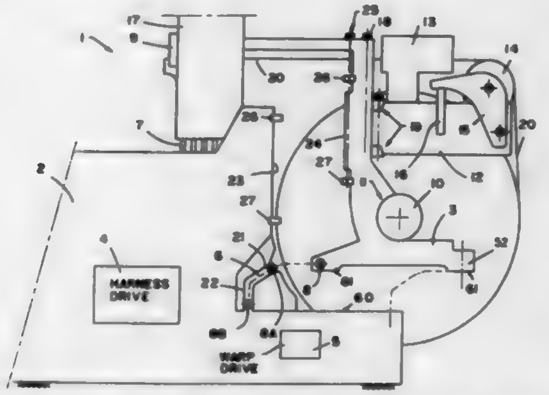
1. A pressure-resistant helical corrugated pipe, comprising:

a helical corrugated pipe wall formed of a top portion, opposite side wall portions extending from said top portion toward a central axis of the pipe, and a bottom portion disposed close to the central axis of the pipe;
a helically wound belt plate formed of a thin metal plate of a generally inverted U-shaped transverse cross-section, said belt plate being disposed at least in said top portion and also in at least a portion of said opposite side wall portions extending therefrom, and said belt plate serving as a constituent element of said pipe wall; and
wherein only a portion of said metal belt plate disposed at said top portion has at least one reinforcement rib which is continuous in a circumferential direction, said at least one reinforcement rib protruding outwardly in a direction away from the central axis of the pipe and being corrugation-shaped; and further wherein an outer surface of said portion of said metal belt plate disposed at said top portion is covered with one of a synthetic resin material and a rubber material so as to follow along said at least one outwardly protruding reinforcement rib; and
further comprising a connective portion provided between adjacent edges of said metal belt plate, said connective portion being integrally formed of one of a synthetic resin material and a rubber material.

5,316,048
ARRANGEMENT FOR SEPARATION AND RE-ASSEMBLY OF A TWO-PART WEAVING MACHINE

Marc Gruwez, Zwalm, Belgium, assignor to Picanol N.V., Belgium

Filed Feb. 24, 1993, Ser. No. 21,596
Claims priority, application Belgium, Feb. 27, 1992, 09200198
Int. Cl.^{5} D03D *49/02*
U.S. Cl. 139—1 R **9 Claims**



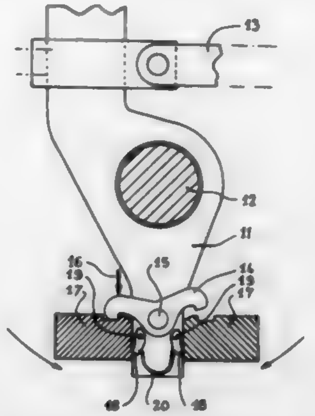
1. In a two-part weaving machine comprising a machine frame which includes stationary first part containing a means for winding up woven material, and a removable second part containing a bearing for a warp beam, the improvement wherein said stationary and removable parts of the machine frame comprise side parts fitted with respective stop surfaces, and further comprising tightening means including tightening wedges for pressing the stop surfaces of the side parts against each other.

5,316,049
LOCKING MECHANISMS FOR SELECTIVE RETENTION OF OSCILLATING LEVERS ENGAGED BY KNIVES IN A DOBBY

Siegmund H. Tremer, Eckersdorf, Fed. Rep. of Germany, assignor to Staubli & Trumpelt GmbH Maschinenfabrik, Bayreuth, France

Filed Apr. 7, 1993, Ser. No. 43,749
Claims priority, application France, Apr. 28, 1992, 92 05481
Int. Cl.^{5} D03C *1/06*
U.S. Cl. 139—69 **6 Claims**

1. In a heavy closed-shed dobby for a weaving machine which includes a pair of actuation knives which are reciprocally movable in opposite directions and which are selectively engagable with a double rocking hook pivotally mounted to an oscillating lever which is connected to a heddle frame of the weaving machine, a locking mechanism for selectively retaining the oscillating levers connected to one of the knives comprising, a pair of spaced pivotable locking members mounted to the oscillating lever, resilient means for urging each of said locking members toward the double rocking hook in such a manner that when the double rocking hook is engaged with one of the knives, one of said locking members will engage the double rocking hook to prevent the pivotal movement thereof, and said locking members being pivoted away from the double rocking lever when the knives are in simultaneous engagement with the oscillating lever.



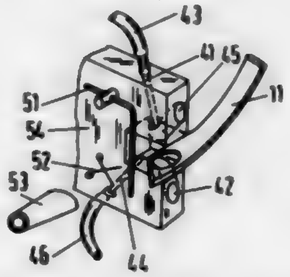
5,316,050
AIR-OPERATED SELVAGE LAYING EQUIPMENT FOR LOOMS

Gotthilf Bertsch, Ebnat-Kappel, Switzerland, assignor to Gebrueder Sulzer Aktiengesellschaft, Winterthur, Switzerland

Filed Mar. 23, 1993, Ser. No. 35,855

Claims priority, application European Pat. Off., Mar. 26, 1992, 92810224.3

Int. Cl.^{5} D03D *47/48*
U.S. Cl. 139—434 **15 Claims**



1. An air-operated selvage laying equipment for looms, having a selvage laying needle (**11**) for laying an end (**21***a*) of a weft yarn lying outside a shed (**31**) into a following shed, a catcher nozzle (**44**) acting upon the weft yarn (**21**) for securing the end (**21***a*) of the weft yarn and a threader nozzle (**41**) for threading the end (**21***a*) of the weft yarn into the eye of the selvage laying needle (**11**), a catcher channel being arranged coaxially with the nozzle and on an opposite side of a gap on a carrier (**54**), a first axis of an airstream from the catcher nozzle (**44**) to an associated catcher channel (**45**) and a second axis of a further airstream from the threader nozzle (**41**) to an associated catcher channel (**42**) crossing over one another.

5,316,051

SELF-ADJUSTING THREAD BRAKING DEVICE FOR WEFT FEEDER UNITS

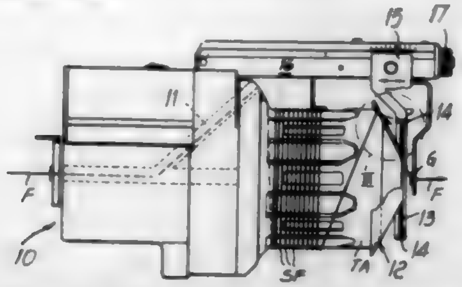
Pietro Zenoni; Giovanni Pedrini, both of Leffe, and Rosario Castelli, Gandino, all of Italy, assignors to L.G.L. Electronics S.p.A., Bergamo, Italy

Filed Sep. 14, 1992, Ser. No. 944,382

Claims priority, application Italy, Sep. 20, 1991, T091A000713; Apr. 30, 1992, T092A000372

Int. Cl.^{5} D03D *47/36*

U.S. Cl. 139—452 **27 Claims**



1. A system including a thread braking device and a weft feeder unit of the type comprising at least one drum on which a plurality of turns of a thread constituting a feed reserve are wound, said drum having an axis and a maximum circumference, said thread braking device comprising a braking means which has a continuous circular extension, said braking means being supported by elastic means coaxially and frontally with respect to said drum, said braking means being actuated by said elastic means to elastically engage against said drum along an output circumference of said drum which is smaller than said maximum circumference and to exert an elastic force thereon, said thread, as unwound from said drum, running between said drum and said breaking means and extending from said output circumference to a thread guide means disposed substantially at the axis of said drum along a path which is inclined by a preset angle with respect to the axis of said drum, so that the tension produced by said elastic force of said braking means on said thread has at least one axial component which discharges onto the braking means and is balanced by said elastic means, whereat an increase in said tension of the unwound thread causes, as a consequence of a corresponding increase in said at least one axial component of said tension of said braking means, the separation of said braking means from said drum and the corresponding self-adjustment of the braking action.

5,316,052

MACHINE FOR MAKING WIRE LATTICE MATS OF WELDED LONGITUDINAL AND CROSS WIRES WITH WELDED END LOOPS

Klaus Ritter; Gerhard Ritter, and Anton Lassbacher, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungsgesellschaft m.b.H., Raaba, Austria

PCT No. PCT/AT92/00099, § 371 Date Mar. 1, 1993, § 102(e) Date Mar. 1, 1993, PCT Pub. No. WO93/01904, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 16, 1992, Ser. No. 989,007

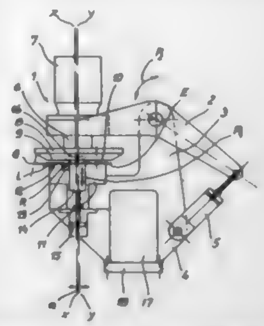
Claims priority, application Austria, Jul. 17, 1991, 1438/91

Int. Cl.^{5} B21F *27/14*

U.S. Cl. 140—112 **13 Claims**

1. A machine for making wire lattice mats made of welded longitudinal wires (L, R) and cross wires (Q), having

- a device (U) for bending back end pieces (E) of the cross wires which extend beyond a longitudinal edge wire (R) of the lattice mat to form end loops (S),
- said bending device having
  - an approximately circular-cylindrical bending template (**14**) which is displaceable in the direction of its axis;
  - a bending plate (**8**);
  - a guide block (**11**) and a bending tool (**10**) eccentrically located on the bending plate (**8**) and pivotable about the bending template (**14**),
  - the guide block (**11**) being located opposite the bending plate (**8**) and forming a support surface (**12**) for the wire to be bent; and
- a welding device (V) for welding the end loops (S) formed of the bent-back cross wire end pieces (E) to the longitudinal edge wires (L, R), located downstream of said bending device (U),



wherein, in accordance with the invention,

the bending tool (**10**) is movable back and forth between a work position for bending the wire and a rest position independently of the bending template (**14**), and, when in rest position, located to form a penetration gap for the end piece (E) of the cross wire to be bent, said penetration gap being formed between said support surface (**12**) of the guide block (**11**) and the bending tool (**10**).

5,316,053

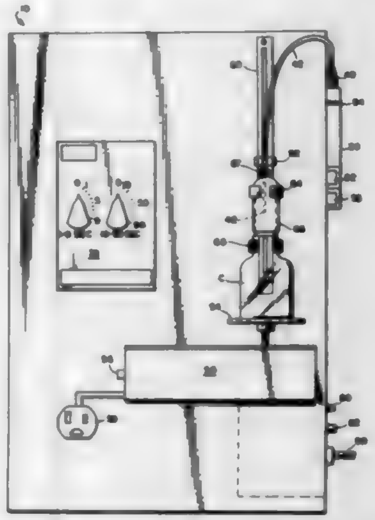
APPARATUS AND PROCESS FOR AUTOMATICALLY RECONSTITUTING DRY MATERIALS, ESPECIALLY PHARMACEUTICALS

Donald Waber, 1519 Nuuanu Ave., Honolulu, Hi. 96817

Division of Ser. No. 861,321, Mar. 31, 1992, Pat. No. 5,203,385. This application Apr. 19, 1993, Ser. No. 49,979

Int. Cl.^{5} B65B *3/30*

U.S. Cl. 141—1 **13 Claims**



1. A process for automatically reconstituting dry pharmaceuticals that have been stored in a container without removing said dry pharmaceuticals from said container, comprising:

simultaneously automatically dispensing a predetermined amount of solvent into said container and agitating said container, wherein said dispensing step is carried out by a peristaltic pump controllably activated by a timer, wherein said solvent is dispensed at a flow rate of at least 1 milliliter per second.

5,316,054

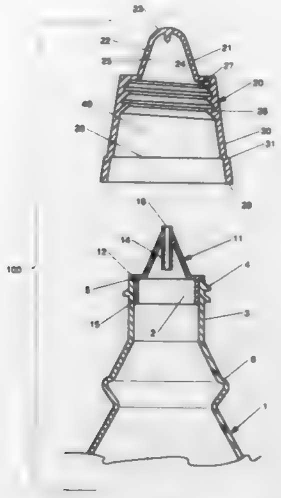
SELF-CONTAINED PACKAGE FOR HOUSING, DISPENSING AND DILUTING CONCENTRATED LIQUID

William G. Hall, and Robert S. Dirksing, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 30, 1993, Ser. No. 56,215

Int. Cl.^{5} B65B *1/04, 3/04, 31/00*

U.S. Cl. 141—22 **8 Claims**



1. A self-contained package for housing, dispensing and diluting to a predetermined concentration level a concentrated liquid housed within said package, said package comprising:

a) a container for housing said concentrated liquid, said container including a discharge orifice and means for releasably securing a closure about the periphery of said discharge orifice;
b) a spout having a first end sealingly secured across said discharge orifice in said container, and a second end exhibiting a discharge orifice of smaller cross-section than the discharge orifice in said container;
c) a closure having a vertical axis and securement means complementary to said securement means on said container for releasably securing said closure about said discharge orifice in said container, said closure further including a concentrate reservoir for receiving a predetermined quantity of said concentrate from said container and a main body portion for receiving a predetermined quantity of dilution liquid after said concentrate reservoir has been filled with said concentrated liquid, said main body portion of said closure having a cross-section, as measured perpendicular to its vertical axis, which is larger than the cross-section of said concentrate reservoir, said closure further including a centrally located post which penetrates said discharge orifice in said spout to form a seal with said discharge orifice in said spout when said closure is fully assembled onto said container; and
d) visual indicator means coincident with the uppermost end of said concentrate reservoir to signal the user when the desired predetermined quantity of concentrated liquid has been added thereto.

5,316,055

BICYCLE TIRE RECHARGE APPARATUS

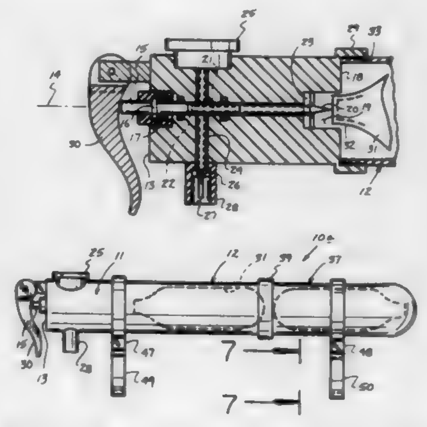
John A. Brimmer, 1911 W. Freeway #2, Grand Prairie, Tex. 75051

Filed Apr. 19, 1993, Ser. No. 48,313

Int. Cl.^{5} B63C *9/24;* **B60C** *29/06*

U.S. Cl. 141—38 **4 Claims**

1. A bicycle tire recharge apparatus including a first housing and a second housing, with the first housing and second housings coaxially aligned along a predetermined axis, with the first housing having a first housing first end wall spaced from a first housing second end wall, the first housing first end wall including a plunger coaxially aligned along the axis reciprocatably directed into the first housing, with the plunger including an abutment disc mounted within the first housing having a spring captured between the abutment disc and the first housing to bias the plunger exteriorly of the first housing first end wall, and an actuator lever pivotally mounted to the first housing in engagement with the plunger, the first housing second end wall having a socket cavity, with the socket cavity including the plunger directed therethrough terminating in a puncture projection coaxially aligned along the axis, with the puncture projection mounted to a plunger piston within the socket cavity, and the plunger including a first conduit extending from the plunger piston through the plunger in communication with a second conduit orthogonally intersecting the first conduit, and a delivery conduit directed orthogonally relative to the axis, with the delivery conduit having a delivery conduit first end terminating in a pressure gauge, and the delivery conduit second end directed from the first housing, with a conduit socket receiving the delivery conduit second end, and the delivery conduit socket including a needle valve lug mounted fixedly coaxially aligned along with the socket, with the delivery conduit in pneumatic communication through the delivery conduit socket, and the second conduit arranged in a first position displaced relative to the delivery conduit, and the second conduit in pneumatic communication with the delivery conduit when the actuator lever effects deflection of the plunger to a second position to simultaneously project the puncture projection coaxially aligned along the axis, with the second housing having a second housing cavity, the second housing cavity including a pressure cylinder, and the pressure cylinder including a neck coaxially aligned along the axis in facing relationship relative to the puncture projection to effect puncturing of the pressure cylinder upon displacement of the plunger to the second position directing pressurized gas from the pressure cylinder along the first conduit, the second conduit, and the delivery conduit.



5,316,056

POWDER DISPENSING APPARATUS

Leslie Stott, Bacup, England, assignor to L. E. Stott Limited, Bacup, England

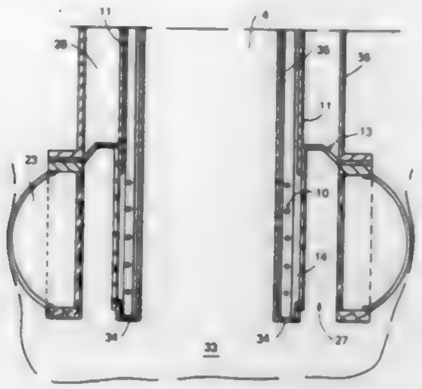
Continuation-in-part of Ser. No. 938,777, Sep. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 658,925, Mar. 14, 1991, abandoned. This application Oct. 30, 1992, Ser. No. 969,486

Int. Cl.^{5} B65B *1/28*

U.S. Cl. 141—68 **6 Claims**

1. An apparatus for filling a flexible container from a bulk supply, comprising: a weighing base providing a support for a container during filling thereof; a filling head adapted to be disposed in sealing engagement with an upper part of said container to be filled; a powder conduit in said filling head

adapted to conduct powder from said bulk supply to an interior space of said container; a vent conduit providing a gas flow path from said space to atmosphere via a first filter in said vent conduit; an extraction conduit with one end connected to said interior space and with another end connectable to an extraction fan, said extraction conduit having a second filter in a path of gas flow from said space into said extraction conduit; and a purge conduit, connected at one end to a supply of purge



gas, the purge conduit having an other end arranged for discharging the purge gas into said extraction conduit which thereafter flows under pressure into said container interior space via said second filter to cause cleaning thereof, said extraction and vent conduits being arranged relative to each other so that extraction of gas via said extraction conduit causes ingress of ambient gas via said vent conduit to effect cleaning of said first filter by reverse flow.

5,316,057

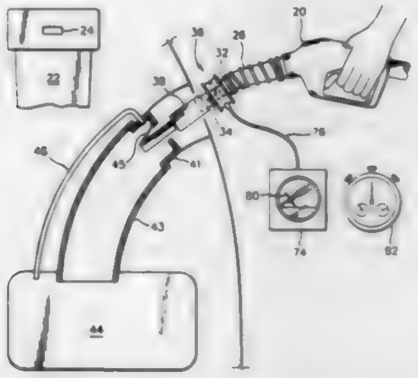
VAPOR RECOVERY SYSTEM TESTER

Detlev E. M. Hasselmann, 519 S. Nardo, Solana Beach, Calif. 92075

Filed Apr. 28, 1993, Ser. No. 53,775

Int. Cl.^{5} B65B *1/30, 31/00, 3/00*

U.S. Cl. 141—94 **19 Claims**



14. A vapor recovery system testing sleeve for use on a liquid dispensing and vapor recovery spout of the type which has vapor recovery apertures comprising:

spout receiving means for receiving the spout and its vapor recovery apertures with space located between the spout and said spout receiving means;

sealing means connected to said spout receiving means for providing a chamber which encloses said space and which is sealed about the vapor recovery apertures; and

fitting means connected to said spout receiving means and adapted to open into said chamber for connection to an air flow sensing means.

5,316,058

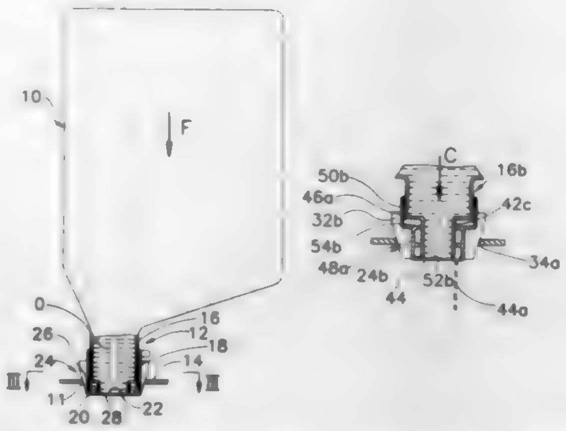
CONTAINER HAVING A SELF-OPENING POURING SPOUT

Semyon Spektor, 766 33rd Ave., and Mark Gozokhovsky, 490 33rd Ave. #206, both of San Francisco, Calif. 94121

Filed Sep. 15, 1992, Ser. No. 944,960

Int. Cl.^{5} B65D *25/08*

U.S. Cl. 141—319 **3 Claims**



1. A container having a pouring spout for pouring a liquid contained in said container into a liquid-receiving tank having an inlet opening, said container comprising:

a container body with a cylindrical neck portion having an opening;

a cap which is connected to said container and has an outer surface, and a bottom portion, said cap being sealingly attached to said neck portion;

radial ribs on the outer surface of said cap for forming an air gap between said cap and said inlet opening, said radial ribs tapering in the direction away from said container body toward said cap;

a breakable portion in said cap which, when broken, opens said container, said breakable portion being a portion of said bottom portion of said cap which has a reduced thickness; and

breaking means on said cylindrical neck portion for breaking said breakable portion, said breaking means comprising a portion of a reduced diameter on the end of said neck, said opening being formed in said portion of a reduced diameter;

a part of said breakable portion having a thickness greater than said reduced thickness, so that after breaking said breakable portion, it remains attached to said cap, said breakable portion being prescored at least on a part of its surface;

said container body being filled with a liquid and connection of said cap with said neck portion being sealed with a breakable sealing member in a form of a sealing band which in a sealing state forms a ring-shaped seal around said connection.

5,316,059

OIL FILLER FUNNEL CAP

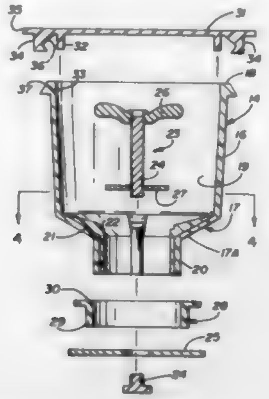
Robert A. Lahnan, East Springfield, and Raymond L. Diehl, Girard, both of Pa., assignors to Springfield Investments, Inc., West Springfield, Pa.

Filed Mar. 1, 1993, Ser. No. 21,259

Int. Cl.^{5} B65B *39/00*

U.S. Cl. 141—340 **4 Claims**

1. An oil filler device mounted on an internal combustion engine by insertion into an oil access opening within said engine, said oil filler device comprising a funnel cap having a continuous side wall, a contoured bottom and an interconnected tubular extension extending therefrom, means for sealingly engaging said tubular extension within said oil access opening comprising, a resilient insert spacer and a retaining nut and bolt assembly in communication with said funnel cap and said oil access opening, a plurality of annularly spaced tapered engagement ribs extending from said bottom for supporting



said nut and bolt assembly and extending downwardly into said tubular extension, retaining nut and bolt assembly comprising a retaining bar and an engagement washer on a threaded bolt, a flexible closure element releaseably secured to said container side wall and means for removably securing said flexible closure element to said side wall.

5,316,060

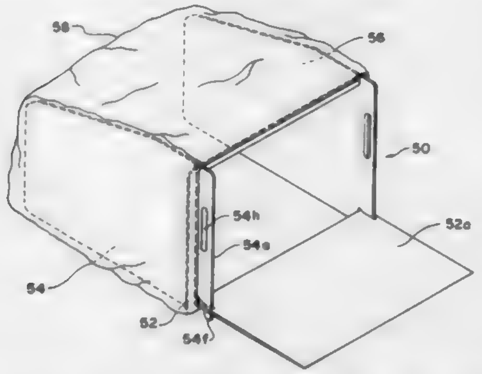
REFUSE COLLECTOR WITH HINGED COLLECTION TRAY FOR USE WITH A TRASH BAG

Marion Y. Hodgdon, 3570 Arizona, and Henn Oona, 103 Beryl, both of Los Alamos, N. Mex. 87544

Continuation-in-part of Ser. No. 866,624, Apr. 10, 1992, Pat. No. 5,222,536. This application Mar. 8, 1993, Ser. No. 28,536

Int. Cl.^{5} B65B *67/04*

U.S. Cl. 141—390 **10 Claims**



1. A refuse collector for use with a plastic trash bag, said refuse collector comprising a planar peripheral frame member having an integral collection tray formed therein, said collection tray being foldable outwardly from the plane of said frame member to form an opening in said frame member, and first and second planar side panels, said side panels being insertable through said opening in said frame member and engageable with said frame member so as to extend rearwardly from said frame member, said frame member and said side panels being sized to cooperably fit inside common plastic trash bags for the purpose of facilitating the collection and disposal of solid waste.

5,316,061

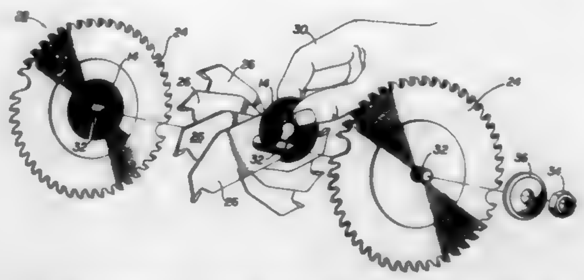
SHIMS FOR DADO CUTTER SET

Leonard G. Lee, 517 Westminster Ave., Ottawa, Ontario, Canada K2A 2T9

Filed Mar. 16, 1993, Ser. No. 31,607

Int. Cl.^{5} B26D *1/12;* **B27G** *13/00;* **F16B** *43/02*

U.S. Cl. 144—218 **9 Claims**



1. A dado shim for spacing two components of a dado blade set positioned on an arbor comprising a disk of uniform thickness, oil and grease resistant, substantially incompressible, flexible plastic sheet material having sufficient tooth to resist rotation of the dado blade set components separated by the shim as such components are fixed on the arbor and having a perimeter, a centered, round arbor hole and a radial slot between the arbor hole and the disk perimeter, which slot is smaller in width adjacent to the arbor hole than the arbor hole diameter.

5,316,062

TIRE TREAD FOR HEAVY VEHICLES

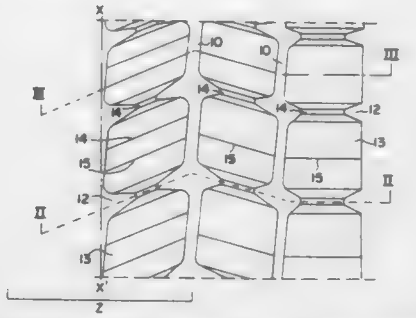
Patrick Lurois, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin - Michelin & Cie, Ferrand Cedex, France

Filed Nov. 4, 1991, Ser. No. 787,588

Claims priority, application France, Nov. 15, 1990, 90 14343

Int. Cl.^{5} B60C *11/11*

U.S. Cl. 152—209 R **6 Claims**



4. A tire provided with a tread having a plurality of grooves of generally circumferential orientation **(10)** and a plurality of grooves of generally transverse orientation **(12)** defining a plurality of circumferential rows of individual blocks **(13)** connected together in circumferential direction by platforms **(14)** and some part of which rows are provided with incisions **(15)**, characterized by the fact that, from the center of the tread towards the edges, the height of the platforms **(14)** increases and the depth of the incisions **(15)** decreases, and the density of the incisions **(15)** is maximum in the central zone of the tread and by the fact that the height and area of the platforms **(14)** and the depth and total area of the incisions **(15)** present in the blocks satisfy all of the following relationships when it has 4 to 5 circumferential grooves:

$$\begin{array}{lcl} h1 = 0 \text{ to } 50\%\ H1 & & (h3/H3) - (h2/H2) \geqq 20\% \\ h2 = 40 \text{ to } 75\%\ H2 & \text{with} & \\ h3 = 70 \text{ to } 100\%\ H3 & & (h2/H2) - (h1/H1) \geqq 10\% \end{array}$$

-continued

s1 = 0 to 35% S1		(s3/S3) − (s2/S2) ≧ 20%
s2 = 20 to 55% S2	with	
s3 = 40 to 100% S3		(s2/S2) − (s1/S1) ≧ 10%
p1 = 40 to 100% H1		(P2/H2) − (P3/H3) ≧ 10%
p2 = 20 to 55% H2	with	
p3 = 0 to 35% H3		
A1 = 40 to 100% S1		(A2/H2) − (A3/H3) ≧ 10%
A2 = 20 to 55% S2	with	
A3 = 0 to 35% S3		(A1/H1) − (A2/H2) ≧ 10%

in which

h1, h2, h3	represent the respective heights of the platforms present in the circumferential rows of blocks of the row in question, going from the median axis of the tread towards its edges;
H1, H2, H3	represent the heights of the rubber blocks of the tread of the row in question;
s1, s2, s3	represent the areas of the walls of the platforms adjacent to the walls of the blocks defining the transverse grooves of the circumferential rows of the row in question;
S1, S2, S3	represent the area of the walls of the blocks defining the transverse grooves of the circumferential rows of the row in question;
P1, P2, P3	represent the depth of each of the incisions present in each of the blocks of the circumferential rows of the row in question;
A1, A2, A3	represent the total area in each of the blocks of all of the incisions present in the blocks of the circumferential rows of the row in question.

5,316,063
TREAD HAVING GROOVES WITH INCISIONS IN THE WALLS

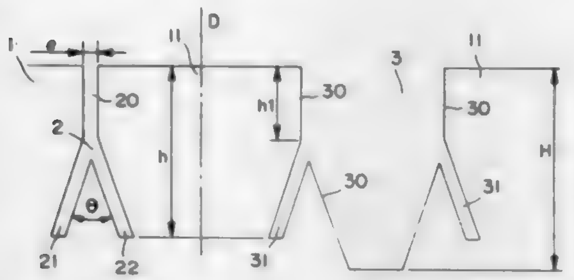
Alain Lagnier, Romagnat, France, assignor to Compagnie Generale Des Establissements Michelin - Michelin & CIE, Clermont-Ferrand Cedex, France

Filed Nov. 17, 1992, Ser. No. 977,817

Claims priority, application France, Nov. 18, 1991, 91/14278

Int. Cl.^{5} B60C *11/12*

U.S. Cl. 152—209 R **5 Claims**



1. A tread (1), when in an annular configuration for a tire with radial carcass reinforcement and a tread reinforcement, comprising at least elements in relief or blocks (11) separated by circumferential and transverse grooves (3), provided with incisions (2) of width e other than zero and between 0.2 and 2 mm and having on the surface of the tread (1) traces parallel to each other and forming with the axial direction or with the circumferential direction angles at most equal in absolute value to 40°, and in cross section traces of width e which, starting from a certain depth h1 greater than zero, are subdivided into two branches (21, 22) of width e/2, characterized by the fact that the grooves (3) parallel to the average orientation of the incisions in a block, seen in cross section, have walls (30) provided with an incision (31) commencing at the depth h1 and the trace of which over the remaining depth (h−h1) forms with the trace of the wall (30) of the groove (3) down to the depth h a trace symmetrical, with respect to a straight line D perpendicular to the surface of the tread, to the trace of the incision (2) closest to the groove (3), h being the depth of said incision.

5,316,064
PNEUMATIC RADIAL TIRE INCLUDING A WOUND AUXILIARY BELT LAYER

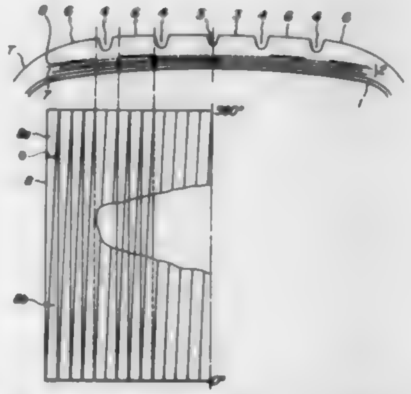
Katsutoshi Tani, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 6, 1991, Ser. No. 710,986

Claims priority, application Japan, Jun. 13, 1990, 2-152532

Int. Cl.^{5} B60C *9/18, 9/20*

U.S. Cl. 152—531 **6 Claims**



1. A pneumatic radial tire comprising; a radial carcass composed of at least one carcass ply extending through a cylindrical crown portion between a pair of sidewall portions extended inward form both ends of the crown portion in a radial direction, a belt and a tread successively arranged on the carcass outward from the crown portion in radial direction;

said tread having a plurality of grooves extending circumferentially of the tire and a plurality of island portions defined between said circumferential grooves and both side ends of the tread;

said belt comprising at least two main belt layers containing substantially inextensible cords arranged at a small inclination angle with respect to an equatorial plane of the tire, cords of said belt layers being crossed with each other, and an auxiliary belt layer formed by winding a ribbon-shaped ply, said ply obtained by arranging plural heat-shrinkable cords side by side and coating them with rubber, said auxiliary layer positioned radially outside the main belt layer over its full width;

said auxiliary belt layer having a structure wherein a regions substantially corresponding to said island portions adjacent to the tread ends each have a partially overlapped alternating arrangement of a parallel winding in which the heat-shrinkable cords in the ribbon-shaped ply extend on the same circumference in parallel to the equatorial plane and a slant winding in which the heat-shrinkable cords of the ribbon-shaped play extend substantially at an angle of inclination θ where $\tan \theta =$ width of the ribbon-shaped ply/outer peripheral length of the main belt layers, while a region substantially corresponding to at least one circumferential groove in the tread has a repetitive side by side arrangement only of slant windings; and

said ribbon-shaped ply being continuous at least in each of the above regions.

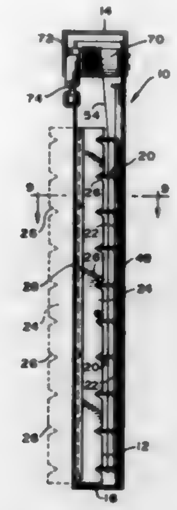
5,316,065
BURGLAR AND STORM-RESISTANT COVER FOR WINDOWS AND DOORS

Ira J. Alligood, 1160 Hillsboro Mile P.H., Hillsboro Beach, Fla. 33062

Filed Dec. 18, 1992, Ser. No. 993,126

Int. Cl.^{5} E06B *9/30*

U.S. Cl. 160—170 **11 Claims**



1. A burglar and wind-resistant cover assembly for attachment to the frames of an opening said cover assembly comprising:

a frame having a pair of opposed transversely-spaced generally parallel U-shaped guide channels facing each other;

a top frame member extending between and connected to the upper ends of said generally parallel channels;

a series of angled louvers parallel to said top frame member and having ends located to move within said U-shaped channels wherein each of the louvers includes a first leg disposed closer to said top frame member and in a generally parallel plane with respect to said top frame member and a second leg disposed generally at a right angle with respect to said first leg, a first cable having means fixed thereto and engaging said louvers in a manner to hold them spaced at regular intervals slightly less than the dimension of said second leg of said louvers, whereby when said louvers are disposed in a spaced hanging manner from said top frame member, a lower free edge portion of each of said second legs overlaps a portion of the next louver immediately below the same; and;

at least one locking member coupled to said frame, extending parallel to said U-shaped channels and movable relative to a free edge of said first legs of said louvers in a manner to engage said edge of said first legs of said louvers to lock the louvers in a fixed position such that said second legs of said louvers overlap to form a contiguous surface which covers an openings.

5,316,066
CORD-LOCK MECHANISM

William H. Rapp, Buena Park, Calif.; Ira Gaber, West Norwalk, Conn., and Cooper C. Woodring, Topeka, Kans., assignors to Nien Made Enterprise Co., Ltd., Chang Hua, Taiwan

Filed Dec. 4, 1992, Ser. No. 985,959

Int. Cl.^{5} E06B *9/324*

U.S. Cl. 160—178.2 **4 Claims**

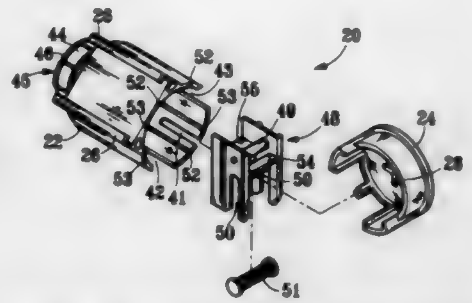
1. A cord-lock mechanism for a Venetian blind comprising a rotary tubular headrail, a rotary tubular foot rail, at least two ladder sets fixed between the headrail and the foot rail each comprising an inner ladder tape and an outer ladder tape running in parallel with each other as well as a plurality of equidistant and parallel horizontal connecting tapes each supporting a slat between the inner and outer ladder tapes, said slats being above the respective horizontal connecting tapes, and a lifter comprising:

a fixed hollow drum secured to the headrail and permitting free rotation of the headrail, the drum including an inner surface provided with a plurality of slide ways;

an end cover firmly secured to the hollow drum to define in the hollow drum a middle cord outlet and two cord outlets symmetrically located on two ends of the hollow drum;

a pully block fixed in the hollow drum, having a guide channel and two symmetric L-like fixing elements located at two opposite sides above the guide channel;

a pulley at the pulley block at a position just above the guide channel; and



a brake wheel with teeth-like pattern engraved on its surface, reciprocally movable between a braking position and a release position in the guide channel;

a lift cord made of soft material, wound around the brake wheel and the pulley, having its both ends extended to the respective ends of the headrail, passed through the middle cord outlets, turned downwards and tied to the respective ends of the foot rail so as to drive the brake wheel to displace between a braking position and a release position in the slide ways by pulling the lift cord slantwise; to retain the lift cord by action of the brake wheel at the braking position and the two L-like fixing elements; and to permit free pulling of the lift cord while the brake wheel is at the release position.

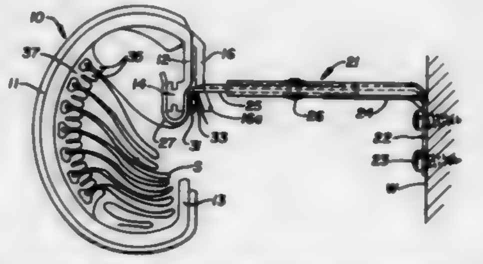
5,316,067
SWAG SUPPORT

John W. LeClaire, Middleton, Wis., assignor to Springs Window Fashions Division, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 983,379, Nov. 30, 1992. This application Jun. 25, 1993, Ser. No. 81,137

Int. Cl.^{5} A47H *13/14*

U.S. Cl. 160—348 **10 Claims**



1. In a swag holder including a unitary body having a generally C-shaped front portion and an upper rear portion extending downwardly at a rear side of the front portion and a lower rear portion extending upwardly at a rear side of the front portion, a lower end of the upper rear portion and an upper end of the lower rear portion being spaced apart for installation of a fabric swag into the C-shaped front portion from the rear side of the body, the upper rear portion including head means for mounting the body on a curtain rod, the combination with said

swag holder of wall mounting bracket means including a generally horizontal bracket member, and an upwardly opening U-shaped saddle means on a forward end of the bracket member for receiving the head means on the upper rear portion of the body, the saddle means supporting the body with the bracket member at a level above the lower end of the upper rear portion and with the upper end of the lower rear portion spaced below the saddle means, the head means for mounting the body on a curtain rod including grooves for reception in a slotted curtain rod.

5,316,068

METHOD FOR PRODUCING CASTING WITH FUNCTIONAL GRADIENT

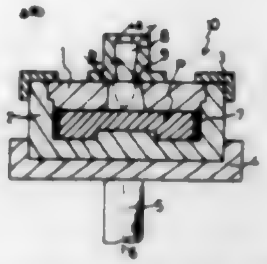
Wataru Yagi; Masao Yamada; Masami Ishii; Yukuo Makimura; Tsutomu Kurikuma, and Norihiro Akita, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 800,720, Dec. 3, 1991, abandoned, which is a continuation of Ser. No. 467,505, Jan. 19, 1990, abandoned. This application Jul. 7, 1992, Ser. No. 909,659

Claims priority, application Japan, Jan. 20, 1989, 1-12825

Int. Cl.⁵ B22D *13/02, 27/20*

U.S. Cl. 164—58.1 **12 Claims**



1. A method for producing a casting having at least a disk-like portion having a functional gradient, said disk-like portion comprising a gray cast iron region and a spheroidal graphite region in which the graphite structure is gradually transformed from the spheroidal graphite region toward the gray cast iron region through an intermediate region containing vermicular form graphite, said method comprising the steps of:

providing a mold rotatable about a center axis thereof, said mold being formed therein with a cavity having at least a disk-like portion for receiving molten metal of gray cast iron, and having a pouring gate formed in said mold;

providing spheroidizing agent containing magnesium in said cavity to a position of said disk-like portion where the casting is to be increased in at least one property before pouring the molten metal;

pouring said molten metal into said cavity of said mold through said pouring gate while rotating said mold;

allowing said molten metal in said cavity while rotating said mold to react with said spheroidizing agent under the centrifugal force produced in accordance with the rotation of said mold; and

solidifying the reacted molten metal to form said spheroidal graphite region as a radially outermost region, said intermediate region comprising vermicular graphite and said grey cast iron region comprising flaky graphite as an inner region, so that said spheroidal graphite region and said intermediate region are functional gradient oriented in the radial direction resulting from a concentration gradient of the spheroidizing agent.

5,316,069

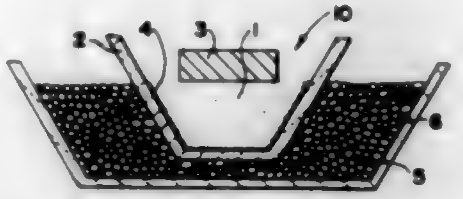
METHOD OF MAKING METAL MATRIX COMPOSITE BODIES WITH USE OF A REACTIVE BARRIER

Michael K. Aghajanian, Bel Air, Md.; Steven D. Keck; John T. Burke, both of Hockessin, Del.; Gregory E. Hannon, North East, Md.; Kurt J. Becker, Newark, Del.; Steven J. Taylor, Middletown, Del.; Robert J. Wiener, Newark, Del., and Allyn L. McCormick, Bear, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 520,915, May 9, 1990, abandoned. This application Dec. 5, 1991, Ser. No. 803,769

Int. Cl.⁵ B22D *19/02*

U.S. Cl. 164—97 **29 Claims**



1. A method for making a metal matrix composite, comprising:

(a) providing a permeable mass comprising at least one of a body of substantially non-reactive filler and a preform;

(b) contacting said permeable mass with a reactive barrier means so as to define at least a portion of at least one surface of said permeable mass; and

(c) spontaneously infiltrating without the requirement of an internally created vacuum within said permeable mass, at leat a protion of said permeable mass with a molten matrix metal up to at least a portion of said eactive barrier means to form a metal matrix composite having at least a portion of at leat one surface established by said reactive barrier means.

5,316,070

CONTROLLED CASTING OF AL-SI HYPEREUTECTIC ALLOYS

Kevin P. Rogers, Ringwood, and Christopher J. Heathcock, Kew, both of Australia, assignors to Comalco Aluminium Limited, Melbourne, Australia

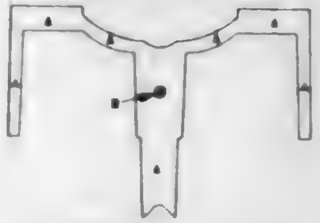
PCT No. PCT/AU90/00588, § 371 Date Jul. 2, 1992, § 102(e) Date Jul. 2, 1992, PCT Pub. No. WO91/02100, PCT Pub. Date Feb. 21, 1991

PCT Filed Dec. 11, 1990, Ser. No. 867,113

Claims priority, application Australia, Dec. 11, 1989, PJ7821; Dec. 11, 1989, PJ7822

Int. Cl.⁵ B22D *21/04, 25/06, 27/04*

U.S. Cl. 164—122 **24 Claims**



1. A process for producing an article of an Al-Si hypereutectic alloy, in which the article is produced by feeding a melt of the alloy to a permanent mould A, the process comprising the steps of:

(a) feeding the melt to a cavity of the mould through at least one gate, to fill the mould cavity by flow of the melt to remote regions of the cavity through a region of the mould, herein referred to as the "control region", which extends above and upwardly from the or each gate;

(b) maintaining the temperature in the control region below an upper level; and

(c) controlling a temperature differential between the remote regions and the control region;

wherein the step of feeding the melt is controlled so that the melt as received in the die cavity has a feed temperature of not less than 700°C, and wherein the steps of maintaining the temperature of the control region and of controlling said temperature differential are achieved by at least one of extraction and distribution of heat energy from the or each control region, by causing flow of a fluid coolant through the control region to extract heat energy therefrom, such that:

(i) the mold walls of the remote regions on completion of filling of the mould cavity are at a temperature of from 150 to 350°C;

(ii) the mold walls of the or each control region is at a temperature above that of the remote regions by at least 50°C;

(iii) solidification of the melt in the mould is from the remote regions of the gate, through a portion of the melt within the control region of the mould;

(iv) the solidification proceeds substantially throughout the cavity, by coupled growth of eutectic, to achieve substantially throughout the resultant article a microstructure comprising modified eutectic; and

(v) the melt in substantially all regions of the die cavity is able to solidify without strong convection currents and with a temperature gradient and resultant growth rate to achieve said coupled growth of Al-Si eutectic and said substantially uniform eutectic structure throughout.

5,316,071

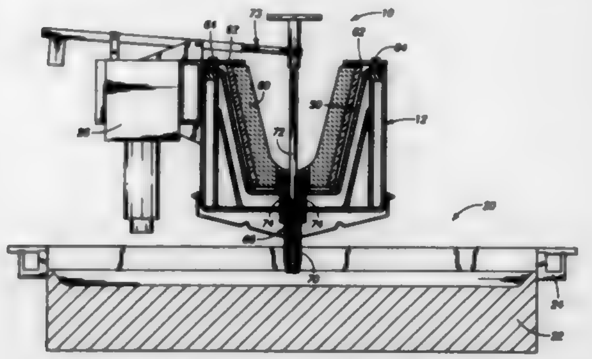
MOLTEN METAL DISTRIBUTION LAUNDER

Andrew C. Skinner, Spokane, Wash., and James A. Imthurn, Post Falls, Id., assignors to Wagstaff Inc., Spokane, Wash.

Filed May 13, 1993, Ser. No. 62,415

Int. Cl.⁵ B22D *41/02*

U.S. Cl. 164—155.1 **35 Claims**



1. A low-flexure launder for molten materials, comprising:

an elongated structural beam which extends longitudinally between opposite ends, the structural beam having an unsupported length between its ends;

a plurality of refractory holders extending along the structural beam, each refractory holder being vertically supported by the structural beam to allow longitudinal expansion and contraction of said refractory holder relative to the structural beam;

a refractory liner received by the refractory holders;

wherein the refractory holders have inner surfaces and outer surfaces, the refractory liner being received within the inner surfaces of the refractory holders, the outer surfaces of the refractory holders being spaced from the elongated structural beam to form an air space along the outer surfaces of the refractory holders.

5,316,072

SEALING MEMBERS FOR USE IN GAS PREHEATER

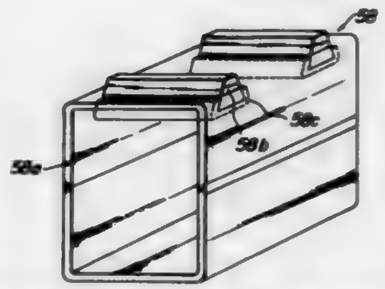
Shoji Seike; Keiichiro Watanabe, both of Nagoya, and Akira Ito, Ama, all of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 542,753, Jun. 25, 1990, Pat. No. 5,145,011. This application Jun. 26, 1992, Ser. No. 903,946

Claims priority, application Japan, Jul. 19, 1989, 1-184493; May 25, 1990, 2-133882

Int. Cl.⁵ F28D *19/04*

U.S. Cl. 165—9 **3 Claims**



1. A sealing member for sealing a gap between an outer surface of a rotor and a housing in a gas preheater adapted to recover heat from exhaust gases emitted from a boiler using heavy coal or heavy oil as a fuel, said sealing member comprising:

an elongate rectangular tubular metal base body having an upper surface to be arranged opposed to one of the outer surface of the rotor and a sealing bar of the housing, a plurality of holes provided in said upper surface, and a plurality of metal members each fixed to an inner surface of said metal base body to define, in cooperation with said holes, a plurality of trough-shaped recesses in said upper surface; and

a plurality of sliding members, each fixed in one of said trough-shaped recesses such that only an upper sliding face portion of each of said sliding members, which upper sliding face portion is to contact one of the outer surface of the rotor and a sealing bar of the housing, extends upwardly from and is exposed outside of said metal base body, said surface members comprising at least one water insoluble and acid-resistant member selected from the group consisting of

a) a ceramic selected from the group consisting of alumina-containing porcelain, alumina, silicon carbide, silicon nitride, mullite, sialon and zirconia, said ceramic having a coefficient of thermal expansion of not more than 70×10⁻⁷/° C.; and

b) an inorganic glass selected from the group consisting of glass lining consisting essentially of at least 55 wt % silicic acid, 0–10 wt % boric acid and 10–20 wt % alkali, and an acid-resistant enamel consisting essentially of at least 40 wt % silicic acid, 0–10 wt % boric acid and 10–30 wt % alkali.

5,316,073

TWINNING CONTROL

J. Michael Klaus, Watertown, and Marvin A. Lucas, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Apr. 2, 1993, Ser. No. 41,706

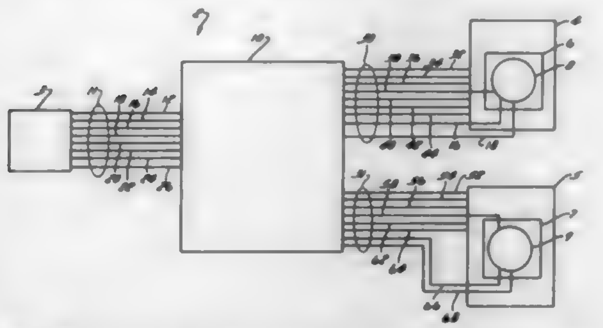
Int. Cl.⁵ F25B *7/00*

U.S. Cl. 165—11.1 **23 Claims**

1. A control for use in temperature controlling system including a system thermostat, a plurality of blower sense cir-

cuits including a first blower sense circuit and a second blower sense circuit, and a plurality of HVAC units including a first HVAC unit including a first blower unit and a second HVAC unit including a second blower unit, said first blower sense circuit coupled to the first blower in said first HVAC unit and a second blower sense circuit coupled to the second blower in said second HVAC unit, the control for controlling said first HVAC unit and said second HVAC unit, the control comprising:

system thermostat input means for receiving first stage heating, and second stage heating input signals;



first blower sense input means for receiving a first blower signal from said first blower sense circuit;

second blower sense input means for receiving a second blower signal from said second blower sense circuit;

first output means for providing a first HVAC unit signal for said first HVAC unit;

second output means for providing a second HVAC unit signal for said second HVAC unit; and

computer means for generating said first and said second HVAC unit signals in response to said first and said second blower signals and said first stage heating and said second stage heating input signals.

5,316,074
AUTOMOTIVE HAIR CONDITIONER

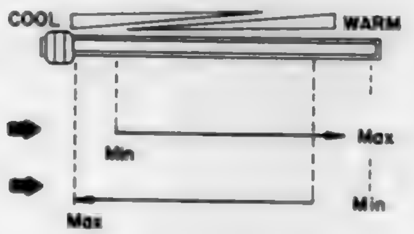
Akira Isaji, Nishio; Kunio Iritani, and Nobunao Suzuki, both of Anjo, all of Japan, assignors to Nippondenso, Co., Ltd., Kariya, Japan

Filed Oct. 11, 1991, Ser. No. 773,327

Claims priority, application Japan, Oct. 12, 1990, 2-274845; Oct. 12, 1990, 2-274846

Int. Cl.^{5} F25B *27/00*

U.S. Cl. 165—43 **9 Claims**



1. An electrically-driven automotive air conditioner comprising:

a blower for blowing air into a passenger compartment of an automobile;

a duct for guiding air blown by the blower into the passenger compartment;

an internal heat exchanger provided within the duct to cool or heat the air flowing through the duct;

an external heat exchanger for heat exchanging between fresh air and the refrigerant;

a compressor for supplying a refrigerant to the internal heat exchanger;

a rotating electric motor for driving the compressor;

an inverter for producing a driving current having a variable frequency and connecting said driving current to the electric motor so that the compressor operates at a predetermined rotating speed related to the frequency;

temperature setting means for setting a desired temperature of the air to be blown to the passenger compartment, the temperature setting means varying between a maximum position and a minimum position;

mode switching means for switching a flow of the refrigerant to the internal heat exchanger in a heating mode and to the external heat exchanger in a cooling mode; and

control means responsive to the position of the temperature setting means in both heating mode and cooling mode, for controlling an output signal to said inverter to vary the frequency of the current produced by said inverter, the output signal being adjusted to raise the frequency of the driving current of said inverter when the temperature setting means is set toward a cooler position in cooling mode and when the temperature setting means is set toward a hotter position in heating mode.

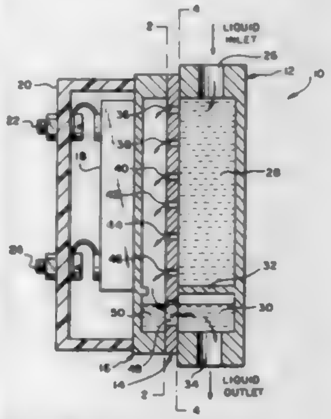
5,316,075
LIQUID JET COLD PLATE FOR IMPINGEMENT COOLING

William Quon, Alhambra, and Herbert J. Tanzer, Topanga, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 22, 1992, Ser. No. 994,823

Int. Cl.^{5} H01L *23/473*

U.S. Cl. 165—80.4 **7 Claims**



1. A liquid jet cold plate comprising:

an inlet manifold, said inlet manifold having a liquid coolant inlet passage and a spent liquid coolant outer passage, said manifold having a flat nozzle plate surface on one side thereof, an inlet cavity in said inlet manifold below said nozzle plate surface and an outlet cavity in said manifold below said nozzle plate surface, said inlet cavity being connected to said inlet passage and said outlet cavity being connected to said outlet passage, said outlet passage being for the discharge of spent liquid coolant;

a substantially flat nozzle plate, said substantially flat nozzle plate having nozzle openings therein overlying said inlet cavity, said nozzle plate having at least one drain opening therein overlying said outlet cavity so that when liquid coolant under pressure is supplied to said inlet cavity liquid coolant jets issue from said nozzles;

a mounting plate, said mounting plate having a mounting plate cavity overlying both said nozzle openings and said drain opening in said nozzle plate, said mounting plate having a cooling surface overlying said nozzle openings so that liquid collant jets issuing from said nozzle openings impinge on said cooling surface, said mounting plate having a mounting surface thereon directly over said cooling surface so as to maximize heat extraction from said mounting surface; and

a plurality of pins extending from said cooling surface to increase the area of said mounting plate exposed to coolant liquid.

5,316,076
METHOD AND ARRANGEMENT FOR AN ENFORCED HEAT TRANSMISSION BETWEEN ALIMENTARY BODIES AND GASES

Roland Sandström; Ann Maxe, both of Stockholm; Tore Strandberg, Nacka; Lars Lundsten, Kävlinge, and Alvar Andersson, Viken, all of Sweden, assignors to Frigoscandia Food Process Systems AB, Helsingborg, Sweden

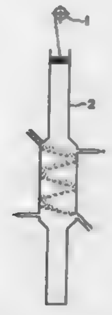
PCT No. PCT/SE89/00621, § 371 Date Jun. 18, 1991, § 102(e) Date Jun. 18, 1991, PCT Pub. No. WO90/05277, PCT Pub. Date May 17, 1990

PCT Filed Oct. 31, 1989, Ser. No. 679,004

Claims priority, application Sweden, Nov. 1, 1988, 8803973

Int. Cl.^{5} F28F *13/10*

U.S. Cl. 165—84 **34 Claims**



12. Arrangement for an enforced heat transmission, by means of sound, between the surface of an alimentary body and an ambient gas, including a low-frequency sound generator comprising a pulsator part and a resonator part, characterized in that the resonator part is acoustically virtually closed and so designated that the alimentary body which is to be exposed to the enforced heat transmission is located within a zone inside the resonator part where a standing sound wave generator by the pulsator has a particle velocity anti-node, the sound wave being provided having only one particle velocity anti-node.

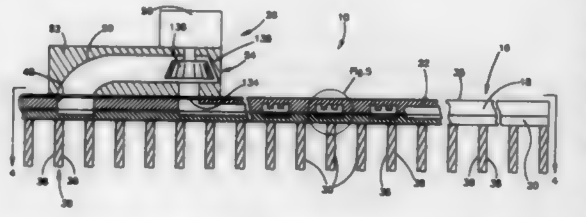
5,316,077
HEAT SINK FOR ELECTRICAL CIRCUIT COMPONENTS

Jeffrey A. Reichard, Menomonee Falls, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 9, 1992, Ser. No. 987,692

Int. Cl.^{5} H01L *23/473*

U.S. Cl. 165—104.28 **30 Claims**



1. An apparatus comprising a front plate having an outer side for receiving a plurality of electrical circuit components, a back plate secured to a side of said front plate opposite from said outer side of said front plate, said front plate and said back plate cooperating to define a plurality of passages disposed between said front and back plates for conducting a cooling medium, a plurality of fins fixedly connected with said back plate and disposed on a side of said back plate opposite from said front plate for conducting heat away from said back plate, said plurality of fins being exposed to the atmosphere to enable heat to be transmitted from said plurality of fins to the atmosphere, pump means mounted on one of said front and back plates and connected in fluid communication with said passages for inducing a flow of cooling medium through said passages, means for forming an outlet opening in said one of said front and back plates and through which the cooling medium is conducted from said passages into said pump means, and means for forming an inlet opening in said one of said front and back plates and through which the cooling medium is conducted from said pump means into said passages.

5,316,078
PANEL HEAT EXCHANGER WITH INTEGRAL THERMOELECTRIC DEVICE

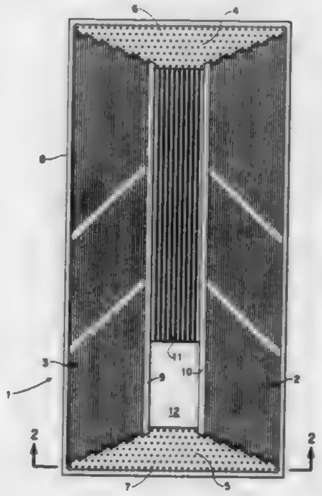
Anthony J. Cesaroni, 9 Heathmore Court, Unionville, Ontario, Canada L3R 8J1

Filed May 19, 1993, Ser. No. 70,722

Claims priority, application United Kingdom, May 21, 1992, 9210812; Jun. 23, 1992, 9213246

Int. Cl.^{5} F25B *21/02*

U.S. Cl. 165—104.33 **10 Claims**



1. A substantially planar panel heat exchanger, consisting essentially of an elongated liquid storage vessel in the form of a closed loop that is adapted for circulation of said liquid, said loop being substantially planar and being adapted to be disposed substantially vertically; the elongated storage vessel having a Peltier thermoelectric device located such that one end of the thermoelectric device is in contact with liquid in the liquid storage vessel and being disposed to heat or cool the liquid; the closed loop for the circulation of liquid being comprised of a plurality of vertical tubes formed from a thermoplastic polymer having a diameter in the range of 1.3–6.4 mm and a wall thickness of 0.13–0.76 mm, a first set of tubes being adapted for upward movement of liquid from the Peltier device and a second set of tubes being disposed for downward movement of liquid to the Peltier thermoelectric device, said first set of tubes and said second set of tubes being interconnected to form a closed planar loop and being in fluid flow communication with the said one end of the Peltier thermoelectric device in contact with liquid in the closed loop, said first set of tubes and said second set of tubes being aligned, linear in cross-section and conforming to a planar surface; and an electrical connection for the Peltier thermoelectric device.

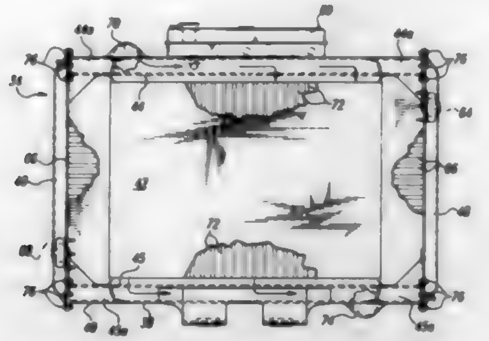
5,316,079
INTEGRATED HEAT EXCHANGER

Randall E. Hedeen, Snohomish, Wash., assignor to Paccar Inc, Bellevue, Wash.

Filed Feb. 12, 1993, Ser. No. 17,464

Int. Cl.^{5} F28F *9/00*

U.S. Cl. 165—140 **11 Claims**



1. An integrated heat exchanger, comprising:

a first heat exchange core adapted for cooling a first heat exchange fluid and having a perimeter that defines a front face of the first heat exchange core;

a second heat exchange core adapted for cooling a second heat exchange fluid and positioned in front of the first heat exchange core; and

an integrated, self-supporting, peripheral support structure supporting the heat exchange cores on a motor vehicle frame, the support structure including:

a first pair of fluid manifolds supporting the heat exchange cores and communicating with the first heat exchange core to allow the first heat exchange fluid to pass between the first fluid manifolds and the first heat exchange core; and

a second pair of fluid manifolds coupled to and extending between the first fluid manifolds, thereby forming the peripheral support structure supporting the heat exchange cores, the second fluid manifolds communicating with the second heat exchange core to allow the second heat exchange fluid to pass between the second fluid manifolds and the second heat exchange core, the second fluid manifolds being positioned outside of the first heat exchange core perimeter;

wherein the first and second fluid manifolds are of sufficient strength to support the fluid manifolds and the heat exchange cores without additional structural frame support.

5,316,080
HEAT TRANSFER DEVICE

Bruce A. Banks, Olmsted Township, Cuyahoga County, and James R. Gaier, Strongsville, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Division of Ser. No. 880,951, May 11, 1992, Pat. No. 5,224,030, which is a division of Ser. No. 657,238, Feb. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 501,893, Mar. 30, 1990, abandoned. This application Feb. 10, 1993, Ser. No. 17,402

The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

Int. Cl.^{5} F28F *7/00;* **H05K** *7/20*

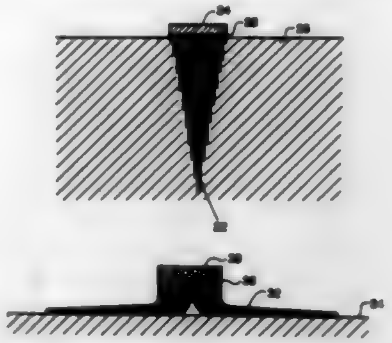
U.S. Cl. 165—185 **2 Claims**

1. A heat transfer device for conducting heat from an element having a first temperature to a copper member having a tapered slot therein and a second temperature lower than said first temperature resulting in a temperature differential comprising

an intercalated graphite fiber composite having a hot end and a tapered cool end,

means for mounting said hot end in thermal contact with said element,

an electrical isolator interposed between said element and said composite, and



means for potting said tapered cool end in said tapered slot in said member whereby said composite is in thermal contact with said member for optimum heat transfer.

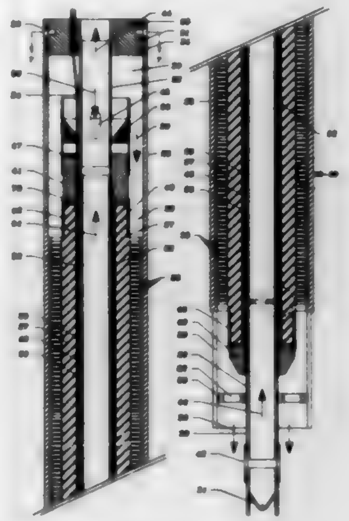
5,316,081
FLOW AND PRESSURE CONTROL PACKER VALVE

Henry A. Baski, Denver, and Emil Hauck, Littleton, both of Colo., assignors to Baski Water Instruments, Denver, Colo.

Filed Mar. 8, 1993, Ser. No. 27,839

Int. Cl.^{5} E21B *33/00, 23/00*

U.S. Cl. 166—188 **24 Claims**



1. A packer valve for controlling a fluid flow rate in a conduit, comprising:

a housing formed with an inside diameter and adapted to be placed within the conduit in fluid communication therewith; and

an inflatable packer element mounted within the housing and adapted to be inflated to vary the annular area between the inside diameter of the housing and the outside diameter of the packer, thereby providing a flow path between the housing and inflatable packer element for regulating a fluid flow rate and pressure within the conduit.

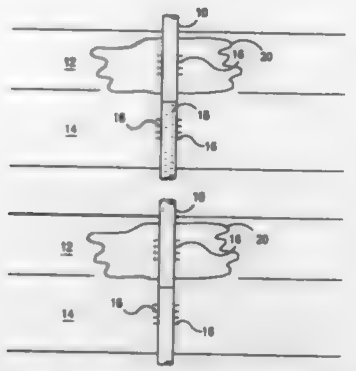
5,316,082
METHOD OF EFFECTIVELY DIVERTING TREATING FLUID FROM A HIGH PERMEABILITY INTERVAL DURING WELL STIMULATION

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 28, 1992, Ser. No. 936,480

Int. Cl.^{5} E21B *33/138, 43/26, 43/27*

U.S. Cl. 166—281 **13 Claims**



1. A method for diverting treating fluid from a high permeability zone during well stimulation comprising:

a) directing a first solidifiable gel mixture of a known density having a water soluble salt mixed therein into a lower permeability zone located beneath a higher permeability zone and into a wellbore area adjacent thereto;

b) directing a second solidifiable gel mixture having a density less than the first solidifiable gel with gel breakers therein into the higher permeability zone and wellbore area adjacent thereto so as to form subsequently, a solid gel that is more stable and slower yielding than said first gel; and

c) allowing both gels to remain in said zone and wellbore areas adjacent thereto for a time sufficient to form a solid gel in said zones and wellbore areas where said gel mixtures are precluded from entering an undesired permeability zone because of a density difference between said mixtures.

5,316,083
BLAST FURNACE SLAG SPACER

James J. W. Nahm, and Reece E. Wyant, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1992, Ser. No. 999,239

Int. Cl.^{5} E21B *33/16*

U.S. Cl. 166—291 **20 Claims**

1. A method for drilling a well, comprising:

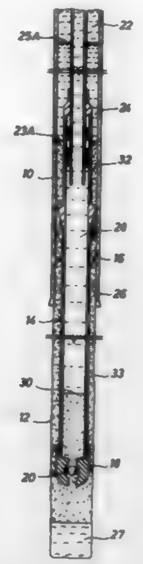
drilling a borehole with a drill string utilizing a drilling fluid, thus producing a used drilling fluid;

removing said drill string and disposing a pipe within said borehole, said used drilling fluid thus being disposed in said pipe and in an annulus surrounding said pipe;

passing a spacer fluid comprising granulated water-quenched blast furnace slag and water into said pipe into direct fluid contact with said used drilling fluid;

passing a cementitious slurry into said pipe into direct fluid contact with said spacer;

displacing said used drilling fluid out of said annulus surrounding said pipe; and



passing said cementitious slurry into said annulus surrounding said pipe.

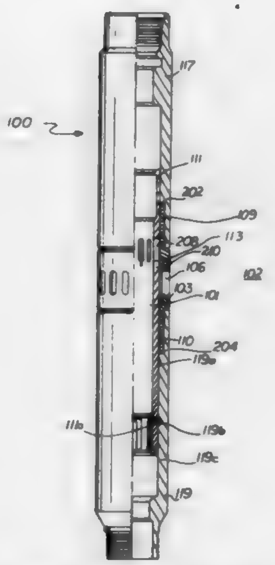
5,316,084
WELL TOOL WITH SEALING MEANS

Douglas J. Murray, Humble; Robert J. Coon, Houston; Mark E. Hopmann, Alvin, all of Tex.; Ronald D. Williams, Morris, Okla.; Steve Jennings, and Timothy R. Tips, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 573,581, Aug. 27, 1990, Pat. No. 5,156,220. This application Aug. 28, 1991, Ser. No. 751,350

Int. Cl.^{5} E21B *34/14*

U.S. Cl. 166—332 **48 Claims**



2. A downhole well tool securable to tubular members for forming a section of fluid flow conduit within said well for selective transmission of fluids therethrough between an interior and an exterior of said tool, said tool comprising:

a housing which has at least one fluid communication port disposed therethrough;

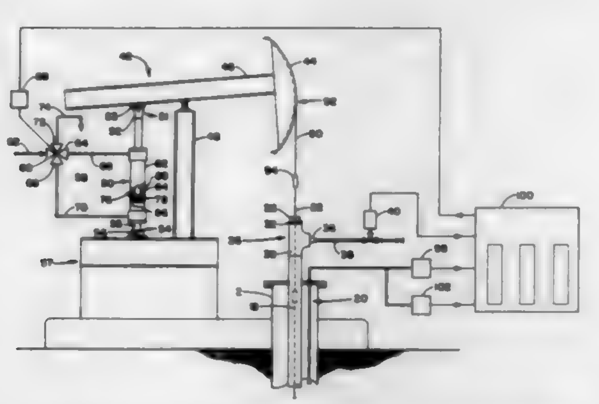
first and second threaded ends for securing said housing between companion ends of said tubular members;

a sleeve disposed within said housing;

first and second seal members positioned about and sealingly engaging between said sleeve and said tubular members to prevent a fluid flow of gases and liquids therebetween across said sealing means;
wherein said sleeve has at least one fluid flow port disposed therethrough and wherein said sleeve is selectively moveable between at least two positions, including:
  a closed position, wherein said first seal member is disposed between and sealingly between said at least one fluid flow port and said at least one fluid communication port;
  an open position, wherein said first and second seal members are disposed removed from a fluid flow path between said at least one fluid flow port and said at least one fluid communication port for said selective transmission of fluids between said at least one fluid flow port and said at least one fluid communication port;
a fluid flow diffuser disposed between said at least one fluid communication port and said at least one fluid flow port when said first seal member is positioned between said at least one fluid flow port and said at least one fluid communication port; and
wherein said fluid flow diffuser chokes a flow of fluids between said at least one fluid flow port and said at least one fluid communication port to substantially reduce said flow of fluids across said first seal means when said sleeve is selectively moved between said closed position and said open position.

5,316,085
ENVIRONMENTAL RECOVERY SYSTEM

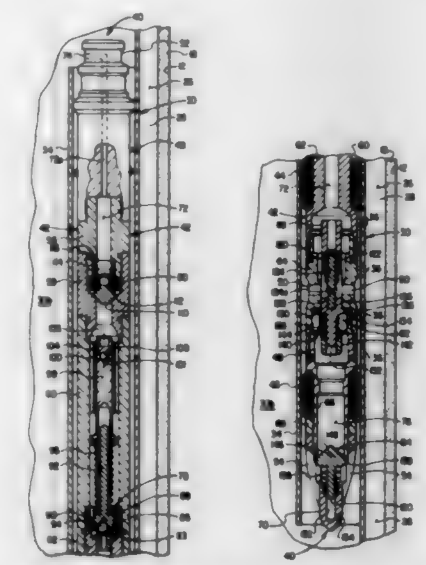
William C. Dawson, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Apr. 15, 1992, Ser. No. 869,289
Int. Cl.^{5} E21B *43/00*
U.S. Cl. 166—369 **20 Claims**



7. A method of recovering contaminated subterranean fluids from a wellbore utilizing a pumping unit assembly, wherein the pumping unit assembly contains a downhole pump means for pumping the contaminated fluids to the surface, sensing means of sensing the hydrostatic head of pressure within the wellbore, means for generating a signal representative of the hydrostatic pressure sensed by the sensing means, processor means for storing and interpreting the signals received from the generating means, surface pump unit means for imparting reciprocating movement to the downhole pump to stroke, and pneumatic actuator means for pneumatically actuating reciprocating movement of the surface pump unit means, the method comprising the steps of:
  a. flowing the contaminated subterranean fluids into the wellbore;
  b. sensing the level of fluid in the wellbore;
  c. determining when the level of fluid in the wellbore surpasses a predetermined threshold level;
  d. presetting a fill timer means for setting the desired maximum amount of time for a pumping cycle of the pneumatically controlled pumping unit to pump the contaminated fluid from the wellbore wherein said maximum amount of time to pump corresponds to a normal discharge cycle;
  e. generating a signal in response to the level surpassing the threshold pressure level;
  f. transmitting and storing the signal in a programmable processing means;
  g. comparing the length of time from the transmission of the signal due to surpassing the predetermined threshold level and the time remaining in the fill timer means;
  h. activating the pneumatic controlled pumping unit to cause the pumping unit to pump the contaminated fluid from the wellbore whenever the length of time between the pumping cycle exceeds the length of time of said preset fill time means; and
  i. activating the pneumatic pumping unit to cause the pumping unit to pump the fluid from the wellbore in response to the level surpassing the threshold pressure level when the time between the pumping cycle of the pumping unit is less than the time of said preset fill time.

5,316,086
COMBINATION WELL CASING PRESSURE RELIEF AND KILL VALVE APPARATUS

Edward E. DeMoss, Garland, Tex., assignor to Halliburton Company, Duncan, Okla.
Filed Dec. 14, 1992, Ser. No. 990,639
Int. Cl.^{5} E21B *34/06*
U.S. Cl. 166—373 **22 Claims**

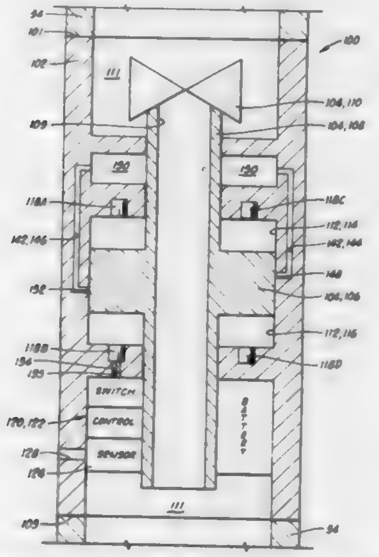


21. For use in a subterranean well of the type having a bore hole extending downwardly into the earth, a tubing string extending downwardly through the bore hole and operative to flow a production fluid upwardly to the surface, a casing structure lining said bore hole, and a sealed, fluid-filled annulus circumscribing the tubing string and radially outwardly bounded by the casing structure, a method of relieving a heat-generated fluid pressure increase within the casing annulus during an initial production period of the well, and subsequently killing the well, said method comprising the steps of:
  providing a single valve having a hollow body having an inlet opening, first and second outlet openings, a first internal flow passage extending from said inlet opening to said first outlet opening, and a second internal flow passage extending from said inlet opening to said first outlet opening, and a second internal flow passage extending from said inlet opening to said second outlet opening in parallel with said first internal flow passage and having a fluid flow rate capacity substantially higher than that of said first internal flow passage;

  communicating said valve body inlet opening with the casing annulus;
  communicating said first and second valve body outlet openings with the interior of said production tubing string;
  using said valve to relieve a heat-generated fluid pressure increase within the casing annulus, during an initial production period of the well, by causing a portion of the elevated pressure annulus fluid to flow into the interior of said tubing string, through said first internal valve body flow passage, when the operating casing annulus/tubing string fluid pressure differential reaches a first predetermined magnitude; and
  killing the well, during a subsequent production period thereof, by forcing a pressurized kill fluid into the casing annulus, at a flow rate substantially higher than the flow rate capacity of said first internal valve body flow passage, in a manner elevating the magnitude of the casing annulus/tubing string fluid pressure differential to a second predetermined magnitude greater than said first predetermined magnitude, and then causing pressurized fluid to flow into the interior of the tubing string from the casing annulus through said second internal valve body flow passage while continuing to force pressurized kill fluid into the casing annulus.

5,316,087
PYROTECHNIC CHARGE POWERED OPERATING SYSTEM FOR DOWNHOLE TOOLS

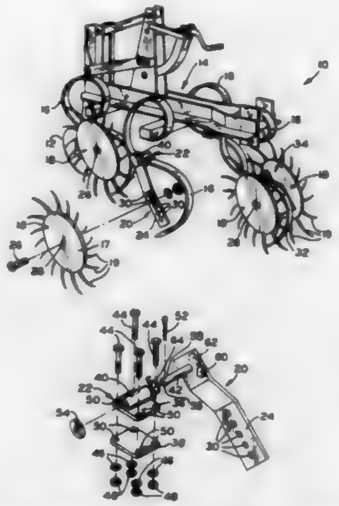
Kevin R. Manke, Flower Mound; David S. Wesson, Waxahachie, and Roger L. Schultz, Richardson, all of Tex., assignors to Halliburton Company, Houston, Tex.
Filed Aug. 11, 1992, Ser. No. 928,929
Int. Cl.^{5} E21B *23/04*
U.S. Cl. 166—381 36 Claims



1. A downhole tool apparatus for use in a well, comprising:
a housing;
an operating assembly disposed in said housing;
a power chamber defined in said housing and communicated with said operating assembly;
a first explosive charge means communicated with said power chamber for creating a first operating pressure communicated to said operating assembly through said power chamber to move said operating assembly from a first position to a second position; and
a second explosive charge means communicated with said power chamber for creating a second operating pressure communicated to said operating assembly through said power chamber to move said operating assembly from its second position.

5,316,088
ROTARY HOE MOUNTING UNIT FOR ROW CROP CULTIVATOR

Robert H. Ries, 14134 Liberty Union Rd., Ohio City, Ohio 45874
Filed Feb. 4, 1992, Ser. No. 830,614
Int. Cl.^{5} A01B *17/00*
U.S. Cl. 172—510 **17 Claims**



1. A row crop cultivator adapted to be pulled by a tractor, said row crop cultivator comprising:
  a plurality of closely spaced shanks arranged as a row unit operably connected to the tractor;
  a rotary hoe including a wheel and a plurality of projections radially extending from said wheel, said projections adapted to penetrate and agitate the ground; and
  means for attaching said rotary hoe between any two adjacent ones of said shanks, said attaching means including mounting means for adjustably mounting said attaching means on any portion of one of said adjacent shanks, said mounting means also including a plate having means for pivotally supporting said rotary hoe, said attaching means including an arm which positions said rotary hoe adjacent one of said shanks such that the arm pivots in an arc so that said projections of said rotary hoe impinge the soil as the soil is tilled by said shanks, said arm associated with said plate and including a stop block mounted on said arm which limits the pivoting arc of said arm by abutting said plate, whereby said rotary hoe independently floats over the surface of the ground being cultivated.

5,316,089
METHOD AND APPARATUS FOR DRILLING A SUBSEA WELL

Randolfo M. Fernandez, Aberdeen, Scotland, assignor to ABB Vetco Gray Inc., Houston, Tex.
Filed Oct. 18, 1991, Ser. No. 781,054
Int. Cl.^{5} E21B *7/128*
U.S. Cl. 175—7 **19 Claims**

1. A method of drilling a subsea well, comprising:
positioning a receptacle on the subsea floor;
mounting a gimbal to a latching mechanism;
mounting an upward facing funnel to the latching mechanism;
latching the latching mechanism, funnel and gimbal to an outer wellhead housing, then lowering the outer wellhead housing and a string of conductor pipe into the receptacle, landing the gimbal on the receptacle and supporting the weight of the conductor temporarily with the gimbal; then
drilling through the conductor pipe to a selected depth; then lowering an inner wellhead housing and a string of casing

through the funnel and landing the inner wellhead housing in the outer wellhead housing; then

cementing the string of casing in place; then

releasing the latching mechanism and retrieving the funnel, latching mechanism and gimbal to the surface, thereby preventing any weight of the conductor pipe and casing from transferring to the receptacle.

15. A subsea well assembly, comprising in combination:

an outer wellhead housing;

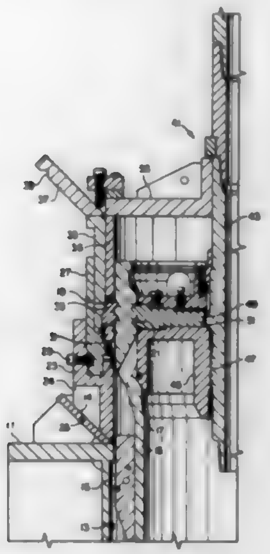
an upward facing funnel;

latch means secured to the funnel for releasably latching the funnel to the outer wellhead housing;

an inner wellhead housing;

inner wellhead housing running tool means for lowering the inner wellhead housing through the funnel into the outer wellhead housing, the inner wellhead housing running tool means being retrievable to the surface after cement has set the inner wellhead housing in place; and

funnel retrieving means mounted to the inner wellhead housing running tool means for retrieving the funnel and latch means simultaneously to the surface during the retrieving of the inner wellhead housing running tool.



5,316,090

ATTITUDE CONTROL DEVICE AND DRILLING-DIRECTION CONTROL DEVICE

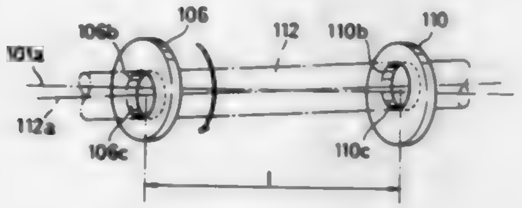
Shoji Kuwana, Ueda; Yoshihide Kiyosawa, Hotaka, and Akio Ikeda, Osaka, all of Japan, assignors to Harmonic Drive Systems, Inc., Kawasaki, Japan

Division of Ser. No. 730,622, Jul. 16, 1991. This application Mar. 5, 1993, Ser. No. 26,790

Claims priority, application Japan, Jul. 18, 1990, 2-189883

Int. Cl.^{5} E21B *44/00*

U.S. Cl. 175—24 **5 Claims**



1. An attitude control device comprising a plurality of harmonic drive mechanisms of the hollow type and at least one rotational member connected to an output of said harmonic drive mechanisms, said rotational member having an eccentric hollow portion which rotates eccentrically around a rotational axis of said harmonic drive mechanisms, a member to be driven being placed to extend through the hollow portions of said harmonic drive mechanisms and said eccentric hollow portions of said rotational member so that inner surfaces of said eccentric hollow portions are supportingly contacted with said member to be driven, whereby portions of said member to be driven, which are supported by said inner surfaces of said eccentric hollow portions, are displaced in a direction substantially perpendicular to the axis of said member to be driven by rotating said rotational member relative to one another.

5,316,091

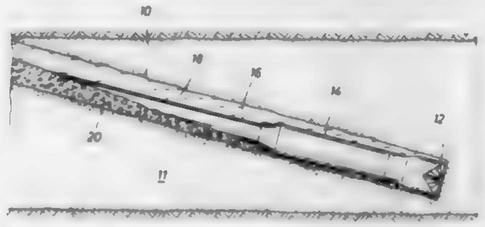
METHOD FOR REDUCING OCCURRENCES OF STUCK DRILL PIPE

Marco Rasi; Mark W. Biegler, both of Houston, and Eugene A. Sikirica, Katy, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Mar. 17, 1993, Ser. No. 32,799

Int. Cl.^{5} E21B *7/04*

U.S. Cl. 175—61 **19 Claims**



1. A method for determining the probability of a drill string becoming stuck as a result of inadequate hole-cleaning in the process of drilling of a well comprising:

(a) from a database containing physical measurements of drilling variables obtained during the drilling of wells and occurrences of drill string sticking, selecting at least two drilling variables;

(b) combining the variables selected in step (a) to form at least one expression of hole-cleaning effectiveness, EV;

(c) calculating the value of the expression of hole-cleaning effectiveness, EV, obtained from step (b) in a plurality of wells and, using statistical analysis, measuring the statistical discrimination between those wells in which the drill string did or did not become stuck within a predetermined time of the measurements;

(d) repeating step (c) a number of times sufficient to select a combination of variables, coefficients and exponents producing a pre-selected measure of statistical discrimination between the expression for hole-cleaning effectiveness, EV, in those wells in which the drill string did or did not become stuck within a predetermined time of the measurements; and

(e) calculating the value of the expression for hole-cleaning effectiveness, EV, determined in step (d) for a plurality of wells in the data base to produce a relationship between statistical frequency or probability of sticking within a predetermined time and the value of the expression of hole-cleaning effectiveness, EV.

5,316,092

METHOD AND APPARATUS FOR DRILLING A TUNNEL

Valto Ilomäki, Loilantie 08, SF-33470 Ylöärvi, Finland

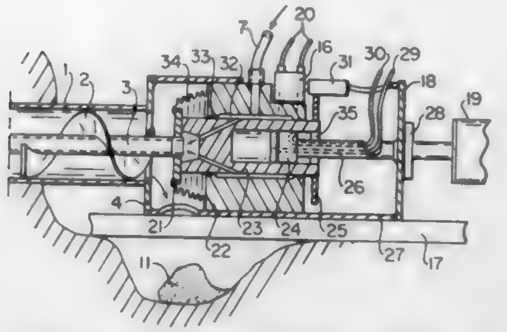
PCT No. PCT/FI90/00231, § 371 Date Mar. 17, 1992, § 102(e) Date Mar. 17, 1992, PCT Pub. No. WO91/05137, PCT Pub. Date Apr. 18, 1991

PCT Filed Sep. 27, 1990, Ser. No. 838,791

Claims priority, application Finland, Sep. 27, 1989, 894560

Int. Cl.^{5} E21B *7/20*

U.S. Cl. 175—62 **9 Claims**



1. A method of drilling a tunnel using a drilling apparatus comprising a frame having two opposed ends, a protecting tube adjacent said frame and fixed to a first of said opposed ends thereof, a conveying tube housed in said protecting tube and a drilling tool mounted on said conveying tube, said method comprising the steps of:

supplying forward driving forces to said protecting tube and said conveying tube by means of a power unit acting on a second of said opposed ends of said frame; and

simultaneously supplying said forward driving force to said conveying tube by hydraulic means mounted inside said frame, said hydraulic means comprising one of the following two configurations:

a piston fixed to said frame and a cylinder fixed to said conveying tube, or

a piston fixed to said conveying tube and a cylinder fixed to said frame;

whereby said forward driving force acting on said conveying tube is adjustable independently of said forward driving force acting on said tube.

5,316,093

FITTING FOR CONTROLLED TRAJECTORY DRILLING, COMPRISING A VARIABLE GEOMETRY STABILIZER AND USE OF THIS FITTING

Pierre Morin, Levallois Perret; Christian Bardin, Rueil Malmaison, and Jean Boulet, Paris, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison Cedex, France

Continuation of Ser. No. 459,129, Dec. 29, 1989, abandoned. This application Aug. 5, 1992, Ser. No. 925,014

Claims priority, application France, Dec. 30, 1988, 88 17597

Int. Cl.^{5} E21B *7/06, 4/02*

U.S. Cl. 175—74 **15 Claims**

1. A fitting for controlled trajectory drilling of a drill-hole from a surface, the fitting being adapted to be fixed to the lower end of a drill string and comprising:

a drilling tool located at the lower end of said fitting,

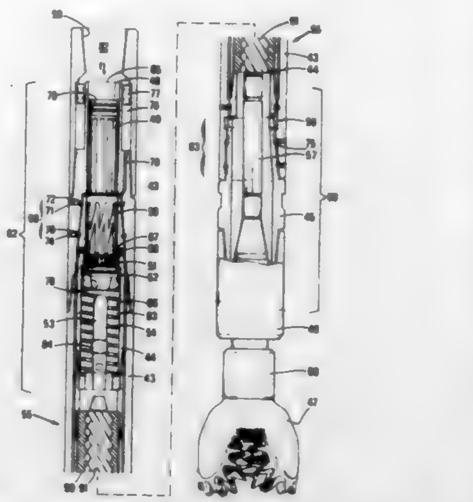
a motor operatively connected to said drilling tool for rotationally driving said drilling tool,

a variable geometry stabilizer including a remotely controlled means for causing the geometry of the variable geometry stabilizer to vary due to a change in fluid pressure within the drill string, and

at least one fixed stabilizer and an elbow element,

wherein said variable geometry stabilizer, said at least one fixed stabilizer and said elbow element are operatively associated with at least one of the motor and the drilling tool to cause the controlled trajectory drilling, and

wherein said variable geometry stabilizer has an outside diameter at most equal to the outside diameter of said fixed stabilizer.



5,316,094

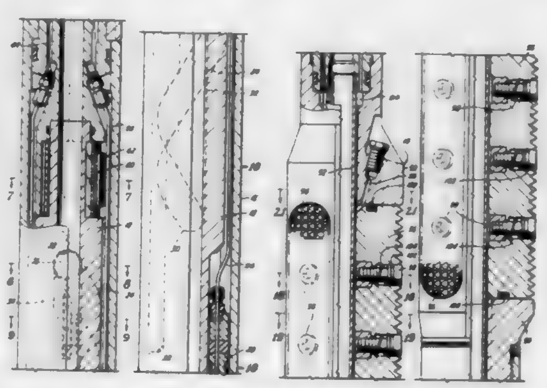
WELL ORIENTING TOOL AND/OR THRUSTER

Ronald E. Pringle, Houston, Tex., assignor to Camco International Inc., Houston, Tex.

Filed Oct. 20, 1992, Ser. No. 963,864

Int. Cl.^{5} E21B *4/18, 7/08*

U.S. Cl. 175—74 **13 Claims**



1. A load thruster for applying a vertical thrust in a well bore comprising,

an elongate body,

a plurality of elongate well gripping bars forming hydraulic actuated pistons longitudinally aligned and positioned around the outer periphery of the body for radially extending into contact with the well bore,

a plurality of longitudinally spaced retainers are connected to each of the bars,

a mandrel slidably and telescopically extending out of the lower end of the body,

an annular piston connected to the mandrel and longitudinally movable in the body,

a separate hydraulic control line leading from the well surface and longitudinally extending in the body connected to the plurality of hydraulic pistons for extending the gripper bars into contact with the well bore and connected to one side of the annular piston for extending the mandrel outwardly from the body and applying a vertical thrust, and

the mandrel includes a longitudinal fluid bore therethrough, said fluid bore being in communication with the second side of the annular piston.

7. A well orientation tool for rotational orientating a tool in a well bore comprising,
- an elongate body,
- a mandrel rotatable in the body extending out of the body for providing rotation to a well tool,
- a longitudinal fluid bore extending through the mandrel,
- a hydraulic piston slidably positioned between the body and the mandrel for longitudinal movement,
- an enclosed helical groove and a pin, one of which is connected to the mandrel and the other of which is connected to the piston whereby longitudinal movement of the piston rotates the mandrel, and
- a hydraulic control line extending from the well surface separate from the fluid bore and longitudinally extending in the body and connected to one side of the hydraulic piston for rotating the mandrel.

5,316,095

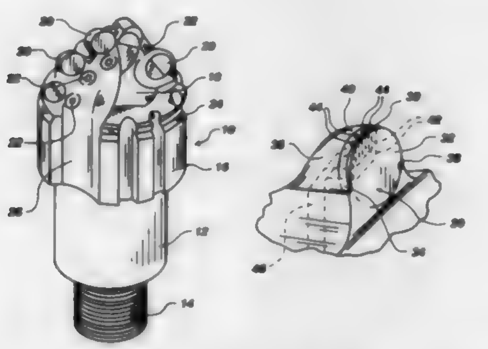
DRILL BIT CUTTING ELEMENT WITH COOLING CHANNELS

Gordon A. Tibbitts, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jul. 7, 1992, Ser. No. 910,719

Int. Cl.^{5} E21B *10/18*

U.S. Cl. 175—429 **31 Claims**



1. A diamond cutting element for boring a subterranean formation, comprising:
- a diamond layer including a front face and a rear face;
- substrate means secured to said rear face;
- a peripheral contact zone on said diamond layer for engaging said subterranean formation; and
- at least one internal channel including an outlet proximate said peripheral contact zone said at least one internal channel extending along the boundary between said rear face and said substrate means as said channel approaches said outlet.

5,316,096

PORTABLE MOTORIZED SUITCASE

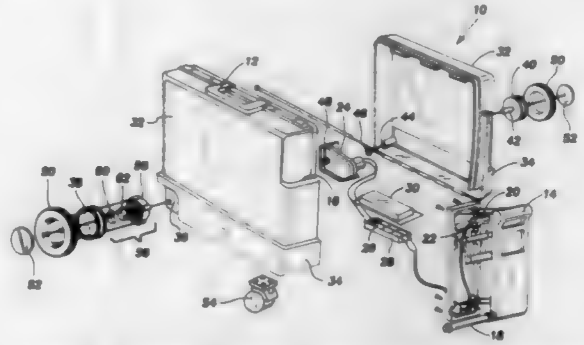
Sidney R. Good, Cleveland, Ohio, assignor to Good Marketing, Inc., Cleveland, Ohio

Filed Jul. 22, 1992, Ser. No. 918,274

Int. Cl.^{5} B62D *51/04*

U.S. Cl. 180—19.1 **8 Claims**

1. A portable suitcase for transporting articles, comprising:
- a motor means which includes a drive shaft, said drive shaft being coupled to a centrifugal clutch associated with a driven wheel, said centrifugal clutch mechanically coupling said driven wheel to said drive shaft when said motor is in a first mode of operation and uncoupling said driven wheel from said drive shaft when the motor is in a second mode of operation, said centrifugal clutch including a clutch housing fastened to said driven wheel, a clutch drive wheel mounted on said drive shaft, and a clutch brake, said clutch brake being pivotally mounted on said clutch drive wheel whereby rotation of said drive shaft and said clutch drive wheel causes the clutch brake to pivot and engage said clutch housing, engagement of said clutch brake and the clutch housing mechanically interlocking said clutch housing and said clutch drive wheel and causing said clutch housing and said driven wheel to rotate with said clutch drive wheel and said drive shaft;
- a battery means to power said motor, said battery means supplying electrical energy to the motor to drive said wheels in response to user manipulation of a control means; and
- a handle means, said handle means being slidably and pivotally mounted on said suitcase whereby said handle can move from a retracted, undeployed position to an extended, deployed position, said handle means further including said control means to control the operation of said motor, said control means being mounted on said handle means and including a switch, wherein the operator can manipulate said switch to select between the first and second modes of operation, said first mode of operation being a self-propelled mode wherein the drive shaft and motor are coupled to and rotatably drive the driven wheel and the handle is adapted to guide the suitcase along its intended path, and said second mode of operation being a manual mode wherein the drive shaft and motor are uncoupled from the driven wheel and the handle is adapted to allow an operator to simultaneously manually propel and guide the suitcase.



5,316,097

LAWN MOWER

Robert B. Meyer, Middleburg Heights; John R. Lackner, Westlake; Hans J. Matuscheck, and Daniel J. Kennedy, both of Parma, all of Ohio, assignors to The Scott Fetzer Company, Westlake, Ohio

Continuation-in-part of Ser. No. 837,157, Feb. 18, 1992, Pat. No. 5,251,711, which is a continuation-in-part of Ser. No. 708,464, May 31, 1991, which is a division of Ser. No. 442,615, Nov. 19, 1989, abandoned. This application Feb. 5, 1993, Ser. No. 13,789

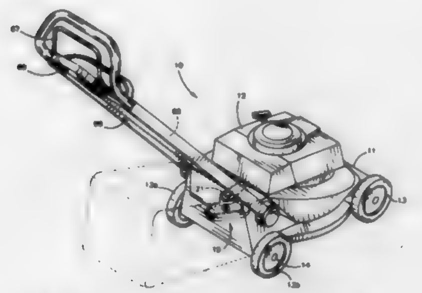
The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

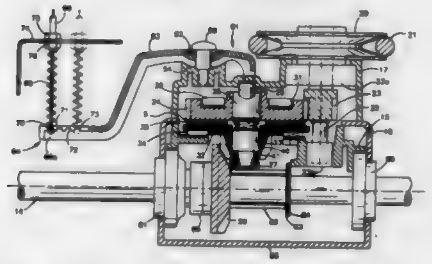
Int. Cl.^{5} B62D *51/04*

U.S. Cl. 180—19.1 **23 Claims**

1. A walk-behind, self-propelled, variable speed lawn mower comprising:
- a. a frame structure;
- b. an engine mounted on said frame structure;
- c. wheels supporting said frame structure for movement along a ground surface;
- d. a drive shaft rotatably connected to said frame structure, at least one of said wheels being drivingly connected to said drive shaft;
- e. a drive shaft bevel gear connected to said drive shaft;
- f. a drive system operatively interposed between said engine and said drive shaft comprising:
  - i. a housing;

  - ii. an input gear operatively connected to said engine for constant rotation during operation;
  - iii. a stub shaft supported within said housing;
  - iv. an intermediate gear having a face, the intermediate gear being meshed with said input gear and journaled on said stub shaft for rotation about said stub shaft;
  - v. a driving bevel gear having a face, the driving bevel gear being meshed with said drive shaft bevel gear and journaled on said stub shaft for rotation about said stub shaft;
  - vi. biasing means for biasing the face of said driving bevel gear away from the face of said intermediate gear; and,
  - vii. clutching means interposed between said intermediate gear and said driving bevel gear for coupling said intermediate gear and said driving bevel gear in driving engagement;
- g. actuator means controllably connected to at least one of said intermediate gear and said driving bevel gear for controllably overcoming said biasing means and responsive to operator applied forces for controlling the speed at which said lawn mower traverses along said ground surface and to vary the speed proportionally to said operator applied forces; and,
- h. a handle movably connected to said frame and operatively connected to said actuator means, said handle being adapted to move in response to said operator applied forces whereby the speed and direction of the mower are controlled by the operator without his being required to remove one of his hands.





5,316,098

SYSTEM FOR STEERING REAR WHEELS OF AN AUTOMOTIVE VEHICLE

Ryuya Akita, and Shigefumi Hirabayashi, both of Hiroshima, Japan, assignors to Mazada Motor Corporation, Hiroshima, Japan

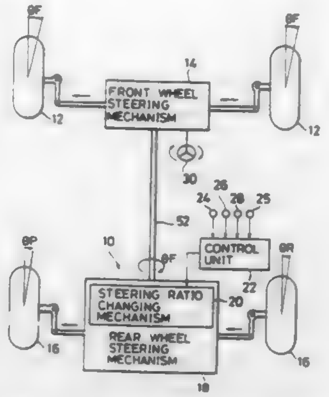
Filed Mar. 24, 1992, Ser. No. 856,697

Claims priority, application Japan, Mar. 31, 1991, 3-93500

Int. Cl.^{5} B62D *5/06*

U.S. Cl. 180—140 **30 Claims**

1. A system for steering a rear wheel of a vehicle having a mechanism for altering a steering ratio of an amount of steering of the rear wheel to an amount of steering of a front wheel, disposed in an interconnecting mechanism for mechanically interconnecting a mechanism for steering the front wheel with a mechanism for steering the rear wheel, comprising:
- means for detecting a yaw rate of a vehicle body;
- control means for controlling the mechanism for altering the steering ratio on the basis of the yaw rate so that the rear wheel is steered through a larger angle as the yaw rate increases;
- means for detecting a steered angle of a steering wheel; and


θF
θF
14
FRONT WHEEL STEERING MECHANISM
12
12
30
26
24
28
25
52
θP
10
θF
CONTROL UNIT
θR
22
STEERING RATIO CHANGING MECHANISM
20
REAR WHEEL STEERING MECHANISM
16
16
18

- means for altering a control gain of the yaw rate so that a value of the control gain increases when the steered angle of the steering wheel is small and decreases when the steered angle is large.

5,316,099

FOUR-WHEEL STEERING SYSTEM FOR AUTOMOTIVE VEHICLE

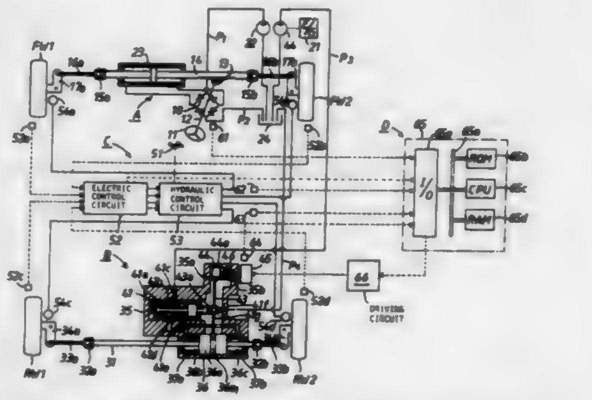
Hideo Inoue, Kanagawa, and Osamu Takeda, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 577,654, Sep. 4, 1990, abandoned. This application Jun. 12, 1992, Ser. No. 898,176

Claims priority, application Japan, Sep. 4, 1989, 1-228706

Int. Cl.^{5} B62D *5/06*

U.S. Cl. 180—140 **6 Claims**

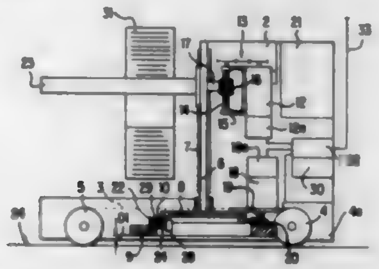


1. A four-wheel steering system for an automotive vehicle having a front wheel steering mechanism operable in response to a steering effort applied thereto for steering a set of dirigible front road wheels and a rear wheel steering mechanism for steering a set of dirigible rear road wheels, said four-wheel steering system comprising:
- an electric control apparatus comprising:
- a speed sensor for detecting a travelling speed of the vehicle based on the rotational speed of at least one of the front road wheels and rear road wheels,
- means for detecting lateral deviation of the vehicle,
- computing means for:
  - determining a parameter related to the detected vehicle speed,
  - determining whether a difference between the vehicle speed detected by the speed sensor at a beginning of a predetermined time interval and the vehicle speed detected by the speed sensor at an end of the predeter-

mined time interval is larger than a predetermined value,
setting the parameter to a fixed value when the computing means determines that the difference is larger than the predetermined value,
determining a first steering angle of the rear road wheels in accordance with the detected lateral deviation of the vehicle and the parameter related to the detected vehicle speed, and
determining a second steering angle of the rear road wheels in accordance with the detected lateral deviation of the vehicle and the parameter set to the fixed value, and
means for controlling said rear wheel steering mechanism to steer the rear road wheels independently of the front road wheels at the first determined steering angle when said parameter is related to the detected vehicle speed and to steer the rear road wheels in the same direction as the front road wheels at the second determined steering angle when said parameter is set to said fixed value.

5,316,100
STATIONARY DIRECTION CHANGING DEVICE FOR A HANDLING TROLLEY

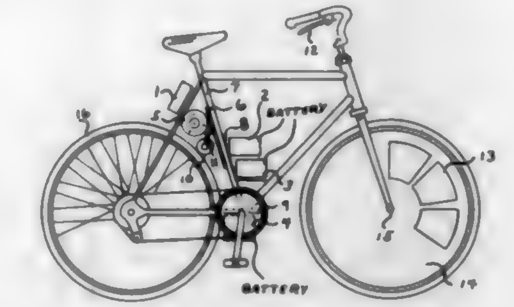
Richard Juan, 20, rue du Pont Blanc, 69360 Saint Symphorien D'Ozon (Rhone), France
PCT No. PCT/FR91/00646, § 371 Date Feb. 24, 1993, § 102(e) Date Feb. 24, 1993, PCT Pub. No. WO92/02397, PCT Pub. Date Feb. 20, 1992
PCT Filed Aug. 2, 1991, Ser. No. 969,202
Claims priority, application France, Aug. 3, 1990, 90 10165
Int. Cl.⁵ B62D *1/24*; B66F *7/24*
U.S. Cl. 180—167 **10 Claims**



1. Stationary direction changing device for a handling trolley, of the type comprising a chassis with means for driving at least in translation, means able to carry a load, means for vertically displacing a ring between a transport position, in which it is above the ground, and a pivoting position in which it rests on the ground and allows the trolley to be raised, and drive means for making the ring rotate with respect to the raised trolley, wherein the means for vertically displacing the ring comprise a slide which is mounted so as to slide in vertical slideways of the chassis and carrying, attached to its lower end, a circular plate on which the ring is mounted to rotate freely, the slide supporting in its upper part the means able to carry a load and the slide being connected to the chassis by drive means able to provide vertical displacement of the trolley and of the load, the drive means bringing about vertical displacement of the trolley being equipped with means for detecting rectilinear travel accomplished by the trolley, and controlled by on-board control means, while the drive means bringing about the rotation of the ring are equipped with means for detecting the circular travel performed which are similarly controlled by the on-board control means.

5,316,101
ELECTRIC AND PEDAL DRIVEN BICYCLE WITH SOLAR CHARGING

Henry M. Gannon, 2026 10th St., Boulder, Colo. 80302
Division of Ser. No. 716,089, Jun. 17, 1991, Pat. No. 5,237,263. This application Apr. 29, 1993, Ser. No. 55,216
Int. Cl.⁵ B62K *11/00*
U.S. Cl. 180—221 **7 Claims**

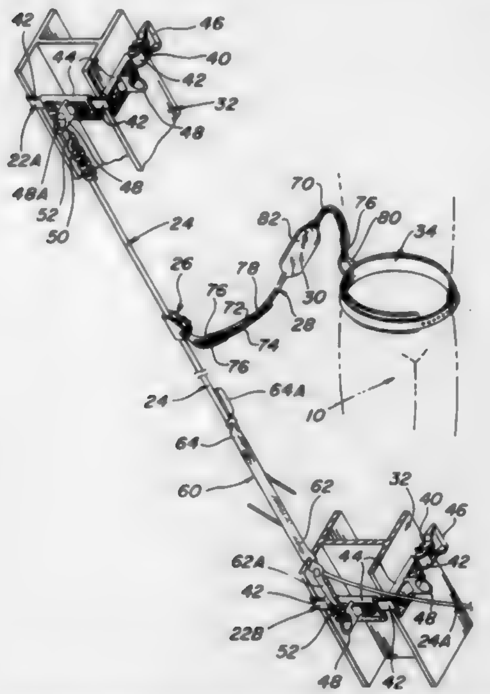


1. A multi-wheeled vehicle comprising:
a vehicle frame;
front and rear wheels coupled to the vehicle frame;
motor means for supplying power for driving the vehicle;
throttle means, coupled to the motor means, for variably regulating power supplied by the motor means;
a continuously variable automatic transmission coupled to the motor means, said continuously variable automatic transmission being operative for frictionally applying driving power from the motor means to at least one of said rear wheels under a variable ratio corresponding to a load applied, said continuously variable ratio corresponding to a load applied, said continuously variable automatic transmission comprising a drive shaft, a drive cone, a transmission frame, a swing axle, and drive cone positioning means;
said drive shaft being positioned parallel to an axle of said at least one of said rear wheels being driven;
said drive cone having a larger diameter at one end thereof and a smaller diameter at an opposite end thereof and being mounted coaxially on and driven by said drive shaft to thereby permit said drive cone to move longitudinally along said drive shaft;
said transmission frame supporting said drive shaft and said drive cone;
said swing axle being mounted to said vehicle frame and to said transmission frame and being positioned parallel to the axle of said at least one of said rear wheels being driven, thereby permitting said transmission frame to swing into a drive position such that an outer surface of the drive cone remains in constant frictional contact with said at least one of said rear wheels being driven, independent of the position of said drive cone longitudinally along said drive shaft;
said drive cone positioning means being operative to urge said drive cone longitudinally along said shaft to thereby select a drive cone ratio, said drive cone positioning means comprising a spring coaxially positioned on said drive shaft in contact with said drive cone for urging said drive cone into a position along said drive shaft representative of a state of equilibrium between a force produced by said spring and a force produced by said motor means.

5,316,102
SAFETY SYSTEM FOR USE IN ERECTING STATIC STRUCTURES

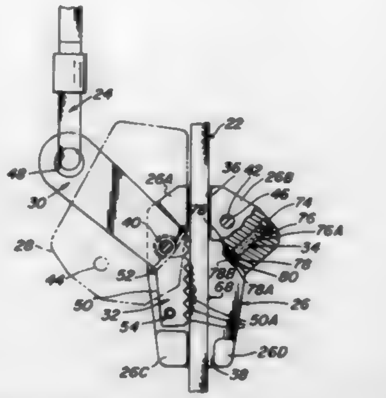
Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976
Filed Feb. 12, 1992, Ser. No. 834,421
Int. Cl.⁵ A62B *35/00*
U.S. Cl. 182—3 **19 Claims**

1. A safety system for connection to at least one fixed, elongated, structural component of a static structure to prevent a worker located on said structure from falling, said system comprising first and second releasably securable means, rope means, and sliding anchor means,
said first releasably securable means being arranged for encircling and frictionally engaging a first portion of said structural component,
said second releasably securable means being arranged for encircling and frictionally engaging a second portion of said structural component, said second portion of said structural component being spaced from said first portion thereof,
wherein each of said releasably securable means comprises
(a) an elongated strap formed of a strong and flexible material having first and second end portions,
(b) receiving means fixedly secured to said first end portion of said strap for receiving said second end portion of said strap so that said strap encircles said structural component,
(c) releasable locking means comprising a ratchet assembly enabling said encircling strap to be pulled tightly around said structural component into good frictional engagement therewith and to hold said strap in said position against accidental release therefrom and
(d) at least one sleeve through which said strap extends, said sleeve being slidable along said strap and having a connector secured thereto,
said rope means being connected between said sleeves of said first and second releasably securable means by at least one frictional engagement connector connected to said connector,
said sliding anchor means comprising a member mounted on said rope means for generally unobstructedly sliding therealong to a desired position between said first and second releasably securable means, whereupon said sliding anchor means may be releasably secured against further sliding, said sliding anchor means additionally comprising means for connection to a safety device worn by a worker to secure the worker to said sliding anchor means, whereupon said worker is prevented from falling more than a predetermined distance away from said sliding anchor means.



5,316,103
ROPE GRAB DEVICE INDICATING THE EXISTENCE OF SHOCK IMPACT ON PERSONAL SAFETY

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976, and Anthony Carenzo, Audubon, Pa., assignors to Michael Bell, Warrington, Pa.
Filed Jan. 22, 1993, Ser. No. 7,456
Int. Cl.⁵ A62B *1/14*
U.S. Cl. 182—18 **16 Claims**



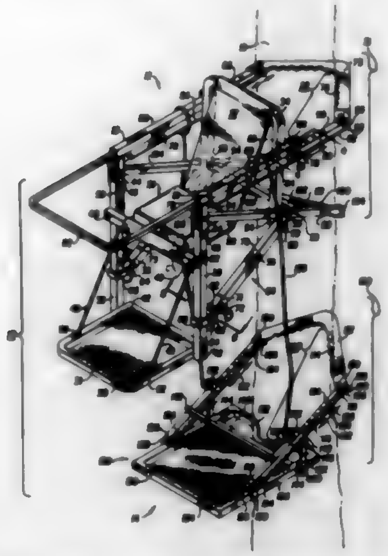
1. A device for protecting a worker at an elevated position from a fall, said device being disposed on a vertically extending safety line and connected to said worker by connection means, said device comprising pullable actuator means, safety line engagement means, and operation indicator means, said actuator means being connectable to said connection means to secure said worker to said device and being movable upon the application of a downwardly directed force thereon, said safety line engagement means being coupled to said actuator means and movable in response to a downwardly directed force on said actuator means from a first position to a second position, said line engagement means when in said first position permitting said device to be slid along said safety line and when in said second position engaging said safety line to preclude said device from being slid along said safety line, said indicator means operating in automatic response to said line engagement means being in said second position to provide a visual mark on at least one of said device and said safety line.

5,316,104
AUTOMATICALLY ADJUSTABLE TREE CLIMBING STAND HAVING A LOUNGING SEAT

Joseph A. Amacker, 1212 Main St., Delhi, La. 71232
Continuation-in-part of Ser. No. 818,120, Jan. 8, 1992. This application Nov. 16, 1992, Ser. No. 977,159
Int. Cl.⁵ A01M *31/02*
U.S. Cl. 182—187 **59 Claims**

1. A lounging stand for an upright columnar member, comprising:
a gripping frame for gripping the upright columnar member;
an extendable and retractable seat frame, connected to said gripping frame, for supporting a seat and a footrest, said seat and footrest mounted on said seat frame, said seat and

footrest being pivotally movable outwardly from an upright seating position to a reclining seating position,



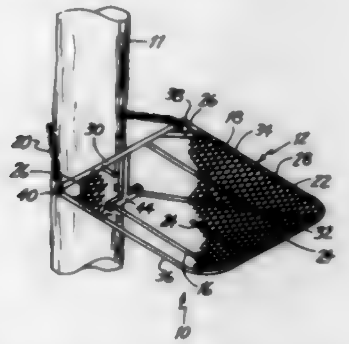
thereby to accommodate a user sitting in an upright position to move to a reclining position.

5,316,105

PORTABLE TREE STAND FOR DEER HUNTING

Robert F. Reggin, 10751 Ahern Ave., Watertown, Minn. 55388, and Michael F. Zamzow, 4198 Northshore Dr., Mound, Minn. 55364

Filed Mar. 3, 1993, Ser. No. 25,927
Int. Cl.⁵ A01M *31/02*
U.S. Cl. 182—187 **9 Claims**



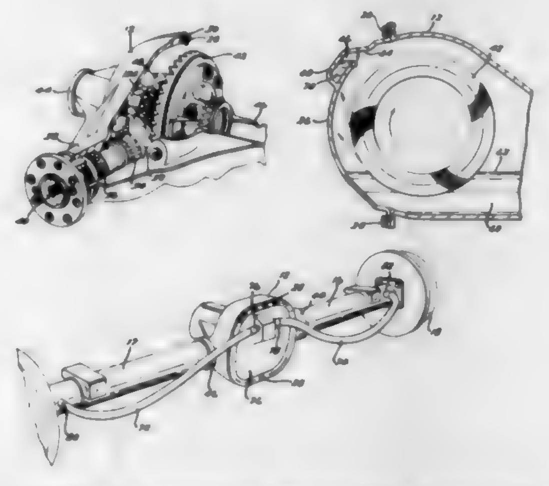
1. A tree stand assembly capable of supporting a person on a trunk of a tree, the tree stand comprising:
- a platform having a rear side which is positionable adjacent to the tree trunk, a front side opposite the rear side, a left side and a right side connecting the front and rear sides, and a supporting surface;
- securing means for securing the platform to the tree trunk, the securing means comprising:
  - a support structure comprising a first support member having a first end connected to the rear side of the platform, a second end and a length of about six inches, the first support member extending transversely from the rear side of the platform in a direction opposite the supporting surface; and a second support member, transverse to the first support member, the second support member having a middle region connected to the second end of the first support member and a length approximating that of the first support member;
  - a plurality of spurs extending rearwardly from the rear side of the platform and the support structure; and
  - connection means capable of encircling the tree trunk and being connectable to the platform for holding the platform against the trunk of the tree; and
- a plurality of cantilevered support members, each cantilevered support member having a first end and a second end, the first end of each cantilevered support member being connected to the front side of the platform, the second end of each cantilevered support member being connected to the support structure.

5,316,106

LUBRICANT COOLING SYSTEM FOR A MOTOR VEHICLE AXLE

William D. Baedke, Romeo, and Michael J. Alder, Oxford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 7, 1993, Ser. No. 57,929
Int. Cl.⁵ F01M *9/00*
U.S. Cl. 184—6.12 **6 Claims**



1. A system for circulating lubricant in an assembly, comprising:
- a housing adapted to contain a reservoir of hydraulic lubricant, having a tubular portion extending outward from the reservoir, the tubular portion hydraulically communicating with the reservoir;
- an aperture in the housing to permit lubricant circulation;
- a chamber located adjacent the aperture, adapted to hold lubricant therein, the chamber located at a first elevation;
- a component supported for rotation partially in the lubricant and partially in a portion of the housing located above the lubricant, having means for moving lubricant from the reservoir to the chamber; and
- conduit means having a first end hydraulically connected to the chamber and a second end hydraulically connected to said tubular portion of the housing at a location that is distant from the reservoir and at a second elevation lower than the first elevation, for carrying lubricant from the chamber to the tubular portion of the housing, using gravity to transport lubricant from the first elevation to the second elevation.

5,316,107

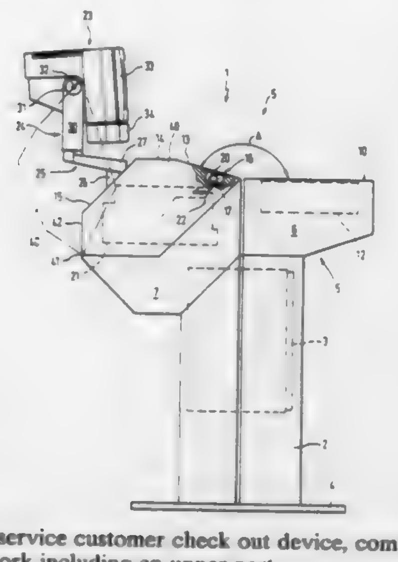
DEVICE FOR CHECKING OUT GOODS

Siegfried Wieschemann, Paderborn; Günter Baitz, and Hartmut Kamin, both of Berlin, all of Fed. Rep. of Germany, assignors to Siemens Nixdorf Informationssysteme AG, Paderborn, Fed. Rep. of Germany

Continuation of Ser. No. 654,615, Feb. 18, 1991, abandoned. This application Jan. 15, 1993, Ser. No. 6,100

Claims priority, application European Pat. Off., Jun. 20, 1989, 89111174.2; Fed. Rep. of Germany, Sep. 14, 1989, 8911035[U]

Int. Cl.⁵ A47F *9/04*
U.S. Cl. 186—61 **9 Claims**



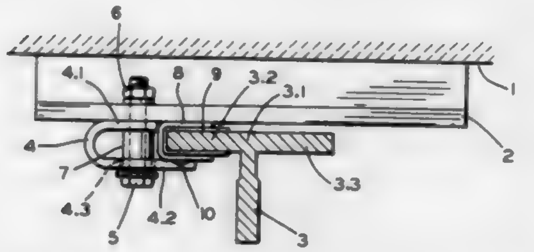
8. A self-service customer check out device, comprising:
- a framework including an upper part;
- a goods registry device, said registry device comprising an upper, essentially horizontal, goods registry surface carried by said upper part and forming a transport path for goods and including a goods registry window;
- a control surface adjoining said goods registry surface transverse to a goods transport device and carried by said upper part, said control surface including control elements and at least one of an input opening and output opening, and having a slope compared to said registry surface, said slope having an angle between 135 degrees and 180 degrees;
- a video terminal having a screen adjustably mounted by a support device to said control surface; and
- an input keyboard, said keyboard located on said terminal.

5,316,108

APPARATUS FOR ATTACHING ELEVATOR GUIDE RAILS TO ELEVATOR SHAFT WALLS

David B. Pearson, Raritan, N.J., assignor to Inventio AG, Hergiswil, Switzerland

Filed Sep. 4, 1992, Ser. No. 940,639
Int. Cl.⁵ B66B *7/02*
U.S. Cl. 187—95 **14 Claims**



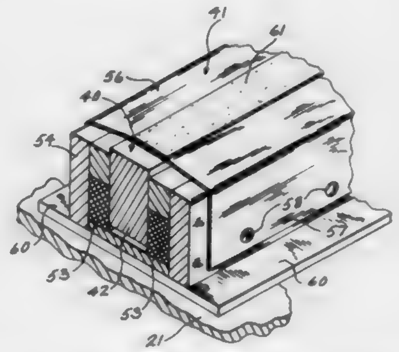
1. In an apparatus for attaching guide rails for elevators to girders which are mounted on walls of an elevator shaft, wherein opposed side surfaces of a flange of the guide rails are enveloped by a U-shaped support bracket and are pressed together with the bracket by a rail clamp onto the girder, the improvement comprising: a generally U-shaped intermediate plate formed of a first predetermined material positioned between the side surfaces of the flange of the guide rail and the U-shaped support bracket, the U-shaped support bracket being formed of a second predetermined material wherein a friction coefficient between the side surfaces of the flange of the guide rail and said U-shaped intermediate plate is greater than a friction coefficient between said U-shaped intermediate plate and the U-shaped support bracket.

5,316,109

LOCKDOWN APPARATUS WITH INTERMEDIATE MEMBRANE

Richard H. Thomas, and Gerald K. Langreck, both of Phillips, Wis., assignors to Marquip Inc., Phillips, Wis.

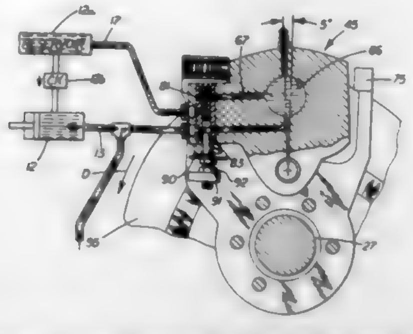
Filed Jan. 29, 1990, Ser. No. 471,547
Int. Cl.⁵ B61H *7/00*
U.S. Cl. 188—41 **3 Claims**



1. A lockdown apparatus for releasably locking an operating mechanism in a selected position, which mechanism is translatable in a linear path along a supporting track to any of a plurality of selected positions, said apparatus comprising:
- a locking surface on said mechanism, said locking surface fixed in a selected position against movement along said linear path;
- a rigid elongate locking bar supported for reciprocal movement in a direction normal to said linear path and positioned parallel to and generally coextensive with said linear path and adjacent said locking surface in any selected position of said mechanism;
- said locking bar being movable between an unlocked position spaced from said locking surface and a locked position in operative engagement with said locking surface;
- a flexible membrane positioned between said locking surface and said locking bar, said membrane being fixed against movement in the direction of said linear path and flexurally movable in response to direct engagement by said locking bar into direct locking engagement with said locking surface in the locked position of said locking bar;
- said locking bar being movable along said linear path in said locked position with respect to said membrane and said locking surface; and,
- a solenoid device for moving said locking bar between its unlocked and locked positions, said device including a rigid supporting base fixed against movement in the direction of said linear path means for connecting said locking bar to said supporting base including resilient means for biasing said locking bar into the locked position interposed therebetween;
- means for overcoming the bias of said resilient means and moving said locking bar into the unlocked position; and
- means for attaching said flexible membrane to said supporting base.

5,316,110
TRAILER BRAKE SYSTEM WITH RELEASE APPARATUS

Robert L. Null, Rte. 1, Box 344, Willow Wood, Ohio 45696
Filed Mar. 24, 1992, Ser. No. 856,544
Int. Cl.⁵ B60T *7/20*
U.S. Cl. 188—112 R **12 Claims**



1. A braking system including a disc brake assembly having brake pads for a trailer or other towed vehicle to provide release of the brake pads from firm braking engagement with a rotor upon backing comprising:

a stationary mounting bracket for attachment to the vehicle for supporting the disc brake assembly;

self-contained hydraulic means for moving the pads into and out of engagement with the rotor in responses to the presence and absence of hydraulic pressure for forward braking and backing non-braking modes of vehicle operation, respectively;

a caliper unit including a housing for mounting said pads for relative movement toward and away from said rotor and into and out of engagement therewith;

said hydraulic means including a piston within a brake cylinder in said housing in operative engagement with at least one of said pads to provide said relative movement;

a single pivot pin for securely mounting said caliper unit to said mounting bracket, said pivot pin defining an axis for stable pivoting movement of said caliper unit in response to the rotor movement upon backing;

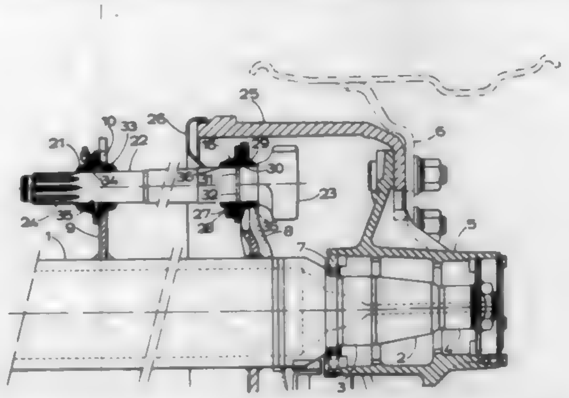
a relief valve for relieving the hydraulic pressure on said piston to provide the release of the firm braking engagement of the brake pads with the rotor; and

actuating means for operating said valve in response to said pivoting movement of said caliper unit, whereby said braking system is effective to provide efficient braking during forward movement and automatic release upon backing.

5,316,111
VEHICLE AXLE BEAM AND BRAKE ASSEMBLY

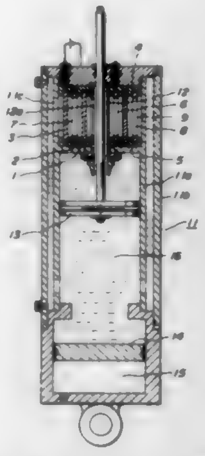
Jonathon M. H. Layfield, Cranfield, England, assignor to Rubery Owen-Rockwell Limited, Wednesbury, United Kingdom
PCT No. PCT/GB90/01897, § 371 Date Aug. 6, 1992, § 102(e) Date Aug. 6, 1992, PCT Pub. No. WO91/09235, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 5, 1990, Ser. No. 917,114
Claims priority, application United Kingdom, Dec. 7, 1989, 8927638
Int. Cl.⁵ F16D *51/22, 65/22;* **F16C** *23/04*
U.S. Cl. 188—205 R **14 Claims**

1. A vehicle axle beam and brake assembly comprising an internal shoe drum brake having brake shoes operated by a brake camshaft (22) supported for rotation by two spaced, first and second, bearing assemblies (16, 21) carried by an axle beam (1), the first bearing assembly (16) being supported on the axle beam by a brake anchor bracket (8;37), having opposite first and second sides, and the brake camshaft having adjacent and remote ends respectively near to and remote from the brake anchor bracket and a cam (23) at said adjacent end by means of which the brake shoes are caused to be actuated upon rotation of the brake camshaft, the first bearing assembly (16) being releasably mounted on a first mounting at the brake anchor bracket having an aperture (13;38) of a shape to allow the cam (23) to be passed therethrough and through which the brake camshaft (22) extends so that the cam is adjacent said first side of the brake anchor bracket and the brake camshaft extends from said second side to the second bearing assembly, the second bearing assembly (21) being releasably secured to the axle beam (1) at a second mounting (9) also having an aperture (10) through which the brake camshaft extends, and the aperture (10;38) of at least one of the mountings being open or openable laterally of the brake camshaft to enable the brake camshaft, the construction and arrangement being such that when the bearing assemblies have been released from the mountings the apertures enable the brake camshaft, with both of the bearing assemblies thereon, to be manoeuvred to pass the cam from said first side to said second side of the brake anchor bracket and withdraw the brake camshaft and the bearing assemblies from the mountings.



5,316,112
RESTRICTED PASSAGE SYSTEM IN VIBRATION DAMPING DEVICE

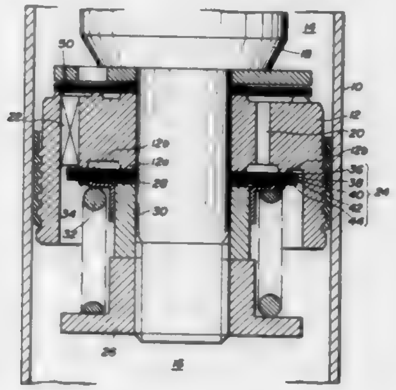
Takeshi Kimura, Kodaira City, and Satoru Kawamata, Higashimurayama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Apr. 20, 1992, Ser. No. 871,089
Claims priority, application Japan, Apr. 20, 1991, 3-115230
Int. Cl.⁵ F16F *15/18*
U.S. Cl. 188—267 **10 Claims**



1. A restricted passage system for a vibration damping device, comprising at least three cylindrical members each made from a conductive material and substantially concentrically arranged from each other at a given interval, which members alternately forming positive and negative electrodes; a pair of insulation members fixed to upper end and lower ends of said cylindrical members, respectively, so as to liquid-tightly close a channel defined between adjoining cylindrical members; and wherein each of said cylindrical members has a hole, each of the holes being arranged along a common line which extends through said cylindrical members, wherein none of the holes directly opposes a hole of an adjacent cylindrical member, and wherein each of the holes has an opening approximately equal to a cross sectional area of said channel.

5,316,113
HYDRAULIC SHOCK ABSORBER

Fumiyuki Yamaoka, Kanagawa, Japan, assignor to Atsugi Motor Parts Company Ltd., Atsugi, Japan
Continuation of Ser. No. 619,870, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 272,551, Nov. 17, 1988, abandoned. This application Apr. 8, 1993, Ser. No. 44,965
Claims priority, application Japan, Nov. 19, 1987, 62-292586
Int. Cl.⁵ F16F *9/348*
U.S. Cl. 188—282 **6 Claims**



1. In a shock absorber:

a hollow cylinder containing a working fluid;

means for defining a fluid chamber within said hollow cylinder;

said fluid chamber defining means including a member formed with a fluid passage, said fluid passage having one end communicating with said fluid chamber and an opposite end;

a disk valve assembly cooperating with said member to cover said opposite end of said fluid passage;

said disk valve assembly having a plurality of disk plates including an orifice disk plate formed with a plurality of radially extending openings, said orifice disk plate being disposed between an adjacent two of said plurality of disk plates and cooperating therewith to form radially extending passages within said plurality of radially extending openings, respectively;

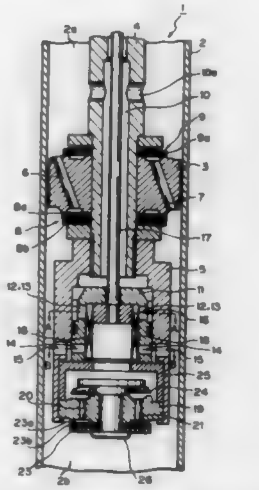
said plurality of disk plates being formed with opening means for establishing fluid communication between said opposite end of said fluid passage of said member and one radial end of each of said plurality of radially extending passages;

one of said plurality of disk plates being formed with a plurality of outlets, each in the form of a cut-out cut inwardly from a periphery thereof;

one of said two disk plates adjacent said orifice plate, but different from said one disk plate formed with said plurality of outlets, being formed with an arc-shaped downstream opening communicating with at least one of said plurality of radially extending passages at an opposite radial end thereof, said arc-shaped downstream opening communicating with at least one of said outlets wherein said opening means includes an arc-shaped upstream opening formed through said one of said two disk plates adjacent said orifice plate formed with said arc-shaped downstream opening, said arc-shaped upstream opening communicating with at least one of said plurality of radially extending openings at said one radial end thereof.

5,316,114
DAMPING FORCE CONTROL TYPE HYDRAULIC SHOCK ABSORBER

Akihiro Furuya, and Kinya Matsumoto, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan
Continuation of Ser. No. 944,441, Sep. 14, 1992, abandoned. This application Oct. 12, 1993, Ser. No. 135,426
Claims priority, application Japan, Sep. 20, 1991, 3-268943
Int. Cl.⁵ F16F *9/44*
U.S. Cl. 188—299 **4 Claims**



1. A damping force control type hydraulic shock absorber comprising:

a cylinder having a hydraulic fluid sealed therein;

a piston slidably fitted in said cylinder and dividing the interior of said cylinder into upper and lower chambers;

a piston rod connected at one end thereof to said piston and extending through said upper chamber so as to have the other end project from said cylinder;

a first damping force generating mechanism provided on said piston and which generates a damping force during both extension and retraction strokes of said piston rod in which the piston rod is extended from and retracted into the cylinder, respectively;

a bypass passage placing said two chambers in communication, a portion of said bypass passages extending in said piston;

a second damping force generating mechanism provided in said bypass passage and including a disk valve which opens to a degree depending on the pressure of the hydraulic fluid applied thereto during the extension stroke to vary a flow path area and a check valve which allows the hydraulic fluid to pass through the bypass passage during the retraction stroke without the fluid encountering substantial resistance;

first orifice means provided in said bypass passage between said upper chamber and said second damping generating mechanism and in series with said second damping force generating mechanism;

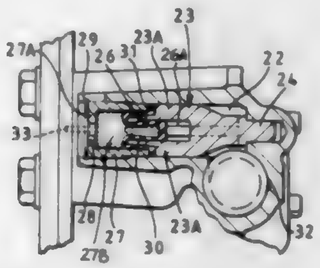
a first shutter actuatable between respective positions at which the first orifice means is closed and open, a first flow path for hydraulic fluid being formed when the first orifice means is in one open position thereof and a second flow path for hydraulic fluid being formed when the first orifice means is in another open position thereof, the cross-sectional area of said second flow path being larger than that of said first flow path;

an auxiliary bypass passage communicating with said bypass passage at a location between said first orifice means and said second damping force generating mechanism and open to said lower chamber, said auxiliary bypass passage including second orifice means, said second orifice means being the only means in the auxiliary bypass passage or restricting the flow of fluid through the auxiliary bypass passage to generate a damping force;

a second shutter actuatable to place said second orifice means in a first state wherein the second orifice means is open to form a first flow path for hydraulic fluid having a cross-sectional area smaller than that of said second flow path, and a second state wherein the second orifice means is closed or provides a second flow path for hydraulic fluid having a cross-sectional area smaller than that of said first flow path formed when said second orifice means is in the first state and also smaller than that of said first flow path; and

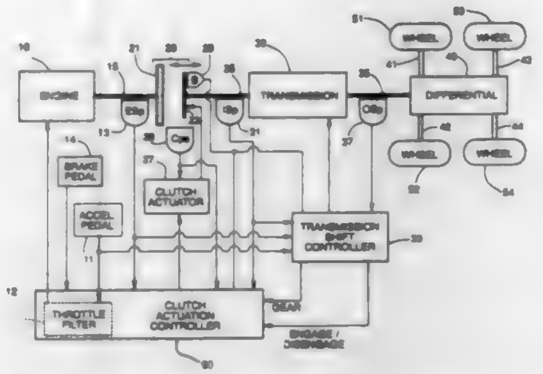
means for actuating said first and second shutters to selectively assume a first position wherein said first orifice means is closed and said second orifice means is in said second state, a second position wherein said first orifice means is in said one open position thereof and said second orifice means assumes said second state, and a third position wherein said second orifice means assumes said first state and said first orifice means is in another said open position thereof.

5,316,115
BRAKE ACTUATOR
John A. Urban, Plainwell, Mich., assignor to Lucas Industries public limited company, West Midlands, England
Filed Oct. 26, 1990, Ser. No. 604,659
Claims priority, application United Kingdom, Nov. 4, 1989, 8924962
Int. Cl.^{5} F16D *65/78*
U.S. Cl. 188—325 13 Claims



1. A brake actuator comprising a housing, force transmission means in the housing operable by a mechanical actuator to apply a friction element to a rotary member to be braked, means for the admission of lubricant to a cavity within said housing, means for establishing a predetermined maximum positive system lubricant pressure, and an element within said cavity, said element being of material which is not compressed at said maximum positive system lubricant pressure and subject at one side thereof to lubricant pressure and at an opposite side to atmospheric pressure, whereby the element exerts substantially no pressure on the lubricant but is movable during outward movement of said transmission means so as to compensate for any increase in volume of the cavity caused by said outward movement and thereby substantially to avoid the occurrence of negative pressure in the cavity.

5,316,116
ENGINE CONTROL METHOD FOR USE WITH AUTOMATIC CLUTCH CONTROL
James Slicker, West Bloomfield; Joseph S. Mazur, Livonia, and Michael T. Breen, Garden City, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio
Filed Dec. 9, 1992, Ser. No. 987,797
Int. Cl.^{5} B60K *41/02*
U.S. Cl. 477—181 14 Claims



1. In a vehicle having a gear transmission driven through a friction clutch by an engine that is controlled by an accelerator pedal, a method of controlling the engine in response to the accelerator pedal during clutch engagement for vehicle launch comprising the steps of:

generating a pedal position signal;

monitoring engine speed to detect a speed decrease indicative of substantial clutch torque;

producing an engine control signal by the steps of

a) when the pedal position signal exceeds a threshold, increasing the control signal from a beginning value to a set percentage of pedal position;

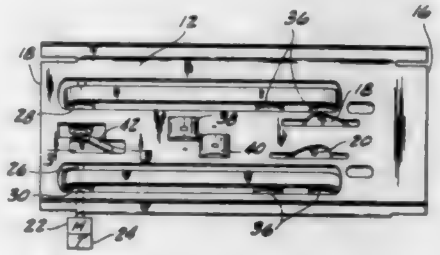
b) when the control signal reaches the set percentage of pedal position, maintaining the control signal at that percentage until detection of the speed decrease;

c) after detection of the speed decrease, increasing the control signal at a given rate; and

d) limiting the control signal at all times to a maximum value corresponding to the pedal position signal; and

controlling the engine in accordance with the control signal.

5,316,117
BILL VALIDATOR WITH ANTI-STRINGING SHUT-DOWN FEATURE
Paul K. Griner, St. Louis, and Paul T. Smith, Florissant, both of Mo., assignors to Unidynamics Corporation, New York, N.Y.
Filed Mar. 4, 1992, Ser. No. 846,780
Int. Cl.^{5} G07D *7/00*
U.S. Cl. 194—203 35 Claims



30. A bill validator for evaluating paper articles comprising:

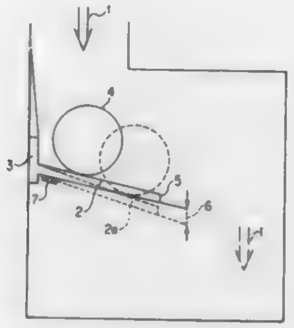
a bill guide for receiving the paper articles;

means for validating the received articles corresponding to genuine currency and for rejecting other articles;

means for detecting tampering in which one or more of the validated articles is rejected with one or more of the other articles; and

means responsive to the detecting means for disabling the bill validator when the detecting means detects said tampering, whereby the bill validator is disabled in the event that a user attempts to tamper with the bill validator by removing coin or currency in an unauthorized manner.

5,316,118
DEVICE FOR OBTAINING MECHANICAL CHARACTERISTIC OF COINS
Jesus E. Ibarrola, and Jose L. P. Insausti, both of Pamplona, Spain, assignors to Azkoyen Industrial, S.A., Peralta, Spain
PCT No. PCT/ES91/00051, § 371 Date Jun. 4, 1992, § 102(e) Date Jun. 4, 1992, PCT Pub. No. WO92/02905, PCT Pub. Date Feb. 20, 1992
PCT Filed Aug. 6, 1991, Ser. No. 839,762
Claims priority, application Spain, Aug. 8, 1990, 9002145; Jul. 30, 1991, 9101787; Jul. 30, 1991, 9101789
Int. Cl.^{5} G07D *5/06*
U.S. Cl. 194—317 14 Claims



1. An apparatus for detecting mechanical characteristics of coins in order to determine whether the coins are authentic, the apparatus comprising:

an elastically deformable element capable of being deformed by the weight of a coin, the element being in the form of a beam having a fixed portion and an overhanging portion;

said beam defining a rolling path along which a coin can travel, the beam being deformable by the rolling coin to an extent which depends on the weight of the coin and the position of the coin relative to the fixed portion of the beam; and

the beam having means for measuring deformation of the beam as the coin travels therealong;

wherein the measuring means is for providing a signal based on the measured deformations that is representative of the mechanical elasticity of the coin which can be compared with stored data to determine whether or not the coin is authentic.

5,316,119
METHOD AND APPARATUS FOR DISCRIMINATING BETWEEN TRUE AND FALSE COINS OR THE LIKE
Osamu Sugimoto, Iruma; Yonezo Furuya, Hatoyama, and Ichiro Fukuda, Kawagoe, all of Japan, assignors to Nippon Conlux Co., Ltd., Tokyo, Japan
Filed Sep. 27, 1991, Ser. No. 766,750
Claims priority, application Japan, Mar. 27, 1991, 3-063575; Jul. 30, 1991, 3-190070
Int. Cl.^{5} G07D *5/08*
U.S. Cl. 194—318 6 Claims

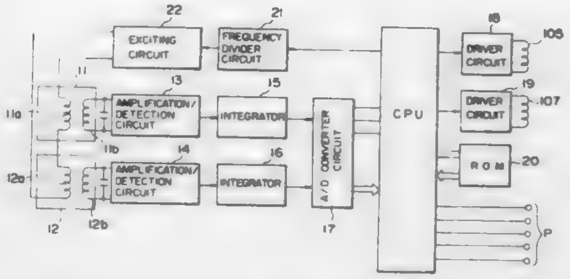
1. A method of discriminating between true and false coins by mounting a discriminating means relative to a predetermined passage along which a coin to be discriminated passes, wherein true/false discrimination is carried out in accordance with whether or not data detected from said coin and developed on a coordinate system falls within a predetermined function closed area,

characterized in that said method comprises the steps of;

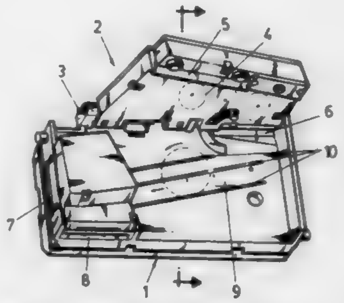
applying an electromagnetic field of given frequency to a coin which passes along said predetermined passage to excite the coin;

detecting a state of said coin excited by the electromagnetic field; and

discriminating said coin between true and false in accordance with whether or not the data representing the state of said coin falls within a circular area on a predetermined two-dimensional coordinate system which represents two parameters, including material quality and an outer diameter of said coin, the radius of said circular area being represented by a characterizing value which is derived from the values of the material quality and the outer diameter.



5,316,120
HOUSING FOR COIN SELECTORS
Jesus E. Ibarrola, Pamplona, Spain, assignor to Azkoyen Industrial, S.A., Peralta, Spain
PCT No. PCT/ES91/00054, § 371 Date Jun. 19, 1992, § 102(e) Date Jun. 19, 1992, PCT Pub. No. WO92/04355, PCT Pub. Date Mar. 19, 1992
PCT Filed Sep. 4, 1991, Ser. No. 855,024
Claims priority, application Spain, Sep. 5, 1990, 9002665[U]
Int. Cl.^{5} G07D *5/08*
U.S. Cl. 194—318 1 Claim



1. A coin selector housing comprising a first section and a second section hingedly connected to each other and defining therebetween a coin receiving chamber when said first and second sections are in a closed position, said first section including a coin entrance slot at one side thereof and coin exit slots at another side thereof, said first section accommodating an electronic control circuit having sensors, said second section accommodating electromagnetic coils for generating electromagnetic fields which are varied in response to coins passing said coin receiving chamber and measured by said sensors, said second section including a wall which defines an inclined rolling ramp for coins passing from said entrance slot towards said exit slots when said first and second sections are in said closed position, said first section having a surface forming a wall of said coin receiving chamber, said surface including a plurality of spaced-apart, elongated, parallel ribs extending

parallel to said rolling ramp and positioned in an area where said control circuit sensors are located to prevent a buildup of dirt carried by the coins passing said chamber, at said area.

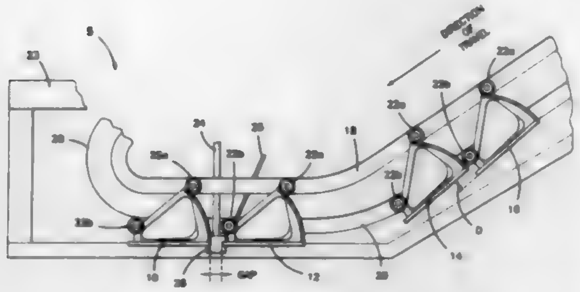
5,316,121
ESCALATOR MISSING STEP DETECTION

Vlad Zaharia, Rocky Hill, and Gerald E. Johnson, Farmington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 25, 1992, Ser. No. 981,699

Int. Cl.⁵ B65G *43/00*

U.S. Cl. 198—323 **8 Claims**



1. An apparatus for detecting a missing or misaligned step of an escalator, comprising:

sensing means, responsive to the presence of one or more moving escalator steps, for providing a signal in a first state when a gap between the moving escalator steps is a first width and in a second state when the gap between moving escalator steps is a second width greater than said first width.

5,316,122
STORAGE UNIT FOR ELONGATED ELEMENTS, PARTICULARLY CIGARETTES

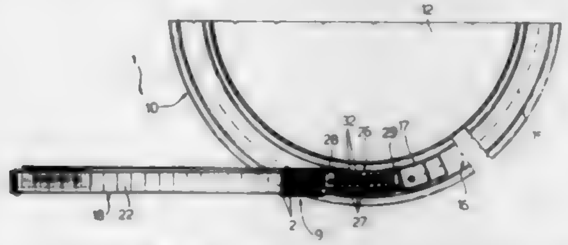
Giuseppe Taddia, Lovoleto Di Granarolo Emilia, and Armando Neri, Bologna, both of Italy, assignors to G. D Societa' Per Azioni, Bologna, Italy

Filed Jul. 20, 1993, Ser. No. 94,847

Claims priority, application Italy, Jul. 28, 1992, BO92A 000291

Int. Cl.⁵ B65G *1/00*

U.S. Cl. 198—347.3 **6 Claims**



1. A storage unit (9) for elongated elements (2), particularly cigarettes, the unit comprising a variable-capacity store (10) ; a store loading-unloading station (11) ; and a first reversible loading-unloading conveyor (14) moving to and from said station (11) along a first path (16); said unit (9) comprising a second reversible conveyor (18) for a number of said elements (2), the second conveyor (18) moving along a second path (24) extending through said station (11); and fixed bridging means (25) interposed between said conveyors (14, 18) at said station (11); characterized by the fact that it also comprises a slide (26) moving along said first and second paths (16, 24) and comprising contact means (31) for containing and pushing said elements (2) along said paths (16, 24) ; the length of the slide (26) being greater than that of said bridging means (25).

5,316,123
APPARATUS FOR TURNING WORKPIECES MOVED FORWARD IN A FLAT POSITION

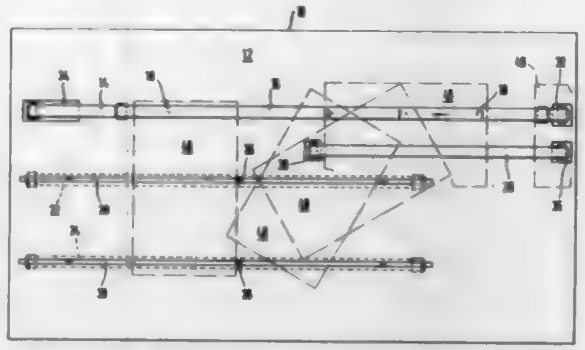
Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 22, 1992, Ser. No. 994,750

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1991, 4142824

Int. Cl.⁵ B65G *47/24*

U.S. Cl. 198—416 **10 Claims**



1. Apparatus (10) for turning workpieces (40) moved forward in a flat position, with a conveyor belt pair (14 , 16) which engages and moves forward the workpiece eccentrically at one point, and a conveyor belt (20) running parallel thereto which is shorter than the conveyor belt pair (14, 16), wherein,

both the conveyor belt pair (14, 16) and the parallel conveyor belt (20) are driven at the same speed, and wherein the apparatus further comprises:

a table surface for supporting and frictionally engaging the workpiece and subjecting the workpiece to torque around a forward-moving point of engagement of the workpiece with the supporting table surface,

wherein clamping pins (18) are located on the upper conveyor belt (16) at predetermined intervals for engaging a rear portion of the workpieces.

5,316,124
METHOD AND APPARATUS FOR A LOW-POWER, BATTERY-POWERED VENDING AND DISPENSING APPARATUS

Elwood E. Barnes, Cochranville; Ronald R. Bernardini, Downingtown, and Geoffrey A. June, Aston, all of Pa., assignors to Mars Incorporated, McLean, Va.

Continuation of Ser. No. 610,031, Nov. 7, 1990, abandoned. This application Nov. 5, 1992, Ser. No. 972,099

Int. Cl.⁵ G07F *7/04*

U.S. Cl. 194—206 **15 Claims**

1. A solely battery-powered, money-operated dispensing apparatus, comprising:

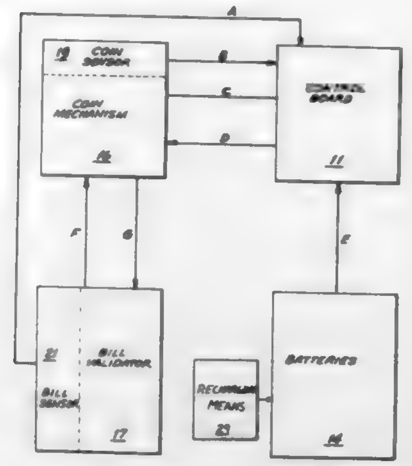
a battery;

a bill sensor for sensing the insertion of paper currency;

a bill validator for testing paper currency;

a delivery means; and

a control means connected to the battery, bill sensor, bill validator, and delivery means, wherein the control means normally operates in a low-power nap mode to conserve power, strobes the bill sensor during the nap mode and powers-up the apparatus and actuates the bill validator when paper currency insertion is sensed, activates the delivery means if an adequate amount of money was inserted, and powers-down the apparatus to return to the nap mode after dispensing.



5,316,125
ASSEMBLY LINE STRUCTURE

Hidetoshi Matsushima; Yoshinori Noguchi, and Shizuo Ishijima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

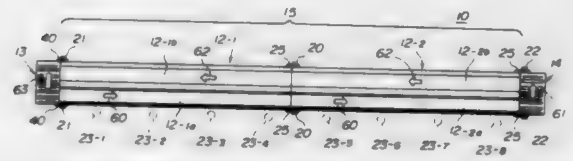
PCT No. PCT/JP91/01470, § 371 Date Jun. 24, 1992, § 102(e) Date Jun. 24, 1992, PCT Pub. No. WO92/07683, PCT Pub. Date May 14, 1992

PCT Filed Oct. 29, 1991, Ser. No. 862,576

Claims priority, application Japan, Nov. 6, 1990, 2-300150

Int. Cl.⁵ B65G *21/06*

U.S. Cl. 198—465.2 **5 Claims**



1. An assembly line for assembling a product by a series of operations, comprising:

a conveyor body assembly including a plurality of conveyor body units in an arbitrary number greater than or equal to two and arranged in line,

each conveyor body unit (12-1, 12-*n*) forming a minimal unit for carrying out a part of the series of operations and including an assembly area part (12-1*a*, 12-*n*) for carrying out a predetermined process for making a product to be assembled, said assembly area part transporting an assembly jig (11) in a predetermined direction along said line, and an assembly jig return conveyor part (12-1*b*,12-*n*) which is arranged in parallel to the assembly area part (12-1*a*, 12-*n*) and transports the assembly jig (11) used when assembling the product in a direction opposite to said predetermined direction.

5,316,126
SYSTEM FOR CONVEYING PACKAGES

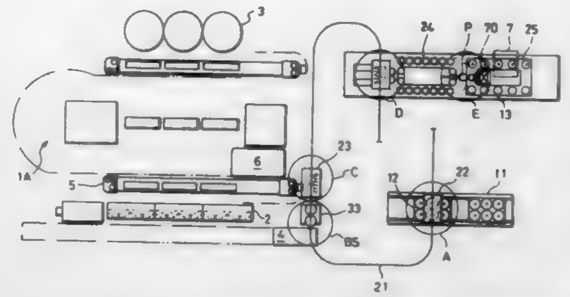
Kazuyasu Hirai, Nagaokakyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 16, 1992, Ser. No. 899,506

Claims priority, application Japan, Jun. 17, 1991, 3-173054

Int. Cl.⁵ B65G *47/04*

U.S. Cl. 198—468.6 **5 Claims**



1. A system for conveying packages wherein a plurality of packages are received from a package receiving station by means of an overhead traveling carriage and the received packages are delivered to a package supply station in which packages are arranged in a different pitch from the pitch in said package receiving station, characterized in that the pitch between the packages is changed on said overhead traveling carriage.

5,316,127
APPARATUS FOR LOADING CONTAINERS ON A CONVEYOR

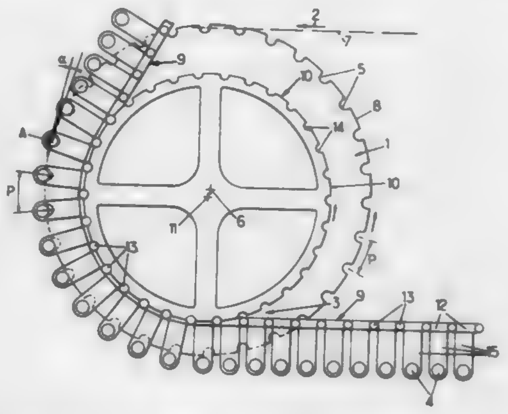
Alain Evrard, Le Havre, France, assignor to Sidel, Le Havre Cedex, France

Filed May 28, 1993, Ser. No. 67,627

Claims priority, application France, Jun. 5, 1992, 92 06838

Int. Cl.⁵ B65G *47/86*

U.S. Cl. 198—470.1 **8 Claims**



1. Apparatus for loading containers having necks, in particular bottles, on a conveyor (3) equipped with devices (4) for individually gripping said containers by their necks, the gripping devices (4) being spaced apart by a predetermined pitch (P) and the containers being fed (2,7) in succession to said apparatus while being spaced apart by said pitch, wherein said apparatus comprises:

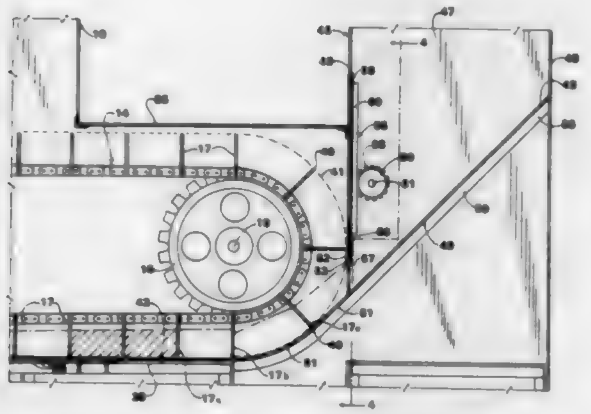
a) a circular or arc-shaped conveyor (3) disposed in a container-loading area, said conveyor turning in a given direction around an axis of rotation (11) and said gripping devices (4) being supported by the conveyor and describing, in the container-loading area, an arc-shaped path having a predetermined diameter and extending around said axis;

b) a rotatable disk (1) for picking up containers fed to the apparatus, equipped at or near a periphery thereof with individual container-housing means (5) defining a mutual spacing pitch identical to said predetermined pitch (P), said disk being positioned beneath said conveyor and rotating in the same direction thereas around an axis (6) parallel to the axis of said conveyor, the diameter of the disk and the respective positions of said axes of the conveyor and the disk being such that, in a plane projection, the circular path of the housing means intersects (A) the arc-shaped path of the gripping devices;

c) means for controlling the gripping devices such that said gripping devices individually grip the container necks at an instant when they arrive at said point of intersection of said paths; and

d) means for synchronously rotationally driving the conveyor and the pick-up disk, such that the gripping devices arrive in succession at said point of intersection of the paths in synchronism with the housing means, wherein said disk is configured so that the container-housing means (5) follow a circular path having said predetermined diameter and the axis (6) of rotation of the disk is spaced apart from the axis of rotation (11) of the conveyor so as to form said point of intersection of the respective paths of the gripping devices and the housing means.

5,316,128
PARTICULATE MATERIAL FEEDER
David H. Long, Springfield, Ohio, assignor to Jet-Pro Company, Inc., Atchison, Kans.
Filed Mar. 11, 1991, Ser. No. 667,271
Int. Cl.^{5} B65G *47/19*
U.S. Cl. 198—530 **12 Claims**



1. Apparatus for feeding of particulate material into a receiver at a predetermined flow rate comprising

A) an elongated bedplate having an upwardly facing top surface for support of particulate material thereabove,

B) transport means for effecting displacement of particulate material longitudinally over said bedplate, said transport means including

1) a continuous conveyor supported for revolution in a vertical plane extending longitudinally over said bedplate with upper and lower runs and having a plurality of flights disposed in relatively spaced relationship extending transversely to their plane of revolution with said flights having outer extremities which on the lower run are disposed in close proximity to the top surface of said bedplate, said conveyor being supported at a first end for movement of said flights about an arcuate path to the lower run traversing over said bedplate, and

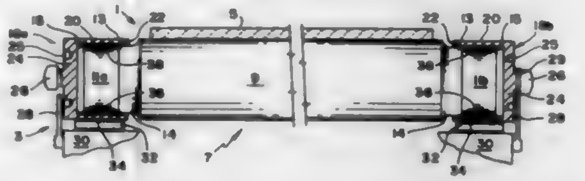
2) drive means mechanically coupled with said conveyor and operable to effect revolution thereof with the flights on the lower run moving forwardly in a direction away from said first end, and

C) a particulate material dispenser disposed adjacent the first end of said conveyor in longitudinally aligned relationship thereto including

1) a dispensing hopper disposed closely adjacent but spaced a distance rearwardly to the first end of said conveyor in longitudinally spaced relationship to the path of movement of the outer extremities of said flights and adapted to receive and contain a quantity of particulate material, said dispensing hopper having a discharge throat disposed at a bottom end thereof extending transversely with respect to said conveyor's plane of revolution and through which material flows downwardly out of said hopper in a stream of predetermined transverse extent and thickness in a direction toward said conveyor, said discharge throat disposed a distance above said bedplate whereby particulate material flows out of said hopper and into association with said conveyor flights during the course of their arcuate path of movement in a downward and forward direction at said conveyor's first end, and

2) a transfer plate disposed in underlying relationship to said throat for receiving material discharged therethrough and extending in downwardly inclined relationship in the direction of movement of the lower run of said conveyor joining with said bedplate and forming a contiguous top surface therewith, said transfer plate being arcuately curved for a distance from its juncture with said bedplate in conformance with the arcuate path of movement of the outer extremities of said conveyor flights and having an upper surface disposed to lie in close proximity to the outer extremities of said conveyor flights during the course of their traversing movement thereover whereby said conveyor flights are caused to enter into the material on said transfer plate and to thereafter control its displacement onto and over said bedplate in a uniform thickness layer.

5,316,129
CERAMIC CONVEYOR ROLL HAVING FLAT-SIDED SPRING RETAINER FOR NON-ROTATABLY MOUNTING END CAPS TO ROLLER
Alan W. Daily, Darlington, Pa., assignor to Vesuvius Crucible Company, Wilmington, Del.
Filed Mar. 2, 1993, Ser. No. 24,779
Int. Cl.^{5} B65G *13/02*
U.S. Cl. 198—780 **25 Claims**



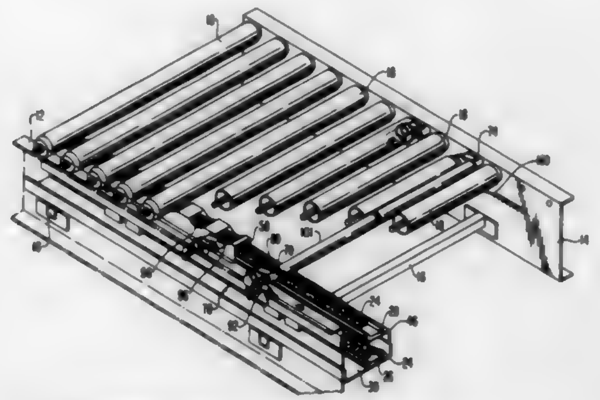
1. A conveyor roll for conveying articles at elevated temperatures, comprising:

a ceramic roller member having at least one cylindrical end;

a metallic end cap for rotatably mounting said roller member within a conveyor assembly, said cap having a tubular wall for receiving and surrounding said cylindrical end of said member, and

a retaining means for non-rotatably mounting said cap to the roller member, including a coil spring helically wound around said cylindrical end of said roller member and having a plurality of interconnecting angular portions along its coils for resiliently and frictionally inter-engaging the tubular wall of the cap and the cylindrical end of the roller member despite thermal differential expansion between said cap and roller member between ambient and elevated temperatures.

5,316,130
ZERO PRESSURE ACCUMULATION CONVEYOR
Martin A. Heit; John J. Wilkins, both of Cincinnati, Ohio, and William C. Rau, Florence, Ky., assignors to Litton Industrial Automation Systems, Inc., Hebron, Ky.
Continuation-in-part of Ser. No. 725,644, Jul. 3, 1991, abandoned. This application Jul. 1, 1992, Ser. No. 907,013
Int. Cl.^{5} B65G *13/06*
U.S. Cl. 198—781 **13 Claims**



1. An accumulating conveyor comprising:

a) a first sidewall and a second, parallel sidewall,

b) a plurality of rotatable rollers located within said sidewalls along the length of the conveyor to define a bed for said conveyor,

c) drive means for contacting said rollers to rotate same,

d) motor means for energizing said drive means,

e) sensor means positioned at regular intervals along the length of said conveyor to divide same into a plurality of zones,

f) each of said sensor means including a primary sensor roller bracket situated inboard of one sidewall and a secondary roller bracket situated inboard of the other side wall, said brackets being aligned with one another for movement in concert,

g) a sensor roller secured within said brackets to extend across the bed of said conveyor parallel to said rotatable rollers,

h) a bore formed in each primary sensor roller bracket and a piston movable within said bore,

i) a pneumatic circuit, including a pressurized line, extending along the length of the conveyor and being connected to each bore to pressurize same and thus move the piston therewithin, and

j) valves located proximate to said sensor rollers, whereby pivotal movement of said sensor rollers operates said valves and controls the operation of said pneumatic circuit.

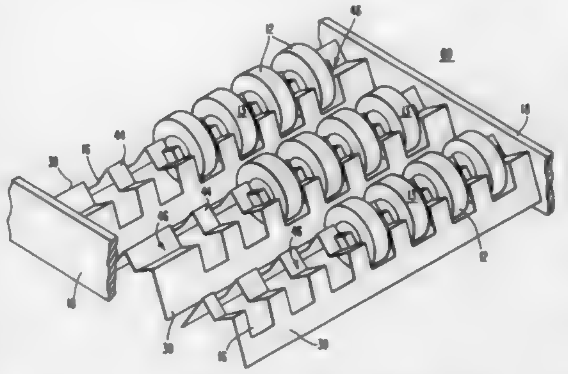
5,316,131
EASY MAINTENANCE HIGH SPEED ENDLESS BELT CONVEYOR
Henri Bonnet, Atlanta, Ga., assignor to United Parcel Service of America, Inc., Atlanta, Ga.
Continuation of Ser. No. 818,606, Jan. 10, 1992, Pat. No. 5,242,047. This application Aug. 11, 1993, Ser. No. 105,376
Int. Cl.^{5} B65G *39/10*
U.S. Cl. 198—842 **10 Claims**

1. An endless belt conveyor system for transporting objects longitudinally along said system, comprising:

roller means having an axis for permitting rotation when said objects are transported;

roller support means for supporting said roller means, said roller support means have receiving means for removably receiving and mating with said axis when said axis is disposed at a receiving angle with respect to said receiving means;

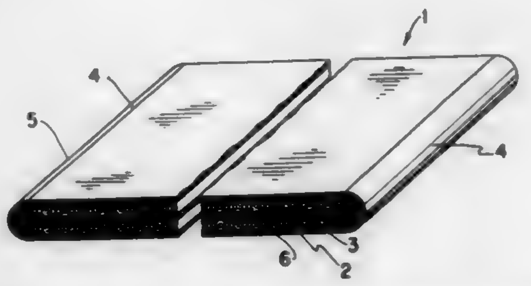
a receiving region defined between receiving surfaces of said receiving means, said receiving region adapted to allow said axis to pass freely there-through when said axis is disposed at a continuous range of receiving angles while said axis is being received by said receiving means;



frame means for supporting said conveyor system, said frame means having means for maintaining transverse integrity and means for maintaining longitudinal integrity; and,

said means for maintaining transverse integrity being formed only by said roller support means bracingly couple to said means for maintaining longitudinal integrity of said frame means.

5,316,132
CONVEYOR BELT AND METHOD FOR ITS MANUFACTURE
Tomonori Muraoka, Kakegawa, and Isato Atsumi, Ogasa, both of Japan, assignors to FA. Ernst Siegling, Hanover, Fed. Rep. of Germany
Filed May 8, 1992, Ser. No. 881,019
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1991, 4121572
Int. Cl.^{5} B65G *15/34*
U.S. Cl. 198—847 **26 Claims**



1. Conveyor belt with a support fabric, which is provided with at least one thermoplastic coating, characterized in that to cut edges of the conveyor belt is welded a thermoplastic, strand-like profile material as an edge protection, the strand-like profile material having a lower melting point than the thermoplastic material of the coating.

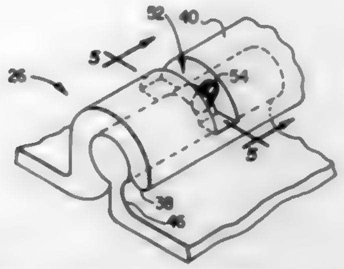
5,316,133
MOVABLE FLOOR MECHANISM

William H. Moser, Paris, Tex., assignor to Mosermatic, Inc., Paris, Tex.

Filed Jun. 3, 1993, Ser. No. 72,175

Int. Cl.^{5} B65G *17/06*

U.S. Cl. 198—850 **4 Claims**



1. A movable floor mechanism comprising:
(a) a frame;
(b) a movable floor at least partially encircling said frame;
(c) a motor attached to said frame; and
(d) at least one sprocket attached to said motor, the sprocket engaging the movable floor, wherein said movable floor comprises a plurality of interengaged floor elements, wherein each of said floor elements comprises a central portion, a connector, and a receptor, wherein said receptor is configured to accept the connector of an adjacent floor element, and wherein said receptor contains an axial slot and said connector contains a pin receiving hole, wherein said axial slot and pin receiving hole are aligned to receive a pin.

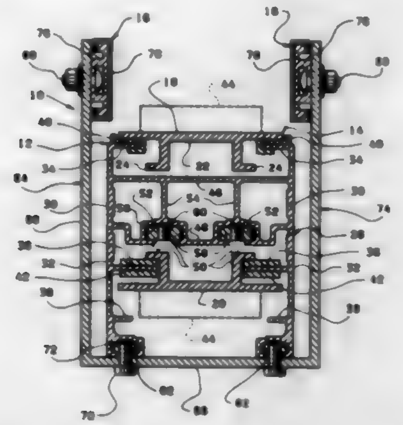
5,316,134
CONVEYOR GUIDETRACK SEGMENT

William J. Donohue, Brooklandville, Md., assignor to Automated Production Systems Corporation, York, Pa.

Filed Oct. 21, 1992, Ser. No. 963,989

Int. Cl.^{5} B65G *21/06*

U.S. Cl. 198—861.1 **11 Claims**



2. A guidetrack segment for a modular conveyor; the segment comprising a pair of elongate spaced apart sidewalls, said sidewalls extending generally parallel along the length of the segment and having tops and bottoms; sidewall connection means located between the sidewalls for joining the sidewalls together, a first pair of ribs extending inwardly from the tops of the sidewalls above the sidewall connection means for supporting an upper run of a conveyor belt; conveyor support means belong the sidewall connection means for supporting a lower run of a conveyor belt; mounting means located on the inside of the sidewalls adjacent the bottoms of the sidewalls for forming connections with a conveyor support system; and exterior surfaces on the sidewalls extending continuously between the tops and the bottoms of the sidewalls and ends of the segment, such surfaces being smooth, imperforate and recess free to facilitate cleaning; said segment comprising an integral metal extrusion and said sidewall connection means including a first plate extending between the sidewalls immediately under said first pair of ribs and a cross member located between said plate and said conveyor support means.

5,316,135
CONTAINER

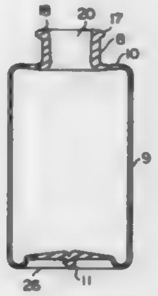
Roland Kneer, Farchant, and Christoph Heiland, Saulgrub, both of Fed. Rep. of Germany, assignors to Caplast GmbH, Fed. Rep. of Germany

Filed Aug. 24, 1992, Ser. No. 934,707

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1991, 4131035; Nov. 30, 1991, 4139555

Int. Cl.^{5} B65D *25/00*

U.S. Cl. 220—461 **9 Claims**



1. A container made in a coextrusion blow molding process and having a substantially dimensionally stable outer container having a bottom and an upper shoulder neck, and opening, and an easily deformable inner bag within the outer container, and said outer container and inner bag being composed of different thermoplastic materials, the improvement comprising a weld seam on the bottom of the inner bag and a weld seam on the bottom of the outer container, the weld seam of the inner bag being clamped by the weld seam of the outer container and being held thereby, and said upper shoulder of said outer container comprising an unwelded open seam formed between two opposite wall sections of said upper shoulder.

5,316,136
CONDOM CASE WITH DUAL LOCKING MECHANISMS

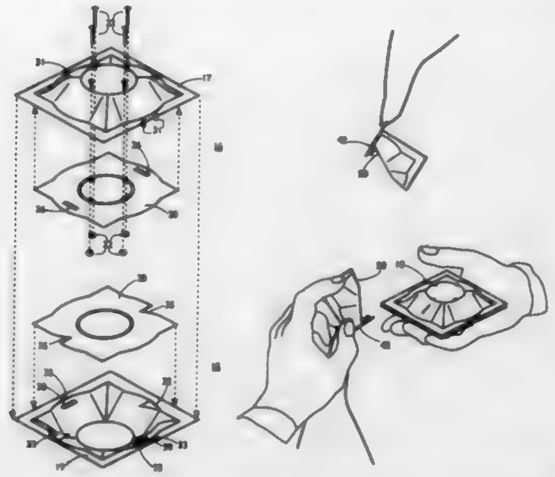
Mary C. Castagna, 2002 Alta Vista, Austin, Tex. 78704

Filed Feb. 24, 1993, Ser. No. 22,256

Int. Cl.^{5} B65D *85/14*

U.S. Cl. 206—69 **5 Claims**

1. In combination, a condom case and keyset comprising:
a first key;
a second key; and
a palm-sized case comprising:
  a base portion including an area for supporting a condom;
  a lid portion attachable to said base portion, wherein said lid portion includes a first key hole for accommodating said first key and a second key hole for accommodating said second key;
a first locking mechanism for locking said lid portion to said base portion, wherein said first locking mechanism includes a first reciprocating catch member, a first spring, and a first stationary catch member wherein said first reciprocating catch member is positioned such that said first reciprocating catch member is capable of latching with said first stationary catch member when said lid portion is placed upon said base portion, and wherein said first reciprocating catch member is movable away from said first stationary catch member such that said first reciprocating catch member unlatches from said first stationary catch member when said first key is inserted and engaged within said first key hole; and
a second locking mechanism for locking said lid portion to said base portion, wherein said second locking mechanism includes a second reciprocating catch member, a second spring, and a second stationary catch member wherein said second reciprocating catch member is positioned such that said second reciprocating catch member is capable of latching with said second stationary catch member when said lid portion is placed upon said base portion, and wherein said second reciprocating catch member is movable away from said second stationary catch member such that said second reciprocating catch member unlatches from said second stationary catch member when said second key is inserted and engaged within said second key hole;
wherein said first spring is coupled to said first reciprocating catch member and wherein said second spring is coupled to said second reciprocating catch member such that both said first key and said second key must be engaged simultaneously within said first and second key holes, respectively, to unlock said lid portion from said base portion.



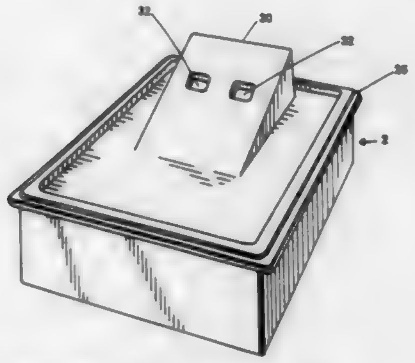
5,316,137
PAINT SAVER TRAY

Glenn F. Kyllonen, 14501 Kidston Road, Vernon, British Columbia, Canada V1B 1R7

Filed Apr. 13, 1993, Ser. No. 46,229

Int. Cl.^{5} B65D *81/24;* A47L *13/56*

U.S. Cl. 206—209 **1 Claim**



1. A paint roller tray and lid comprising:
sealing means for resealable air-tight mating of said lid with said paint roller tray;
means for detachably securing a paint roller handle when said lid is mated onto said tray;
said lid being formed with a housing wherein said means for detachably securing a paint roller handle comprises a first resilient protrusion and a second resilient protrusion depending from said housing, said protrusions being in spaced apart relation so as to snugly receive therebetween said paint roller handle;
wherein said housing has contiguous sides extending upward from an upper surface of said lid and a roof extending between said contiguous sides, said contiguous sides and said roof defining a cavity, said protrusions depending from said roof into said cavity; and
wherein said first resilient protrusion has therein first receptacle extending into said first protrusion for insertion therein of a finger or thumb, and wherein said second resilient protrusion has therein a second receptacle extending into said second protrusion for insertion therein of a finger or thumb, whereby said protrusions may be resiliently deformed by said finger or thumb in said receptacles acting in conjunction so as to grip said paint roller handle between said protrusions.

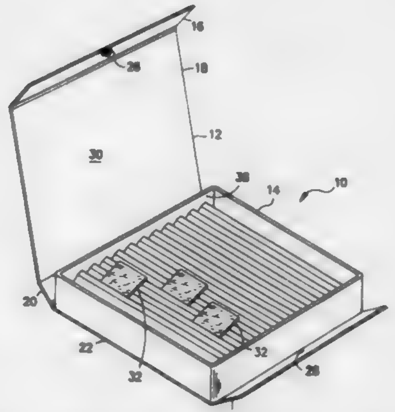
5,316,138
CARPET DISPLAY SAMPLE KIT

Carl D. Thompson, Lagrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 1, 1993, Ser. No. 11,875

Int. Cl.^{5} B65D *85/62*

U.S. Cl. 206—223 **4 Claims**



1. A carpet sample display kit comprising: a binder and a carpet display tray mounted on said binder, said binder enveloping said display tray and having a means to maintain it closed around said display tray, said tray having four interconnected walls and a bottom, a display rack within said four walls and resting on said bottom, said display rack having a plurality of spaced support members spaced from one another and located at an acute angle to two of said interconnected walls, said support members having a means to support carpet samples therebetween.

5,316,139
SHIRT STORAGE AND PACKAGE APPARATUS

Thomas W. Judd, Peterborough, N.H., and Cyril Wagner, Jr., Midland, Tex., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Filed May 18, 1993, Ser. No. 63,207

Int. Cl.^{5} B65D *85/18*

U.S. Cl. 206—278 **11 Claims**

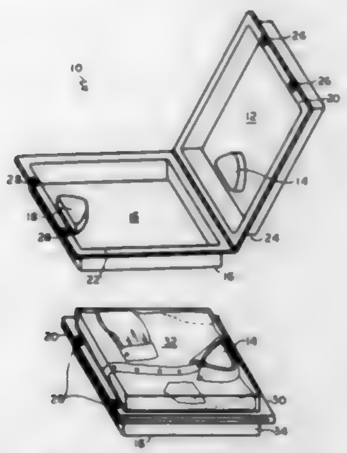
1. In combination:
a) a shirt storage and package apparatus to receive and store two folded shirts, each shirt having a shirt collar, which apparatus comprises:
  i) a top cover having a generally rectangular shape, said top cover comprising a rectangular and generally planar inner wall portion having a periphery, upright side-

walls joined to each other at ends thereof and further joined to said periphery, said sidewalls extending orthogonally to said inner wall portion to define with said inner wall portion an interior of said top cover, said sidewalls having edges at sides thereof opposite to said inner wall portion;

ii) a bottom cover substantially identical to and placed in an orientation opposite from the top cover, so as to form a shirt-receiving space between the covers to receive two folded shirts when in a closed position;

iii) a means for moving the top and bottom covers between an open and closed position relative to one another;

iv) a means for releasably locking the top and bottom covers to one another;



v) a pair of collar inserts, one of said pair of collar inserts extending orthogonally from the inner wall portion of the top cover into the interior of said top cover at one end thereof, the other of said pair of collar inserts extending orthogonally from the inner wall portion of the bottom cover into the interior of said bottom cover at an end thereof opposite to said one end, said pair of collar inserts; of a size, shape, and height to permit insertion of each collar insert within the shirt collars of two folded shirts that lie in a back-to-back and opposite direction relative to one another within the shirt-receiving space to maintain the shirt collars in a noncrushable position; and

b) a pair of folded shirts in a back-to-back, reverse, stored position within said apparatus with said collar inserts inserted within the collars of said shirts" has been inserted immediately.

5,316,140
GARMENT CARRIER

Dennis Purkiss, Chicago, Ill., assignor to American Guard-It Manufacturing, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 856,255, Mar. 25, 1992. This application Aug. 12, 1993, Ser. No. 105,803

Int. Cl.^{5} B65D *85/18*

U.S. Cl. 206—287.1 **8 Claims**

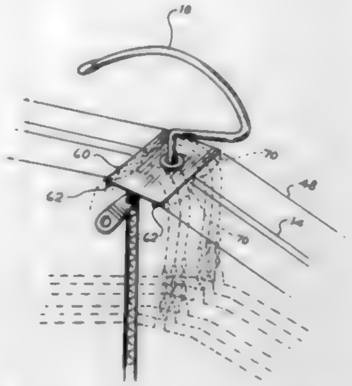
1. A garment carrier for supporting a plurality of garments mounted on respective hangers having hooks for transportation of the garments, the garment carrier comprising:

a cover for at least substantially covering said plurality of garments having an opening in its upper end;

a support strap attached to the upper end of the interior of the cover and having an opening which underlays the opening in the upper end of the cover;

a frame having a lower cover supporting portion disposed within said cover for engagingly supporting the cover thereon, and an upper hand gripping portion integral with the lower cover supporting portion and extending outward of the openings in the support strap in the upper end of the cover;

said support strap having means for attaching to said cover and means for engaging hangers disposed within said cover, said hanger engaging means being adapted to engagingly receive each of the hooks of the plurality of hangers having garments thereon, to support each of the plurality of garments at approximately the same height within said cover; and



said opening in said support strap and said opening in the upper end of said cover defining a first aperture which extends completely through said cover and support strap by which the cover is slidably onto and off of said hand gripping portion of said frame, and said hanger engaging means comprising at least a second aperture defined by said strap and aid cover, whereby the hooks of the plurality of hangers of the respective garments are slidably received by said at least second aperture between said strap and said cover.

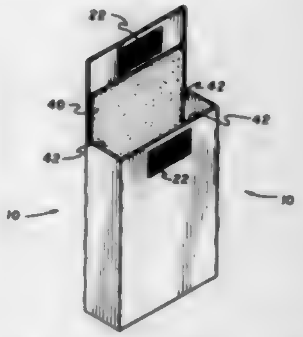
5,316,141
REMOTE CONTROL COVER

Bernabe F. Jalomo, 2105 Santa Cleotilde, Laredo, Tex. 78041

Filed Oct. 9, 1992, Ser. No. 958,785

Int. Cl.^{5} B65D *85/38*

U.S. Cl. 206—320 **2 Claims**



1. A remote control cover comprising a hollow body having a solid front wall having a front surface, a solid rear wall having a front surface, solid right side and solid left side walls, and a solid bottom panel, said walls and bottom panel being continuously attached at their respective joints, and

a flexible flap cover having an inside surface, said flexible flap cover being an extension of said rear wall, whereby said flat cover is folded over to close said hollow body, said hollow body further including hook and loop material fastening means, there being one of said hook and loop material fastening means mounted on said flap cover inside surface and the other of said hook and loop material fastening means being mounted on said front wall surface such that said one and said other hook and loop material fastening means overlap and fasten when said flap cover is folded over, thus closing said remote control cover, whereby a remote control device is protected against minor bumps and collisions,

said hollow body being made of flexible, plastic material, whereby said joints formed by joining said plastic material are at least as strong as said hollow body, so that said body flexibly yield to pressure and said hollow body flexibly conforms to a configuration of a remote control device inserted thereinto within elastic limits of said hollow body, said plastic material enabling said flap cover to bend and thus close said hollow body, said hollow body maintaining a rectangular configuration in the absence of pressure and in the absence of a remote control device therein,

said control cover further including a plastic foam sheet attached to said rear wall front surface, said plastic foam sheet extends from said rear wall front surface at least partially thereabove and onto said inside surface of said flexible flap cover, and said plastic foam sheet extends to and terminates at a transverse line immediately beneath said one of said hook and loop material fastening means mounted on said flap cover inside surface.

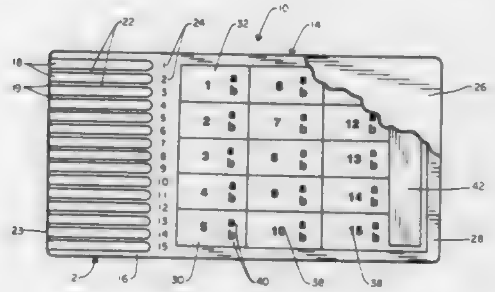
5,316,142
SURGICAL NEEDLE AND PACKAGE COUNTER

Krishna M. Jain, 8405 Plover, Kalamazoo, Mich. 49002

Continuation of Ser. No. 653,000, Feb. 8, 1991. This application Mar. 18, 1992, Ser. No. 853,880

Int. Cl.^{5} A61B *17/02*

U.S. Cl. 206—370 **7 Claims**



1. A surgical needle package counter comprising a body having an upper surface and an adjoining side surface, at least one slot in said body, said at least one slot extending through said upper and side surfaces and adapted to receive a used needle package, said body further comprising a needle counting extension having means for receiving needles, said needle receiving means comprising a resilient flexible material disposed on the extension and having at least one needle receiving zone, a first visual indicium on said upper surface adjacent to said at least one slot for counting and identifying a used needle package received in said slot, a second visual indicium disposed on said needle receiving zone, said zone corresponding to said at least one slot by an identity between said first and second visual indicia so that needles received in the zone can be identified as coming from said used needle package in said at least one slot adjacent to the corresponding first visual indicium.

5,316,143
DEVICE FOR HOLDING CYLINDRICAL SOCKET HEADS

Billy L. Horn, 1313 Greenbriar, Rapid City, S. Dak. 57701

Filed Nov. 12, 1992, Ser. No. 959,117

Int. Cl.^{5} B65D *85/70*

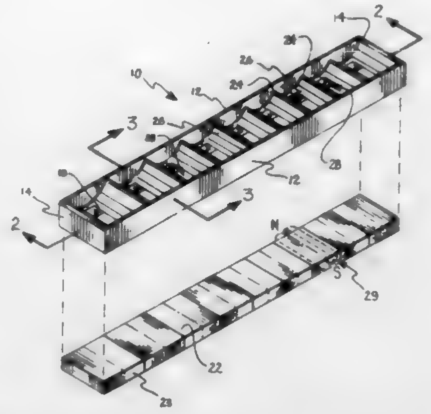
U.S. Cl. 206—378 **24 Claims**

1. A device for holding cylindrical socket heads of varying circumference comprising:

(a) a body having a pair of parallel sidewalls and a pair of parallel end walls;

(b) a plurality of ridges traversing said body perpendicular to said sidewalls, said ridges defining a plurality of parallel channels of descending circumference;

(c) a rectangular aperture traversing each of said channels; and



(d) a magnet engaged to said pair of sidewalls, and said pair of end walls opposite said channels, said magnet is positioned proximal to said apertures, said magnet having a plurality of pole lines perpendicular to said pair of sidewalls, one of said pole lines centrally positioned within each of said channels, said magnet further engaging a socket head of corresponding circumference to one of said channels, maximizing visibility of said socket head.

5,316,144
HOLDER FOR A CASSETTE

Gerhard Habelt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

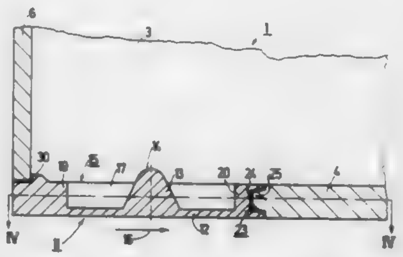
Continuation-in-part of Ser. No. 784,352, Oct. 29, 1991, abandoned. This application Mar. 19, 1992, Ser. No. 853,677

Claims priority, application Austria, Mar. 26, 1991, A 666/91

The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.

Int. Cl.^{5} B65D *85/575*

U.S. Cl. 206—387 **17 Claims**



1. A holder of rectangular shape for holding a magnetic tape cassette, said holder having two main walls and three minor walls interconnecting said two main walls, said walls enclosing an interior of said holder, an open fourth side through which the cassette is insertable into the interior of the holder, and a clamping member connected to said holder at one of said minor walls for clamping a cassette inserted in the holder, said clamping member consisting of an elastic material and including a projection projecting into the holder interior, said clamping member being elastically deformed by engagement of a cassette inserted in the holder with said projection, characterized in that:

said clamping member consists of an abrasion-proof elastic plastics and comprises a flat elastically deformable plate portion having a thickness smaller than that of said one of said minor walls to which said clamping member is connected and a frame extending about the periphery of said plate portion and having a thickness greater than the thickness of said plate portion, and said projection projects from said plate portion into the holder interior to engage a minor wall of the cassette and retain the cassette inserted into the holder.

5,316,145

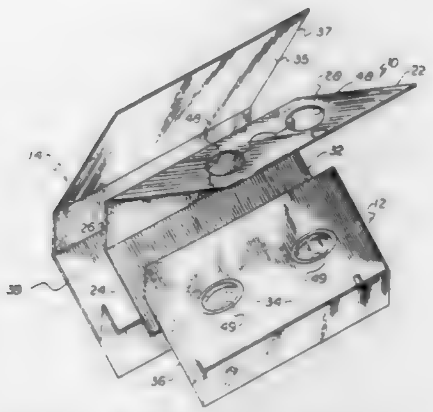
ADVERTISING DISPLAY FOR A VIDEO CASSETTE OR LIKE STRUCTURE

Alija Cohodar, 1465 NE. 29th St., Pompano, Fla. 33064

Filed Jul. 8, 1992, Ser. No. 910,429

Int. Cl.^{5} B65D *85/672*

U.S. Cl. 206—387 **10 Claims**



1. An advertising display structure designed to removably engage a cassette structure such as a video cassette and be removably mounted within a cassette container, said structure comprising:

- a) a first panel disposed in overlying, covering relation with at least a portion of a top face of the cassette,
- b) a second panel movably connected to said first panel and disposed in overlying and covering relation to at least a portion of a bottom face of the cassette,
- c) a base portion movably interconnecting said first panel and said second panel and disposed in overlying relation to at least a portion of a periphery of the cassette,
- d) said first panel, second panel, and base portion structurally adapted and congruently configured to assume an operative position defined by at least partially surrounding the cassette while within the cassette container,
- e) said operative position further defined by said first and second panels removably disposed in substantially sandwiched relation between said top and bottom faces respectively and correspondingly positioned inner surface portions of the cassette container,
- f) said first and second panels each including an outer display surface and an inner display surface oppositely disposed relative to one another, said outer display surface of each panel disposed in confronting engagement with a correspondingly positioned inner surface portion of the cassette container, and in a visually exposed position when said first and second panels are in said operative position and said inner display surface of each panel being disposed in a visually exposed position when spaced outwardly from the cassette and not in said operation position,
- g) at least one of said first or second panels including at least one aperture formed therein and disposed in aligned registry with a hub portion of the cassette, said one aperture structurally adapted to allow passage therethrough of a support post formed on an inner portion of the cassette container, and
- h) indicia means selectively disposed on said outer and inner display surfaces of said first and second panels, said one aperture adapted to be an integral part of a pictorial display defining said indicia means on said one panel.

5,316,146

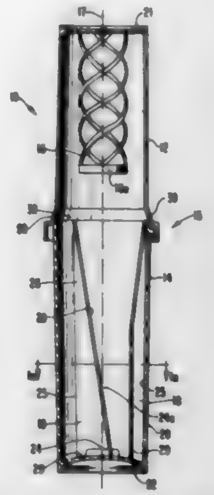
VIAL TRANSPORTER

Daniel A. Graff, Rhinebeck, N.Y., assignor to Ulster Scientific, Inc., Milton, N.Y.

Filed Mar. 6, 1991, Ser. No. 665,077

Int. Cl.^{5} A61B *19/02*

U.S. Cl. 206—438 **24 Claims**



1. A transport container for transporting fragile fluid containers, the transport container comprising:

- an elongated body having first and second ends and side wall means, said first and second ends and said side wall means defining an openable closed container for receiving said fluid container therewithin;
- means for accessing the interior of said closed container for allowing insertion and removal of said fluid container;
- a plurality of yieldably deflectable vanes in said transport container for accommodating the diameter of a fluid container inserted into said transport container between said vanes, said vanes attached to said side wall means and said second end and extending inwardly from a portion of said side wall means and said second end into said transport container, said vanes each including an inclined edge portion extending substantially along the entire length of said vane and having a width, measured along each vane from said side wall means toward the longitudinal axes of said transport container, which is greater for portions of each said vane adjacent said second end wall than for portions of said vanes along said axis remote from said second end wall, said vanes yieldably restraining movement of said fluid container in a direction toward said second end and supporting said fluid container along its bottom and lower side surfaces within said transport container with the end of said fluid container adjacent to and spaced from said second end of said transport container, said vanes also spacing said fluid container from and yieldably restraining movement thereof toward said side wall means; and
- bias means in said transport container for spacing said fluid container from and restraining movement of said fluid container toward said first end and for applying a biasing force to said fluid container in a direction away from said first end and toward said second end for seating said fluid container within said plurality of vanes;
- whereby a fluid container received within the transport container is maintained out of contact with said first and second ends and said side wall means by the cooperative interaction of said bias means and said plurality of vanes.

5,316,147

CASE FOR RECEIVING A BREAST PROSTHESIS

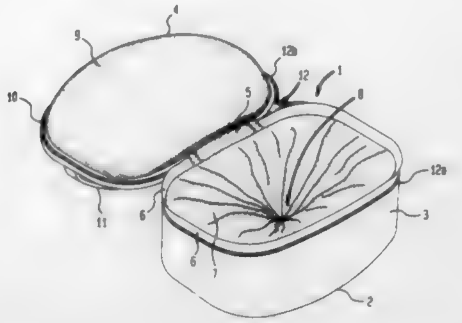
Georg Weber-Unger, Kufstein, Austria, assignor to Dr. Helbig GmbH & Co Orthopädische Produkte KG, Brannenburg, Fed. Rep. of Germany

Filed Sep. 1, 1993, Ser. No. 116,069

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1992, 9212261

Int. Cl.^{5} B65D *81/06*

U.S. Cl. 206—438 **12 Claims**



1. A case for receiving a breast prosthesis, comprising:

- a main body and;
- a cover for closing said main body, said main body being filled with elastic material such as to include a depression which opens toward said cover, said depression being funnel-shaped when being unstressed and essentially conforming to the configuration of a breast prosthesis when the latter is placed in said main body.

5,316,148

DISPENSER FOR THE CONTROLLED RELEASE OF PHEROMONES

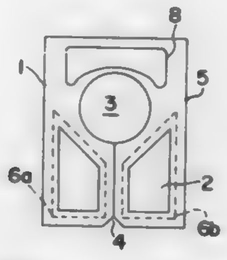
Ulrich Neumann, Schifferstadt; Ernst Buschmann, Ludwigshafen; Ulrich Kiessling, Erpolzheim, and Guenter Renz, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 29, 1992, Ser. No. 968,409

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1991, 4136212

Int. Cl.^{5} F17G *13/00;* **B65D** *73/00*

U.S. Cl. 206—484.1 **10 Claims**



1. A dispenser for the controlled release of pheromones, in particular sexual pheromones, wherein a dimensionally stable container which consists of a material impermeable to the pheromone and serves as a pheromone reservoir having a volume of from 0.5 to 2.5 ml is closed by means of a pheromone-permeable film which is responsible for the pheromone release and whose release area does not exceed 10 cm^2.

5,316,149

REUSABLE BAG FOR PACKAGING ARTICLES

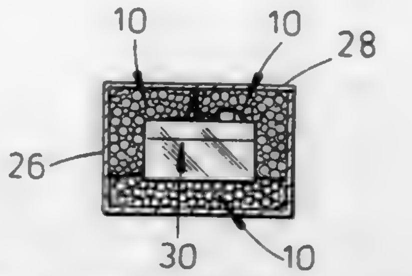
David J. Tate, Cumbria, England, assignor to Lilliput Lane Limited, Cumbria, United Kingdom

Filed Feb. 27, 1991, Ser. No. 661,239

Claims priority, application United Kingdom, Jun. 5, 1990, 9012521

Int. Cl.^{5} B65D *81/02, 85/30*

U.S. Cl. 206—584 **12 Claims**



1. A reusable packaging bag for fitting around an article, comprising:

- a plastic bag containing a plurality of plastic particles, some of the particles having a smaller size than other of the particles, the plastic gag being air-permeable so that forcing the packaging bag against the article causes air to escape from the particles and the larger size particles to fit together to form a substantially rigid body against the article, said plastic bag being made of an anti-static material.

5,316,150

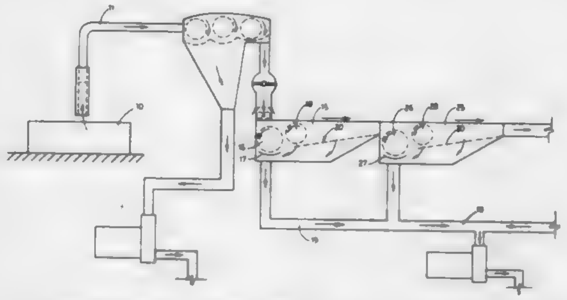
FIBER SEPARATION PROCESS

Gordon Fisher, P.O. Box 577, Corcoran, Calif. 93212

Filed Mar. 2, 1993, Ser. No. 25,262

Int. Cl.^{5} B07B *9/00*

U.S. Cl. 209—30 **18 Claims**



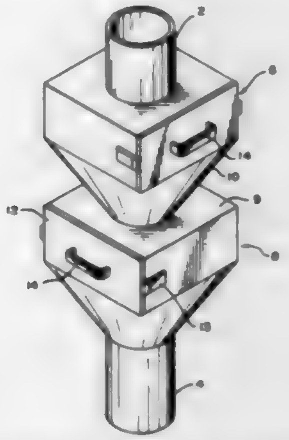
1. A method for separating the long outer bast fibers from the short woody inner core fibers of herbaceous fiber producing plants comprising the steps of:

- a. harvesting the plants using a short cut length;
- b. introducing the plants so harvested into a first core separator wherein the harvested plant fibers come into contact with a rotating spiked cylinder partially surrounded by a concave grated housing, said cylinder mounted adjacent to a means for producing air flow, said means mounted adjacent to a plurality of upwardly inclined moving conveyor surfaces having openings therein, whereby many of the woody innercore plant fibers are caught by the spikes in said cylinder and thrown through said grated housing leaving the longer outer bast fibers to pass onto said moving conveyor by said air flow means such that as said conveyors move said fibers upward, many more of the woody innercore fibers drop through the openings therein; then

c. introducing the bast fibers output from the first core separator into an identical second core separator; and then
d. introducing the bast fibers from the previous step into a first incline separator wherein the fibers come into contact with a plurality of synchronously rotating spiked cylinders mounted adjacent to each other on an incline and above a set of grid bars having openings between them wherein, as the bast fibers are worked upward on the spiked cylinders, innercore fibers are removed and drop through the grid bar openings; then
e. introducing the bast fibers output from the first incline separator into a second incline separator which is identical to the first incline seperator except that the openings between the grid bars of said second incline separator are more narrow than the openings between the grid bars of the first incline separator; and then
f. introducing the bast fibers from the previous step into a saw cleaner wherein the fibers come into contact with a cylinder around which a spiked wire has been tightly wrapped, said cylinder mounted above a set of stationary grid bars, so that centrifugal force throws the innercore fibers through the grid bars and the separated bast fibers exit the saw cleaner; then
g. introducing the bast fibers from the previous step into a jet air fiber separator wherein the fibers are blown against the facing edge of an adjustable blade for separation; then
h. introducing the bast fibers from the previous step into a four cylinder fiber cleaner wherein the fibers come into contact with four (4) synchronously rotating level-mounted spiked cylinders which are mounted above a set of horizontal grid bars under which a suction is applied, so that any remaining innercore fibers fall through the grid bars and very clean bast fibers exit the cleaner.

5,316,151
MAGNETIC PARTICLE SEPARATOR

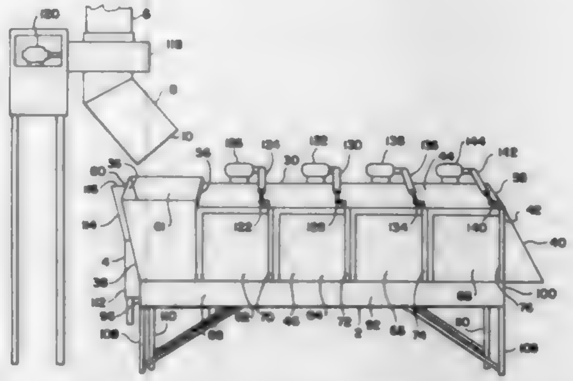
R. Bruce Thompson, Havertown, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Mar. 9, 1993, Ser. No. 28,226
Int. Cl.⁵ B03C *1/00*
U.S. Cl. 209—223.1 **7 Claims**



1. A magnetic particle separator for removing magnetically attractable particles from a particle stream of mixed composition flowing in a conduit along an axis of flow, said separator comprising:
a housing forming an enlarged portion of said conduit, said housing being open at the top and bottom thereof to allow the particle stream to flow through said housing;
an entrance pipe formed at the top of said housing for receiving the particle stream into the housing;
an exit pipe formed at the bottom of said housing for exhausting the particle stream from the housing;
a first drawer assembly, having opposite side walls and front and back end walls forming a drawer open at its top and bottom and slideably mounted in said housing between said entrance pipe and said exit pipe for movement in one direction parallel to the plane of said side walls;
a plurality of hollow tubes extending between said side walls and attached at each end to one of said side walls of said drawer and transverse to the one direction of the drawer, said hollow tubes being open on at least one end;
a plurality of magnetic rods attached to a rod supporting plate to form a magnetic rod assembly, said magnetic rods being attached to said rod supporting plate to allow the rods to be inserted into the inside of said tubes through the open ends of said tubes and the rod supporting plate lying against the outside surface of one of said side walls of said drawer and between the outside of said side wall and the inside surface of said housing when the rods are in the tubes and said drawer is in said housing whereby the rods can only be removed from the tubes when the drawer is removed from the housing and;
a second drawer assembly the same as said first drawer assembly and assembled in said housing downstream from said first drawer assembly in said particle stream, said second drawer assembly mounted for movement in a second direction in a plane parallel to the plane of said one direction of movement of said first drawer assembly, said second direction being at an angle to said one direction of said first drawer assembly about the axis of flow of said particle stream.

5,316,152
HIGH RISE RECYCLING SYSTEM

James A. Ross, 1891 W. Rowley Rd., Plainfield, Ill. 60544
Filed Jul. 6, 1992, Ser. No. 909,491
Int. Cl.⁵ B07C *5/36*
U.S. Cl. 209—630 **16 Claims**

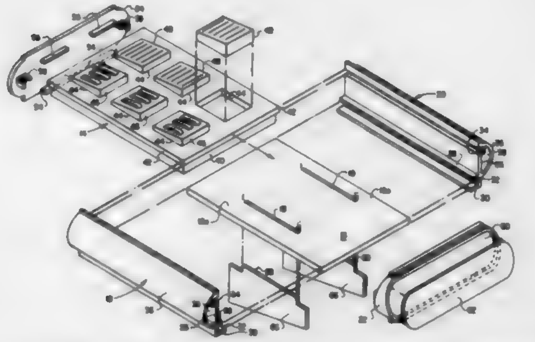


1. A disposal system to receive disposable items and separate them into a plurality of different categories for discharge into a corresponding plurality of disposal receptacles, comprising an upwardly extending chute having an upper end and a lower end, entrance aperture means opening to said chute above its said lower end and below its said upper end to receive disposable items therein for disposal, movable discharge means at said lower end of said chute movable to direct discharge of disposal items into a first disposal receiving chamber when moved to a first discharge position and into a second disposal receiving chamber when moved to a second discharge position, including said first and second disposal receiving chambers, an elongated housing having said second disposal receiving chamber position at the upstream end thereof, an elongated conveyor cavity extending in said elongated housing in communicating with said second disposal receiving chamber at the said upstream end thereof and terminating in an end wall at the downstream end thereof, conveyor means positioned relative to said elongated conveyor cavity and said second disposal receiving chamber to receive disposal items discharged into said second disposal receiving chamber and convey them from

said upstream end of said elongated housing in the direction toward said downstream end thereof, said elongated housing including selective discharge means between its said upstream and downstream ends to selectively discharge a plurality of different kinds of disposal items into respective ones of a corresponding plurality of disposal receptacles, wherein said first disposal receiving chamber comprises a hopper mounted on a compactor for discharge of garbage into said hopper to be compacted by said compactor.

5,316,153
DISPLAY CASE APPARATUS

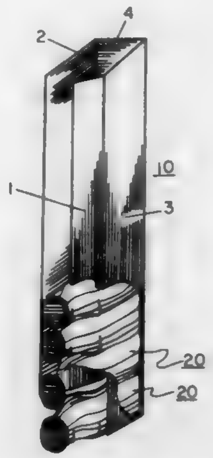
Dennis L. Crawford, Dallas; Barry K. Rutherford, and Paul E. Chandler, both of Plano, all of Tex., assignors to Chippenhook Corporation, Lewisville, Tex.
Filed Jul. 10, 1992, Ser. No. 911,875
Int. Cl.⁵ B65D *1/34*
U.S. Cl. 211—13 **19 Claims**



1. A display case base unit for interchangeably receiving, supporting and displaying a selectively variable one of a plurality of display inserts each having an opposed pair of similarly sized and spaced apart parallel side edge portions, said base unit comprising:
a rectangular base wall having first and second pairs of opposed side edges;
an upstanding rectangular support frame structure secured to and extending around the periphery of said base wall, said support frame structure defining with said base wall an open-topped cavity portion of said base unit permitting substantially unobstructed viewing of the selected display insert operatively received in said base unit, said support frame structure being sized to peripherally circumscribe each of the display inserts and including:
first and second frame side members secured to and longitudinally extending along said first pair of opposed side edges of said base wall, said first and second frame side members having inner side surface portions disposed above said base wall,
a third frame side member extending along one of said second pair of opposed side edges of said base wall between first ends of said first and second opposed side edges of said base wall,
a fourth frame side member,
attachment means for removably attaching said fourth frame side member to said first and second frame side members to extend along the other of said second pair of opposed side edges of said base wall between the second ends of said first and second frame side members, and
groove means, formed in and extending along the lengths of said inner side surface portions of said first and second frame side members, for slidably receiving the opposite side edge portions of a selected one of the display inserts as the insert is moved into said cavity portion of said base unit, toward said third frame side member, with said fourth frame side member temporarily removed from
said first and second frame side members, and
elevating means associated with the underside of said base all and engageable with a horizontal support surface upon which said base unit is rested, said elevating means being operative to slope the base unit at a predetermined angle relative to the support surface,
whereby, after reattaching said fourth frame side member to said first and second frame side members, the selected display insert is given the appearance of being permanently framed within a dedicated display case, but may be readily removed and replaced with a selected second one of the display inserts to give the second display insert the same permanently framed appearance using the same base unit.

5,316,154
RACK FOR STORING AND DISPENSING PLASTIC OIL CONTAINERS

John W. Hajec, Jr., P.O. Box 2006, Eaton, Colo. 80615
Filed Nov. 4, 1992, Ser. No. 971,358
Int. Cl.⁵ A47F *5/00*
U.S. Cl. 211—59.2 **5 Claims**



1. A rigid, elongate rack positioned vertically for storing and dispensing a vertical stack of rectangular plastic oil containers of the type having a spout that is offset to one side of a centerline of each of the containers, the rack comprising:
a flat rear member;
left and right flat side members extending forward of the rear member and being perpendicular thereto;
an open top through which a supply of plastic oil containers may be loaded into said rack;
a flat bottom member connected to the rear member and to the left and right side members; and
a forwardly angled front member extending from one of the left and right side members, the front member being angled to provide a longitudinal frontal opening in said rack for receiving said spout of each of the plastic oil containers stacked in said rack, said longitudinal frontal opening being provided adjacent an opposite one of said left and right side members to that from which said forwardly angled front member extends;
said left and right side members and said front member being notched upward and rearward from the bottom member to create a frontal opening adjacent the bottom member through which only a bottom one of the vertical stack of plastic oil containers may be withdrawn.

5,316,155
SKI RACK

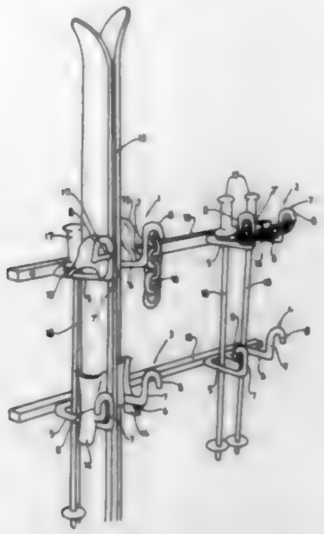
Antony P. Collins, 67 Ilam Road, and Alfred B. Wright, 29 Kirkwood Avenue, both of Christchurch, New Zealand

Filed Sep. 28, 1992, Ser. No. 953,476

Claims priority, application New Zealand, Sep. 28, 1991, 239035

Int. Cl.⁵ A47F *7/00*

U.S. Cl. 211—70.5 **9 Claims**



1. A ski rack that comprises a frame with at least one pair of ski-retaining sections mounted thereon, the ski-retaining sections of each pair being spaced above each other and dimensioned and shaped to retain upright therein a set of skis that are positioned together with their bases facing each other and with their bindings facing outward, the bindings of the set of skis being retained by the ski-retaining sections, which have U-shaped regions, the outer ends of the U-shaped regions having an upstanding member on each side, the U-shaped regions and upstanding member of each ski-retaining section being adapted to retain the sets of skis in position against accidental release, the upper and lower ski-retaining sections being spaced apart so that rear bindings of the skis rest on the lower ski-retaining section with the front bindings contained by the upper ski-retaining sections.

5,316,156
DISPLAY RACK

Marty W. Land, 211 White Oak St., Tullahoma, Tenn. 37388; Russell E. Mangrum, 48 Broadrick Rd., Normandy, Tenn. 37360, and Joseph W. Martin, Rte. 2, Box 152D, Wartrace, Tenn. 37183

Filed Jan. 4, 1993, Ser. No. 242

Int. Cl.⁵ A47F *5/00*

U.S. Cl. 211—149 **7 Claims**

1. A display rack including a foundation, a core and one or more dividers constructed from a cardboard-like material and a clear strip constructed from a plastic-like material, wherein:

a. the foundation, core, dividers and strips are formed from plane sheets of material in pre-determined patterns;

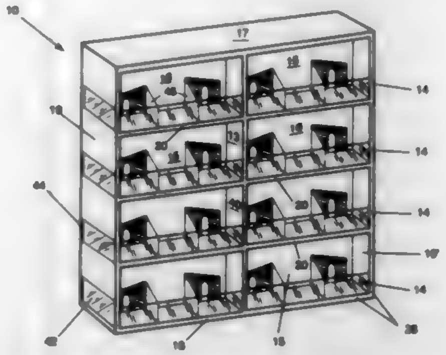
b. the foundation includes a back and panels, the panels connected to the back by hinges;

c. the panels include sections which can be folded upon themselves to create a top, bottom and sides so that when the foundation is assembled it takes the shape of a box;

d. the core includes joints which allows the core to be folded upon itself to form one or more shelves, the core having ears which are captured within slots formed in the panels that are folded to create the sides to the foundation, and the ears fit within the slots to hold the shelves in place within the box formed by folding the foundation;

e. a divider which extends perpendicular to the shelves and which has slots that mate with the shelves to connect the shelves and the divider in a fixed relationship;

f. the divider having ears which fit within slots formed within the panels of the foundation which are folded to form the top and bottom of the box created when the foundation is folded to assemble the display rack; and



g. clear strips in contact with the shelves and aligned with the shelves to create a barrier across the open part of the sections formed when the core is inserted in the foundation, said strips passing around the sides of the foundation and connecting to the foundation.

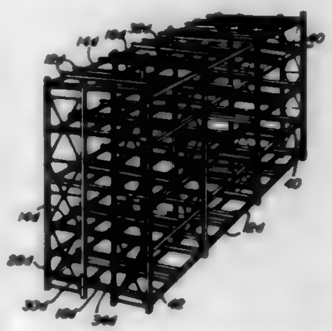
5,316,157
RACK HAVING BEAMS AND COLUMNS OF DIFFERING NUMBERS

Anthony N. Konstant, 920 Fisher La., Winnetka, Ill. 60093

Filed Oct. 29, 1992, Ser. No. 968,198

Int. Cl.⁵ A47F *5/00*

U.S. Cl. 211—151 **17 Claims**



1. A pallet rack which comprises at least two pairs of spaced, parallel rails, said pairs of rails carrying at least one rolling cart for receiving a pallet, said rails being carried on a first beam and a second beam, said beams being positioned in spaced and generally parallel relation to each other and positioned transversely of said rails, a plurality of spaced first columns connected to and supporting said first beam; a plurality of spaced, second columns connected to and supporting said second beam, there being present a greater number of second columns than first columns, said second columns being more closely spaced together than said first columns.

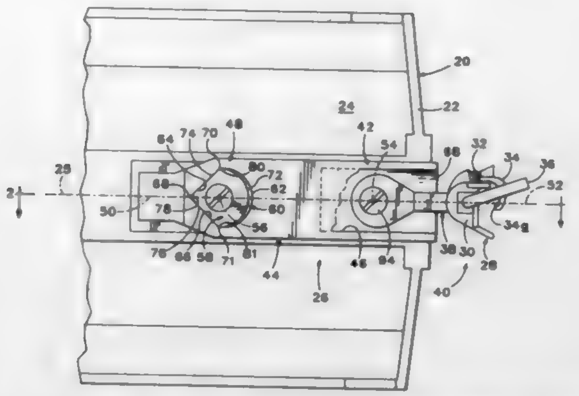
5,316,158
COUPLER STRUCTURE FOR MODEL TRAINS WITH CENTERING CAVITY AND SURFACES

Michael N. Dunham, and Lawrence D. Edwards, both of Eagle Point, Oreg., assignors to Kadee Quality Products Co., White City, Oreg.

Filed Jan. 26, 1993, Ser. No. 9,272

Int. Cl.⁵ B61G *3/00*

U.S. Cl. 213—75 TC **17 Claims**



1. An improved coupler structure for use on model railroad rolling stock, which rolls on trucks attached thereto, wherein the rolling stock has a body, having a body axis thereon, comprising:

a coupler having a shank;

a joining mechanism, for joining to a companion joining mechanism on another unit of rolling stock, located at one end of said shank; and

a centering structure located adjacent the other end of said shank for maintaining said coupler in an axially aligned condition with the body axis, said centering structure including a centering cavity formed in said shank other end and a centering mount attached to said body wherein said centering cavity includes a first dome-capped triangular potion and said centering mount includes a second dome-capped triangular portion, wherein said centering mount is substantially conformal with said centering cavity and said centering cavity is oversized relative to said centering mount.

5,316,159
DUAL BOTTLE CONTAINER

Jerry A. Douglas, Harrisburg, Ill., and Godfried Schmidt, Redondo Beach, Calif., assignors to Plastic Processing Corporation, Gardena, Calif.

Continuation-in-part of Ser. No. 791,009, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 662,827, Mar. 1, 1991, Pat. No. 5,158,191. This application Jul. 20, 1992, Ser. No. 916,532

Int. Cl.⁵ B65D *23/08, 21/02, 25/38*

U.S. Cl. 215—10 **28 Claims**

1. A dual bottle container comprising:

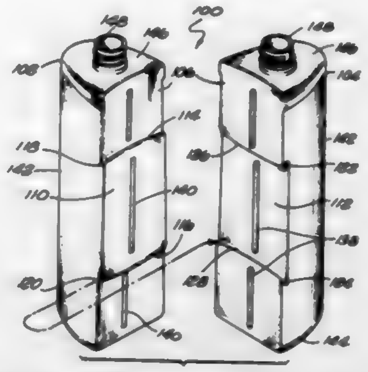
first and second bottles each having a generally planar wall portion extending from a front surface to a back surface of said bottle, and a longitudinal axis extending heightwise of the bottle;

the generally planar wall portion of the first bottle having a raised portion forming a substantially flat plateau extending transversely with respect to the longitudinal axis of the bottle and bordered on opposite sides by rounded lip portions;

the generally planar wall portion of the second bottle having a recessed portion forming a substantially flat depression extending transversely with respect to the longitudinal axis of the bottle and bordered on opposite sides by rounded groove portions;

at least one of the rounded lip portions or the rounded groove portions being tapered at opposite ends to form a peak;

the plateau being receivable within the depression in a sliding relationship to engage the rounded lip portions of the first bottle with the rounded groove portions of the second bottle as the two bottles are moved to a predetermined engaged position in which said generally planar wall portions are in close face-to-face relation.



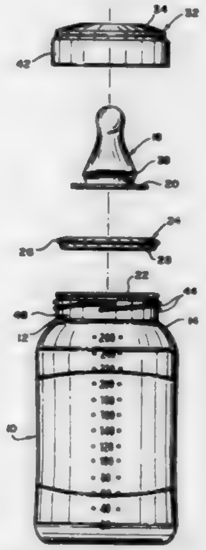
5,316,160
BABY BOTTLE ASSEMBLY

Victor J. J. Cautereels, Borsbeek, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.

Filed Sep. 4, 1992, Ser. No. 940,562

Int. Cl.⁵ A61J *9/00, 11/04*

U.S. Cl. 215—11.1 **8 Claims**



3. A baby bottle assembly including a bottle with a wide mouth defined by a peripheral rim, a feeding nipple alignable over said mouth radially inward of said rim and dimensionally of a size for free movement through said mouth, a removable adapter overlying and engaged with said rim, said adapter extending radially inward of said rim peripherally thereabout and partially overlying said mouth, said adapter extending partially inward of said nipple peripherally thereabout upon alignment of said nipple over said mouth to define a support for receiving said nipple thereon and precluding passage of said nipple through said mouth, collar means for clamping said nipple and said adapter against said rim, and cooperating means on said collar means and said bottle for securing said collar means to said bottle and for indicating the presence and absence of said adapter, said collar means comprising an annular top panel overlying said adapter and adapted to partially

overlie said nipple, and a depending peripheral skirt encircling said bottle below said rim, said cooperating means on said collar means and said bottle comprising internal threads on said skirt projecting inward thereof, and cooperating external threads on said bottle projecting outward thereof whereby rotation of said collar means relative to said bottle will effect downward travel of said collar means on said bottle for a selective clamping and release of said nipple and adapter, said skirt being of a depth and said internal threads thereon being so located as to, with the presence of said adapter, maintain threaded engagement between said internal threads and said external threads throughout the full extent of downward movement of the collar means relative to said bottle, and so as to, in the absence of said adapter, position said internal threads on said skirt below and disengaged from said external threads on said bottle for free rotation of said collar means relative to said bottle whereby absence of said adapter is indicated.

5,316,161

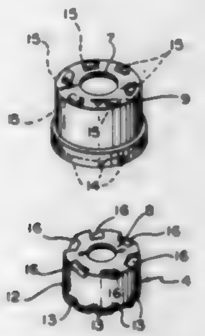
CHILD RESISTANT CLOSURE

Frank V. Gargione, Egg Harbor, N.J., assignor to Comar, Inc., Buena, N.J.

Filed Apr. 20, 1993, Ser. No. 48,509

Int. Cl.⁵ B65D *55/02*

U.S. Cl. 215—220 **2 Claims**



1. A child resistant closure comprising, an inner cap threadably connected to a container, an outer cap rotatably mounted on said inner cap, each cap having a top wall and a depending skirt portion, a plurality of resilient flexible fingers provided on the outer peripheral surface of the inner cap skirt along the lower edge portion thereof said flexible fingers being flexible in a vertical direction only with respect to the inner cap skirt, a plurality of teeth provided on the inner peripheral surface of the outer cap skirt along the lower edge portion thereof, a portion of the resilient flexible fingers being normally biased into engagement with a portion of said teeth, to thereby connect the inner cap with the outer cap for screwing the closure onto the container, another portion of the teeth engaging another portion of the resilient flexible fingers, to thereby cause the fingers to flex vertically with respect to the inner cap skirt portion to move the resilient flexible fingers out of engagement with the teeth when the outer cap is turned in a direction to remove the closure from the container, whereby the outer cap is freely rotatable on the inner cap, and means operatively connected between the inner and outer caps for interconnecting the caps when the closure is turned in a direction to remove the closure from the container.

5,316,162

UNIVERSALLY ADAPTABLE CHILDPROOF CAP

Theodore J. Pierson, Kinnelon, N.J., assignor to Pierson Industries, Inc., Rockaway, N.J.

Filed Nov. 13, 1992, Ser. No. 976,183

Int. Cl.⁵ B65D *55/02*

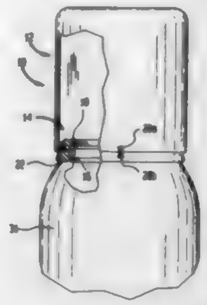
U.S. Cl. 215—223 **7 Claims**

1. A two-piece safety cap for a container including a valve assembly having a valve rim thereon, said cap comprising:

a collar having an inner surface and an outer surface and a top portion and a bottom portion, said collar securably seatable on said valve rim so that said inner surface is arranged adjacent said valve rim, said bottom portion being sized and shaped so that said collar can be seated on said valve rim independent of the diameter of the container adjacent said valve rim without any interference occurring between said bottom portion and said container;

a cover mountable on said collar in a removable position and also in a non-removable position, said outer surface of said collar comprising a circumferentially arranged groove, said groove being sized and shaped to receive a portion of said cover therein, and recess means for permitting said cover to be mounted on said collar and removed therefrom, said recess means being arranged on said outer surface of said collar, said cover comprising a ridge and a projection, said ridge and said projection extending from said inner surface of said cover, said ridge being adapted to be mounted within said groove of said collar and said projection being sized and shaped to fit within said recess means of said collar, said cover being rotatably mounted on said collar so that said projection can rotate into said groove; and

locking means for locking said cover on said collar when said cover is in said non-removable position, said locking means comprising a combination of said groove of said collar and said ridge and said projection of said cover.



5,316,163

BOTTLE TOP HAVING INNER AND OUTER CAPS FOR SECURING AND SEALING A RESILIENT STOPPER

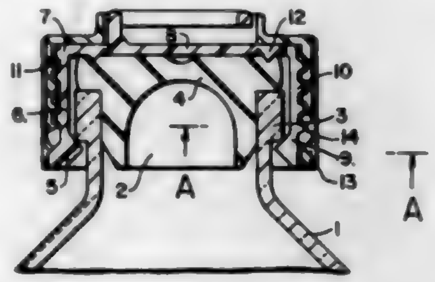
Alfred von Schuckmann, Kevelaer, Fed. Rep. of Germany, assignor to Pohl GmbH & Co. KG, Karlsruhe, Fed. Rep. of Germany

Filed May 4, 1993, Ser. No. 57,285

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1992, 4228090

Int. Cl.⁵ B65D *41/62*

U.S. Cl. 215—249 **12 Claims**



1. A bottle top for a bottle having a vertical neck with an upper surface and an external circumferenctial surface which forms a bead, said bottle top comprising a tough plastic outer cap, a tough plastic inner cap, and a soft polymer stopper, wherein the stopper fits inside the inner cap, which, in turn, fits inside the outer cap; wherein the inner cap has a roof portion and a lateral circumferential portion; wherein the circumferential portion of the inner cap comprises a plurality of vertical strips that are resilient radially outward and are held against the neck of the bottle by the outer cap; wherein outer surfaces of said strips form an external thread; wherein bottom ends of said strips comprise beveled-in edges that engage the bottom edge of the bead, forcing the stopper against the upper surface of the bottle's neck; and wherein the outer cap has an internal thread that screws onto the external thread on said strips.

5,316,164

HOUSING SUITABLE FOR WALL OR BOTTOM FASTENING

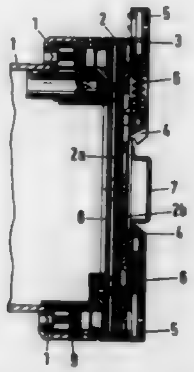
Friedrich Feuerlein, and Helmut Müller, both of Nürnberg, Fed. Rep. of Germany, assignors to Metrawatt GmbH, Nürnberg, Fed. Rep. of Germany

Filed Aug. 17, 1992, Ser. No. 930,175

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1991, 4127253

Int. Cl.⁵ B65D *25/24*

U.S. Cl. 220—3.2 **26 Claims**



1. An electrical system equipment housing for fastening to a wall or bottom surface, comprising a substantially parallelepiped housing body, a bottom part being secured to said housing body and having an outer surface, a replaceable or interchangeable fastening adaptor being adapted to an intended type of wall or bottom fastening, and retaining elements formed on said outer surface of said bottom part for enabling said fastening adaptor to be slipped on; wherein said bottom part includes two bottom halves being slipped onto said housing body from two opposite sides and meeting one another in the middle of said bottom part with abutting edges; and wherein said bottom part has bottom walls and two side walls forming a flat shell shape, said bottom part has housing walls with ends, said bottom part is opened on one side for slipping on only when separated into said two bottom halves, said interengaging side elements are disposed in sliding direction and on corresponding outer surfaces of said housing body for effecting a meandering sealing of the equipment housing.

5,316,165

FOLDABLE ELECTRICAL COMPONENT ENCLOSURES

Thomas F. Moran, Jr., Chagrin Falls, Ohio, assignor to Qube Corporation, Chagrin Falls, Ohio

Continuation-in-part of Ser. No. 683,783, Apr. 11, 1991, abandoned. This application Jan. 22, 1993, Ser. No. 7,567

Int. Cl.⁵ B65D *7/00*

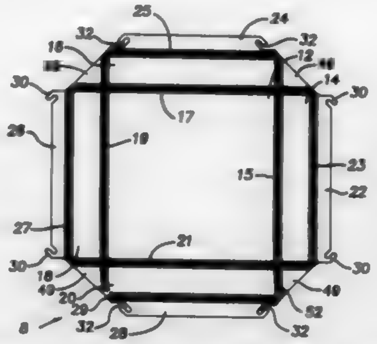
U.S. Cl. 220—62 **13 Claims**

1. A flat rigid or semi-rigid plastic blank comprising:

a backplate;

grooves with an included angle between first and second groove walls of substantially 90 degrees cut into one surface of the blank to define four rectangular sidewalls, an edge of each sidewall being attached to an edge of the backplate by an integral hinge portion in the other surface of the blank below the groove;

the cross section of each groove defining at least one ridge in a first groove wall which interfits with a furrow in a second groove wall, the grooves parallel to each other being identical in cross-section and the grooves at right angles to each other being reversed but otherwise identical in cross-section to the parallel grooves,



the sidewalls being foldable along the hinge portions to form a rigid, open-faced structure when provided with means for holding the edges of adjacent sidewalls together.

5,316,166

CONTAINERS

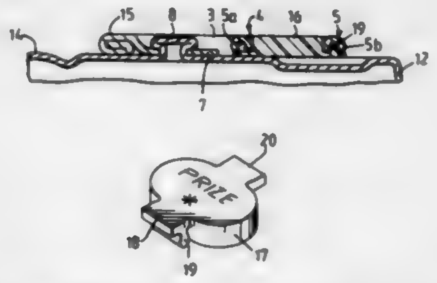
Andrew P. Pavely, Lower Blunsdon; Roy J. Marr, Newbury; Peter S. Foskett, and David M. White, both of Abingdon, all of United Kingdom, assignors to CarnaudMetalbox plc, United Kingdom

Division of Ser. No. 781,693, Oct. 23, 1991, Pat. No. 5,191,695. This application Dec. 22, 1992, Ser. No. 993,606

Claims priority, application United Kingdom, Oct. 25, 1990, 90 23243.0

Int. Cl.⁵ B65D *17/34*

U.S. Cl. 220—269 **10 Claims**



1. The combination of a pull tab and a token comprising a token having a body removably retained in engagement with a pull tab, the pull tab being adapted for attachment to a container wall, said pull tab having a groove defined by a clinched peripheral curl portion, and a portion of the token being engaged within said groove of said clinched peripheral curl portion of said pull tab.

5,316,167

PRESSURE RESISTANT FUEL TANK CLOSURE

Bruce F. Kay, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

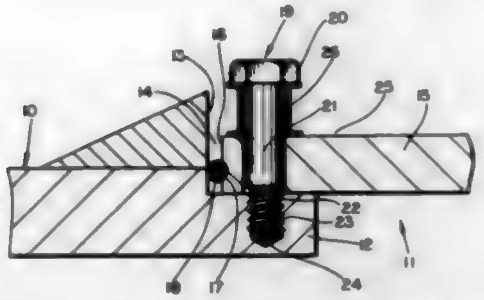
Filed Dec. 23, 1992, Ser. No. 995,874

Int. Cl.⁵ B65D *45/02*

U.S. Cl. 220—328 **13 Claims**

1. A fuel tank comprising a container for fuel having an access opening, defined by a lip portion of the container, a channel having a continuous sidewall surrounding the lip portion, a closure fitted within the channel to cover the access opening and having a seal about the periphery thereof, the seal engaged with the sidewall, means to retain the closure over the access opening and collapsing means associated with the retaining means, the collapsing means having a collapsing thresh-

old sufficiently high such that the collapsing means remain rigid under normal pressure conditions, but sufficiently low such that the collapsing means collapse when an abnormal pressure acts on the closure, the closure being axially displaced as the collapsing collapse, the seal means remaining in engagement with the sidewall of the channel to prevent substantial leakage when the closure has been axially displaced.

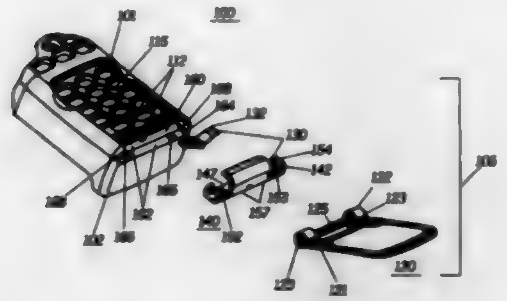


5,316,168
DOOR COVER ASSEMBLY

Steven J. Finch, Sunrise; Kok H. Chong, Tamarac, and Julio Abdala, Miami, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1993, Ser. No. 85,797
Int. Cl.⁵ B65D *43/26*

U.S. Cl. 220—341 **11 Claims**



1. A detachable self-contained door cover assembly, comprising:

a hinge member having a rotation track therein;

a door cover having an integral hinge shaft, said hinge shaft engaging the rotation track to rotatably couple said door cover to said hinge member about an axis of rotation extending through said hinge shaft and said rotation track;

a housing having an integral socket; and

attachment means, engaging said hinge member and said housing, for attaching said hinge member within said socket, said attachment means being detachable, when a force exceeding a threshold value is applied to said hinge member, thereby disengaging said hinge member from said socket without substantial damage to said hinge member or to said housing.

5,316,169
RINGLESS PAINT CONTAINER WITH DRIP FREE LID

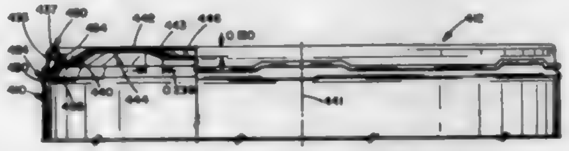
Thomas A. Gallagher, Chagrin Falls, Ohio, assignor to Van Dorn Company, Cleveland, Ohio

Continuation of Ser. No. 750,113, Aug. 26, 1991, which is a continuation-in-part of Ser. No. 629,431, Dec. 18, 1990, Pat. No. 5,065,888, which is a continuation-in-part of Ser. No. 528,531, May 25, 1990, which is a continuation-in-part of Ser. No. 335,566, Apr. 10, 1989, Pat. No. 4,936,482, which is a continuation of Ser. No. 120,471, Nov. 13, 1987, Pat. No. 4,880,131. This application May 5, 1992, Ser. No. 878,613

The portion of the term of this patent subsequent to Oct. 6, 2009, has been disclaimed.

Int. Cl.⁵ B65D *41/00*

U.S. Cl. 220—355 **8 Claims**



1. The combination of a ringless metal container with a removable, resealable lid for sealing liquid contents therein comprising:

a) a container having a cylindrical body portion, a mouth opening formed as a curled bead and a rim portion extending from said mouth opening to said body portion, said opening smaller in diameter than said body portion so that said rim portion tapers radially-inwardly therebetween, stiffening means at the juncture of said rim portion with said body portion for strengthening said rim portion, said curled bead having a generally vertical, inner annular wall section extending at its top into said curled bead and at its bottom into said rim portion; and

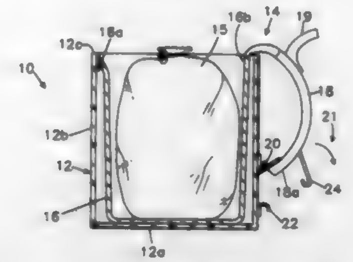
b) a lid having a generally circular configuration with an annular sealing groove extending about its periphery, said sealing groove defined by annular, vertically extending inner and outer sealing wall segments with a bight wall segment longitudinally extending therebetween; said outer sealing wall segment forming an annular outer line contact with said curled bead and said inner sealing wall segment in flat area contact with said curled bead's vertical wall section to compress said curled bead; said inner sealing wall segment terminating in an annular, frusto-conical drip wall segment tapering radially inwardly and vertically upwardly at an ingress angle approximating that at which said rim portion tapers radially inwardly and vertically-upwardly towards said bight wall segment, said vertical inner sealing wall segment intersecting said drip wall segment in an annular groove approximately at the intersection of said rim portion with said bottom of said container's inner annular wall section when said lid is assembled to said body portion so that said rim portion and said drip wall segment cooperate to direct container contents radially-inwardly and upwardly past said sealing groove upon can shaking thus avoiding content leakage past said curled bead; said frusto-conical drip wall segment terminating at an annular, radially-inwardly extending collecting wall segment, said collecting wall segment terminating at a stiffening frusto-conical wall segment tapering radially inwardly and vertically-downwardly at an egress angle whereby paint splashed against said lid during can shaking is directed back into the container; said frusto-conical drip wall segment, said collecting wall segment and said stiffening wall segment forming a collecting basin for container contents splashed against said lid during shaking whereby said contents do not drip into said sealing groove nor on the outside of said body portion after said container is shaken and said lid is removed.

5,316,170
SELF-EJECTING GARBAGE RECEPTACLE

Rita C. Brown, 2120 First Ave., #252, New York, N.Y. 10029

Filed Aug. 3, 1992, Ser. No. 923,387
Int. Cl.⁵ B65D *43/26*

U.S. Cl. 220—409 **5 Claims**



1. A self-ejecting garbage receptacle comprising:

means for holding a bag containing refuse, said means for holding including a container having a bottom and a side wall enclosure with an open upper end, said side wall enclosure being connected with said bottom;

means for normally supporting the bag in a lowered position in said container, said means for supporting including a belt draped in said container and said belt having first and second opposite ends, with said first end being fixed to said side wall enclosure adjacent said open upper end; and

means for raising said belt to a raised position such that the bag is displaced relative to the container in a substantially vertical direction and substantially all of the bag is exposed above said side wall enclosure and open upper end of said container when said belt is in said raised position, said means for raising including an ejector handle connected with said second opposite end of said belt wherein said ejector handle is pivotally connected at one end thereof to said container and is connected with said second opposite end of said belt at an opposite end of said ejector handle.

5,316,171
VACUUM INSULATED CONTAINER

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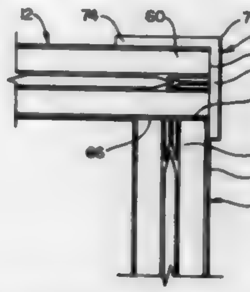
Filed Oct. 1, 1992, Ser. No. 955,354
Int. Cl.⁵ B65D *90/04*

U.S. Cl. 220—423 **17 Claims**



1. A thermal insulating container, comprising:

a plurality of generally planar panels, each of which comprises a first inner air impervious panel section and a second outer air impervious panel section, with each of the first and second panel sections having:

i. first and second main panel portions, respectively, spaced from one another, and

ii. first and second perimeter portions respectively, which extend entirely around the first and second main panel portions, respectively, and which are joined to one another to form an air impervious perimeter seal with said first and second main panel portions and parameter portions defining an evacuated region between said first and second panel sections;

b. a reflective radiation shield positioned in and extending across, said evacuated region, said radiation shield comprising a plurality of reflective sheets positioned in spaced overlapping relationship relative to one another;

c. a plurality of standoff units positioned at laterally spaced intervals in said evacuated region, and engaging said first and second panel sections to withstand compression loads created by ambient atmosphere pressure against said first and second panel sections

d. said panels being joined to one another at edge portions thereof to form a thermally insulated enclosed containing area.

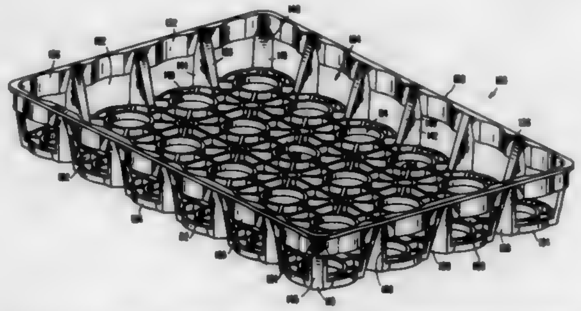
5,316,172
CAN TRAY ASSEMBLY

William P. Apps, Anaheim, and Arne Lang-Ree, Manhattan Beach, both of Calif., assignors to Rehrig-Pacific Company, Inc., Los Angeles, Calif.

Continuation of Ser. No. 765,511, Sep. 25, 1991, abandoned, which is a division of Ser. No. 528,215, May 25, 1990, abandoned, and Ser. No. 739,721, Jul. 30, 1991, abandoned, which is a continuation of Ser. No. 369,598, Jun. 21, 1989, abandoned, said Ser. No. 528,215, is a continuation-in-part of Ser. No. 272,039, Nov. 15, 1988, Pat. No. 4,932,532, Ser. No. 369,598, Nov. 15, 1988, Ser. No. 357,068, May 23, 1989, Pat. No. Des. 317,670, and Ser. No. 504,399, Apr. 3, 1990, abandoned, which is a division of Ser. No. 272,039, Apr. 3, 1990. This application Jun. 1, 1993, Ser. No. 69,677

Int. Cl.⁵ B65D *21/00*

U.S. Cl. 220—519 **8 Claims**



1. A low depth nestable can tray for containing a four-by-six layer array of substantially cylindrical, rimmed beverage cans, said tray having a pair of opposed end walls and a pair of opposed side walls, said end and side walls together forming a low-depth can tray wall structure, a floor construction secured to said wall structure for supporting thereon said array of cans, said floor construction having an open gridwork and a can receiving area for each can of said array, a peripheral top lip protruding outwardly from a top of said wall structure, and said cans of said array extending a distance above said top lip in a low-depth arrangement relative to said wall structure;

wherein the improvements comprise:

at least portions of each of said side and end walls angled inwardly to provide for empty tray nesting;

a plurality of can receiving openings in each of said side and end walls, wherein portions of peripheral cans of said array partially extend out beyond said walls through said openings;

a plurality of interior curved wall portions disposed on each said wall, said curved wall portions generally conforming to the sidewalls of adjacent cans, and generally disposed above each said opening and below said top lip; and

at least one tab structure extending down from said top lip on outer surfaces of said walls to prevent empty nested tray wedging.

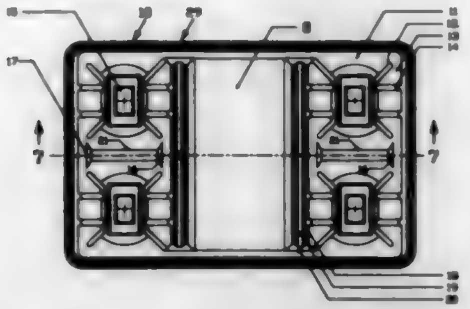
5,316,173
CARRY OUT TRAY

Roy W. Emery, 1 Domino Court, Toronto, Ontario, Canada M4N 2H6

Filed Jul. 27, 1993, Ser. No. 97,679

Int. Cl.^{5} B65D *1/36*

U.S. Cl. 220—556 **10 Claims**



1. A tray comprising at least one cell, said at least one cell having a supporting base for receiving an article thereon, said at least one cell comprising two opposing pressure panels extending downwardly toward said base, each of said pressure panels having inwardly directed faces and being inclined downwardly toward the centre of said at least one cell, and exerting a restraining pressure on opposite sides of any said article seated between them on said supporting base, each of said pressure panels having first and second projections protruding from their inwardly directed faces, said first and second projections being spaced laterally from each other in such manner as to exert restraining pressure in four locations spaced horizontally around the perimeter of said article, and thus to inhibit lateral movement of any said article in said at least one cell.

5,316,174
PALLET CONTAINER

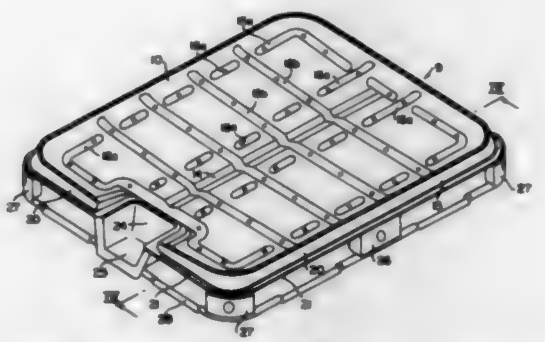
Udo Schutz, Selters, Fed. Rep. of Germany, assignor to Protechna SA, Fribourg, Switzerland

Continuation-in-part of Ser. No. 851,897, Mar. 16, 1992, Pat. No. 5,253,777. This application Sep. 24, 1993, Ser. No. 125,732

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1991, 4108399; Nov. 11, 1991, 4136963

Int. Cl.^{5} B65D *21/02*

U.S. Cl. 220—571 **2 Claims**



1. Pallet container for liquids, with an inner container of a synthetic resin with sealable filling and discharge openings and with an outer jacket of metal in contact with the inner container as well as with a bottom fashioned as a pallet, the pallet (9) shape-matingly receiving the inner container (2) and being attachable to a jacket (6), the bottom (11) of the inner container (2) comprising a drainage floor with a central shallow drainage channel (12) extending with a slight slope from a container rear wall (2*c*) toward a discharge nipple (13) located on the front wall (2*d*) of the container (2) for the connection of a drainage valve (5), a floor pan (10) below the drainage bottom (11) of the inner container (2) having reinforcing creases (16*a*, 16*b*), the bases (17) of which lie in a common horizontal plane (18—18), said bases forming downwardly open chambers (19) in the floor pan (10), the floor pan (10) having a downwardly drawn outer supporting rim (15) forming a continuously extending, hollow supporting collar (20); and a marginal strip (21) extending at an angle from the outer supporting rim (15) of the floor pan (10), this strip forming, with a reinforcing strut (22) attached underneath the floor pan (10), a bottom frame (23) by means of which the floor pan (10) is attached, together with the jacket (6), to corner feet (27) and central feet (25, 26) of a pallet frame (28).

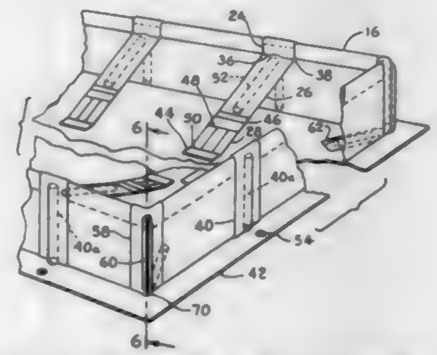
5,316,175
FOLDABLE SPILL COLLECTOR CONTAINER

Edward W. Van Romer, 1018 Arrowhead Point, Anderson, S.C. 29625

Continuation of Ser. No. 971,580, Nov. 5, 1992, abandoned. This application Jun. 28, 1993, Ser. No. 84,079

Int. Cl.^{5} B65D *1/37*

U.S. Cl. 220—573 **7 Claims**



1. A portable containment for containing spilled material which may be easily folded for transportation comprising:

a floor composed of sheet material;

a foldable generally upstanding wall composed of sheet material integrally connected to said floor for containing the spilled material in cooperation with said floor;

a plurality of rigid side braces integrally carried by said peripheral wall and spaced around said wall to brace said wall generally in an upright configuration while allowing said wall to be folded inwardly;

a plurality of internal foldable braces interconnecting with said wall and said floor having extended positions preventing outward movement of said wall and maintaining said wall in aid generally upright configuration when containing said spilled material, and having intermediate inclined upright positions for maintaining said wall in an inclined position when empty and also having inwardly folded positions in which said wall is folded generally horizontal permitting a vehicle to drive over said folded wall;

said internal foldable braces including first brace segments having first, abutment ends affixed to said wall, second abutment ends, and an elongated reinforcing member extending generally between said first and second abutment ends,

a second brace segment secured to said floor, and a hinge portion connected with said second abutment end and arranged intermediate said first and second brace segments having a firs pivot about which said first brace segment pivots to allow said first brace segment to move upwardly and clockwise over said second brace segment, as said second segment moves downwardly and counterclockwise, to allow said wall to move to said folded position; and

said intermediate upright positions being maintained when said second abutment ends engage said floor with said first abutment ends affixed with said wall to support the wall in an inclined, upstanding position.

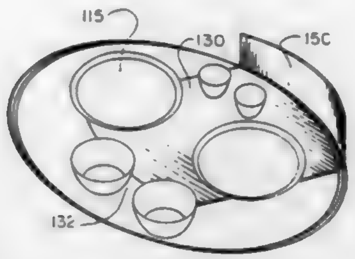
5,316,176
HAIR PROTECTOR SHIELD FOR FOOD SERVICE TRAYS

Nelson J. Genest, 14 Fontaine St., Augusta, Me. 04330

Filed Nov. 12, 1992, Ser. No. 975,462

Int. Cl.^{5} B65D *51/00*

U.S. Cl. 220—694 **9 Claims**



1. In combination with a food service tray, a selfstanding hair protector used to shield a user's hair and other contamination from falling upon food dishes to be served that are resting on said food service tray upon which the hair protector is placed between the server's head and food dishes being carried on the tray to patrons to be served, said hair protector comprising:

a thin flat base section for resting said hair protector as a free standing unit on a service tray, with said base section extending only inwardly from the periphery of the tray sufficiently that food dishes to be served may supportably rest on said base or both on said base and said tray; and

an essentially vertical shield extending upwardly from the base section such that the shield is located on the tray between and separated from the food dishes to be served and shielding the user's head from the food dishes on said tray.

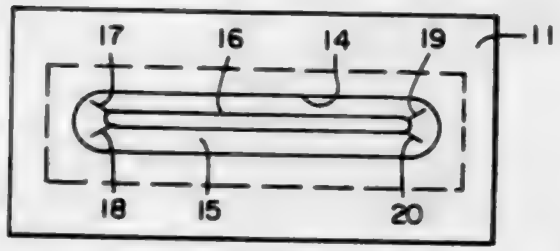
5,316,177
FACIAL TISSUE DISPENSING CARTON

Hans G. K. Boldt, Lahnstein, Fed. Rep. of Germany, assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 906,725, Jun. 30, 1992, abandoned. This application May 12, 1993, Ser. No. 61,190

Int. Cl.^{5} B65H *1/00*

U.S. Cl. 221—63 **10 Claims**



1. A pop-up tissue dispensing carton having a top wall with a carton opening therein, said carton opening being covered with a paper dispensing window affixed to the inside of the top wall and having an elongated opening through which tissues within the carton are withdrawn, said elongated opening having at least two slits emanating from its distal ends at an acute angle relative to the longitudinal axis of the elongated opening and which lightly pinch and hold the tissues to prevent fallback.

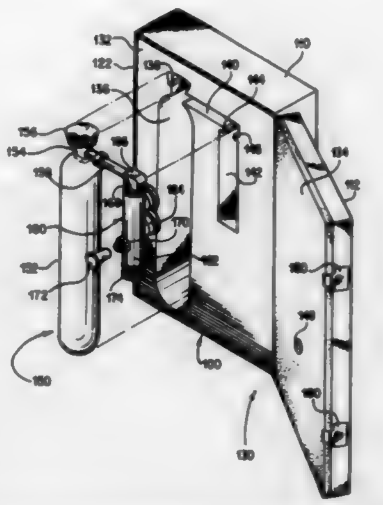
5,316,178
FRUIT RIPENING ETHYLENE GAS STORAGE AND DISPENSING SYSTEM AND CONTAINER THEREFOR

Edward E. Garber, Jr., 5415 Linton Rd., Sykesville, Md. 21784

Filed Aug. 5, 1992, Ser. No. 924,964

Int. Cl.^{5} B67D *5/00*

U.S. Cl. 222—3 **16 Claims**



1. A fruit ripening system and container therefore, comprising:

an outer housing in the form of a paralelepiped and having a frontal wall hingedly coupled to a first side wall for providing access to an interior cavity of said housing, said frontal wall having a through opening formed therein for passage of ethylene gas therethrough;

means for releasably securing said frontal wall to at least one second side wall;

means for ethylene gas storage and dispensing disposed within said housing cavity, said means for ethylene gas storage and dispensing including (1) an ethylene gas cylinder having a valve for controlling release of ethylene gas therefrom, (2) a flow control assembly having an input fluidly coupled to said valve for dispensing said ethylene gas at a predetermined rate, and (3) a nozzle member fluidly coupled to an output of said flow control assembly; and,

means for resiliently supporting said ethylene storage and dispensing means within said housing cavity, said resilient support means including a first resilient support member disposed within said housing cavity, said first resilient support member having a truncated U-shaped opening formed therein for receipt of said ethylene storage and dispensing means therein, said resilient support means further including a second resilient support member coupled to an interior face of said frontal wall for providing a resilient closure for said truncated U-shaped opening of said first resilient support member.

5,316,179
SYSTEM FOR DISPENSING A KNOWN VOLUME OF FLUID

Antonis C. Ioannides; James S. Wilson, both of Abingdon, and Ashok Patel, Littlemore, all of United Kingdom, assignors to Oxford Glycosystems Limited, Abingdon, United Kingdom

Filed Feb. 20, 1992, Ser. No. 837,897

Claims priority, application United Kingdom, Feb. 28, 1991, 9104276

Int. Cl.^{5} B67D *5/08*

U.S. Cl. 222—56 **14 Claims**

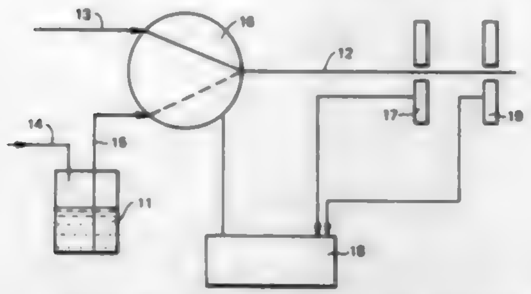
1. A fluid delivery system comprising fluid reservoir means for containing a first fluid;

a pipe or tube; and

control means including

a valve connected between said reservoir means and said pipe or tube, said valve controlling the flow of fluid from said fluid reservoir to said pipe or tube; and

detector means for detecting the arrival of a leading end of said first fluid at a position along said pipe or tube



corresponding to the delivery of a unit or pulse of said first fluid to said pipe or tube, said valve being closed upon detection of said first fluid by said detector means, the amount of fluid disposed between said valve and said detector means representing one unit or pulse; and

means for supplying a required amount of said first fluid to a destination as a multiple of one such unit or pulse.

5,316,180

BEVERAGE DISPENSING MACHINE WITH PRESSURIZED WATER AND SYRUP SUPPLIES

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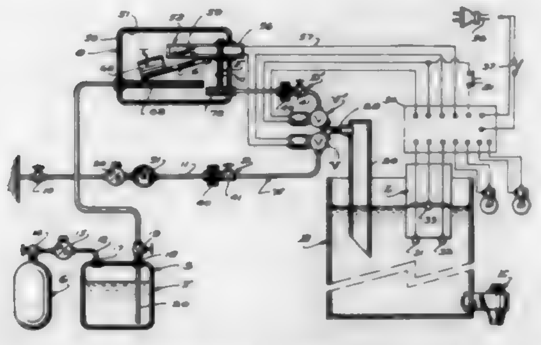
Filed Feb. 25, 1992, Ser. No. 841,093

Int. Cl.^{5} B67D *5/08*

U.S. Cl. 222—56 **19 Claims**



11. A beverage dispensing machine including a beverage tank with a beverage dispensing valve, a mixing head including electrically operated normally closed water and syrup valves and operating to receive metered volumes of water and beverage concentrate syrup and to deliver them into the beverage tank; a fluid level actuated switch unit in the beverage tank and operating to cause the water and syrup valves to open simultaneously when the liquid level in the beverage tank reaches a predetermined low level and to close when the liquid level in the beverage tank reaches a predetermined high level, a water supply including an elongate water line extending between a pressurized water service system and an upstream side of the water valve; a syrup supply including a replaceable syrup tank holding a discrete volume of syrup, and elongate syrup line extending between and connected with the syrup tank and an upstream side of the syrup valve, and a high-pressure gas supply connected with the syrup tank and delivering gas at a predetermined pressure into the syrup tank to move syrup therefrom to the syrup valve; the machine includes a normally open syrup actuating switching device between and connected with the syrup line and the syrup valve and electrically connected between the liquid level switch unit and the water valve, said syrup actuated switching device normally disables and prevents opening of the water valve and closes and enables opening of the water valve when syrup in the syrup tank is delivered to the syrup valve; the syrup actuated switching device includes a substantially horizontal case with upstream and downstream ends and defines an accumulator chamber that extends longitudinally and vertically between said ends, a syrup inlet fitting communicates with the lower portion of the chamber at the upstream end thereof, a syrup outlet fitting communicates with the lower portion of the chamber at the downstream end thereof, a normally open fluid level actuated switch is in the chamber above the inlet and outlet fittings and is connected to normally disable and prevent opening of the water valve, said fluid actuated switch is operated to close and to enable operation and opening of the water valve when the syrup valve is opened and the liquid level of syrup in the chamber rises to a level where pressures on the gas and syrup in the chamber are in substantial equilibrium.

5,316,181

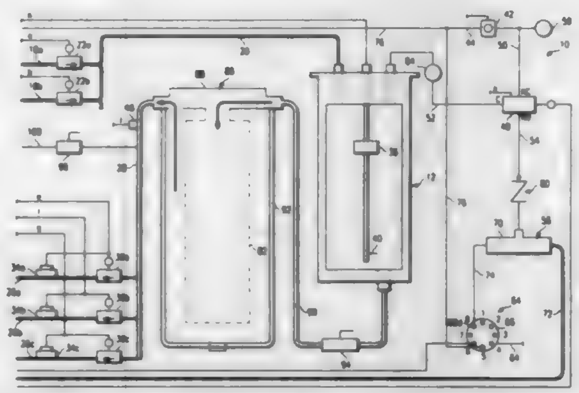
LIQUID DISPENSING SYSTEM

Daniel E. Burch, Lewisville, Tex., assignor to Integrated Designs, Inc., Dallas, Tex.

Continuation of Ser. No. 860,197, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 483,264, Jan. 29, 1990, abandoned. This application Apr. 12, 1993, Ser. No. 47,046

Int. Cl.^{5} B67D *5/54*

U.S. Cl. 222—61 **90 Claims**



52. A method of dispensing liquid in measured quantities comprising the steps of:

filling a reservoir with liquid to be dispensed from the reservoir through an outlet in communication with a dispense means that opens for a preselected period of time to deliver liquid under known pressure to deliver a measured quantity of liquid;

applying pressure to liquid in the reservoir when demanded for dispensing;

monitoring a pressure of the liquid at the outlet of the reservoir;

adjusting the pressure applied to the liquid during demand dispensing to maintain a preselected liquid pressure at the outlet of the reservoir within preselected tolerances; and

reducing the pressure applied to the liquid in the reservoir when dispensing is halted to less than atmospheric pressure.

5,316,182

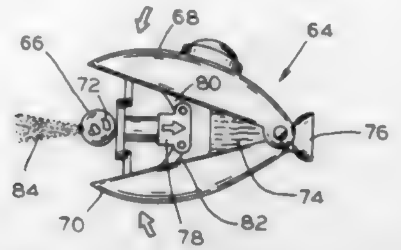
SCENTED TOY JEWELRY USING WATER SPRAYED OVER A SCENTED BEAD

James S. W. Lee, Long Island, N.Y., and Chiu K. Kwan, Kowloon, Hong Kong, assignors to G.J. Associates, Ltd., Monrovia, Liberia

Filed Jan. 15, 1992, Ser. No. 821,359

Int. Cl.^{5} A63H *33/00;* B67D *5/00*

U.S. Cl. 222—78 **16 Claims**



1. A toy comprising a center surface in the form of a simulated jewelry item, a water compartment having means associated therewith to enable said compartment to be filled with water, a device for releasing a scent into said water as it bathes said device, means for spraying water from said compartment past said device in order to bathe it and for spraying the scented water into the ambient atmosphere, and means for supporting the toy as jewelry when worn on a human body.

5,316,183

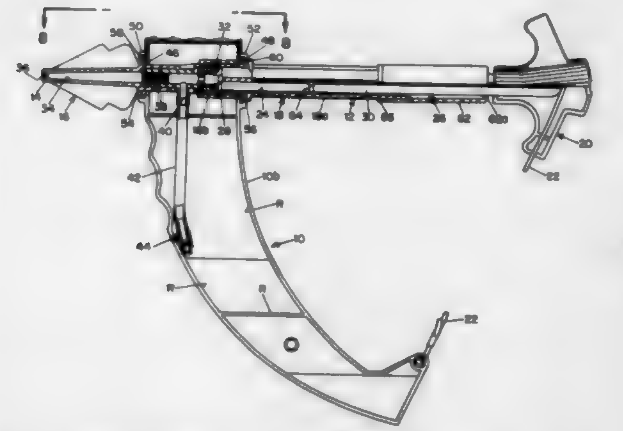
WATER-SHOOTING TOY CONFIGURED AS A BOW AND ARROW

Virginio A. Brovelli, Taino, Italy, and Mei H. Man, New Territories, Hong Kong, assignors to Lanard Toys Limited, Kowloon, Hong Kong

Filed Oct. 27, 1992, Ser. No. 967,697

Int. Cl.^{5} G01G *13/00*

U.S. Cl. 222—78 **20 Claims**



1. A water-shooting toy configured as a bow and arrow comprising a self-contained water pump sub-assembly having a cylinder member defining a pump chamber, a piston member received in the cylinder member for axial movement therein, the piston member including a body portion and a piston rod portion extending from the body portion out of one end of the cylinder member and having a handle located externally of the cylinder member adapted to be grasped by a user for manual operation of the pump sub-assembly, a sealing ring engaged between the piston body portion and the cylinder member, a nozzle member joined to the other end of the cylinder member and having a water-discharge passage and a discharge nozzle opening adapted to form a stream of water upon operation of the pump sub-assembly, a one-way discharge valve in the discharge passage adapted to permit water to flow through the discharge passage only from the pump chamber to the nozzle and to prevent induction of air into the pump chamber through the nozzle inlet passage, and a water inlet passage into the pump chamber and having a one-way inlet valve adapted to admit water to the pump chamber upon movement of the piston member toward said one end of the cylinder member and to prevent discharge of water through the inlet passage when the piston is moved toward the other end of the cylinder member; and a case assembly configured to resemble a bow and being composed of two parts joined together at a juncture, the case parts having respective wall portions that together define a water reservoir, the wall portions having a pair of oppositely located openings intersected by the juncture between the case parts, a portion of the pump sub-assembly adjacent the water inlet being received within the reservoir with the respective wall portions straddling said pump sub-assembly portion, the wall portions of the case parts along the respective openings having grooves and the pump sub-assembly having flanges received in the grooves, the flanges and grooves joining and sealing the pump sub-assembly to the case assembly.

5,316,184

FOLDABLE PLASTIC BOTTLE, BLOW MOLD FORM TO MAKE THE BOTTLE, AND METHOD OF MAKING THE BOTTLE

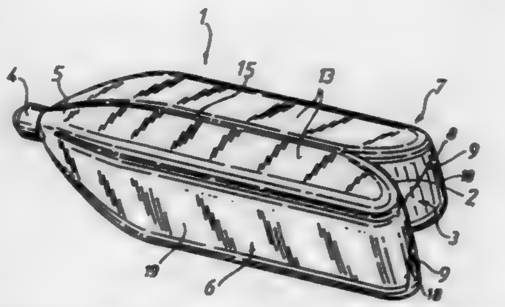
Walter Düring, Zürich, Switzerland, assignor to Düring AG, Dällikon, Switzerland

Filed Jul. 28, 1992, Ser. No. 920,784

Claims priority, application Switzerland, Aug. 8, 1991, 02347/91

Int. Cl.^{5} B65D *35/08*

U.S. Cl. 222—107 **20 Claims**



1. Foldable, blow-molded bottle (1, 1') of plastic material defining a bottle axis (17), and having

a neck portion (5);

a body portion (6);

a longitudinal separating seam (15) extending longitudinally in a separating plane which includes said bottle axis (17) along the body portion and the neck portion;

a bottom portion (8) merging with and connected to the body portion (6),

wherein the bottom portion (8) is formed with a generally V-shaped depression (3), and in which the apex of the V defines a bottom fold line (2), said bottom portion having a bottom supporting seam,

wherein, in accordance with the invention,

the bottom separating seam (9) in the bottom portion (8) extends at an angle α with respect to the bottom fold line (2), which angle is other than 0°; or 90°; and

a central region of the bottom separating seam (9) intersects, at least approximately, the bottle axis (17) at a central region of the bottom fold line (2),

whereby the bottom seam (9) and the bottom fold line (2) are non-congruent and material accumulation (11) upon blow-molding the bottle will occur remote from the bottom fold line (2).

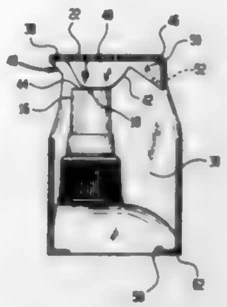
5,316,185
LEVER ACTION SPRAY PUMP DISPENSER

Joseph E. Meenan, Pleasantville, N.Y., assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed May 28, 1993, Ser. No. 69,969

Int. Cl.⁵ B65D *88/54*

U.S. Cl. 222—321 **7 Claims**



1. A spray pump dispenser comprising:
a container with an opening at an upper end thereof;
a pump mounted atop said upper end;
a vertically moving plunger to operate said pump, said plunger being positioned above said pump, said plunger comprising:
a head with a cylindrical outer wall;
a spray nozzle opening in said outer wall;
an upper surface orthogonal to the cylindrical wall defining an upper end of said head; and
guide means for orienting said spray nozzle, said guide means projecting outwardly from opposite sides of said cylindrical outer wall;
a lever actuator mechanism comprising:
a cap fitted over and surrounding said pump and plunger, said cap being defined by a front, a top, a rear, and a pair of side walls, said front wall having a window, said top wall having an opening, and said side walls on an inner surface thereof each having an elongated rib protruding inwardly toward said pump, said ribs being symmetrically positioned opposite one another and symmetrically flanking said window;
a lever with outer and inner major surfaces pivotally attached to a border of said opening in said top wall and form fittingly occupying said opening, said inner major surface having a pair of fins protruding therefrom downwardly to contact said upper surface of said plunger, whereupon downward pressure on said lever causes said fins to press said plunger in a downward direction to activate said pump to emit a spray, said pair of ribs interacting with said guide means on said plunger to properly position said plunger so that said spray nozzle opening is oriented opposite said window and a spray therefrom can exit onto its intended target.

5,316,186
FULLY DISCHARGEABLE CARTRIDGE FOR PASTE-LIKE SUBSTANCES

Eugen Prestele, Albert-Greiner-Strasse 73, 8900 Augsburg, Fed. Rep. of Germany

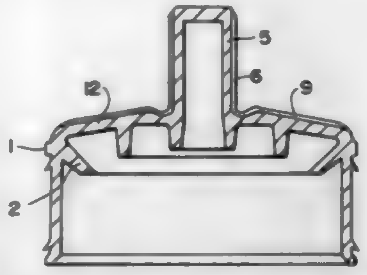
Filed Aug. 26, 1992, Ser. No. 935,401

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1991, 9110529

Int. Cl.⁵ B67D *5/00*

U.S. Cl. 222—327 **18 Claims**

1. A cartridge for paste-like substances, comprising:
a tubular cartridge body closed at one end by a front end wall having an outlet nipple defining an outlet opening;
a plunger for pressing such a paste-like substance through the outlet opening, said plunger being inserted into an open rear end of the cartridge body, wherein an outer periphery of the plunger is in sealing contact with an inner wall of the cartridge body;
a journal protruding from and fixed to said plunger, said journal being adapted to penetrate the outlet opening when the plunger rests against the front end wall of the cartridge body, said journal being at least the same length as the outlet opening;
at least one continuous axial groove formed in at least one of an outer peripheral surface of the journal and an inner wall of the outlet opening, wherein the plunger is adapted to have substantially its entire front face contact the front end wall of the cartridge body upon forcing the journal through the outlet opening; and radially extending grooves formed on at least one of an inner surface of the front end wall of the cartridge body and the front face of the plunger.



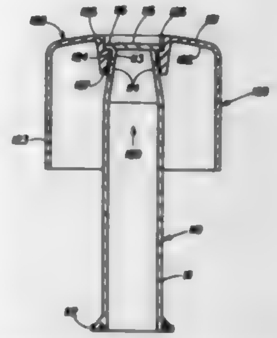
5,316,187
PUMP PISTONS FOR PRESSURIZING LIQUID DISPENSING CONTAINERS

James L. Drobish, Wyoming; Frank A. Ciboch, Jr., Forest Park; Robert A. Paul, Fairfield; Jimmy C. Edwards, Cincinnati, and Lawrence E. Robbins, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 980,867, Nov. 24, 1992, abandoned. This application Jan. 25, 1993, Ser. No. 7,939

Int. Cl.⁵ B65D *83/00*

U.S. Cl. 222—401 **25 Claims**



1. In a valved piston assembly for use with a liquid dispensing pump apparatus attached to a container, said liquid dispensing pump apparatus including dispensing means for dispensing a liquid product from said container and a cylinder assembly, said cylinder assembly having a cylindrical outer wall which is enclosed at one end by a bottom wall to define a pumping chamber, the improvement comprising:
(a) an upper cap having a generally circular top portion with a lower surface and an upper surface, said upper cap further having a generally cylindrical side wall attached at one end to said top portion and extending downwardly therefrom; and
(b) an elongated tubular piston having a first end connected to said upper cap at said lower surface and a second end located remotely from said upper cap, said piston being concentrically disposed within said side wall, said piston being sized to be slideably received within said pumping chamber and including an annular seal at said second end for engaging said cylindrical outer wall, said piston further having a longitudinal axis extending therethrough defining an axial direction, said piston further including valve means located remotely from said second end for admitting air into said piston, said valve means being opened to admit air when an upward force is applied to said upper cap by a user and closed to form an airtight seal when a downward force is applied to said upper cap by a user;
whereby said piston and said pumping chamber cooperate to form an air pump for pressurizing said container, while said remotely located valve means is protected from contact with said liquid product throughout the liquid dispensing cycle, thereby avoiding degradation of sealing performance.

5,316,188
APPARATUS FOR STRETCHING TUBULAR MATERIAL WITH A LEAST ONE CLOSED END ON A STRETCHER

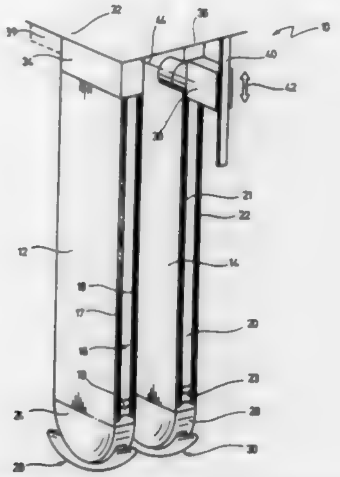
Eckhard Froehlich, Steinheim; Peter Steiner, Goeppingen, and Karl Hildebrandt, Weilheim/Teck, all of Fed. Rep. of Germany, assignors to August Krempel Sohne GmbH & Co., Fed. Rep. of Germany

Filed Jun. 17, 1993, Ser. No. 78,999

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1992, 4220543

Int. Cl.⁵ D06C *5/00, 15/00*

U.S. Cl. 223—77 **12 Claims**



1. Apparatus for stretching tubular material with at least one closed end, said apparatus comprising:
at least a first belt drive connected substantially in an axial direction to a first elongated stretcher and having at least one belt segment projecting laterally over said elongated stretcher for pulling said material onto said stretcher;
a first end member connected at a first end of said first elongated stretcher;
at least a first switching means including a first sensing means arranged on said first end member which is coupled to said first belt drive for switching off said first belt drive when sensing that said closed end of said material reaches said first end member.

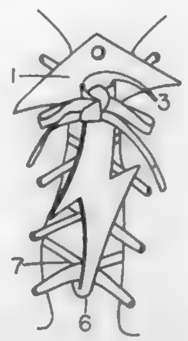
5,316,189
ATTACHABLE LACE TIGHTENING HOOK AND LACE SECURING DEVICE

Susan R. Galeros, 829 Barretts Mill Rd., Concord, Mass. 01742, and Judi H. Zalles, 10 Sattonstall Pkwy., Salem, Mass. 09180

Filed Jul. 21, 1992, Ser. No. 917,457

Int. Cl.⁵ A43C *7/00*

U.S. Cl. 223—113 **6 Claims**



1. A small hand-sized attachable lace tightening device for use in combination with laces, said device having smooth edges and consisting of an elongated shaft, a hook with a bend integral with one end of said shaft, and a triangular shaped handle having a top and integral with an opposite end of said shaft, the hook is a means for ensnaring, pulling, and attaching to a crossed-section of laces, and the handle is a means for holding and pulling the device for tightening laces, and said handle having two open-ended smooth edged slots set on opposite sides of the shaft, each having an open mouth extending through a peripheral edge on a base side of the handle, the slots used for securing laces while tying, and thusly completing attachment of said device to footwear in combination with laces, the device having a uniform thickness from the handle to the bend of the hook and being concavely curved through the shaft from the top of the handle to the bend of the hook so as to conform to the slope of the instep of the footwear when worn, whereby the attachment of said device to the footwear facilitates easy wearability, and accessibility for use.

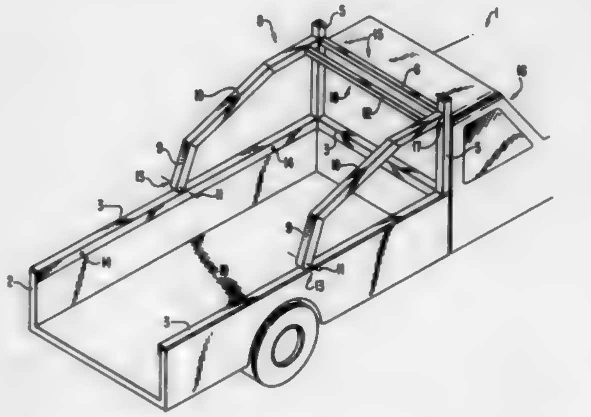
5,316,190
UTILITY RACK FOR VEHICLE

Roddy M. Bullock, 2620 Oak Haven, San Marcos, Tex. 78666

Filed Jan. 25, 1993, Ser. No. 8,652

Int. Cl.⁵ B60P *3/00*

U.S. Cl. 224—42.42 **6 Claims**



1. A utility rack adapted to fit the utility bed of a vehicle comprising:
(a) a horizontal support rail shaped to form three sides of a rectangle;
(b) a forward transverse rack member attached near the

corners of said horizontal support rail where the two long sides meet the short side of said rectangle;

(c) a rear transverse rack member proximally connected at about the midpoint of the two long sides of said horizontal support rail, said rear transverse rack member having a proximal portion close to said horizontal support rail and a distal portion remote from said horizontal support rail; and

(d) pivotal connection means attaching said rear transverse each member to said horizontal support rail wherein said rear transverse rack member is moveable from a forward, closed position wherein the distal portion of said rear transverse member rests generally against said forward transverse rack member, to a rearward, open position, wherein the proximal segment of said rear transverse rack member rests generally horizontally on said horizontal support rail, with the distal end raised in a cantilevered manner.

5,316,191

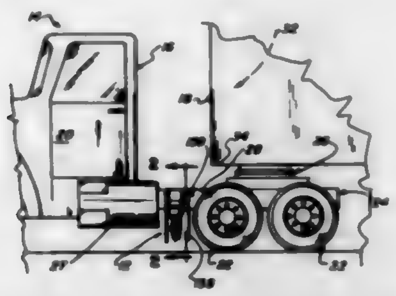
TIRE CHAIN HANGER SUPPORT ASSEMBLY

C. Norman Gibson, 7080 York St., Denver, Colo. 80229, and O. Dean Gibson, Rte. 2, Box 151, Wakeeney, Kans. 67672

Filed Apr. 10, 1992, Ser. No. 866,557

Int. Cl.⁵ B60R *7/00*

U.S. Cl. 224—42.45 R **6 Claims**



1. A tire chain hanger support assembly mountable on a support frame assembly operable to support tire chains thereon, comprising:

a) a main support frame assembly having an elongated support beam member;

b) a chain support frame assembly including an elongated chain support beam member telescopingly mounted on said support beam member and a chain support assembly secured to said chain support beam member;

c) a telescoping control assembly secured to said support beam member and operably connected to said chain support beam member to aid in and limit longitudinal telescoping movement of said chain support beam member relative to said support beam member and prevent disconnection from said support beam member; and

d) a mud flap support assembly including a forward flap assembly having a flap support plate secured to a forward portion of said chain support beam member and having a primary flap member connected thereto extended downwardly therefrom;

whereby said chain support beam member is telescopingly movable to an extended position relative to said support beam member to permit ready access to tire chains mounted or to be placed on said chain support beam member.

5,316,192

APPARATUS FOR PAIRWISE TRANSPORT OF ELONGATE OBJECTS

Daniel Ng, Mt. Vernon, N.Y., assignor to Industri AB Thule, Sweden

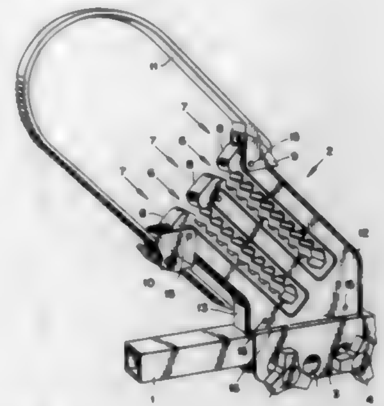
PCT No. PCT/SE91/00056, § 371 Date Jul. 31, 1992, § 102(e) Date Jul. 31, 1992, PCT Pub. No. WO91/11344, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 25, 1991, Ser. No. 916,152

Claims priority, application Sweden, Feb. 1, 1990, 9000349

Int. Cl.⁵ B60R *9/00*

U.S. Cl. 224—324 **10 Claims**



1. An apparatus for pairwise transport of elongate, panel-shaped objects, the apparatus comprising:

a strut extending transversely across a vehicle roof and secured in side portions of the vehicle roof;

a holder device on the strut, the holder device defining at least one accommodation space in which the objects are held such that, a longitudinal dimension of the objects is in a direction of travel of the vehicle and a lateral dimension of the objects is inclined in relation to a vertical line, the holder device including

an anchorage arrangement including at least two spaced-apart outer portions formed from panel-shaped material, the outer portions being connected to one another by connection devices, the outer portions each including at least two substantially parallel fingers defining one or more accommodation space, and

one or more gripping members formed of yieldable material, the gripping members extending outside facing surfaces of the fingers, the gripping members being arranged between the outer portions and being provided with fingers having a greater width than the fingers of the outer portions.

5,316,193

BOTTLE WITH REFLECTIVE BARRIER LAYER FOR REDUCING ELECTROMAGNETIC ENERGY TRANSFER

Robert A. Heiberger, P.O. Box 4927, Boulder, Colo. 80306

Filed Jan. 24, 1991, Ser. No. 645,569

Int. Cl.⁵ B67D *5/00*

U.S. Cl. 222—131 **20 Claims**

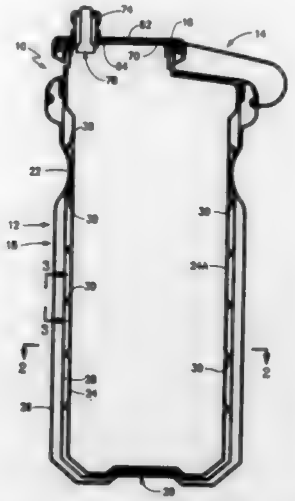
1. A container body for a thermally insulated bottle adapted to hold a liquid contents and constructed to resist heat transfer between the contents and external environment said container body comprising:

(a) an inner means capable of holding a liquid contents;

(b) an outer cap surrounding and spaced radially outwardly of said inner means, said outer cup having a construction sufficient to provide mechanical strength capable of supporting said inner means in an upright relation;

(c) a barrier layer disposed between said inner means and said outer cup, said barrier layer being composed of a reflective metallic material and capable of reflecting radiant electromagnetic energy back toward a source thereof so as to reduce transfer of said energy across said barrier layer;

(d) means associated with said inner means and said barrier layer for maintaining said inner means said barrier layer in a spaced-apart relation to one another; and



(e) an opening for receiving and dispensing liquid contents, wherein said outer cup has a semi-rigid semi-flexible construction providing a moisture barrier and permitting squeezing of said outer cup for dispensing the liquid contents.

5,316,194

FLUID DISPENSING APPARATUS

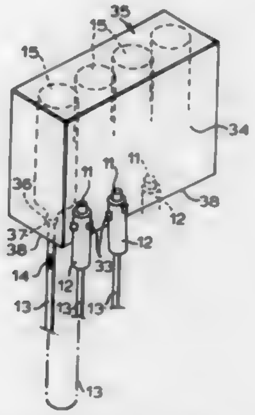
Nabil G. Sarraf, 33 Princes Gate Court, Exhibition Road, London SW7, England

Filed Jun. 19, 1992, Ser. No. 901,169

Claims priority, application United Kingdom, Nov. 15, 1991, 9124258.6

Int. Cl.⁵ G07F *15/04*

U.S. Cl. 222—136 **16 Claims**



1. Fluid dispensing apparatus comprising:

a plurality of containers for fluids to be dispensed,

a plurality of atomiser units associated with said containers and for dispensing the fluids therethrough, each unit comprising an elongate hollow body having attached to one end thereof a dispensing head from which the fluid is to emanate, said dispensing head being manually depressible in a direction inwardly of the body and being resiliently restorable in a direction outwardly of said body, and said body incorporating within it a manually-operable piston-cylinder arrangement actuable directly upon the fluid to feed the fluid to said dispensing head, said piston-cylinder arrangement being manually-operable by manual depression of said dispensing head,

a single reservoir for the fluid at a location remote from said containers, and

a plurality of fluid paths, each including a flexible conduit, connecting the single reservoir and the piston-cylinder arrangement of the plurality of containers to provide for replenishment of said container with fluids from the single reservoir.

5,316,195

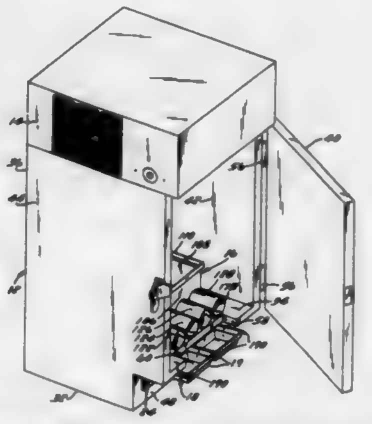
APPARATUS FOR DISPENSING A FLAVORABLE MATERIAL

Stephen L. Moksnes, Whitewater; Jayant Sharma, Racine; Ronald D. Olson, West Allis; Ronald S. Tump, Whitewater; James M. Kocher, Fort Atkinson, and Terrance J. Pausch, Brookfield, all of Wis., assignors to Accurate, Inc., Whitewater, Wis.

Filed Sep. 30, 1991, Ser. No. 768,804

Int. Cl.⁵ B67D *5/62*

U.S. Cl. 222—146.6 **5 Claims**



1. An apparatus for dispensing a flowable material, comprising:

a feeder including a hopper having two substantially parallel, substantial vertical sidewalls, a bottom extending between the sidewalls, first and second elongated and parallel feed screws extending from a third sidewall, and means for rotably supporting the feed screws at the third sidewall;

a feed screw drive mechanically coupled to the first and second feed screws and configured to move the material toward ducts in a fourth sidewall;

an enclosure including a plurality of walls defining an interior space, where the feeder is located within the interior space; and

a refrigeration unit disposed adjacent to the enclosure to maintain the interior space at a selected temperature.

5,316,196

FLUID DISPENSER, IN PARTICULAR FOR GLUING PARTS

Léon Reich, Nidau, Switzerland, assignor to Hormec Technic SA, Nidau, Switzerland

PCT No. PCT/EP90/02261, § 371 Date Mar. 3, 1992, § 102(e) Date Mar. 3, 1992, PCT Pub. No. WO92/00814, PCT Pub. Date Jan. 23, 1992

PCT Filed Dec. 18, 1990, Ser. No. 836,346

Claims priority, application Switzerland, Jul. 5, 1990, 2248/90

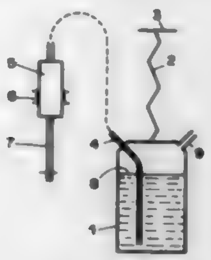
Int. Cl.⁵ B67D *5/64*

U.S. Cl. 222—160 **14 Claims**

1. A fluid dispenser for dispensing a fluid, comprising:

an applicator;

an applicator support having a receptacle for holding the applicator at a predetermined height;
a reservoir being air-tight and holding the fluid;
a flexible tube connecting the reservoir to the applicator, said flexible tube having an open end near the bottom of the reservoir;
a pneumatic pulse generator being connected to the reservoir and producing momentary excess of pressure within said reservoir to create pressure on a surface of the fluid; and
reservoir support means for holding said reservoir in a stable manner so that the level of the surface of the fluid remains at an approximately constant height with respect to said applicator support during functioning of said dispenser, said reservoir support means comprising:

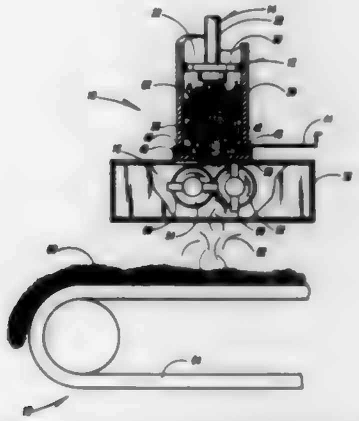


a support;
a rigid arm pivoting around a horizontal axis with respect to the support and being connected at one end to said reservoir by an articulated axis; and
an elastic suspension having at least one distortable element disposed between the pivoting rigid arm and the support, said at least one distortable element elongating to determine said variable position of the reservoir as a function of the weight, said elastic suspension varying the height of the position of the reservoir with respect to the receptacle based on the amount of liquid in the reservoir so that the level of fluid in the reservoir remains substantially constant in relation to the receptacle as the contents of the reservoir decrease.

5,316,197
FEEDER FOR ADDING FIBROUS MATERIAL TO A CONVEYOR HAVING CONCRETE INGREDIENTS

Hugh J. Tobler; Larry G. Lepper, both of Indianola, Iowa, and Robert B. Sawdon, Williamston, Mich., assignors to Cemen Tech, Inc., Indianola, Iowa

Filed Dec. 1, 1992, Ser. No. 983,887
Int. Cl.⁵ G01F *11/20*
U.S. Cl. 222—281 14 Claims

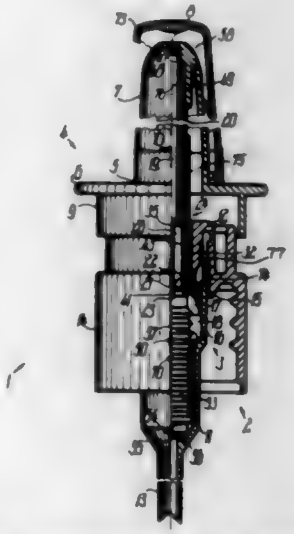


1. A fiber feeder and conveyer for introducing fibrous material into a continuous flow of matter comprising:
a container for fibrous materials, said container having an aperture therein;
extruding means for extruding fibrous material through said aperture;
agitating means for raking said fibrous material from said aperture and agitating said fibrous material located adjacent to said aperture; and
conveyor means containing ingredients for the production of concrete aligned below said aperture for carrying said fibrous material and other concrete ingredients away.

5,316,198
MEDIA DISPENSER WITH ELASTICALLY DEFORMABLE PLUNGER

Karl-Heinz Fuchs, Radolfzell, and Lothar Graf, Rielasingen-Worblingen, both of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Radolfzell, Fed. Rep. of Germany

Filed Mar. 27, 1992, Ser. No. 858,815
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1991, 4110303
Int. Cl.⁵ G01F *11/00*
U.S. Cl. 222—321 25 Claims

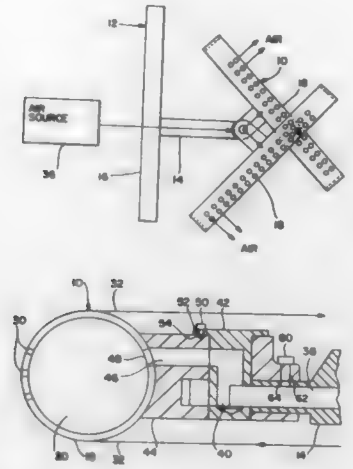


1. A dispenser for discharging media, the dispenser comprising:
a basic dispenser body (2) having a discharge and operating head (5), said discharge and operating head having an outlet channel (19) and a medium outlet (8);
a plunger (20) to be moved relative to said basic dispenser body (2) for discharge operation;
wherein the outlet channel (19) provides medium guide faces for operationally receiving and guiding the media to the medium outlet (8), said medium guide faces defining medium spaces for receiving the medium; and
wherein the plunger (20) is moveable in a control motion, said plunger (20) having a shaft section (32), said shaft section (32) being elastically deformable during a portion of said control motion of said plunger (20),
wherein said shaft section (32) provides first guide face means (33) on an outer circumference of said shaft section (32) and wherein second guide face means (43) are provided for cooperation with said first guide face means (33) for preventing deformation of said shaft section (32) under operational stresses occurring during said control motion, said shaft section (32) being allowed to be deformed in a direction transverse to said guide face means (33, 43) when said shaft section (32) is freed from said first guide face means (43) during said control motion.

5,316,199
ADJUSTABLE ANGLE BAR ASSEMBLY FOR A PRINTING PRESS

Robert E. Hansen, Clarendon Hills, and H. L. Carlson, Chicago, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 18, 1992, Ser. No. 947,320
Int. Cl.⁵ B65H *23/32*
U.S. Cl. 226—197 8 Claims



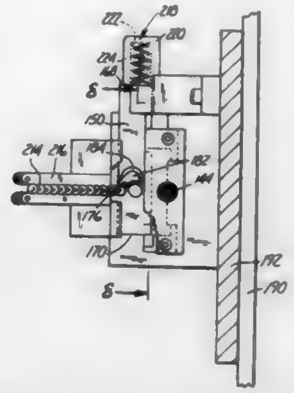
1. An adjustable angle bar assembly for a printing press, comprising:
a support;
a hollow angle bar having a pair of opposed portions and a central portion spaced inwardly from the end portions of the bar, with the central portion of said angle bar being pivotally mounted to the support, said angle bar having a cavity for the passage of air, and a plurality of openings extending through the angle bar and communicating with the cavity for passage of air through the angle bar from the cavity to a web passing over the angle bar; and
means for passing the air into the central portion of the angle bar for distribution of the air by the angle bar against the web irrespective of the orientation of the angle bar with respect to said support,
wherein the support comprises a bracket supporting the angle bar in the central portion of the bar, with the angle bar being pivotally supported on the bracket;
wherein the bracket has a bore extending through the bracket, and in which the air passes through the bore to the central portion of the bar.

5,316,200
AUTOMATIC NAILING HEAD

Roger W. Wallin, 23042 Nightingale St., St. Francis, Minn. 55070

Filed Mar. 1, 1993, Ser. No. 22,682
Int. Cl.⁵ B27F *7/02*
U.S. Cl. 227—119 4 Claims

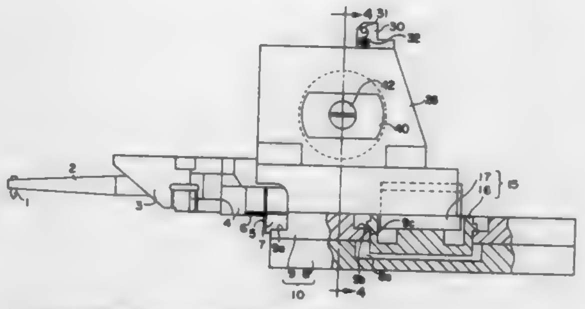
1. An nail driving assembly for an automatic nailing device, comprising:
a support frame;
a hydraulic cylinder with a ram mounted on the support frame;
a nailing rod mounted to the ram for driving nails;
control means for controlling the movement of the nailing rod and ram;
a nailing head comprising:
  a main body portion having a longitudinal throughbore extending therethrough defining first and second openings, the throughbore for receiving a nail and the nailing rod;
  a nail feed channel extending from a third opening in the main body and intersecting the longitudinal throughbore;
a nail picker plate mounted for sliding engagement in the main body portion proximate the third opening having first and second major surfaces and an aperture extending therethrough, an edge with a receiving notch extending into the edge, and a channel connecting the aperture and the receiving notch;
actuation means for causing the nail picker plate to move back and forth from a first position to a second position and for causing a nail to be positioned in the notch when the plate is in the first position, and to move from the notch, through the channel, into the aperture and down into the nail delivery channel when the plate is in the second position, said picker plate movable from the first position to the second position as the nailing rod moves downwardly; and
means for retaining a nail in the longitudinal throughbore until the driving rod drives the nail out of the throughbore.



5,316,201
BONDING APPARATUS

Kazuo Sugiura, Tokyo, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Apr. 15, 1992, Ser. No. 869,487
Claims priority, application Japan, Apr. 16, 1991, 3-109690
Int. Cl.⁵ H05K *13/06*
U.S. Cl. 228—4.5 1 Claim



1. A bonding apparatus comprising:
a motor which is able to rotate forward and backward;
a cam rotated forward and backward by said motor;
a capillary moved downwardly by contacting an outer circumference of said cam used as a down profile when said motor and cam rotates backward; and
a biasing means which urges said cam so as to rotate backward to move said capillary upwardly.

5,316,202

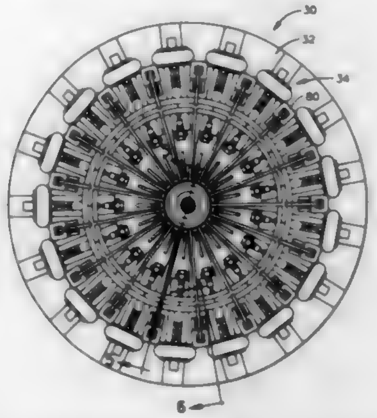
IN-JIG ASSEMBLY BOND FIXTURE FOR MANUFACTURING COMPOSITE COMPONENTS

William J. Murray; Mark K. McCallough, both of Albuquerque; Philip D. Brubaker, Tijeras, and Paul S. Manicke, Albuquerque, all of N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 14, 1992, Ser. No. 960,628

Int. Cl.^{5} B23K *20/02;* **B23P** *11/00*

U.S. Cl. 228—5.5 **19 Claims**



1. An in-jig assembly bond fixture for manufacturing a composite component having a plurality of parts, comprising:

at least one fixture for holding each of said plurality of parts in proper alignment relative to one another during a bonding operation;

means integral with said at least one fixture for applying a predetermined uniform compressive force to each bond line between each of said plurality of parts during the bonding operation; and

a plurality of heating elements selectively located within said fixture for applying heat uniformly across each bond line during the bonding operation.

5,316,203

ENCAPSULATED STOP-OFF COATING FOR DIFFUSION BONDING

Raymond G. Rowe, Schenectady, N.Y.; Gary T. Martini, Loveland, Ohio; Lawrence J. Galaske, Jr., Mason, Ohio; Douglas J. White, Cincinnati, Ohio, and Mark A. Robinson, Covington, Ky., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1993, Ser. No. 52,972

Int. Cl.^{5} B23K *20/18*

U.S. Cl. 228—118 **2 Claims**

1. A method for fabrication of metal structures from metal sheets by superplastic forming diffusion bonding which comprises application of an adherent stop-off coating to those regions of the sheets which are not to be bonded, applying a protective encapsulating coating over the stop-off coating.

5,316,204

METHOD FOR BONDING LEAD WITH ELECTRODE OF ELECTRONIC DEVICE

Shinitsu Takehashi, Shijonawate; Kenzo Hatada, Katano, and Hiroaki Fujimoto, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 9, 1992, Ser. No. 973,636

Claims priority, application Japan, Nov. 8, 1991, 3-292765

Int. Cl.^{5} B23K *31/02*

U.S. Cl. 228—179.1 **8 Claims**

1. A method for bonding leads of a film carrier to electrodes of electronic devices, said method comprising the steps of:

positioning said leads and said electrodes with a predetermined clearance therebetween such that said leads and said electrodes are aligned to define corresponding pairs of said leads each and said electrodes each;

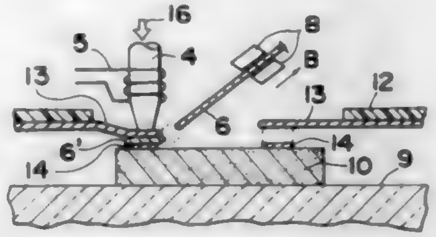
placing a pressure means having a contact area and a conductive bonding material served under said contact area such that said conductive bonding material is located between a first of said leads and a first of said electrodes of a first of said corresponding pairs;

pressing said first lead of said first corresponding pair by said contact area of said pressure means such that said conductive bonding material is pressed between said first lead and said first electrode with a predetermined pressure for bonding said first corresponding pair;

pulling said conductive bonding material for cutting said conductive bonding material at a position near said bonded lead and electrode;

releasing said pressure means from said bonded lead and electrode; and

serving said conductive bonding material under said contact area of said pressure means.



5,316,205

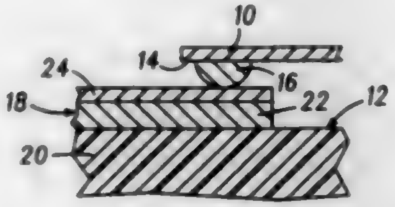
METHOD FOR FORMING GOLD BUMP CONNECTION USING TIN-BISMUTH SOLDER

Cynthia Melton, Bolingbrook, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1993, Ser. No. 43,102

Int. Cl.^{5} H05K *3/34*

U.S. Cl. 228—180.21 **7 Claims**



1. A method for attaching an electronic component to a substrate, said component comprising a gold bump contact, said substrate comprising a bond pad formed of a solder-wettable metal, said method comprising

applying to the bond pad a solder alloy composed predominantly of tin and bismuth,

assembling the electronic component and the substrate to form an assembly such that a surface of the gold bump contact rests adjacent to the bond pad and the solder alloy,

heating the assembly to a first temperature to melt the solder alloy to form molten solder and thereafter maintaining the assembly at a second temperature less than 150° C. for a time of at least 30 seconds to cause said molten solder to wet the gold surface, and

cooling the assembly to solidify the molten solder alloy, whereupon the solder bonds to the gold contact and to the bond pad to connect the component to the substrate.

5,316,206

METHOD OF JOINING ALUMINIUM MEMBERS

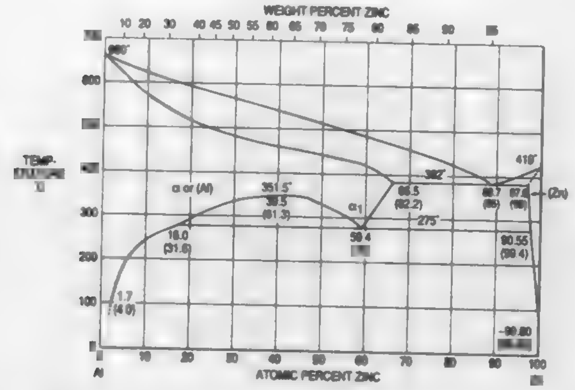
Morten Syslak, Haugesund; Edward J. Morley, and Leiv Å. Folkedal, both of Kopervik, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed May 18, 1992, Ser. No. 884,006

Claims priority, application Norway, Jun. 14, 1991, 912300

Int. Cl.^{5} B23K *31/02, 101/14*

U.S. Cl. 228—183 **15 Claims**



1. A method of joining at least two aluminum members by brazing, said method comprising:

providing at least one of said members with an adhering surface layer of zinc or zinc based alloy;

preassembling said at least one member having thereon said adhering surface layer with at least one other said member;

applying flux material to surfaces of said members to be brazed;

subjecting the thus preassembled members to rapid heating to a predetermined elevated brazing temperature within a furnace and therein exposing said members to said elevated brazing temperature for a predetermined period of time, thereby forming a layer of molten filler material in the form of interface zinc aluminum alloys between said members by diffusion of at least part of the material of said surface layer into the material of said members with increasing temperatures; and

cooling said members and filler material to thereby form an assembly of said members joined by brazed solidified joints formed by said filler material.

5,316,207

CONTAINER ADAPTED FOR STACKING

John A. Ross, Marietta, Ga., and Richard L. Schuster, Monroe, La., assignors to Riverwood International Corporation, Atlanta, Ga.

Filed Jul. 1, 1993, Ser. No. 86,499

Int. Cl.^{5} B65D *5/32*

U.S. Cl. 229—23 R **27 Claims**

1. A container, comprising:

two spaced, substantially parallel, relatively rigid end panels;

each of the end panels having upper and lower edges, side edges and upper and lower corner areas;

top, bottom and side panel sections extending between the end panels;

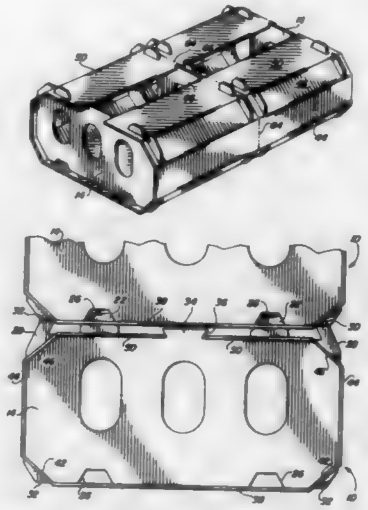
each of the end panels including a plurality of stacking projections extending from either the upper or lower edge thereof and a plurality of recesses in the upper or lower edge opposite the projections, whereby the recesses are capable of receiving stacking projections of a similar adjacent stacked container;

each of the end panels further including shoulders in the upper corner areas and feet in the lower corner areas, the feet and shoulders having aligned support surfaces, whereby the support surfaces of the feet are capable of contacting shoulder support surfaces of a similar adjacent stacked container;

the top, bottom and side panel sections comprising portions of a relatively flexible sheet folded about the end panels, the sheet including slots through which the plurality of stacking projections and the shoulders and feet of the end panels extend, the sheet also including slots opposite the plurality of recesses, whereby the slots are capable of receiving stacking projections of a similar adjacent stacked container;

the top panel sections including end portions of the sheet; and

means for holding the end portions of the sheet in place.



5,316,208

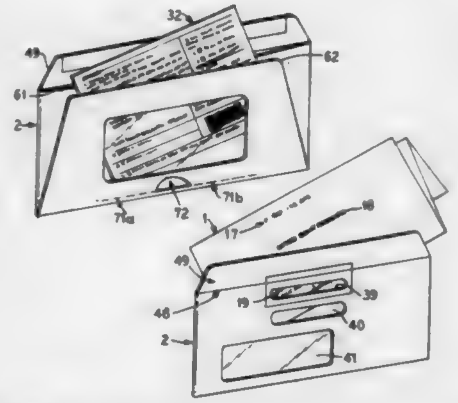
SINGLE LAYER MULTI-PART MAILER ASSEMBLY

Glenn Petkovsek, 20 Tortoise Park Cove, Little Rock, Ark. 72211-2349

Filed Jul. 16, 1992, Ser. No. 913,893

Int. Cl.^{5} B65D *27/04, 27/06, 27/08*

U.S. Cl. 229—71 **12 Claims**



1. A multi-part mailing system, said system comprising:

a form having printed information relating to mail handling, said form being a single-layer of material having a plurality of detachable parts wherein said plurality of detachable parts are capable of being detached from each other;

means for separating said plurality of detachable parts by formation of pre-set boundaries on said form wherein separation of said form is along said pre-set boundaries;

an envelope having an interior, the envelope individually and separately formed from the form and further having a first compartment for securing and exposing appropriate portions of said information from said form in addition to other inserted materials, said envelope having an external means for accessing at least one of said plurality of detachable parts from a second compartment without disturbing the remainder of said plurality of detachable parts and said other inserted materials in the first compartment;

said first compartment in the interior of the envelope defining a first means for receiving at least one detachable part of said form; and

said second compartment in the interior of the envelope defining a second means for receiving at least another detachable part of said form.

5,316,209
EASY OPENING FILM PACKAGE AND A METHOD OF PREPARING THE SAME

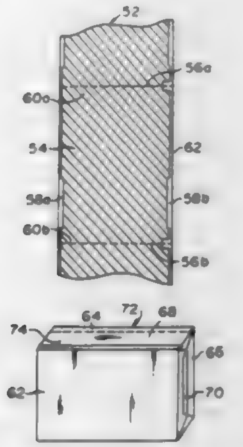
Maya Tomisawa; Shuji Higashi, both of Saku; Koji Sasagawa, Chiba, and Tatsuo Fujii, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 30, 1992, Ser. No. 983,406

Claims priority, application Japan, Nov. 30, 1991, 3-342147

Int. Cl.⁵ B65D *27/00, 27/34*

U.S. Cl. 229—87.05 **1 Claim**



1. An easy opening film package formed by lapping a cubic or rectangular prism article with a resin film having first and second surfaces, and opposing first and second ends, and having a printed portion on at least one of the surfaces, said lapping resulting in an overlap of said first surface over said second surface across a face of said rectangular prism, the area of said overlap across said face defining a sealing zone wherein the film surfaces at said sealing zone are bonded together by heat, said film package being characterized in that said printed portion comprising ink and a resin compatible with the resin film covers the entire resin film printed surface in the sealing zone of the film, said compatible resin comprising a thermoplastic resin in an amount such that a bond formed in the sealing zone by the application of heat to said print layer is of sufficient strength to prevent separation of said thermoplastic film at said sealing zone during normal handling but whose bond strength is less than the bond strength which would otherwise be obtained by heat sealing said resin film to itself.

5,316,210
PAPERBOARD STORAGE CONTAINER

David J. Scullin, North Olmsted, Ohio, assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed May 14, 1993, Ser. No. 61,282

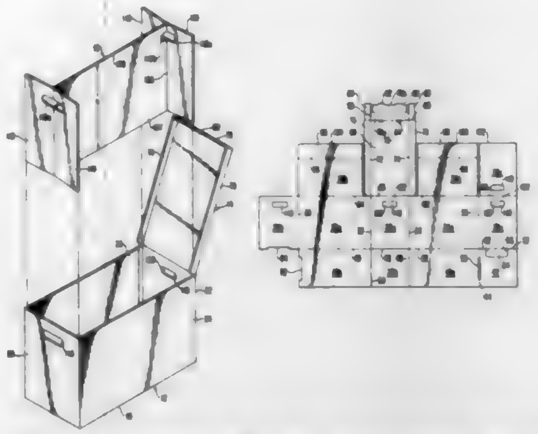
Int. Cl.⁵ B65D *5/48, 5/10*

U.S. Cl. 229—117.16 **21 Claims**

1. A container formed from a paperboard blank, said container having a bottom and rectangularly disposed walls including oppositely spaced side and end walls upstanding from said bottom, said container comprising:

a pair of side wall panels foldably connected in alternating disposition between three end wall panels placing one of said end wall panels in overlapping registry with another of said end wall panels with said sidewall panels and said end wall panels positioned in mutual rectangular disposition;

a bottom panel foldably connected to a bottom edge of a sidewall panel adjacent said one end wall panel and carrying a foldably connected spacer panel which is interposed between said registering end wall panels when said bottom panel is angularly offset with respect to said sidewall panel and closes lower ends of said rectangularly disposed side and end walls;



a locking tab foldably connected to a bottom edge of said one end wall panel; and

means forming a slot on a fold line between said bottom panel and said spacer panel, said slot receiving said locking tab for locking said container in an assembled condition.

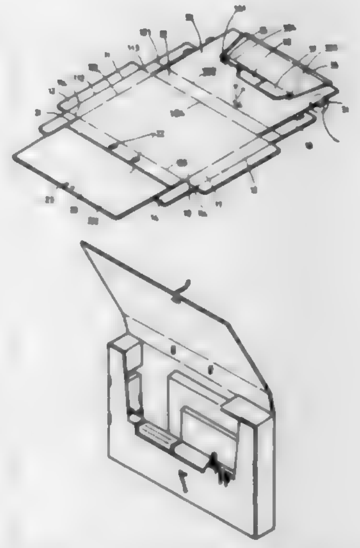
5,316,211
HAND CARRYING CASE

Chung-Cheng Chang, No. 346, Ingtsair Rd., North District, Taichung City, Taiwan

Filed Apr. 7, 1993, Ser. No. 43,739

Int. Cl.⁵ B65D *5/48, 85/28*

U.S. Cl. 229—120.21 **1 Claim**



1. A hand carrying case made by folding up a unitary base sheet, comprising a front panel, a cover flap, two side panels, two reinforcing side strips, two upper parting strips, two lower

parting strips, a partition flap, and a back panel, said back panel having one longer side connected to said front panel by a bottom panel, an opposite longer side connected to said cover flap by a top panel, two opposite shorter sides respectively connected to said reinforcing side strips by said side panels, said upper and lower parting strips being respectively and longitudinally extended from said side panels at two opposite ends, said partition flap being connected to said front panel by a first connecting strip and a second connecting strip, said first and second connecting strips being separated by a projecting strip on said front panel, said front panel having side projections respectively inserted through holes between said side panels and said reinforcing side strips and then respectively fitted into respective recessed portions on said front panel, said first connecting strip having round holes for inserting, said cover flap and said front panels having wire holes for inserting a wire to tie said cover flap to said front panel, said top panel having holes for mounting a carrying handle, said partition flap being folded back to define a compartment between said front panel, said side panels, said reinforcing side strips, and said upper and lower parting strips flap being respectively folded back to define two separate compartments with said back panel.

5,316,212
PACKAGE AND BLANK FOR MAKING THE SAME

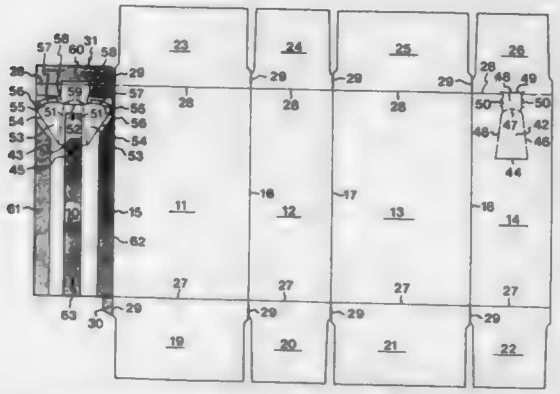
Per A. Eriksson, Solbacksvägen 6, S-217 63 Malmö , and Mats A. Lindgren, Björkgatan 22, S-214 34 Malmö , both of Sweden

Filed Dec. 28, 1992, Ser. No. 997,178

Claims priority, application Sweden, Dec. 30, 1991, 9200007-4

Int. Cl.⁵ B65D *5/54, 5/72*

U.S. Cl. 229—215 **40 Claims**



1. A package constructed of cardboard material, adapted to contain free-flowing pulverulent or granular goods and comprising tightly interconnected bottom, lid and side walls, one of said side walls being at least partially double-walled, including inner and outer side wall panels which are adhesively bonded together in overlapping fashion and have a pouring spout device formed from the cardboard of said inner and outer side walls panels, said pouring spout device comprising a channel bottom and channel side walls extending from the opposite side edges of said channel bottom, said channel side walls being free of adhesive bond to juxtaposed parts of the outer side wall panel, said channel bottom being formed of an outer layer and an inner layer, said outer layer channel bottom being disposed in the outer side wall panel and being delimited from the remainder of the outer side wall panel by a fold line intended to serve as a hinge and situated at an inner end of said channel bottom, and by perforated tear lines extending from the ends of said fold line to an outer end of the channel bottom where they are interconnected by a transverse perforated tear line, said inner layer being disposed in the inner side wall panel and being delimited, at the inner end of the channel bottom, from the remainder of the inner side wall panel by a fold line intended to serve as a hinge and situated in the erected package approximately opposite to the corresponding fold line in the outer side wall panel, and, said channel side walls are delineated at the outer end of the channel bottom, from the remainder of the inner side wall panel by a punched line, said inner layer being connected to said channel side walls by fold and punched lines which extend from ends of said fold line situated at the inner end of the channel bottom, to the ends of said punched line situated at the outer end of the channel bottom, said channel side walls being delimited from the surrounding parts of the inner side wall panel by arcuate punched lines, said arcuate punched lines extending from the ends of said punched line situated at the outer end of said channel bottom and merging into hook-forming punched lines which in turn merge into substantially straight punched lines extending substantially to the ends of said fold line situated at the inner end of said channel bottom, characterized in that a tear flap is formed in the outer side wall panel between said transverse perforated tear line delimiting the outer end of the pouring spout device, and a corner edge of said outer side wall panel spaced therefrom, said tear flap being delimiting, by a punched line at said edge and by perforated tear lines extending between said punched line and the ends of said transverse perforated tear line situated at the outer end of the channel bottom; that the inner side wall panel is provided with short punched lines which start from the transition between said punched line situated at the corner end of the channel bottom, and the arcuate punched lines at the outer end of the channel side walls, and extend outwards in relation to the outer end of the channel bottom; that said arcuate punched lines are so designed that the outer end ends delimited thereby project, when the spout is opened, into said short punched lines for positively guiding the channel side walls when opening and closing the spout.

5,316,213
CONDENSATE TRAP

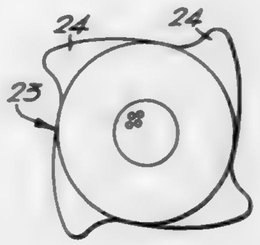
Roy J. Gooderham, Cheltenham, United Kingdom, assignor to Spirax-Sarco Limited, Cheltenham, United Kingdom

Filed May 12, 1993, Ser. No. 59,566

Claims priority, application United Kingdom, May 14, 1992, 9210352.2

Int. Cl.⁵ F16T *1/10*

U.S. Cl. 236—58 **5 Claims**



1. A condensate trap comprising:

a casing comprising a peripheral wall and oppositely disposed end walls which define a valve chamber, an aperture being provided in each end wall for the passage of fluid into and out of the valve chamber, the end walls having, on the outside of the casing, mutually parallel flat end surfaces which extend from the peripheral wall to the respective apertures; and

a valve disposed within the valve chamber, whereby the condensate trap is adapted for mounting in a fluid line by clamping between two flanges which are secured together by flange bolts situated externally of the condensate trap, the peripheral wall being provided with outwardly extending centering means comprising a plurality of cam lobes, each of which has a convex ramp surface for engagement with a respective one of the flange bolts in order to center the condensate trap with respect to the flange bolts.

5,316,214
AIR CONDITIONER FOR RAILWAY VEHICLES

Takane Suzuki; Sakuo Sugawara, both of Kamakura; Nobuyoshi Hamazaki, Nagasaki; Ken-ichi Ito, Nagasaki; Koichiro Tsutsumi, Nagasaki, and Osamu Sakai, Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

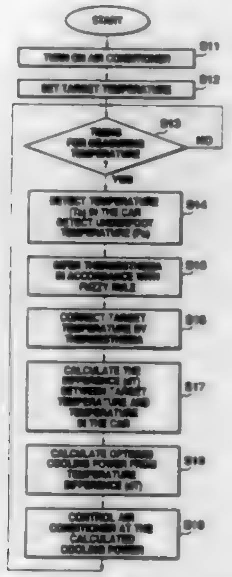
PCT No. PCT/JP91/01219, § 371 Date May 18, 1992, § 102(e) Date May 18, 1992, PCT Pub. No. WO92/05058, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 13, 1991, Ser. No. 856,953

Claims priority, application Japan, Sep. 18, 1990, 2-248225; Sep. 18, 1990, 2-248226; Sep. 18, 1990, 2-248227

Int. Cl.^{5} G05D *23/00*

U.S. Cl. 236—78 B **8 Claims**



1. An air conditioner for railway vehicles for controlling the temperature of a car to a preset target temperature, the air conditioner comprising:

(a) a warm/cool air current generator for generating a warm air current during a heating operation and a cool air current during a cooling operation;

(b) a car temperature detector provided in the vicinity of a ceiling in the car for detecting an air temperature in the car;

(c) an underfoot temperature detector provided in the vicinity of a floor of the car for detecting an air temperature in the vicinity of the floor;

(d) a target temperature correcting means for inferring the thermesthesia of passengers in the car on the basis of an output of the car temperature detector and an output of the underfoot temperature detector and correcting the target temperature in accordance with the result of the inference;

(e) an optimum heating/cooling power calculator for calculating the optimum heating/cooling power on the basis of a difference between the corrected target temperature and the temperature of the air in the car;

(f) a heating/cooling power controller for controlling the warm/cool air current generator in accordance with an output of the optimum heating/cooling power calculator; and

(g) a radiant heat quantity detector provided at an appropriate location in the car for detecting a quantity of radiant heat;

wherein the target temperature correcting means infers the thermesthesia of the passengers from the detected quantity of radiant heat.

5,316,215
LIQUID DELIVERY APPARATUS

David Mitchell, Church Farm, Winfarthing, Diss, Norfolk IP22ED, United Kingdom

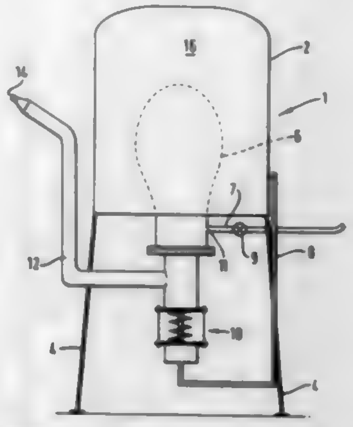
PCT No. PCT/GB91/01570, § 371 Date Mar. 1, 1993, § 102(e) Date Mar. 1, 1993, PCT Pub. No. WO92/04986, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 13, 1991, Ser. No. 977,407

Claims priority, application United Kingdom, Sep. 15, 1990, 9020220; Apr. 22, 1991, 9108558

Int. Cl.^{5} B05B *9/047*

U.S. Cl. 239—67 **18 Claims**



1. A liquid delivery apparatus comprising

(i) a liquid reservoir into which a liquid may be introduced via an inlet to pressurize liquid in the reservoir;

(ii) an outlet via which said liquid may be discharged from the reservoir under the pressure of the liquid in the reservoir;

(iii) a valve between the reservoir and the outlet to control passage of liquid from the reservoir to the outlet, said valve having (a) an opening, (b) a closure member adapted to close the opening, and (c) a biasing means, the arrangement of the components of the valve being such that the valve is normally held closed under the force of the biasing means and the pressure of the liquid in the reservoir;

(iv) a valve control mechanism for controlling the operation of the valve in response to the pressure of the liquid in the reservoir; and

(v) a means for transmitting the pressure in the reservoir to the valve control mechanism;

wherein the valve control mechanism comprises a movable element which is capable of being acted on by the pressure of the liquid in the reservoir and transmitting a resultant force to the closure member of the valve in a direction to open the valve, and wherein the respective effective surface areas of the movable element and the closure member and the force of the biasing means are chosen such that the closure member is opened when the pressure of the liquid in the reservoir reaches a predetermined level.

5,316,216
SHOWERHEAD

Michael A. Cammack; Michael W. Kollha, and David W. Smith, all of Fort Collins, Colo., assignors to Teledyne Industries, Inc. and Teledyne Water Pik, Fort Collins, Colo.

Continuation-in-part of Ser. No. 747,742, Aug. 20, 1991, abandoned. This application Dec. 9, 1992, Ser. No. 988,434

Int. Cl.^{5} B05B *1/08, 1/18*

U.S. Cl. 239—71 **13 Claims**

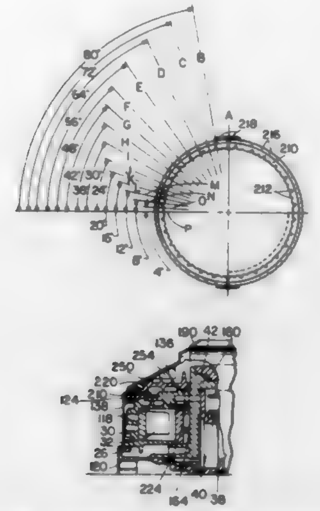
1. In a showerhead including a housing having a water inlet and a water outlet spaced from said inlet along a water flow path with said outlet being defined by a circular array of orifices spaced in succession one after another, said outlet comprising:

a cylindrical body having a radially outward exterior surface;

an annular member having a radially inward interior wall;

a ring disposed within and captivated by said annular member with said ring having a radially inward interior surface;

a circular array of grooves oriented to lie in an axial direction and formed into one of said surfaces;



a cylindrical lip projecting in the axial direction from the other of said surfaces to cover said grooves in definition of said orifices;

a first thread formed on said exterior surface;

and a second thread formed on said interior wall and matable with said first thread to removably mount said member and said ring on said body with said lip covering said grooves.

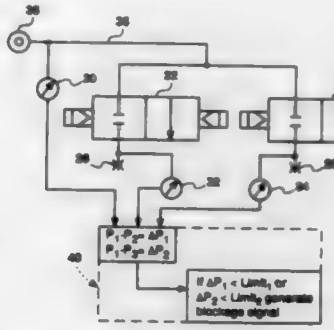
5,316,217
METHOD AND SYSTEM FOR DETECTING BLOCKAGE IN A SPRAY GUN OF A LIQUID SPRAY SYSTEM

Raymond J. Guzowski, Fenton, and David W. Lazar, Troy, both of Mich., assignors to FANUC Robotics North America, Inc., Auburn Hills, Mich.

Filed Aug. 23, 1993, Ser. No. 110,369

Int. Cl.^{5} B67D *5/08*

U.S. Cl. 239—71 **9 Claims**



1. A method for detecting blockage in a spray gun of a liquid spray system including a pressurized liquid supply, a spray gun having a spray orifice and a line for conveying pressurized liquid from the liquid supply to the spray gun, the liquid having a first pressure at an upstream position in the line and a second pressure less than the first pressure at a downstream position in the spray gun, the method comprising the steps of:

generating a first signal based on the first pressure of the liquid;

generating a second signal based on the second pressure of the liquid;

calculating a pressure drop of the liquid between the upstream and downstream positions based on the first and second signals; and

generating a blockage signal when the pressure drop of the liquid is less than a predetermined amount.

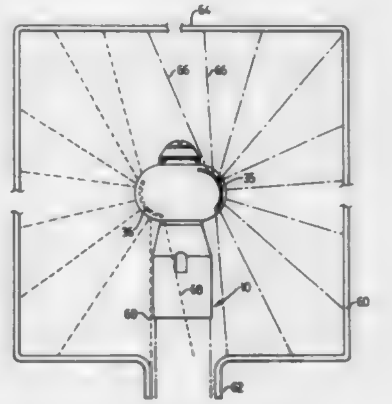
5,316,218
ROTATING NOZZLE

Strachan D. Bowen, Holland Landing, Canada, assignor to Bex Engineering Ltd., Ontario, Canada

Filed May 12, 1993, Ser. No. 60,119

Int. Cl.^{5} B05B *1/04, 3/06*

U.S. Cl. 239—246 **14 Claims**



1. A rotating spray nozzle comprising:

a nozzle mounting member adapted for fitting to a supply pipe;

a nozzle body rotatably mounted on the nozzle mounting member, for rotation about a nozzle axis, and having an internal cavity in communication with the nozzle mounting member, for supply of fluid;

and a pair of slot-shaped nozzles in the nozzle body, extending from the internal cavity and each defining a nozzle plane that inersects the nozzle axis, wherein the slot-shaped nozzles intersect the nozzle body on generally opposite sides of the nozzle body and each nozzle is offset from the nozzle axis, to impart a driving couple to the nozzle body, to cause rotation thereof, and wherein one nozzle is inclined to produce a spray pattern intersecting the nozzle axis, adjacent one end of the nozzle body, remote from the nozzle mounting member, and the other nozzle is inclined to produce a spray pattern intersecting the nozzle axis proximate the nozzle mounting member, adjacent the other end of the nozzle body.

5,316,219
COATING APPARATUS WITH PATTERN WIDTH CONTROL

Richard G. Christyson, Lakewood; William E. Donges, Wellington, and James J. Turner, Amherst, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Jul. 8, 1992, Ser. No. 910,670

Int. Cl.^{5} B05B *1/04, 13/04*

U.S. Cl. 239—533.1 **7 Claims**

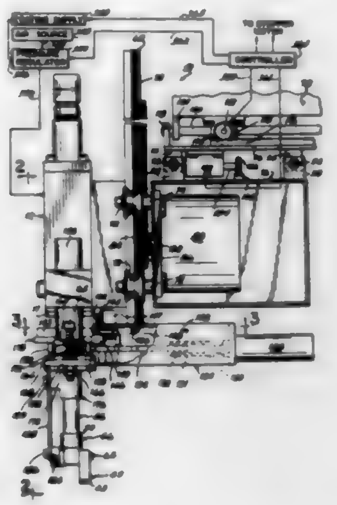
1. Apparatus for applying a coating material to a printed circuit board, comprising:

a spray device adapted to connect to a source of coating material which is supplied under pressure to said spray device at a predetermined flow rate;

a nozzle carried by said spray device, said nozzle being formed with a discharge outlet which emits a pattern of coating material having a width dimension;

drive means for producing relative movement between said spray device and the printed circuit board along at least one axis;

pattern control means for varying at lest one of the pressure



and flow rate at which the coating material moves through said spray device during the time said drive means produces relative movement between said spray device and the printed circuit board so that said width dimension of said spray pattern emitted from said discharge outlet of said nozzle is correspondingly varied during the same time.

5,316,220
IRRIGATOR WITH MUTUALLY PERPENDICULAR WATER PATH COMPONENTS

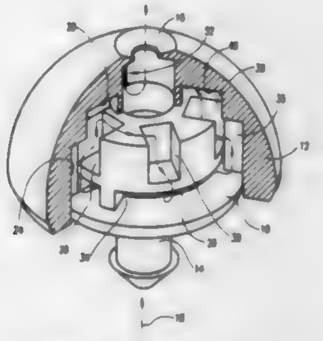
Eldad Dinur, Kibbutz Naan, Israel, assignor to Naan Irrigation Systems, Israel

Filed Aug. 18, 1992, Ser. No. 931,917

Claims priority, application Israel, Aug. 22, 1991, 99281

Int. Cl.⁵ B05B *1/02, 15/00*

U.S. Cl. 239—542 **17 Claims**



1. An irrigation device comprising:

a first interior water path defining member; and

a second exterior water path defining member, cooperating with the first water path defining member to define a circuitous water path including multiple sequential repeated groups of sequential water path components, said sequential water path components extending generally in three mutually perpendicular directions within each of said groups, said multiple sequential repeated groups following one another without interruption.

5,316,221
FLUID DISPENSER HAVING DEFORMABLE CONTAINER PRESSURIZED BY LEAF SPRINGS

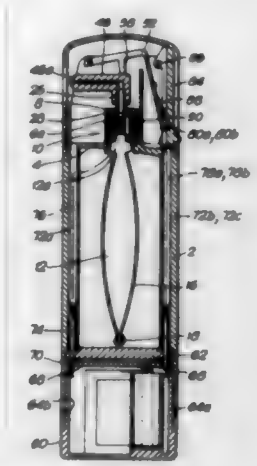
Paul A. Glover, Loughborough, and Brian R. Law, Leicester, both of England, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jan. 29, 1993, Ser. No. 11,011

Claims priority, application United Kingdom, Jan. 31, 1992, 9202149

Int. Cl.⁵ B05B *5/035, 11/04*

U.S. Cl. 239—708 **7 Claims**



1. A fluid dispenser comprising:

a casing;

closure valve means within said casing for controlling dispensing of a fluid material therefrom;

a spray outlet downstream from and communicating with said closure valve means for dispensing said fluid material;

a resilient means for placing said fluid material under pressure, said resilient means comprising a leaf spring and a cooperating member each having first and second ends, said first ends being disposed upstream and below said closure valve means, said first ends forming an open mouth through which said fluid material can flow toward said closure valve means, aid second ends being opposite said first ends and being locked together, and said cooperating member being selected from the group consisting of a further leaf spring and a non-resilient rigid support;

a deformable container capable of being filled with said fluid material to be dispensed, said deformable container being positioned between and deformable by said resilient means.

5,316,222
COLLISION TYPE GAS CURRENT PULVERIZER AND METHOD FOR PULVERIZING POWDERS

Hitoshi Kanda, Yokohama; Masayoshi Kato, Iruma; Satoshi Mitsumura, Tokyo; Yusuke Yamada, Machida, and Yasuhide Goseki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 575,371, Aug. 30, 1990, abandoned. This application Nov. 30, 1992, Ser. No. 983,287

Claims priority, application Japan, Aug. 30, 1989, 1-221805; Sep. 22, 1989, 1-245215; Dec. 7, 1989, 1-316525; Jan. 9, 1990, 2-1102; Jan. 17, 1990, 2-6459

Int. Cl.⁵ B02C *19/00*

U.S. Cl. 241—5 **18 Claims**

1. A pneumatic pulverizer, comprising:

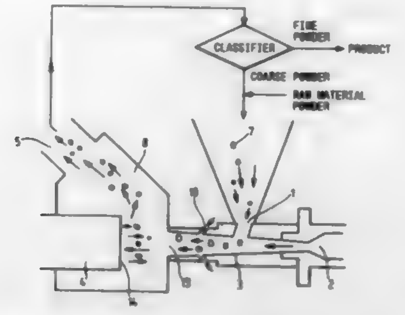
an acceleration pipe for transporting powders under acceleration by a high pressure gas;

a pulverization chamber;

a collision member for pulverizing the powders ejected from said acceleration pipe by a collision force, with said collision member being provided opposite an outlet of said acceleration pipe;

a raw material powder supply inlet provided on said acceleration pipe; and

a secondary air inlet for introducing secondary air into said acceleration pipe at a position downstream from where the raw material enters said acceleration pipe and upstream from the outlet of said acceleration pipe, wherein



a distance x between said raw material powder supply inlet and the outlet of said acceleration pipe and a distance y between said raw material powder supply inlet and said secondary air inlet satisfy the following condition:

$0.2 \leqq y/w \leqq 0.9.$

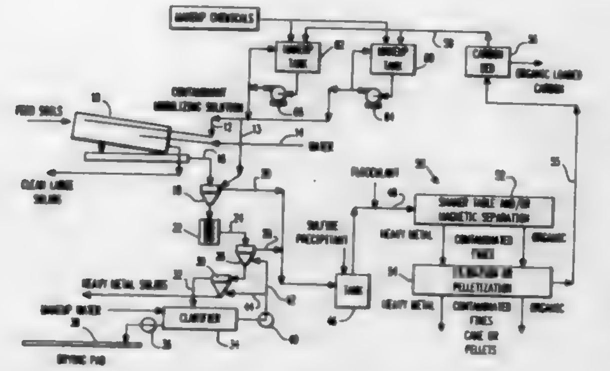
5,316,223
METHOD AND APPARATUS FOR CLEANING CONTAMINATED PARTICULATE MATERIAL

Edward J. Lahoda, Edgewood Borough; David C. Grant, Gibsonia, and Edward F. Sverdrup, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 529,092, May 25, 1990, Pat. No. 5,128,068. This application Apr. 20, 1992, Ser. No. 870,962

Int. Cl.⁵ G21F *9/28;* **C02F** *1/42*

U.S. Cl. 241—24 **33 Claims**



1. Apparatus for treating particulate materials contaminated with a contaminant, said apparatus including:

means washing said particulate material with a contaminant mobilizing solution selected from a group consisting of leaching solutions, surfactants, and mixtures thereof, and mechanically separating large particles of a size substantially free of residual contamination from intermediate sized particles, fines and said contaminant mobilizing solution, and washing the separated large particles with water to produce recovered particulate material;

means separating fines by size from said intermediate sized particles with a countercurrent flow of contaminant mobilizing solution to form a waste slurry;

means abrading the intermediate sized particles from which fines have been removed from said countercurrent flow of contaminant mobilizing solution to dislodge attached fines from the intermediate sized particles;

means separating the dislodged fines by size from the intermediate sized particles by a countercurrent flow of wash water to form additional waste slurry and an effluent of said intermediate sized particles and wash water; and

means dewatering said effluent of intermediate sized particles and wash water to produce additional recovered particulate material.

30. A method of treating particulate material contaminated with a contaminant, said method comprising the steps of:

washing said particulate material with a first quantity of contaminant mobilizing solution selected from a group consisting of leaching solutions, surfactants and mixtures thereof to mobilize soluble and dispersible contaminants in the liquid phase of said contaminant mobilizing solution;

size separating a first part including fines from a second part including larger sized particles with a countercurrent flow of additional contaminant mobilizing solution to form a waste slurry, said size separating of said first part by countercurrent flow being performed by introducing said first part, said second part, and said first quantity of contaminant mobilizing solution into a size separator in a flow with a first flow direction while introducing additional contaminant mobilizing solution in a countercurrent flow with a second flow direction counter to said first flow direction whereby the fines are carried with said counterflow as part of the waste slurry;

attrition abrading the second part from which fines have been removed by said countercurrent flow of contaminant mobilizing solution to dislodge attached fines from larger sized particles; and

size separating the dislodged fines from the larger sized particles by a countercurrent flow of wash water to form additional waste slurry and effluent of said larger sized particles and wash water, said size separating of said dislodged fines by countercurrent flow being performed by introducing the larger particles and dislodged fines into a size separator in a flow with a first flow direction while introducing wash water in a countercurrent flow in a second flow direction counter to said first flow direction whereby the dislodged fines are carried with said counterflow as part of the additional waste slurry and effluent.

5,316,224
METHOD AND APPARATUS FOR RECOVERING ELASTOMERIC MATERIAL

John Dobozy, 62 Mingoletta Drive, Ashmore, Queensland 4214, Australia

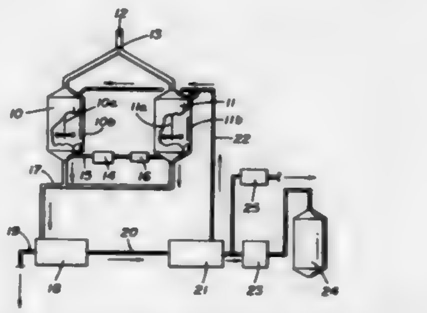
PCT No. PCT/AU90/00484, § 371 Date Jun. 10, 1992, § 102(e) Date Jun. 10, 1992, PCT Pub. No. WO91/05818, PCT Pub. Date May 2, 1991

PCT Filed Oct. 10, 1990, Ser. No. 847,025

Claims priority, application Australia, Oct. 10, 1989, 6768

Int. Cl.⁵ C08J *11/04*

U.S. Cl. 241—30 **15 Claims**



1. A method for recovering elastomeric material from articles containing such material comprising the steps of

softening said elastomeric material by contacting said article with at least one fluid which absorbs into said elastomeric material,

at least partially removing said softened elastomeric material from said article by a shearing means,

recovering said removed softened elastomeric material,

at least partially removing said at least one fluid from the elastomeric material, and

carbonizing the recovered elastomeric material by subjecting it to microwave radiation sufficient to cause carbonization of the elastomeric material.

5,316,225

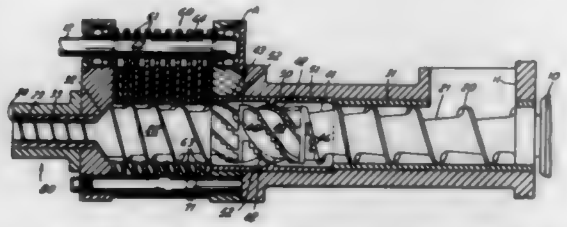
SHREDDING STRAINING APPARATUS

Paul Geyer, 210 B. N. Lindell Rd., Greensboro, N.C. 27403

Filed Feb. 23, 1993, Ser. No. 21,312

Int. Cl.^{5} B02C ***23/10***

U.S. Cl. 241—74 **3 Claims**



1. An apparatus for separating oversize material from various polymer like materials which are processed to provide feed material comprising:

(a) means for continuously supplying feed material which is warmed and under pressure to a downstream straining section; and

(b) said straining section comprising a rotor and a surrounding barrel provided with a bore, which is formed by a series of plates, one set of plates which is ridgedly attached, the other set of plates, sandwiched between said one set of plates is movable in an orbital pattern; said plates being separated from each other by shim material which measures the openings between the plates at the barrel bore to provide circumferential barrel openings to lead off the fine and fluent material from the rotor to radial barrel passages; with the oversize material, being dislodged from the opening entrances, and conveyed downstream by the rotor member to a back pressure developing outlet means.

5,316,226

APPARATUS FOR WINDING A FILM CONDENSOR ELEMENT MATERIAL

Masao Kaito, Kyoto, Japan, assignor to Kaido Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 29, 1992, Ser. No. 905,313

Claims priority, application Japan, Dec. 10, 1991, 3-113934[U]

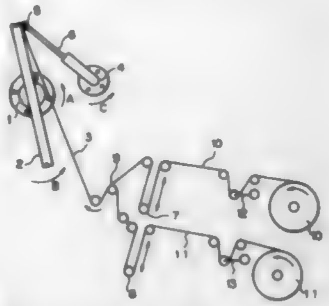
Int. Cl.^{5} B65H ***23/025;*** **H01G** ***13/02***

U.S. Cl. 242—56.1 **5 Claims**

1. An apparatus for winding a film condensor element comprising

a rotating plate jig, said rotating plate jig rotating in a first direction about a winding axis disposed at a central portion of said rotating plate jig;

a pressing roller assembly including a pressing roller mounted upon an arm, and means for rotating said arm in said first direction, wherein said pressing roller is urged against said plate jig to press the film condensor element against said plate jig as said film condensor element is wound upon said plate jig.



5,316,227

SHAPING APPARATUS FOR FORMING A FIELD COIL

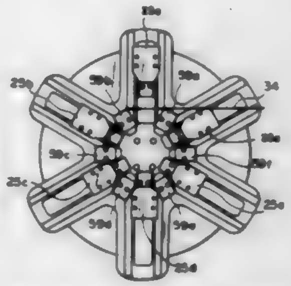
Yasushi Oohashi, Kariya; Mithuyuki Hayashi, Nishio, and Masahiko Sakai, Takahama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 27, 1991, Ser. No. 750,087

Claims priority, application Japan, May 10, 1991, 3-106082; Aug. 27, 1991, 2-225994

Int. Cl.^{5} H02K ***15/06***

U.S. Cl. 242—7.03 **8 Claims**



1. An apparatus for forming a field coil from a conductor comprising:

a rotary base adapted to be rotatably driven for winding the conductor into the field coil;

a plurality of winding guides rotatably coupled to the rotary base for guiding the conductor as the conductor is wound into the field coil;

a plurality of movable shaping members alternately arranged with the winding guides and adapted to be radially movable on the rotary base; and

a moving mechanism for radially reciprocating the movable shaping members on the rotary base at a rate of one reciprocation per revolution of the rotary base, said shaping members being operable to push the conductor between the winding guides to thereby shape the field coil.

5,316,228

MACHINE FOR WINDING TWO-POLE STATORS

Luciano Santandrea, and Massimo Lombardi, both of Florence, Italy, assignors to Axis S.p.A., Florence, Italy

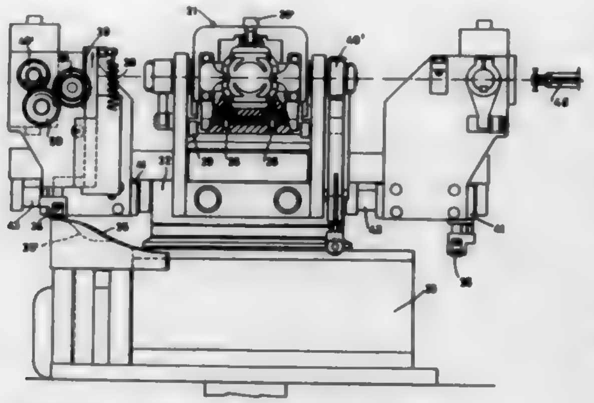
Continuation of Ser. No. 579,606, Sep. 10, 1990, Pat. No. 5,149,000, which is a division of Ser. No. 306,618, Feb. 6, 1989, Pat. No. 4,969,606. This application Jul. 9, 1992, Ser. No. 911,126

Claims priority, application Italy, Mar. 10, 1988, 67196 A/88

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.^{5} H02K ***15/02***

U.S. Cl. 242—1.1 R **55 Claims**



1. Stator processing apparatus comprising:

a table member mounted for rotation in a substantially horizontal plane about a substantially vertical axis;

a plurality of stator holders mounted on said table member, said stator holders being angularly spaced from one another about said substantially vertical axis, each of said stator holders including first and second jaw members movable relative to one another so that a stator can be releasably held between said jaw members; and

first, second, and third work stations disposed adjacent to said table, said work stations being angularly spaced from one another about said substantially vertical axis so that by rotation of said table about said substantially vertical axis, each of said stator holders can be successively disposed adjacent said first, second, and third work stations, said first work station including means for placing a stator in a stator holder disposed adjacent said first work station, said second work station including means for winding at least one coil of wire having at least one coil lead on a stator in a stator holder disposed adjacent said second work station, and said third work station including means for anchoring to a stator in a stator holder disposed adjacent said third work station the coil lead of the coil wound on that stator.

5,316,229

DEVICE FOR TAKING UP THE LEADING END OF A NEW ROLL OF STRIP MATERIAL AND TRANSFERRING IT TO A SUCCESSIVE WORK STATION

Florenzo Draghetti, Medicina, Italy, assignor to G.D. SpA, Bologna, Italy

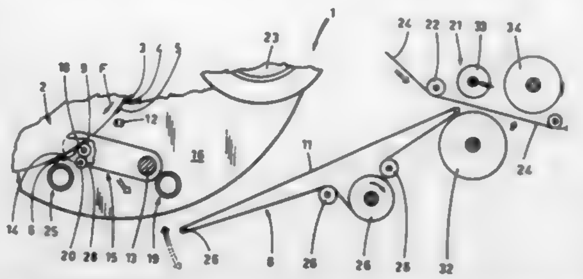
Filed Jan. 7, 1993, Ser. No. 1,629

Claims priority, application Italy, Jan. 9, 1992, BO92A000003

Int. Cl.^{5} B65H ***19/10***

U.S. Cl. 242—58 **7 Claims**

1. A device for taking up the leading end of a strip of material from a new roll, supported with freedom to rotate about its own axis of revolution, and transferring it to a successive work station, comprising first suction means rotatable about an axis parallel to the axis of the roll, by which the roll is set in rotation and by which the leading end of the strip is taken up from the new roll, held and transferred, and second suction means by which the leading end of the strip is received, held and fed toward the successive work station, wherein the first suction means are capable of movement, brought about through the intervention of sensing means designed to detect the passage of the leading end, at least between a first operating position of tangential contact with the roll, in which the roll is set in rotation and the leading end of the strip attracted and held, and a second operating position in which the leading end of the strip is exposed to the action of cutting means and the newly cut end thereupon taken up by the second suction means and directed toward the successive work station.



5,316,230

METHOD AND APPARATUS FOR JOINING THE ENDS OF WEBS OF PACKAGING MATERIAL

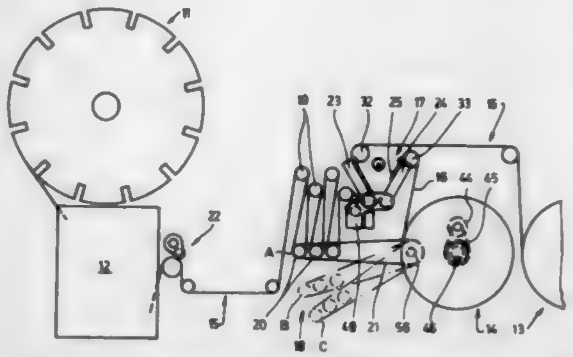
Heinz Focke, Verden, and Jürgen Wach, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Feb. 28, 1992, Ser. No. 843,029

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1991, 4107254

Int. Cl.^{5} B65H ***19/18***

U.S. Cl. 242—58.1 **14 Claims**



1. A method of joining a trailing, running-off end (30) of a running-off web (15) of packaging material to a leading, connecting end (25) of a connecting web (16) of packaging material, in which, during a phase of a temporary standstill of the running-off web (15), the running-off web (15) is severed and the resulting running-off end (30) of the running-off web (15) is joined to the connecting end (25) of the connecting web (16), characterized in that: the position of the running-off web (15) is scanned, by means of markings (43) which are arranged on the running-off web (15) at equal distances, to cause the running-off web (15) to be stopped; a severing cut is subsequently applied in a given position relative to a marking (43); and finally the connecting end (25) of the connecting web (16) is joined to the trailing end (30) of the running-off web (15) in a required position;

wherein the length of the running-off web (15), which is conveyed after identification of a marking (43) of the running-off web (15) and until the standstill for applying the severing cut, is measured by a revolution indicator of a rotating means, in the form of a deflecting roller (38) of the running-off web (15), located in the region of a severing and connecting unit (17).

5,316,231

UNWINDING APPARATUS FOR WOUND ROLLS

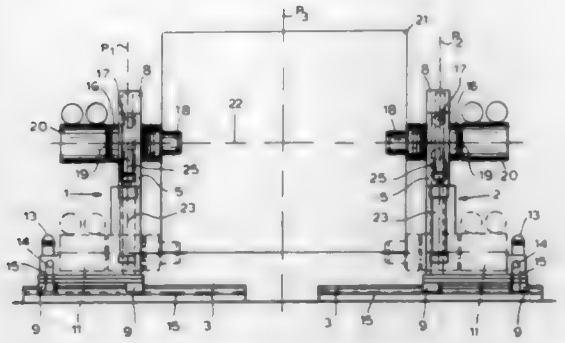
Karl Thievessen, Grevenbroich, and Peter Weiss, Neuss, both of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 31, 1992, Ser. No. 830,406

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1991, 4103057

Int. Cl.^{5} B65H *19/12*

U.S. Cl. 242—58.6 **4 Claims**



1. An unwinding apparatus for a wound roll of a web, comprising:

a pair of spaced-apart generally upright stands forming vertical guides, each of said guides having a pair of spaced apart vertical posts and a traverse bridging opposite upper ends of said posts;

a respective bearing housing received in each guide and vertically displaceable therealong;

a respective engaging head journaled in each of said housings and engageable in a respective end of a winding tue on which the roll is wound for supporting said roll, said head of each housing lying inwardly of the posts thereof;

a respective drawing piston-and-cylinder assembly mounted on each stand in a common vertical guide plane with the respective guide, laterally offset from the respective housing and laterally outwardly of a respective post thereof, each of said assemblies having a vertically displaceable sprocket in said plane;

at least one guide roller on each stand journaled in a respective traverse above the respective housing in the respective plane;

a respective traction chain in the respective guide plane passing around the vertically displaceable sprocket of each assembly and around the respective guide roller and having a respective vertical stretch extending vertically from above into engagement with the respective housing symmetrically with respect to a vertical plane of symmetry including axes of said heads and perpendicular to said guide planes each chain having one end anchored to the respective traverse, passing under the respective sprocket, passing over the respective guide roller and extending vertically downward in the vertical plane of symmetry to the respective housing; and

a brake engaging the head on at least one of said housings and mounted on a portion thereof externally of a space between said stands.

5,316,232

OMNIDIRECTIONAL WIRE DISPENSER

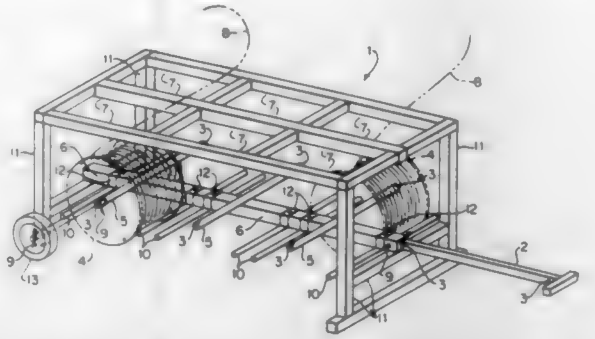
John A. Lambert, Jr., 211 Shelly La., Montgomery, Ala. 36110

Filed Nov. 13, 1992, Ser. No. 975,739

Int. Cl.^{5} B65H *16/00*

U.S. Cl. 242—86.50 R **2 Claims**

1. An omnidirectional wire dispenser for dispensing wire from multiple spools, which comprises a generally rectangular top frame member configured to define a plurality of guide windows, end frame members attached to said top frame member generally perpendicular thereto at first and second ends thereof, an inner shaft member attached to and extending between said first and second end frame members, a plurality of spool holders perpendicularly mounted on said inner shaft member and corresponding in number to the number of guide windows, pairs of spool tension bars corresponding to each spool holder, each said pair of spool tension bars mounted perpendicular to said inner shaft member so to be located on either side of the corresponding said spool holder, wheels mounted on one of said end frame members opposite said top frame member and a handle that is extendable from said inner shaft is mounted on the other of said end frame members.



5,316,233

SEAT BELT RETRACTOR WITH SPRINGS CONNECTED IN SERIES AND MOTORIZED SPRING FORCE ADJUSTMENT

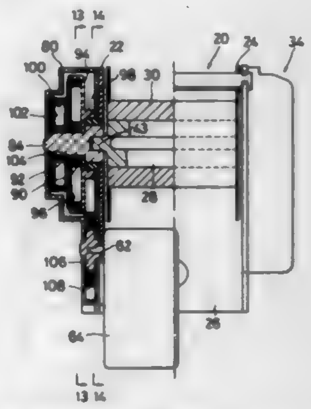
Koji Hiramatsu, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Jul. 13, 1992, Ser. No. 912,754

Claims priority, application Japan, Jul. 19, 1991, 3-179368

Int. Cl.^{5} B60R *22/44, 22/46;* **B65H** *75/48*

U.S. Cl. 242—107 **6 Claims**



4. A seat belt retractor comprising:

a frame having a pair of side plates which face each other and a back plate which interconnects said side plates;

a reel shaft arranged between said side plates and having ends projecting to exterior areas of said side plates;

power springs linked in series and provided at one exterior side of said side plates, said power springs having first and second ends, said first end being connected to one of the ends of said reel shaft adjacent thereto to energize said reel shaft in a direction of retracting a seat belt, said power springs including at least first and second power springs which have different spring constants; and

a retracting force adjusting device for adjusting force of retracting said seat belt by partially taking up said power springs, said retracting force adjusting device including:

a tape for transmission of rotation and having first and second ends;

a shaft actuator member mounted coaxially on said reel shaft, said first and second power springs being wound on said shaft actuator member and an inner circumferential end portion of said second power spring forming said first end of the power springs being connected to said shaft actuator member;

a first rotary member fitted rotatably over said shaft actuator member and having a portion for taking up said tape, said first end of said tape being wound onto the first rotary member, an outer circumferential end portion of said first power spring forming sid second end of the power springs being connected to the first rotary member;

a second rotary member fitter rotatably over said shaft actuator member, an inner circumferential end portion of said first power spring being wound on said second rotary member and an outer circumferential end portion of said second power spring being connected to said second rotary member;

a third rotary member for taking up said tape and having a rotation axis parallel to said shaft actuator member, said second end of the tape being wound onto the third rotary member; and

a drive unit for rotating said third rotary member.

5,316,234

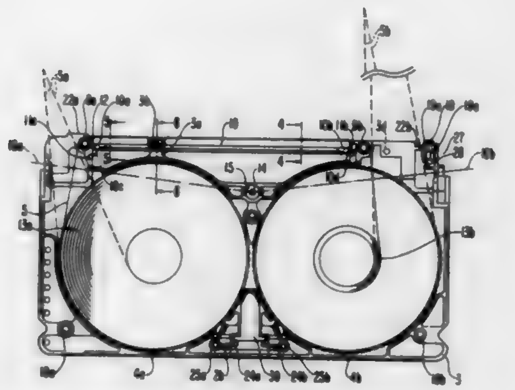
TAPE CASSETTE FOR CASSETTE RECORDING/REPRODUCING APPARATUS

Hironori Honsho, Neyagawa, and Fuminari Saito, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1991, Ser. No. 706,998

Int. Cl.^{5} G11B *23/04, 23/08*

U.S. Cl. 242—198 **3 Claims**



1. A tape cassette comprising:

a pair of tape reels for winding a tape thereon and for respectively fixedly holding leading and trailing ends of said tape, each of said tape reels having a rotational axis;

a cassette case having a front, a back, and opposing side surfaces, and containing said pair of tape reels therein with a forwardly exposed portion of the tape being extended across said front of said cassette case, an opening being provided in said cassette case behind said forwardly exposed portion of the tape;

first and second side walls arranged in the cassette case and having first and second surfaces, respectively, defining therebetween said opening;

first and second guide posts mounted on said cassette case at positions close to said first and second side walls, respectively, for guiding the forwardly exposed portion of the tape along a line;

a front lid pivotably supported on said side surfaces of said cassette case for pivotal movement between a closed position in which said front lid covers a front surface of said forwardly exposed portion of the tape and an open position in which said front lid does not cover said forwardly exposed portion of the tape;

an inner lid pivotably supported on said front lid for pivotal movement between a closed position in which said inner lid covers a back surface of said forwardly exposed portion of the tape when said front lid is in its closed position, and an open position in which said inner lid does not cover the back front surface of said forwardly exposed portion of the tape when said front lid is in its open position; and

wherein a forwardly and rearwardly extending partition is mounted in said casing between said first and second side walls and is located on a forwarding and rearwardly extending center line extending through said rotational axis of one of said tape reels, said partition dividing said opening into a first opening and a second opening, said first opening being located substantially centrally between said opposing side surfaces of said cassette case and having a symmetrical shape.

5,316,235

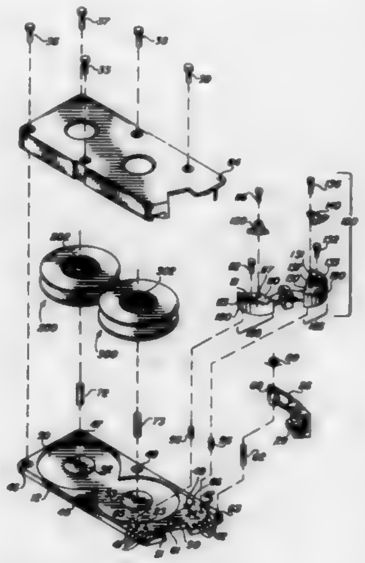
TAPE CARTRIDGE WITH MOUNT PLATE

Don G. East; Steven L. Felde; Paul Y. Hu, and Guillermo S. Robles, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1992, Ser. No. 902,093

Int. Cl.^{5} G11B *23/087*

U.S. Cl. 242—199 **29 Claims**



1. A tape cartridge comprising:

a plate having a side with a first surface, a second surface, and a third surface thereon, the first surface, the second surface, and the third surface in a single plane and separated from each other by at least one recess in the side of the plate, the third surface including an edge and a portion interior of the edge;

a first tape reel on the first surface;

a second tape reel on the second surface;

a tape having a first end wound upon the first tape reel and a second end wound upon the second tape reel; and

a cover affixed to the plate to form a box-like housing about the first tape reel and the second tape reel, the housing having an inside and an outside, the majority of the side of the plate on the inside of the housing, the cover having a plurality of walls adjacent the plate, one of the walls having a recess therein exposing the portion of the third surface interior of the edge to the outside of the housing.

5,316,236

TAPE SUPPLYING AND TAKING UP APPARATUS AND TAPE CASSETTES FOR USE THEREWITH

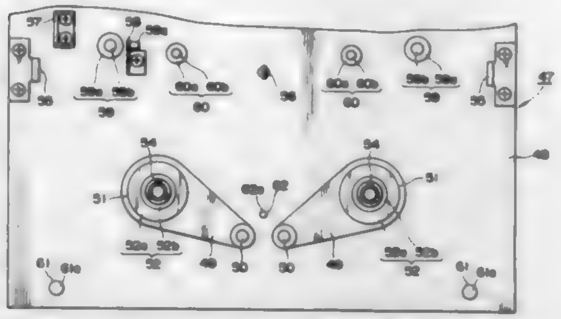
Shinichi Hasegawa, Chiba; Shuichi Ota, Kanagawa; Akihiro Uetake, Tokyo; Takashi Sawada, Kanagawa; Yoichirou Senshu, Kanagawa, and Chiaki Sugai, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1992, Ser. No. 991,266

Claims priority, application Japan, Dec. 27, 1991, 3-350034

Int. Cl.^{5} G11B *15/18*

U.S. Cl. 242—200 **8 Claims**



1. A tape supplying and taking up apparatus capable of receiving two types of tape cassettes of large and small sizes, respectively, and which each contain a pair of tape reels, and a tape wound on said tape reels and having a tape portion extending therebetween, said tape supplying and taking up apparatus comprising:

a chassis;

large and small size tape cassette locating means on said chassis for selectively locating said large and small size tape cassettes in respective operative positions on said chassis; and

a pair of reel spindles mounted on said chassis for engaging the pair of tape reels of either one of said large and small size tape cassettes when in its respective operative position, each of said reel spindles having a reel driving portion, a large size cassette receiving portion for receiving a respective tape reel of a large size tape cassette thereon, and a small size cassette receiving portion for receiving a respective tape reel of a small size tape cassette thereon, said reel driving portion, said large size cassette receiving portion, and said small size cassette receiving portion of each of said reel spindles being disposed in a relatively fixed coaxial relationship, said small size cassette receiving portion of each of said reel spindles having an outer diameter smaller than an outer diameter of said large size cassette receiving portion of the respective spindle and being fixedly disposed at a higher position than said large size cassette receiving portion of said respective spindle.

5,316,237

MAGNETIC TAPE APPARATUS HAVING A COMPACT REEL-BRAKE ASSEMBLY

Winfried Schafler, Korneuburg, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 785,182, Oct. 31, 1991, abandoned, which is a continuation of Ser. No. 570,245, Aug. 17, 1990, abandoned. This application Jun. 9, 1992, Ser. No. 896,804

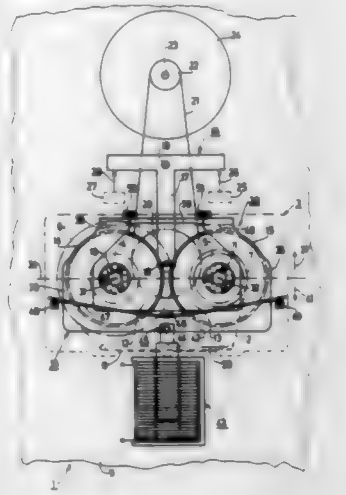
Claims priority, application Austria, Aug. 25, 1989, 2016-89

Int. Cl.^{5} G11B *15/22, 15/46*

U.S. Cl. 242—204 **16 Claims**

1. A recording and/or reproducing apparatus for a record carrier in tape form which extends between two rotatable drivable hubs, said apparatus having two winding spindles connected to two adjacent drive wheels rotatable about two axes, separated by a predetermined space, wherein the improvement comprises:

a closed one piece braking frame which is displaceable substantially perpendicularly to a plane including the axes of the drive wheels, the frame having two carrier portions passing through said plane and outside the predetermined space between the drive wheels axes, one carrier portion being located on each side of said predetermined space, said two carrier portions being joined together by two joining members, said two joining members and said two carrier portions defining a closed, continuous perimeter of said braking frame;



two braking surfaces on one of the joining members of the frame on a first side of said plane for interacting with said drive wheels; and

displacement means engaging the other of the joining members of the frame on a second side of said plane for displacing the frame and causing the braking surfaces to interact simultaneously with the two drive wheels.

5,316,238

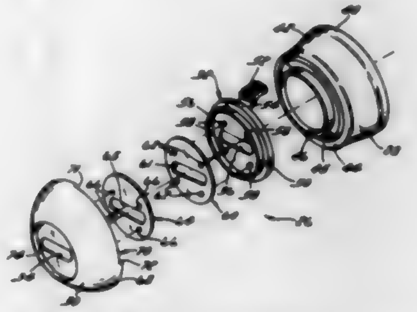
CLOSED FACE FISHING REEL

Dale E. Simonson, North Mankato, Minn., assignor to Johnson Fishing, Inc., Mankato, Minn.

Filed Aug. 2, 1991, Ser. No. 739,666

Int. Cl.^{5},A01K *89/01*

U.S. Cl. 242—234 **23 Claims**



1. A closed face fishing real comprising:

a body, including a spool and winding drum for winding line onto said spool;

a housing detachably secured to said body, said housing having an aperture for permitting said line to pass through; and

means for selectively altering the shape of said aperture, whereby the shape of said aperture may be selected from a continuum of shapes, wherein said continuum of shapes ranges from a shape which imparts substantially little or no jerking motion to the line to a shape which imparts considerable jerking motion to the line.

5,316,239

SPINNING REEL WITH OSCILLATING MECHANISM

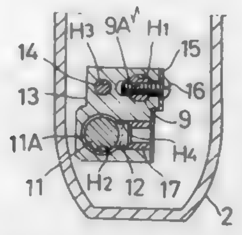
Kenichi Sugawara, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Jul. 5, 1991, Ser. No. 726,285

Claims priority, application Japan, Jul. 10, 1990, 2-73521[U]; Jul. 26, 1990, 2-80106[U]

Int. Cl.^{5} A01K *89/00*

U.S. Cl. 242—241 **3 Claims**



1. A spinning reel comprising:

a reel body, a handle, a spool, and a spool shaft, said spool shaft having a front end and a rear end, said spool being mounted on said front end of said spool shaft, said spool being located at a front portion of said reel body; and

an oscillating mechanism for operatively connecting said handle and said spool shaft, such that said spool shaft and said spool reciprocate in an axial direction in response to rotation of said handle, said axial direction being substantially parallel to said spool shaft, said oscillating mechanism including:

- a worm shaft having a peripheral endless groove, said worm shaft being located within said reel body, said worm shaft being substantially parallel to said spool shaft, said worm shaft being rotated in response to rotation of said handle,
- a transmission member coupled to said worm shaft and being displaceable axially of said worm shaft, said transmission member being fixedly connected to said rear end of said spool shaft, and said transmission member having a through hole of predetermined cross-section,
- a pawl member, for coupling said transmission member to said worm for converting rotation of said worm shaft into reciprocation of said transmission member in said axial direction, and
- a guide member of said predetermined cross-section for guiding said transmission member such that said transmission member moves only in said axial direction, said guide member being located within said reel body, said guide member being substantially parallel to said worm shaft, said guide member being encompassed within and slidably engaged with said through hole of said transmission member.

5,316,240

METHOD AND DEVICE FOR FILTERING THE VIBRATORY EXCITATIONS TRANSMITTED BETWEEN TWO PARTS ESPECIALLY BETWEEN THE ROTOR AND THE FUSELAGE OF A HELICOPTER

Laurent Girard; Tomasz Krysinski, both of Marseille, and Pierre Michel, Aix-en-Provence, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Aug. 12, 1992, Ser. No. 928,306

Claims priority, application France, Sep. 28, 1991, 91 10722

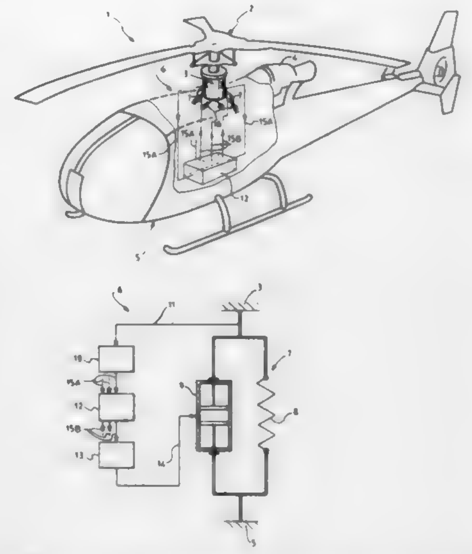
Int. Cl.^{5} B64C *27/51;* **F16F** *7/00*

U.S. Cl. 244—17.27 **21 Claims**

1. A method for filtering the vibratory excitations transmitted between two parts (3,5), linked by at least one linking element (7) comprising a member (8) for transmission of the static force between said parts (3,5), and an actuator (9) associated with said transmission member (8), comprising:

generating a physical quantity which is representative of the vibratory excitations transmitted from one part to the other part is measured on said linking element (7), and corresponding first signals are generated;

processing said first signals by processing means (12), in order to convert said first signals into second control signals for said actuator (9); and



carrying out the decoupling of the static force and of the vibratory excitations by said processing means (12), in such a way that said second control signals drive the actuator in order to exactly oppose said vibratory excitations.

5,316,241

AIRCRAFT DOOR LIFTING AND DOOR HINGE SWIVELLING MECHANISM

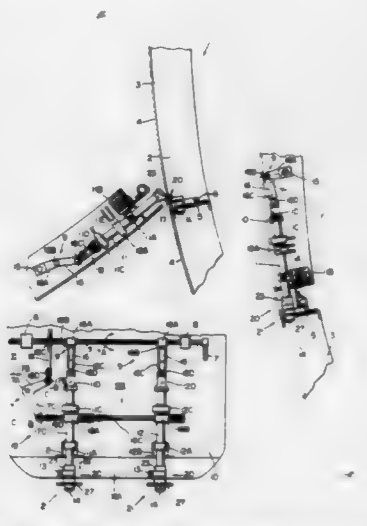
Guenter Kallies, and Wolfgang Lessat-Kaupat, both of Hamburg, Fed. Rep. of Germany, assignors to Deutsche Aerospace Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 19, 1993, Ser. No. 6,232

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1992, 4200930

Int. Cl.^{5} B64C *1/14*

U.S. Cl. 244—129.5 **8 Claims**



1. An aircraft door lifting and door hinge swivelling mechanism, comprising an aircraft door, at least two door support rods, slide bearings for movably mounting said door to said support rods, a torque transmitting shaft rotatably mounted to

said door and connected to a door handle, torque converting first link means connected between said torque transmitting shaft and said support rods for lifting said door relative to said support rods, torque transmitting second link means connected between said torque transmitting shaft and said support rods for rotating said support rods through an angular range about a longitudinal axis of each of said support rods, door hinges connected to said support rods, and means for rotatably supporting each of said door hinges, whereby said door hinges are inside said aircraft door when said door is closed and outside said door when said door is opened.

5,316,242
APPARATUS FOR GUIDING DIFFERENT SIZE PALLETS, ESPECIALLY ON THE LOADING FLOOR OF AN AIRCRAFT

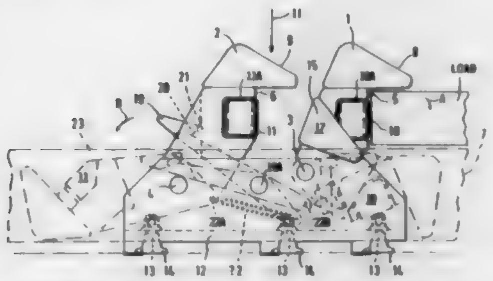
Wilfried Ellenstein-Wiegmann, Stuhr, and Guenter Vogg, Bremen, both of Fed. Rep. of Germany, assignors to Deutsche Aerospace Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 29, 1993, Ser. No. 39,809

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1992, 4210702

Int. Cl.⁵ B63B *25/22;* **B64C** *1/20*

U.S. Cl. 244—137.1 **12 Claims**



1. A mechanism for guiding a load on the loading floor of an aircraft comprising a pair of two separate guide elements, means for tiltably mounting both guide elements in said loading floor, whereby said two guide elements are arranged in a row having a longitudinal row axis extending substantially perpendicularly to a freight moving direction (R) on the loading floor, each guide element comprising guide roller means for guiding a vertical edge of a load pallet and with a latching hook for guiding a horizontal edge of a load pallet for preventing a tilting of a load pallet, said mounting means for said guide elements comprising journal bearings arranged so that one of the guide elements is tiltable into said loading floor with respective guide roller means facing substantially downwardly, while the other guide element is tiltable into the loading floor so that respective guide roller means face substantially upwardly, one of the two guide elements comprising a roll-over bail which tilts the respective guide element into said loading floor in response to a load rolling over said roll-over bail, whereby a large pallet moves one of the guide elements out of the way for the large pallet to be guided by the other guide element.

5,316,243
OPTIC CABLE MANAGEMENT

Roy Henneberger, Eagan, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 678,131, Apr. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 387,978, Jul. 31, 1989, Pat. No. 5,067,678. This application Nov. 30, 1992, Ser. No. 984,246

Int. Cl.⁵ H02G *3/04*

U.S. Cl. 248—68.1 **5 Claims**

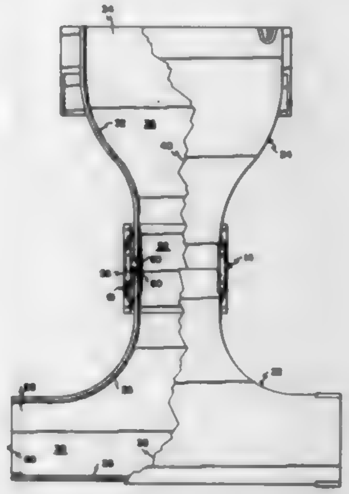
1. A cable routing system comprising:

a plurality of cable pathway-defining elements;

each one of said plurality terminating at least one attachment end and each of said elements including walls for defining a cable pathway;

a coupling for joining at least a first one of said attachment ends to at least a second one of said attachment ends, said coupling including wall means for defining a coupling pathway and aligning means for aligning the first and second ones in a predetermined alignment with said cable pathway aligned with said coupling pathway, said elements including at least first and second sidewalls, said coupling further including clamp means for automatically clamping an attachment end when in said predetermined alignment;

said alignment means including first and second outer walls and first and second inner walls spaced from said first and second outer walls, respectively, by a distance to define first and second pockets, respectively, sized to receive said first and second sidewalls, respectively, of said elements, said inner and outer walls disposed for said elements to be in said predetermined alignment when said sidewalls are disposed between said outer and inner walls of said coupling; and



said clamp means includes first and second resiliently biased spring means carried on said coupling and disposed within said first and second pockets, respectively, and directed to urge an element wall against a wall of said coupling upon insertion of said element wall between said outer and inner walls, said inner walls sized to cover said clamp means and shield said clamp means from said coupling pathway with said first and second inner walls cooperating with said element wall to define a generally continuous closed wall between said pathway-defining elements.

5,316,244
SUPPORTING BRACKETS FOR CABLE RACEWAYS

Maurice F. Zetena, Jr., P.O. Box 59, Bridgewater, Conn. 06776

Continuation of Ser. No. 591,058, Oct. 1, 1990, Pat. No. 5,271,585. This application Sep. 27, 1993, Ser. No. 127,045

The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.

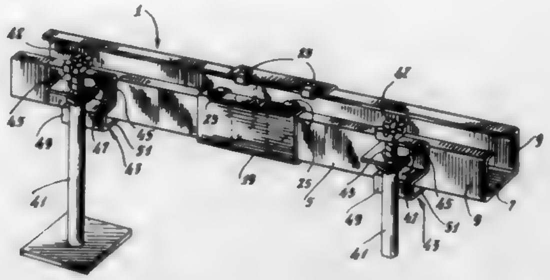
Int. Cl.⁵ F16L *3/00*

U.S. Cl. 248—49 **4 Claims**

1. A cable raceway adapted to be supported form pre-existing internal building structures, said raceway including

a plurality of channel members, each said channel member being formed of stiff sheet material and including a bottom portion, sides extending upwardly from said bottom portion, and lips extending inwardly from said sides along the upper edges of said sides, thereby having a generally upright U-shaped cross-section,

telescope members having a cross-section complementary to said channel members and being so shaped and dimensioned as to telescopically interfit with said channel members, the extent of said interfit being continuously variable, each said telescopic member being formed of stiff sheet material and including a bottom portion, sides extending upwardly from said last-named bottom portion, and lips extending inwardly from said sides of said telescoping members along the upper edges of said last-named sides, thereby having a generally U-shaped cross-section, said telescope members each telescopically joining two said channel members at the respective proximate ends thereof, and



brackets having securing means proximate to the upper ends of said brackets for supporting said channel members and said telescope members from said building structures at spaced intervals, said building structures being floor-supporting pedestals, said brackets having openings at their upper ends for receiving the upper ends of said pedestals, and said brackets having downwardly-extending sides leading to open and upright U-shaped lower ends dimensioned to receive said channel members with their respective said upper edges being uppermost,

whereby said raceway has telescopic length flexibility for easy installation.

5,316,245
PLASTIC HOLDING ELEMENT

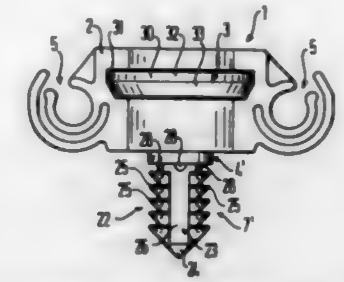
Hans-Werner Ruckwardt, Eisenberg, Fed. Rep. of Germany, assignor to TRW United Carr GmbH & Co., KG, Alsenborn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 783,545, Oct. 25, 1991, abandoned. This application Apr. 12, 1993, Ser. No. 46,037

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1992, 4213231

Int. Cl.⁵ F16L *3/22*

U.S. Cl. 248—68.1 **21 Claims**



1. In a plastic holding assembly with a mounting means for connecting the assembly to a support element and carrying at least one storage zone for mounting a tube-shaped part, the improvement wherein the assembly comprises a three-component construction with one first part of hard material carrying the storage zone, a second part placed therein and formed of soft, damping material with a third part formed of hard material vibration isolated from the first part by being placed in a transverse aperture in the second part, the transverse aperture defined by a collar assembly of soft damping material disposed between the one first part and the third part and preventing contact between the one first part and the third part, the third part carrying the mounting means for connecting the assembly to a support, the mounting means comprising a rigid peg equipped with a profiled exterior positionable into an aperture in the support element.

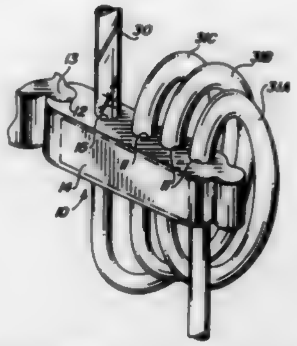
5,316,246
INTRAVENOUS TUBE HOLDER

James Scott, and Chet Ross, both of Tucson, Ariz., assignors to Scott/Ross Designs Inc., Tucson, Ariz.

Filed Mar. 23, 1992, Ser. No. 855,777

Int. Cl.⁵ A61M *39/00*

U.S. Cl. 248—68.1 **17 Claims**



14. An intravenous delivery system comprising:

a) at least one intravenous bottle having a therapeutic fluid therein;
b) a hollow needle inserted into a patient;
c) an intravenous tube communicating said therapeutic fluid to said hollow needle and the patient; and,
d) at least one intravenous tube holder, each of said intravenous tube holders having,
  1) positioned along one edge, a plurality of clip means for securing said body member to the intravenous tube,
  2) a labeling surface on a side opposite said plurality of clip means,
  3) a male attachment means located on a first end of said body member, and
  4) a female receptacle means for receiving a male attachment means from a different intravenous tube holder, said female receptacle means located on a second end of said body member, and wherein said female receptacle is also a clip means for securing said body member to the intravenous tube.

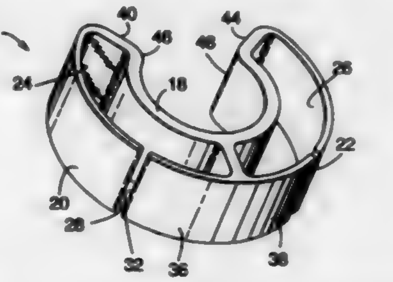
5,316,247
WIRE-AND-TUBE-RETAINING POLE CLIP

Michael A. Wodka, Ann Arbor, Mich., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 1, 1992, Ser. No. 907,156

Int. Cl.⁵ F16L *3/22*

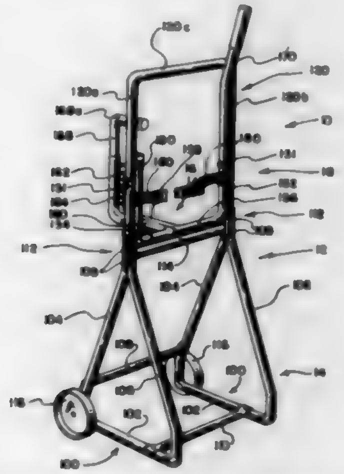
U.S. Cl. 248—073 **23 Claims**



1. A pole clip for arranging wires and/or tubing around the circumference of a pole, the clip comprising:

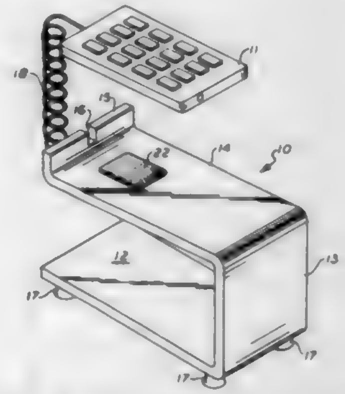
a resilient, flexible, generally C-shaped, generally arcuate body configured for a snap fit on the pole;
at least one resiliently-flexible arcuate first arm extending in generally concentric relationship relative to the C-shaped body; and
at least one arcuate second arm extending in generally concentric relationship relative to the C-shaped body;
the first and second arms defining an elongate, arcuate wire-and-tube-retaining area between the C-shaped body and the arms, the wire-and-tube-retaining area being concentric with the C-shaped body and being elongate and arcuate to receive a plurality of wires and/or tubes such that the wires and/or tubes are visibly retained in side-by-side relationship around the pole, each arm having a free end closely spaced from the free end of the other arm such that wires and/or tubes are allowed to be manually introduced into or released from the wire-and-tube-retaining area by flexing the first arm but the arms normally retain the wires and/or tubes, the second arm defining an area for accommodating a wire or tube immediately after being pushed into the wire-and-tube-retaining area by flexing the first arm toward the C-shaped body.

5,316,248
HAND ACTUATED-BUCKET POURER
Donald K. Allen, Rte. 4 Box 352, Four Oaks, N.C. 27524
Continuation-in-part of Ser. No. 930,282, Aug. 17, 1992, abandoned. This application May 19, 1993, Ser. No. 63,546
Int. Cl.⁵ A47F *5/12, 7/28*
U.S. Cl. 248—129 **6 Claims**



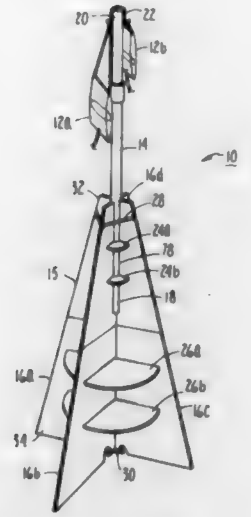
1. A hand-actuated mobile bucket pouring device comprising:
a) a base support structure for sitting on the ground or other support surface;
b) the base support structure including a pair of laterally spaced side frames with each side frame having a lower run and a pair of upwardly converging runs having upper ends that converge and are secured together to form a converging junction such that each side frame forms a closed frame structure that consists essentially of the lower run and the two upwardly converging runs;
c) a series of cross-members connected between the side frames and including a lower cross-member connected between the lower runs and an upper cross-member connected between the converging junctions of the upwardly converging runs of the side frames;
d) an upright member secured to each converging junction of each side frame and extending upwardly therefrom;
e) a bucket support structure pivotally mounted between the upright members that extends upwardly from the converging junctions of the side frames;
f) the bucket support structure including a pair of laterally spaced side arms, each side arm pivotally mounted to one of the upright members, and a T-shaped open frame bottom support structure secured between the laterally spaced side arms and including a cross-member extending between lower portions of the side arms and a bottom member extending generally perpendicularly from a mid point area of the cross-member a selected distance, and a back post connected to an end of the bottom member and extending generally perpendicularly upwardly therefrom to form a back portion of the bucket support structure, wherein the side arms, the T-shaped bottom support structure and the back post form the bucket support structure held between the upright members;
g) a retainer extending from an upper portion of the back post generally perpendicularly to the back post for engaging the top of a bucket and retaining the bucket on the bucket support structure; and
h) a handle secured to the bucket support structure and extending therefrom for pivoting the bucket support structure from an upright position to a tilted pouring position.

5,316,249
STAND WITH TETHER FOR ELECTRONIC REMOTE CONTROL UNITS
Alfred Anderson, 2453 Garapan, Houston, Tex. 77091
Filed Aug. 25, 1992, Ser. No. 934,277
Int. Cl.⁵ A47F *7/00*
U.S. Cl. 248—146 **6 Claims**



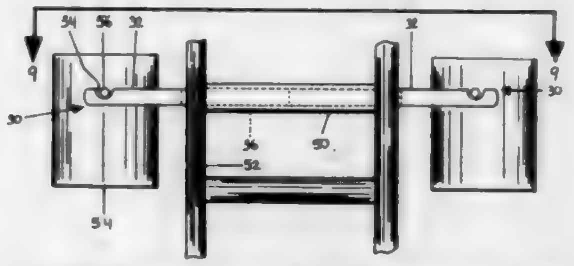
1. A stand for releasably holding an electronic remote control unit comprising in combination;
a generally rectangular stand member of unitary construction having a generally rectangular horizontal bottom surface and a flat rectangular top surface spaced above said horizontal bottom surface for supporting an electronic remote control unit thereon;
a flexible extendible and retractable tether cord secured at one end to said stand and having a free end adapted for connection to an electronic remote control unit to be supported on said stand, said cord is capable of being extended relative to said stand to allow removal of the electronic remote control unit from a position supported on said stand for use while preventing complete separation of the remote control unit from said stand, said cord is automatically retractable to occupy a small space in the retracted condition;
one element of a hook and loop fastener secured on said stand top surface and a mating element of the hook and loop fastener secured on the free end of said tether cord such that the electronic remote control unit connected to said tether cord free end is releasably engaged on said stand top surface in the supported position by engaging said hook and loop fasteners and removed therefrom by disengaging said hook and loop fasteners; and
releasable attachment means on said stand bottom surface to releasably anchor said stand to a flat surface and facilitate one-handed disengagement of said hook and loop fasteners.

5,316,250
FLUID CONTAINER STAND FOR THERAPEUTIC TREATMENTS
Bradley R. Mason, Olivehain, and Jeffrey T. Mason, Escondido, both of Calif., assignors to Breg, Inc., Vista, Calif.
Continuation-in-part of Ser. No. 906,407, Jul. 1, 1992. This application Aug. 31, 1992, Ser. No. 937,597
Int. Cl.⁵ F16M *13/00*
U.S. Cl. 248—165 **18 Claims**



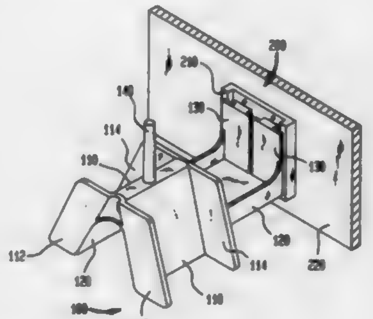
1. A fluid container stand comprising:
an extension member having an upper end, a lower end, and a longitudinal axis;
a plurality of planar base members, each of said base members having a bottom end and a top end, said plurality of base members radially disposed about said longitudinal axis of said extension member and engaging said lower end of said extension member; and
a substantially planar union member engaging said plurality of base members.

5,316,251
SELF-LEVELING PAINT CAN HOLDER FOR LADDERS
Raymond V. McGraw, 1427 Bussard Ct., Arden Hills, Minn. 55112
Filed Aug. 13, 1993, Ser. No. 106,908
Int. Cl.⁵ E06C *7/14*
U.S. Cl. 248—210 **20 Claims**



1. A self-leveling paint bucket holder for use with a ladder having a plurality of rungs for supporting a paint bucket having a pair of diametrically opposed handle protrusions, the bucket holder comprising:
(a) a rigid elliptical member having a major and minor axis and forming an paint can receiving opening, said elliptical member having a paint can receiving means disposed along said minor axis for pivotably receiving the paint can handle protrusions while securingly preventing shifting of the paint can along the major axis, said receiving means facilitating rotation of the paint can about the minor axis to allow self-leveling; and
(b) coupling means coupled to said elliptical member proximate said major axis for facilitating rotatably coupling said elliptical member to the ladder for rotation about the major axis.

5,316,252
UNIQUE EYEGLASS HOLDER FOR DISPLAYS
Morris Charnow, Jericho, and Frederick Manners, Long Island, both of N.Y., assignors to Avant-Garde Optics, Inc., Port Washington, N.Y.
Filed Jun. 1, 1992, Ser. No. 890,873
Int. Cl.⁵ A47F *7/00*
U.S. Cl. 248—223.4 **20 Claims**



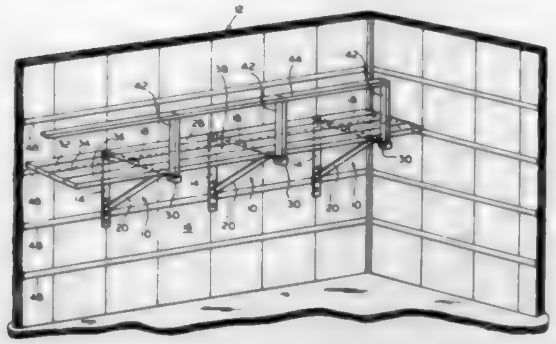
1. An eyeglass holder, comprising
a base;
a nosepiece for supporting a pair of eyeglasses;
connecting means for removably connecting said nosepiece to said base, said connecting means including an interlocking member formed on one of said base and said nosepiece and having a pair of opposed edges, a receiving channel formed on the other one of said base and said nosepiece and having a pair of opposed sidewalls and an open end for receiving said interlocking member in a sliding direction in an assembled position of said connecting means, and a resilient member connected to a selected one of said base and said nosepiece, said resilient member being biased to a first position and movable to a second position; and
retaining means on either one of said base and said nosepiece for locking said connecting means in said assembled position, said retaining means blocking movement of said interlocking member out from said receiving channel when said resilient member is in said first position, and said retaining means permitting movement of said interlocking member out from said receiving channel when said resilient member is in said second position.

5,316,253
SCAFFOLD BRACKET
Robert J. Flathau, Cary, and Frank T. Connors, Deerfield, both of Ill., assignors to Symons Corporation, Des Plaines, Ill.
Filed Dec. 3, 1992, Ser. No. 984,855
Int. Cl.⁵ A47G *29/02*
U.S. Cl. 248—235 **20 Claims**

1. A scaffold bracket for a concrete form, comprising:
a generally triangular shaped brace including an attachment leg adapted to be secured to an outer surface of said concrete form, a plank supporting leg extending generally transversely of said attachment leg, and a brace leg extending from said attachment leg to said plank supporting leg at an acute angle to both said attachment leg and said plank supporting leg;
a first stop on said plank supporting leg at a preselected

distance outwardly of said attachment leg to define a waler bracket for accepting a plank of a predetermined width for aligning said concrete form;

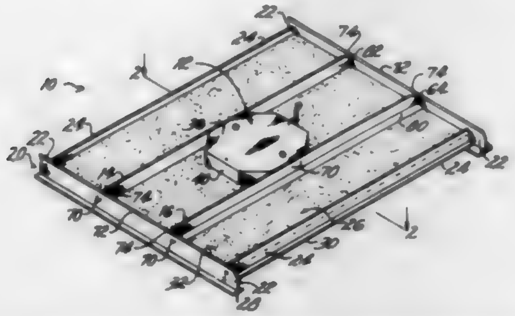
a second stop on said plank supporting leg at a preselected distance outwardly of said first stop to define an outer limit for accepting one or more planks of predetermined width for creating a working walkway; and



means associated with said attachment leg for cooperating with one or more spaced fasteners on said outer surface of said concrete form for utilizing said waler bracket and said working walkway with said attachment leg secured to said spaced fastener(s) on said outer surface of said concrete form such that said planks of predetermined width are positioned on said plank supporting leg.

5,316,254
JUNCTION BOX SUPPORT FOR SUSPENDED CEILINGS

Robert D. McCartha, 268 Sid Bickley Rd., Chapin, S.C. 29036
Filed May 14, 1992, Ser. No. 882,884
Int. Cl.^{5} B42F *13/00*
U.S. Cl. 248—343 **8 Claims**

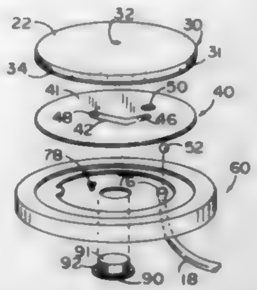


1. An article for use with a suspended ceiling having a frame and panels carried by said frame, said panels having an upper surface and a lower surface, said lower surface of said panels engaging said frame, at least one panel of said panels having a hole in it, and for use with a junction box, said hole in said at least one panel dimensioned to receive said junction box, said article comprising:

a pair of supports, each support dimensioned to run substantially the length of a panel but no longer, each support having means formed therein for holding a panel in engagement with said frame, said holding means having a face engaging said upper surface of said at least one panel substantially along its entire length and extending across said panel to hold said at least one panel between said holding means and said frame, and first means formed therein for engaging said frame so that said support can be attached to said frame and second means formed therein for engaging said junction box so that said support can be attached to said junction box, said face of said holding means preventing upward movement of said panel with respect to said junction box when said supports are attached thereto and said panel is lifted.

5,316,255
VACUUM CONTAINER HOLDER

David P. Marcusen, Fennville, Mich., assignor to Prince Corporation, Holland, Mich.
Filed Jan. 9, 1992, Ser. No. 818,793
Int. Cl.^{5} F16M *13/00*
U.S. Cl. 248—362 **26 Claims**



1. A vacuum actuated container holder comprising:

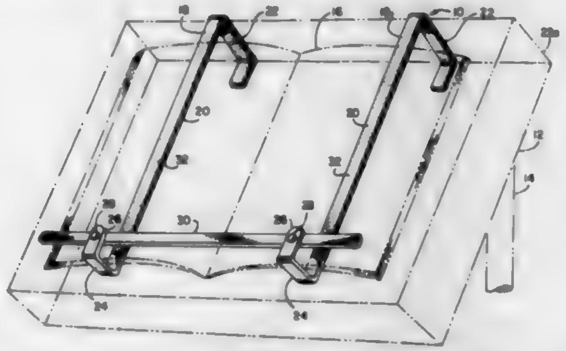
a support member having a surface for sealably engaging a lower surface of a container;

means for mounting said support member to a vehicle; and

means for selectively applying a vacuum to said support surface for selectively holding a container thereon, said applying means including a ball valve adapted to disconnect the vacuum from said support surface.

5,316,256
RACK FOR READING MATERIAL

James L. Siebenaler #3 Linwood, Bloomington, Ill. 61701, and Herman P. Valentine, 5547 Lindford Ave. NE., North Canton, Ohio 44721
Filed Feb. 24, 1993, Ser. No. 21,089
Int. Cl.^{5} A47B *97/04*
U.S. Cl. 248—453 **20 Claims**



1. A rack for supporting articles of reading material on an instrument panel face of an exercise machine console which face is oriented in an upwardly inclined plane for convenient viewing by a user of the machine, said console having a substantially horizontally extending upper edge at the top of the panel face, the rack comprising:

at least two substantially parallel spaced apart elongated upwardly extending frame members each having;

an upwardly extending intermediate portion having an upper and lower end;

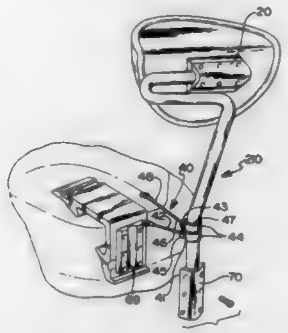
an upper hook portion extending rearwardly from the upper end of the intermediate portion and downwardly to engage the upper edge of the console; and

a lower hook portion extending forwardly from the lower end of the intermediate portion and upwardly to provide a support for reading material placed on the rack; and

an elongated horizontal frame member extending between the upwardly extending frame members and attached to each of such frame members to hold them in spaced relationship to each other.

5,316,257
VEHICLE MOUNTING ASSEMBLY

William P. Schmidt, 21000 Woodruff, Rockwood, Mich. 48173, and Franklin D. Hutchinson, 28000 Beel Rd., New Boston, Mich. 48164
Continuation of Ser. No. 419,213, Oct. 10, 1989, Pat. No. 5,106,049. This application Apr. 17, 1992, Ser. No. 870,522
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.^{5} B60R *1/00*
U.S. Cl. 248—487 **16 Claims**



1. A bracket assembly for mounting a mirror shaft to a vehicle, the bracket assembly comprising:

(a) a base portion, the base portion being removably mountable to a portion of a surface of a vehicle body, the base portion having a first face and a second face angularly extending from the first face, the first face having a first strut provided thereon and the second face having a second strut provided thereon, the faces cooperating to define an essentially curved mounting with the first and second struts complementary to the surface of the vehicle body, at least one of the faces having a seat for a mirror shaft;

(b) a cover portion for covering the seat of the base, the cover portion being attachable to the base portion, the cover portion having a bearing surface and an outer surface, the cover portion and the base portion being cooperable to securely clamp a mirror shaft therebetween; and

(c) means for attaching the cover portion to the base portion.

5,316,258
POWER SEAT ADJUSTER WITH DRIVE GEAR FORCE BYPASS

Derek K. Gauger, Ann Arbor; Kirk K. Horvet, Royal Oak, and Phillip Chaban, Grass Lake, all of Mich., assignors to ITT Corporation, New York, N.Y.
Filed Apr. 30, 1992, Ser. No. 876,549
Int. Cl.^{5} B60N *2/00*
U.S. Cl. 248—548 **17 Claims**

1. A power seat adjuster for a vehicle comprising:

first and second spaced track assemblies, each formed of a lower track and an upper track slidably disposed within each lower track

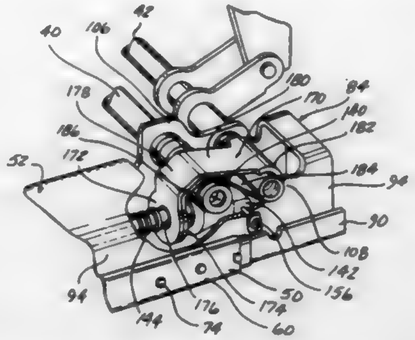
a drive motor having at least a first rotatable output shaft extending toward one of the first and second track assemblies;

a lead screw disposed between one upper track and one lower track;

a drive block fixedly mounted to the one lower track and threadingly engaging the lead screw;

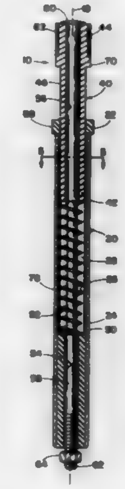
gear means fixedly mounted to the one upper track and coupling the one motor output shaft to the lead screw, the gear means including a plurality of meshingly engaged gears, at least certain of which gears are formed of a plastic material; and

means force transmittingly coupled at one end to the one upper track and disposed at another end about the lead screw associated therewith and normally decouplingly spaced from the gear means, for transmitting forces imparted on the upper track and tending to move the upper track in a forward direction between the one upper track and the lead screw bypassing around the gear means.



5,316,259
CYCLE SEAT SUPPORT APPARATUS

Zenon Pawlykowych, 1892 N. Albert, Falcon Heights, Minn. 55113, and Hy Rosenstein, 9600 Portland Ave. South, Bloomington, Minn. 55420
Continuation-in-part of Ser. No. 531,029, May 31, 1990, abandoned. This application Aug. 19, 1991, Ser. No. 747,186
Int. Cl.^{5} F16M *13/00*
U.S. Cl. 248—601 **7 Claims**



1. A cycle seat support apparatus for dampening impact loading between a cycle frame and a cycle seat, the cycle frame including a hollow tubular member, the cycle seat support apparatus comprising:

a plastic elongated sleeve defining a longitudinal axis of the sleeve and having a first end, a second end, and an elongated inner surface extending in a direction of the longitudinal axis from the first end toward the second end, the plastic exhibiting sufficient lubricity to permit sliding engagement of the inner surface with another compatible plastic surface thereby minimizing wear of the inner surface;

a metal tube having a top end for receiving the sleeve in an interior of the tube, the tube including means for mounting the sleeve to the tube to limit relative movement between the tube and the sleeve, the tube being receivable by the hollow tubular member of the cycle frame to mount the sleeve to the cycle frame;

a plastic elongated post defining a longitudinal axis of the post and having a first end, a second end, and an elongated outer surface extending in a direction of the longitudinal axis of the post from the first end toward the second end, the plastic of the post compatible with the plastic of the sleeve during sliding engagement, the first end of the post positioned in the first end of the sleeve thereby providing sliding engagement between the outer surface of the post and the inner surface of the sleeve and providing securable engagement of the post and the sleeve, the post further defining an inner passage in the post extending in the direction of the longitudinal axis of the post, the second end of the post being attachable to the cycle seat;

a metal rod with at least a portion positioned in the inner passage of the post, the rod including means for interconnecting the post to the sleeve to limit movement of the post away from the sleeve to a predetermined amount;

means for limiting rotational movement of the post with respect to the sleeve about each respective longitudinal axis; and

means for biasing the post to urge the post toward an at rest position when the post is moved longitudinally relative to the sleeve.

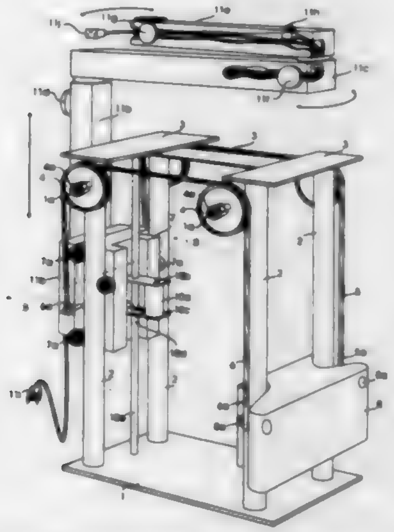
5,316,260
OPHTHALMIC INSTRUMENT STAND

Jack L. Johnston, 4708 18th Ave. W., Bradenton, Fla. 34209

Filed Oct. 19, 1992, Ser. No. 962,867

Int. Cl.^{5} A47F *1/14*

U.S. Cl. 248—648 **3 Claims**



1. A low profile ophthalmic instrument support stand comprising:

a free standing counter weighted support base; comprising a roller frame and counter weight suspended over two sets of pulleys and guided by two sets of vertical members of equal height attached to the base at the bottom and to a frame at the top,

an electro-mechanical locking mechanism preventing only downward vertical motion of the roller frame,

a support arm assembly; comprising a lower support being external to the frame, lower support arm, upper support arm, and receptacle for insertion of the shafts of various ophthalmic instrument platforms,

a switch for remote operation of said locking device,

a modular receptacle providing providing electrical service to ophthalmic instruments.

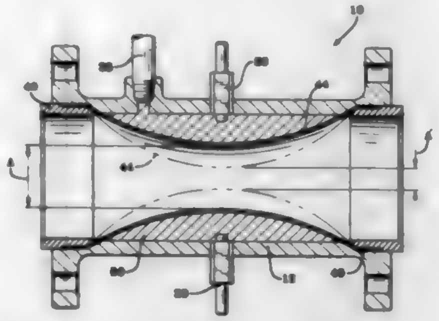
5,316,261
FLUID CONDUIT HAVING A VARIABLE INNER DIAMETER

George S. Stoner, Woburn, Mass., assignor to Northern Research & Engineering Corp., Woburn, Mass.

Filed Oct. 26, 1992, Ser. No. 966,476

Int. Cl.^{5} F16K *7/07, 31/02;* **G01F** *1/42*

U.S. Cl. 251—5 **6 Claims**



1. A fluid metrological device comprising:

a conduit having a dynamically variable inner diameter;

a means for varying the inner diameter of the conduit, the means including a varying quantity of electrorheological fluid;

a means for varying the shear stress of the electrorheological fluid and causing the electrorheological fluid to become substantially solidified thereby fixing the inner diameter of the conduit; and

a means for measuring flow through the conduit, wherein the means for measuring flow comprises a means for measuring the flow induced pressure drop across the conduit, the flow induced pressure drop being proportional to the inner diameter of the conduit.

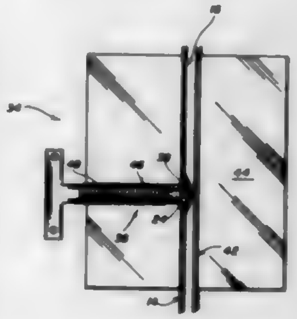
5,316,262
FLUID RESTRICTOR APPARATUS AND METHOD FOR MAKING THE SAME

Douglas J. Koebler, Irwin, Pa., assignor to Suprex Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1992, Ser. No. 828,729

Int. Cl.^{5} F16K *7/06*

U.S. Cl. 251—8 **36 Claims**



1. An apparatus for restricting the flow of supercritical fluid comprising:

a tubular member having a channel, said tubular member having a first portion in which said channel has a first cross sectional area, a second portion restricting the flow of supercritical fluid at a pressure between 100–680 atmospheres to a flow having pressure below supercritical pressure, said second portion defined by a reproducible deformity in the channel such that the channel has a second cross sectional area which is smaller than the first cross sectional area of the first portion, and a third portion having a third cross sectional area which is greater than the second cross sectional area of the second portion, said first portion having an essentially constant outside diameter and wherein the cross sectional dimensions of the second and third portions of the tubular member are less than or equal to said outside diameter of said first portion, all of said cross sectional dimensions of the second and third portions disposed within a cylindrical envelope having a diameter equal to the diameter of the first portion and extending therefrom, said tubular member comprised of a material having sufficient rigidity to maintain a preferred reproducible permanent deformity in the channel when it is freestanding.

5,316,263
SYSTEM FOR CONTROLLING ELECTRONIC EXPANSION VALVE PROVIDED IN REFRIGERATING MACHINE

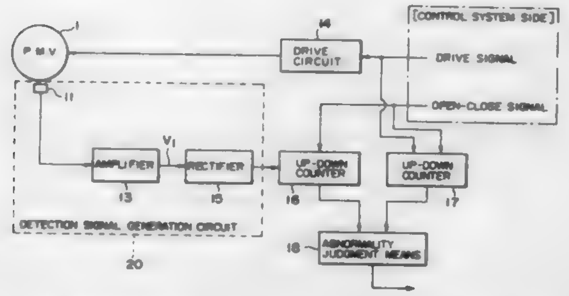
Yoshihito Mino, Shizuoka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 29, 1992, Ser. No. 997,784

Claims priority, application Japan, Mar. 12, 1992, 4-053843

Int. Cl.^{5} F16K *31/02;* **G05B** *11/00*

U.S. Cl. 251—129.05 **11 Claims**



1. An electronic expansion valve control apparatus for a refrigeration machine comprising:

an electronic expansion valve incorporated into a coolant pipe, wherein the electronic expansion valve ha a magnet rotor rotationally driven stepwisely by an excitation pulse current which is output to an excitation coil arranged on an outer side of a cylindrical body in which the magnet rotor is housed, and wherein the cylindrical body is combined with a mounting base to form a single body and a feed screw is accommodated in said cylindrical body and said mounting base such that the feed screw is not exposed to the outside of said single body, whereby adjustment of a degree of opening or closing of the valve mounted inside the magnet rotor is performed by the rotational drive of said magnet rotor;

magnet pole position change detection means which is arranged to the outer side of said cylindrical body for outputting detection pulse signals in accordance with a change in position of a pole formed on said magnet rotor, said magnet pole position change detection means including a hall element configured such that a strength of an electric field as an electric signal is detected by a hall effect;

detection pulse measurement means for measuring a number of pulses of said detection pulse signals from said magnet pole position change detection means;

excitation pulse number measurement means for measuring a pulse number of excitation pulse outputted to said excitation coil; and

abnormality judgement means for judging an operational abnormality of said electronic expansion valve by comparison of each measured value form said detection pulse measurement means and said excitation pulse number measurement means.

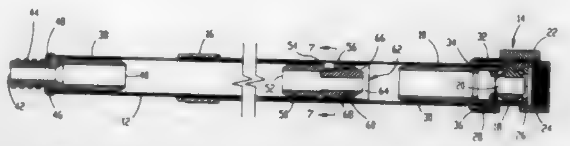
5,316,264
FLOW-THROUGH TELESCOPING POLE

Robert D. Newman, Sr., and Robert D. Newman, Jr., both of P.O. Box 377, Greenwood, Mo. 64034

Filed Jul. 7, 1993, Ser. No. 87,279

Int. Cl.^{5} F16K *5/00*

U.S. Cl. 251—150 **8 Claims**



1. A flow-through telescoping pole apparatus for use in dispensing fluid from a source, the apparatus comprising:

an elongated hollow outer pole;

an elongated hollow inner pole received in the outer pole for axial telescoping movement;

a female connection means for connecting the pole apparatus to the source of fluid;

a fluid passageway extending completely through the outer and inner poles to permit fluid flow through the apparatus;

a sealing means for sealing the space between the inner and outer poles to prevent leakage of fluids from between the poles; and

a locking means for locking the axial position of the inner pole relative to the outer pole, the locking means including a cam mounted on the inner pole and a friction member supported between the cam and the outer pole, the cam and friction member being movable together on the inner pole during relative axial movement between the inner and outer poles, the cam pinching the friction member against the outer pole when the inner pole is rotated relative to the outer pole to lock the axial position of the inner pole.

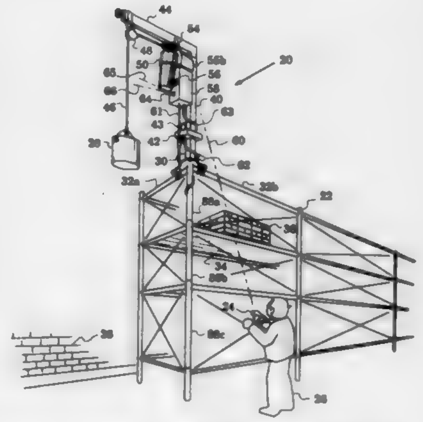
5,316,265
REMOTE CONTROLLED SCAFFOLD HOIST

James L. Welch, 4292 Valley View, and Stephen R. Miller, 4320 Valley View, both of Norco, Calif. 91760

Filed Sep. 17, 1991, Ser. No. 760,897

Int. Cl.^{5} B66C *13/18, 23/02*

U.S. Cl. 254—362 **12 Claims**



1. A remote controlled scaffold hoist mountable on a pin projecting upward from a scaffold, comprising:

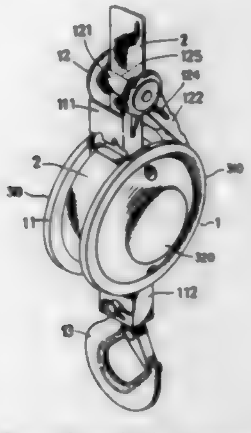
means for receiving transmitted signals;

an adaptor having an upper end and a lower end, said lower end adapted for receiving said pin;

a standard having an upper end and a lower end, said standard substantially coaxial with said adaptor and carrying said receiving means;

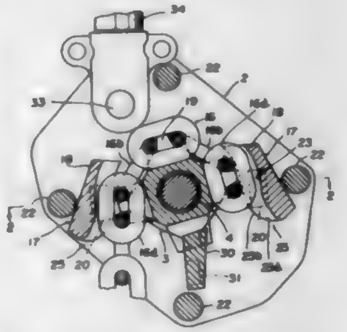
transmission means, connecting said adaptor upper end and said standard lower end and responsive to said receiving means, for rotating said standard relative to said adaptor;
a boom extending outwardly from said standard upper end;
a cable;
means, mounted on said standard and responsive to said receiving means, for bidirectional winding of said cable; and
rotatable means attached to said boom for reeving said cable from said winding means to a load;
lifting, lowering and circumferential movement about said adaptor of the load thereby responsive to the transmitted signals.

5,316,266
STRAP EXTENDER AND TENSIONING SYSTEM
An-Chuan Chou, No. 212, Yung An Street, Tainan, Taiwan
Filed Apr. 21, 1992, Ser. No. 871,715
Int. Cl.^{5} B66D *3/02*
U.S. Cl. 254—364 **1 Claim**



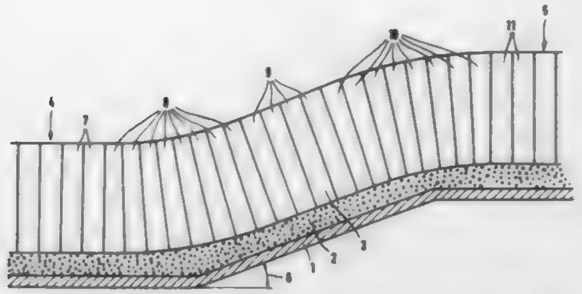
1. A strap extender and tensioning system comprising:
(a) a strap winding mechanism having an upper section secured to a first connector element and a lower section secured to a second connector element, said strap winding mechanism having a central rotatable shaft biased for reversibly winding a strap around said shaft, said strap winding mechanism having a pair of circular plate members mounted on opposing ends of said shaft for capturing said strap therebetween;
(b) a clevis slip hook having a latch member, said clevis slip hook fixedly coupled to said second connector element;
(c) strap tightening means for tightening said strap wound on said strap winding mechanism, said strap tightening mechanism including (1) a strap tightener shaft member having a through slot for passage of said strap therethrough, (2) a pair of ratchet wheels fixedly secured to opposing ends of said strap tightener shaft member and rotatable therewith, (3) and rotatably displaceable handle having a pair of opposing wall members formed on an upper section thereof and a pair of pawl members extending from opposing sides of a pawl plate for engagement with a tooth member formed on each of said ratchet wheels, said pawl plate being biased by a pawl spring member for biasing said pawl members toward said ratchet wheels, said rotatably displaceable handle being rotatable in a clockwise direction about said strap tightener shaft independent of said ratchet wheels and said pawl members being out of engagement with said ratchet wheel teeth, said rotatably displaceable handle being rotatable in a counter-clockwise direction wherein said pawl members engage said ratchet wheel teeth for rotatably displacing said ratchet wheels and said strap tightener shaft member and said strap being concurrently wound on said strap tightener shaft member, said first connector element having a lower section secured to said strap winding mechanism upper section, said first connector element having an upper section forming a pair of circularly shaped opposing walls rotatably secured to said strap tightener shaft member, a pair of connector pawl members extending from said circularly shaped opposing walls and biased for engagement with said ratchet wheel teeth when said ratchet wheel members are rotated in said clockwise direction, said strap initially being pulled from said strap winding mechanism to a predetermined length and then tightened for maintaining said strap in a tensioned manner.

5,316,267
HOIST INCLUDING GUARDS WITH CHAIN SWELLING AND TWIST CORRECTIVE SURFACES
Yoshio Nishi; Haruo Kubota, and Yoshio Ueno, all of Osaka Sayama, Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan
Filed Apr. 9, 1992, Ser. No. 865,883
Claims priority, application Japan, Oct. 31, 1991, 3-286894
Int. Cl.^{5} B66D *1/36, 3/02*
U.S. Cl. 254—383 **4 Claims**



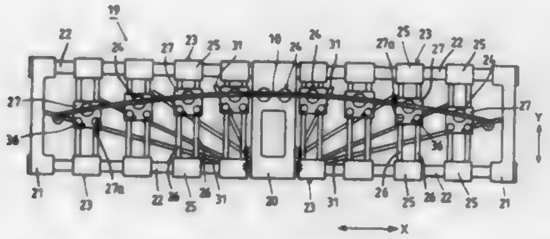
1. A lever type traction machine comprising:
a pair of side plates, spaced from one another;
a load sheave, rotatably interposed between said pair of side plates, for supporting and pulling a chain including vertical links and horizontal links;
an operating lever for driving said load sheave to pull said chain; and
a pair of chain holders, fixed between said side plates at two radial sides of said load sheave, for holding said chain toward said load sheave so that said chain engages with said load sheave, each of said chain holders comprising:
(i) a first surface, which faces said load sheave, having a groove formed therein for receiving said vertical links,
(ii) a second surface, which opposes said first surface,
(iii) a chain swelling restraint portion provided at a rear portion of said chain holder with respect to an entering direction of said chain into said side plates, and
(iv) a guide portion, provided at a front portion of said chain holder with respect to an entering direction of said chain into said side plates, including a first section that extends along a line tangential to a rotary path of said load sheave and a second section that extends outwardly, away from said load sheave, in an outwardly facing arc; wherein said guide portion corrects twists of said chain and comprises a first rounded correcting portion for correcting twists of said vertical links and a second rounded portion for correcting twists of said horizontal links.

5,316,268
METHOD FOR INCREASING THE DURABILITY OF REFRACTORY VESSEL LININGS
Paul-Gerhard Mantey, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to CRA Services Limited, Melbourne, Australia
Continuation of Ser. No. 929,486, Aug. 8, 1993, abandoned, which is a continuation of Ser. No. 620,478, Nov. 30, 1990, abandoned. This application Apr. 30, 1993, Ser. No. 54,826
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1989, 3940575
Int. Cl.^{5} C21B *7/04*
U.S. Cl. 266—44 **12 Claims**



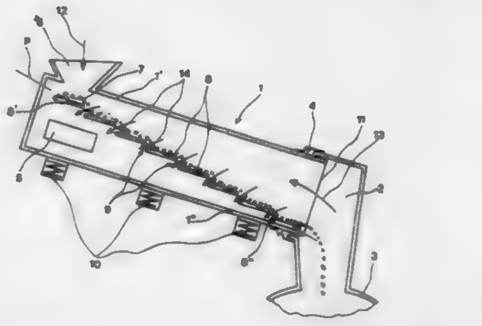
1. A generally rotationally symmetrical, refractory lined vessel suitable for containing molten metals, said vessel having a generally vertical wall section and an inclined or tapered wall section having an area of change of curvature from the vertical wall section, the refractory lining of the vertical wall section comprising at least one ring of refractory bricks, the refractory lining at the area of change of curvature being at least two rings of turning bricks, each turning brick having six surfaces comprising first planar surface defining a plane, four planar side surfaces extending in a perpendicular direction from said plane, and a second planar surface located on said brick opposite said first surface, said second surface being inclined from said plane of an angle of less than 5°.

5,316,269
LEAF SPRING CONSTRAINING APPARATUS
Motoo Morita, Nagoya, Japan, assignor to Morita and Company Co., Ltd., Aichi, Japan
Filed Dec. 29, 1992, Ser. No. 997,785
Claims priority, application Japan, Sep. 24, 1992, 4-280444
Int. Cl.^{5} C21D *9/00*
U.S. Cl. 266—117 **3 Claims**



1. An apparatus for quenching leaf springs comprising:
a tank with a quenching liquid therein;
a constraining apparatus for constraining leaf springs to which a camber has been imparted; and
drive means provided in said tank for driving said constraining apparatus into and out of said quenching liquid in said tank;
wherein said constraining apparatus comprising:
a pair of endless chains installed with a space in between, under halves of said endless chains being in said quenching liquid and upper halves of said endless chains being above a surface of said quenching liquid; and
a plurality of constrainers provided on said pair of endless chains for constraining leaf springs thereon, said constrainers being spaced with predetermined intervals in a direction in which said endless chains are rotated, and each one of said constrainers comprising:
a pair of support frames installed with a space in between and facing each other;
a pair of slide shafts provided parallel to each other and between said pair of support frames;
a plurality of pairs of carriers provided on said pair of slide shafts so as to be slidable on said slide shafts;
a pair of parallel guide shafts provided in each one of said pair of carriers;
a base provided on said parallel guide shafts so as to be slidable on said pair of guide shafts in a direction perpendicular to a sliding direction of said carriers;
a constraining jig provided on said base for constraining a leaf spring blank in directions of thickness and width of said leaf spring;
a positioning bar inserted in a slidable fashion into a through hole opened on one surface of said base, one end of said positioning bar being coupled to a center frame which is fixedly provided between said pair of support frames; and
a locking member provided on said base, said locking member pressing said positioning bar such that said carriers and said base are immovable to accomplish a positioning of said constraining jig.

5,316,270
DEVICE FOR THE CHARGING OF MATERIALS INTO A FURNACE AND THE PREHEATING OF THESE
Michel Hamy, Strasbourg; Christian Lebrun; Jean-Michel Thebault, both of Valenciennes; Ghislain Maurer, Chatel Saint Germain; Jacques Michelet, Longeville-lès-Metz, and Jean-Luc Roth, Metz, all of France, assignors to Institut de Recerches de la Siderurgie Francaise (Irsid en Abrege), Paris, France
Filed Sep. 27, 1990, Ser. No. 589,451
Claims priority, application France, Sep. 28, 1989, 89 13047
Int. Cl.^{5} C21C *5/40*
U.S. Cl. 266—159 **7 Claims**



1. A device for preheating and continuously loading metal scraps into a metallurgical furnace, the device comprising:
a tube inclined to a horizontal plane, said tube having an upper end and a lower end;
a means for loading scraps into said upper end of said tube;
a means for sealingly connecting said tube lower end to an opening in a roof of the furnace to allow for a flow of smoke from the furnace into said tube;
a support structure mounted in said tube for supporting a layer of the scraps as the layer flows towards the furnace, said support structure being inclined in relation to said tube such that said support structure is more inclined to the horizontal plane than is said tube, said support structure extending from said tube upper end, under said means for loading scraps, towards said tube lower end;
a means for driving the scraps on said support structure in the direction of the furnace;

a plurality of gaps in said support structure, through which gaps the smoke can flow; and,

an outlet orifice for the smoke, said outlet orifice being located in the tube below said support structure, so that the smoke flows from said tube lower end, through said gaps in said support structure to said outlet orifice.

5,316,271

DISCHARGE REGULATOR OF MOLTEN METAL

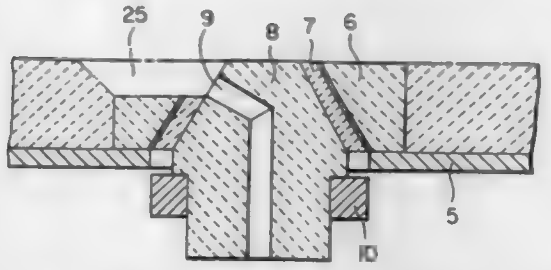
Takashi Otsuka, Okayama; Kenji Yamamoto, Bizen; Mototsugu Osada, Bizen; Tadao Taniguchi, Bizen, and Yoshifumi Shigeta, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00550, § 371 Date Nov. 6, 1991, § 102(e) Date Nov. 6, 1991, PCT Pub. No. WO91/16275, PCT Pub. Date Oct. 31, 1991

PCT Filed Jun. 1, 1989, Ser. No. 768,989

Int. Cl.⁵ B22D *41/14*

U.S. Cl. 266—236 **8 Claims**



1. In a metallurgical vessel having a rotary valve unit for controlling the discharge of molten metal from the interior of said vessel, the improvement wherein said rotary valve unit comprises:

a rotary nozzle having a nozzle hole for the flow of molten metal, a nozzle-carrying brick in which said nozzle is mounted for rotation, said brick being fixedly mounted in a wall of said vessel, the internal end surfaces of said rotary nozzle and said brick being flush with the inner surface of the wall of the vessel in which the rotary nozzle unit is mounted, said brick having at least one notch in its inner surface, said notch extending to the outer surface of said rotary nozzle, and means for rotating said rotary nozzle to bring said nozzle hole into alignment with said notch to permit molten metal in said vessel to flow through said nozzle hole to thereby discharge said molten metal from the interior of said vessel.

5,316,272

LIQUID SPRING VEHICULAR SUSPENSION SYSTEM AND ASSOCIATED CONTROL APPARATUS

Leo W. Davis, Dallas, Tex., assignor to Richard J. Meyer, La Habra, Calif.

Continuation of Ser. No. 927,795, Aug. 10, 1992, abandoned, which is a continuation of Ser. No. 771,814, Oct. 7, 1991, abandoned, which is a continuation of Ser. No. 614,012, Nov. 14, 1990, abandoned, which is a continuation of Ser. No. 465,519, Jan. 17, 1990, abandoned, which is a continuation of Ser. No. 189,241, May 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 941,289, Dec. 12, 1986, Pat. No. 4,741,516, which is a continuation-in-part of Ser. No. 907,140, Sep. 12, 1986, Pat. No. 4,735,402. This application Sep. 14, 1993, Ser. No. 121,228

Int. Cl.⁵ F16F *5/00;* **B60G** *11/26*

U.S. Cl. 267—64.13 **1 Claim**

1. A suspension system for use on a vehicle having a frame, a wheel structure, and a means for producing a signal representative of a vehicle operating parameter, said suspension system comprising:

liquid spring means, operably interposed between said frame and said wheel structure, said liquid spring means including

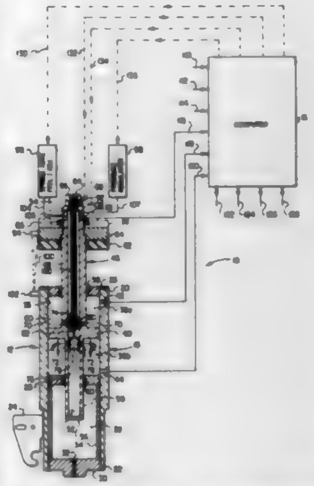
a housing having a chamber in which a first volume of compressible liquid is disposed;

piston means reciprocally disposed within said chamber and dividing it into bounce and rebound subchambers;

rod means carried by said housing for movement relative thereto into and out of said chamber and secured to said piston means;

a second volume of compressible liquid; and

valve means selectively operable to place said second volume in communication with said bounce subchamber and said rebound subchamber through respective first and second port means disposed on opposite sides of said piston means;



said liquid spring means operable for utilizing to exert spring and damping forces to both statically and reactively control relative vertical displacement between said frame and said wheel structure, said liquid spring means having spring characteristics dependent upon liquid volume and pressure and damping characteristics dependent upon rate of flow of liquid bypassing said piston; and

means including a digital computer for varying at least one of said volume, pressure or rate of liquid flow to change at least one of said spring and damping characteristics in response to a sensed variation in at least one of said signals representative of the operating parameters during operation of the vehicle.

5,316,273

COUNTERBALANCE ACTUATOR HAVING AN EXTENDED STROKE

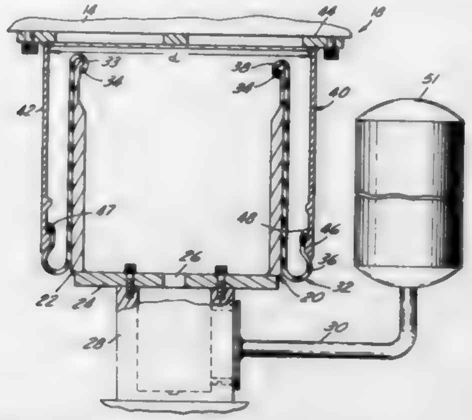
John L. Vaphiadis, Birmingham, Mich., assignor to Litton Industrial Automation Systems, Inc., Warren, Mich.

Continuation of Ser. No. 809,014, Dec. 17, 1991, abandoned. This application Feb. 22, 1993, Ser. No. 23,164

Int. Cl.⁵ F16F *9/05*

U.S. Cl. 267—64.24 **8 Claims**

1. A lift mechanism comprising, a base, a platen carried by said base, a drive operably connected with said platen for moving said platen generally vertically from a first fully lowered position to a second fully raised position relative said base, a counterbalance actuator carried by said base and operably connected with said platen to bear at least part of the weight of objects carried by said platen, said counterbalance actuator having a first casing having a rigid side wall, a closed end, and an open end and defining in part an enclosed space receiving gas under pressure, a second casing having a rigid side wall, a closed end and an open end and defining in part an enclosed space for receiving gas under pressure, a single bellows having a flexible side wall and spaced apart open ends with one of said open ends being connected with a substantially gas impervious seal to said side wall of said first casing adjacent the open end thereof and the other of said open ends of said bellows being connected with a substantially gas impervious seal to said side wall of said second casing, a port communicating with said first casing for admitting gas under pressure to an expansible chamber defined by said casings and said bellows, and an accumulator chamber communicating with said port and having a volume at least ten times greater than the minimum volume of said expansible chamber defined by said casings and said bellows, said side wall of one of said casings having a sufficiently larger diameter than said side wall of the other of said casings so that in said first lowered position of said platen said side walls are telescoped one within the other with at least part of said side wall of said bellows received between them and in the second fully raised position of said platen said casings are axially spaced apart with said bellows extending between them so that the length of the maximum stroke of the platen between said first and second positions is greater than the maximum axial length of said flexible bellows, there is no structure within said casings aligning or guiding them for generally axial movement between said lowered and raised positions of said platen, and in said fully raised position of said platen said side wall of said bellows is not laterally restrained other than by connection of said ends thereof with said casings.



5,316,274

RUBBER BEARING THAT SUPPRESSES VIBRATIONS HYDRAULICALLY

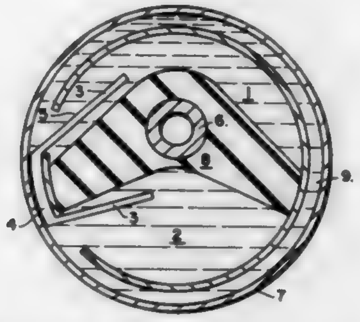
Axel Rudolph, Bensheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Jun. 22, 1992, Ser. No. 902,099

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1991, 4126674

Int. Cl.⁵ F16M *5/00*

U.S. Cl. 267—140.12 **5 Claims**



1. In a rubber bearing that suppresses vibrations hydraulically having two liquid-filled compartments separated by a resilient element that communicate through a first connecting aperture and having two gas-filled compartments, each disposed in a respective one of said liquid-filled compartments and communicating with each other through a second connecting aperture, the improvement wherein each gas-filled compartment is elongate in shape and is enclosed on opposite sides by separate, resilient compensating walls such that the compensating walls are substantially surrounded by liquid of the respective liquid-filled compartments.

5,316,275

HYDRAULIC DAMPING DEVICE

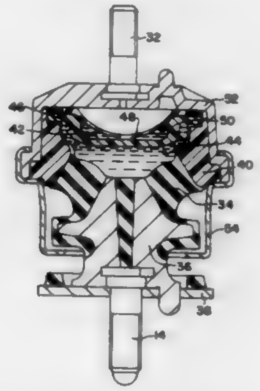
Takashi Maeno, and Tatsuo Suzuki, both of Inazawa, Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 30, 1992, Ser. No. 982,676

Claims priority, application Japan, Dec. 13, 1991, 3-110001

Int. Cl.⁵ F16F *9/00*

U.S. Cl. 267—140.13 **6 Claims**



1. A hydraulic damping device comprising:

a rubber elastic body having a cup-shaped opening;

a resilient rubber film member closing said cup-shaped opening of said rubber elastic body to define a closed chamber;

a partition member disposed between said rubber film member and said rubber elastic body to divide said closed chamber into two liquid chambers, said partition member including a restricted liquid passageway interconnecting said two liquid chambers;

a support member connecting said rubber elastic body to a vibrating body; and

a cylindrical frame member interposed between said support member and said rubber elastic body, said frame member being composed of a resin material having a coefficient of thermal productivity so as to limit heat transfer to the rubber elastic body, an inner peripheral surface of said cylindrical frame member being joined to an outer peripheral surface of said rubber elastic body, an outer peripheral surface of said cylindrical frame member being covered entirely by said support member.

5,316,276

THICKNESS COMPENSATION ACTUATOR SYSTEM

Konrad Heinle, 2820 Mark Ave., Santa Clara, Calif. 95051

Filed Dec. 18, 1992, Ser. No. 993,773

Int. Cl.⁵ B23B *31/30*

U.S. Cl. 269—21 **8 Claims**

1. A thickness compensation actuator system for enabling automatic, coarse adjustment of wafer height in combination with a stepper mechanism for imposing image patterns on said wafer which comprises:

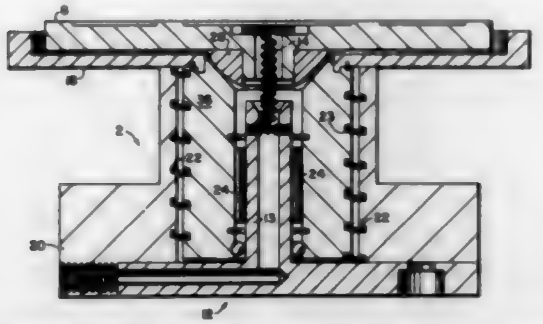
a vacuum chuck capable of supporting a wafer thereon;

vacuum applying means capable of providing said vacuum chuck with sufficient vacuum to maintain said wafer in contact with said vacuum chuck, said vacuum applying means including a centrally located vacuum conduit portion;

means for adjustably securing said vacuum chuck to said vacuum applying means;

an actuator means rotatably disposed about said vacuum conduit portion; and

means, including a motor, for reciprocally moving said actuator means such that its movement produces a similar reciprocal movement by said vacuum chuck; and



feedback means, including a focus sensor means, a microprocessor, and said motor, said feedback means being operative for automatically, coarsely adjusting the height of said vacuum chuck in response to the thickness variation of said wafer, such that the upper surface of said wafer will lie in a predetermined plane, said thickness variation exceeding the total range of focus accommodation built into the stepper mechanism.

5,316,277

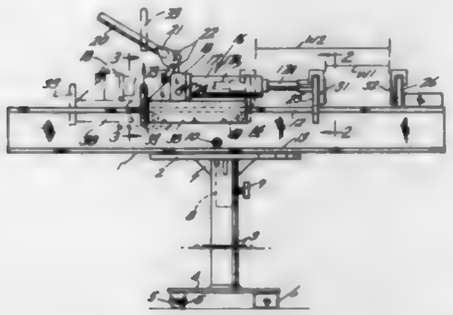
PORTABLE HYDRAULIC VISE

Willie E. Banks, 434 NE. Morris, Portland, Oreg. 97212

Filed Apr. 12, 1993, Ser. No. 44,797

Int. Cl.⁵ B23Q *3/08*

U.S. Cl. 269—25 **5 Claims**



1. In a vise for clamping articles of widely varying dimensions, the improvement comprising,

a beam having a flange, a fixed jaw on said flange,

a cylinder assembly on said beam including an elongate carrier manually positionable along said flange, a hydraulic cylinder and pump assembly on said carrier and including a movable jaw positionable relative said fixed jaw,

a stop insertably engageable with said flange to prevent movement of the carrier during a clamping operation, said stop including a pair of legs insertably engageable with pairs of openings spaced at intervals along said flange and a handgrip integral with said legs facilitating removal and installation of the stop on said flange.

5,316,278

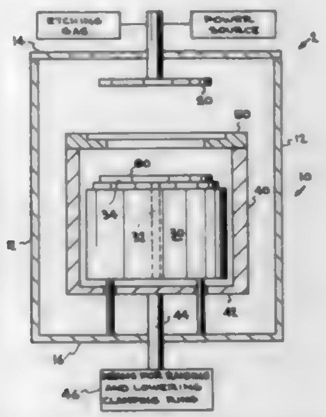
CLAMPING RING APPARATUS FOR PROCESSING SEMICONDUCTOR WAFERS

Semyon Sherstinsky, San Francisco; Mei Chang, Cupertino; Charles C. Harris, Los Gatos; Alfred Mak, Union City; James F. Roberts, Campbell; Simon W. Tam, San Jose, and Wen T. Chang, Mountain View, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Sep. 18, 1992, Ser. No. 947,212

Int. Cl.⁵ B25B *1/00*

U.S. Cl. 269—254 R **15 Claims**



1. In a semiconductor wafer processing apparatus comprising a wafer support pedestal adapted to support a generally circular semiconductor wafer thereon during processing of said wafer in said apparatus, the improvement which comprises a clamping ring apparatus for yieldably engaging said generally circular semiconductor wafer to peripherally clamp said wafer to said support pedestal to provide a peripheral seal between said wafer and the surface of said pedestal facing said wafer, adjacent the circular end edge of said wafer which comprises a clamping ring means with yieldable finger means for providing a spring bias against the upper surface of said wafer peripherally adjacent said circular end edge of said wafer to peripherally seal said wafer to said pedestal.

5,316,279

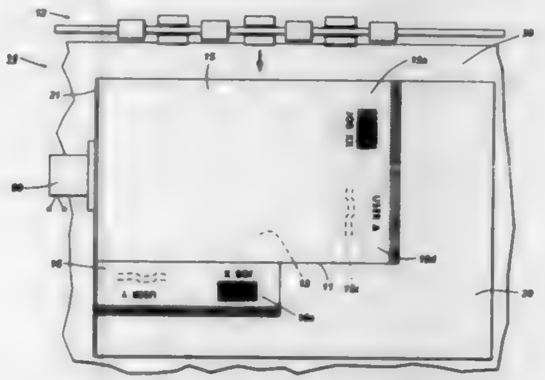
COPIER/PRINTER JOB STACKING WITH DISCRETE COVER SHEETS WITH EXTENDING PRINTED BANNERS

Stephen C. Corona; Elizabeth D. Fox, and Norman D. Robinson, Jr., all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 4, 1993, Ser. No. 79

Int. Cl.⁵ B41F *13/54;* **B65H** *33/04, 3/44*

U.S. Cl. 270—1.1 **13 Claims**



1. An improved system for segregating, identifying and separating separate job sets of copy sheets from a commonly stacked output of plural job sets of copy sheets and cover sheets therefor which are sequentially generated by a printer, wherein the copy sheets are sequentially outputted into a sheet stacker in which the plural job sets of copy sheets and their cover sheets may be superposed commonly stacked; and wherein the printer has at least two separate sheet supply trays for the selective feeding of at least two standard sizes of copy sheets for printing; comprising:

control means for selecting which said sheet supply tray will feed copy sheets for a selected job set and for a cover sheet for said job set;

said control means automatically repeatedly feeding and printing a cover sheet for a job set from a said sheet supply tray which is different from the said paper sheet supply tray from which said job set copy sheets are fed;

said sheet stacker being adapted to commonly stack said plural job sets of copy sheets and said respective cover sheets therefor commonly edge aligned on at least two edges, but with at least one edge area of said cover sheets for said job sets extends substantially from at least one edge of said stack of copy sheets of job sets to provide an exposed extended edge banner strip which provides job set segregation and separation by being easily visible and graspable even if said stack of plural job sets is subsequently misaligned;

wherein said sheet supply tray from which said cover sheets are fed contains a differently oriented standard paper size than the sheet supply tray from which said job set copy sheets are fed.

5,316,280

STITCHING AND FOLDING APPARATUS WITH PIVOTABLE BODY

Christopher R. Watkiss, Biggleswade, England, assignor to Watkiss Automation Limited, Bedfordshire, England

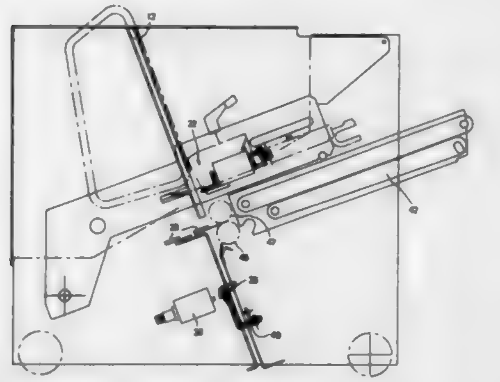
PCT No. PCT/GB92/00125, § 371 Date Oct. 6, 1992, § 102(e) Date Oct. 6, 1992, PCT Pub. No. WO92/12860, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 22, 1992, Ser. No. 934,750

Claims priority, application United Kingdom, Jan. 22, 1991, 9101377

Int. Cl.⁵ B41L *43/00;* **B42C** *1/00*

U.S. Cl. 270—37 **18 Claims**



1. Apparatus for stitching and folding sheets of material, comprising

in-feed means arranged to receive a plurality of overlaid sheets on a downward path,

stitching means arranged to insert at least one fastening stitch through the sheets,

folding means to fold the stitched sheets,

said stitching means and folding means further arranged such that the stitching means are encountered by the sheets before the folding means on a continuous rectilinear path of travel, said rectilinear path defining a downward straight line continuation of the path through the in-feed means,

and out-feed means for the stitched and folded sheets,

wherein the stitching and initiation of folding is effected on the sheets without the sheets leaving the rectilinear path downward from the in-feed means.

5,316,281

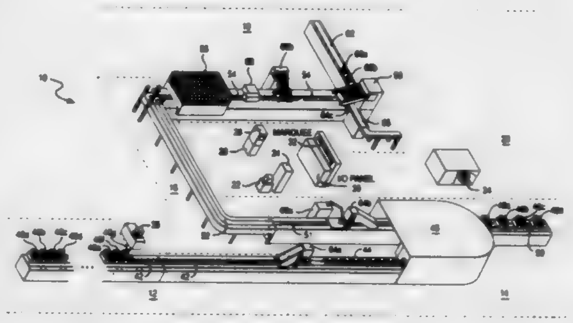
SYSTEM AND METHOD FOR MONITORING A DOCUMENT ASSEMBLY SYSTEM

Richard E. Bale, Galena, Ohio; Jon M. Banks, Austin, Tex.; Melvin R. Clearman, Jr., Austin, Tex.; James C. Colson, Austin, Tex.; James M. Crisp, Eden Prairie, Minn.; David C. Loose, Austin, and James E. Varan, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1993, Ser. No. 3,176

Int. Cl.⁵ B65H *39/02;* **G06F** *15/20*

U.S. Cl. 270—58 **49 Claims**



1. A method of monitoring a document assembly system, comprising the steps of,

initiating assembly of a set of documents according to multiple document types:

selecting at least one of said document types: and

after initiating assembly of said set, initiating assembly of at least one supplemental document according to at least one said selected document type.

17. A system for monitoring a document assembly system, comprising:

means for initiating assembly of a set of documents according to multiple document types;

means for selecting at least one of said document types; and

means for initiating, after initiation of assembly of said set, assembly of at least one supplemental document according to at least one said selected document type.

5,316,282

SHEET FEEDING AND SEPARATING DEVICE FOR IMAGE FORMING EQUIPMENT

Noriaki Fukube, Soka; Katsumi Kurihara; Satoshi Takano, both of Tokyo; Hiroshi Tanabe, Yokohama; Hiroshi Fujiwara, Tokyo; Kazunori Bannai, Tokyo, and Hiroyuki Inobe, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 774,349, Oct. 10, 1991, Pat. No. 5,219,154. This application May 26, 1993, Ser. No. 67,006

Claims priority, application Japan, Oct. 11, 1990, 2-270507; Oct. 22, 1990, 2-283707; May 16, 1991, 3-111922

Int. Cl.⁵ B65H *5/00*

U.S. Cl. 271—10 **2 Claims**

1. A sheet feeding device comprising:

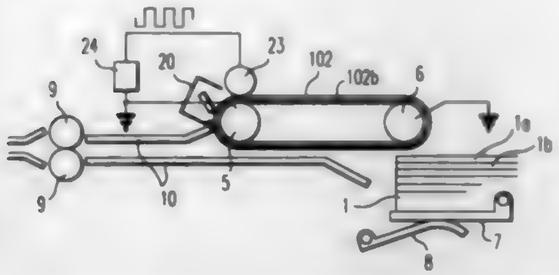
sheet pick-up means facing and spaced from the top of a stack of sheets, said sheet pick-up means being movable in an intended direction of sheet feed for picking up an uppermost sheet from the stack of sheets, said sheet pick-up means comprising an endless dielectric belt;

means for rotating said dielectric belt in at least said intended direction of sheet feed; and

charge pattern forming means for applying an alternating voltage to a surface of said belt to thereby form an alternating charge pattern on said surface of the belt, said charge pattern forming means comprising a charging and discharging member associated with said dielectric belt and having a charging function and a discharging function;

wherein:

said charging and discharging member forms a charge on a surface portion of said belt for picking up the uppermost sheet and causing the uppermost sheet to adhere to said charged surface portion of the belt, such that said rotating means rotates said belt to transport said picked-up uppermost sheet in said intended direction of sheet feed and to a position where the picked-up uppermost sheet is separated from the belt and guided by way of a guiding path to a transport roller pair;



said charged surface portion of said belt has a length which is substantially equal to a length of said guiding path from the position where the picked-up uppermost sheet is separated from the belt to the transport roller pair; and

said charging and discharging member discharges said belt when the separated sheet is nipped by said transport roller pair.

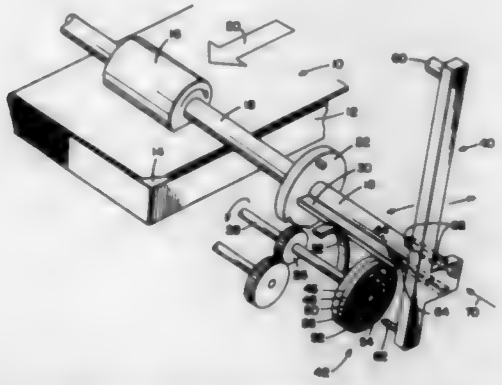
5,316,283
CLUTCH MECHANISM FOR A SHEET FEEDER

Ben B. Tyson, Eagle, Id., and Alfonso German, Zapopan, Mexico, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 21, 1993, Ser. No. 81,049

Int. Cl.^{5} B65H *3/06*

U.S. Cl. 271—114 **6 Claims**



1. A sheet feeder mechanism comprising:

a D-shaped roller mounted on a shaft, said shaft positioned transversely to a direction of sheet feed;

a D-roller gear mounted on said shaft and having a geared region and recessed region that extends partially about a circumference of said D-roller gear;

gear drive means for engaging said geared region of said D-roller gear and causing rotation of said D-roller gear, said shaft and said D-roller;

a shaft extension extending from said shaft;

spring means engaging said shaft extension for causing said shaft extension, shaft and D-roller gear to rotate to a position that enables said gear drive means to engage said geared portion of said D-roller gear;

cam means mounted for rotation with said gear drive means, said cam means including a rotatable spiral cam positioned between and resiliently bearing upon, inner and outer annuli; and

control arm means engaged by said cam means and said shaft extension, and responsive to rotation in a first direction of said cam means, to enable said spring means to move, via said shaft extension and shaft, said geared portion of said D-roller gear to an alignment position with said gear drive means, and further responsive to rotation of said cam means in a second direction, after said first direction rotation, to cause said gear drive means to rotate said D-roller gear, shaft and D-roller to thereby cause a sheet feed.

5,316,284
DEVICE FOR FEEDING SINGLE SHEETS OUT OF A STACK OF FILM SHEETS

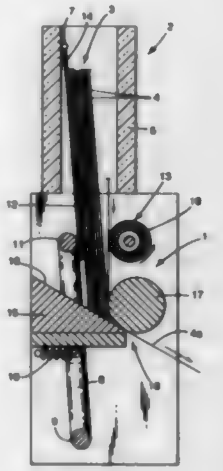
Renato Bolognese, Savona; Marco Notini, Genova Pegli, and Gian C. Pastorino, Mallare, all of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 2, 1992, Ser. No. 908,152

Claims priority, application Italy, Jul. 3, 1991, MI91A001835

Int. Cl.^{5} B65H *3/52*

U.S. Cl. 271—121 **5 Claims**



1. Device for feeding single sheets out of a stack of film sheets, comprising housing means (5) for housing the stack of film sheets in a substantially vertical position within 15 degrees of vertical, a driven feed roller in contact with the first film sheet of the stack, biasing means for keeping the stack with its first film sheet in contact with the feed roller, and a withdrawal passageway for the film sheets, characterized in that the passageway is defined by a first guide surface forming with the sheets of the stack an angle of 30° to 60° and a second rounded guide surface, said passageway having an opening height of at least twice the thickness of a single film sheet, and the feed roller having outer surface of a material providing a coefficient of static friction between the material and a film sheet greater than the coefficient of static friction between two adjacent film sheets of the stack.

5,316,285
SHEET MEDIA REALIGNMENT MECHANISM

Allan G. Olson, Camas, and James O. Beehler, Brush Prairie, both of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

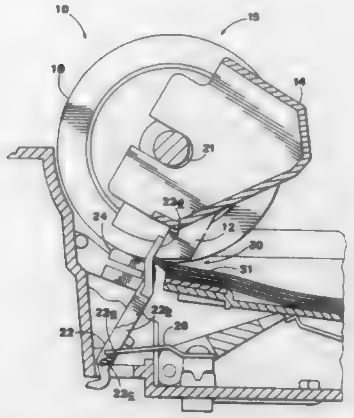
Filed Apr. 30, 1993, Ser. No. 55,629

Int. Cl.^{5} B65H *3/52*

U.S. Cl. 271—122 **13 Claims**

1. A sheet media realignment mechanism for stacked sheet feeding equipment including a single sheet pick/feed mechanism moveable by a drive mechanism for feeding a single sheet from the top of a sheet media stack through a feed zone, the realignment mechanism comprising:

a first member adjacent the pick/feed mechanism and controllably moveable between a first position free of the feed zone for unobstructed feeding of a top sheet therethrough and a second position within the feed zone and adjacent the sheet media stack, said first member including a sheet media-confronting expanse for guiding next-to-top sheets in the stack upstream into leading edge alignment with the remaining sheets in the stack, and



a control mechanism operable synchronously with the pick-/feed mechanism to move said first member from said first to said second position after the feeding of a single sheet through the feed zone, thereby to restore leading edge alignment of remnant sheet media in the stack, wherein said control mechanism includes a second member operatively connected with the pick/feed mechanism for selected movement therewith, said second member selectively engaging said first member to urge the latter into said first position, wherein said control mechanism further includes a return mechanism for urging said first member into said second position after the top sheet has been fed by the pick/feed mechanism downstream past said first member.

5,316,286
SHEET DISCHARGING APPARATUS FOR USE IN AN IMAGE FORMING APPARATUS

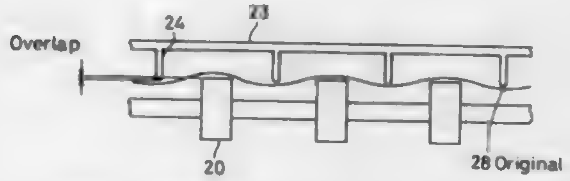
Kazushi Takimoto, Kusatsu, Japan, assignor to Mita Industrial Co., Ltd., Japan

Filed Jul. 27, 1992, Ser. No. 920,205

Claims priority, application Japan, Jul. 30, 1991, 3-214468; Aug. 7, 1991, 3-223427

Int. Cl.^{5} B65H *29/68*

U.S. Cl. 271—182 **18 Claims**



1. An original discharging apparatus comprising:

conveying means for conveying an original with respect to which a processing has been finished;

a discharging roller which rotates at a speed lower than an original conveying speed of said conveying means, said discharging roller having at least one space therein;

a guide member provided opposite said discharging roller, said guide member having at least one guide rib;

moving means for moving said discharging roller so that the condition of said discharging roller is changed from a retrieving condition where a discharge speed of an original conveyed through a clearance formed between said guide member and said discharging roller is hardly influenced or not influenced at all by a rotation of the discharging roller to a protruding condition where a discharge speed of an original is heavily influenced by the rotation of the discharging roller; and

controlling means for controlling said moving means so as to be activated before said original being conveyed is separated from said conveying means, and

wherein said protruding condition of said discharging roller is a condition wherein said guide rib of said guide member is in an overlapping relationship with respect to said at least one space of said discharging roller such that an original interposed between said discharging roller and said guide member is nipped and urged into a wavy profile along its width.

5,316,287
TRAY APPARATUS

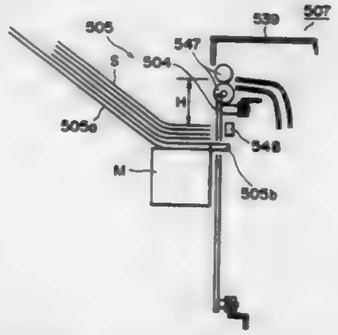
Masakazu Hiroi, Tokyo; Akimitsu Hoshi, Yokohama; Noriyoshi Iida, Ichikawa; Tadayuki Kitajima, and Nobutaka Uto, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 758,484, Sep. 9, 1991, Pat. No. 5,215,300, which is a continuation of Ser. No. 277,523, Nov. 28, 1988, abandoned, which is a continuation of Ser. No. 839,610, Mar. 14, 1986, abandoned. This application Dec. 10, 1992, Ser. No. 988,579

Claims priority, application Japan, Mar. 15, 1985, 60-053065; Mar. 18, 1985, 60-055485; Mar. 20, 1985, 60-057141

Int. Cl.^{5} B65H *31/04*

U.S. Cl. 271—213 **7 Claims**



1. A tray apparatus, comprising:

a stacking tray for stacking discharged sheet materials;

a sheet end stopper for stopping an end edge of the sheet material discharged to said tray to align the sheet materials, said end stopper being movable in a lateral direction with respect to a direction of sheet discharge;

supporting means for supporting the tray so that the tray is movable substantially vertically relative to said end stopper and is movable laterally together with said end stopper;

first control means for controlling downward movement of said tray in accordance with an amount of sheet materials on said tray; and

second control means for controlling lateral movement of said end stopper and said tray in accordance with a sorting signal to sort said sheet materials.

5,316,288

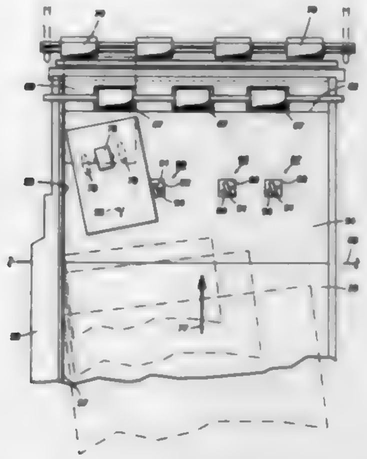
SHEET HANDLING APPARATUS AND METHOD FOR REGISTERING A SHEET USING A GATE DEVICE

David J. Fish, Webster; Jeffrey L. Andela, deceased, late of Sodus by Christine R. Andela, executrix , and Henry T. Chiavaroli, Honeoye Falls, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 330, Jan. 4, 1993, abandoned. This application Nov. 16, 1993, Ser. No. 153,942

Int. Cl.⁵ B65H *9/16*

U.S. Cl. 271—250 **6 Claims**



1. A method for registering sheets, comprising the steps of:
transporting a sheet along a path;
urging the sheet laterally toward an edge of the path to register a first side edge of the sheet;
engaging a second side edge of the sheet, opposed from the first side edge, to prevent rotation of the sheet, said step of engaging includes positioning a gate in the path to oppose rotation of the sheet; and
opening the gate in response to engagement with an edge of the sheet substantially perpendicular to the first edge thereof to permit transport of the sheet therethrough.

5,316,289

SHEET CONVEYING APPARATUS WITH STOP TIMING DELAY OF UPSTREAM CONVEYING MOTOR

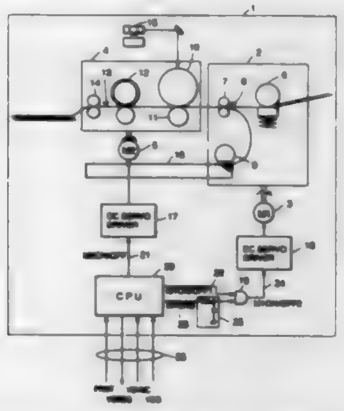
Shimpei Matsuo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1993, Ser. No. 87,857

Claims priority, application Japan, Jul. 15, 1992, 4-188185

Int. Cl.⁵ B65H *7/04*

U.S. Cl. 271—258 **6 Claims**



6. A sheet conveying apparatus comprising:
first conveying means driven by a first motor;
second conveying means driven by a second motor, said second conveying means being situated downstream of said first conveying means;
abnormality detecting means for detecting an abnormality in said sheet conveying apparatus;
clock means for counting a predetermined time following detection of an abnormality by said abnormality detecting means; and
control means for, when said abnormality detecting means has detected an abnormality, immediately stopping said second motor in response to the output from said abnormality detecting means and stopping said first motor in response to the counting of the predetermined time by said clock means.

5,316,290

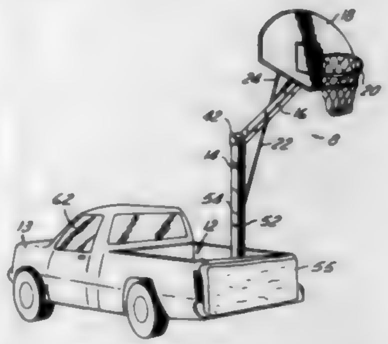
PORTABLE BASKETBALL GOAL ASSEMBLY

Jason Parr, 2605 Homeplace, West Bloomfield, Mich. 48325, and Jonathan P. VarnHagen, 44150 Richmond, Canton, Mich. 48187

Filed Jun. 19, 1992, Ser. No. 901,537

Int. Cl.⁵ A63B *63/08*

U.S. Cl. 273—1.5 R **10 Claims**



1. A portable collapsible backboard and basket assembly mounted in the cavity in the rear of a pickup truck comprising:
base means positioned in and affixed to the cavity of said pickup truck;
foldable support means attached to said base means and rotatable between a storage position adjacent the floor of the cavity of the pickup truck and to a second position generally vertically upright relative to the floor of the cavity of the pickup truck;
said foldable support means comprising a first support member rotatably attached to the base means and a second support member rotatably attached to said first support member;
a backboard foldably and rotatably attached to said second support member;
a basket member attached to said backboard; and
brace means for holding said support means in position to allow said backboard to be utilized to play basketball, said brace means being positioned between said first support member and said second support member;
wherein one of said first or second support members has a channel therein for retaining said brace means when said support means is collapsed to said storage position;
wherein when said assembly is foldable and collapsible into said storage position, it forms a compact package in the rear of the pickup truck, and wherein when said assembly is erectable into said display position, it holds and supports said backboard and basket in position above and outside the dimensions of the cavity for playing basketball.

5,316,291

Patent Not Issued For This Number

5,316,292

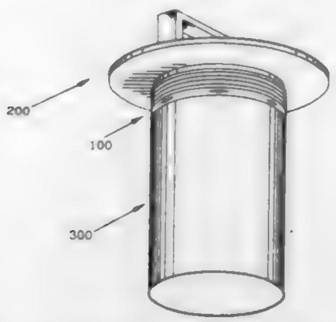
METHOD OF INSTALLING PUTTING HOLE LINER AND COLLAR

Richard P. Browne, 26 Lazy La., The Woodlands, Tex. 77380

Continuation-in-part of Ser. No. 766,056, Sep. 26, 1991, Pat. No. 5,108,162. This application Oct. 13, 1992, Ser. No. 959,389

Int. Cl.⁵ A63B *57/00;* **A01B** *79/00*

U.S. Cl. 273—34 R **1 Claim**



1. A method for installing a golf hole collar for preserving the shape and firmness of a golf hole while increasing the visibility of the golf hole, the collar abutting an earthen strip cup liner which forms the bottom and sides of the golf hole, the collar having an upper perimeter having a uniform cylindrical shape and a lowermost perimeter having a uniform cylindrical shape thicker than said upper perimeter, such method incorporating the use of a cup setter, the cup setter having a base with a side for flushly engaging the earth surrounding the hole and a cylindrical member extending from the base for pushing the cup liner into the hole a specific depth below the surface of the earth engaged by the base, the cylindrical member having a larger outside diameter portion adjacent the base for engaging the upper inner surface of the golf hole and a reduced outside diameter portion below the larger diameter portion for engaging and forcing the cup liner to the specified depth, the method of installing the golf hole collar comprising the steps of:
(a) coring a cylindrical hole;
(b) inserting the cup liner into said cylindrical golf hole;
(c) affixing the collar onto the cup setter such that the upper perimeter of the collar removeably engages the larger outside diameter portion of the cylindrical member of the cup setter and the lower perimeter of the collar removeably engages the smaller outside diameter portion of the cylindrical member of the cup setter such that the portion of the collar closest to the base remains displaced from the base a fixed uniform distance;
(d) engaging the cup setter, with the collar affixed thereto, with the cup liner;
(e) pushing the assembly comprising the cup setter, the collar and the liner into the cored golf hole until the side of the base flushly engages the earth surrounding the cored hole;
(f) removing the cup setter from the golf hole such that the collar and the liner remain securely affixed in the cored golf hole whereby the collar remains displaced from the surface of the earth a fixed uniform distance corresponding to the distance the collar was displaced from the base.

5,316,293

SIGNAL EMITTING BALL

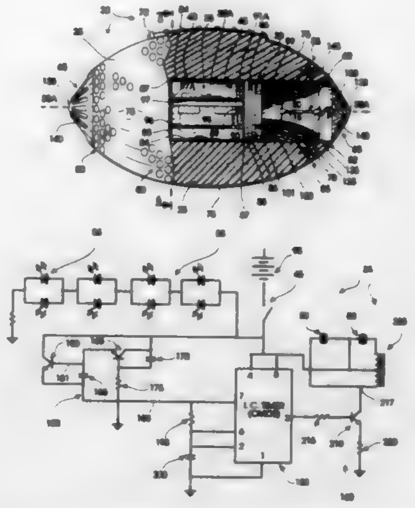
David H. Hamilton, 5506 B. St., Little Rock, Ark. 72205

Filed Apr. 26, 1993, Ser. No. 51,652

Int. Cl.⁵ A63B *43/06, 37/06*

U.S. Cl. 273—65 EF **20 Claims**

1. A signal emitting toy ball comprising:
a resilient body comprised of pliable material, the body defining a longitudinal axis, a central interior bore coincident with said axis, and at least one open end;
an electronic circuit disposed within said body;
switch means disposed in said ball for activating said circuit in response to acceleration of said ball;
transducer means for generating sound in response to said circuit; and,



end cap means associated with said at least one open end for distributing sound from said transducer means.

5,316,294

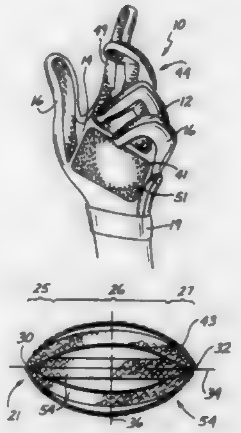
GLOVE AND BALL FACILITATING A GAME OF CATCH

Farid J. Turangan, Fremont, Calif., assignor to Steven M. Allgeier, Santa Monica and Julius A. Turangan, Fremont, both of Calif.

Filed Apr. 3, 1992, Ser. No. 862,797

Int. Cl.⁵ A63B *43/02*

U.S. Cl. 273—65 EG **8 Claims**



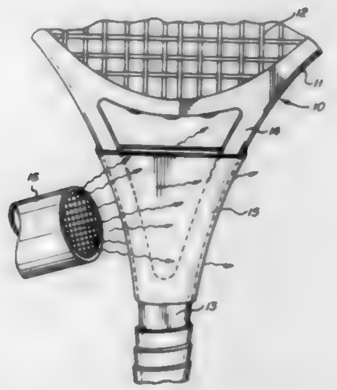
7. A football having an outer surface and being adapted to be caught by a glove or mitt which is at least partially covered by a first material, the football including:
an outer surface;
two tapered ends, one of which leads the football when the ball is thrown;
a central section progressively enlarged between the two ends;
a second material disposed to cover completely the leading end of the ball, the second material being in the form of a plurality of strips adhered to the outer surface of the football and alternating with the outer surface around the central section of the football, each strip extending from one end of the football to the other end of the football and having a thickness sufficient to form a raised edge to facilitate gripping the football, the strips being aligned to

fully cover the ends of the football without overlapping; and

the second material having characteristics for being releasably held by the first material of the glove or mitt to facilitate catching the football with the glove or mitt.

5,316,295
METHOD AND APPARATUS FOR DAMPENING RACQUET VIBRATION

Raphael J. Costanzo, 63 Senior Dr., Monroe, Conn. 06468
Filed Mar. 19, 1993, Ser. No. 34,427
Int. Cl.⁵ A63B *49/00*
U.S. Cl. 273—73 R **11 Claims**



1. A method of dampening the vibration of a stringed racquet during the play of a game requiring a racquet wherein the racquet includes a head frame and a handle connected thereto, comprising the steps of:

forming a band of a resilient material of sufficient thickness to absorb the vibratory motion imparted to said head frame upon impact with a ball during the play of the game,

placing said band of resilient material about the junction at which the racquet handle connects to the head frame,

tightly securing said band to conform to the shape of said junction,

and shrinking said band onto said junction for tightly securing said band to said junction.

5,316,296
SHOCK-ABSORBING GAME RACKET

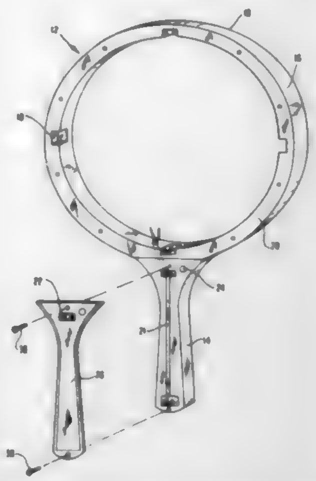
Liora B. Ben-Zirma, Rehov Cordova 5, Tel-Aviv; Yoram Levanon, Rehov Szold 44, Ramat Hasharon, and Samuel Ronen, Rehov Golomb 2a, Herzliya, all of Israel
Filed May 5, 1993, Ser. No. 57,057
Int. Cl.⁵ A63B *49/00*
U.S. Cl. 273—73 R **15 Claims**

1. A game racket comprising:

a handle;

a frame extending from said handle; and

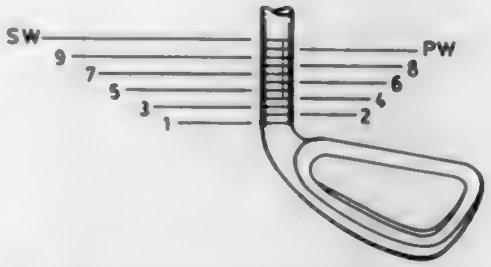
a pair of planar surfaces mounted in said frame, at least one of said surfaces incorporating at least one shock-absorbing means for absorbing impact forces when hit by a ball;



wherein said at least one shock-absorbing means comprises at least one coil spring disposed between said pair of planar surfaces.

5,316,297
GOLF CLUB SETS

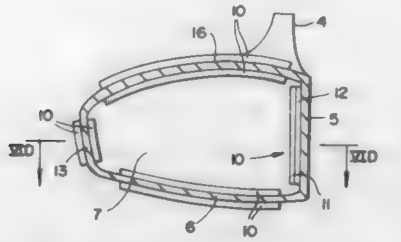
Chris Chappell, Westminster, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.
Filed Oct. 22, 1992, Ser. No. 964,916
Int. Cl.⁵ A63B *53/04*
U.S. Cl. 273—77 A **15 Claims**



1. A set of golf club irons, each having a head portion, and a hosel connecting the head portion to a shaft portion, with the head portions ranging in loft from a minimum of approximately 14° for a least lofted club to a maximum of approximately 54° for a highest lofted club wherein the lengths of the hosels range from a length of less than 2" for the least lofted clubs to approximately 2⅜" for the highest lofted clubs, and each head portion has a heel, a toe and a sole, and weight is positioned toward the toe and the sole on the least lofted club and progressively moves toward the heel as the loft of the club increases, with more weight positioned toward the heel of the highest lofted club, so that a location of a center of percussion for the clubs is not uniform for each club in the set.

5,316,298
GOLF CLUB HEAD HAVING VIBRATION DAMPING MEANS

Patrice Hutin; Roger Cleveland, both of Los Angeles, and Daniel J. Stone, Long Beach, all of Calif., assignors to Skis Rossignol S.A., France
Filed Apr. 14, 1993, Ser. No. 45,784
Claims priority, application France, Apr. 14, 1992, 92.04882
Int. Cl.⁵ A63B *53/04*
U.S. Cl. 273—78 **33 Claims**



15. A metal wood golf club head comprising:

a front strike face;

a sole extending rearwardly from a bottom region of said front strike face;

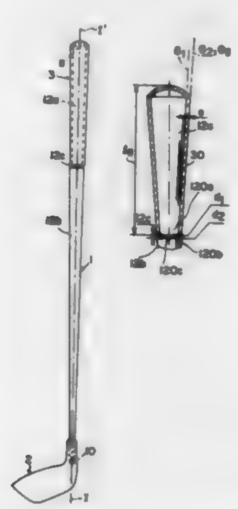
a top surface extending rearwardly from a top region of said front strike face;

an arcuate skirt portion joining said top surface to said sole and extending from a toe region of said strike face to a heel region of said strike face, wherein the front strike face, sole, top surface and arcuate skirt portion define a cavity within the club head; and

vibration damping means provided on the club head at a position other than on the front strike face, comprising constraining means connected to the club head by a viscoelastic material, said constraining means comprising a rigid plate having a Young's modulus greater than 10,000 MPa and a thickness between 0.07 and 2.0 mm.

5,316,299
GOLF CLUB SHAFT

Pierre Feche, Cran-Gevrier, and Jean-Luc Veux, Rumilly, both of France, assignors to Taylor Made Golf Company, Carlsbad, Calif.
Filed Oct. 16, 1992, Ser. No. 961,620
Claims priority, application France, Oct. 16, 1991, 91 12937
Int. Cl.⁵ A63B *53/10*
U.S. Cl. 273—80 R **9 Claims**



1. Golf club comprising: a shaft (1) made of a composite material, said golf club having a lower end (10) on which a head (2) is mounted, and an upper end (11) or grip end on which a grip (3) is mounted, said shaft having:

(a) a first, upper tapered portion (12*a*) extending from said upper end (11) toward said lower end (10) and at least partially covered by said grip (3);

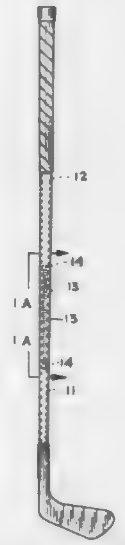
(b) a second, lower portion (12*b*) extending from adjacent said first, upper tapered portion (12*a*) to said lower end (10); and

(c) a third, short connecting portion (12*c*) which connects said first portion (12*a*) to said second portion (12*b*) and is located proximate to a section of a lower end of said first, upper tapered portion;

(d) the diameter (d1) of the section of said lower end (120*a*) of said first, upper tapered portion (12*a*) being less than the diameter (d2) of a section of an upper end (120*b*) of said second lower portion (12*b*).

5,316,300
GOLF CLUB HAVING HOLLOW SHAFT WITH FLUID SELECTIVELY INSTALLED THEREIN

Samuel P. Simmons, Grass Valley, Calif., assignor to Tourshot Golf Co., Inc., Grass Valley, Calif.
Continuation-in-part of Ser. No. 814,495, Dec. 30, 1991, abandoned. This application Feb. 25, 1993, Ser. No. 22,130
Int. Cl.⁵ A63B *53/08, 69/36*
U.S. Cl. 273—80 R **10 Claims**



1. In a golf club having a hollow shaft with an inner wall and opposite ends, the improvement comprising:

a pair of spaced dam elements installed along the inner wall of said shaft, said dam elements along with the inner wall of said shaft forming a fluid tight chamber, and

a high viscosity fluid which does not flow readily installed in said chamber, wherein the fluid installed in said chamber has a viscosity of 250,000–350,000 centipoises at 5 rpm and 76 degrees Fahrenheit,

said chamber being spaced from both of the ends of said shaft.

5,316,301
STRING RACE GAME

Bradley J. Boury, 20430 Kemp, Mt. Clemens, Mich. 48043
Filed Feb. 10, 1993, Ser. No. 16,029
Int. Cl.⁵ A63F *9/14*
U.S. Cl. 273—86 R **8 Claims**

1. A game comprising:

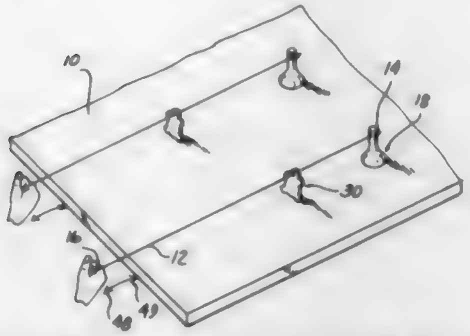
a string having first and second opposed ends;

a suction cup releasibly and stationarily mounted at a first end on a surface and a neck of a predetermined length joined to and extending from the suction cup;

a bore formed in the neck and receiving the first end of the string therethrough;

means for attaching the first end of the string through the bore to the neck;

a body having first and second opposed ends, an aperture formed in the body adjacent the first end thereof and slidably receiving the string therethrough, the body having a high friction surface formed on at least the second end thereof;



the bore in the neck being spaced an identical distance from the first end of the suction cup as the distance of the aperture in the body from the second end of the body; and

the second end of the string being spaced from the first end of the string over a surface and freely supported by a player such that alternating tensioning and untension of the second end of the string from the first end to the second end of the string as long as the second end of the string is not raised above the first end of the string.

5,316,302

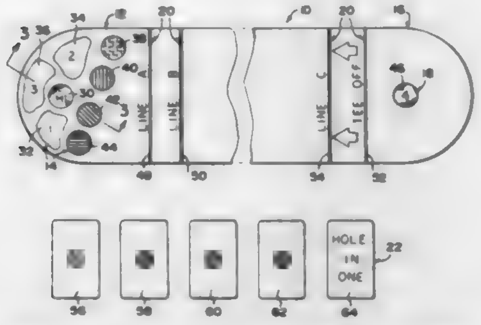
GOLF GAME OF SKILL AND CHANCE

William C. Sedberry, 632-31st Ave. N., Apt. 35-A, Columbus, Miss. 39701

Filed Aug. 14, 1992, Ser. No. 930,264

Int. Cl.^{5} A63F *7/06;* **A63B** *69/36*

U.S. Cl. 273—87 C **5 Claims**



1. A golf game of skill and chance which comprises:
- a) a playing board having a playing surface with a course end having a plurality of golf ball receiving cups under the playing surface and an opposite end having a single golf ball receiving cup under the playing surface;
- b) a plurality of putting start lines transversely positioned at the course end and the opposite end of said playing board respectively, between said plurality of golf ball receiving cups and said single golf ball receiving cup;
- c) a plurality of game cards having indicia thereon to match up with some of the cups on said playing board to indicate to each player how to play the game;
- d) a score pad for each player to keep a written record of the score during the play of the game;
- e) a golf ball for each player; and
- f) a putter club, so that each player can in turn stand on said playing board and initially hit a respective golf ball from a start line at the opposite ends towards one of the golf ball receiving cups at the course end for receipt therein, as indicated by one of said game cards picked and, subsequently hit the respective golf ball towards either end of the playing board without modification of the playing surface thereof from a putting start line selected from one at the course end and the opposite end towards a selected one of the plurality of cups and the single cup respectively, according to whether the respective golf ball was successfully received in the indicated golf ball receiving cup as a result of the initial hit.

5,316,303

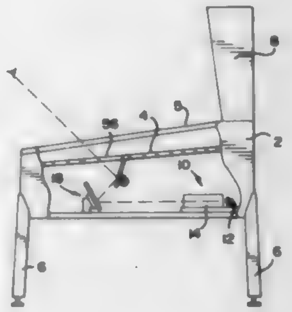
HOLOGRAPHIC DISPLAY FOR PINBALL GAMES

John T. Trudeau, Melrose Park, and Ernie S. Pizairo, Chicago, both of Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.

Filed Mar. 16, 1993, Ser. No. 33,166

Int. Cl.^{5} A63F *7/22*

U.S. Cl. 273—121 A **8 Claims**



1. A pinball game having an inclined playfield supporting a rolling ball and a plurality of play features one of said play features, comprising:
- a) a hologram mounted below the playfield;
- b) means for generating a light beam located below the playfield, said light beam being directed onto the hologram creating a hologram image; and
- c) means on the playfield for enabling the viewing of the hologram image.

5,316,304

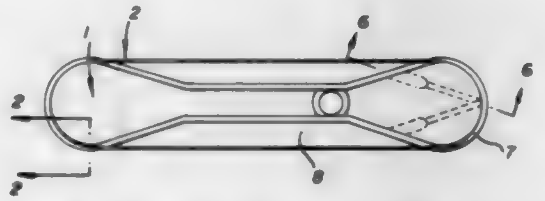
WIRE FACED GOLF PUTTER

David A. Yost, 3504 Windsor Cir. NE., Cleveland, Tenn. 37312

Filed Jan. 4, 1993, Ser. No. 215

Int. Cl.^{5} A63B *69/36, 53/04*

U.S. Cl. 273—168 **3 Claims**



1. A golf putter comprising a solid, elongated head having two striking surfaces on opposing sides thereof and means for accommodating a shaft on the top surface of said head; said elongated head being circumferentially bound by a plurality of parallel wire strands which laterally traverse opposite sides of said head and form said striking surfaces; the opposite sides of said head including a concave mid portion across which said wire strands extend the opposing ends of said putter being provided with hemispherical grooves to accommodate said strands.

5,316,305

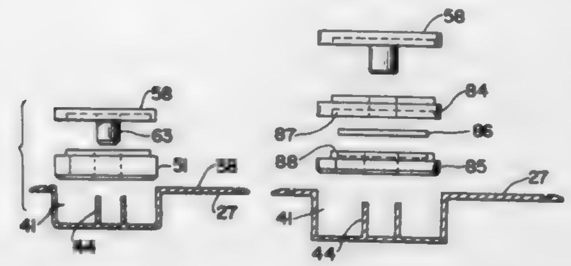
GOLF CLUBHEAD WITH MULTI-MATERIAL SOLEPLATE

Terrill R. McCabe, West Chester, Ohio, assignor to Wilson Sporting Goods Co., Chicago, Ill.

Filed Jul. 2, 1992, Ser. No. 907,677

Int. Cl.^{5} A63B *53/04*

U.S. Cl. 273—174 **9 Claims**



1. A wood-type golf clubhead having a sole, a front face, a top wall which extends rearwardly from the face, and a side wall which extends between the top wall and the sole, the sole having a cavity formed therein which is formed by a side wall which extends upwardly from the sole and a top wall, a projection extending downwardly from the top wall of the cavity, an insert of dampening material positioned in the cavity and surrounding the projection, and a cover attached to the projection below the insert.

5,316,306

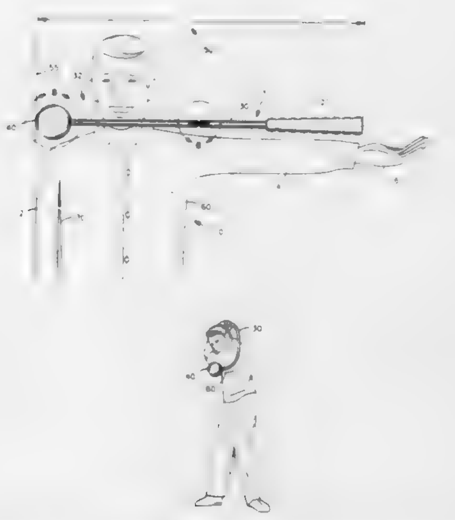
GOLF SWING TRAINING DEVICE

Douglas R. Cody, 2008 Deerpark Dr. #339, Fullerton, Calif. 92631

Filed Jun. 11, 1993, Ser. No. 75,668

Int. Cl.^{5} A63B *69/36*

U.S. Cl. 273—196.2 **5 Claims**



1. A device for training a golfer for generally improving golf club swing technique, comprising a 10½ inch long rigid hand grip connected to one end of a shaft formed from a soft flexible tube, the other end of the shaft connected to a ball of 4 inches diameter, the device having a required overall length, when the device is held horizontally, being such as to just fit between a vertical aligned with the outside of one arm of the golfer, the one arm resting at the golfers side, and the wrist of the golfer's other arm, when the other arm and hand are jointly stretched horizontally to the other side of the golfer with the hand of the other arm held palm-up, whereby the overall length, the flexibility of the tube, and the weight of the ball combine to result in a swing action such that on each correctly executed backswing the ball gently touches one side of the golfer just below one of the golfer's arms, and on each correctly executed foreswing follow-through the ball gently touches the other side of the golfer just below the other of the golfer's arms, and on each incorrectly executed backswing or foreswing, the ball touches the golfer contrariwise so that the golfer receives a tactile feedback indication of the correctness of each swing and is thus able to improve swing technique.

5,316,307

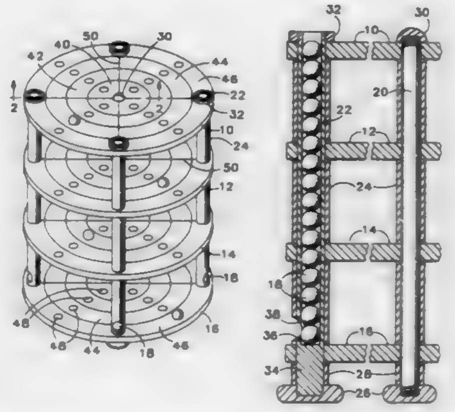
THREE-DIMENSIONAL STRATEGY GAME

Karol W. Kersh, 285 Boice St. S., Salem, Oreg. 97302

Filed Feb. 25, 1993, Ser. No. 23,269

Int. Cl.^{5} A63F *3/00*

U.S. Cl. 273—241 **6 Claims**



1. A three-dimensional strategy game, comprising:
- a) a plurality of plate members providing playing surfaces,
- b) means forming a plurality of concentric bands on each plate member,
- c) a plurality of game piece position stations on each plate member in said concentric bands arranged on radial lines spaced apart about the periphery of the plate member, the number of concentric bands and radial lines being the same as the number of plate members,
- d) support means securing the late members together in vertically spaced apart relationship with the concentric bands and radial lines of game piece position stations arranged in vertical alignment, and
- e) a plurality of game pieces configured for mounting on the position stations.

5,316,308

SHADOW BOARD GAME

Jeffrey Stembokas, 162 S. Evergreen Dr., Seldon, N.Y. 11784

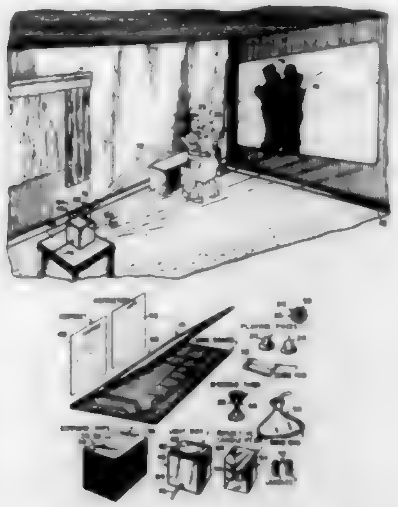
Filed May 7, 1992, Ser. No. 879,297

Int. Cl.^{5} A63F *3/00*

U.S. Cl. 273—249 **13 Claims**

1. A shadow board game which comprises:
- a) a game board having a path within its perimeter with a beginning position and an end position, said path is divided into consecutive playing spaces bearing instructions representing various tasks to do during the play of the game including at least some of said tasks requiring the casting of players' shadows;
- b) a plurality of playing pieces, one representing each player with each said playing piece being of a size to easily fit within each playing space on said game board;

- c) means for producing by chance, a random output count to indicate a number of playing spaces on said game board to be moved by one of said playing pieces;
- d) means for timing each task required by each of the players within an allotted time frame;
- e) a plurality of command chips, each having thereon instructions for a task for a player to perform, time amount allotted for the task, and a point scoring amount;



- f) a score pad, used for keeping score by each player during the play of the game; and
- g) means for casting shadows of the players onto a wall for carrying out some of said tasks requiring the casting of players' shadows.

5,316,309

MEMORY MATCHING GAME WITH MECHANICALLY ACTIVATED ROTATING DISK

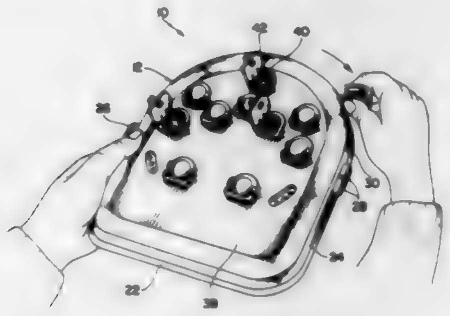
Sano Takeshi, Saitama, Japan, assignor to Asahi Corporation, Tokyo, Japan

Filed Nov. 5, 1992, Ser. No. 972,122

Claims priority, application Japan, Nov. 6, 1991, 3-099027[U]

Int. Cl.^{5} A63F *3/00*

U.S. Cl. 273—273 **7 Claims**



1. A game apparatus comprising:
- a base receivable on a playing surface;
- a first disk which is rotatably received on said base;
- a second disk including a plurality of groups of matched pictures thereon;
- means for releasably mounting said second disk on said first disk in a predetermined rotational position;
- a cover received on said base so as to be positioned above said second disk, said cover having a plurality of apertures therein;
- a plurality of movable doors on said cover for individually selectively opening and closing said apertures;
- means for rotating said first disk; and
- means for stopping rotation of said first disk in one of a plurality of predetermined positions,
- said pictures on said second disk and said apertures being oriented such that a plurality of pairs of matched pictures is aligned with said apertures when said first disk is stopped in each of said predetermined positions.

5,316,310

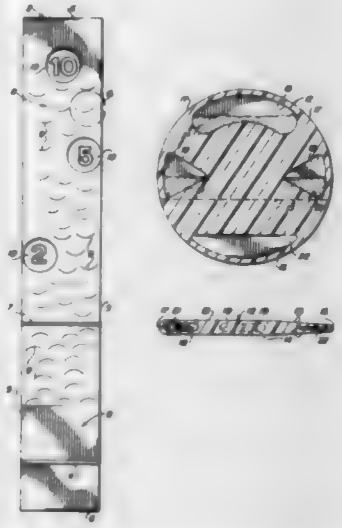
DISC TOSS GAME

Oscar E. Nicholas, Sr., 1110 Spruce St., Leesville, La. 71446; Martin Rogers, Rogers Loop, New Llano, La. 71461; Anthony J. Caruso, 908 Marvin Ave., Leesville, La. 71446, and Perry F. Morrow, P.O. Box 1124, Leesville, La. 71496

Filed May 27, 1993, Ser. No. 66,557

Int. Cl.^{5} A63B *67/06, 65/10*

U.S. Cl. 273—317 **12 Claims**



1. A disc toss game apparatus comprising target means and a disc having a disc perimeter, a tapered edge segment extending along a portion of said disc perimeter, a plurality of separate cavities provided in said disc and a separate mass of particulate material provided in each of said separate cavities for shifting the center of gravity of said disc when said disc is tossed at said target means.

5,316,311

ARTICLES OF PLAY FOR USE IN THE GAME OF CATCH

Miryoung Lee, West Covina, Calif., assignor to Many Amazing Ideas, Inc., Walnut, Calif.

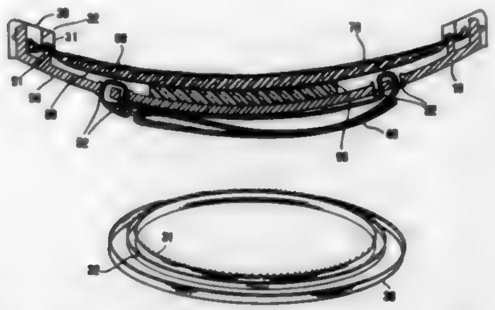
Continuation-in-part of Ser. No. 490,301, Mar. 8, 1990, Pat. No. 4,995,617, and a continuation-in-part of Ser. No. 642,278, Jan. 15, 1991, Pat. No. 5,085,442. This application Jan. 31, 1992, Ser. No. 828,746

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.^{5} A63B *67/00*

U.S. Cl. 273—346 **3 Claims**

1. A mitt for use with the game of catch, which comprises:
- (a) a rigid rear layer;
- (b) an intermediate flexible layer;
- (c) a front layer having substantially all its front surface defined by a multitude of irregular filamentary formations, the flexible layer occupying a surface area less than the surface area of the rear layer; and
- (d) a retaining ring having an inner-toothed edge, the inner-toothed edge extending over a portion of the front layer to prevent the front layer from separating from the intermediate flexible layer, the teeth on the inner toothed edge being formed as a plurality of concentric rings.



5,316,312

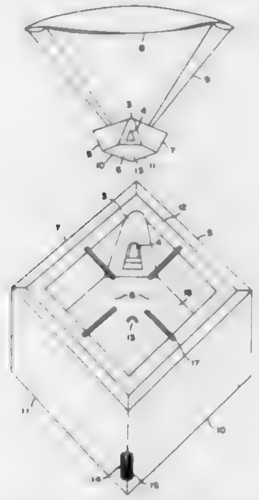
AIRBORN ARCHERY TARGET

Jerome M. Dudley, 210 N. Pleasant Ave., Galesburg, Ill. 61401

Filed Jun. 1, 1993, Ser. No. 69,207

Int. Cl.^{5} F41J *3/00, 9/08*

U.S. Cl. 273—362 **4 Claims**



1. An airborn archery target comprizing in combination; a two ply open topped housing, said housing having a cavity, said cavity having a rigid foam bottom and walls bonded to an external soft foam plastic covering, said housing having releasable means for holding captive within its cavity a parasail device, said releasable means allowing for the release of said parasail device from said cavity with assistance from air pressure through a vent in said housing's sloped front triangular shaped wall when said target is launched skyward by a launch vehical using a slotted launch pin externally located near the rear lower corner of said target housing.

5,316,313

FRANGIBLE BIODEGRADABLE CLAY TARGET

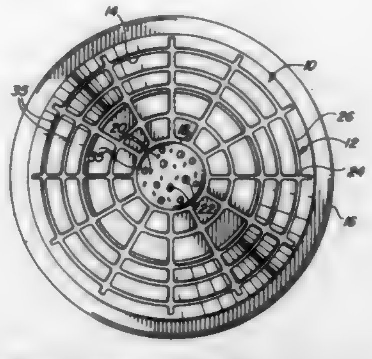
Patrick T. Moore, 24204 Dahgo Dr., Santa Clarita, Calif. 91355-1915

Filed Dec. 9, 1993, Ser. No. 164,037

Int. Cl.^{5} F41J *9/16*

U.S. Cl. 273—363 **13 Claims**

1. An improved, biodegradable, frangible clay target for sport shooting, said target comprising an unfired dried greenware target body capable of being thrown into the air to function as a moving target but readily fragmenting when struck by a shotgun pellet, said body comprising up to about 2 percent, by weight of said body, of a biodegradable binder, said binder comprising sodium silicate, with substantially the remainder of said target comprising clay and a low concentration of water.



5,316,314

SPORTS EQUIPMENT

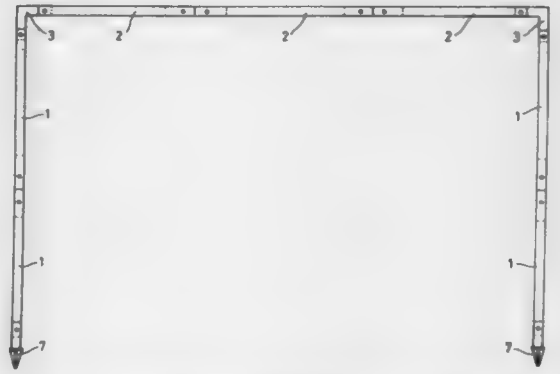
John Wilson, 101 John St., Worksop S8O 1TH, England

Filed Aug. 5, 1992, Ser. No. 917,125

Claims priority, application United Kingdom, Feb. 6, 1990, 9002599

Int. Cl.^{5} A63B *63/00*

U.S. Cl. 273—400 **6 Claims**



1. A securing means for attaching a net to the posts and crossbar of a sports goal, comprising a first part to said securing means of a shape to constitute an engagement means, said first part exiting to a shoulder from the opposite side of which extends a second part to said securing means, said second part having a number of hook-like formations extending from its outer free end towards said shoulder, there being an axial bore through said first and second parts of the securing means to receive a rod-like component, and whereby said first part is insertable through and engageable behind, a hold in a post or crossbar, and said rod is insertable down the axial bore in said first and second parts to ensure engagement of said first part behind the hole in the post or crossbar.

5,316,315

POOLSIDE ANCHORING SYSTEM AND METHOD

John L. Roark, Jr., 19 Robinwood St., Brownsburg, Ind. 46112

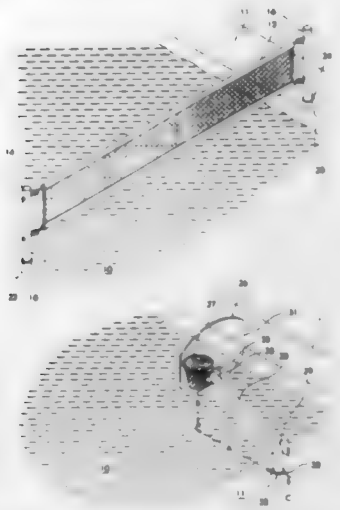
Filed Aug. 10, 1993, Ser. No. 104,856

Int. Cl.^{5} A63B *71/00*

U.S. Cl. 273—411 **18 Claims**

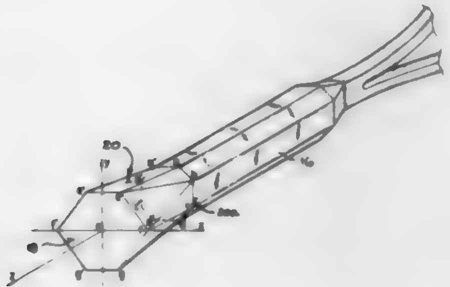
1. A support system for mounting a netted water sport game piece from a deck of a pool, comprising:
- a netted water sport game piece adapted for recreational use with a pool;
- a first elongated member for supporting said netted water sport game piece from at least one edge of the pool, said

first elongated member including a cylindrical portion having a diameter in the range of about 1.85 to 1.95 inches;
means for mounting said netted water sport game piece to said first elongated member; and
a built-in anchor mounted in the deck of the pool, said built-in anchor including;
  a top surface disposed substantially flush with the deck of the pool;



  a longitudinal bore extending downwardly from said top surface, said longitudinal bore having a predetermined common diameter sized for receiving said cylindrical portion therein; and
an adjustable clamp accessible from said top surface for clamping said cylindrical portion in place in said longitudinal bore.

5,316,316
TENNIS RACKET HANDLE
Genhone Lai, 6F, No. 20, Alley 50, Lane 119, Tung Hu Road, Neihu District, Taipei, Taiwan
Filed Feb. 19, 1993, Ser. No. 19,845
Int. Cl.⁵ A63B *49/08*
U.S. Cl. 273—73 J **27 Claims**

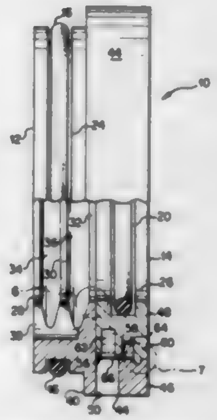


1. A handle for a tennis racket to improve the grip and the grasping action at the hypothenar eminence of the palm, the tennis racket having a head portion with a planar hitting surface, the handle comprising:
  a) a middle portion having a first polygonal cross-section;
  b) a butt end portion facing way from the head portion and having a second polygonal cross-section, the polygon of the butt portion cross-section being different in shape from the polygon of the middle portion cross-section wherein the polygon of the butt portion comprises opposite, parallel sides extending obliquely to the plane of the hitting surface; and,
  c) a transition zone connecting the middle portion to the butt portion, a cross-section of the transition zone comprising a polyhedron having a number of sides N_T such that:

$$N_t=(N_M+N_B)-N_P$$

where:
  N_T=number of sides of transition zone cross-section;
  N_M=number of sides of polygon at middle portion;
  N_B=number of sides of polygon at butt portion; and,
  N_P=number of sides of middle portion and butt portion polygons that are parallel to each other in an octant.

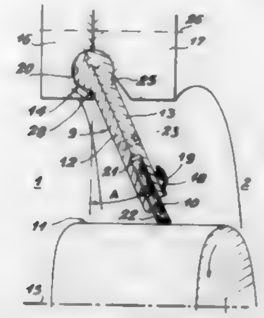
5,316,317
METHOD OF ASSEMBLING A SEAL DEVICE
George Fedorovich, Nacogdoches, Tex., and Kenneth J. Sharrer, Waterloo, N.Y., assignors to JM Clipper Corporation, Nacogdoches, Tex.
Filed May 21, 1993, Ser. No. 64,375
Int. Cl.⁵ F16J *15/447*
U.S. Cl. 277—1 **9 Claims**



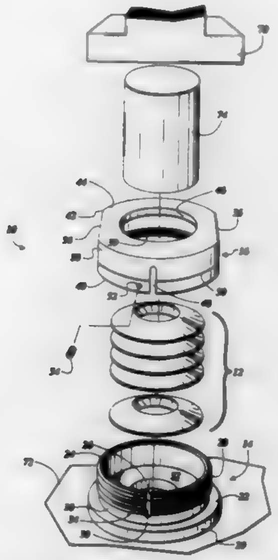
1. A method of assembling a seal device, said method comprising the steps of:
  providing a first ring member having a connecting portion;
  providing a second ring member having a connecting portion;
  heating said connecting portion of said first ring member;
  subsequently, positioning said connecting portions such that said connecting portion of said second ring member is located radially inside of said connecting portion of said first ring member; and
  subsequently, cooling said connecting portion of said first ring member, and thereby connecting said first and second ring members together; and
  wherein said connecting portions include a recess and a protrusion, and wherein said connecting step includes the step of locating said protrusion within said recess; and
  wherein said connecting step includes the step of rotatably connecting said first and second ring members together. such that said recess and said protrusion are rotatable relative to each other subsequent to said connecting step.

5,316,318
ANNULAR BRUSH GASKET
Albert Veau, Combs La Ville, France, assignor to Societe Nationale D'Etude et de Construction de moteurs D'Aviation "Snecma", Paris, France
Filed Apr. 21, 1993, Ser. No. 49,327
Claims priority, application France, Apr. 23, 1992, 92.04985
Int. Cl.⁵ F16J *15/447*
U.S. Cl. 277—53 **7 Claims**

1. Annular brush gasket for providing imperviousness between two annular volumes delimited by a rotary shaft with a specific axis and a housing, the shaft being rotatable about the axis thereof in the housing, said gasket comprising:
  a brush body mounted in the housing, and
  a plurality of filaments mounted in the brush body so as to be slanted with respect to the axis of the shaft and fixed via first extremities thereof in the brush body and orientated towards the shaft so that the respective second extremities thereof are flush with the shaft so as to create a sealed curtain between the two annular volumes, wherein the housing has a groove formed therein and the brush body is ring-shaped and comprises a plurality of arcuate sectors each having a head portion pivotally mounted in the groove in the housing so as to enable the filaments to be slightly distanced from the shaft by being adjustably slanted with respect to the axis of rotation of the shaft and thus allow off centering of the shaft with respect to the housing while ensuring imperviousness between the two annular volumes.

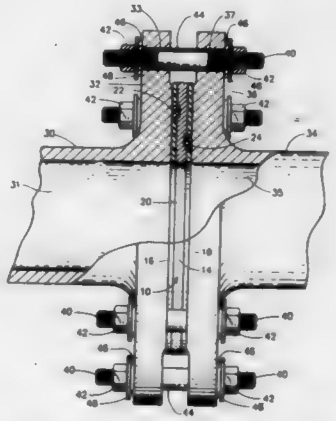


5,316,319
LIVELOAD ASSEMBLY FOR MAINTAINING TORQUE ON BOLTS
Steven M. Suggs, Atlanta, Ga., assignor to RM Engineered Products, Inc., North Charleston, S.C.
Filed Sep. 22, 1992, Ser. No. 949,167
Int. Cl.⁵ B65D *53/04;* **F16B** *43/02;* **F16F** *1/34*
U.S. Cl. 277—106 **5 Claims**



1. A liveload assembly for communicating force to an axially translatable gland follower which compresses packing in a stuffing box of a fluid flow apparatus, comprising:
  a cylindrical cup having a thread extending from a first end on an exterior side surface and an annular seat at a second end defining an opening for receiving therethrough a bolt extending from the stuffing box;
  a plurality of compressible belleville washers stacked inside the cup on the seat; and
  a retainer cap having a thread extending from a first end on an interior side surface of the cap and an annular plate at a second end of the cap defining an opening for receiving therethrough the bolt and a nut for threading on the bolt, the annular plate of the retainer cap contacting and holding the compressible belleville washers in compression by screwing the cap onto the cup to a first position;
whereby the compressed force of the belleville washers is applied to the gland follower by threading the nut on the bolt to contact the stack of belleville washers and unscrewing the retainer cap to a second position out of contact with the stack of belleville washers.

5,316,320
ISOLATION GASKET FOR CRITICAL SERVICE FLOW LINE APPLICATIONS
John V. Breaker, Golden, Colo., assignor to Corrosion Control Corp., Lakewood, Colo.
Filed Mar. 18, 1992, Ser. No. 853,489
Int. Cl.⁵ F16J *15/12*
U.S. Cl. 277—233 **23 Claims**

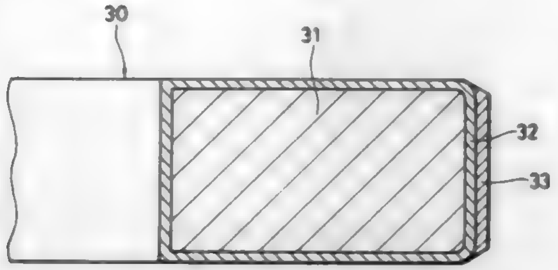


1. A gasket adapted to be interposed between joined pieces in a flow line that is operative to convey a flow of fluid, comprising:
  (a) a flat gasket body formed of an inner plate of metal and a pair of outer linings of electrically insulative material bonded to said inner plate, said gasket body having a central opening formed therethrough and wherein each of said outer linings has an endless channel surrounding the central opening and formed at a selected depth through said outer lining and into said inner plate such that each said endless channel has a bottom wall, an outer sidewall formed at an acute angle ϕ with respect to said bottom wall and an inner sidewall formed at an angle ϕ of at least ninety degrees with respect to said bottom wall; and
  (b) a seal element disposed in each said channel.

5,316,321
NONFERROUS PISTON RING WITH HARD SURFACE TREATMENT LAYER
Masao Ishida, and Yoshio Naruse, both of Okaya, Japan, assignors to Teikoku Piston Ring Co., Ltd., Tokyo, Japan
Filed Jul. 2, 1992, Ser. No. 907,579
Claims priority, application Japan, Jul. 15, 1991, 3-63095[U]; Sep. 2, 1991, 3-248335
Int. Cl.⁵ F16J *9/26*
U.S. Cl. 277—235 A **11 Claims**

1. A piston ring made of a nonferrous metal having a solid,

non-porous construction with a Young's modulus of 15000 kgf/mm^2 or less and a tensile strength of 100 kgf/mm^2 or more, said piston ring including a hard surface treatment layer on at least an outer peripheral sliding surface thereof.



5,316,322
METAL PLATE WITH INTERSECTING BEADS

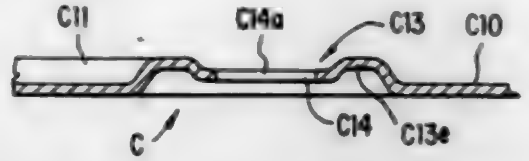
Tsunekazu Udagawa, Ichikawa, and Itsuo Ishikawa, Tokyo, both of Japan, assignors to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1992, Ser. No. 931,472

Claims priority, application Japan, Aug. 26, 1991, 3-075137[U]

Int. Cl.^{5} F16J *15/08*

U.S. Cl. 277—235 B **7 Claims**



1. A metal plate for a gasket, comprising,
a main metal plate having an outer surface, and
a plurality of beads formed on the main metal plate around portions to be sealed to project outwardly from the outer surface of the main plate, sad beads intersect with each other and having at least one intersecting portion, said intersecting portion having an outer edge to surround the intersecting portion, a center portion situated in a center of the intersecting portion, a surrounding portion located between the outer edge and the center portion, said surrounding portion having a cross sectional height which is the same as a cross sectional height of said beads, and a hole with an inner edge, said hole penetrating through the main metal plate and located in the center portion of the intersecting portion so that when the metal plate with the intersecting portion is tightened, the inner edge is at first compressed and the hole operates to disperse stress applied to the inner edge, a nearest distance between the inner edge and the outer edge being substantially the same throughout the intersecting portion to thereby form a surface pressure at the surrounding portion substantially the same throughout the intersecting portion and as that on the bead outside the intersecting portion.

5,316,323
TWO-PART TOOL HOLDING FIXTURE

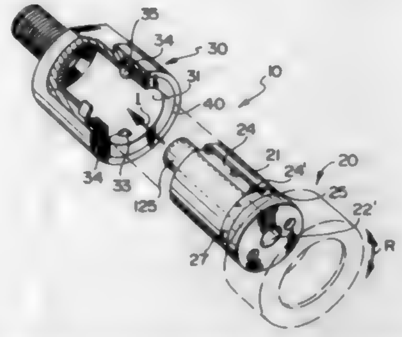
Victor Jovanovic, 5265 Burke St., R.R. #1, Windsor, Ontario, Canada N9A 6J3

Filed Jan. 8, 1993, Ser. No. 2,018

Int. Cl.^{5} B23B *31/107*

U.S. Cl. 279—22 **11 Claims**

1. A two-part tool holding fixture comprising:
(a) a first part, having means adapted for anchoring, affixing, and holding the same to a tool holding fixture base, the first part also adapted to be releasingly affixed to,
(b) a second part having means adapted to hold a tool,
(c) one of said parts defining a bore with a radially protrudingly finger, extending a predetermined distance into a portion of the bore,
(d) the other part defining a cylindrical portion with distal and proximate ends, sized to the diameter of the bore, and defining a radial race near the proximate end thereof, and at least one axial race extending from the radial race to the distal end of the cylinder portion and having a depth at least as great as the predetermined distance, the radial race defining a depth less than that of the axial race and at an angle θ relative to the axial race, an indentation adapted to engage the finger after the cylindrical portion has been inserted into the bore and turned relative thereto.



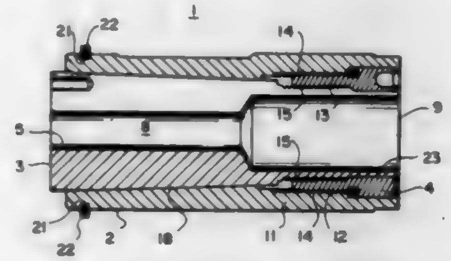
5,316,324
COLLET-AND-SHANK ASSEMBLY

Warren E. Hufe. Jr., Wells Ave., Southold, N.Y. 11971

Filed Dec. 28, 1992, Ser. No. 997,027

Int. Cl.^{5} B23B *31/20*

U.S. Cl. 279—51 **10 Claims**



1. A collet-and-shank assembly for gripping a work piece or a tool therein, said collet-and-shank assembly comprising:
a. a collet with a tool opening for receiving said work piece or said tool;
b. a shank with a collet opening for receiving said collet, wherein said shank is insertable in a machine's holder, said shank having a removable retaining ring on an exterior shank region, wherein said removable retaining ring is designed to engage a stop shoulder within said machine's holder; and
c. a securing component with collet connection means for removably joining said collet with said securing component, and shank connection means for removably joining said shank with said securing component,
wherein said securing component is designed to affix said collet to said shank and to lock said tool or work piece in said collet.

5,316,325
MECHANICALLY ACTIVATED SKATE BRAKE AND METHOD

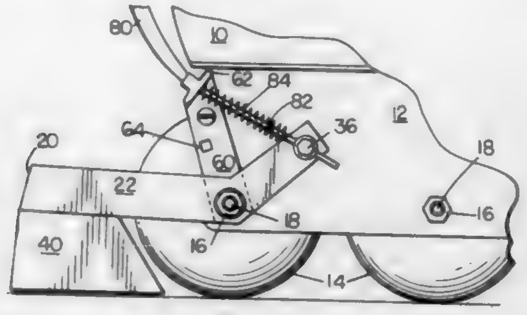
David N. Mitchell, Englewood, and Ivan Histand, Denver, both of Colo., assignors to Out of Line Sports, Inc., Englewood, Colo.

Continuation of Ser. No. 830,609, Feb. 4, 1992, Pat. No. 5,211,409. This application Jan. 19, 1993, Ser. No. 6,041

The portion of the term of this patent subsequent to May 18, 2010, has been disclaimed.

Int. Cl.^{5} A63C *17/14*

U.S. Cl. 280—11.2 **19 Claims**



1. A roller skate brake system, comprising:
(a) a rocker arm having a first end, a second end, and a pivot point located between said first and second ends, said rocker arm being rotatably connected at said pivot point to a roller skate, the rocker arm riding on said skate above a skating surface when the skate is being used to skate on said surface; a rotation of said rocker arm in a first direction about said pivot point urging said first end towards the skating surface, and a rotation of said rocker arm in a second direction about the pivot point urging said end away from the skating surface, the rocker arm being rigid so that an angle defined by the first end, the pivot point, and the second end remains constant as the rocker arm rotates,
(b) a brake pad operatively connected to said first end of the rocker arm so as to move towards and away from said skating surface in concert with said first end, and an actuator operatively connected to one of said first and second ends of the rocker arm, said actuator urging the rocker arm to rotate in said first direction so that the brake pad is urged towards said skating surface when the actuator is engaged and;
(c) return means operatively connected to said rocker arm, said return means urging the rocker arm to rotate in said second direction about said pivot so that the brake pad is urged away from the skating surface when the actuator is not engaged,
said brake system thereby using the skating surface for stopping said skate when the actuator is engaged and while the angle of the skate relative to the ground remains constant.

5,316,326
MULTI-PURPOSE SUSPENSION SYSTEM

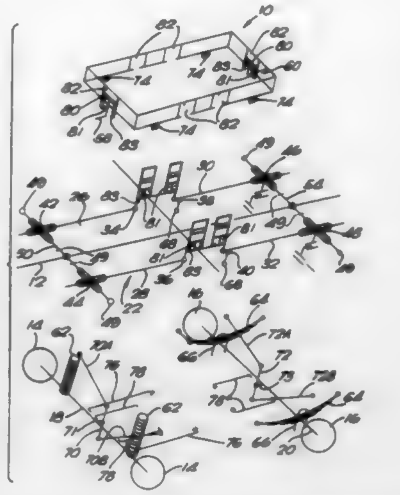
Nestor E. Kyriacou, Dodecanisou St., Limassol, Cyprus

Continuation-in-part of Ser. No. 712,112, Jun. 7, 1991, abandoned. This application Dec. 18, 1992, Ser. No. 993,317

Int. Cl.^{5} B62D *21/00*

U.S. Cl. 280—104 **20 Claims**

1. A multi-purpose suspension system for resiliently mounting a rigid body on a rigid base assembly, said system comprising an intermediate frame supported by spring means from said base assembly for limited relative angular movement about an axis vertically aligned with the central longitudinal axis of the base assembly and pivotally supporting said body for limited horizontal and vertical movement relative thereto, and arm means pivotally mounted on at least one end of said base assembly for limited angular movement relative thereto about an axis parallel with the axis of rotation of said intermediate frame, said arm means being connected to opposite sides of said body.



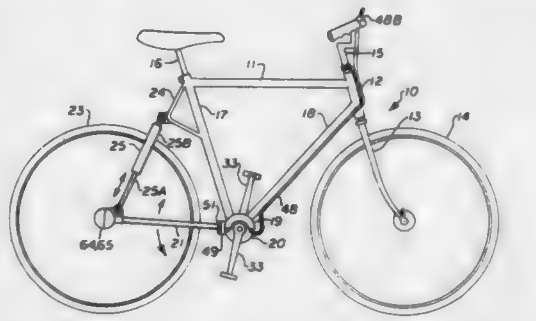
5,316,327
CHAINLESS BICYCLE WITH DUAL DRIVE SHAFTS AND FLOATING DRIVE TRAIN SUSPENSION SYSTEM

James H. Bell, 1201 Hwy. 35, West Columbia, Tex. 77486

Filed Apr. 15, 1993, Ser. No. 46,301

Int. Cl.^{5} B62M *1/02*

U.S. Cl. 280—260 **10 Claims**



9. In a bicycle having a top bar, a seat tube connected to the top bar having an upper end for supporting a seat and a bottom end extending downwardly therefrom, a steering tube connected to the top bar and adapted to receive a handlebar and front fork assembly, a front downtube connected at an upper end to the steering tube and having a bottom end extending downwardly therefrom, and a crank hanger secured to the bottom ends of the seat tube and front downtube; the combination of a drive shaft drive train assembly and a shock absorbing system in which:
said drive shaft drive train assembly comprises; a pedal gear box pivotally mounted on said crank hanger and containing drive gear means, a pair of elongate tubular support members each secured at a forward end to said pedal gear box and each having a rearward end extending rearwardly therefrom to straddle a rear wheel, a rear wheel gear box secured at the rearward end of each said tubular support member and adapted to support a hub of the rear wheel and each containing rear wheel gear means connected with the rear wheel hub for imparting rotation to the rear wheel hub, and a drive shaft rotatably mounted in each said tubular support member and extending between said pedal gear box and said rear wheel gear box, each said drive shaft having a gear at a forward end to engage said drive gear means in said pedal gear box and a gear at a

rearward end to engage said rear wheel gear means in said rear wheel gear box for transmitting rotary motion from said drive gear means to the rear wheel hub; and

said shock absorbing system comprises a pair of shock absorbers each having a bottom end connected to one of said rear wheel gear boxes and having an upper end connected to the seat tube for allowing pivotal movement of said pedal gear box relative to said crank hanger to prevent misalignment of said drive shafts and said gear means and insulating said drive train assembly from shock and vibration imparted to said frame.

5,316,328

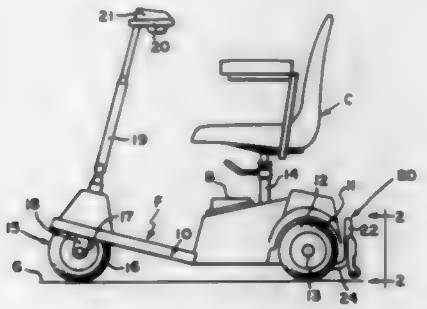
BUMPER MOUNTED ANTI-TIP STABILIZERS FOR CHAIR-MOUNTING VEHICLES UTILIZED BY PHYSICALLY DISADVANTAGED PERSONS AND OTHERS DESIRING MOBILITY ASSISTANCE, AND METHODS OF STABILIZING SUCH VEHICLES

Allen L. Bussinger, Saginaw, Mich., assignor to Amigo Mobility International, Inc., Bridgeport, Mich.

Filed Jun. 14, 1993, Ser. No. 75,549

Int. Cl.⁵ B60R *21/13*

U.S. Cl. 280—304.1 **9 Claims**



1. A vehicle, having a frame with a chair thereon, and carried on a pair of rear wheels having ground engaging surfaces, said pair or rear wheels being mounted on an axle assembly and at least one front wheel having a ground engaging surface, including:

(a) a rear bumper supported by said frame and including side elements at each side of the vehicle frame;

(b) an anti-tip wheel support leg pivotally connected to each side element for front to rear swinging movement;

(c) pivot means for said legs;

(d) an anti-tip wheel connected to the lower end of each leg such that said legs are gravity biased to swing forwardly in toward said bumper;

(e) said legs being of a length to support said anti-tip wheels at a predetermined vertical distance above the ground engaging surface of the rear wheels when the frame is traveling over level ground, and operative to swing rearwardly out away from said rear wheels, when the vehicle frame tilts upwardly from front to rear, to engage the ground; and

(f) means for limiting the rearward swing of said legs to permit said anti-tip wheels to stabilize the vehicle and resist further tilting movement.

5,316,329

SLIDING BOAT TRAILER ROLLER MOUNT

Charles J. MacKarvich, 6220 SW. 126th St., Miami, Fla. 33156

Continuation-in-part of Ser. No. 796,253, Nov. 22, 1991, abandoned. This application Apr. 29, 1993, Ser. No. 54,055

Int. Cl.⁵ B60P *3/10*

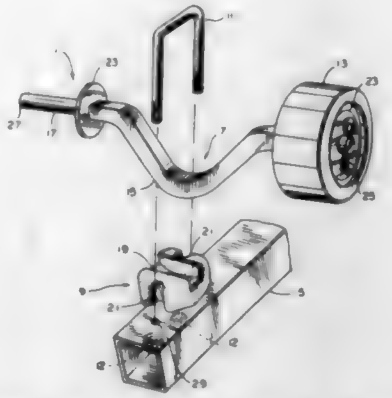
U.S. Cl. 280—414.1 **17 Claims**

1. A sliding boat trailer roller mount comprising:

(A) a saddle with a plurality of faces, having a horizontal groove with a concavely curved bottom formed in an upper face of the saddle;

(B) a mounting arm with a curved support portion and a pair of substantially coaxially aligned horizontally elongated cylindrical ends, the support portion being received in the groove of the saddle and moveable therein to shift within the saddle;

(C) a fastener which is placed over the curved support portion for securing said saddle and mounting arm to a trailer member; and



(D) a pair of rollers rotatably fixed on the ends of said mounting arm; wherein said curved support portion of said mounting arm and said curved bottom of said groove have a mating curvature such that the mounting arm has a center of rotation which is offset to a position between said fastener and a line coaxial to said cylindrical ends of said mounting arm.

5,316,330

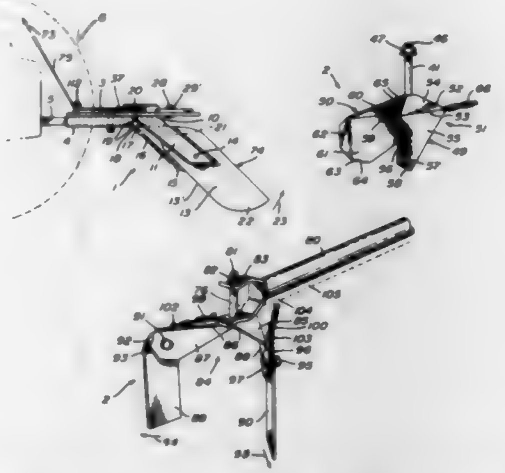
AUTOMATIC COUPLING AND DECOUPLING HITCH SYSTEM

Rénald Bergeron, 114, Route 265 Sud, Ste-Sophie, Québec, Canada G0P 1L0

Filed Mar. 31, 1993, Ser. No. 40,979

Int. Cl.⁵ B60D *1/00*

U.S. Cl. 280—477 **14 Claims**



1. A system for hitching to a towing vehicle a trailing vehicle including a forwardly extending tongue provided with a free end, comprising a first hitch section to be mounted on said towing vehicle and a second hitch section to be mounted on said trailing vehicle, wherein said second hitch section comprises:

a hitch pin to be mounted generally vertically on said free end of the tongue whereby said pin has a lower end; and

a guidable means having a ground-engaging lower portion connected to a pyramidal upper portion, said pyramidal upper portion defining a plurality of mutually interconnected triangular walls and a vertex secured to said lower end of the hitch pin, said pyramidal upper portion including a generally flared guide recess formed by the absence of one of said triangular walls; wherein said first hitch section comprises:

a mechanism for detachably connecting the hitch pin to said first hitch section; and

a ramp means which, upon moving said towing vehicle toward said trailing vehicle, engages the flared recess whereby said flared recess slides on said ramp means in order to guide the hitch pin toward said mechanism.

5,316,331

SKI BINDING WITH DEVICE FOR COMPENSATING THE CALIBRATION LOAD FOR TOE UNIT SAFETY RELEASE

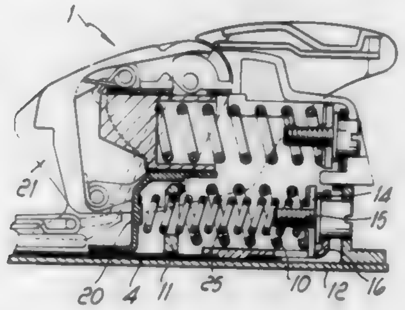
Roberto Gorza, Feltre; Giorgio Baggio, San Martino Di Lupari, and Mirco Battistella, Spresiano, all of Italy, assignors to Noridca S.p.A., Montebelluna, Italy

Filed Mar. 26, 1992, Ser. No. 857,905

Claims priority, application Italy, Apr. 11, 1991, 91A-001006

Int. Cl.⁵ A63C *9/08*

U.S. Cl. 280—618 **6 Claims**



1. A ski binding comprising a heel holding unit (1) and a toe holding unit (2), the heel holding unit and the toe holding unit being connectable, at a distance apart, to a top portion of a ski (3), the ski binding further comprising a lamina element (4) which is interconnected between said heel holding unit and said toe holding unit and which is slidable with respect to said heel and toe holding units in a longitudinal direction of the ski when said heel and toe holding units are connected to the top portion of the ski, said heel holding unit comprising a fixed body (12) which is rigidly connectable to the ski top portion and a sliding body (20) which is slidably supported by said fixed body, said heel holding unit housing adjustable calibration means (10) for biasing said lamina element with respect to said fixed body in a rearward direction away from said toe unit, said heel holding element further housing elastic recovery means (25) for biasing said lamina element in said rearward direction with respect to said sliding body.

5,316,332

METHOD AND STRUCTURE FOR CORRECTING ALIGNMENT OF KINGPIN AXLE ASSEMBLIES

William E. Ingalls, Atascadero, Calif., assignor to Thomas W. O'Rourke and John E. O'Rourke, both of Boulder, Colo.

Filed Sep. 21, 1992, Ser. No. 947,450

Int. Cl.⁵ B62D *17/00*

U.S. Cl. 280—661 **9 Claims**

1. In a solid axle steering assembly comprising:

an axle;

a spindle;

a steering knuckle member having a cylindrical bore defined therethrough and end surfaces defined thereon;

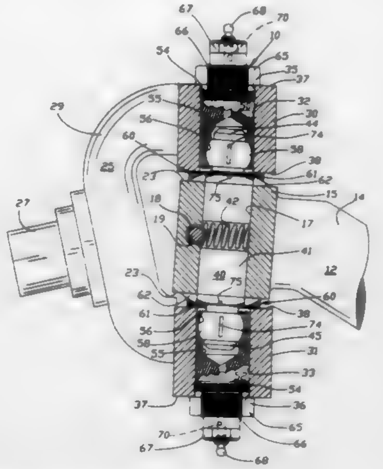
a yoke member having upper and lower bore housings each with bores defined therethrough each with an axis and positioned with each of the bore housings adjacent an end surface of the steering knuckle member, the yoke member and steering knuckle member being interposed between and fixed one each to the axle and spindle;

the improvement comprising:

a kingbolt having an axis and rotatably mounted within the steering knuckle bore, the kingbolt also having end portions;

means to selectively rotate and lock the kingbolt within the steering knuckle member;

endcaps mounted one each within each of the upper and lower bore housings, the endcaps and kingbolt being journalled together eccentrically relative to at least one of the kingbolt axis and a bore housing axis;



angular compliance bearing means interposed between the end portions of the kingbolt and adjacent endcap for permitting three axis movement therebetween; and

compliant thrust bearing means positioned between the steering knuckle member end surfaces and the yoke bore housings for permitting three axis movement therebetween;

whereby at least one of caster and camber can be changed by rotating at least one of the kingbolt and endcaps.

5,316,333

AIR BAG COVER MOUNTING HAVING ENGAGEMENT PORTIONS TO FACILITATE ATTACHMENT

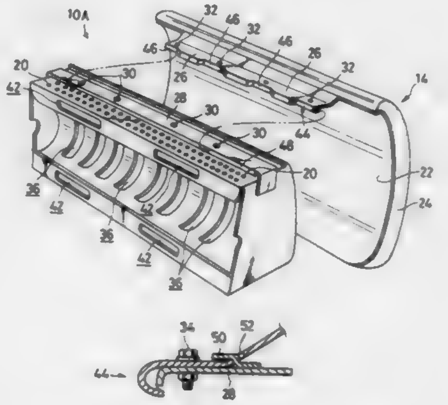
Akira Kokeguchi, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Nov. 16, 1992, Ser. No. 977,099

Claims priority, application Japan, Dec. 4, 1991, 3-320513

Int. Cl.⁵ B60R *21/20*

U.S. Cl. 280—728 A **2 Claims**



2. An air bag device for a passenger, comprising:

a box-shaped container having an opening in a front side, an air bag folded and retained in the container,

an inflator attached to the container for inflating the air bag,

a lid mount bracket fixed to and extending along an upper surface of the container, said lid mount bracket having a rear edge located away from the opening of the container and a rib extending downwardly from the rear edge thereof,

a lid for covering the opening of the container and having a back-up plate, said back-up plate having a front face for covering the opening of the container and a lid mounting portion extending rearwardly from the front face and disposed above the lid mount bracket, said lid mounting portion having a rear edge,

fixing means for immovably connecting the lid mounting portion to the lid mount bracket,

engaging means for engaging the lid mounting portion to the lid mount bracket to prevent the lid mounting portion from moving forwardly relative to the lid mount bracket when the lid is opened, said engaging means including a lid engaging hook protruding upwardly from an upper surface of the lid mount bracket and extending rearwardly from the opening along the rear edge of the lid mount bracket, and a slit formed in the lid mounting portion, said lid engaging hook, when the lid is assembled with the container, engaging the slit and being disposed above the lid mounting portion so that forward and upward movements of the lid is prevented when the lid is opened, and

a hook having a side portion extending along and projecting downwardly from the rear edge of the lid mounting portion and a flange formed at the bottom edge of the side portion and extending toward the front face of the lid to securely engage the hook to the rear edge of the lid mount bracket, said hook having a plurality of recesses along the rear edge of the lid mounting portion indented toward the front face of the lid to increase rigidity of the hook.

5,316,334
AIR BAG RESTRAINT SYSTEMS

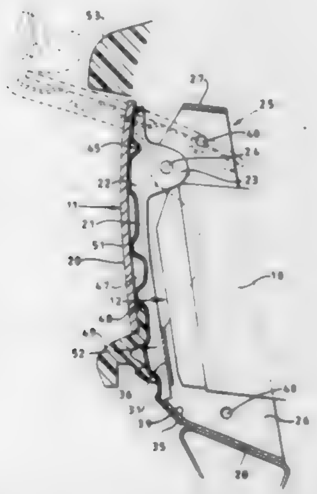
Gerald P. Skidmore, Nuneaton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Filed Jun. 2, 1992, Ser. No. 892,265

Claims priority, application United Kingdom, Jun. 5, 1991, 9112063

Int. Cl.⁵ B60R *21/16*

U.S. Cl. 280—728 B **8 Claims**



1. A cover for an air bag module of an air bag restraint system, the air bag module being adapted to be mounted behind a vertically extending portion of a facia of a vehicle, an aperture being provided in the vertically extending portion of the facia to permit deployment of the air bag in front of an occupant of the vehicle, the cover comprising a frame mounted with respect to the facia on a side thereof adjacent the air bag module so that the frame surrounds the aperture, a door having two vertical edges and being pivotally mounted with respect to the frame for movement about a horizontal axis by means of a pair of pivot pins each pivot pin extending between a flange extending rearwardly from each of the vertical edges of the door and an adjacent vertical side member of the frame, said pivot pins being located part way along the vertical edges of the door and rearwardly of a plane of the aperture; and means being provided to maintain the door in a position in which the door closes the aperture until a predetermined load is applied thereto upon expansion of the air bag.

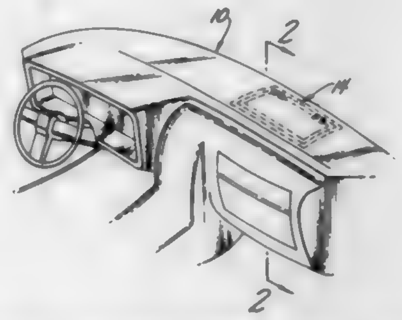
5,316,335
SELF PIERCING COVER ASSEMBLY AIR BAG

John Gray, Union, and John Galloway, Nottingham, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Dec. 14, 1992, Ser. No. 990,028

Int. Cl.⁵ B60R *21/22*

U.S. Cl. 280—728 B **8 Claims**



1. A self piercing cover assembly for concealing an air bag in a vehicle passenger compartment comprising:

a support that is adapted for securement beneath a decorative panel in a vehicle passenger compartment;

a door that closes a rectangular opening in the support for deployment of an air bag;

the door having a rear end that is connected to the support by a hinge and a front end that is spaced from an edge of the support to maintain a slot at the front end of the door when the door is closed;

the outer surface of the support and the hinged door being bonded to an elastomeric cushion formed in an underlying relationship to a polymeric skin that forms an outer surface of a decorative panel;

the support having a depending bracket for holding an air bag housing beneath the opening in alignment with the door and that provides a space beneath the door;

piercing means comprising:

a plurality of piercing members disposed in the space beneath the door and attached to an underside of the door;

the piercing members having springs holding the piercing members in a retracted position and cutter blades that are aligned with the slot to cut through the cushion and skin of the decorative panel;

the piercing members being moveable outwardly by initial inflation of an air bag so that the cutter blades project through the slot and cut through the cushion and skin at several locations and form a tear line at the front end of the door that is easily ruptured by door itself as it is pivoted outwardly by force of an inflating air bag;

the piercing members being retractable by the springs so that sharp cutting edges of the cutter blades are below the surface of the skin that is attached to the door as an air bag collapses and the springs overcome the force of the collapsing air bag to protect against contact with the sharp cutting edges of the cutter blades,

the front end of the door having a flange that is spaced from a flange of the support to define the slot that is maintained when the door is closed and reduces the thickness of the cushion to be cut by the cutter blades, and

the cutter blades having tips that are disposed between the flanges.

5,316,336
AIR BAG APPARATUS

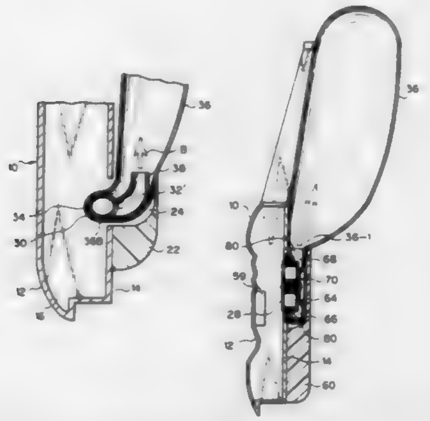
Masahiro Taguchi, Hazu; Motonori Tominaga, Okazaki, and Toshiaki Matsuhashi, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of Japan

Filed Jul. 17, 1992, Ser. No. 914,743

Claims priority, application Japan, Jul. 18, 1991, 3-178246; Nov. 1, 1991, 3-315522

Int. Cl.⁵ B60R *21/22*

U.S. Cl. 280—730 A **4 Claims**



1. An air bag apparatus adapted to be mounted to a body of a vehicle, for protecting a passenger and comprising:

an air bag;

means for storing said air bag, in at least a partly retracted condition, at a location inside the vehicle body, laterally of the passenger;

means for detection of a collision; and

means for injecting a flow of gas, when a collision is detected, directly upward into the air bag so that the air bag is inflated upward and the inflated bag couples a space between the passenger and the vehicle body, laterally of the passenger; wherein:

said vehicle body has an arm rest fitted laterally of the passenger, said storing means stores said air bag at least partly in said armrest, said gas injecting means discharges a flow of the gas upward from said arm rest; and

said gas injecting means comprise an inflator for instantly generating a flow of gas and having an outlet, a gas discharge pipe having axially spaced first and second ends, the first end being open and the second end being closed, the opened end of the gas discharge pipe being connected to the outlet of the inflator for receiving the generated gas flow, the gas discharge pipe having a slit opened laterally to the pipe, and an elbow pipe having one end connected to said slit of the gas discharge pipe and a second end opened upward to the space inside the air bag, for obtaining a flow of the gas directed upward into the air bag.

2. An air bag apparatus adapted to be mounted to a body of a vehicle, for protecting a passenger and comprising:

an air bag;

means for storing said air bag, in at least a partly retracted condition, at a location inside the vehicle body, laterally of the passenger,

means for detection of a collision; and

means for injecting a flow of gas, when a collision is detected, directly upward into the air bag so that the air bag is inflated upward and the inflated bag occupies a space between the passenger and the vehicle body, laterally of the passenger; wherein:

said storing means stores said air bag in a wall of said vehicle laterally of the passenger, said gas injecting means discharges a flow of the gas upward from the side wall;

said storing means comprise a pad connected to the wall of the vehicle, the pad having at a top side thereof a breakable portion which is broken upon an inflation of the bag, and said gas injecting means comprise an inflator for generating a flow of the gas, a guide casing arranged around the inflator, the guide casing having a mouth opened upward so that the flow of the gas is directed into the air bag, and means for connecting the inflator and the guide casing to the wall of the vehicle body while being covered by the pad; and

said inflator comprises an inflator casing, a central casing located inside the casing for storing an ignitable material therein, a gas generating material being filled in a space between the central casing and the inflator casing, the central casing having nozzles for generating flames caused by the ignition of the ignitable material, the inflator casing having nozzles for ejecting the flow of the gas toward the guide casing.

5,316,337
INFLATABLE BAGS FOR AIRBAG PASSIVE RESTRAINT SYSTEMS FOR FRONT SEAT PASSENGER AND METHODS FOR MANUFACTURING THEREOF

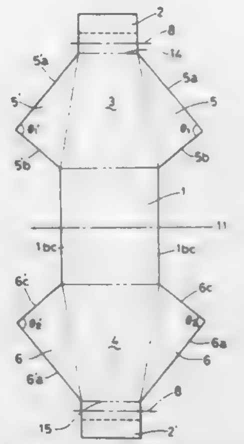
Takeshi Yamaji, Nagoya; Toru Ozaki, Toyota; Koji Sugiura, Kasugai; Kazuaki Bito, Seto; Motoaki Naruse, and Hidehito Sogi, both of Nagoya, all of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka and Toyota Jidosha Kabushiki Kaisha, Aichi, both of Japan

Filed Mar. 25, 1993, Ser. No. 36,666

Claims priority, application Japan, Mar. 30, 1992, 4-105623; Oct. 22, 1992, 4-309300; Dec. 24, 1992, 4-358171; Jan. 25, 1993, 5-29827; Jan. 27, 1993, 5-32668

Int. Cl.⁵ B60R *21/20*

U.S. Cl. 280—743 R **24 Claims**



1. An inflatable bag for airbag passive restraint systems for a front seat passenger having a generally quadrilateral prismoidal body and being made of a one-piece cloth, wherein said bag comprises a base portion of a right-angled quadrilateral shape adapted to face and receive the passenger by the extension of the bag upon inflation and deployment, opposing lateral face portions of a generally trapezoidal shape, opposing upper and lower face portions of a generally trapezoidal form, and a lip portion defining a quadrilateral opening of the prismoidal body for admitting therethrough gas from the system and adapted to be fastened through a housing for the bag to an instrument panel, said lateral face portions having each a T-like joint diverging from the lip portion to the base portion and exhibiting a strap effect capable of regulating the extension and flaring

of the bag upon deployment, thus having a tapered profile diverging from the lip to base portions;

said one-piece cloth comprises a first generally trapezoidal section and a second generally trapezoidal section respectively mainly corresponding to the upper and lower face portions of the bag, a central right-angled quadrilateral section corresponding to the base portion of the bag and interposed longitudinally between the first and second trapezoidal sections so that its parallel lateral sides may coincide with parallel longer sides of the first and second trapezoidal sections, a pair of first generally triangular sections extending laterally from non-parallel sides of the first trapezoidal section, a pair of second generally triangular sections extending laterally from nonparallel sides of the second trapezoidal section, the first triangular section and the second triangular section on each lateral side of the cloth having end sides of an equal length and mutually near sides having a total length equal to the length of a longitudinal side of the central section, and respective salient apex angles totaling to about 180°, whereby the first triangular sections and the second triangular sections are adapted cooperatively to form the T-like joints and the lateral face portions.

5,316,338
ARRANGEMENT FOR ENDWISE TRANSPORT OF AN IMPLEMENT

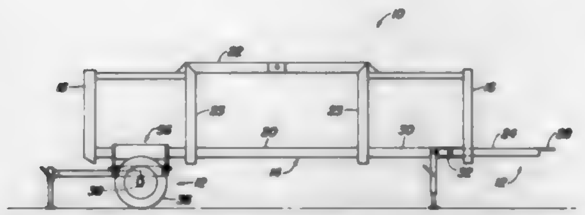
Helmut Wolf, Homburg-Einoed; Gerd Bramstedt, Zweibruecken; Xaver Mak, Zweibruecken, and Fritz Mak, Zweibruecken, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Apr. 23, 1992, Ser. No. 872,875

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1991, 4113299

Int. Cl.^{5} B62D *63/06*

U.S. Cl. 280—789 **8 Claims**



1. In a combination of a transport arrangement and a wide implement wherein the transport arrangement is mounted for use in the endwise transport of the implement and includes an elongate frame forming an axle having a wheel at each of opposite ends thereof, said axle extending crosswise beneath and being attached to the implement at a location forwardly of a rear end of the implement, as considered in a direction for forward endwise transport of the implement and constituting the sole support for supporting said rear end of the implement during transport thereof, with a forward end of the implement being equipped with a tongue for connection to a towing vehicle which supports said forward end during transport of the implement, the improvement comprising: said axle having a first attaching structure fixed thereto; said implement having a main frame extending widthwise of the implement; a second attaching structure being mounted to said main frame at a location forwardly of said rear end of the implement; one of said first and second attaching structures defining a receptacle having an entrance and the other of said first and second attaching structures including a mating part releasably received in said receptacle; a latch mounted for selectively blocking said entrance of the receptacle for releasably retaining the mating part in the receptacle, whereby the axle together with the wheels may be easily and quickly attached to and detached from the implement.

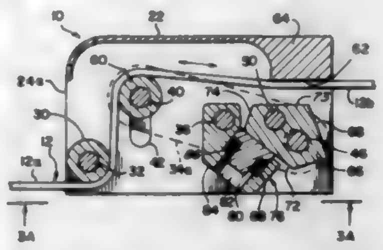
5,316,339
SAFETY BELT GRIPPING MECHANISM

David A. Lorenz, Anaheim Hills, Calif., assignor to Pacific Scientific Company, Yorba Linda, Calif.

Filed May 31, 1991, Ser. No. 708,736

Int. Cl.^{5} B60R *22/00*

U.S. Cl. 280—806 **17 Claims**



5. A restraint belt clamping device, comprising:

means for guiding a restraint belt through the belt clamping device;

means for clamping the belt between surfaces to prevent further pullout of the belt upon the application of a predetermined payout load on said belt after payout of said belt is initially restrained; and

means for locking and maintaining the surfaces together in a locked sate so as not be be releasable upon the cessation of forces which trigger the clamping of the belt and for preventing the extension and retraction of the belt relative to a belt payout reel, whereby manual force is required to unlock said surfaces.

5,316,340
SKI STICK FOR SKATING STRIDE

Alexandr A. Maltsev, korpus 415, kv. 23 Moscow,

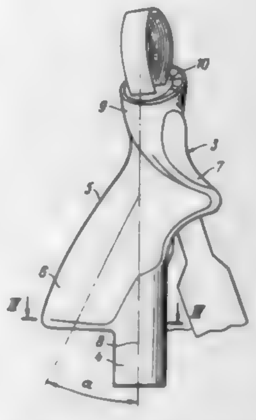
PCT No. PCT/SU92/00026, § 371 Date Nov. 12, 1992, § 102(e) Date Nov. 12, 1992, PCT Pub. No. WO92/13612, PCT Pub. Date Aug. 20, 1992

PCT Filed Feb. 3, 1992, Ser. No. 941,146

Claims priority, application U.S.S.R., Feb. 4, 1991, 4907599

Int. Cl.^{5} A63C *11/22*

U.S. Cl. 280—821 **3 Claims**



1. A ski pole for skating stride comprising a rod with a supporting basket attached at a lower end thereof and a handle attached at an upper end thereof, the handle having a tube at a lower end for receiving the upper end of the rod, a cross-piece of the handle having a larger portion and a smaller portion extending outwardly therefrom, the larger portion having an inclined surface extending forwardly and downwardly at an acute angle with respect to a vertical axis of the tube, and a boss projecting above the cross-piece and being displaced relative to the axis of the tube towards the smaller portion, the boss having means for attaching a hand strap thereto, wherein a horizontal cross-section of the boss is offset relative to a horizontal cross-section of the tube with respect to the axis of the tube and the larger and smaller portions of the cross-piece are oriented at an obtuse angle with respect to each other about the axis of the tube.

5,316,341
HYPERTEXT BOOK ATTACHMENT

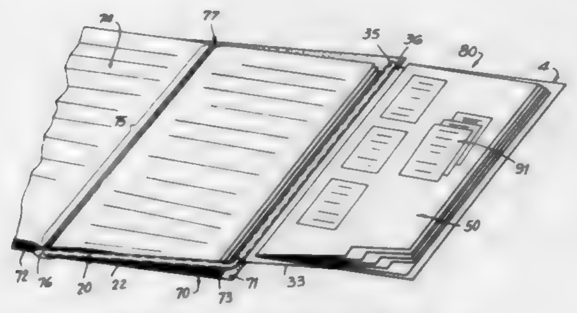
David C. Schwartz, Southborough, Mass., assignor to Productive Environments, Inc., Southborough, Mass.

Continuation-in-part of Ser. No. 324,417, Mar. 16, 1989. This application Mar. 8, 1990, Ser. No. 490,828

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.^{5} B42D *1/00*

U.S. Cl. 281—15.1 **14 Claims**



1. In combination, a leaf attachment and a book:

said book comprising a binding structure with a cover attached thereto, said binding structure further having one or more pages pivotally attached to said binding structure, said each of said pages having a width, where the widest of said one or more pages has a width, maximum page width;

said leaf attachment comprising a mounting surface having perimeter features including opposing edges and having a mounting surface width, between those edges;

an orientation member having first and second opposing attachment locations and an orientation member width between those opposing attachment locations, said opposing attachment locations comprising first and second orientation member attachment locations; and

an extension member having opposing attachment locations and an extension member width between those opposing attachment locations, said opposing attachment locations comprising first and second extension member attachment locations, said extension member width, being greater than said maximum page width; wherein:

said orientation member width and said mounting surface width are not greater than said extension member width; and, wherein:

said extension member first attachment location is attached substantially adjacent said book binding structure, and said orientation member is pivotally attached at said second orientation member attachment location to said extension member at said second of said extension member attachment locations thereby forming an orientation member-extension member pivotal hinge, having an orientation member-extension member pivotal axis of rotation therefore, and said orientation member is pivotably hinged at said orientation member first attachment location to said mounting surface at a location between said opposing edges of said mounting surface and substantially away from said opposing edges of said mounting surface, thereby joining said mounting surface and said orientation member, said pivotal hinge having an orientation member-mounting surface pivotal axis of rotation therefore, said mounting surface, orientation member, and extension member being attached with said orientation-member mounting surface pivotal axis of rotation parallel to said orientation member-extension member pivotal axis of rotation, such that:

said mounting surface may be placed in any one of a plurality of positions, at least three of said plurality of positions being a first position to one side of said orientation member-extension member pivotal hinge and a second position to the other side of said orientation member-extension member pivotal hinge, one along side the other, and a third position with said mounting surface on top a portion of any page of said one or more pages of said book, where the orientation of said mounting surface perimeter features may be preserved in all three of said three positions.

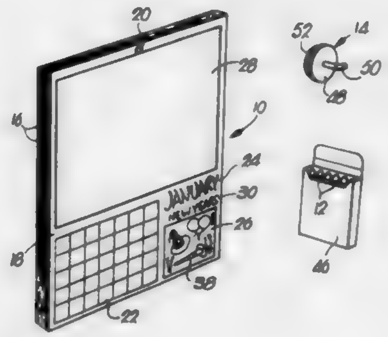
5,316,342
CALENDAR

Victor Almo, 219 E. 65th St., Kansas City, Mo. 64113

Filed Mar. 1, 1993, Ser. No. 24,664

Int. Cl.^{5} B42D *5/04*

U.S. Cl. 283—2 **6 Claims**



1. A calendar comprising:

at least twelve pages of a printing material, each page including

- a calendar field filled with a series of numbered spaces arranged to indicate the days of a particular month in the Gregorian calendar,
- a title field provided with alphabetical indicia indicative of the month represented in the calendar field,
- a display field provided with one or more graphical symbols of an event which occurs within the month represented in the calendar field, and
- a plain, original artwork field within which alphanumeric and graphical symbols may be drawn by an art student,

wherein the original artwork field covers at least one half of the area of each page.

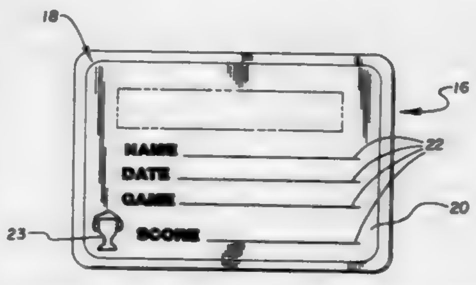
5,316,343
VIDEO GAME HIGH-SCORE APPLIQUE

Douglas T. Waldhoff, Maple Grove, Minn., assignor to Label Masters, Inc., Minneapolis, Minn.

Filed Jun. 5, 1992, Ser. No. 893,713

Int. Cl.^{5} B42D *15/00*

U.S. Cl. 283—70 **2 Claims**



1. A method for memorializing information regarding the

highest score achieved in playing a video game stored on a medium in a specialized cassette cartridge body, said medium having the video game recorded permanently thereon, comprising the steps of:

(a) providing a thin sheet having a first side and a second side, said first side having at least one location defined thereon to accept affixation of score information;

(b) affixing said thin sheet to said cartridge body by adhesively binding said second side of said thin sheet to said cartridge body; and

(c) marking the highest score achieved by a player of the video game on said thin sheet at said defined location.

5,316,344

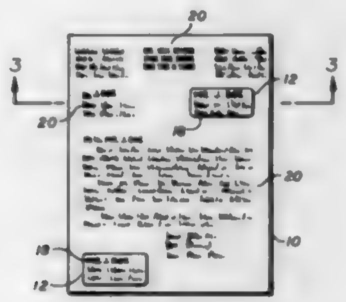
STATIONERY WITH REMOVABLE PRINTABLE LABELS AND METHOD THEREFOR

Ghanshyam H. Popat, Alta Loma, and Stephen M. Sharp, Glendora, both of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Jul. 31, 1992, Ser. No. 922,818

Int. Cl.⁵ B42D *15/00*

U.S. Cl. 283—81 **15 Claims**



1. Stationery for use with an envelope having a selected Sheffield smoothness value comprising:

a sheet having a selected Sheffield smoothness value, said Sheffield smoothness values being different so that said Sheffield smoothness value of said sheet is higher than said Sheffield smoothness value of said envelope;

a single label having an adhesive applied to one side thereof, said adhesive removably attaching said label directly to said sheet, said sheet adapted to be sent through a printer in order to print indicia on said sheet and said label, said difference in Sheffield smoothness values being selected to facilitate peeling said label off said sheet after exit from said printer and then using said adhesive to firmly secure said label to said envelope; and

the surface of said envelope being smoother than the surface of said stationery sheet, with the difference in the Sheffield smoothness values between said envelope and said sheet being equal to or greater than 50.

5,316,345

SINGLE PANEL COMMUNICATION CARD AND ITS COLOR METHOD

Roberta E. Madison, P.O. Box 24483, Nashville, Tenn. 37202

Continuation of Ser. No. 904,829, Jun. 26, 1992, abandoned. This application Jun. 10, 1993, Ser. No. 74,729

Int. Cl.⁵ B42D *15/00*

U.S. Cl. 283—117 **43 Claims**

1. A communication vehicle comprising:

a sheet of card stock material,

said sheet having no fold,

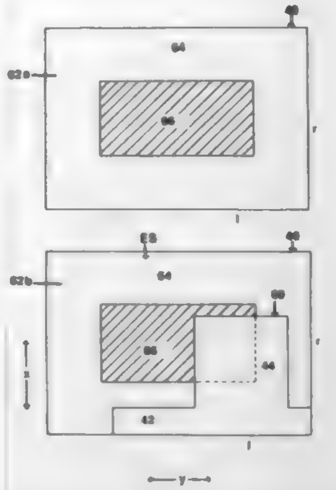
said sheet having a front face and a back face;

multi-color graphics having a unified theme of social expression applied to said front face and said back face,

said graphics being the principal means of communication,

said back face having a critical region constituting an area reserved for the insertion of identifying indicia, and

means integral with said back face for reflecting light directed at said critical region, said means having reflective properties adequate to reflect light at a level sufficient to comply with postal regulations.



5,316,346

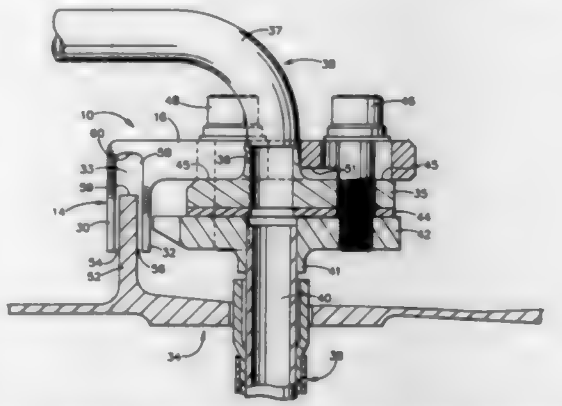
ANTI-ROTATION BRACKET FOR A FLANGED CONNECTION SPACED FROM FIXED STRUCTURE

Manfred F. Maurer, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 10, 1992, Ser. No. 866,719

Int. Cl.⁵ F16L *3/22*

U.S. Cl. 285—23 **12 Claims**



1. In a fluid supply tube of a type having first and second segments terminating in first and second flanges, respectively, and means for connecting said flanges together, an anti-rotation bracket comprising:

means for attachment to said first flange;

means for engaging an adjacent fixed structure, said engaging means being sidewardly and vertically spaced from said fixed structure so as to allow thermal expansion of said fluid supply tube relative to said fixed structure while restraining rotational and sideward movement of said fluid supply tube during assembly and disassembly of said first and second flanges.

5,316,347

QUICK-FITTING COUPLING FOR SIMULTANEOUSLY CONNECTING OR DISCONNECTING A PLURALITY OF COUPLINGS

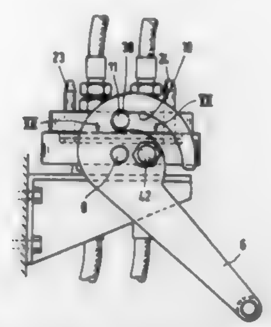
Massimo Arosio, Via L. Da Vinci No. 1, Rivolta D'Adda (CR), Italy

Filed Jul. 9, 1992, Ser. No. 911,174

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1991, 4122613

Int. Cl.⁵ F16L *35/00*

U.S. Cl. 285—26 **12 Claims**



1. A quick-fitting coupling comprising:

respective interengaging coupling and socket type connectors (2,3) positioned on two support plates (4,5) movable towards one another by mutually interconnected clamping levers (6,7) engaging the edges of the support plates, the support plates being fixed into position upon reaching a coupled position, one of the support plates (4) being fixedly mounted and having a coupling side (18);

the clamping levers (6,7) being pivotably movable about coaxially oriented spindles on one of the two support plates (4,5) and being provided with arcuate engagement slots (10) designed for engaging coaxially oriented clamping pins (11,12) projecting from oppositely positioned edges on the other support plate and extending parallel to pivot pins (8,9);

flat-face sealing couplings (1) having female and male members (2,3) provided respectively on the two support plates;

the female members (2) of each flat-face sealing coupling being provided with a projecting peripheral flange (14) designed to engage with a correspondingly shaped peripheral groove (15) on a mounting opening for the female member (2) and being secured to the fixed support plate (4) in such a manner that its flat end face is on the coupling side (18) of the support plate (4) and forms a common plane therewith;

the male members (3) of the flat-face sealing couplings being rigidly secured to the movable support plate (5) and extending therefrom to a point so as to enable the two support plates (4,5) to be placed in abutting relationship when the flat-face sealing couplings are in the coupled position.

5,316,348

WRENCH SLEEVE ATTACHMENT FOR GARDEN HOSE

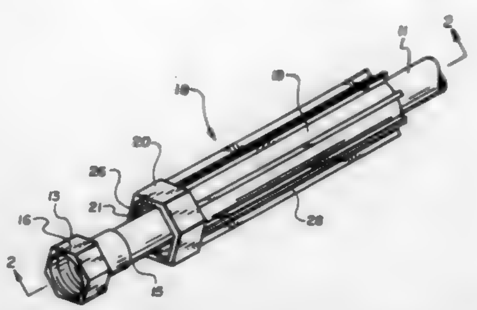
H. Joe Franklin, Pampa, Tex., assignor to William F. Franklin, Dallas, Tex.

Filed Nov. 27, 1990, Ser. No. 618,485

Int. Cl.⁵ F16L *35/00*

U.S. Cl. 285—39 **10 Claims**

8. A reinforcement sleeve for a water hose including a body portion slidably mounted over the sidewall of a said hose so that it is movable and selectively positionable along the length of said hose, said body portion being integral with a wrench portion oriented towards a terminal end of said hose, said terminal end carrying a coupling fixture having an exterior configured for engagement by said wrench portion of said sleeve, whereby said sleeve may be turned to apply torque to the exterior of said coupling fixture.



5,316,349

TUBE CONNECTING ELEMENT OF PLASTIC FOR SANITARY AND HEATING PURPOSES

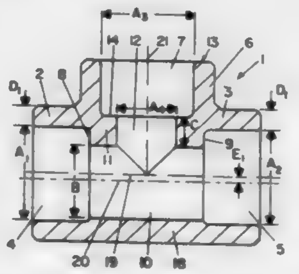
Karl Rafeld, Biessenhofen-Ebenhofen, Fed. Rep. of Germany, assignor to Karl Rafeld KG Spritzgusswerk, Elektronik und Formenbau, Biessenhofen-Ebenhofen, Fed. Rep. of Germany

Filed Jul. 27, 1992, Ser. No. 919,249

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1992, 9202575[U]

Int. Cl.⁵ F16L *41/00*

U.S. Cl. 285—156 **14 Claims**



1. Tube connecting element having a T-configuration and being formed of plastic for sanitary and heating purposes, comprising first and second connecting sleeve elements having first and second bores, respectively, which first and second bores are in alignment with respect to one another and into which first and second respective plastic tubes are to be welded, and further comprising a sleeve body between the first and second connecting sleeve elements and forming therewith a unitary element, which sleeve body is provided with a third bore extending perpendicularly in relation to the first and second bores and which is suited for the reception of a third plastic tube, characterized in that the sleeve body is provided with a fourth bore connecting the aligned first and second bores, the center line of the fourth bore being offset with respect to the center line of the aligned first and second bores in the direction of an outer wall of the tube connecting element, opposite to the perpendicularly extending third bore, which connecting fourth bore is provided with a diameter B smaller than respective diameters A1, A2 of the first and second bores, and being separated from the perpendicularly extending third bore by a bottom wall thereof, the bottom wall having a thickness C substantially equal to a wall thickness D of the first and second connecting sleeve elements and which fourth bore is joined with the perpendicularly extending third bore by a fifth bore, the cross section of which is in general smaller by the wall thickness D of the connecting sleeve element than the cross section of the perpendicularly extending third bore.

5,316,350
COUPLING DEVICE FOR A TUBE SYSTEM

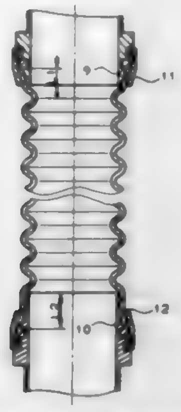
Norbert Kollenbrandt, Berkenthin; Heiko Schwenke, Lübeck, and Elmar Wimmers, Hemmelsdorf, all of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany

Filed Apr. 14, 1992, Ser. No. 868,479

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1991, 4113707

Int. Cl.^{5} F16L *35/00*

U.S. Cl. 285—242 **7 Claims**



1. A coupling device for producing a detachable connection between two parts of a tube system, comprising: a pipe socket including an undercut and two substantially oppositely arranged projecting parts; a tube including a locking member engaging said undercut of said pipe socket; a sleeve-shaped coupling box encompassing said tube in a clamping manner, adjacent said locking member, said coupling box forming a retaining ring including a circumferential notch on an interior side, wherein said two oppositely arranged projecting parts of said pipe socket engage said circumferential notch flexing engagement and disengagement means including a flexible region of said coupling box at least in an area of said circumferential notch, allowing said coupling box to be expanded upon exerting pressure in a transverse direction, perpendicular to said projecting parts, thereby allowing disengagement of said projecting parts from said circumferential notch to release said coupling box.

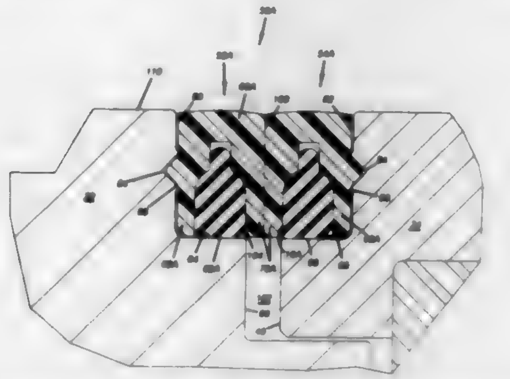
5,316,351
HOSE SWIVEL

Arnold Czimny; Spencer M. Nimberger, both of Harris County, and Robert L. Ward, Fort Bend County, all of Tex., assignors to Precision General, Inc., Houston, Tex.

Filed Aug. 6, 1992, Ser. No. 926,689

Int. Cl.^{5} F16L *33/16, 27/00*

U.S. Cl. 285—276 **24 Claims**



1. A swivel for transmitting fluid between an upstream component and a downstream component while permitting rotation of one component relative to the other, the swivel comprising:

- a male housing having a cylindrical outer surface, a first seal stop surface, and a first static sealing surface;
- a female housing having a cylindrical inner surface, a second seal stop surface, and a second static sealing surface;
- a bearing assembly acting between the cylindrical outer surface of the male housing and the cylindrical inner surface of the female housing to permit controlled rotation of one housing relative to the other about a central axis;
- a first annular seal ring member including a first plastic ring having a generally U-shaped cross-sectional configuration defining first ring-shaped stop leg for static engagement with the first seal stop surface, an axially spaced first ring-shaped dynamic leg, and a first base interconnecting the first stop leg and first dynamic leg, the first stop leg and the first dynamic leg defining a first cavity therebetween having a first opening;
- the first seal ring member further including a first elastomeric ring within the first cavity for urging the first dynamic leg axially away from the first stop leg, and for maintaining a static seal ring member including as second plastic ring having a generally U-shaped cross-sectional configuration defining a second ring-shaped stop leg for static engagement with the second seal stop surface, an axially spaced second ring-shaped dynamic leg, and a second base interconnecting the second stop leg and second dynamic leg, the second stop leg and second dynamic leg defining a second cavity therebetween having a second opening;
- the second seal ring member further including a second elastomeric ring within the second cavity for urging the second dynamic leg axially away from the second stop leg, and for maintaining a static seal with the second static sealing surface; and
- each of the first dynamic leg and second dynamic leg having a sealing surface in dynamic sealing engagement with the sealing surface of the other dynamic leg when the male housing rotates relative to the female housing.

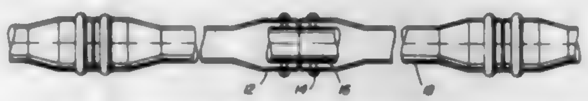
5,316,352
PIPE COUPLING

Michael S. Smith, 240 Templewood Place NE., Calgary, Alberta, Canada T1Y 4A8

Filed Dec. 16, 1991, Ser. No. 807,237

Int. Cl.^{5} F16L *21/02*

U.S. Cl. 285—370 **9 Claims**



1. A pipe coupling apparatus, comprising:

a) a plurality of pipes each including a body section provided with an annular receptacle at the ends thereof;
b) said receptacle including a sloping shoulder for connection with said body section;
c) said receptacle having an inside diameter larger than the inside diameter of said body section;
d) said receptacle having an inside diameter larger than the inside diameter of said shoulder;
e) at least one nipple having bevelled edge portions at the ends of said nipple for coupling two pipes;
f) said nipple having an outside diameter smaller than the inside diameter of said receptacle such that said nipple can be inserted within said receptacle;
g) said nipple having a length such that upon insertion in two opposed receptacles only one end of said nipple engages with the corresponding shoulder portion;
h) sealing means for coupling said nipple with said pipes;

i) said receptacle including a radially extending end face; and
j) wherein the end faces of two opposed receptacles remain free upon assembly of the apparatus and come in direct engagement with each other when a longitudinal pushing force is applied.

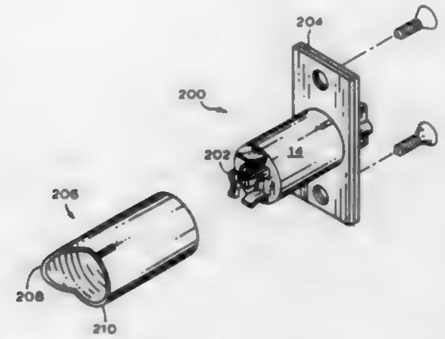
5,316,353
SLEEVE FOR DEAD BOLT

John L. McKernan, 32 Province St., Boston, Mass. 02108

Continuation of Ser. No. 547,380, Jul. 2, 1990, abandoned, which is a continuation of Ser. No. 217,319, Jul. 11, 1988, abandoned. This application Oct. 24, 1991, Ser. No. 782,974

Int. Cl.^{5} E05B *9/00*

U.S. Cl. 292—337 **11 Claims**



1. A sleeve having a tongue extending from one end thereof, the sleeve being tubular, the sleeve configured to enclose a barrel of a latch lock, the lock including ears, the tongue spaced apart from and configured to shield the ears of the latch to thereby deny access to the ears from a location exterior of the lock.

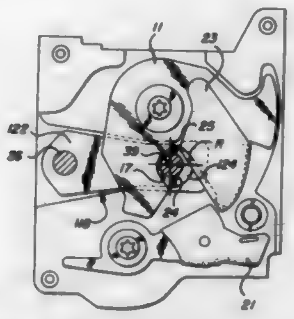
5,316,354
LOOP STRIKER

Frank J. Arabia, Jr., Shelby Township, Macomb County, and Thomas A. Dzurko, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1993, Ser. No. 25,429

Int. Cl.^{5} E05B *15/02*

U.S. Cl. 292—340 **2 Claims**



1. A loop striker for use with a door latch having a wedge shaped mouth for receiving a cross bar and a leading leg of a loop striker and a rotatable fork bolt that traps the leading leg of the loop striker in a throat of the fork bolt and the cross bar of the loop striker behind the fork bolt when the fork bolt is in a latched position, comprising;

- a base having a pair of laterally spaced legs that is adapted for securement to a support so that the laterally spaced legs are centered on a longitudinal center plane and the leading leg is located to be received in the wedge shaped mouth of the door latch,
- the cross bar being spaced from the base and attached to the pair of laterally spaced legs,
- the leading leg being at an end of the cross bar that has a tab that extends beyond the one leg by a substantial amount so that the tab maintains the leading leg substantially perpendicular to a fork bolt of a door latch when it is trapped in a latched position in the door latch,
- the cross bar having a wedge shaped portion at the opposite end that engages a wedge shaped mouth of a door latch for locating the leading leg in the door latch, and
- the tab having a longitudinal extension measured from a centerline of the leading leg which is greater than the lateral extension of the tab from the centerline so as to produce a significant overlap within the confines of the slot, between respective parts of the cross bar and the fork bolt that are outboard of the centerline when the fork bolt is in the latched position.

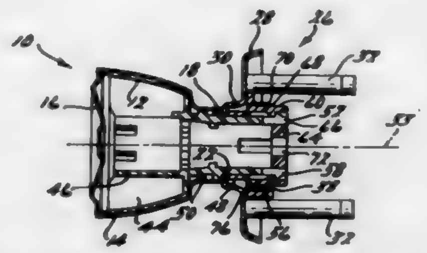
5,316,355
INTEGRAL DOOR KNOB ASSEMBLY WITH SPRING RETURN

Rae Hartwell, Surrey, and Ian Garben, Burnaby, both of Canada, assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed May 13, 1993, Ser. No. 61,219

Int. Cl.^{5} E05B *1/00*

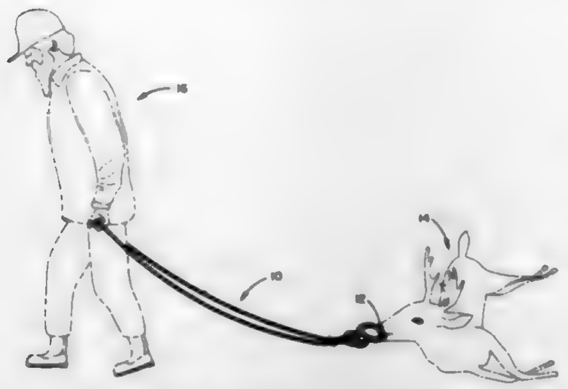
U.S. Cl. 292—347 **11 Claims**



1. A door knob assembly having a knob member with a spring return, rotatably connected to a rose member for mounting on a face of the door, the knob member including a tubular shank formed of plastic material, the tubular shank having a tubular portion extending from the knob member with a plurality of fingers at the end of the tubular portion positioned about an axis of rotation for the knob member, the fingers formed by a plurality of slots in the tubular portion parallel to the axis, each of the fingers having snap lock engagement means at the end thereof;

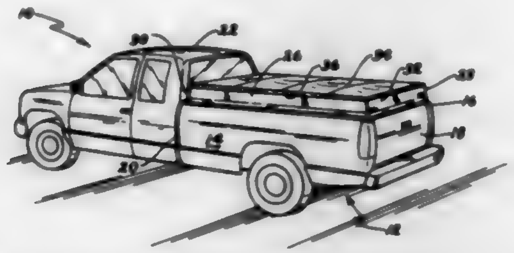
- the rose member having an internal bearing portion for supporting the tubular portion of the knob member permitting rotation of the shank therein, and two post members extending internally from the rose member for engagement with a door knob assembly mounted on the other side of the door, the post members spaced equidistant from the axis and in line therewith;
- a cylindrical spring assembly member formed of plastic material and having a concentric bore on one end for engagement with the tubular shank, curved openings formed in a face on the other end of the spring assembly member for receiving the fingers of the tubular shank in snap lock engagement, and attachment means in the face of the spring assembly member for axial attachment to a spindle, the knob member and spring assembly member having means to restrict rotation within the rose member, and
- spring means on the spring assembly member to return the knob member to a first position after partial rotation and release.

5,316,356
GAME DRAGGING DEVICE
Frederick S. Nutting, 2 Maplecroft St., Greenville, S.C. 29609
Filed May 3, 1993, Ser. No. 55,317
Int. Cl.⁵ B66C *1/58;* **A01K** *29/00*
U.S. Cl. 294—118 **10 Claims**



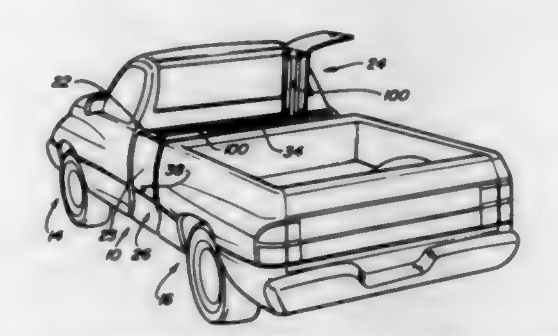
1. A game dragging device for attaching to a fallen game animal to thereby facilitate the dragging of the animal, said game dragging device comprising:
- a pair of tongs for securing to the animal, said pair of tongs comprising a first tong member and a second tong member, each of said first and second tong members having a proximate end and a distal end, said first and second tong members being pivotally attached together at a point between the proximate and distal ends thereof; and
- a pair of cables, one end of each of said pair of cables being attached to one each of said proximate ends of said first and second tong members;
- wherein each of said distal ends of said first and second tong members has a V-shaped edge portion provided thereon;
- wherein each of said first and second tong members is at least partially S-shaped;
- said game dragging device additionally comprising a pair of grips, one each of said pair of grips being attached to the other end of one each of said pair of cables;
- whereby said pair of grips may be grasped by separate individuals to actuate the tong members.

5,316,357
EXTENSION WALL ATTACHMENT STRUCTURE FOR PICKUP TRUCKS
James C. Schroeder, 8020 23rd Ave. North, Golden Valley, Minn. 55427
Filed Aug. 16, 1993, Ser. No. 106,706
Int. Cl.⁵ B60P *3/04*
U.S. Cl. 296—36 **19 Claims**



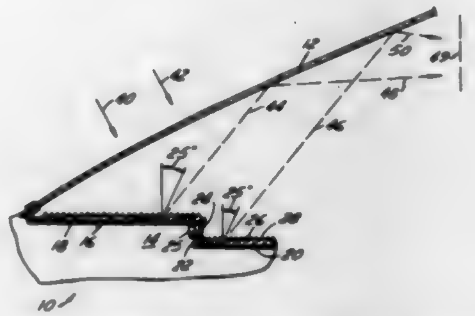
1. An extension wall structure for a sidewall of a cargo compartment of a pickup truck having a sidewall stake pocket tie-down with a port therethrough, said extension wall structure comprising:
- an upright longitudinally extending side wall panel having an exterior face, an interior face, a front end, a rear end, a top edge and a lower edge;
- a longitudinal mounting channel joined to the side wall panel along the lower edge thereof and having a hollow interior portion and a mounting face generally adjacent said interior face, said channel having a longitudinal slot extending from said mounting face into said hollow interior portion;
- a fastener having a first end slidably attachable to said mounting channel and a second end configured to lockably project through said port of a stake tie-down to fix said side wall panel to said cargo compartment sidewall.

5,316,358
INTEGRAL STORAGE CONTAINER FOR PICK-UP TRUCK
Phillip E. Payne, Northville, and Clyde N. Ney, Waterford, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Feb. 6, 1992, Ser. No. 832,067
Int. Cl.⁵ B60R *9/00*
U.S. Cl. 296—37.6 **6 Claims**



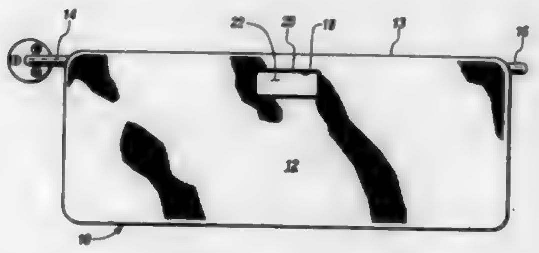
1. A storage container for a pick-up truck having a cab and a truck bed both secured to a frame, said storage container adapted to be secured between the cab and the truck bed comprising:
- an overall box shaped member having means for enabling access within said box shaped member, said box shaped member having a rear wall abutting a front wall of the truck bed; and
- means for securing said box shaped member to the frame between the cab and truck bed, wherein said box shaped member has a front wall abutting a rear wall of the cab.

5,316,359
ANTI-REFLECTIVE AUTOMOTIVE INTERIOR INSTRUMENT PANEL SURFACE
Jere R. Lansinger, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Mar. 8, 1993, Ser. No. 28,109
Int. Cl.⁵ B62D *25/14*
U.S. Cl. 296—70 **3 Claims**



1. In a motor vehicle having a cowl structure, a windshield inclined upwardly and rearwardly from the cowl structure at about 30° to the horizontal, and an instrument panel mounted on the cowl structure, the improvement wherein said instrument panel has a shelf beneath said windshield, said shelf having an upper generally horizontal wall portion and a lower generally horizontal wall portion rearwardly of said upper wall portion and a generally upright wall portion between and connecting said upper and lower wall portions, at least one instrument in said generally upright wall portion provided with illumination and observable by the vehicle operator, each of said upper and lower wall portions being formed with a multiplicity of laterally extending, alternate grooves and ridges, each of said grooves and ridges being defined by a forwardly facing surface and a rearwardly facing surface, the grooves and ridges extending generally parallel to the windshield, said forwardly facing surfaces each being planar surfaces inclined upwardly and rearwardly with respect to the windshield at an angle to the vertical of about 25 degrees to prevent reflection of light upwardly to the windshield and thence reflected from the windshield into a vehicle operator's eye area or directly from the shelf into a vehicle operator's eye area, said forwardly facing surfaces and rearwardly facing surfaces having a dull finish and being dark in color.

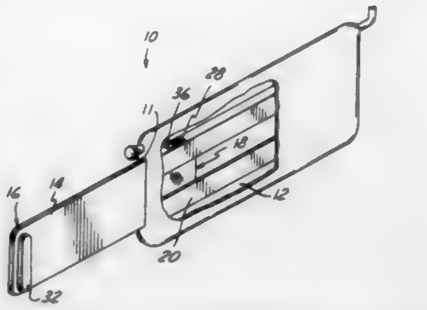
5,316,360
AUTOMOBILE SUN VISOR
Orville A. Feikema, 6805 Riverview Blvd. W., Bradenton, Fla. 34209
Filed Jan. 5, 1993, Ser. No. 1,385
Int. Cl.⁵ B60J *3/00*
U.S. Cl. 296—97.3 **9 Claims**



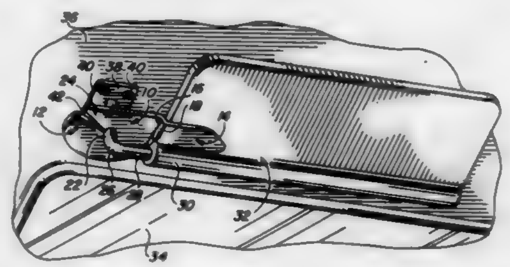
1. An automobile sun visor comprising:
- a generally flat and rectangular visor member having means for pivotal connection thereof adjacent a windshield of the automobile about a pivotal margin of said visor;
- said visor member including a frame connected thereto around a perimeter of a single small hole formed centrally through said visor member and positioned in close proximity to said pivotal margin, said hole having a width substantially smaller than a width of said visor member;
- said frame defining a viewing aperture sized and positioned on said visor member to allow a driver of the automobile to observe substantially only a traffic signal through said viewing aperture.

5,316,361
EXPANDABLE VISOR
Douglas C. Miller, Hersey, Mich., assignor to Plasta Fiber Industries Corp., Marlette, Mich.
Filed Jan. 25, 1993, Ser. No. 8,694
Int. Cl.⁵ B60J *3/02*
U.S. Cl. 296—97.8 **16 Claims**

1. A visor extender in combination with a vehicle visor, said visor extender comprising:
- a visor defining an internal cavity and having an aperture located along an external surface of the visor for providing access to said internal cavity;
- a sheath located within said cavity, said sheath defining a channel and a pair of openings;
- a blade defining a first end and a second end, said blade movable along said channel between a retracted position substantially within said cavity and an extended position substantially outside of said cavity;
- a pair of tangs located on said blade adjacent said second end, said tangs are biased away from said blade towards said sheath providing control friction against said sheath enabling even slidable movement of said blade throughout its movement, and said pair of tangs engage said pair of openings in said sheath as said blade moves toward said extended position to prevent said blade from being completely removed from said visor; and
- guide means located on said blade for guiding movement of said blade on said sheath as said blade moves in said channel between said retracted position and said extended position.



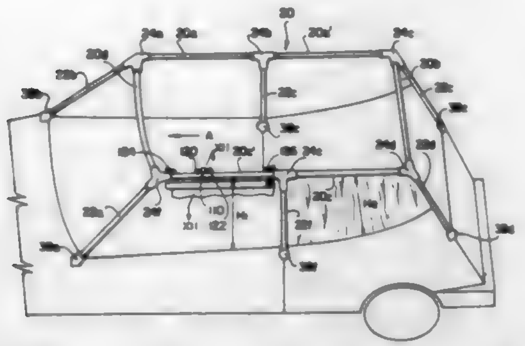
5,316,362
VEHICLES VISOR POSITION RETAINER
Morgan McGuinness, 9620 Sepulveda Blvd., #49, North Hills, Calif. 91343
Filed Dec. 7, 1992, Ser. No. 986,325
Int. Cl.⁵ B60J *3/02*
U.S. Cl. 296—97.9 **12 Claims**



1. An improved vehicle sun visor position retainer, said retainer comprising a unitary flexible, resilient material, said retainer having
- a) a first approximately horizontal member having first and second opposite ends,
- b) a second approximately horizontal member having first and second opposite ends; and,
- c) a step portion interconnecting said second opposite end of said first member to said first opposite end of said second member, whereby said second member extends laterally of said first member in a plane below but generally parallel to said first member, said first member having a generally central vertical opening therein adapted to receive the vertical rod of a vehicle sun visor bracket, and a slot extending from the outer periphery of said first member to said opening for sliding said first member around said rod, said retainer being rotatable around said rod between an operative position in which the underside of said sun visor is supported by said second member in an up position, and a storage position in which said second member is rotated away from sun visor so that sun visor can be lowered for protection against the sun.

5,316,363
AUTOMOBILE WINDOW SHADE SYSTEM

Adolf Tyutinman, 2983 Cambridge Dr., San Jose, Calif. 95125
Filed Aug. 21, 1992, Ser. No. 933,392
Int. Cl.⁵ B60J *1/20*
U.S. Cl. 296—138 **8 Claims**

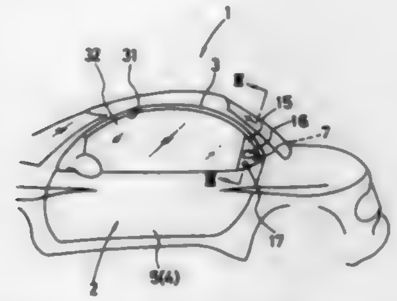


1. A window shade system for an automobile having a body with windows, each of said windows having a periphery, comprising:

at least one endless flexible element,
a plurality of guide elements for guiding said one flexible element along the peripheries of said windows,
a plurality of shading elements attached to said one flexible element so that they can be moved together with said one flexible element with respect to said windows between (a) a window shading position, and (b) a window unshading position;
means on said one flexible element for moving said plurality of shading elements; and
means attaching said plurality of guide elements to said body;
said means for moving said shading means comprising at least one yoke connected to said shading means and first and second stops both connected to said one flexible element;
said stops having paths of movement which intersect said at least on yoke, said first stop being located above said one yoke, said second stop being located below said one yoke.

5,316,364
STRUCTURE OF A DOOR FOR AN AUTOMOTIVE VEHICLE

Takeji Ohya, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 14, 1992, Ser. No. 989,683
Claims priority, application Japan, Dec. 12, 1991, 3-109841[U]; Dec. 12, 1991, 3-351561
Int. Cl.⁵ B60J *5/04*
U.S. Cl. 296—146.5 **30 Claims**

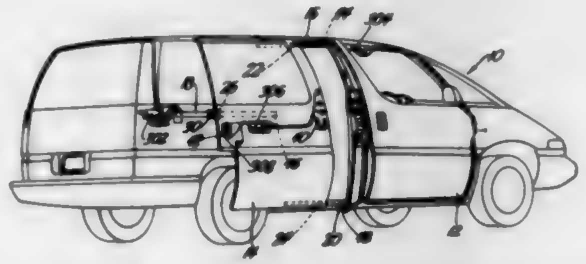


1. A structure of a door for an automotive vehicle, comprising:

a bracket mounted to an upper portion of a door panel projecting upwards from said door panel;
a key cylinder for locking or unlocking said door mounted to said bracket and having a key insert hole disposed toward the outside of an automotive vehicle body;
a door handle base mounted to said bracket covering said key cylinder from the outside of said automotive vehicle body, said door handle base having an aperture disposed in a position corresponding to said key insert hole of said key cylinder; and
a door handle for opening or closing said door, said door handle mounted to said door handle base.

5,316,365
SLIDING DOOR CLOSED LOOP CABLE CLOSURE SYSTEM WITH BALANCED CABLE TENSION AND VARYING DIAMETER PULLEYS

Howard W. Kuhlman, Rochester Hills, and Jeffrey K. Joyner, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 25, 1993, Ser. No. 8,817
Int. Cl.⁵ B60J *5/00*
U.S. Cl. 296—155 **3 Claims**



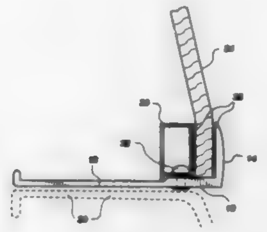
1. A sliding door opening and closing system for a vehicle including a vehicle frame; at least one sliding door track mounted on the vehicle frame; a sliding door supported by the sliding door track and moveable along the sliding door track between a closed position and an open position; and a closed loop cable closure system mounted on the vehicle frame and including a cable drive with a front cable drive pulley having a large diameter cable groove and a small diameter cable groove mounted on the vehicle frame for rotation about an axis, a rear cable drive pulley having a large diameter cable groove and a small diameter cable groove mounted on the vehicle frame for rotation about an axis, a motor that drives the front and rear cable drive pulleys in one direction to open the sliding door and in another direction to close the sliding door, a front cable that extends from the front cable drive pulley to the sliding door, a rear cable that extends from the rear cable drive pulley to the sliding door, a fixed idler roller mounted on the vehicle frame and spaced from the front cable drive pulley, a spring biased roller mounted on the frame between the front cable drive pulley and the fixed idler roller and spring biased into contact with the front cable to apply tension to the front cable and wherein the fixed idler roller and the spring biased roller are mounted in positions which provide a cable tension when the front cable is driven by the large diameter cable groove that is substantially equal to the cable tension when the front cable is driven by the small diameter cable groove.

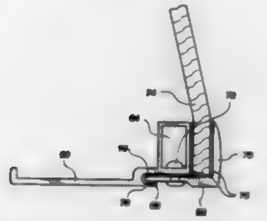
5,316,366
CAMPER SHELL MOUNTING RAIL

Larry K. Wilkins, 6098 W. 10550 North, Highland, Utah 84003
Filed Jan. 5, 1993, Ser. No. 629
Int. Cl.⁵ B60P *7/02*
U.S. Cl. 296—167 **10 Claims**

1. A mounting rail for securing a camper shell to the tops of side walls of a pickup truck bed, where the camper shell has a downwardly projecting lower rim, said rail including

a one-piece base element formed with an elongate strip for placement on the top of the truck bed sidewall, said base element including a lip extending upwardly from an outer side of the strip to enable placement of the lower rim of the camper shell onto the strip, against the lip so that the lip prevents the rim from moving laterally off from the strip,
an elongate clamping means for placement on the strip and against the lower rim of the camper shell to hold the rim in position between the clamping means and lip,

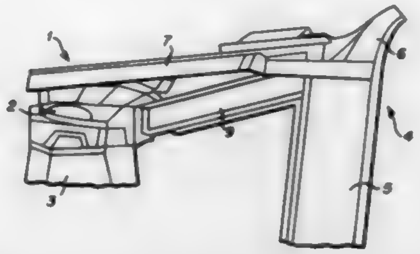




pivot means for causing the clamping means to pivot toward and against the lower rim of the camper shell when the clamping means is urged downwardly against the strip, and
fastener means for urging the clamping means downwardly against the strip to secure the clamping means thereon.

5,316,367
BEARING STRUCTURE FOR THE BODYWORK OF A VEHICLE

Norbert Enning, Denkendorf; Gundolf Kreis, Oberstimm; Alois Feldschmid; Christian Dornberg, both of Ingolstadt; Karl Reiter, Lenting, and Heinrich Timm, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany
PCT No. PCT/EP91/02335, § 371 Date May 5, 1993, § 102(e) Date May 5, 1993, PCT Pub. No. WO92/11166, PCT Pub. Date Jul. 9, 1992
PCT Filed Dec. 6, 1991, Ser. No. 50,224
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1991, 4041036
Int. Cl.⁵ B62D *25/00*
U.S. Cl. 296—189 **23 Claims**

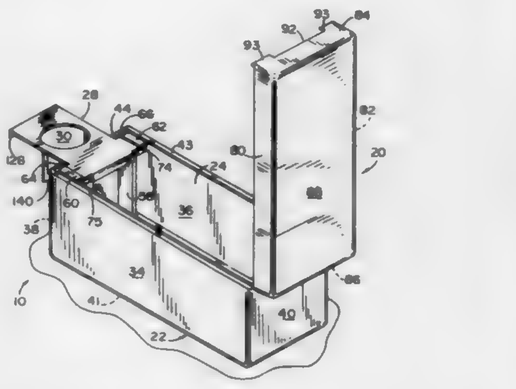


1. An improved front-end bearing structure in the bodywork of a vehicle of the type which includes a front suspension mount disposed above and supported on a lower front longitudinal bearer, a front door post disposed rearward of the front suspension mount and having a node connector element disposed along a mid portion thereof at a height adjacent an upper portion of a fire wall dividing the engine compartment from the passenger compartment and a suspension strut bearer for bracing the front suspension mount to the front door post at the node connector element, the improvement which comprises:

a) a suspension strut bearer formed as a hollow section member generally polygonal in cross section and having a curvature in a lengthwise direction such that the suspension strut bearer buckles by a reduction of the radius of curvature in the event a frontal collision of the vehicle and thereby preventing deformation to the front door post.

5,316,368
VEHICLE ACCESSORY

Thomas E. Arbisi, Holland, Mich., assignor to Prince Corporation, Holland, Mich.
Filed Apr. 28, 1992, Ser. No. 875,076
Int. Cl.⁵ A47C *7/62*
U.S. Cl. 297—194 **21 Claims**



1. A vehicle accessory comprising:

a base defining an open compartment and adapted to be mounted to a vehicle;
a cover movably mounted to said base and movable between a closed position covering said compartment and an open position uncovering said compartment;
a drawer operably connected to said base and said cover, said drawer being slideably movable between a retracted storage position and an extended use position relative to said base when said cover is in said closed position;
first engaging means coupled to said cover for retaining said drawer to said cover when said drawer is in said storage position, said first engaging means releasing said drawer from said cover as said drawer is moved to said use position; and
second engaging means coupled to said base for retaining said drawer to said base when said drawer is in said use position, said second engaging means releasing said drawer from said base as said drawer is moved to said storage position.

5,316,369
SEAT ARM REST CAPABLE OF HOUSING TELEVISION RECEIVER THEREIN

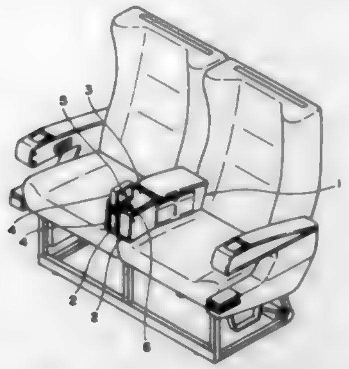
Yasushi Kanda, Kanagawa, Japan, assignor to Koito Industries, Ltd., Kanagawa, Japan
Continuation of Ser. No. 573,124, Nov. 2, 1990, abandoned. This application May 10, 1993, Ser. No. 58,809
Claims priority, application Japan, Feb. 15, 1989, 1-15794
Int. Cl.⁵ A47C *7/68*
U.S. Cl. 297—194 **12 Claims**

1. An armrest for a seat to be installed on an aircraft or a vehicle, capable of housing a television set, comprising:

an armrest body provided with a cavity in a front end thereof and under a cocktail tray to house the television set;
a hinge mechanism provided with a turning unit, said hinge mechanism being attached to an upper front end of the armrest body for swinging the turning unit in a direction

parallel to a length of the armrest between first and second positions into and out of the cavity; and

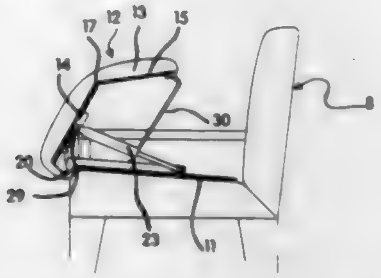
a television set mounted on the turning unit, said turning unit being turnable between said second position and a third position facing a user sitting in the seat, said turning unit and hinge moving said set between the first and third positions without interfering with persons sitting next to the user.



5,316,370
SEAT ASSIST

Duncan Newman, Toronto, Canada, assignor to Newman Engineering Inc., Toronto, Canada

Filed Nov. 16, 1992, Ser. No. 977,209
Int. Cl.^{5} A47C *1/02*
U.S. Cl. 297—313 **7 Claims**



1. In a device for use with a chair wherein a power source is provided to raise the seating surface from a lowered position to an elevated position to assist an occupant to rise from the chair and to restrain the speed of return of the seating surface from the elevated position to the lowered position as an occupant seats himself in the chair, the improvement comprising:

a base;

a seat mounted to the base and having an occupant assisting section and a front seat section hingedly connected thereto;

link means hingedly connected to the occupant assisting section;

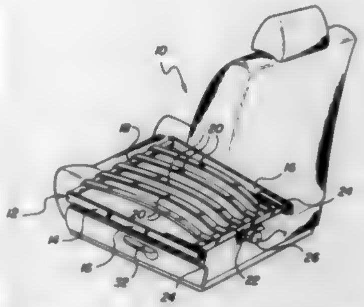
said front seat section hingedly connecting to said base and said link means hingedly connecting to said base, the said hinged connections each being about horizontal axes and at substantially the same elevation whereby to form a linkage system operable to move the occupant assisting section between a lowered position where it combines with the front seat section to form the seating surface with the front seat section overlying said base in juxtaposed relation thereto and with the occupant assisting section overlying said link means in juxtaposed relation thereto and an elevated position where the occupant assisting section is distance upwardly and forwardly from its lowered position at an orientation horizontally-suitable for seating and elevated from said base and the front seat section of the seating surface slopes downwardly and forwardly therefrom;

said power source hingedly connected to said base and to said front seat section.

5,316,371
ADJUSTABLE VEHICLE SEAT

Macram N. Bishai, Weston, Mass., assignor to McCord Winn Textron, Winchester, Mass.

Filed Mar. 25, 1993, Ser. No. 36,973
Int. Cl.^{5} B60N *2/02*
U.S. Cl. 297—339 **8 Claims**



4. An adjustable automotive vehicle seat equipped with a height adjust mechanism comprising:

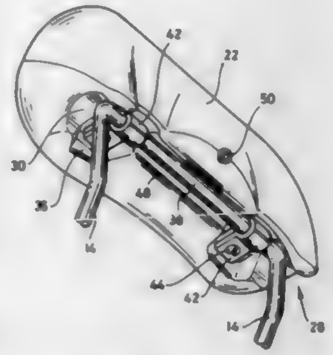
a frame having laterally spaced side members and a first cross member that are fixed with respect to the vehicle seat, a second cross member that translates with respect to the frame in a longitudinal direction, a plurality of bow shaped leaf springs that are laterally spaced and that have front and rear ends secured to the first and second cross members respectively, and an actuator for translating the second cross member in the longitudinal direction that has a moveable member that is operatively associated with the second cross member, the height of the seat being adjusted by adjusting the curvature of the bow shaped leaf springs which is accomplished by controlling the actuator to translate the second cross member with respect to the frame in the longitudinal direction.

5,316,372
HEADREST FOR A MOTOR VEHICLE

John A. Amner, Rochford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 491,893, Mar. 12, 1990, abandoned.
This application Nov. 8, 1991, Ser. No. 789,399
Claims priority, application United Kingdom, Sep. 10, 1987, 8721269

Int. Cl.^{5} A47C *1/10*
U.S. Cl. 297—400 **10 Claims**



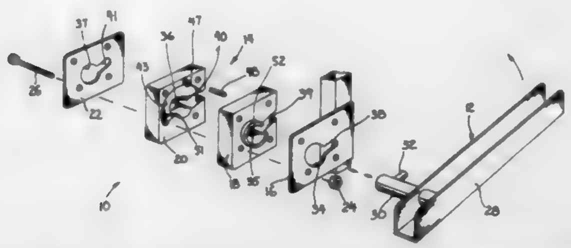
1. A headrest for use with a motor vehicle seat, the headrest comprising a blow-molded plastic body, a threaded insert

molded in place within the body, a support frame and at least one friction clamp adapted to be connected to the insert and to hold the frame relative to the insert while allowing the insert and the body to tilt, and means defining a re-entrant formation formed as a single part with the body, and the walls of the formation engaging directly with the support frame to limit the extent of tilting.

5,316,373
SEAT ARM REST

David I. Markel, Elkhart, Ind., assignor to Voyager, Inc., Elkhart, Ind.

Filed Feb. 4, 1993, Ser. No. 13,359
Int. Cl.^{5} A47C *7/54*
U.S. Cl. 297—411.32 **2 Claims**

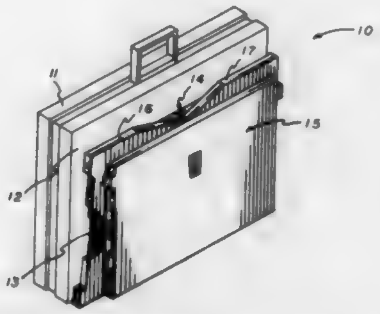


1. An arm support for a seat, said arm support comprising a control housing adapted for mounting to a seat, said control housing defined by inner and outer faces and an end face, a throughbore extending between said inner and outer faces, a first slotted passage defined in said housing oriented transverse of said throughbore and communicating therewith, a second slotted passage defined in said housing spaced from and generally coaxial with the throughbore, said second slotted passage partially communicating with the first slotted passage, a stop pin shiftably housed in said second slotted passage between a first position not in communication with said first slotted passage, and a second position interrupting said first slotted passage, said arm support further including an arm rest having a connecting rod, said connecting rod extending into said throughbore, a guide pin fastened to said connecting rod and radially shiftably fitted in said first slotted passage between a generally horizontal down position and a generally vertical raised position, said stop pin in said second position constituting means for limiting movement of said guide pin and arm rest towards said raised position.

5,316,374
PORTABLE FOOTREST APPARATUS

Raymond W. Fidler, 12321 Woodrun Dr., Laurinburg, N.C. 28352

Filed Jan. 26, 1993, Ser. No. 9,060
Int. Cl.^{5} A47C *16/02*
U.S. Cl. 297—423.39 **2 Claims**



1. A portable footrest apparatus, comprising,

a first side plate and a second side plate, the first side plate having a first side plate lower end wall, the second side plate having a second side plate lower end wall, wherein the first side plate lower end wall and the second side plate lower end wall include a flexible hinge web pivotally mounting the first side plate to the second side plate, the first side plate having parallel first plate end walls, with each first plate end wall of said first plate end walls having an end plate attached thereto by, an end plate hinge, with the first side plate having a first side plate front wall and a first side plate rear wall, with each said end plate hinge secured to the first plate front wall adjacent one of said first plate end walls, and

each end plate includes an end plate angulated first end and an end plate angulated second end, and

each end plate includes a plurality of arcuate slots directed through each end plate adjacent said each end plate second end, the second side plate includes second side plate end walls, with each of said second side plate end walls including a lug, with each said lug arranged for reception within one of said arcuate slots of one of said end plates, and

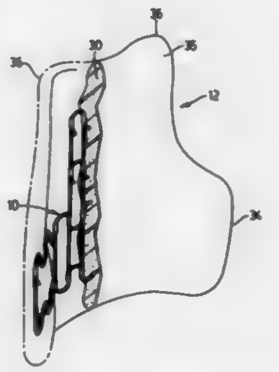
each end plate first end and second end includes intersecting planar sides intersecting at an obtuse included angle for angularly supporting each end plate, first side plate, and second side plate, and

the first side plate rear wall includes a plurality of spaced parallel hook and loop fastener strips spaced apart a predetermined spacing, and a transport container, the container including container side wall, the container side wall includes container hook and loop fastener strips spaced apart said predetermined spacing to receive the end plate hook and loop fastener strips.

5,316,375
BACK SUPPORT AND INTERNAL FRAME

William R. Breen, Etobicoke, Canada, assignor to Buddy Orthopoedic Inc., Etobicoke, Canada

Filed Jul. 16, 1992, Ser. No. 914,090
Int. Cl.^{5} A47C *7/28*
U.S. Cl. 297—452.34 **11 Claims**



1. A frame for a back support, said back support being adapted to face forwardly towards a user's back, said frame comprising;

(a) an elongated center portion having a top and a bottom and a pair of sides and extending in a longitudinal direction between said top and bottom, said center portion also extending in a transverse direction between said sides, said transverse direction being at right angles to said longitudinal direction, said center portion being configured in one of a substantially flat orientation and a slightly convex forward orientation.

(b) a pair of wing portions, said wing portions extending oppositely in said transverse direction and forwardly, one wing portion extending from each side of said center portion, said wing portions having outer free ends,

(c) said wing portions being of smaller dimension in said longitudinal direction than said center portion and being located adjacent said bottom of said center portion, there being no wing portions adjacent the top of said center portion,

(d) said center portion comprising a plurality of parallel column supports spaced apart in said transverse direction and extending in said longitudinal direction, there being a pair of said column supports one adjacent each side of said center portion, and a plurality of column supports between said pair of column supports,

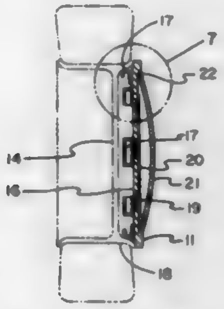
(e) said center portion further including a plurality of cross members extending in said transverse direction and each connected rigidly to each of said column supports,

(f) at least one of said cross members having a pair of wing sections extending transversely into said wing portions, said one cross member being located in a lumbar region of said user's back, for said wing sections to be depressed rearwardly when a user sits against said backrest and for the rearward movement of said wing sections to cause said center portion to bulge forwardly at least adjacent said one cross member and hence to assume a convex shape adjacent said lumbar region, and for said center portion to remain unbulged forwardly adjacent its top, so that the center part of said center portion will then assume an increasingly convex shape from said top of said center portion to said one cross member, such convexity providing lumbar support to said user.

5,316,376
DECORATIVE WHEEL COVER

Manuel P. Defreitas, 62 Tulane Cres., Don Mills, Ontario, Canada M3A 2C1

Filed Feb. 19, 1993, Ser. No. 19,649
Int. Cl.⁵ B60B *7/00*
U.S. Cl. 301—37.26 **3 Claims**



1. A vehicle wheel cover securable to a wheel rim of a vehicle, said vehicle wheel cover comprising:

a solid circular support plate having a groove circumscribing a periphery thereof;

a plurality of clips being substantially U-shaped and fixedly secured to a back area of said support plate in a spaced relationship, said plurality of clips being operable to releasable snap into and secure a portion of said wheel rim of a vehicle;

a plurality of circular magnets secured to and embedded in a front area of said support plate so as to lie flush therein;

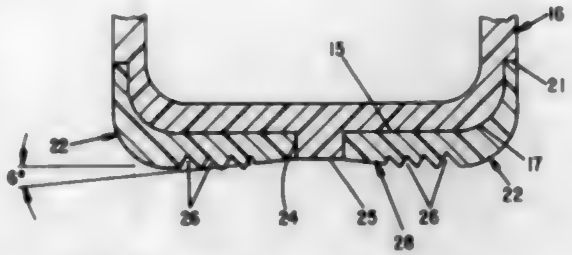
at least one circular indicia supporting member comprised of a substantially ferrous material, said at least one indicia supporting plate by an engagement with said plurality of circular magnets and operable to releasably mount indicia thereon; and,

a transparent convex lens capable of deformation and having a substantially circular shape defining an end around a periphery thereof and adapted to be placed against said circular support plate to releasably engage said groove of said circular support plate, said transparent convex lens being operable to magnify all of said indicia supporting member.

5,316,377
COMPOSITE INJECTION-BLOW MOLDED WHEEL AND METHOD OF FABRICATION

Floyd F. Markling, Fort Myers, Fla.; Tracy A. Markling, Delavan, Wis., and Robert A. Harlow, Harvard, Ill., assignors to Poly-Flex, Inc., Walworth, Wis.

Filed Apr. 29, 1992, Ser. No. 875,676
Int. Cl.⁵ B60B *3/12, 5/02*
U.S. Cl. 301—64.7 **13 Claims**



1. A wheel comprising:

a) a molded plastic rim including an annular hub having a bore, an annular tread support having a bonding surface, and a plurality of spokes, which spokes couple said tread support to said hub, and further including a plurality of hollow cavities; and

b) first and second annular tread pieces bonded to said tread support and spaced apart from one another to provide an annular gap at said boning surface and wherein a wear surface of each of said tread pieces tapers in a range of 2 to 10 degrees of declination toward the gap.

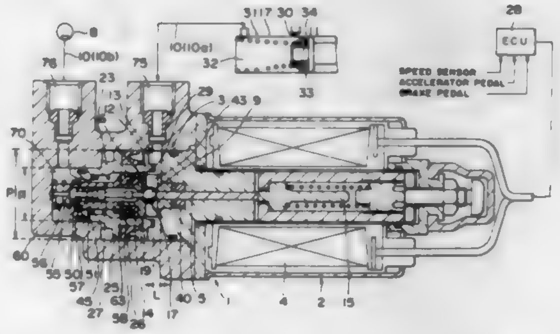
5,316,378
BRAKE FLUID PRESSURE CONTROL APPARATUS

Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1992, Ser. No. 824,033

Claims priority, application Japan, Jan. 22, 1991, 3-006014; Jan. 14, 1992, 4-005221

Int. Cl.⁵ B60T *15/46*
U.S. Cl. 303—84.2 **6 Claims**



1. A brake fluid pressure control apparatus, comprising:

a valve mechanism inserted in a main fluid passage connecting a master cylinder to a wheel cylinder, the valve mechanism having a main control valve for closing the main fluid passage so as to hold a wheel cylinder fluid pressure when a motor vehicle is halted and held stationary with brakes applied;

a check valve mounted in the valve mechanism and permitting supply of a fluid pressure from the master cylinder to the wheel cylinder when said main fluid passage is closed by the main control valve;

a stepped cylinder having an inlet port connected to the master cylinder and an outlet port connected to the wheel cylinder and;

a stepped piston housed in the stepped cylinder, having a large diameter end receiving the fluid pressure of the master cylinder and a small diameter end receiving the wheel cylinder fluid pressure, and pressed toward the outlet port side by an elastic member;

wherein, the stepped piston receives the fluid pressure of the master cylinder by movement of the stepped piston by utilizing a pressure difference between fluid the pressure supplied from said master cylinder to the large diameter end of the stepped piston and the wheel cylinder fluid pressure to the small diameter end of the stepped piston, when the fluid pressure is applied from the master cylinder to said wheel cylinder after said fluid passage is closed by said main control valve with the motor vehicle brought to a halt.

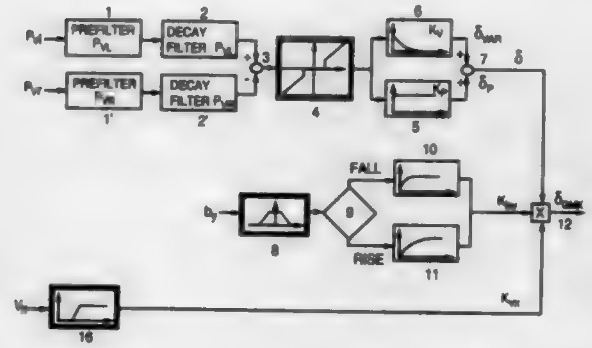
5,316,379
VEHICLE WITH AN ANTILOCK CONTROLLER

Rolf Becker, Ditzingen; Ulrich Belzner, Schwieberdingen; Rolf-Hermann Mergenthaler, Leonberg, and Gerhard Heess, Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 800,165, Nov. 27, 1991, abandoned. This application Jun. 2, 1993, Ser. No. 71,197

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1990, 4038079

Int. Cl.⁵ B62D *6/00;* **B60T** *8/32*
U.S. Cl. 303—100 **12 Claims**



1. System for controlling yawing moment in a vehicle equipped with front wheel steering, rear wheel steering, and ABS control for individual wheels on at least one axle, said yawing moment being caused by different coefficients of friction on opposite sides of the vehicle during ABS control, said front and rear wheel steering being characterized by respective steering angles, said system comprising

means for determining a brake pressure P at individually controlled wheels on one axle on opposite sides of the vehicle during ABS control,

means for determining a difference ΔP between said pressures P on opposite sides of the vehicle,

means for generating a compensation steering angle δ dependent upon said difference ΔP, said angle δ being zero for said difference ΔP up to threshold and thereafter consisting of a constant portion depending upon said difference ΔP added to a variable portion depending upon said difference ΔP, said variable portion decreasing to zero in a given time, and

means for adjusting at least one of said front and rear wheel steering in dependence upon said compensation steering angle δ.

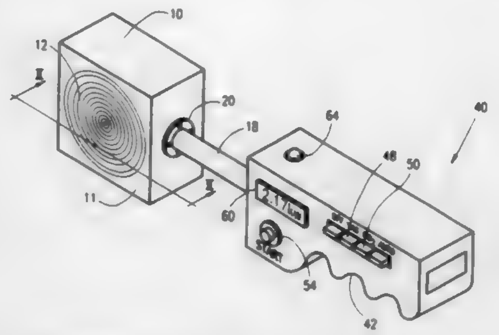
5,316,380
LASER POWER METER

Ephraim Secemski, 55 Hizkiyahu Hamelech Street, Jerusalem, Israel 93224

Filed Dec. 21, 1992, Ser. No. 994,377

Claims priority, application Israel, Dec. 26, 1991, 100528

Int. Cl.⁵ G01K *17/00*
U.S. Cl. 374—32 **20 Claims**



1. An isoperibol calorimeter type laser power meter comprising:

a laser beam energy absorber;

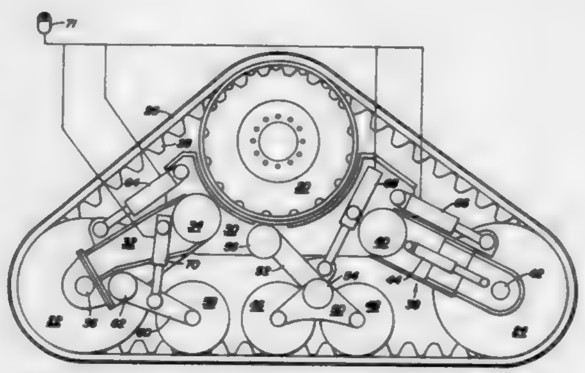
a temperature sensor for measuring the change in temperature of the absorber in response to impingement thereon of an input laser beam; and

electronic circuitry operative in response to a measured change in temperature, which measured change in temperature is proportional to the energy of said input laser beam, occurring in the absorber over a period of time whose duration is determined by said electronic circuitry to provide an output indication of laser power, which is the rate of change of the energy of said input laser beam per unit time.

5,316,381
TENSIONING AND SUSPENSION SYSTEM FOR A TRACKED VEHICLE

Charles D. Isaacson, Colona; Dale H. Killen, Green Rock, both of Ill., and James A. Nagorcka, Vic., Australia, assignors to Deere & Company, Moline, Ill.

Filed Nov. 13, 1992, Ser. No. 976,090
Int. Cl.⁵ B62D *55/30*
U.S. Cl. 305—10 **5 Claims**



1. An undercarringe for a tracked vehicle comprising:

a rigid frame;

a main drive wheel mounted to and extending outward from the rigid frame, the main drive wheel having a main drive wheel axis;

a front pivot arm is pivotally coupled to the rigid frame;

a front idler is rotatably coupled to the front pivot arm, the front idler having a front idler axis;

a front hydraulic suspension cylinder is mounted between

the rigid frame and the front pivot arm for biasing the front pivot arm downwardly;
a rear pivot arm is pivotally coupled to the rigid frame, the rear pivot arm is a telescoping arm that can be extended and retracted, the telescoping arm is provided with a tensioning hydraulic cylinder for extending telescoping arm;
a rear idler is rotatably coupled to the rear pivot arm, the rear idler having a rear idler axis;
a rear hydraulic suspension cylinder is mounted between the rigid frame and the rear pivot arm for biassing the rear pivot arm downwardly;
an intermediate pivot arm pivotally mounted to the rigid frame, the intermediate arm is located between the front and rear pivot arms, the intermediate arm is provided with a track roller mounting member pivotally coupled to the intermediate pivot arm, the track roller mounting member is provided with two track rollers which are rotatably mounted to the track roller mounting member;
an intermediate hydraulic suspension cylinder is mounted between the rigid frame and the intermediate arm for biassing the intermediate arm downwardly;
a track surrounds the main drive wheel, the front idler and the rear idler, and is engaged by the two track rollers of the intermediate arm, the main drive wheel axis is located above and between the front idler axis and the rear idler axis, the rear pivot arm is extended to tension the track.

5,316,382
ELECTRICALLY DRIVEN HAND MIXER WITH KNIFE-LIKE TOOL INTERLOCK

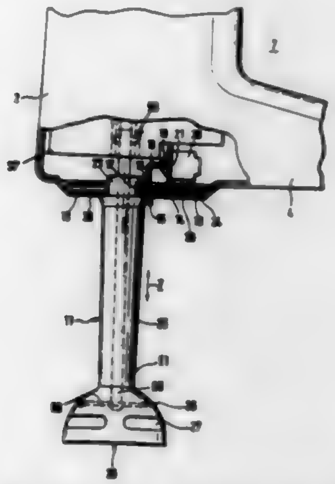
Mariano Penaranda; José Millán; Desiderio Falcó; Josep M. Masip i Baldaque, all of Barcelona, and Emilio Rodriguez, Cornella, all of Spain, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 28, 1992, Ser. No. 920,686

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1991, 4126721

Int. Cl.^{5} B01F *13/04*

U.S. Cl. 366—129 **12 Claims**



1. Electrically driven hand mixer for processing foodstuffs, comprising housing structure, said housing structure defining an opening, spring structure adjacent said opening, an electromotor in said housing structure, a manually actuated switching device for setting said electromotor into operation and having a switch step for permanent operation of said electromotor and a switch stage (IL) which, causes said electromotor to remain in operation only as long as said switch stage (IL) remains manually actuated, coupling structure in said housing structure for holding and driving an insertable knife-like tool, and interlock means responsive to insertion of said knife-like tool into said coupling structure for preventing connection of said electromotor with a power supply despite activation of said switch step for permanent operation, while allowing said electromotor to be connected with said power supply when said switch stage (IL) is manually actuated, said interlock means including an electric switch for connecting said electromotor with said power supply, said electric switch having an actuating element, said coupling structure being externally accessible through said opening and a flap adapted to close said opening by force of said spring structure, such that, during the insertion of said tool into said opening, said flap is displaced such that said flap actuates said actuating element to open said electric switch.

5,316,383
MIXING SYSTEM FOR MIXING TWO LIQUIDS AT CONSTANT MIXTURE VOLUME FLOW FOR SUPPLYING THE HEADBOX OF A PAPER MACHINE

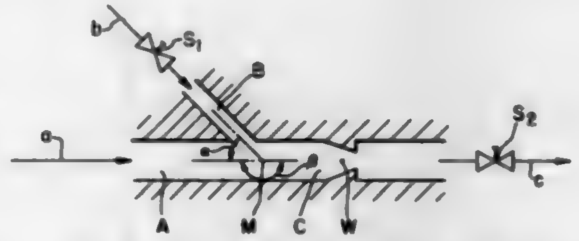
Ulrich Begemann, Leonberg, Fed. Rep. of Germany, and Thoroe Scherb, Sao Paulo, Brazil, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Apr. 2, 1993, Ser. No. 42,158

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1992, 4211291

Int. Cl.^{5} B01F *15/04*

U.S. Cl. 366—160 **10 Claims**



1. A mixing system for mixing two liquids at the inlet to a headbox of a paper machine, said two liquids received by said mixing system at first and second partial volume flow rates respectively and discharged from said mixing system at a mixture volume flow rate, said mixing system comprising:
a first inlet line for receiving one of the two liquids at the first partial volume flow rate;
a second inlet line for receiving the other of the two liquids at the second partial volume flow rate;
an outlet line for transporting said two liquids at the mixture volume flow rate;
a first flow resistance disposed in said outlet line; and
a valve disposed in said second inlet line for controlling the second partial volume flow rate;
said first inlet line disposed relative to said second inlet line at a mixing angle (α), said first inlet line disposed relative to said outlet line at a main flow angle (β), said mixing angle (α) selected whereby the mixture volume flow rate remains constant and is independent of said second partial volume flow rate.

5,316,384
PRIMARY-SECONDARY CIRCUIT HYDRAULIC INTERFACE

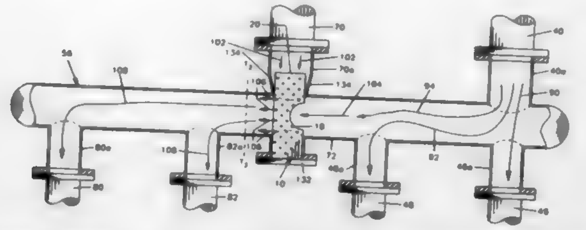
Anthony B. Corso, Cincinnati, Ohio, assignor to Unosource Controls, Inc., Cincinnati, Ohio

Filed Nov. 13, 1992, Ser. No. 976,262

Int. Cl.^{5} B01F *5/00*

U.S. Cl. 366—338 **10 Claims**

1. A hydraulic interface, comprising a hollow cylinder with a cylindrical wall which has a first open inlet end and a second closed end, said cylindrical wall having a large opening formed therein comprising a bidirectional flow opening, and said cylindrical wall having a plurality of smaller openings formed therein comprising outlet openings, wherein said first open end of said cylindrical wall is sufficiently large to allow a first fluid to enter said hollow cylinder without significant pressure loss, said inlet opening in said cylindrical wall being sufficiently large to allow a second fluid to enter said hollow cylinder without significant pressure loss, and said plurality of smaller outlet openings in said cylindrical wall being sufficiently small to cause said first fluid and said second fluid to be substantially blended together within said cylinder before the first and second fluids can exit said hollow cylinder through said plurality of outlet openings.



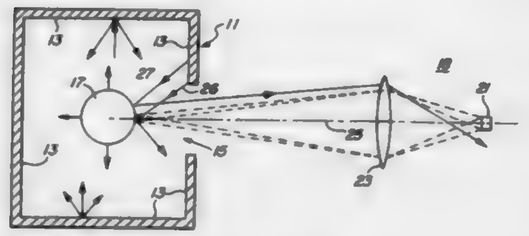
5,316,385
CORRECTION-FREE PYROMETRY IN RADIANT WALL FURNACES

Andrew S. W. Thomas, Webster, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 30, 1993, Ser. No. 44,449

Int. Cl.^{5} G01J *5/08*

U.S. Cl. 374—130 **12 Claims**



1. A pyrometric system comprising:
a furnace having interior walls and a window in one of said walls;
a target to be heated located within said furnace and having a specular surface;
a pyrometer located opposite said window for measuring the temperature of said target and having a pyrometer detector and associated pyrometer optics;
analysis means for using nonparaxial optical analysis to determine the location of an image of said window in said target; and
locating means for locating said pyrometer such that a back projection of the pyrometer detector through the pyrometer optics and onto the image of said window lies within the image of said window.

8. A method of locating a pyrometer, comprising a pyrometer detector and associated pyrometer optics, with respect to a window in a wall of a furnace for heating a specular surfaces target suspended therein, comprising the steps of:
using nonparaxial optical analysis to determine the location of an image of the window in the target; and
locating the pyrometer such that a back projection of the pyrometer detector through the pyrometer optics and onto the image of the window lies within the image of the window.

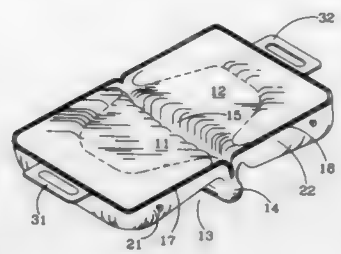
5,316,386
FLUID RECEPTACLE

Jae K. Moore, 24706 Mount Auburn, Katy, Tex. 77494

Filed Mar. 1, 1993, Ser. No. 24,434

Int. Cl.^{5} B65D *33/08, 30/10*

U.S. Cl. 383—10 **9 Claims**



1. A fluid receptacle formed of a bag having first and second sides each with an inner surface and bottom, top and outer edges, said first and second sides being joined along said bottom edges and lower portions of said outer edges to provide a central pocket on opposite sides of which intermediate and upper edges of said first and second sides of said bag are unjoined, permitting portions of said first and second sides to be laid open, each of said first and second sides of said bag being provided near said top edge thereof with an inflatable and deflatable air pocket which, when inflated and when said first and second sides are laid open on a horizontal surface, elevate said top edges of said first and second sides above said central pocket so that any fluid draining onto said sides will gravitate toward said central pocket.

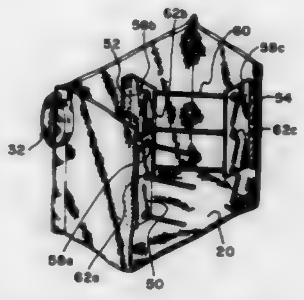
5,316,387
STRUCTURALLY-ENHANCED FLEXIBLE BULK CONTAINER

Walter J. Polett, and Muriel S. Polett, both of P.O. Box 55, Mount Holly, N.J. 08060

Filed Jan. 15, 1993, Ser. No. 6,275

Int. Cl.^{5} B65D *30/10*

U.S. Cl. 383—119 **6 Claims**



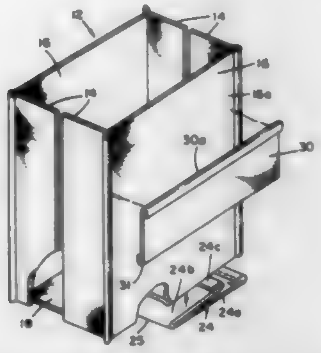
1. A flexible bulk container for the handling and storage of flowable materials, comprising:
a plurality of flexible walls connected together and defining an encircling enclosure and a bottom panel attached to a lower end of said encircling enclosure forming said flexible bulk container;
each of said walls having an inside surface defining an enclosed area;
structural maintenance means comprising components attached to said walls on said inside surfaces for providing structural support to said walls, said components of said structural maintenance means extending from said inside surfaces of said walls and being connected with another of said components of said structural maintenance means extending from another of said walls,
said structural maintenance means being comprised of a plurality of flaps, each of said flaps having a first edge and a second edge, said first edge of each flap being attached

to the inside surface of a different one of said walls, each of said flaps extending toward the center of said enclosure and having a plurality of holes formed thereon adjacent the second edge at a plurality of levels, the second edge of each of said flaps being spaced apart from each of the other second edges, said structural maintenance means further including an elongated joining means extending through said holes at each level for joining the flaps and assisting in maintaining the structure of the container.

5,316,388
FOLDABLE BAG AND POUCH

Theodore L. Caligiuri, 436 Ardmore Ave., Hermosa Beach, Calif. 90254

Filed Mar. 5, 1993, Ser. No. 26,871
Int. Cl.^{5} B65D *30/22, 33/16*
U.S. Cl. 383—127 **4 Claims**



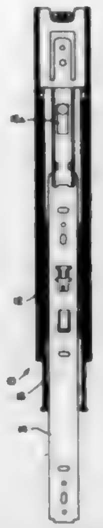
1. A foldable bag for carrying articles comprising:
(a) interconnected side, end and bottom walls defining an article receiving enclosure having a top opening and a first volume, said walls being foldable from a first expanded configuration into a second tightly folded configuration;
(b) a flexible panel connected to said bottom wall for defining in cooperation therewith a storage enclosure for receiving said side and end walls and a portion of said bottom wall in a tightly folded configuration, said storage enclosure being of a second volume substantially smaller than said first volume;
(c) closure means for closing said storage enclosure and for maintaining said side and end walls and a portion of said bottom wall in a tightly folded configuration; and
(d) top opening closure means for closing said top opening of said article receiving enclosure, said means comprising a flexible side panel connected to one of said side walls.

5,316,389
DRAWER SLIDE ASSEMBLY

Keigh A. Hoffman, Hudsonville, Mich., assignor to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Aug. 24, 1992, Ser. No. 934,423
Int. Cl.^{5} F16C *29/04*
U.S. Cl. 384—18 **17 Claims**

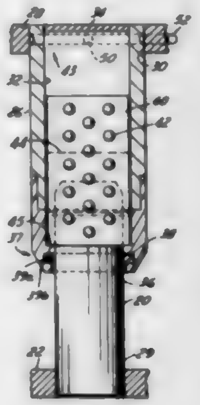
1. A drawer slide assembly comprising:
an elongated outer rail;
an elongated intermediate rail having an outer end;
an elongated inner rail having inner and outer ends;
a rail extension stop lever means between said inner rail and said intermediate rail for stopping extension of said inner rail relative to said intermediate rail;
said stop lever means comprising a polymeric lever element having one end attached to said inner rail, and a second trigger end extending along said inner rail spaced therefrom and resiliently shiftable toward said inner rail;
transversely oriented stop surfaces on said element; and
a center stop on said intermediate rail outer end, said center stop having cooperative stop surfaces complementary to said stop lever element stop surfaces, for making a binding stop therewith upon extension of said slide assembly.



5,316,390
GUIDE SLEEVE WITH SEAL, GUIDE POST AND BALL BEARING ASSEMBLY

Ronald L. Hanaway, 30210 E. Eight Mile Rd., Farmington Hills, Mich. 48236

Filed Dec. 31, 1992, Ser. No. 999,426
Int. Cl.^{5} F16C *29/04;* **F16J** *15/56*
U.S. Cl. 384—49 **18 Claims**

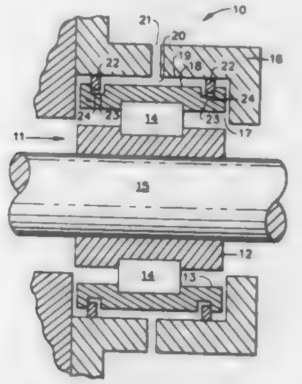


1. In combination, a guide post having a longitudinal axis;
a cylindrical ball bearing cage having a coaxial longitudinal axis and a bore adjustably receiving said post, and adapted for movement thereon;
said cage mounting a plurality of longitudinally spaced circularly arranged ball bearings projecting inwardly and outwardly thereof, engagable with said post and a guide sleeve respectively;
a guide sleeve having a coaxial longitudinal axis and a bore adjustably receiving said post and containing said cage; and
said guide sleeve having a leak resistant sealing means for slidably sealing the interface between said guide sleeve and said post, said sleeve having an end with an inner peripheral surface with a nominal radius that is small than the radius of said bore, but larger than the radius of said guide post and further contains a notch extending radially upward beyond said nominal radius, said notch defining two axially opposed reaction surfaces, a first reaction surface being more internal to said guide sleeve and a second reaction surface being disposed between said first reaction surface and a terminal point on said guide sleeve, said notch further comprising a tapered portion being narrowest at its most external end and having a radius that increases from a value approximately equal to said nominal radius adjacent to said terminal point on said guide sleeve to a value equal to said notch radius minus the radial length of said second reaction surface adjacent to said second reaction surface.

5,316,391
SQUEEZE FILM DAMPER SEAL

Fred J. Monzel, Loveland, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 765,768, Sep. 26, 1991, Pat. No. 5,251,985. This application Jun. 16, 1993, Ser. No. 77,147
Int. Cl.^{5} F16C *27/00*
U.S. Cl. 384—99 **7 Claims**

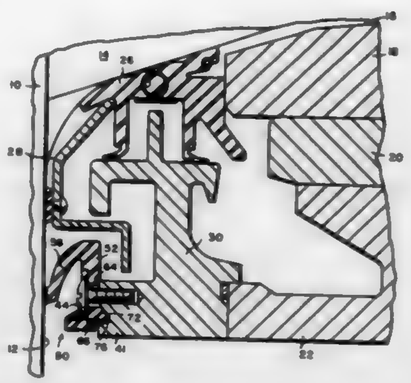


1. In a squeeze film shaft damper having a bearing housing with an annular chamber therein and an annular bearing support member fitted in said chamber for limited radial motion and defining a thin annular squeeze film space between opposing circumferential planar surfaces of said bearing support member and said annular chamber, an improvement therefore comprising
(a) a part of said housing overlying and spaced from said bearing support member on one side thereof to define an annular recess therewith, and
(b) an annular conical spring ring seal positioned compressingly in said recess to circumferentially seal said squeeze film space, and
(c) wherein said bearing support member is an annular outer race of a rolling element bearing with an outer circumferential planar surface, and
  (1) said annular race having a necked down section at each side end thereof with a projecting lip,
  (2) said projecting lip on one side of said race engaging said spring ring seal at an inner rib and defining therewith an inlet seal plenum chamber in circumferential fluid flow relationship with said squeeze film space,
  (3) said projecting lip and necked down section on the opposite side of said race engaging said housing to define therewith an exit plenum chamber in circumferential fluid flow relationship with said squeeze film space,
  (4) an oil exit passage in said housing connecting to said exit plenum for a flow of oil out of said damper, and
  (5) said housing having an oil flow passage therein connected to said inlet seal plenum to supply oil to said damper.

5,316,392
COOLANT GUARD FOR ROLLING MILL OIL FILM BEARING ASSEMBLY

Charles L. Innis, Jr., Paxton, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Oct. 21, 1993, Ser. No. 140,788
Int. Cl.^{5} F16C *33/74*
U.S. Cl. 384—147 **8 Claims**

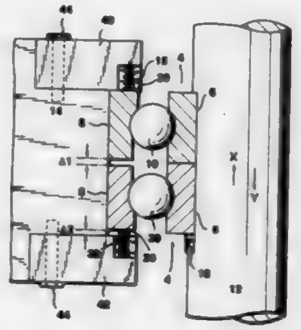


1. In a rolling mill bearing assembly for rotatably supporting a roll neck, said bearing assembly having a non-rotatable flat annular mounting surface surrounding and perpendicular to the rotational axis of the roll neck, said mounting surface being spaced axially from an end face of the roll to define a gap therebetween, a flexible coolant guard for sealing said gap against the ingress of coolant and entrained contaminants into said bearing assembly, said coolant guard comprising:
a radially disposed annular base flange having planar front and rear faces and inner and outer edges, said rear face being adapted to be secured against said mounting surface;
a circular sealing flange integrally joined to said inner edge and extending angularly away from said front face and across said gap into sealing contact with the end face of the roll; and
reinforcement means for accommodating flexible radial deformation of said coolant guard in relation to said axis while resisting any tendency of said base flange to distort axially away from said mounting surface, said reinforcement means comprising a hoop embedded in said base flange, the width of said hoop extending in a direction parallel to said axis.

5,316,393
DUPLEX ROLLING ELEMENT BEARING MOUNTING FOR ENSURING PRELOAD CONTROL

Thomas L. Daugherty, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1992, Ser. No. 953,339
Int. Cl.^{5} F16C *33/58*
U.S. Cl. 384—517 **4 Claims**



1. A bearing assembly comprising:

face to face angular contact paired bearings having two inner races, a first outer race, a second outer race and rolling elements between the inner races an the outer races;
said inner races of said bearings being mounted on a shaft to be supported;
a housing for providing support for the outer races, said housing having a first inner surface, a second inner surface, a third inner surface and a fourth inner surface;
said first inner surface and said second inner surface are spaced apart and face each other;
said third inner surface and said fourth inner surface are spaced apart and face each other,
said first outer race having a first external surface and a second external surface;
said second outer race having a first external surface and a second external surface;
a first spring;
a second spring;
said outer races and said springs being mounted within the said housing so that the recited elements are positioned in the following sequence:
a. the said first inner surface of the housing,
b. the said first spring,
c. the said first external surface of said first outer race,
d. the said second external surface of said first outer race,
e. an air gap Δa,
f. the said second external surface of sad second outer race,
g. the said first external surface of said second outer race
h. the said second spring, and
i. the said second inner surface; and
said springs preload the said outer races such that a gap Δ2 exists between the said first external surface of said second outer race and the said fourth inner surface of the housing and the said first external surface of said first outer race is substantially in contact with the sad third inner surface of the housing.

5,316,394
RADIAL ROLLER BEARING

Rudolf Gehring, Neukirch-Egnach, Switzerland, assignor to Hydrel AG, Romanshorn, Switzerland

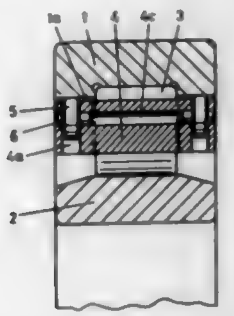
PCT No. PCT/CH91/00138, § 371 Date Feb. 26, 1992, § 102(e) Date Feb. 26, 1992, PCT Pub. No. WO92/00463, PCT Pub. Date Jan. 9, 1992

PCT Filed Jun. 24, 1991, Ser. No. 836,003

Claims priority, application Switzerland, Jun. 27, 1990, 2136/90-9

Int. Cl.^{5} F16C *33/46*

U.S. Cl. 384—574 **24 Claims**



1. A radial antifriction bearing, comprising:
an outer member having an inner surface;
an inner member having an outer surface;
a cage having a plurality of circumferentially spaced ridges separating a plurality of rolling elements from one another, said rolling elements being mounted within the cage and disposed between the inner member and the outer member, the rolling elements contacting and rolling on the inner surface of the outer member and the outer surface of the inner member; and
a plurality of supporting rollers and corresponding shafts, each supporting roller being rotatably supported by the respective shaft, said supporting rollers and shafts being disposed about the circumference of the cage for guiding said cage by rolling contact;
the supporting rollers having an outside diameter less than one-third the outside diameter of the cage.

5,316,395
PRINTING APPARATUS HAVING HEAD GAP ADJUSTING DEVICE.

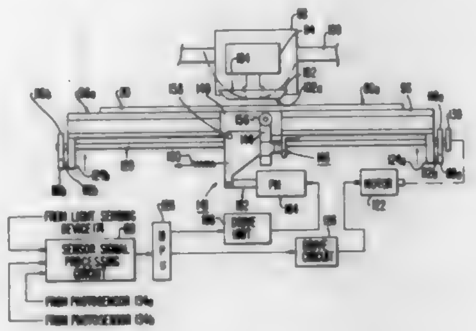
Masayuki Imai, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 24, 1991, Ser. No. 690,831

Claims priority, application Japan, Apr. 25, 1990, 2-109588; Jul. 5, 1990, 2-71113

Int. Cl.^{5} B41J *11/20*

U.S. Cl. 400—56 **13 Claims**



1. A printing apparatus comprising:
a carriage having a printing head which prints on a recording medium, the printing head including a contact area;
a platen having a surface disposed opposite the contact area;
first shift means for relatively moving the contact area and said platen toward or away from each other;
detecting means for detecting a thickness of the recording medium adjacent a printing position which is between the contact area and said platen, and for producing an output signal, said detecting means having a contact portion which pinches the recording medium between the contact area and the contact portion;
second shift means for relatively moving said detecting means toward or away from the contact area;
first control means for controlling said first shift means to form a predetermined gap between the contact area and a surface of the recording medium in accordance with the output signal from said detecting means; and
second control means for controlling said second shift means to move the contact portion of said detecting means away from the contact area after said first shift means forms the predetermined gap between the contact area and the surface of the recording medium.

5,316,396
PRINTER CAPABLE OF PRINTING IN A DESIRED PRINT RANGE

Kousuke Fukaya, Kariya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 24, 1992, Ser. No. 903,481

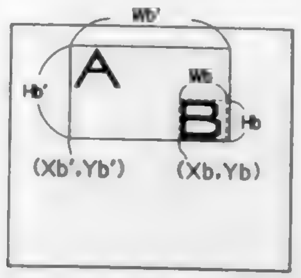
Claims priority, application Japan, Jun. 24, 1991, 3-151846

Int. Cl.^{5} B41J *2/00*

U.S. Cl. 400—76 **18 Claims**

1. A printer comprising:
print data storage means for storing print data on page basis;
developing means for developing a first print range based on the print data stored in said print data storage means;

first print range storage means for storing coordinates representing the first print range developed by said developing means;
specifying means for specifying a second print range in which one page print data stored in said print data storage means are printed;



second print range storage means for storing coordinates representing the second print range specified by said specifying means; and
converting means for converting a size of an image to be printed in the first print range to another size so that one page print data are printed in the second print range in its entirety.

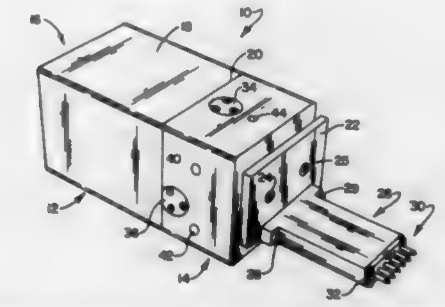
5,316,397
MARKING APPARATUS WITH MULTIPLE MARKING MODES

John A. Robertson, Chillicothe; David L. Cyphert, Canal Winchester; Joseph Muscarella, Columbus, and Robert N. French, Chillicothe, all of Ohio, assignors to Telesis Marking Systems, Inc., Circleville, Ohio

Filed Jul. 31, 1992, Ser. No. 923,267

Int. Cl.^{5} B41J *3/12*

U.S. Cl. 400—121 **29 Claims**



1. Apparatus for marking objects at a surface thereof with a sequence of characters formed by indentation, in response to data inputs, comprising:
a housing having forward and rearward portions;
a translation mechanism mounted at said forward housing portion, including a carrier assembly slidably movable only in a transverse direction in response to a transverse drive input, a transverse screw assembly fixedly mounted upon and supported for rotation by said housing forward portion and rotatable in response to a rotational transverse drive input to provide said carrier assembly transverse drive input, a coupler component mounted to and supported by said housing forward portion for slidable movement only in a vertical direction in response to a vertical drive input, a vertical screw assembly fixedly mounted upon and supported for rotation by said housing forward portion and rotatable in response to a rotational vertical drive input to provide said coupler component vertical drive input, and a carriage component connected with said coupler component for driven movement in said vertical direction while being slidably movable thereon in said transverse direction and connected with said carrier assembly for movement in said transverse direction while being slidably movable thereon in said vertical direction;
a marker head assembly connectable with said carriage component, having a confronting portion positionable in spaced adjacency with said surface and including at least two marker pins, each having an impacting tip drivably movable into said surface in response to pneumatic control inputs;
a first motor mounted within and fixed to said housing rearward portion and responsive to a first control input to provide a transverse drive output of rotational extent corresponding with said first control input;
a first transmission assembly connected in driven relationship with said transverse drive output to derive said rotational transverse drive input for effecting the transverse directional movement of said carriage component;
a second motor mounted within and fixed to said housing rearward portion and responsive to a second control input to provide a vertical drive output of rotational extent corresponding with said second control input;
second transmission assembly connected in driven relationship with said vertical drive output to derive said rotational vertical drive input for effecting the vertical directional movement of said carriage component; and
control means responsive to said data inputs for deriving said first control input, said second control input and for effecting generation of said pneumatic control inputs to effect derivation of said characters at said surface.

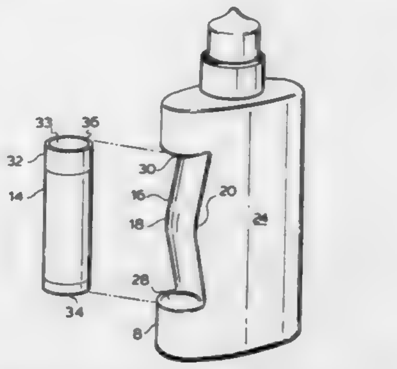
5,316,398
COMBINATION BOTTLE AND STICK

Kapoor Chandaria, Kampala, Uganda Uganda; Benjamin H. Stansbury, Jr., King City, and Robert G. Dickie, Newmarket, both of Canada, assignors to Conros Corporation, Scarborough, Canada

Filed Mar. 4, 1993, Ser. No. 26,325

Int. Cl.^{5} B65D *21/02*

U.S. Cl. 401—18 **17 Claims**

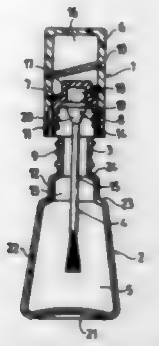


1. In combination, a bottle and a stick dispenser wherein said bottle has a cavity for nesting said stick dispenser, said stick dispenser having a first end and an opposite end, said opposite end of the stick dispenser having a corner extending thereabout,
said cavity having a first end and an opposite end, said opposite end of the cavity having a dome extending into the cavity, one of said first ends having a domed surface and the other of said first ends having a recess,
whereby said fist end of the stick dispenser is presented to said first end of the cavity for revolving the opposite end of said dispenser relative to the first end of the cavity to frictionally engage the corner past the dome, releasably retaining the stick dispenser within the cavity in a snapping fit.

5,316,399

CLOSURE DEVICE FOR A CONTAINER

Gérard Joulia, Paris, France, assignor to L'Oreal, Paris, France
Filed Mar. 29, 1993, Ser. No. 38,833
Claims priority, application France, Apr. 22, 1992, 92 04940
Int. Cl.^{5} A46B *11/00;* **A45D** *34/00*
U.S. Cl. 401—127 **3 Claims**



1. Closure device for a container, comprising: an applicator element for reaching fluid contained in an inner volume of the container and adapted to apply the fluid when the closure device is separated from the bottle;

a cap adapted to be mounted on a neck provided on an upper part of the container,

wherein the cap is mounted on the neck by a capsule carrying the applicator element and capable of directly ensuring closure of the bottle by the cooperation of a first screw thread provided on an inner surface of the capsule with a corresponding second thread provided externally on the neck of the bottle,

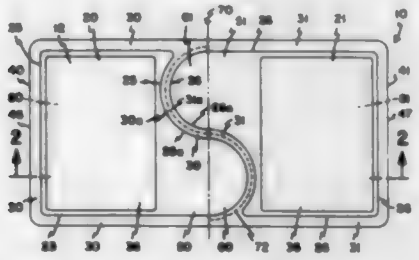
wherein the capsule also carries a seal adapted to cooperate with an edge of the neck when the capsule is in place on the bottle in the closed position, and

wherein the cap is mounted on the capsule and connected to the capsule by a screw-type connection in the same direction as that of the first and second threads, such that the normal rotational movement applied to the cap to separate the closure device from the container results in an initial axial displacement of the cap with respect to the capsule which causes the removal of the cap from the container, and then results in the capsule being unscrewed from the neck, the connection between the cap and the capsule offering less resistance than that between the capsule and the neck of the container.

5,316,400

PACKAGE SYSTSEM FOR FLOWABLE OR SOLID SUBSTANCES

Earl E. Hoyt, Franklin Lakes, N.J., and James A. Smith, Chatham, Mass., assignors to Creative Products Resource, Inc., North Caldwell, N.J.
Filed Dec. 19, 1991, Ser. No. 810,309
Int. Cl.^{5} A47L *13/17*
U.S. Cl. 401—132 **18 Claims**



12. A dispensing device, comprising:

(a) a backing sheet with a first surface and a second surface;

(b) an opening member including peripheral edges, a distal end and a proximal end, the opening member being attached along its peripheral edges to the first surface of the backing sheet; at least a portion of the backing sheets being releasably attached along the peripheral edges of the proximal end of the opening member; and

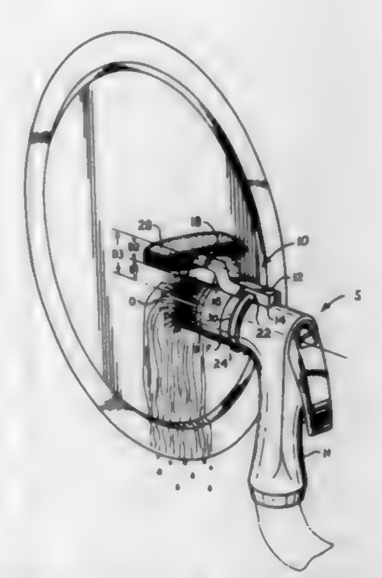
(c) a receptacle unit including peripheral flanges, a distal end and a proximal end, the proximal end being formed to provide at least one extension member protruding therefrom, the peripheral flanges of the receptacle unit sealed to the first surface of the backing sheet to form at least one sealed interior chamber thereinbetween for containing a flowable or solid substance, at least a portion of the backing sheet being releasably attached along the peripheral flanges of the proximal end of the receptacle unit, the receptacle unit and the opening member positioned on the backing sheet with the proximal ends adjacent each other, the extension member of the receptacle unit overlaps an axis extending between the receptacle unit and the opening member and across the width of the dispensing device;

wherein at least a portion of the backing sheet is separable from the extension member of the receptacle unit and the proximal end of the opening member by urging together the distal end of the opening member and the distal end of the receptacle unit to bend the dispensing device about the axis, so that an opening to the interior chamber of the receptacle unit is provided and the substance within the chamber is dispensable therefrom.

5,316,401

SCRUBBING ATTACHMENT FOR SPRAY NOZZLES

Thomas H. Sears, 121 GlenLea Dr., Glen Burnie, Md. 21060, assignor to Thomas H. Sears, Glen Burnie and Craig A. Mercier, Pasadena, both of Md.
Filed Mar. 1, 1993, Ser. No. 24,216
Int. Cl.^{5} A47L *17/00*
U.S. Cl. 401—139 **16 Claims**



1. A scrubbing attachment for a spray nozzle providing a concentric fluid flow, said scrubbing attachment comprising:

a scrubbing pad;

a single, monolithic arm including a nozzle attachment portion, a scrubber attachment portion, and an intermediate offset portion therebetween, said intermediate offset portion configured to displace said scrubbing pad from the spray nozzle concentric fluid flow;

said nozzle attachment portion including a nozzle contact side;

said scrubber attachment portion including a forwardly projecting distal end having a scrubber securing member extending therefrom;

said scrubbing pad secured to and substantially surrounding and covering said scrubber securing member;

a securing strap providing for the securing of said arm to a spray nozzle;

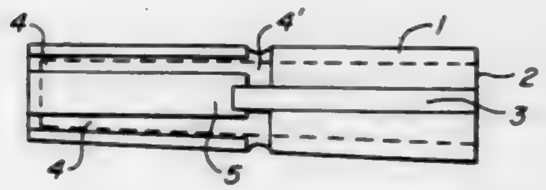
said nozzle attachment portion including lateral passage means providing for the lateral passage therethrough of said securing strap, whereby;

said securing strap is passed through said lateral passage of said nozzle attachment portion of said scrubbing attachment and tightened about the spray nozzle, with said nozzle contact side of said nozzle attachment porton immediately adjacent to and in contact with the spray nozzle, to secure said scrubbing attachment to the spray nozzle with said scrubbing pad radially offset from any concentric fluid flow issuing from the spray nozzle and projecting forward from the spray nozzle.

5,316,402

PENHOLDER CAP

Takeshi Wakai, and Masahiko Nagai, both of Tokyo, Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 806,557, Dec. 13, 1991, abandoned.
This application Jan. 19, 1993, Ser. No. 5,919
Int. Cl.^{5} B43K *9/00*
U.S. Cl. 401—202 **1 Claim**



1. In the combination of a pen and a cap for covering said pen, the improvement to said cap for covering said pen comprising in combination:

a cap body being essentially cylindrical about an axis, said cap body having a first closed end, a second open end, and a defined receiving volume for fitting over and covering said pen when said pen is inserted to said open end along said axis of said pen cap;

an exterior circumferential groove disposed midway between said first closed end and said second open end, said circumferential groove configured on the exterior of said cap and defining a recessed surface entirely around said cap from the regular body of said cap;

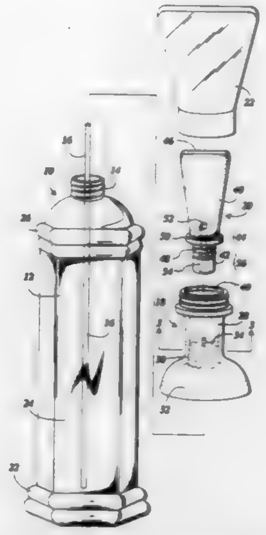
four longitudinally extending grooves on the exterior of said pen cap, said grooves extending parallel to said cap axis and being configured on the exterior of said cap and defining recessed surfaces along said cap parallel to the axis of said cap, said recessed surfaces extending from the regular body of said cap at substantially equal radial intervals, said grooves commencing in the exterior surface of said cap from said closed end to said exterior circumferential groove whereby said exterior circumferential groove and said four longitudinal grooves are all in communication with one another along the exterior of said cap; and,

first and second longitudinal ribs configured on opposite sides of said pen cap on the outside thereof, said ribs extending across said exterior circumferential groove at one end and extending to said cap at said open end, said first and second longitudinal ribs extending axially of said pen cap at radial locations offset from and between pairs of said longitudinally extending grooves whereby said four longitudinally extending grooves, said first and second longitudinal ribs and said exterior circumferential groove define interconnecting irregular surfaces for permitting air passage in the event that said pen cap is swallowed.

5,316,403

APPARATUS FOR APPLYING A FILM OF LIQUID

Amin F. Mansour, P.O. Box 645, Snellville, Ga. 30278
Filed Dec. 15, 1992, Ser. No. 991,207
Int. Cl.^{5} B43M *11/06*
U.S. Cl. 401—207 **4 Claims**



1. A dispenser for applying a uniform film of water as a narrow band to a gummed surface of an envelope, comprising:

a container having an open neck and rigid sidewalls for holding a supply of water in free state;

an open-ended coupler removably attached at a threaded first end to the neck of the container, the coupler having a second open end;

an annular ring disposed concentrically on a longitudinal axis of the coupler at a lower portion thereof by arms extending radially from an inner surface of the coupler to the ring;

an applicator formed of a material that allows water to pass in a uniform way, comprising:

a wedge-shaped blade with a tip at a distal end;

a cylindrical handle configured for being grippingly received in a second open end of the coupler;

and

an air bore extending along a line coaxial with the longitudinal axis from a first opening in a bottom of the handle to a second opening in a side of the blade for communicating air into the container; and

an air tube received in the first opening and extending from the handle through the annular ring into the container,

whereby the water, being transferred by gravity and diffused by capillary action through the handle to the tip of the applicator in the inverted container, passes through the tip and is applied to a gummed surface of an envelope in contact therewith as a narrow band of a uniform film of water and the tube communicates air through the second opening to the interior of the container to relieve the change in pressure in the container.

5,316,404

PAGE WITH PICTURE POCKETS AND ALBUM CONTAINING SUCH PAGES

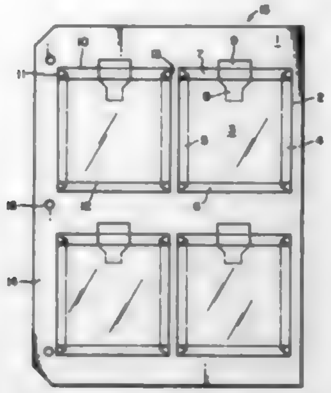
James T. Hensel, 303 Bloomingrove Dr., Troy, N.Y. 12180
Filed Jun. 29, 1992, Ser. No. 905,339
Int. Cl.^{5} B42F *13/00*
U.S. Cl. 402—79 **13 Claims**

1. A storage page for holding a plurality of photographic prints comprising:

(a) a rigid page backing; and

(b) a plurality of expandable, flexible pockets mounted thereon, each of said pockets having

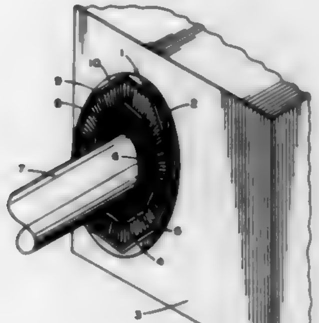
(i) a transparent front wall,
(ii) first and second side walls,
(iii) a bottom, and
(iv) a tab;



said side walls and bottom being of sufficient width to accommodate 10 to 40 photographic prints, and said tabs mounted on said rigid page backing adjacent and above said pockets and adapted so that each of said tabs encloses said photographic prints on a fourth side and prevents said prints from sliding out of said pockets.

5,316,405
CYCLONE SEAL EXPANSION JOINT

Josif Atanasoski, and George Atanasoski, both of 130 River Lane Dr., Ormond Beach, Fla. 32075
Filed Oct. 29, 1992, Ser. No. 968,505
Int. Cl.^{5} F16J *15/02*
U.S. Cl. 403—28 **10 Claims**

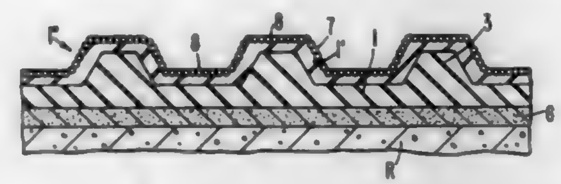


1. A radial expansion seal joint assembly for connecting components under differing thermal conditions, said assembly comprising:

multiple sections of corrugated plates dispersed radially between outwardly protruding "U"-shaped expansion joints attached perpendicularly to inner and outer edges of said plates to form a predetermined shape to allow for movement due to thermal expansion and contraction, the outer edge of said plates being wider than the inner edge.

5,316,406
SURFACE MARKER STRIP AND METHODS FOR PROVIDING IMPROVED INTEGRITY AND ADHESION TO ROADWAY AND THE LIKE

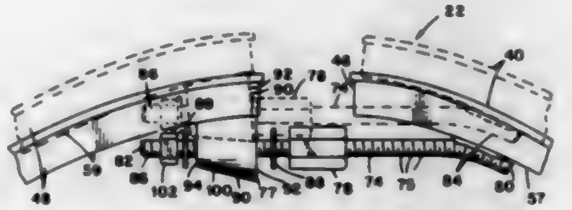
Charles W. Wyckoff, Needham, Mass., assignor to Briteline Industries, Inc., Lexington, Mass.
Division of Ser. No. 630,081, Dec. 19, 1990, Pat. No. 5,139,590, which is a division of Ser. No. 611,135, Nov. 13, 1990, Pat. No. 5,087,148, which is a continuation of Ser. No. 309,312, Feb. 10, 1989, abandoned. This application Aug. 17, 1992, Ser. No. 930,785
The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.
Int. Cl.^{5} E01F *9/06, 9/08*
U.S. Cl. 404—12 **3 Claims**



1. A roadway marker strip for adhesive attachment along a bottom surface of the strip to a roadway, comprising a rubber-like sheet having a bottom layer and flat surface which posses cold-flow substantially memory-free characteristics and an upper layer and surface from which incident light from a vehicle traveling along the roadway may be reflected to indicate a roadway direction, said upper layer and surface of the sheet only being cross-link-vulcanized so as to possess substantial memory enabling restoration of depression of the upper surface caused by a vehicle, while the sheet bottom layer remains unvulcanized and conformably adheres to the roadway.

5,316,407
MANHOLE COVER SUPPORT

Wayborn M. Miller, 3104 Sanderson Rd., Knoxville, Tenn. 37921
Filed Jul. 15, 1992, Ser. No. 914,267
Int. Cl.^{5} E02D *29/14*
U.S. Cl. 404—25 **21 Claims**



1. A manhole cover support cooperable with a manhole frame having an upwardly-opening recess within which a manhole cover is positionable for supporting the manhole cover in an elevated condition with respect to the frame, the manhole cover support comprising:

a support body receivable by the upwardly-opening recess of a manhole frame and having a central access opening and a gap extending between the central access opening and the outer periphery of the support body so that one section of the support body is disposed on one side of the gap and another section of the support body is disposed on the opposite side of the gap; and

means for adjusting the outer dimension of the support body including:

a) an elongated shank having a length and being associated

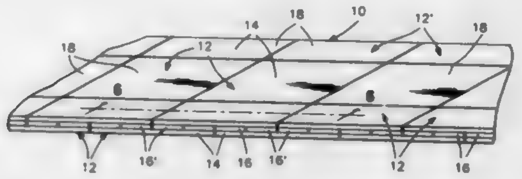
with the one section of the support body and having two opposite end portions;

b) means attached to the another section of the support body providing a passageway opening generally toward said one section, one end portion of the shank being fixedly attached to said one section so that the shank is thereby prevented from moving relative to the one section and the other end portion of the shank being externally-threaded along at least a segment of its length and being received by the passageway of the passageway-providing means; and

c) a rotatable body having an internally-threaded opening threaded upon the externally-threaded segment of said other end portion of the shank and disposed generally between said one end portion of the shank and the passageway-providing means so that by rotating the rotatable body about said other end portion of the shank so as to act upon and thereby move said passageway-providing means along the length of the shank and generally away from said one shank end portion, the outer dimensions of the support body are increased, and the passageway of the passageway-providing means is adapted to accommodate a shift in position of said other end portion of the shank relative to the passageway in a direction substantially perpendicular to the length of the shank as the outer dimensions of the support body are increased and as the shank is prevented from moving relative to the one section of the support body.

5,316,408
BOARD MAT CONSTRUCTION

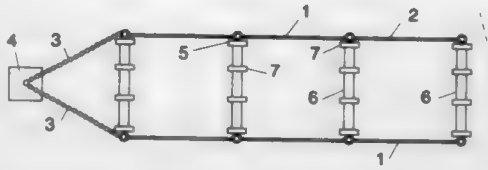
T. K. Stanley, Shubuta, and Cary S. Farrar, Waynesboro, both of Miss., assignors to T. K. Stanley Incorporated, Waynesboro, Miss.
Continuation-in-part of Ser. No. 760,917, Sep. 17, 1991, Pat. No. 5,201,601. This application Dec. 11, 1992, Ser. No. 989,643
The portion of the term of this patent subsequent to Apr. 13, 2010, has been disclaimed.
Int. Cl.^{5} E01C *5/16, 9/08*
U.S. Cl. 404—35 **24 Claims**



1. A board mat construction for soft ground, said mat construction including a plurality of rectangular, panel-like first and second mat structures, said mat structures each including opposite transverse end margins and opposite side longitudinal margins and defining a first rectangular surface, a second rectangular surface facing opposite and paralleling said first surface, said second surface including a pair of opposite end portion elongated log structures disposed transverse to the corresponding mat structure having remote longitudinal sides generally flush with said end portions and opposite ends generally flush with said longitudinal margins, the area of said second surface between each pair of log structures being substantially rectangular and of a length, taken longitudinally of said mat, substantially equal to one-half the length of said mat, the width of each of said log structures being substantially equal to one-fourth the length of said mat, the surfaces of said log structures facing in the direction of said second surface being generally co-planar and spaced a predetermined distance outward of said second surface, said first mat structures being arranged in a first row of end abutted and aligned first mat structures with said first surfaces thereof facing upwardly, said second mat structures being arranged in a second row of end abutted and aligned second mat structures with said second mat structures disposed in one-half lengthwise staggered relation relative to said first mat structures and with said first surfaces of said second mat structures facing downwardly and the end log structures of adjacent ends of said second mat structures snugly received upwardly into the spacing of the first mat structure disposed thereabove between the end log structures thereof and the end log structures of adjacent ends of said first mat structures being snugly received downwardly into the spacing of the second mat structure disposed therebelow between the end log structures thereof.

5,316,409
PORTABLE BOAT SKIDWAY

Harold J. Aune, P.O. Box 1141 Stn. E, Victoria, British Columbia, Canada V8W 2T6
PCT No. PCT/CA90/00456, § 371 Date Oct. 11, 1991, § 102(e) Date Oct. 11, 1991, PCT Pub. No. WO91/09771, PCT Pub. Date Jul. 11, 1991
Continuation-in-part of Ser. No. 454,310, Dec. 22, 1989. This PCT application Dec. 21, 1990, Ser. No. 743,316
Int. Cl.^{5} B63C *3/02*
U.S. Cl. 405—1 **4 Claims**



1. An articulated skidway for boats and the like comprising a series of connecting rods, each joined at its respective ends to the ends of two other rods by flexible coupling means in a ladder-like formation, there being provided around each rod which serves as a rung within such formation a tubular skidding cylinder wherein:

(1) said cylinder is circular in cross-section and is provided with at least two encircling flanges respectively disposed on both sides of the central, midway portion of the length of said cylinder, inwardly from the ends thereof, at positions whereby said flanges will serve to maintain a boat generally centered on the skidway; and

(2) such cylinder has an interior cylindrical diameter that is considerably greater than that of the connecting rod to provide a sloppy fit between the rod and cylinder for rotation there-between without a bearing being therein provided, whereby said cylinder may be rotationally repositioned to distribute wear over its surface.

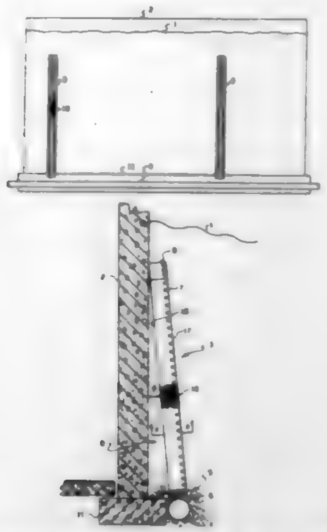
5,316,410
FOUNDATION DRAINAGE SYSTEM

Robert F. Blume, 111 Cliffwood Ct., East Peoria, Ill. 61611
Filed Jun. 9, 1992, Ser. No. 896,528
Int. Cl.^{5} E02B *11/00*
U.S. Cl. 405—45 **23 Claims**

5. A foundation drainage system for draining water from the soil around a foundation wall and footing, comprising:

means for draining oriented approximately horizontally and adjacent to said foundation wall;

a plurality of hollow, members extending upwardly from said draining means and having a plurality of perforations passing through said hollow members, said members having an upper end disposed near the surface of the earth and proximate to said foundation wall and having a lower end



located proximate to said means for draining, wherein said upper end is supported by said foundation wall and said lower end is spaced away from said foundation wall such that said member is disposed at an angle to the wall; and means for covering said upper end of said hollow members.

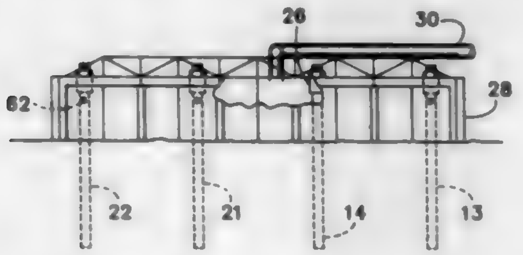
5,316,411
APPARATUS FOR IN SITU HEATING AND VITRIFICATION

James L. Buelt, Richland, Wash.; Kenton H. Oma, Mount Juliet, Tenn., and Eugene A. Eschbach, Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation of Ser. No. 665,776, Mar. 7, 1991, which is a continuation-in-part of Ser. No. 531,890, Jun. 1, 1990, abandoned, which is a division of Ser. No. 181,635, Apr. 14, 1988, Pat. No. 4,957,393. This application Dec. 21, 1992, Ser. No. 994,172

Int. Cl.⁵ E02D *3/00, 3/11*

U.S. Cl. 405—128 **31 Claims**



1. Apparatus for detoxifying waste sites and the like containing hazardous volatilizable material, said apparatus comprising:

a plurality of electrodes inserted at spaced points in the ground proximate a said waste site, said electrodes comprising at least a pair extending downwardly and on opposite sides of at least a portion of the waste at said site to a depth commensurate with the depth of said waste, said electrodes being in direct contact with said ground at their point of insertion and therebelow,

means for applying a voltage between said pair of electrodes to cause a current flow through the ground region therebetween adjacent the soil surface for raising the temperature of said ground region to between 100° and 1200° C. to volatilize said material without melting the ground, and

means for collecting said material as volatilized.

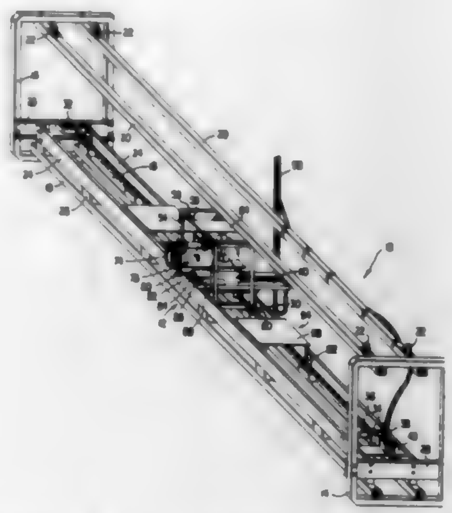
5,316,412
REMOTE CONTROLLED UNDERWATER JOINT AND CRACK SEALING

Kenneth B. Sondergard, Redmond, Wash., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1992, Ser. No. 880,377

Int. Cl.⁵ B63C *11/10*

U.S. Cl. 405—169 **19 Claims**



1. Apparatus for use in effecting underwater repairs at a work site comprising;

a main platform;

an equipment cart supported by and movable along said main platform;

underwater viewing apparatus connected to said equipment cart; and

tool means for effecting underwater repairs at said work site connected to the equipment cart;

wherein said main platform rotatably supports a threaded drive shaft;

said equipment cart is connected to a drive shaft nut receiving said threaded drive shaft; and

a motor is supported on the main platform, the motor being rotatably coupled to the drive shaft for rotating the shaft to drive the equipment cart along the main platform.

5,316,413
OFFSHORE DOUBLE CONE STRUCTURE

Ram G. Sisodiya, Dublin, and Dale Berner, El Cerrito, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Sep. 28, 1992, Ser. No. 952,026

Int. Cl.⁵ E02B *17/02*

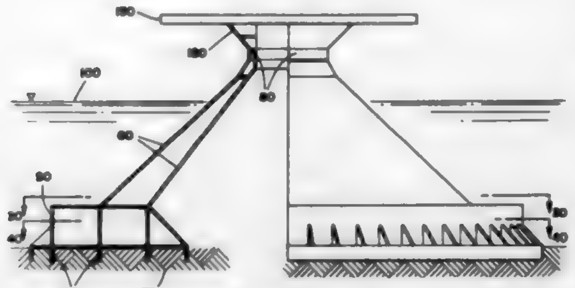
U.S. Cl. 405—217 **6 Claims**

1. An offshore bottom founded structure for operation on an ocean floor foundation comprising:

(a) a outer conical shell;

(b) an inner conical shell positioned concentric with said outer shell;

(c) a load resistance system positioned on the periphery of the structure, said system comprising an internal bracing interposed between and rigidly coupling said outer and inner shells to form a double-cone shell, said double cone having a neck ring fixedly positioned above said double-cone to increase the rigidity of said double-cone; and



(d) a base-caisson supporting the double cone shell, said caisson positioned to rest on the ocean foundation and transfer, by a double-cone shell action, environmental loads, topside weight, and self weight of the double-cone shell through the base caisson to the foundation.

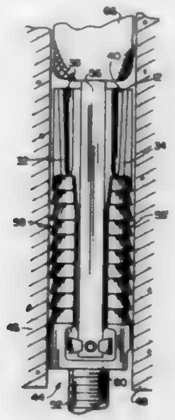
5,316,414
MINE ROOF EXPANSION ANCHOR, TAPERED PLUG ELEMENT USED THEREIN AND METHOD OF INSTALLATION

Raymond L. Wright, Syracuse, N.Y., assignor to The Eastern Company, Naugatuck, Conn.

Filed Apr. 14, 1993, Ser. No. 46,579

Int. Cl.⁵ E21D *20/02*

U.S. Cl. 405—259.6 **22 Claims**



1. A tapered plug element for use in a mine roof expansion anchor in conjunction with a resin grouting material initially in flowable form, said plug element consisting of body member comprising;

a) first and second ends and an axial bore extending through said body member between said first and second end about a central axis, said bore being internally threaded over at least a portion of its length;

b) a plurality of external, compression surface portions extending axially between said first and second ends and lying tangent to circles concentric with said central axis in each plane normal to said axis, the circle at the plane of said first end defining the largest cross-dimension of said body member, said circles decreasing in diameter from said first to said second ends, each of said surface portions being circumferentially spaced from the circumferentially adjacent surface portions by one of a plurality of first, axially extending grooves; and

c) at least one second groove in at least one of said compression surface portions, said second groove extending axially from said first end for at least a portion of the distance to said second end.

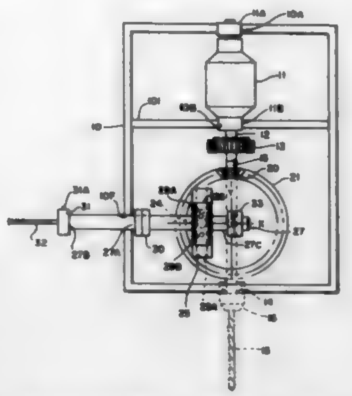
5,316,415
POWER DRILL ADAPTER FOR SAWING OPERATION WITH A SAW BLADE TRANSMISSION

Yong Ho Chiu, No. 26, Lane 48, Hwai Tei Street, Taipei, Taiwan

Filed Jun. 1, 1993, Ser. No. 69,770

Int. Cl.⁵ B23B *47/00*

U.S. Cl. 408—24 **7 Claims**



1. A power drill adapter for sawing operation with a saw blade transmission comprising:

a housing;

a motor fastened inside said housing, said motor having an output shaft extended out of said housing through a hole thereon and coupled with a drill by a chuck outside said housing;

a drive gear mounted around said output shaft of said motor;

a driven gear mounted around a driven shaft inside said housing and meshed with said drive gear;

a channel bearing disposed inside said housing;

a transmission gear disposed inside said housing and driven by said driven gear, said transmission gear comprising an eccentric transmission shaft driven by said driven gear to impart a reciprocating movement to said channel bearing; and

a linking shaft having one end fixed to said channel bearing and an opposite end extended out of said housing through a hole thereon and coupled with a blade holder to hold a saw blade;

whereby turning on said motor causes said transmission gear to reciprocate said saw blade via said linking shaft and said channel bearing.

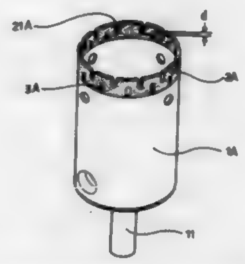
5,316,416
DIAMOND CUTTING TOOL FOR HARD ARTICLES

Soo K. Kim, Seoul, Rep. of Korea, assignor to EHWA Diamond Ind. Co., Ltd., Kyongki-Do, Rep. of Korea

Filed Sep. 29, 1992, Ser. No. 953,509

Int. Cl.⁵ B23B *27/20*

U.S. Cl. 408—145 **1 Claim**



1. A diamond cutting tool for hard articles comprising:

(a) a cup-shaped tool body having an open upper end; and

(b) an annular diamond blade portion comprising:

(i) an upper circumferential edge and a lower circumferential edge, said diamond blade portion being attached at the lower circumferential edge to the open upper end of the cup-shaped tool body;

(ii) a plurality of upper cuts formed at the upper circumferential edge of the diamond blade portion, the upper cuts being spaced from each other at certain intervals, said upper cuts extending downward from the upper circumferential edge of the diamond blade portion and terminating at a depth of the diamond blade portion above the lower circumferential edge; and

(iii) a plurality of lower slots formed at the lower circumferential edge, said lower slots extending upward from the lower circumferential edge of the diamond blade portion and terminating at a height below the upper circumferential edge, each of the lower slots being positioned under and between the upper cuts and extending higher than the bottom of the upper cuts by a predetermined distance.

5,316,417
MICROMETRIC DEVICE FOR FINISHING HIGH PRECISION BORES

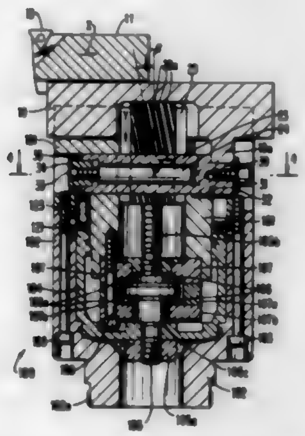
Giordano Romi, Sta. Bárbara d'Oeste-SP, Brazil, assignor to Industrias Romi S/A, Brazil

Filed May 4, 1993, Ser. No. 57,705

Claims priority, application Brazil, Oct. 8, 1992, PI 9204014

Int. Cl.⁵ B23B *51/00*

U.S. Cl. 408—153 **24 Claims**



1. An improved micrometric device for finishing high precision bores, comprising

a tool holder having a cutting tool arranged thereon,

a substantially cylindrical body having an interior,

a movable crossbeam for supporting said tool holder,

displacement means arranged in the interior of said body for displacing said tool holder, said displacement means including a backlash suppression system,

a micrometric screw having an axis of rotation and arranged in the interior of said body, said micrometric screw having an upper extension,

converting means for changing a rotational movement of said micrometric screw into a linear movement of said movable crossbeam, said converting means being connected to said upper extension of said micrometric screw, and

a graduated drum coaxially mounted and connected to said micrometric screw,

said cylindrical body comprising an upper cylindrical body and a lower cylindrical body, said upper cylindrical body being mounted on said lower body, said graduated drum being coaxially arranged between said upper cylindrical body and said lower cylindrical body.

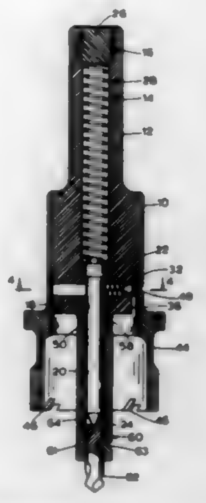
5,316,418
HOLE CUTTER

Masaaki Miyanaga, Hyogo, Japan, assignor to Kabushiki Kaisha Miyanaga, Hyogo, Japan

Filed Sep. 21, 1992, Ser. No. 749,809

Int. Cl.⁵ B23B *51/04*

U.S. Cl. 408—201 **2 Claims**



1. A hole cutter comprising

a spindle having a rearward end shaped to be engaged and rotated by a drive machine, said spindle further having a front end and an axial center bore,

a cylindrical blade for attachment to said front end of said spindle,

a centering pin supported in telescopic relation within said center bore of said spindle, said pin having means for engaging with said spindle to limit the forward movement of said pin relative to said spindle,

a spring supported in said center bore and urging said pin forwardly relative to said spindle to normally project a portion of said pin forwardly from said spindle and said blade, and

a center drill, means for removably attaching said center drill to said front end of said spindle, said center drill projecting forwardly from said blade and from said pin, the drill having an axial center bore which receives the projected portion of said pin, said drill further having a bit attached to its front end and extending forwardly of said pin.

5,316,419
DEVICE FOR MAKING A DRILLED HOLE WITH AN UNDERCUT

Hartmut Bohnet, Waldachtal 3/Tumlingen; Willi Haug, Freudenstadt/Musbach, and Stefan Lind, Waldachtal 3/Tumlingen, all of Fed. Rep. of Germany, assignors to fischerwerke Artur Fischer GmbH & Co. KG., Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Apr. 22, 1993, Ser. No. 51,467

Claims priority, application Fed. Rep. of Germany, May 5, 1992, 4214343

Int. Cl.⁵ B23B *41/00*

U.S. Cl. 408—236 **8 Claims**

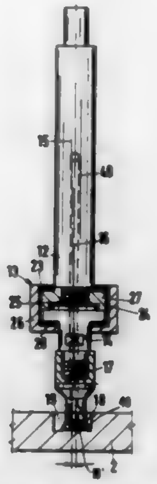
1. Device for producing a drilled hole with an undercut, said device comprising of:

a drilling machine for producing a torque and having a drive axis;

a drilling tool structured to form a drilled hole;

holding means of a supporting stand, said holding means having a swivel bearing for receiving and mounting said drilling machine so that said drilling machine and said drilling tool can swivel, said swivel bearing comprising a bearing bush held fixed in said holding means and a guide sleeve fixedly joined to said drilling machine;

an adapter connectable to the drilling tool and the drilling machine so as to transfer said torque from the drilling machine to the drilling tool, said adapter consisting of a drive part having a center line connectable to the drilling machine and a tool holder connectable to the drive part and also having a center line, the drilling tool being attachable to the tool holder so as to be aligned with the tool holder, and means for detachably securing the tool holder to the drive part so that the center line of the tool holder is inclined relative to the center line of the drive part, said center line of the drive part being aligned with the drive axis of the drilling machine and, when said drilling tool is not in engagement with the facing panel and forming the drilled hole, for rotating the tool holder with the drilling tool relative to the drive part so that a worn engagement region of said drilling tool can be replaced by another engagement region.



5,316,420
SUPPORT FOR A ROTARY MACHINE TOOL

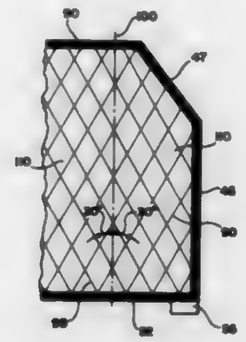
Kazumi Watanabe, and Reiichiro Kashihara, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 9, 1992, Ser. No. 848,267

Claims priority, application Japan, Mar. 15, 1991, 3-076808

Int. Cl.⁵ B23C *1/00*

U.S. Cl. 409—190 **15 Claims**



8. A machine tool assembly comprising:

an upstanding support column including at least a front wall, a pair of spaced, opposed sidewalls and a top which are secured together along respective edges thereof;

a machine tool fixedly secured to said front wall and having a working element projecting therefrom; and

a plurality of elongated reinforcing ribs formed as part of at least said pair of spaced, opposed sidewalls, said reinforcing ribs extending at an acute angle with respect to the vertical; and

a saddle upon which said support column is mounted for linear movement in a first direction.

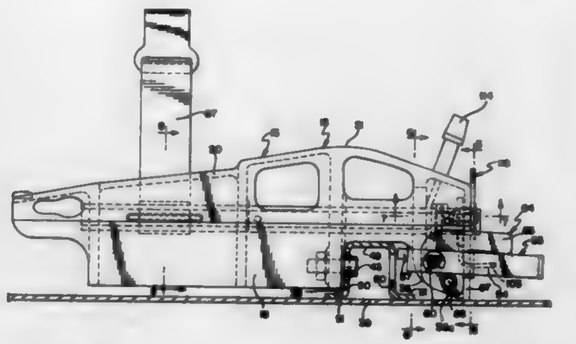
5,316,421
USER FRIENDLY WHEEL CHOCK SYSTEM

Robert L. Bullock, Antioch, and Armand P. Taillon, Chicago, both of Ill., assignors to Standard Car Truck Company, Park Ridge, Ill.

Filed Oct. 29, 1992, Ser. No. 968,289

Int. Cl.⁵ B60P *3/07*

U.S. Cl. 410—9 **18 Claims**



1. A wheel chock system for chocking and restraining a vehicle wheel of a motor vehicle in a transportable carrier, wherein the carrier includes a floor having a longitudinally extending rail mounted thereon to which the wheel chock may be selectively mounted, the chock comprising an elongated body of molded flexible material, means on the body coacting with the rail to mount the chock along the rail, and means carried by the body connectible to a wheel harness for tensioning the harness, said tensioning means comprising a longitudinally extending torque tube rotatably mounted in the body, a wheel harness strap having one end connected to said tube for winding thereon and the other end adapted to be connected to one end of the wheel harness to tension the wheel harness on a wheel of the vehicle, ratchet means for locking the tube against rotation in one direction including a ratchet wheel on the tube and a locking pawl pivotally mounted on a first axis on the body, and a foot-operated lever means pivotally mounted on a second axis on the body for engaging said locking pawl, whereby actuation of the foot-operated lever means will release the locking pawl.

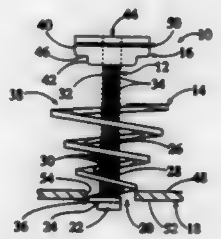
5,316,422
BLIND FASTENER

Ron D. Coffman, Valley Center, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.

Filed Jun. 1, 1992, Ser. No. 891,020

Int. Cl.⁵ F16B *13/04, 37/04, 39/00*

U.S. Cl. 411—107 **14 Claims**



1. A fastener comprising:

a stud having a head and a shank, said shank having a plurality of force fit splines formed longitudinally along an outer surface thereof;

a spring mounted upon, said spring adjacent said head and encircling said shank for engaging a panel surface and exerting a force thereon; and

a washer having a through hole, said washer mounted upon said shank within said through hole and forcibly engaging said splines thereat for retention upon said shank; and

retaining means formed upon said shank for engaging an article for securement thereto.

5,316,423

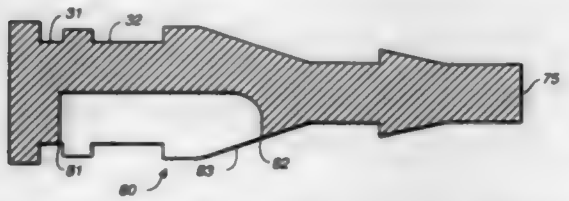
ACOUSTIC ISOLATION FASTENER AND METHOD FOR ATTACHMENT

Daniel C. C. Kin, No. 1 1/F Shatin Wai Village, Shatin N.T., Hong Kong

Filed Dec. 11, 1992, Ser. No. 989,199

Int. Cl.⁵ F16B *19/00, 21/00*

U.S. Cl. 411—510 **15 Claims**



1. A fastener for attaching first and second members by means of substantially aligned first and second openings in the respective members to provide acoustic isolation between the members, each opening having a predefined depth and peripheral shape, said fastener comprising:

a longitudinal shaft portion having first and second segments, said first and second segments having a cross-sectional shape substantially conforming to the a predefined peripheral shape of the first and second openings, respectively, said first and second segments having a longitudinal length substantially conforming to the depth of the first and second openings, respectively;

a cap member integrally disposed longitudinally at a first end of said shaft portion adjacent and outside of said first segment, said cap member having an outer periphery larger than the first opening to inhibit passage of said cap member therethrough;

a spacer member positioned longitudinally on said shaft portion between said first and second segments thereof having an outer periphery larger than the first and second openings to inhibit passage therethrough so as to secure the first member on said first segment of said shaft portion between said cap member and said spacer member and to space the first and second members a predetermined distance from each other corresponding to the longitudinal dimension of said spacer member; and

an abutment member positioned longitudinally on a second end of said shaft portion adjacent and outside of said second segment having an outer periphery larger than the second opening to inhibit passage of said abutment member therethrough so as to secure the second member on said second segment of said shaft portion between said spacer member and said abutment member, said spacer member and said abutment member each having at least one slot therein to permit circumferential compression thereof so as to allow passage of said spacer member and said abutment member through the first and second openings, respectively.

5,316,424

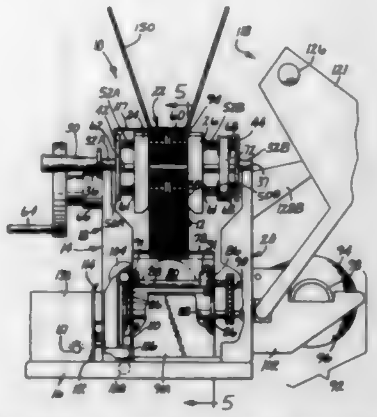
HOT MELT ADHESIVE BINDING METHOD

Robert A. Lahman, Deer Park, Wis.; Gary K. Kuhn, Scandia, Minn.; Kenneth J. Perrington, Maplewood, Minn.; Karl M. Kropp, St. Paul, Minn., and Michael W. Gruber, Huntsville, Ala., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 594,640, Oct. 4, 1990, Pat. No. 5,152,654. This application Apr. 30, 1992, Ser. No. 876,486

Int. Cl.⁵ B42C *9/00*

U.S. Cl. 412—8 **9 Claims**



1. A method of binding a stack of a plurality of sheets of papers together comprising the steps of:

placing a backless, hot melt adhesive material sheet along the top horizontal edge of the plurality of sheets of paper;

heating the hot melt adhesive material sheet to melt the hot melt adhesive material sheet onto the edge of the sheets of paper to cause the liquid adhesive to penetrate the seams between the sheets of paper to bind the sheets of paper together without pressing the liquid adhesive downwardly into the seams between the sheets of paper; and

maintaining a temperature profile across the top of the edge of the sheets of paper at a sufficiently high temperature to prevent the adhesive material from drying before the paper sheets are properly bound and to facilitate adherence of the adhesive material onto the sheets of paper by insulating the edge of the sheets of paper during heating from the remainder of the apparatus.

5,316,425

APPARATUS FOR APPLYING COVERS TO SIGNATURES

William T. Graushar, Wauwatosa, and Robert L. Franz, Jr., Pewaukee, both of Wis., assignors to Quad/Tech, Inc., Sussex, Wis.

Continuation-in-part of Ser. No. 773,025, Oct. 7, 1991, Pat. No. 5,232,324. This application Feb. 10, 1992, Ser. No. 833,356

The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl.⁵ B42C *11/02*

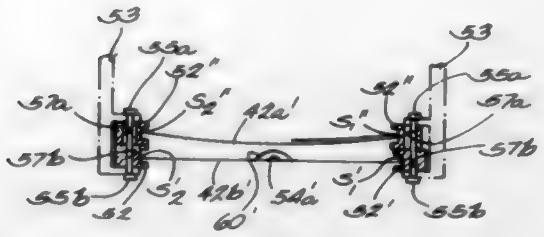
U.S. Cl. 412—19 **7 Claims**

6. An apparatus for delivering covers having respective side edges to a conveyor means and for applying the covers to at least one signature, the apparatus comprising:

cover feeding means for delivering at least a first cover and a second cover upon the conveyor means;

registration means for effecting substantial registration of the first cover and the second cover and for maintaining the first and second covers in substantially superimposed registration on the conveyor means, said registration means including a pair of laterally spaced-apart, elongated cover guides adapted to engage the respective side edges of one of the first and second covers,

means for supporting said cover guides and for affording variation of the lateral spacing of said pair of cover guides; and



fastening means for joining at least said first cover and said second cover in substantially superimposed registration on said at least one signature.

5,316,426

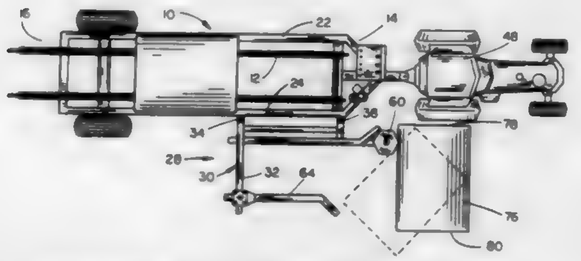
LATERAL BALE PICK-UP ASSEMBLY HAVING A BALE TURNER MOUNTED THEREON

Paul Dwyer, and Mark A. Dwyer, both of HC60, Box 63, Bartlett, Nebr. 68622

Filed Oct. 16, 1992, Ser. No. 962,399

Int. Cl.⁵ B60P *1/48*

U.S. Cl. 414—24.5 **12 Claims**



1. A lateral bale pick-up assembly comprising,

an elongated wheeled frame means having rearward and forward ends and opposite sides,

an elongated bale conveyor means on said wheeled frame means for receiving cylindrical bales thereon in a lengthwise position on said frame and for conveying the same both rearwardly and forwardly,

means on the forward end of said wheeled frame means for attachment to a prime mover,

a bale pick-up cradle assembly pivotally mounted at one side of said wheeled frame means,

said cradle assembly being pivotally mounted, about a horizontal axis parallel to the longitudinal axis of said wheeled frame means and the direction of travel thereof, from a substantially vertical position extending upwardly from said one side of said wheeled frame means to a position extending outwardly from said one side of said wheeled frame means,

said cradle assembly including spaced-apart forwardly extending inner and outer tines for picking up a bale on the ground alongside said one side of said wheeled frame means,

and a generally disc shaped bale turning means at the forward end of one of said tines for engagement with a cylindrical bale positioned on the ground with the ends thereof arranged substantially transverse with respect to the movement of the wheeled frame means,

said generally disc shaped bale turning means engaging the bale and turning the bale approximately 90° so that the ends thereof will be positioned in a lengthwise position on said frame when the bale is received between said inner and outer tines.

5,316,427

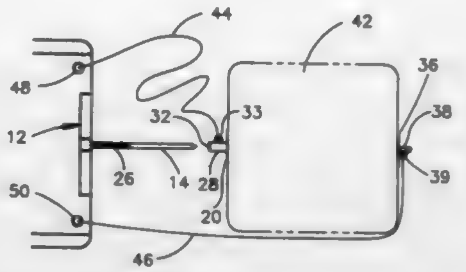
ROUND BALE UNROLLER AND METHOD

Leonard D. DeLong, Rte. 1 Box 204, Duke, Mo. 65461, and Freddy A. Gray, Jr., Rte. 2 Box 66, Waynesville, Mo. 65583

Continuation-in-part of Ser. No. 862,962, Apr. 3, 1992, abandoned. This application May 18, 1993, Ser. No. 63,249

Int. Cl.⁵ A01D *90/10*

U.S. Cl. 414—24.6 **12 Claims**



9. A method for handling round bales of material wound in a spiral mat with a center area by using a vehicle having a vertically movable bale impaling spike thereon in combination with a bale unrolling device comprising a tubular sleeve having opposite ends and an internal diameter sized to fit loosely over said spike, comprising the steps of:

1). Mounting the bale unrolling device over the bale impaling spike in a telescopic relationship;

2). Aligning the bale impaling spike and bale unrolling device thereover with the center area of the bale of material;

3). Inserting the bale impaling spike and bale unrolling device simultaneously into the center area of the bale of material by moving the vehicle in a first direction toward said bale of material;

4). Securing the bale of material to the bale unrolling device so that the ends of the tubular sleeve are located externally of the bale of material;

5). Lifting and transporting said bale of material to a desired area;

6). Depositing the bale of material on the ground at said desired area;

7). Removing the bale impaling spike from the unrolling device by moving the vehicle a sufficient distance in a second direction, opposite to said first direction and away from the bale of material;

8). Connecting a tow line between the vehicle and each respective end of the unrolling device;

9). Unrolling the bale of material on the ground by moving the vehicle and two lines in said second direction.

5,316,428

PALLET STORAGE RACK AND METHOD

Jimmy D. Charping, Taylors, and Walter B. Watson, Greenville, both of S.C., assignors to Engineered Products, Inc., Greenville, S.C.

Continuation of Ser. No. 757,031, Sep. 9, 1991, abandoned. This application Mar. 8, 1993, Ser. No. 29,299

Int. Cl.⁵ B65G *1/02*

U.S. Cl. 414—267 **6 Claims**

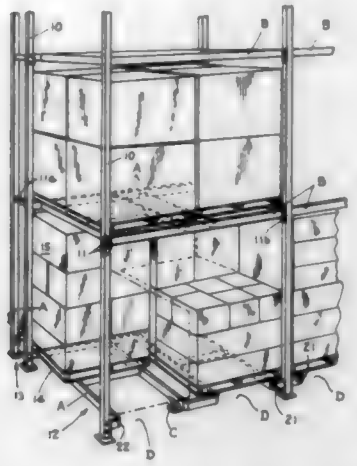
1. A pallet storage rack having a plurality of stacked double wide shelf frame assemblies each supporting a double depth of pallets loaded with articles, wherein said pallets are loaded on said shelf frame assemblies in front to rear relation for selective article removal, comprising:

at least four elongated longitudinal supports extending continuously from a front to a rear of said shelf frame assemblies, said longitudinal supports transversely spaced from each other to bear two loaded pallets disposed in side by side relation and extending transversely across each of said longitudinal supports, said longitudinal supports at ends of outermost ones of said longitudinal supports being connected to vertical frame members;

a plurality of transverse supports spaced longitudinally from a rear portion of said longitudinal supports;

a bottom double wide shelf frame assembly;

base support means carrying said bottom double wide shelf frame assembly above a warehouse floor upon which said pallet storage rack is carried; and



an open central aisle within each double depth of pallets defined by said transverse supports opening at a front portion of said bottom double wide shelf frame assembly;

whereby individuals may enter through said open central aisle for article removal from a rear pallet of each double depth of pallets after a respective front pallet has been removed.

5,316,429

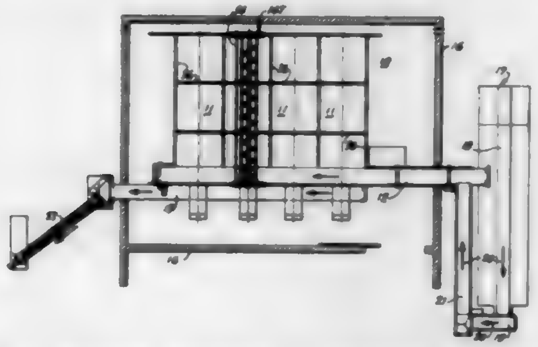
BIN LOADING AND EMPTYING OF CROPS HAVING A ROUNDED ROLLABLE MASS

Joseph W. Connelly, Creston, Iowa; Clive R. Barlow, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat and Control, Inc., So. San Francisco, Calif.

Filed Mar. 24, 1992, Ser. No. 856,489

Int. Cl.^{5} B65G *69/04*

U.S. Cl. 414—298 **10 Claims**



1. In a system for segregating and storing for reallocation a product having a rounded, rollable mass including potatoes, turnips, sugar beets, fruits and the like, the combination comprising;

a plurality of open top bins, generally rectangular in plan, arranged in side-by-side position and having substantial depth so that each bin can receive a substantial volume of product,

incoming conveyor means and discharge conveyor means serving to move product into and out of a selected one of the bins,

the incoming conveyor means including a conveyor belt arranged so that product thereon can be shifted therefrom into the open top of a selected one of the bins,

the conveyor belt being arranged to serve all of the bins disposed in mutual side-by-side relation,

shuttle carriage means operatively mounted for movement over the open tops of the bins and the conveyor belt,

rotatable auger means mounted on the shuttle carriage for rotational movement above the conveyor belt and disposed for removing product from the conveyor belt, the auger extending transversely across the full product carrying width of the conveyor belt and along the length of the open top of a bin selected for filling,

incoming conveyor drive means for moving product into the bins, shuttle carriage drive means serving to shift the carriage along a path over the bins to a bin selected for deposit of product therein,

auger drive means serving to rotate the auger on the carriage for removing product from the conveyor belt arranged therebelow into the selected bin, and

shroud plate means arranged on the carriage and extending across the conveyor belt serving to direct product into the rotating auger and inhibiting product from moving on the belt beyond the selected bin.

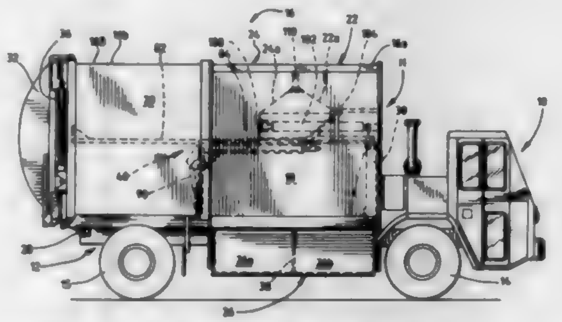
5,316,430

MATERIAL COLLECTING AND HAULING APPARATUS

Larry D. Horning, Crestline; Eugene R. Grubaugh, Galion; Thomas E. Pfeifer, Galion, and Carroll R. Johnson, Galion, all of Ohio, assignors to Galion Holding Company, Galion, Ohio Continuation of Ser. No. 565,172, Aug. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 389,626, Aug. 4, 1989, abandoned. This application Apr. 15, 1993, Ser. No. 47,875

Int. Cl.^{5} B65G *67/02*

U.S. Cl. 414—407 **37 Claims**



1. Material collecting apparatus, comprising:

(a) structure defining a truck body having a front and rear mountable to a truck frame;

(b) front and rear material-receiving compartments defined and separated in part within the body by a moveable dividing wall; said moveable dividing wall including a transverse section slideable along a track extending longitudinally with respect to said truck body and a substantially vertically oriented section extending downwardly from said transverse section;

(c) a bucket moveable between a loading position and a discharge position along a path of travel and along at least one side of said truck body;

(d) a hoist mechanism for transporting said bucket from said loading position to said discharge position; and

(e) a recess which is defined by said truck body at the front thereof and within which said bucket travels for a portion of its path of travel.

19. Material collecting apparatus, comprising:

(a) structure defining a truck body which has a material-receiving compartment:

(b) said truck body being defined by at least one planar sidewall;

(c) a loading device for transporting material between a loading position and a discharge position at which material from said loading device is dumped into said compartment; and

(d) a structure defining a path of travel for said loading device such that said loading device moves along said sidewall in close proximity thereto, material being contained in said loading device jointly by a plurality of external containing walls of the loading device and by said truck body sidewall; and,

(e) said truck body sidewall cooperating with the containing walls of said loading device to maintain material within said loading device until said loading device reaches said discharge position at which material is free to fall from said loading device as said loading device moves past an upper portion of said truck body sidewall.

5,316,431

AUTOMATIC LOADING DEVICE FOR BALES OF HAY, ALFALFA AND THE LIKE

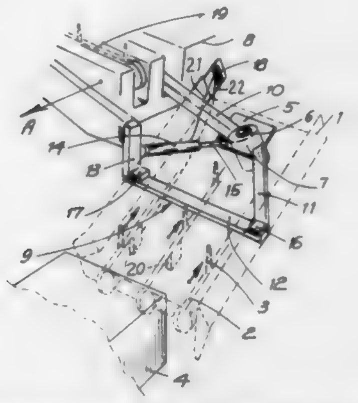
Manuel C. Barber, Ctra. de Tarrega a Balaguer, s/n, 25332 La Fuliola, Lleida, Spain

Filed Jul. 1, 1992, Ser. No. 907,333

Claims priority, application Spain, Sep. 3, 1991, 9101969

Int. Cl.^{5} B60P *1/36*

U.S. Cl. 414—523 **15 Claims**



1. Device for the automatic loading of bales onto a trailer (8), comprising

a ramp (1) provided with traction chains (2) having spikes (3) for handling bales (4), said ramp (1) being movable from a gathering position in which bales are gathered onto said ramp to a loading position in which the bales are transferred from said ramp onto the trailer, said ramp being mounted for rotation on a geometrical axis (aa'), said axis being fixed to the trailer,

said ramp being oriented in a moving direction of the trailer and inclined at an angle δ with respect to a horizontal plane when in said gathering position,

said ramp being oriented at a right angle to the moving direction of the trailer and having a height corresponding to the height of a platform of the trailer when in said loading position,

means to move said ramp between said gathering position and said loading position in a single rotation (Ω) around the geometrical axis (aa'),

said geometrical axis (aa') being inclined with respect to the horizontal plane and a vertical plane arranged at a right angle to the horizontal plane, said vertical plane being arranged in the moving direction of the trailer (8), and

means to move said traction chains to thereby convey the bales along said ramp.

5,316,432

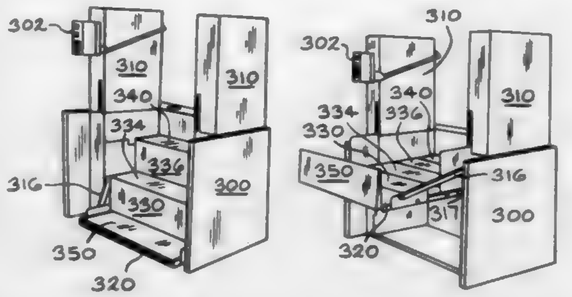
WHEELCHAIR LIFTS WITH AUTOMATIC BARRIER

Raymond L. Smalley; John C. Hall; Ryan J. Clouse; P. Fred Risner, all of Carey, and Edward L. Strohm, Tiro, all of Ohio, assignors to REB Manufacturing Co., Inc., Carey, Ohio

Filed Dec. 7, 1992, Ser. No. 986,569

Int. Cl.^{5} B60R *3/02*

U.S. Cl. 414—540 **16 Claims**



1. In a wheelchair lift having steps convertible into a platform further comprising a barrier for said platform which is automatically raised when said steps are converted into said platform, the mechanism for operating said barrier comprising:

1) means for converting said steps into said platform,

2) a lower step,

3) a shaft journalled in said platform under an inner part of said lower step, said shaft having at least two integral radially projecting arms,

4) an extendible single link connected between one of said radially projected arms and said barrier, and

5) means connected between said converting means and the other of said radially projecting arms for oscillating said shaft and thereby operating said extendible link to raise said barrier.

5,316,433

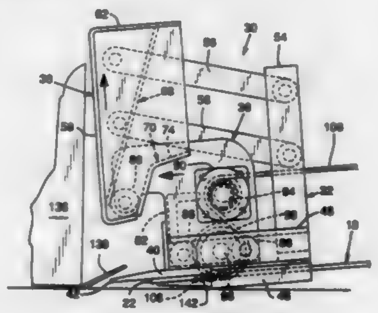
LOW PROFILE PUSH-PULL SLIPSHEET HANDLER

Daniel F. Chase, Longview, Wash., assignor to Loron, Inc., Longview, Wash.

Filed Feb. 21, 1992, Ser. No. 840,717

Int. Cl.^{5} B66F *9/14*

U.S. Cl. 414—607 **32 Claims**



1. A push-pull slipsheet handler comprising:

a platen having an upwardly facing load carrying surface;

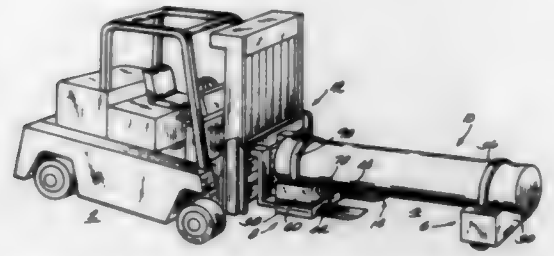
a push plate assembly mounted for movement over the platen between an extended position and a retracted position, the push plate assembly including a forwardly facing push-plate vertically movable relative to the platen between a lowered positioned and a raised position;

a driver carried by the push-plate assembly and actuatable for moving the push-plate assembly between the retracted position and the extended position, the driver being operable to engage the push plate for moving the push plate between the lowered position and the raised position.

5,316,434
APPARATUS AND METHOD FOR HAULING MATERIAL OBJECTS

Clarence E. Martin, Oak Creek, and David J. Burrows, Cudahy, both of Wis., assignors to Harnischfeger Corporation, Brookfield, Wis.

Filed May 7, 1992, Ser. No. 879,409
Int. Cl.⁵ B60P *3/40*
U.S. Cl. 414—607 **7 Claims**



1. A material hauler for transporting a material object, the hauler being in movable engagement with a material handling vehicle travelable on a floor and having a load lifting and lowering means including a pair of vertically movable spaced apart forks extending substantially horizontally from the vehicle, comprising:

a first material carrier separate from the material object except during transport of the latter and including wheel means for permitting movement of the first material carrier along the floor;

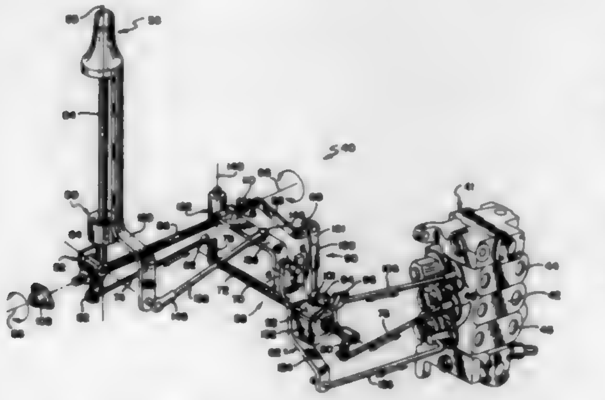
a second material carrier spaced from the first material carrier, the second material carrier being movably supported on the forks relative to the forks whereby the second material carrier travels with the material handling vehicle; and

said material object bridges the space between and is in engaging support with the first and second material carriers only during transport of the material object such that the first material carrier and the material object also travel with the material handling vehicle.

5,316,435
THREE FUNCTION CONTROL SYSTEM

Robert E. Mozingo, Burlington, Iowa, assignor to Case Corporation, Racine, Wis.

Filed Jul. 29, 1992, Ser. No. 921,855
Int. Cl.⁵ E02F *3/36*
U.S. Cl. 414—685 **14 Claims**



1. A three function control system for independently or conjointly controlling three different functions of a front end loader, said control mechanism comprising:

a vertically elongated control lever;

a control lever mounting arranged toward one of the ends of the lever for allowing said control lever to be manipulated through first and second control arcs centered about first and second pivot axes, respectively;

a first linkage assembly connected to the control lever for translating accurate movement of said control lever through said first control arc into a first loader function, said first linkage assembly including an actuator for moving fore-and-aft in response to manipulation of the control lever through the first control arc resulting in control of the first loader function, and for moving side-to-side in response to manipulation of the control lever through the second control arc, with the side-to-side movements of the actuator of the first linkage assembly having substantially no effect on the other two loader functions;

a second linkage assembly connected to the control lever for translating accurate movement of said control lever through said second control arc into a second loader function, said second linkage assembly including an elongated actuator supported for oscillation about a fixed axis in response to manipulation of the control lever through the second control arc resulting in control of the second loader function, said second linkage assembly having said control lever mounting carried thereon such that movement of the control lever through said second control arc imparts oscillatory movement to the elongated actuator of the second linkage assembly while movement of the control lever through said second control arc has substantially no effect on the actuation of the first linkage assembly and substantially no effect on a third loader function;

a handle assembly including a single handle carried at a free upper end of said conrol lever for moving said control lever through said first and second control arcs and mounted for manipulation through a twisting motion;

a third linkage assembly connected to the handle for translating twisting motion of said handle into a third loader function, said third linkage assembly including an actuator for moving a pair of levers in response to twisting movement of the handle resulting in control of the third loader function, with each lever of the third linkage assembly being movable about a separate axis, and with said actuator for the third linkage assembly moving with said handle as the control lever is moved through the first and second control arcs while imparting substantially no movement to said levers and thus substantially no effect relating to the third loader function; and

wherein manipulation of the control lever through the first and second control arcs and twisting manipulation of the handle of the handle assembly allows for all three functions to be accomplished either independently or conjointly relative to each other through manipulation of the handle assembly carried by the control lever.

5,316,436
DEVICE FOR HOLDING AND INVERTING STEAM TURBINE CYLINDER HALVES

Michael A. Main, Winter Springs, Fla., and Jonathan C. Snyder, Brandon, Miss., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1992, Ser. No. 823,415
Int. Cl.⁵ B25J *11/00*
U.S. Cl. 414—778 **6 Claims**

1. A method of inverting a steam turbine cylinder half having a flange thereon, said method comprising the steps of:

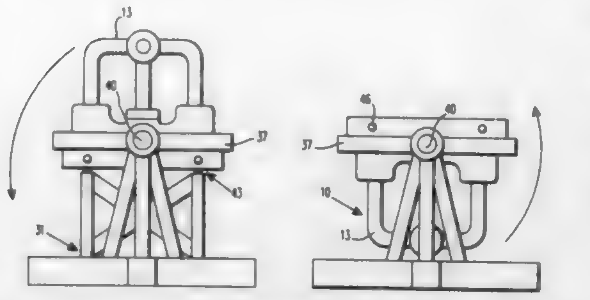
a. providing an inverting apparatus comprising a base member, a removable support platform associated with the base member and having a jacking mechanism, and inverting means extending upward from the base member and having a rotatable carriage assembly adapted to be secured to the cylinder half flange;

b. placing the cylinder half upon the support platform;

c. activating the jacking mechanism of the support platform to position the cylinder half thereon such that the cylinder half flange is disposed adjacent said inverting means;

d. securing the cylinder half flange to said inverting means;

e. deactivating the jacking mechanism and removing the support platform from the base member; and

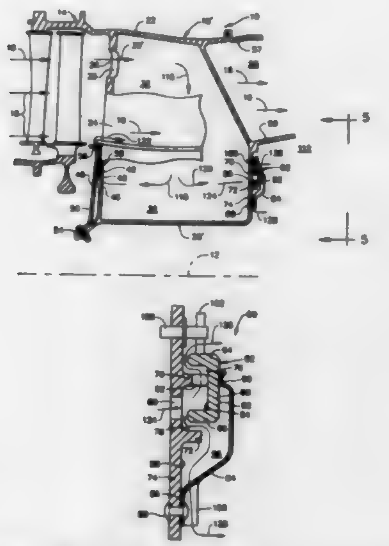


f. actuating said inverting means to rotate the carriage assembly and the cylinder half thereon a predetermined amount.

5,316,437
GAS TURBINE ENGINE STRUCTURAL FRAME ASSEMBLY HAVING A THERMALLY ACTUATED VALVE FOR MODULATING A FLOW OF HOT GASES THROUGH THE FRAME HUB

Robert P. Czachor, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 19, 1993, Ser. No. 19,727
Int. Cl.⁵ F01B *25/00*
U.S. Cl. 415—115 **9 Claims**



1. A structural frame assembly for use in a gas turbine engine, said assembly comprising:

a) an annular inner hub made of a material having a relatively high coefficient of thermal expansion;

b) an annular outer casing concentric with said inner hub about a longitudinal axis of said engine;

c) a plurality of radially extending hollow struts extending between and fixedly connected to said inner hub and said outer casing; and

d) means for reducing a bulk temperature differential between said inner hub and said outer casing and for providing a uniform temperature distribution of said inner hub;

e) said means for reducing and providing comprising:

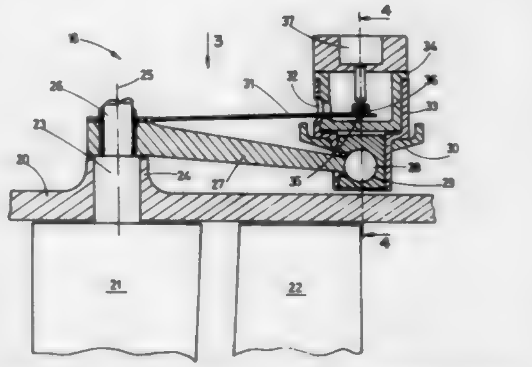
i) scoop means for directing a flow of hot gases from a flowpath of said engine through an interior of each of said struts into an interior of said inner hub;

ii) valve means for modulating a portion of the flow of hot gases entering said inner hub through a flow discharge means formed in an aft wall of said inner hub.

5,316,438
GAS TURBINE ENGINE VARIABLE AEROFOIL VANE ACTUATION MECHANISM

Henry Tubbs, Tetbury, Great Britain, assignor to Industria de Turbo Propulsores S.A., Vizcaya, Spain

Filed Apr. 23, 1993, Ser. No. 52,551
Claims priority, application Spain, Jan. 29, 1993, P9300166
Int. Cl.⁵ F01D *17/16, 21/14*
U.S. Cl. 415—118 **7 Claims**



1. In a gas turbine engine, an actuation mechanism for rotating a plurality of aerofoil vanes spaced circumferentially about a center line, each having a spindle extending through a casing about which the vane is pivotable, comprising:

an annular actuation member circumferentially surrounding said engine;

a plurality of actuation levers, each actuation lever interconnecting a corresponding one of said aerofoil vanes with said actuation member for causing simultaneous equal pivotal movement of said aerofoil vanes about their longitudinal axes as said actuation member is rotated;

a like plurality of indication levers each having first and second ends, each said indication lever being attached at a first end to a respective aerofoil vane to pivot therewith and cooperating with said actuation member in such a manner that during said simultaneous equal pivotal movement of said aerofoil vanes about their spindles, substantially only relative pivotal movement occurs between each indication lever and said actuation member; and

means supported on said actuating member and cooperating with a second end of each indication lever and responsive to any non-pivotal relative movement about said given axis between any of said indication levers and said actuation member resulting from the non-simultaneous, non-equal pivotal movement of any aerofoil vane attached to any indication lever, to provide an indication of such non-simultaneous, non-equal pivotal vane movement.

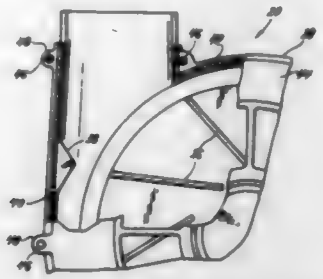
5,316,439
NOISE CANCELLATION DEVICE FOR CENTRIFUGAL BLOWER

William S. Gatley, Jr., and Bobby D. Garrison, both of Cassville, Mo., assignors to Fasco Industries, Inc., Cassville, Mo.

Continuation of Ser. No. 881,998, May 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 820,096, Jan. 13, 1992. This application Aug. 24, 1993, Ser. No. 111,016
Int. Cl.⁵ F04D *17/04*
U.S. Cl. 415—119 **9 Claims**

1. In a device having means for blowing air from an inlet to an outlet, said blowing means including a rotatable impeller having blades mounted thereon, said inlet being disposed to ingest air axially of said impeller, said outlet being disposed to discharge air generally tangentially of said impeller, said device including a first stationary structure formed in part by a

first outlet wall and aligned with said impeller such that as said impeller is rotated said blades sweep past said first stationary structure to create a first noise at a fundamental frequency, the improvement comprising a second stationary structure fixed in the outlet, spaced from said first stationary structure, and on a second outlet wall opposite from said first outlet wall, and aligned with said impeller, said second stationary structure having means for creating a second noise at said fundamental frequency, said second noise interfering with and being out of phase with, said first noise to thereby substantially reduce the intensity of said first noise, wherein said second stationary structure comprises a projection having only a single elongated base portion fixed to said second wall of said outlet, and having walls inclined from said base portion toward each other and extending from said base portion inwardly of said outlet toward said impeller to form a ridge adjacent said impeller defining a constriction in said outlet between said projection and said impeller.



5,316,440
BLOOD PUMP APPARATUS

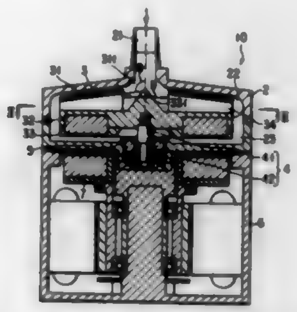
Toshihiko Kijima; Kunio Horiuchi, and Hiroyuki Oshiyama, all of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 880,748, May 8, 1992. This application Feb. 1, 1993, Ser. No. 12,247

Claims priority, application Japan, May 10, 1991, 3-135943; Sep. 11, 1991, 3-232031; Feb. 3, 1992, 4-47962

Int. Cl.⁵ F01D *5/12*

U.S. Cl. 415—206 **28 Claims**



1. A centrifugal type blood pump apparatus for blood components, comprising:

a housing forming a substantially cylindrical liquid chamber;

an inlet port formed at an upper central portion of said housing and communicating with both a supply source of blood component and said chamber;

an outlet port formed in a peripheral portion of said housing and communicating with said chamber, said outlet port comprising an opening in said housing;

a rotator rotatably arranged in said chamber and having an upper cover and a lower shroud, a lower surface of the upper cover being inclined such that an angle θ formed by the lower surface and a central axis of the inlet port is an obtuse angle, and a plurality of grooves formed radially in an upper portion of said shroud;

projection means formed at an upper central portion of the shroud and located immediately below said inlet port for directing input blood component toward said plurality of grooves;

bearing means for rotatably supporting the rotator with respect to the housing;

motor means for applying a rotational force to the rotator to rotate the rotator; and

a plurality of distributing paths defined between said upper cover and said plurality of grooves of the shroud, and communicating with both the inlet port and the outlet port, said distributing paths each having at least a surface which is downwardly inclined from said inlet port toward said outlet port and said distributing paths being separated from each other and out of communication with each other at portions thereof between input and output ends thereof and, each of said distributing paths having a cross sectional area which gradually diminishes in one direction along the length thereof.

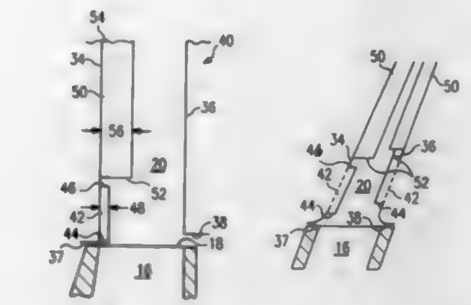
5,316,441
MULTI-ROW RIB DIFFUSER

Colin Osborne, Norwich, Vt., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Feb. 3, 1993, Ser. No. 13,053

Int. Cl.⁵ F04D *29/44, 29/30*

U.S. Cl. 415—208.4 **10 Claims**



1. A vaneless diffuser for correcting nonuniform flow exiting radially from an impeller, the nonuniform flow being characterized by a rate of flow that is lowest at one side and increases towards the middle of the flow, said diffuser comprising:

(a) a housing attachable around the impeller and defining a passage for receiving the nonuniform flow exiting from the impeller, the passage extending radially from the impeller and defined between a first wall for bordering the side of the nonuniform flow that has the lowest rate of flow and a second wall for bordering the other side of the nonuniform flow, said first wall and said second wall having an upstream end proximal the impeller when the housing is attached around the impeller, the passage having no structure that extends across it from the first wall to the second wall;

(b) a plurality of low ribs extending from said first wall partially into said passage and arranged around said upstream end in a first pattern for partially correcting a portion of the low flow, each of said plurality of low ribs having a low rib leading edge towards said upstream end of said first wall and a low rib trailing edge opposite of and downstream of the leading edge; and

(c) a plurality of high ribs extending from said first wall into said passage further than said plurality of low ribs but less than the distance to the second wall and arranged in a second pattern that is concentric with the first pattern of said plurality of low ribs for correcting the low flow downstream of said low rib leading edges, each of said plurality of high ribs having a high rib leading edge towards said upstream end of said first wall.

5,316,442
ARTICULATED ROTOR HEAD FOR GYROPLANES

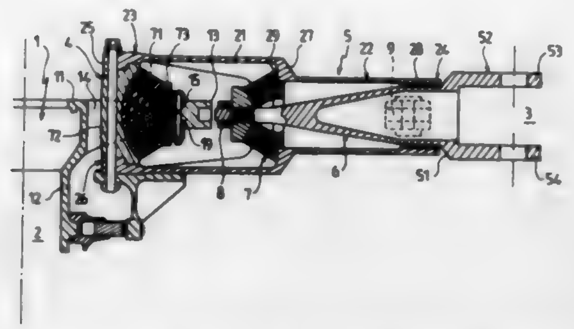
René L. Mouille, Aix-En-Provence, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 22, 1992, Ser. No. 994,749

Claims priority, application France, Dec. 27, 1991, 91 16220

Int. Cl.⁵ B64C *27/48*

U.S. Cl. 416—134 A **31 Claims**



1. Articulated rotor head for gyroplanes having a drive spindle and plural blades, said head comprising a central rigid hub body perpendicularly integrated with the drive spindle and having a plurality of openings made therein, a center, and a rotational axis, each blade being radially fixed to said hub body by a connecting and articulating device, wherein each said device comprises:

a spherical laminated elastomeric stop comprising an outer rigid armature, an inner rigid armature, and alternate concentric and spherical layers of elastic and rigid materials arranged between said outer and inner armatures, said stop being housed in one said opening made in said central hub body, said outer armature bearing against a rigidified edge of said opening;

a hollow sleeve having one end on a center side of the hub body housing the spherical laminated stop, said one end being locked to said inner rigid armature of said spherical laminated stop, said sleeve having another end on the side opposite the center of the hub body, side faces, and means at said another end on one of said side faces for connecting an end of an elastic return and damping brace of the blade;

a connecting and pitch articulation spindle for the blade having an outer part provided with means for rigidly connecting to a foot of the blade, and an inner part mounted to swivel around a pitch axis on two bearings inside said another end of the sleeve, one of said two bearings forming an thrust stop that transmits from said spindle in the sleeve the thrust loads originating from centrifugal forces on the blade;

a pitch lever rigidly locked to said connecting and pitch articulation spindle.

5,316,443
REVERSIBLE MIXING IMPELLER

John M. Smith, Cranleigh, United Kingdom, assignor to Chemineer, Inc., Dayton, Ohio

Filed Oct. 4, 1991, Ser. No. 770,842

Int. Cl.⁵ B01F *3/04*

U.S. Cl. 416—197 R **9 Claims**

1. A liquid mixing impeller operable by changing the direction of rotation to produce distinctively differing mixing modes, comprising:

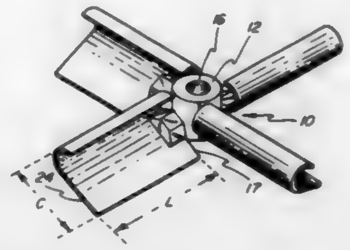
said impeller having a hub for mounting on a driven shaft,

a plurality of substantially identical blades each extending generally radially from said hub, said blades each having a root portion attached to said hub and each having axially remote blade tips,

each of said blades being formed of sheet material having generally radially extending chordwise spaced edges extending from said root portion to said tip,

the same one of said blade edges on each of said blades being defined by a blade portion folded and turned back upon itself through a limited chordwise extent to form a concavity which faces the other blade edge,

the remainder of each of said blades being relatively flat and being inclined with respect to the axis of said hub when viewed from said blade tips to define a positive pitch angle with respect to the plane of rotation of said blades thereby defining for each of said blades a pressure side on one side of said blade and a suction side on the opposite side of said blade such that said concavities are positioned on said blade suction sides when said impeller is rotated in the direction wherein said folded edge portions are the leading edges, and said impeller generates an axial flow and whereby said impeller is rotated in the opposite direction said concavities cause said blades to develop a radially outward flow.



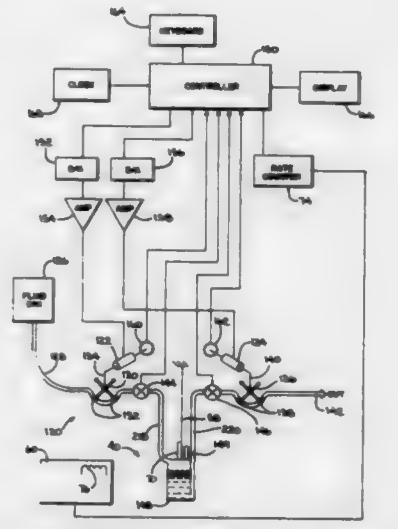
5,316,444
PUMP CONTROL AND METHOD OF PUMPING

Michael F. Wicnienski, 36903 Carol La., Lake Villa, Ill. 60046

Filed Apr. 29, 1993, Ser. No. 54,900

Int. Cl.⁵ G01F *1/84*

U.S. Cl. 417—2 **17 Claims**



1. A pump control for controlling flow through a tube, the tube having an inlet connected to a supply of liquid and an outlet, the pump control comprising:

a variable speed pump having a rotatable shaft and a roller mounted on the shaft, the roller being engaged with the tube between the tube inlet the tube outlet for pumping liquid from the supply toward the outlet when the shaft rotates;

a first sensor for sensing liquid at a first location in the tube;

a second sensor for sensing liquid at a second location in the tube between the first location and the tube outlet;

means for measuring the natural frequency of the tube and liquid contained in the tube between the first location and the second location;

a microprocessor control connected to the pump, the first and the second sensors and the natural frequency measuring means, for
a) computing the mass of the portion of the tube between the first and the second sensors as a function of the natural frequency measured when the tube is empty,
b) rotating the pump shaft at a first pump rate to pump liquid from the supply through the tube,
c) discontinuing rotation of the pump shaft when liquid is sensed by the second sensor,
d) determining the amount of rotation of the pump shaft and the length of time between when liquid is sensed by the first sensor and when liquid is sensed by the second sensor,
e) computing the mass of the portion of the tube and liquid contained therein between the first location and the second location as a function of the natural frequency measured when the second sensor senses liquid,
f) computing the mass of fluid between the first location and the second location,
g) computing a second pump rate as a function of a desired flow rate, the computed liquid mass and the determined amount of rotation of the pump shaft and the length of time between when liquid is sensed by the first sensor and when liquid is sensed by the second sensor, and
h) rotating the pump shaft at the second pump rate.

5,316,445

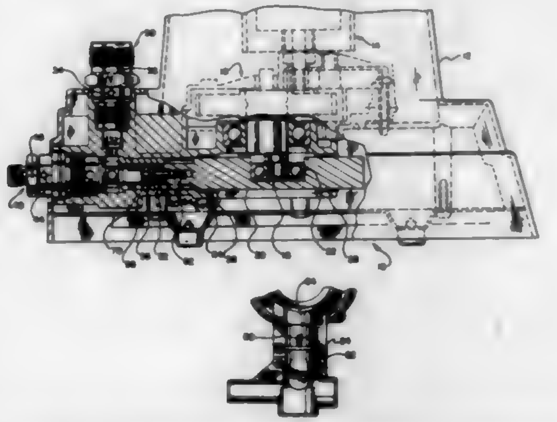
PUMPING APPARATUS WITH PISTON SEAL AND CYLINDER REMOVING MEANS

Mark E. Snetting, Eden Prairie; Thomas F. Kruzel, Maple Grove, and Robert D. Cooper, Jr., Blaine, all of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Mar. 3, 1993, Ser. No. 25,986

Int. Cl.⁵ F01B *29/00*

U.S. Cl. 417—53 **5 Claims**



1. A method of replacing a pumping chamber in a cylindrical piston type paint pump assembly comprising the steps of:
a) removing a closure member at an end of the pump assembly distal of a piston in the assembly to provide an axial access to the pumping chamber;
b) removing an old pumping chamber by:
  i) detaching an old seal from the end of the piston and withdrawing the old seal out of the pump assembly through the axial access, and
  ii) removing an old cylindrical sleeve which formed a cylindrical sidewall of the pumping chamber by levering the old cylindrical sleeve against a housing of the pump assembly in a direction away from the piston and out of the pump assembly through the axial access;
c) installing a new pumping chamber into pump assembly by:
  i) inserting a new cylindrical sleeve into pump assembly through the axial access by moving the new cylindrical sleeve axially toward the piston to provide a new cylindrical sidewall for the pumping chamber,
  ii) inserting a new seal through the axial access,
  iii) axially moving the new seal into the new cylindrical sleeve, and
  iv) attaching the new seal to the piston; and
d) reinserting the closure member at the end of the pump assembly distal of the piston to close the axial access to the pumping chamber.

5,316,446

VARIABLE CAPACITY WOBBLING SWASH PLATE TYPE COMPRESSING APPARATUS

Kazuya Kimura, and Hiroaki Kayukawa, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

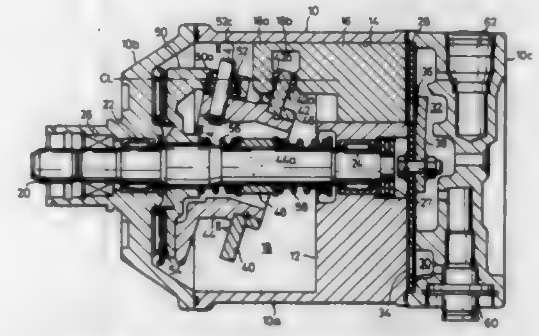
PCT No. PCT/JP92/00370, § 371 Date Nov. 3, 1992, § 102(e) Date Nov. 3, 1992, PCT Pub. No. WO92/17704, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 26, 1992, Ser. No. 945,969

Claims priority, application Japan, Mar. 26, 1991, 3-062093

Int. Cl.⁵ F04B *27/08*

U.S. Cl. 417—269 **5 Claims**



1. A variable capacity wobbling swash plate type compressing apparatus comprising:
a housing means having a central longitudinal axis thereof;
a cylinder block means arranged in the housing means; said cylinder block means being provided with cylinder bores arranged radially equidistantly spaced at a predetermined distance from and equidistantly spaced circumferentially about said central axis of the housing means; said cylinder bores being in communication with a fluid suction chamber and a fluid discharge chamber, respectively, via valve elements;
individual piston means arranged in each of said cylinder bores, each of said piston means having a central longitudinal axis and being slidable within said respective cylinder bores along said piston axis;
a drive shaft means having a longitudinal axis and extending along said central axis of the housing means in a crank chamber defined by said housing means;
a swash plate means capable of wobbling about an axis perpendicular to said longitudinal axis of the drive shaft means;
shoe means arranged between said swash plate means and said respective piston means for converting rotation of said swash plate means into reciprocation of said respective pistons; said shoe means being arranged in substantial alignment with said central longitudinal axes of said respective piston means;
a rotary drive means fixedly mounted on said drive shaft means; and
connecting means arranged between said rotary drive means and said swash plate means for transmitting rotation of said rotary drive means to said swash plate means; said connecting means permitting wobbling movement of said swash plate means in response to a pressure differential between said fluid suction and/or discharge chambers and said crank chamber to thereby vary the compression capacity of said piston means,
said connecting means comprising:
  a pivotable bearing element having a through hole therein and being supported by said rotary drive means for rotation therewith and arranged at said predetermined radial distance from said central axis of the housing for traversing a circular path upon said rotation which path intercepts the longitudinal extensions of said central longitudinal axes of said piston means; and
  a connecting pin element radially extending from said swash plate means and slidably engaged within said through hole of said pivotable bearing element.

5,316,447

AXIAL MULTI-PISTON TYPE COMPRESSOR HAVING MOVABLE DISCHARGE VALVE ASSEMBLY

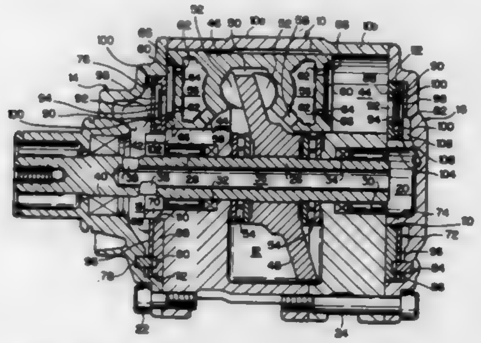
Toshiro Fujii; Koichi Ito; Kazuo Murakami, and Kazuaki Iwama, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 23, 1992, Ser. No. 980,279

Claims priority, application Japan, Nov. 28, 1991, 3-314440

Int. Cl.⁵ F04B *1/12, 27/08;* **F01B** *13/04*

U.S. Cl. 417—269 **10 Claims**



1. An axial multi-piston compressor comprising:
a cylinder block body having a plurality of cylinder bores formed radially outward from and disposed circumferentially equidistantly about a central axis thereof;
a plurality of pistons slidably received in said cylinder bores, respectively, to be reciprocated therein to execute alternately a suction stroke and a discharge stroke;
suction valve means for controlling the delivery of a fluid to be compressed from a suction chamber to each of said cylinder bores during the suction stroke; and
a discharge valve assembly for controlling the discharge of a compressed fluid from each of said cylinder bores into a discharge chamber during the compression stroke,
wherein said discharge valve assembly is axially movable between a first position in which said discharge valve assembly is abutted against an end wall face of said cylinder block body and a second position in which said discharge valve assembly is spaced from said end wall face of said cylinder block body to define a narrow space therebetween to communicate said cylinder bores with each other, and is pushed away toward said second position due to the pressure of the compressed fluid during initial running of the compressor; and wherein, means are provided such that when said discharge valve assembly is at said second position, a small part of the compressed fluid is discharged into said discharge chamber through the discharge valve assembly, and the remaining major part thereof is introduced into said narrow space to be supplied to the cylinder bores in which a suction stroke is being executed, whereby said discharge valve assembly is gradually moved from said second position toward said first position in response to increase in the pressure of said discharge chamber.

5,316,448

PROCESS AND A DEVICE FOR INCREASING THE EFFICIENCY OF COMPRESSION DEVICES

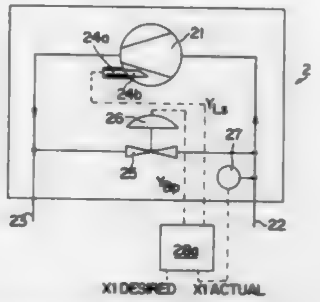
Bruno Ziegler, Wil, Switzerland; Hermann Herzog, Hamburg, Fed. Rep. of Germany, and Udo Wagner, Winterthur, Switzerland, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 19, 1992, Ser. No. 959,947

Claims priority, application Switzerland, Oct. 18, 1991, 03059/91-7

Int. Cl.⁵ F04B *49/00*

U.S. Cl. 417—307 **10 Claims**



1. A process for increasing the efficiency of a compressor having a suction line as an input, a pressure line as an output and a counter-pressure valve wherein the compressor compresses a fluid, the process comprising the steps of:
bleeding fluid from the pressure line to the suction line through a bypass valve disposed in parallel with the compressor;
monitoring the pressure in the suction line to provide a first signal indicative of the actual pressure in the suction line; and
comparing the first signal to a second signal indicative of a desired suction line pressure to produce a first error signal for controlling the size of the opening of the counter-pressure valve in the compressor which counter-pressure valve controls the suction pressure, and providing a second error signal which controls the size of the opening of the bypass valve, wherein fluid flow between the suction and pressure lines is adapted to the requirements of the cooling process while maintaining the suction pressure substantially constant.

5,316,449

MOTOR-DRIVEN PUMP WITH REACTION TURBINE

Guido Vandendorpe, Knokke-Heist, Belgium, assignor to N.V. Baggerwerken Decloedt & Zoon, Belgium

Filed Nov. 3, 1992, Ser. No. 971,526

Claims priority, application European Pat. Off., Nov. 14, 1991, 91870183.0

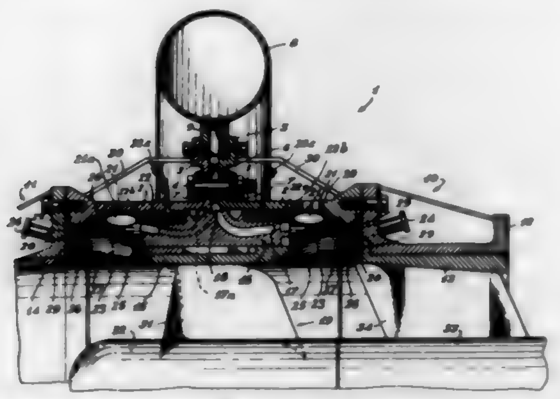
Int. Cl.⁵ F04D *13/04, 3/02;* **F04C** *11/00*

U.S. Cl. 417—355 **15 Claims**

1. A motor-driven pump including a turbine driven by a pressurized fluid and a rotary pump for pumping liquids and liquids laden with solid particles comprising:
a fixed pump body including two cylindrical end members of the same internal diameter, which constitute respectfully a suction port and a delivery port, said two cylindrical end members being spaced apart and disposed in line with one another;
a cylindrical sleeve of an internal diameter substantially equal to that of the two end members, said sleeve being rotatably mounted in line with and between the two end members and adopted to rotate about an axis thereof;
rotary pumping members of the rotary pump being mounted inside and secured to the cylindrical sleeve;
two cylindrical casing elements being assembled together at one end thereof, and with the respective other end fixed to the two end members of the fixed pump body, said two

casing elements constituting a turbine casing for accommodating the rotatably cylindrical sleeve, thereby defining an annular space between each end of the sleeve and one of the end members;

a rotor of the turbine being mounted in ring configuration around the sleeve and secured thereto, said rotor including at least one series of vanes and having a portion of large diameter extending between two portion of smaller diameter, said vanes being formed on a curved surface of the rotor, each vane including a substantially radial inlet part disposed along the large diameter poriton of the rotor and a substantially axially diverting outlet part disposed along one of the smaller diameter portion of the rotor;

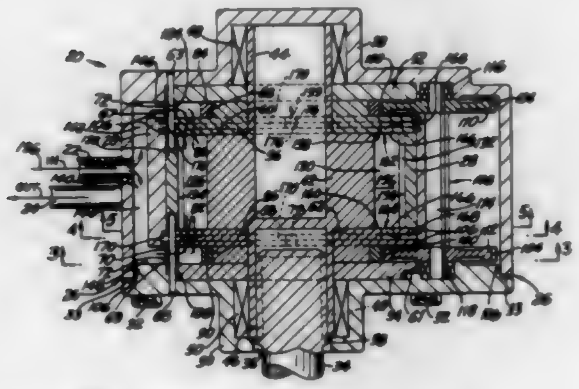


injection means being disposed in ring configuration around the turbine casing and including a distribution volute secured to the casing in an easily detachable manner, said injection means permitting a centripetal injection of the fluid into the turbine and including an injection inlet disposed towards the radial inlet parts of said vanes;

regulation means being disposed on the periphery of the turbine casing between the distribution volute and the rotor, said regulation means adopted to divert the injection flow of the fluid; and

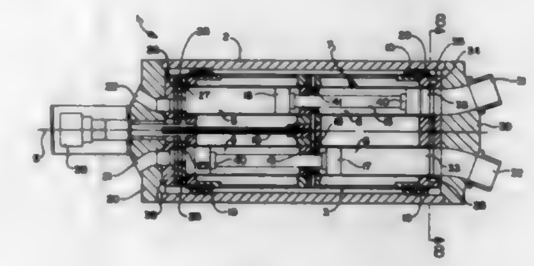
discharge means being disposed in the turbine casing between the axial outlet parts of said vanes and one of the end members of the fixed pump body.

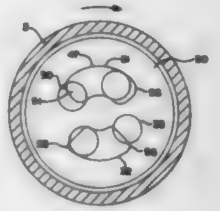
5,316,450
FIXED CAM VARIABLE DELIVERY VANE PUMP
Howard B. Kast, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Feb. 12, 1993, Ser. No. 17,158
Int. Cl.^{5} F04B *49/00*
U.S. Cl. 417—295 **8 Claims**



1. A variable delivery vane pump, comprising:
a housing;
a rotor mounted within said housing;
a plurality of vanes provided on said rotor;
cam means permenently fixed in a predetermined position within said housing and cooperating with said vanes to define a plurality of vane cavities;
inlet means provided in said housing for introducing fluid into said vane cavities;
outlet means provided in said housing for discharging fluid from said vane cavities; and
apportioning means communicating with said inlet means and said outlet means for selectively channeling fluid from said outlet means into said inlet means so as to controllably vary delivery of fluid from said pump, wherein said apportioning means apportions communication of said flow control holes between said inlet means and said outlet means;
a port plate having a plurality of flow control holes formed therein for directing fluid therethrough, wherein said port plate comprises a pair of radial ribs and wherein said actuation ring comprises a pair of port divider ribs moveably aligned over said flow control plates.

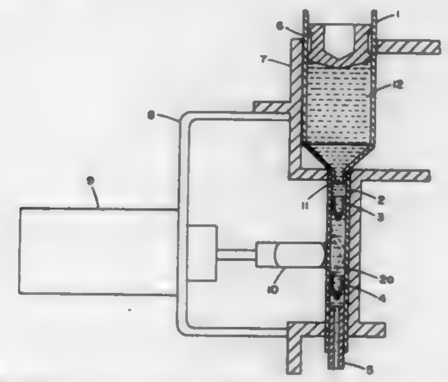
5,316,451
VALVE PORTING FOR ROTATING BARREL RAM PUMP
Donald G. Hore, deceased, late of Adamstown Heights by Margaret H. Hore, executor ; Norman J. Longworth, Bellevue Hill; David McCarthy, Glen Waverley, and Lionel Pullum, Olinda, all of Australia, assignors to ABB Mineral Slurry Transportation Pty. Ltd., Bondi Junction, Australia
PCT No. PCT/AU91/00241, § 371 Date Feb. 1, 1993, § 102(e) Date Feb. 1, 1993, PCT Pub. No. WO91/19094, PCT Pub. Date Dec. 12, 1991
PCT Filed Jun. 4, 1991, Ser. No. 960,457
Claims priority, application Australia, Jun. 5, 1990, PK0485
Int. Cl.^{5} F04B *1/20*
U.S. Cl. 417—392 **14 Claims**





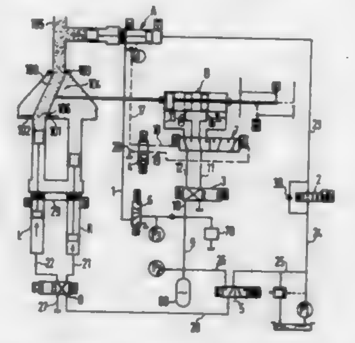
1. A positive displacement pump for slurry incorporating particulate solids in suspension, said pump including:
a housing;
a barrel rotatably mounted within the housing and including a plurality of peripherally spaced motor cylinders and a corresponding number of pump cylinders in respective coaxial alignment with said motor cylinders forming a peripheral array of generally longitudinally extending spaced apart motor and pump cylinder pairs;
a plurality of double acting piston assemblies each comprising a first piston disposed within a respective motor cylinder and a second piston interconnected with and spaced apart from said first piston and disposed within a corresponding pump cylinder, said piston assemblies being sealingly and slideably mounted for reciprocation within the respective motor and pump cylinder pairs;
interconnecting means associated with said motor and pump cylinder pairs whereby axial displacement of any one of said piston assemblies effects a corresponding axial displacement of another of said piston assemblies in predetermined phase relationship;
a stationary motor port block fixed with respect to said housing and including a driving fluid supply port and a driving fluid exhaust port disposed respectively to overlap periodically with corresponding openings in said motor cylinders whereby driving fluid under pressure is alternately admitted into successive motor cylinders through said supply port and discharged through said exhaust port in response to rotational movement of said barrel within said housing thereby to effect a corresponding phase related reciprocating movement of said piston assemblies;
a stationary pump port block fixed with respect to said housing and including an inlet port and a discharge port disposed respectively to overlap periodically with corresponding openings in said pump cylinders whereby fluid to be pumped is alternately admitted into successive pump cylinders through said inlet port as the respective piston assemblies are withdrawn during a suction cycle, and subsequently discharged under pressure through said discharge port as the respective pistons are advanced during a pumping cycle in response to the rotational movement of the barrel;
said inlet port being configured so as to initially overlap with each corresponding opening in said pump cylinders before the respective pistons associated with those cylinders begin to withdraw, thereby to provide an initial inlet port opening clearance corresponding to the exposed area of overlap between said port and each said corresponding cylinder opening sufficient to permit substantially uninterrupted passage of said particulate solids at the commencement of each said suction cycle;
said cylinder openings and said ports being disposed such that following said initial overlap the total cross sectional flow area exposed to each of said ports is generally constant irrespective of the rotational position of said barrel within said housing such that a constant volumetric flow rate of said driving fluid tends to effect a corresponding substantially constant volumetric flow rate of said fluid to be pumped.

5,316,452
DISPENSING ASSEMBLY WITH INTERCHANGEABLE CARTRIDGE PUMPS
Steven A. Bogen, Boston, and Herbert H. Loeffler, Arlington, both of Mass., assignors to Gilbert Corporation, Chicago, Ill.
Filed May 11, 1992, Ser. No. 881,397
Int. Cl.^{5} F04B *43/08*
U.S. Cl. 417—412 **16 Claims**



1. A dispensing assembly comprising:
A) a plurality of pump cartridges, each pump cartridge comprising:
 i) a reservoir for containing a liquid, said reservoir having a liquid flow outlet,
 ii) a metering chamber extending below the reservoir, said metering chamber directly connected to said liquid flow outlet, said metering chamber comprising a compressible housing having an noncompressed shape, and
 iii) a one-way inlet valve and a one-way outlet valve at each end of said compressible housing, said valves aligned in the same direction so as to allow unidirectional fluid flow from the reservoir;
B) an electrically driven reciprocating hammer actuator capable of compressing said compressible housing of each pump cartridge to eject a volume of liquid from the metering chamber thorough the outlet valve, and then release the housing to return the housing to the non-compressed shape to draw a volume of liquid with the metering chamber through the inlet valve;
C) a pump cartridge frame with a plurality of receptacles into which said plurality of pump cartridges are fit for holding each pump cartridge in a fixed position with respect to said actuator; and
D) a second frame supporting the actuator and removably receiving the pump cartridge frame with the plurality of receptacles as a unit to position each pump cartridge adjacent to the actuator, the first frame being removable from the second frame by lifting the first frame to lift all of the plurality of pump cartridges away from the second frame and the actuator.

5,316,453
SLURRY PUMP WITH DISCHARGE CYLINDERS, ESPECIALLY TWO-CYLINDER CONCRETE PUMP
Friedrich Schwing, Gelsenkirchen, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Fed. Rep. of Germany
Filed Mar. 19, 1993, Ser. No. 33,882
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1993, 4208754
Int. Cl.^{5} F04B *7/00, 15/02*
U.S. Cl. 417—516 **16 Claims**



1. A slurry pump for mixing concrete slurry, the slurry pump comprising:
a charge funnel;
a pair of discharge cylinders operable with the charge funnel so that slurry flows therebetween, each dicharge cylinder having an opening through which the slurry flows and a drive for forcing the slurry through the opening;
a discharge line operable with the charge funnel so that slurry flows therebetween;
a control valve having an exit port connected with the discharge line and an entrance port that is alternatively positioned in front of the opening of each discharge cylinder;
a pair of gate value disks, one on each side of the entrance port of the control valve, wherein the size of each gate valve disk conforms to a surface between the discharge cylinder openings such that in a change-over midpoint of the control valve the openings of the discharge cylinders are sealed off by the gate valve disks, and the entrance port in the control valve is sealed off on the surface between the discharge cylinders for the execution of a

partial stroke of a discharge cylinder piston which compresses slurry in the discharge cylinder;

a compensation cylinder for preventing slurry interruptions during the change-over of the control valve; and

a combinatorial circuit which controls the drive of each discharge cylinder and the slurry flow such that during a change-over of the control valve the compensation cylinder pushes slurry into the discharge line and such that during a subsequent discharge cycle of one of the discharge cylinders the compensation cylinder is filled with slurry, wherein the combinatorial circuit lets the drive of the discharge cylinder actually delivering slurry deliver faster in proportion to the amount of the slurry taken in by the compensation cylinder, and wherein the combinatorial circuit delays the change-over of the control valve such that one of the gate valve disks closes off the opening of the discharge cylinder associated with it.

5,316,454

FLUID PUMP AND ROTARY MACHINE HAVING SAID FLUID PUMP

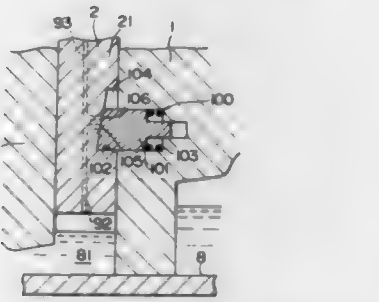
Makoto Fujitani; Yukio Nagato, both of Nagoya; Kimiharu Takeda, Aichi; Katsumi Hirooka, Aichi; Tetsuzo Ukai, Aichi, and Toshiyuki Shikanai, Aichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1992, Ser. No. 927,962

Claims priority, application Japan, Aug. 23, 1991, 3-237095

Int. Cl.⁵ F04C *18/04, 29/02;* **F04B** *19/02, 7/04*

U.S. Cl. 418—55.6 **11 Claims**



1. A fluid pump comprising:

a stationary member having a first thrust surface, said thrust surface being formed with a first cylindrical hole;

ar orbiting member having a second thrust surface, the orbiting member being rotatable relative to the stationary member, the second thrust surface sliding on the first thrust surface during rotation of the orbiting member, the second thrust surface having a second cylindrical hole, the second cylindrical hole being larger than the first cylindrical hole, said second cylindrical hole having an inclined surface, the inclined surface being inclined in a radial direction;

a piston having a part thereof slidably inserted in said first cylindrical hole of said stationary member and another inclined part thereof in surface contact with ,the inclined surface of said second cylindrical hole of said orbiting member; and

a fluid discharge port and a fluid suction port formed in the inclined surface of said second cylindrical hole so that said piston moves periodically in the radial direction and revolving axial direction due to periodical displacement in the radial direction resulting from revolving motion of said orbiting member, said piston thereby opening and closing said fluid discharge port and said fluid suction port at predetermined time intervals.

5,316,455

ROTARY COMPRESSOR WITH STABILIZED ROTOR

Takao Yoshimura, Kamakura; Ichiro Morita, and Hideharu Ogahara, both of Fujisawa, all of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

PCT No. PCT/JP91/00725, § 371 Date Jan. 25, 1993, § 102(e) Date Jan. 25, 1993, PCT Pub. No. WO92/21881, PCT Pub. Date Dec. 10, 1992

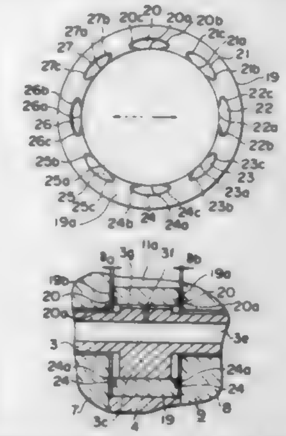
PCT Filed May 30, 1991, Ser. No. 969,815

Claims priority, application Japan, Mar. 20, 1990, 2-070467; Mar. 20, 1990, 2-070479; Oct. 25, 1991, 1-278874

Int. Cl.⁵ F01C *1/02;* **F03C** *2/00*

U.S. Cl. 418—63 **5 Claims**

1. A rotary compressor comprising: a cylinder; a main bearing and a sub bearing which are fixed to end surfaces of said cylinder; a shaft which is rotatable within said main bearing and said sub bearing and has a crank; a roller rotatably accommodated on said crank of said shaft and having end surfaces which face said main bearing and said sub bearing; a vane which makes contact with said roller and reciprocatively slides within a slot provided in said cylinder; and a groove provided in each of said end surfaces of said roller which respectively face said main bearing and said sub bearing, said groove provided in each of said end surfaces having a communicating portion for communicating with an inner peripheral side of said roller and a plurality of sealed portions which extend from said communicating portion, each f said plurality of sealed portions having a cross-sectional area which decreases as a distance from said communicating portion increases.



5,316,456

SLIDE VANE MACHINE

Georg W. Eckhardt, Karlstrasse 38, D-7990 Friedrichshafen 1, Fed. Rep. of Germany

PCT No. PCT/DE90/00971, § 371 Date Jun. 11, 1992, § 102(e) Date Jun. 11, 1992, PCT Pub. No. WO91/10812, PCT Pub. Date Jul. 25, 1991

PCT Filed Dec. 18, 1990, Ser. No. 860,501

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1990, 4000762; Sep. 15, 1990, 4029345

Int. Cl.⁵ F03C *2/00*

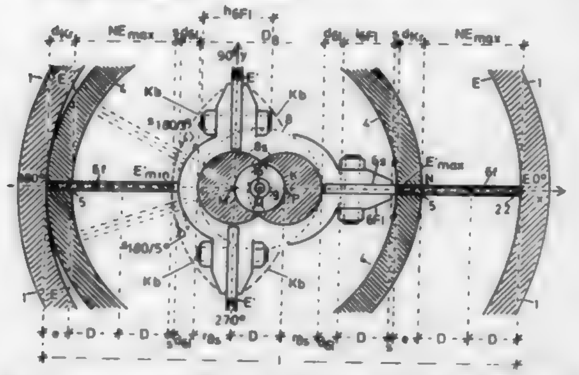
U.S. Cl. 418—150 **1 Claim**

1. A rotary slide vane machine based on the geometric principle of the Pascalian screw, said rotary slide vane machine comprising:

a housing with a hollow cylinder having an inner contour corresponding to the Pascalian screw and housing end pieces;

a rotary piston in the form of a hollow circular cylinder having a side wall with an inner mantle surface, said rotary piston rotatably supported at said housing end pieces and having an axis of rotation that is arranged axially with respect to said hollow cylinder and located within the zero point M′ of the coordinates of the Pascalian screw, said rotary piston further having diametrically opposed longitudinal grooves;

a control shaft arranged inside said rotary piston and rotatably supported at said housing end pieces, said control shaft having an axis of rotation that is arranged axially with respect to said hollow cylinder and located within the center M of a base circle of the Pascalian screw, and having eccentric segments;



slide vanes guided within said diametrically opposed grooves of said rotary piston and having a length L, each said slide vane comprised of stays and wings;

bearing bushings, connected to said stays of said slide vanes, rotatably guided on said eccentric segments with the eccentricity of the radius of said base circle and having flanges, with said wings being connected with said stays to said flanges of said bearing bushings;

said length L of said slide vanes determined according to the following equation:

$$L=6D+2r_{8s}+2d_{61}+2e+2s,$$

wherein

D is the diameter of said base circle,

r_{8s} is the radius of said eccentric segments,

d_{61} is the wall thickness of said bearing sleeves,

e is the minimal displacement of said wing into said side wall of said rotary piston, and

s is the minimal distance between said bearing sleeve and machine parts moving relative thereto;

a contour of said flange limited by an arc having said minimal distance s to said inner mantle surface of said rotary piston and by a lateral minimal distance $S'E'_{min}$ of one of said wings to an inner edge E′ of a neighboring one of said wings which is determined by the following equation:

$$S'E'_{min}=M'E'_{180^\circ}\cdot\sin\beta-(\tfrac{1}{2}\cdot d_{6f}\cdot\cos\beta+\tfrac{1}{2}\cdot d_{6f}+s),$$

wherein

$M'E'_{180^\circ}$ is the distance from said zero point M′ of said rotary piston to the inner edge E′ of one of said wings in the position at 180° corresponding to minimum wing extension from the rotary piston,

β is the angle of 180° divided by the number of said slide vanes, and

d_{6f} is the thickness of said wing; and

said contour of said flange further limited to the area within an arc Kb with a radius r_{Kb}, that leads through housing coordinates E′90°, E′180°, and E′270°, minus said minimal distance s to said inner mantle surface of said rotary piston according to the following equation:

$$r_{Kb}-s=\frac{(D+r_{8s}+d_{61}+s)^2+(r_{8s}+d_{61}+s)^2}{2(r_{8s}+d_{61}+s)}-s.$$

5,316,457

GEAR PUMP WITH IMPROVED GEAR/SHAFT RETENTION

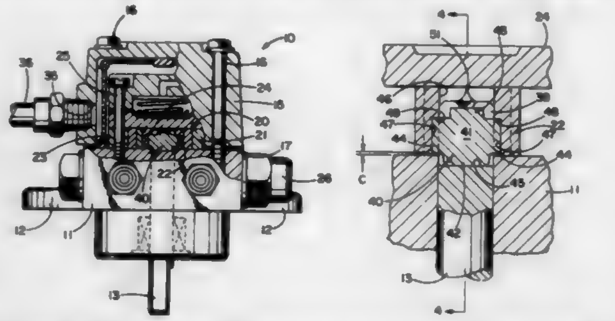
Frank L. Harwath, Rockford, Ill., assignor to Suntec Industries Incorporated, Rockford, Ill.

Filed May 11, 1993, Ser. No. 59,299

Int. Cl.⁵ F04C *2/00*

U.S. Cl. 418—171 **3 Claims**

1. A gear pump comprising a body, an elongated shaft rotatably supported by said body and having an axially facing free end, an end plate connected to said body and disposed in spaced opposing relation with the free end of said shaft, a spur gear rotatable with the free end portion of said shaft and located between said body and said end plate, said gear having a bore receiving said shaft, a slot in said shaft and opening radially out of diametrically opposite sides of the shaft and axially out of the free end of the shaft, said slot having an axially facing bottom, a key disposed in said slot and having an axially extending tongue engaging the bottom of the slot, an upset at the free end of said shaft near the center thereof and clamping said tongue against the bottom of said slot, diametrically opposed keyways formed in said gear and aligned circumferentially with said slot, each of said keyways opening radially into said bore and opening axially out of one end of said bore, each of said keyways having a bottom facing axially toward the bottom of said slot, and said key having radially projecting ears disposed in said keyways and normally engaging the bottoms of said keyways whereby endwise thrust exerted on said shaft in a direction toward said end plate causes said key to push said gear against said plate and thereby keep the free end of said shaft out of contact with said plate, said ears being located to engage said body to prevent withdrawal of said shaft from said body when an endwise force is exerted on said shaft in a direction away from said end plate.



5,316,458

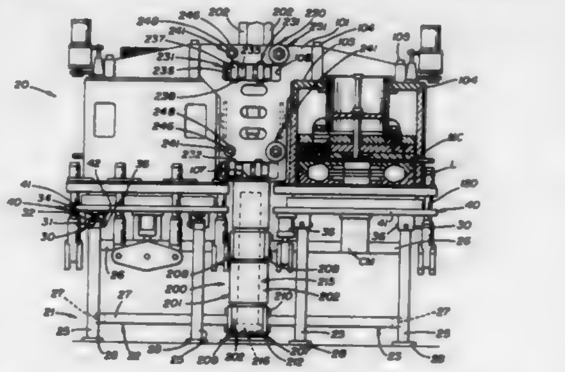
HYDRAULIC TIRE CURING PRESS

Bernard F. Lesneski, Akron, Ohio, assignor to McNeil Akron, Inc., Akron, Ohio

Filed Jan. 31, 1991, Ser. No. 648,187

Int. Cl.⁵ B29C *35/02*

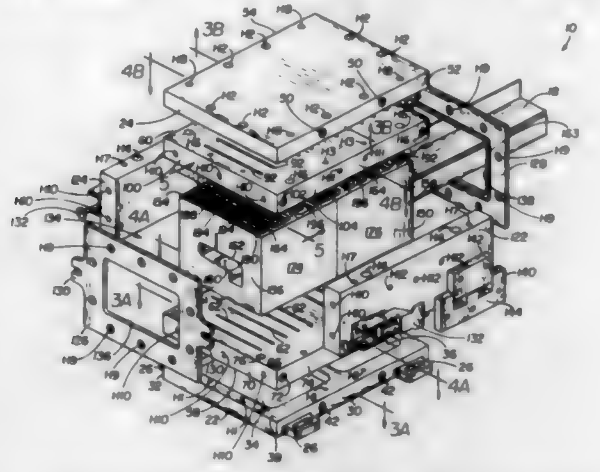
U.S. Cl. 425—34.1 **15 Claims**



1. A tire curing press comprising, base assembly means for supporting a lower mold section, cross beam means for supporting an upper mold section, means for vertically moving said cross beam means to open and close the press, mold locking and clamping means for locking the mold sections and for applying squeeze forces to the mold sections when the press is closed and the mold sections are locked for the curing of a tire, said mold locking and clamping means including a bottom load plate associated with said base assembly means, a vertically spaced reinforcing ring associated with said cross beam means and connecting rods selectively interconnecting said load plate and said reinforcing ring for locking the lower mold section and upper mold section, a plurality of vertically aligned bores on said bottom load plate and said reinforcing ring, each re-

ceiving one of said connecting rods, and lock ring means overlying and movable relative to said reinforcing ring and having keyhole slots therein for selectively receiving and retaining and connecting rods.

5,316,459
EXTRUSION CALIBRATOR WITH INSERT PLATES
George Melkonian, Kent, and Michael R. Crippen, Issaquah, both of Wash., assignors to Mikron Industries, Kent, Wash.
Continuation-in-part of Ser. No. 16,730, Feb. 11, 1993. This application Jul. 8, 1993, Ser. No. 89,276
Int. Cl.^{5} B29C *47/90*
U.S. Cl. 425—71 **27 Claims**



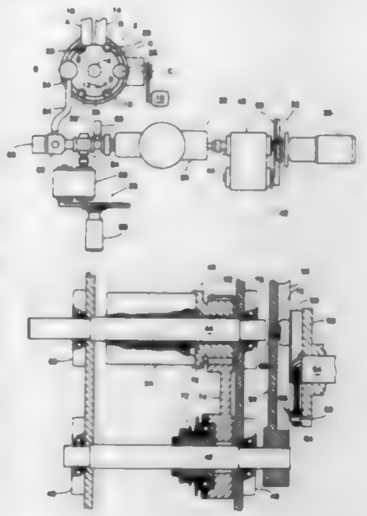
26. An extrusion calibrating apparatus for use on a stationary support and connectable to an external source of vacuum, the apparatus being usable to calibrate the exterior profile of a hollow extrusion upon its exit from an extruding die while the extrusion is still in a heated plastic state, comprising:

first and second assemblies, said first assembly having a vacuum manifold, a vacuum channel providing communication between said vacuum manifold and the source of vacuum, and a plurality of vacuum apertures extending between said vacuum manifold and openings in a first side of said first assembly, one of said first or second assemblies having attachment members fixedly attachable to the stationary support;

a heat-conducting calibrating insert removably positioned between said first and second assemblies with a first side in face-to-face juxtaposition with said first side of said first assembly, said insert having a calibrating aperture corresponding to the exterior profile of the extrusion extending lengthwise therethrough, said insert calibrating aperture having an entry opening to permit the entry of the extrusion into said insert calibrating aperture and an exit opening to permit the exit of the extrusion out of said insert calibrating aperture, said insert having a plurality of plate receiving apertures intersecting with said insert calibrating aperture, each of said plate receiving apertures having a plate entry opening at said insert first side; and

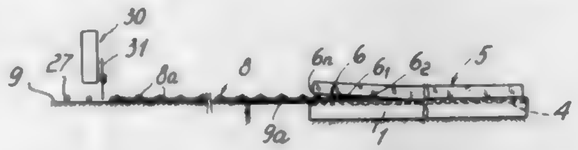
a plurality of pairs of plates, each of said pairs of plates having a first plate and a second plate with a calibrating aperture corresponding to said insert calibrating aperture, and being removably positioned within one of said plate receiving apertures with said plate calibrating apertures thereof in alignment with said insert calibrating aperture, said first and second plates being sized to pass through said plate entry opening of one of said plate receiving apertures within which positioned, said first and second plates of each of said pairs of plates being held in spaced-apart positions within said one plate receiving aperture to define therebetween a vacuum aperture extending between said insert first side and said plate calibrating apertures with said vacuum aperture having an opening at said insert first side in communication with at least one of said openings in said first side of said first assembly.

5,316,460
SYNTHETIC RESIN MATERIAL FEEDING APPARATUS AND SEALING LINER FORMING SYSTEM
Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan
Filed Nov. 13, 1992, Ser. No. 976,422
Claims priority, application Japan, Dec. 6, 1991, 3-323250
Int. Cl.^{5} B29C *45/14*
U.S. Cl. 425—110 **18 Claims**



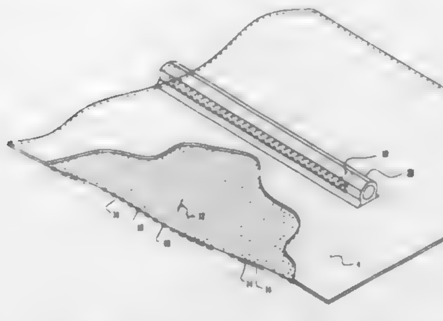
1. A synthetic resin material feeding apparatus comprising an extruder for extruding a synthetic resin material in the softened molten state and an extruder driving mechanism for rotating the rotating screw of the extruder, wherein the extruder driving mechanism has an intermittent rotation-driving function to intermittently rotate the rotating screw, a gear pump for receiving synthetic resin material extruded from the extruder, a gear pump driving mechanism for rotating the gear pump, said gear pump driving mechanism having an intermittent rotation-driving function to intermittently rotate the gear pump.

5,316,461
APPARATUS FOR PRODUCING REINFORCED CONCRETE COMPONENTS
Silvestro Silvestri, Ca' di David, Italy, assignor to Immobiliare Centro Nord S.p.A., S. Bonifacio, Italy
Filed Jun. 20, 1991, Ser. No. 718,039
Claims priority, application Italy, Jun. 21, 1990, 84963 A/90; Jun. 21, 1990, 84964 A/90
Int. Cl.^{5} B28B *13/06, 23/06*
U.S. Cl. 425—111 **18 Claims**



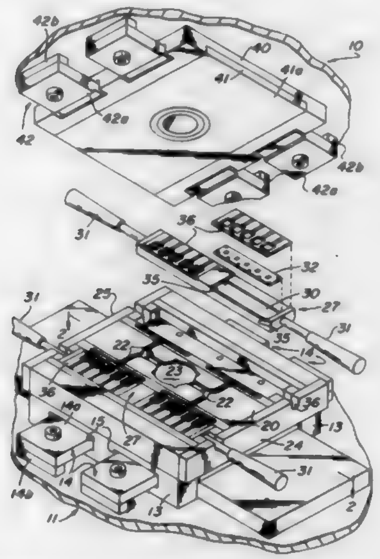
1. An apparatus for producing prefabricated reinforced concrete components, comprising: at least one casting bed having heating means; a reinforcement member pretensioning device; at least one finishing machine movable along the casting bed for casting a component; cutting means for cutting the reinforcement members; a plurality of roller trucks of increasing height for wedge-like penetration between the component and casting bed, the roller trucks slidingly arranged on a support aligned with the casting bed; a sliding roller bed at a rear end of the plurality of roller trucks, of a length equal to the casting bed length; actuation means for generating relative motion between the roller trucks, sliding roller bed and casting bed, transferring the component from the casting bed to the sliding roller bed; and a cutting station for cutting the component into segments.

5,316,462
UNITARY VACUUM BAG FOR FORMING FIBER REINFORCED COMPOSITE ARTICLES
William Seemann, 6011 Montacilla Cir., Ocean Springs, Miss. 39564
Filed Feb. 18, 1993, Ser. No. 18,827
Int. Cl.^{5} B29C *43/02*
U.S. Cl. 425—112 **5 Claims**



1. A vacuum bag for forming a fiber reinforced composite structure by vacuum bag molding comprising:
  in a unitary curable elastomer structure:
    a vacuum bag having a periphery and an inner surface;
    a tubular resin distribution conduit in said inner surface, connected with a repeating, internal plurality of small channels on said inner surface;
  said unitary curable elastomer structure being formed to fit, covering the fiber reinforced composite structure on a rigid mold.

5,316,463
ENCAPSULATING MOLDING EQUIPMENT
H. Karl Neu, Furlong, Pa., assignor to Neu Dynamics Corporation, Ivyland, Pa.
Filed Nov. 24, 1992, Ser. No. 981,742
Int. Cl.^{5} B29C *45/02, 45/14, 45/34, 45/27*
U.S. Cl. 425—116 **9 Claims**



9. Encapsulating mold equipment for use with a mold press, said equipment comprising:

a base platen for support of a mold and an upper platen overlying said base platen;

a center plate supported on said base platen and having a pair of substantially parallel side edges;

end and side frame members disposed on opposite sides of said center plate;

the parallel side edges of said center plate and said end and side frame members forming a pair of substantially rectangular positioning recesses;

a pair of substantially rectangular, portable mold base members dimensioned to interfit within said positioning recesses, said positioning recesses being dimensioned to maintain said mold base members in fixed position relatively to said base platen, said mold base members having upwardly facing planar support surfaces for support of strip material having an upper surface with spaced apart devices to be encapsulated thereon;

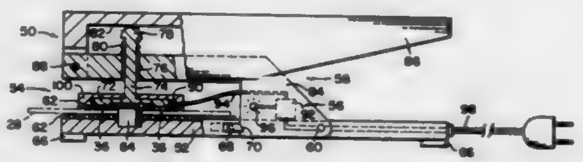
said center plate having an upper planar surface having grooves forming runner passages formed therein, said grooves terminating at the parallel side edges of the center plate;

an elongated cavity insert having substantially parallel edges disposed in overlying relationship on each said mold base member planar support surface, each said cavity insert having a side edge abutting one of said parallel side edges of said center plate and a plurality of spaced mold forming cavities extending therethrough, said cavities corresponding in number to the devices on the upper surface of a piece of said strip material positioned on each said planar support surface, said cavities being dimensioned and positioned to receive said devices and a charge of encapsulating thermosetting resin sufficient to form an encapsulating layer covering said devices, each said cavity insert having a lower sealing surface surrounding each cavity and cooperating with the upper surface of said strip material on said upwardly facing planar support to form a seal surrounding each device, each said cavity insert further having an upper sealing surface cooperating with said upper mold plate when the upper and lower platens are in the closed position, said upper sealing surface of said cavity insert being coplanar with the upper planar surface of the center plate;

gate and vent passages formed exclusively in the upper planar surface of each cavity insert, said gate passages extending from each cavity to the side edge abutting one of said side edges of said center plate and said vent passages extending from the cavities to the opposite side edge of the cavity insert, said gate passages joining with the runner passage terminating at the adjacent side edge of the center plate; and

means for delivery of encapsulating resin through said runner passages, said gate passages to each of said cavities.

5,316,464
COMPACT DISC LABELING SYSTEM
Jason R. Lexell, 133 Ashdown Rd., Ballston Lake, N.Y. 12019
Filed Dec. 16, 1992, Ser. No. 991,577
Int. Cl.^{5} B28B *3/00*
U.S. Cl. 425—318 **16 Claims**



1. An apparatus for labeling a compact disc comprising:

means for operatively mounting said compact disc, said compact disc having digital data encoded thereon and an inner ring including a centrally disposed aperture therethrough;

an impact plate including at least one substantially outwardly protruding character thereon;

impact plate securing means for removably receiving said impact plate;

and

means for controlling the relative displacement of said impact plate securing means and said compact disc mounting means and for compressing said impact plate against the inner ring of said compact disc, wherein said at least one outwardly protruding character on said impact plate is adapted to penetrate the inner ring of said compact disc, thereby imprinting a label corresponding to said at least one character therein.

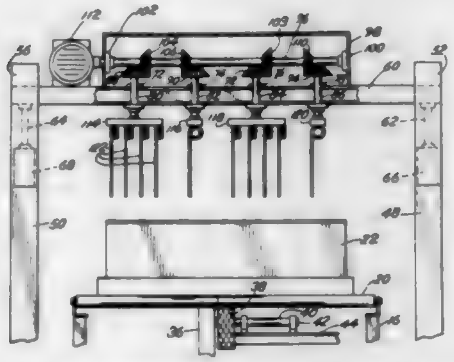
5,316,465
APPARATUS FOR PROVIDING RANDOM RAKE FINISH IN A CAST CONCRETE SURFACE

Robert A. Hummel, Clifton, Va., assignor to The Reinforced Earth Company, Vienna, Va.

Filed Aug. 21, 1992, Ser. No. 934,354

Int. Cl.⁵ B28B *11/08*

U.S. Cl. 425—343 **3 Claims**



1. Apparatus for mechanically forming a random rake finish in the surface of a cast material panel comprising, in combination:

a panel platform including means for transporting a panel in a linear direction along the platform;

vertical support members positioned on opposite sides of the panel platform so as to be on opposite sides of a panel on the platform moving in the linear direction;

a horizontal arm connected between said support members for positioning over the surface of a panel of poured cast material in a viscous fluid condition on the panel platform;

a plurality of tine support bars rotatably mounted in the arm, each bar mounted by means of a vertical shaft journaled in the arm and connected to the bar intermediate the ends of the bar;

a plurality of spaced tines projecting downwardly from each tine support bar;

means for projecting the tines into the poured cast material and for withdrawing the tines from the cast material, said means comprising adjustable piston means connecting each vertical support member to an end of the horizontal arm; and

means for traversing the rotatably mounted tines relative to the surface of the panel of cast material, said means for traversing comprising a single drive shaft and a motor for said drive shaft supported on the horizontal arm for simultaneously engaging each vertical shaft by gear means, whereby the tine support bars are simultaneously rotated with the vertical shafts and the tines are movable in arcuate loops as the means for transporting a panel operates to move a panel on the platform in a linear direction under the arm with the tines projecting into the surface of the material when the material is fluid and viscous to thereby effect a random rake finish.

5,316,466
DISC MOLDING APPARATUS

Toshifumi Tanaka; Yasuo Ohira, and Toshihiko Ishida, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

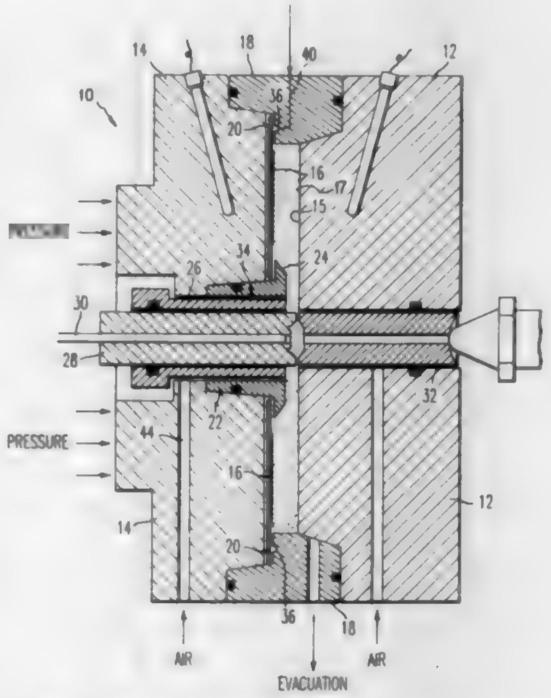
Continuation of Ser. No. 699,343, May 13, 1991, abandoned, which is a continuation of Ser. No. 522,087, May 14, 1990, Pat. No. 5,092,758, which is a continuation of Ser. No. 403,856, Sep. 1, 1989, abandoned, which is a continuation of Ser. No. 288,565, Dec. 22, 1988, abandoned. This application Jul. 27, 1993, Ser. No. 97,626

Claims priority, application Japan, Dec. 24, 1987, 62-325429

The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.

Int. Cl.⁵ B29C *45/43*

U.S. Cl. 425—422 **5 Claims**



1. A disc molding apparatus comprising:

a mold body comprising a stationary mold and a movable mold arranged opposite to each other for defining a cavity therein;

a stamper interposedly arranged between said stationary mold and said movable mold;

an outer ring comprising outer stamper holding means for holding an outer periphery portion of said stamper;

an inner ring comprising inner stamper holding means for holding an inner portion of said stamper, said outer stamper holding means and said inner stamper holding means cooperating with each other to locate said stamper at a predetermined position; and

ejecting means arranged inside of said inner stamper holding means for releasing a disc molded in said cavity;

wherein said outer ring further comprises:

air inlet port means for supplying air into said cavity, said air inlet port means being arranged in a proximity to said outer stamper holding means such that air supply from said air inlet port means is directed toward a central region of said molded disc from the outer periphery of the molded disc between the stationary mold and a transfer side of said molded disc; and

communication passage means for communicating with said air inlet port means and guiding air therethrough to said air inlet port means.

5,316,467
INTERNAL CORE LIFTER APPARATUS WITH MULTIPLE AXIS COMPENSATION FEATURE

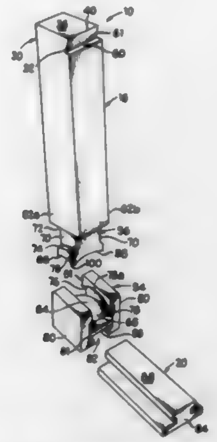
Glenn Starkey, Lindenhurst, Ill., assignor to D & L Incorporated, Wauconda, Ill.

Continuation-in-part of Ser. No. 652,094, Feb. 7, 1991, Pat. No. 5,137,442. This application Jun. 15, 1992, Ser. No. 898,807

The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.

Int. Cl.⁵ B29C *45/44*

U.S. Cl. 425—438 **9 Claims**



2. An internal core lifter apparatus for use with a plurality of molds, each requiring the apparatus to be disposed at different angles, the apparatus comprising:

a core blade with a first end configured by an end user to cooperate with a mold to mold a plastic part having an undercut and to be movable in an ejection direction to assist in ejecting the part, and an opposite end pivotally mounted;

a coupling pivotally mounting the core blade at the opposite end for pivoting about multiple axes in multiple planes including at least in a first plane about at least one axis for seating the core blade at a mold specific angle for assisting in part ejection; and

a support mounted to an ejector plate, the support having a sliding surface on which the opposite end travels linearly, and curved surfaces on the core blade and on the coupling including dovetail surfaces interengaged for pivoting the second end of the core blade about multiple axes.

5,316,468
SIDE GATE HOT RUNNER NOZZLE

Herbert Günther, Allendorf/Eder, Fed. Rep. of Germany, assignor to Dipl.-Ing Herbert Gunther Gesellschaft mbH, Perchtoldsorf, Austria

Filed Aug. 17, 1992, Ser. No. 930,895

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1991, 4127035

Int. Cl.⁵ B29C *45/20*

U.S. Cl. 425—549 **14 Claims**

1. A hot runner nozzle assembly (10) for an injection molding machine which comprises

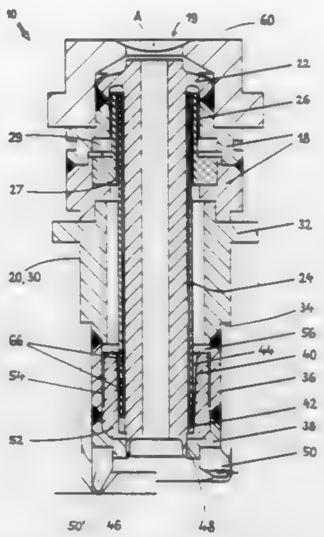
(a) a casing (12),

(b) an elongated shaft (20) mounted centrally in said casing (12),

(c) a flow tube (22) mounted annularly within said elongated shaft (20) so as to provide a space between the interior walls of said elongated shaft (20) and the exterior walls of said flow tube (22), said flow tube (22) having an inlet and an outlet end,

(d) heating means positioned in said space for heating said flow tube (22),

(e) a mold insert (16) having a lateral wall (17) positioned adjacent the outlet end of said flow tube (22), said mold insert (16) consisting of two halves which are adapted to be displaced in a direction transverse to the longitudinal axis of said flow tube (22) and to be wedged in a closed together position within said casing (12), and



(f) at least one nozzle tip (50, 50′) joined to the end of said elongated shaft (20), said at least one nozzle tip (50, 50′) extending into said mold insert (16) and having a free end (20), the free end of the at least one nozzle tip (50, 50′) extending free of contact through said lateral wall (17) of said mold insert (16).

5,316,469
NITROGEN OXIDE CONTROL USING INTERNALLY RECIRCULATED FLUE GAS

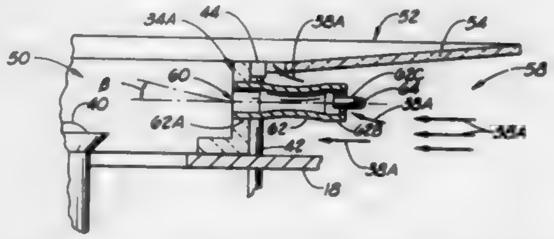
Michael J. Martin, Broken Arrow; William C. Gibson, and Lee R. Massey, both of Tulsa, Okla., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Continuation of Ser. No. 917,576, Jul. 21, 1992, abandoned, which is a continuation of Ser. No. 719,520, Jun. 24, 1991, Pat. No. 5,135,387, which is a continuation of Ser. No. 423,145, Oct. 19, 1989, Pat. No. 5,044,932. This application May 18, 1993, Ser. No. 63,362

The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.

Int. Cl.⁵ F23L *9/00*

U.S. Cl. 431—116 **18 Claims**



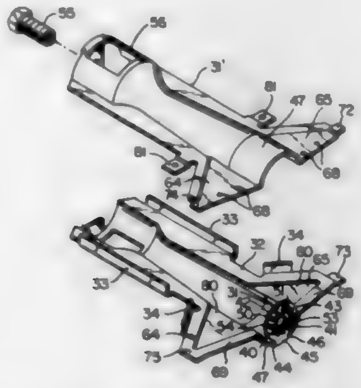
1. A process for combusting fuel and air to form a combustion flame in a combustion zone of a furnace such that the flue gas effluent from said furnace has a reduced NO_x content, said furnace having a fuel and air inlet port in a floor thereof, a furnace wall extending upwardly from said floor, and a plurality of furnace tubes positioned adjacent said furnace wall such that a downward flow of downdraft flue gas occurs adjacent said furnace wall, said process comprising the steps of:

(a) discharging said air into said combustion zone of said furnace by way of said inlet port;
(b) discharging at least a first portion of said fuel into said combustion zone by way of said inlet port from a primary fuel nozzle whereby said first portion of said fuel mixes with air in said combustion zone and is combusted in said combustion flame;
(c) collecting at least a part of said downdraft flue gas from adjacent said furnace wall; and
(d) educting at least a portion of said collected downdraft flue gas into said combustion flame to thereby lower the NO_x content of the flue gas effluent from said furnace, wherein the driving fluid used for educting said portion of collected downdraft flue gas is pressurized fuel gas.

5,316,470
JET BURNER CONSTRUCTION HEATING APPARATUS UTILIZING THE JET BURNER CONSTRUCTION AND METHODS OF MAKING THE SAME

Kent K. Sigler, Youngwood, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 22, 1993, Ser. No. 7,497
Int. Cl.⁵ F23D *14/58*
U.S. Cl. 431—286 **12 Claims**

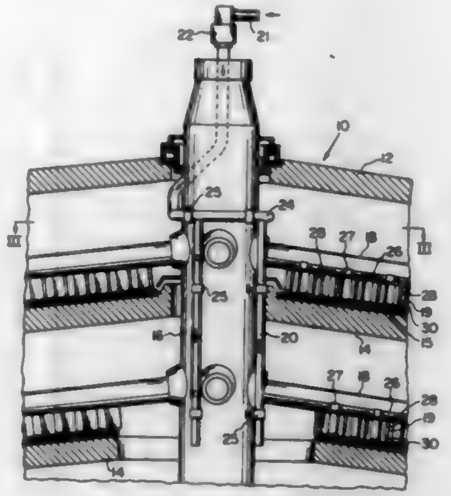


1. In a jet burner construction comprising a burner body means having a chamber means therein and having an inlet means leading to said chamber means for directing fuel from a fuel source therein and an outlet means leading from said chamber means and defining an outlet opening means through which said fuel is adapted to issue from said chamber means to burn externally to said burner body means, said burner construction having an insert means disposed in said outlet opening means, said insert means having a central opening part passing therethrough and a plurality of spaced apart opening portions passing therethrough whereby flows of fuel respectively issuing out of said portions and said central part of said insert means merge together in a turbulent manner externally of said outlet opening means, said burner body means being formed of two generally similar integral and one-piece body sections secured together in superimposed relation and each having generally one-half of said outlet opening means thereon, the improvement wherein one of said body sections has said insert means integral and one-piece therewith, said insert means having a portion thereof that hinges said insert means to said one of said body sections, each of said body sections being formed from a sheet of material having substantially a uniform thickness through-out the entire surface area thereof, said insert means comprising a disc-like member hinged to said one of said body section by said portion thereof, said portion of said insert means having opposed sides, said disc-like member having an outer peripheral edge means extending from one of said sides of said portion to the other of said sides of said portion.

5,316,471
METHOD AND APPARATUS FOR MASS TRANSFER IN MULTIPLE HEARTH FUNACES

David J. Nell, 880 Lotus Ave., Oradell, N.J. 07649

Filed Feb. 16, 1993, Ser. No. 17,850
Int. Cl.⁵ F27B *9/00*
U.S. Cl. 432—139 **24 Claims**



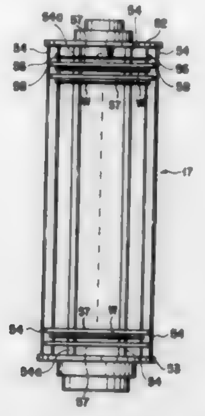
1. An apparatus for mass transfer in a furnace having a center shaft with a plurality of radially extending arms, said arms extending over a hearth on which a material to be treated is conveyed, said material conveyed outward or inward on said hearth by a plurality of rabbles on said arms, said apparatus comprising:
at least one riser parallel with said center shaft, said riser in communication with a source of treatment fluid;
at least one branch pipe radially extending from said riser, said branch pipe discrete from and extending along one of said arms;
a plurality of downcomers extending from said branch pipe in the direction of said hearth, each downcomer having an outlet thereon;
means for securing said riser and said branch pipe to said center shaft and said rabble arm, respectively;
each outlet located adjacent one of said rabbles to define means for injecting said treatment fluid into said material at such time as the material is ploughed over by said rabble.

5,316,472
VERTICAL BOAT USED FOR HEAT TREATMENT OF SEMICONDUCTOR WAFER AND VERTICAL HEAT TREATMENT APPARATUS

Reiji Niino, Kofu; Isao Siratani; Yutaka Simada, both of Sagamihara; Hiroki Fukusima, Sagamihara; Hirofumi Kitayama, Kanagawa; Akimichi Yonekura, and Yuuichi Mikata, both of Kawasaki, all of Japan, assignors to Tokyo Electron Limited, Tokyo; Tokyo Electron Sagami Limited, Kanagawa and Kabushiki Kaisha Toshiba, Kawasaki, all of Japan

Filed Dec. 16, 1992, Ser. No. 991,597
Claims priority, application Japan, Dec. 16, 1991, 3-331076
Int. Cl.⁵ F27D *3/12*
U.S. Cl. 432—241 **24 Claims**

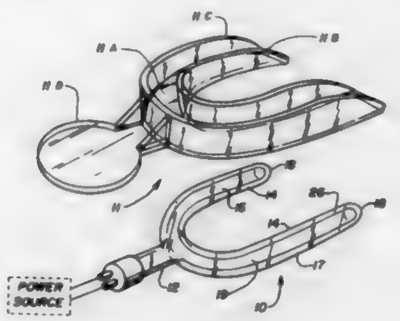
1. A vertical boat used for heat-treating a plurality of semiconductor wafers each having a main region to be processed on the upper surface, at the same time, comprising:
an upper support plate;
a lower support plate;
a plurality of columns, an upper end of each of which is fixed to the upper support plate, and a lower end of each of which is fixed to the lower support plate, each of said columns having a plurality of first steps formed in the vertical direction with intervals therebetween so as to support the wafers substantially parallel to each other, and a plurality of second steps formed so as to be arranged alternately with the first steps; and
a plurality of plate rings, each having an outer diameter larger than that of the wafers, and an inner diameter defining an opening for exposing substantially the entire main region of each wafer, and provided on the second steps, said rings serving to improve a uniformity of a heat treatment carried out on each wafer;
wherein each first step is arranged such that one of the wafers supported thereon is positioned apart from lower and upper rings of the plate rings adjacent to said one of the wafers with first and second clearances formed therebetween, respectively, in the vertical direction so as not to contact the lower and upper rings, the first clearance having a dimension to allow transfer means for transferring said one of the wafers to be inserted therein and the second clearance having a dimension to allow the transfer means to lift said one of the wafers.



5,316,473
LIGHT CURING APPARATUS AND METHOD

Robert V. Hare, Georgetown, Del., assignor to Dentsply Research & Development Corp., Milford, Del.

Continuation-in-part of Ser. No. 609,036, Nov. 5, 1990, abandoned, which is a continuation of Ser. No. 208,201, Jun. 17, 1988, abandoned. This application Apr. 24, 1992, Ser. No. 873,909
Int. Cl.⁵ A61C *1/00, 3/00, 5/00, 9/00*
U.S. Cl. 433—29 **48 Claims**

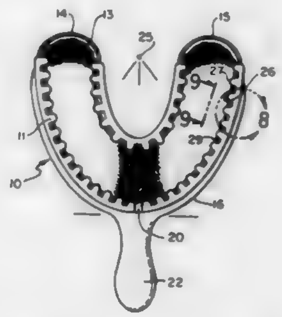


1. A visible wavelength light source for polymerizing light curable dental material within the mouth, comprising:
(a) an element adapted to support light curable dental material in the mouth and
(b) means for generating light in said element,
said element having a U-shape length and a size conforming substantially to the configuration of a dental arch, said element having a U-shaped bottom wall, integrally connected to inner and outer U-shaped side walls, said element having a light emitting surface area of at least about 5 cm², and said means for generating light being integrally connected to said element said means for generating having a light source selected from the group consisting of an optical fiber and a bulb having a filament, said light source being supported by and substantially evenly distributed along said length of said element, and being adapted to transmit light substantially uniformly onto said dental material.

5,316,474
DENTAL IMPRESSION TRAY

Walter H. Robertson, 16947 Shinedale St., Santa Clarita, Calif. 91351

Filed Jun. 7, 1993, Ser. No. 71,969
Int. Cl.⁵ A61C *9/00*
U.S. Cl. 433—38 **19 Claims**



1. A dental impression tray comprising:
a pair of arcuate walls arranged in parallel spaced-apart relationship defining a working area between opposing wall surfaces;
an impression material support membrane disposed in said working area and having opposite edge marginal regions attached to said pair of walls so as to divide said working area into an upper section and a lower section;
impression material retaining means carried on said wall opposing surfaces;
said retaining means comprising a plurality of ribs substantially perpendicular to said membrane and integral with each of said opposing wall surfaces respectively; and
said plurality of ribs on each of the wall surfaces arranged in fixed parallel spaced-apart relationship and each rib of said plurality having rounded upper and lower ends connected by a linear surface, said lower section including an undercut recessed notch at said lower end immediately adjacent to said support membrane whereby the gums of the patient are protected from irritation or injury.

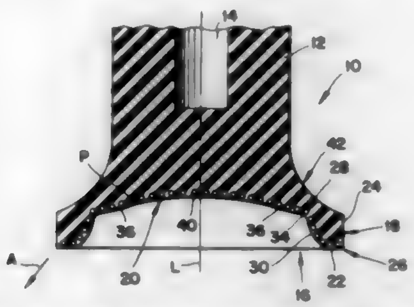
5,316,475
DENTAL PROPHY CUP

Neil A. Rosenberg, 32 Equator Dr., Nantucket, Mass. 02554

Filed Feb. 5, 1993, Ser. No. 14,249
Int. Cl.⁵ A61C *3/06*
U.S. Cl. 433—166 **17 Claims**

1. A dental prophy cup comprising a body including front and rear portions, said rear portion adapted for connection to a drive mechanism for rotating said body about a longitudinal axis, said front portion being formed of an elastic material and including an annular rim encircling a recessed space, said recessed space being formed by a forwardly facing surface, said rim extending longitudinally forwardly and radially outwardly and including a flexure region about which said rim flexes rearwardly upon being pressed against a tooth surface so that said forwardly facing surface contacts the tooth surface, said flexure region defined by a reduced thickness of said rim, said rim increasing in thickness from a minimum thickness of said flexure region to a region of maximum thickness located forwardly of said flexure region, said rim diminishing in thick-

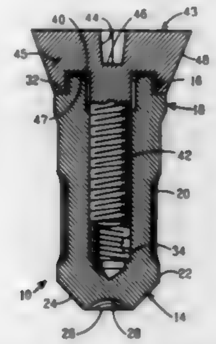
ness from said region of maximum thickness to said front end of said rim, said minimum thickness of said flexure region extending annularly about said rim and intersecting said forwardly facing surface at a plane and said plane being oriented perpendicular to said longitudinal axis.



5,316,476
DENTAL IMPLANT WITH A LONGITUDINALLY GROOVED CYLINDRICAL SURFACE

Jack T. Krauser, 3017 Embassy Dr., West Palm Beach, Fla. 33409

Filed Jun. 19, 1992, Ser. No. 901,510
Int. Cl.⁵ A61C *8/00*
U.S. Cl. 433—173 **23 Claims**



1. An integral dental implant comprising:

an upper end having an upper surface;

an apical end, including a lower surface, opposite to said upper surface, and a trunconical surface extending from said lower surface toward said upper surface, said truncoconical surface being continuous and increasing in diameter along an axis from said lower surface to said upper surface;

a generally cylindrical portion extending between said upper end and said apical end including a plurality of longitudinally extending grooves in the surface thereof; and

attachment means extending axially inward from said upper surface,

wherein said upper end further includes a head extending downward from said lower surface to an outward extending ledge, said head having means for preventing axial rotation of a member affixed thereto;

wherein said generally cylindrical portion extends between said truncoconical surface and said outward extending ledge;

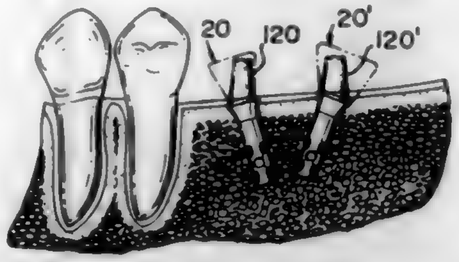
wherein said head, said outward extending ledge, and an upper portion of said generally cylindrical portion, adjacent to said outward extending ledge, have a smooth metallic surface; and

wherein said apical end and the remaining portion of said generally cylindrical portion includes a bioactive coating.

5,316,477
UNIVERSAL IMPLANT ABUTMENT

Luis O. Calderon, 8522 S.W. 74 St., Miami, Fla. 33143

Filed May 25, 1993, Ser. No. 66,269
Int. Cl.⁵ A61C *8/00*
U.S. Cl. 433—173 **8 Claims**

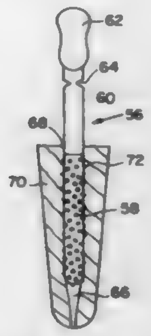


1. In an abutment that cooperatively supports a prosthesis and engages with an implant of the cylindrical type, said implant being positioned inside the maxillary and mandibular bones in a substantially perpendicular relationship thereto and said implant further including a threaded central opening, and said abutment comprising anchorage means for mounting said prosthesis thereon the improvement comprising a frustoconical shape for said abutment having the narrower portion adjacent to said implant so that sufficient mass is provided to permit a user to cut away portions of said abutment to correct the lack of parallelism of said implant.

5,316,478
DENTAL POST WITH CUTTING SURFACES

Paul R. Chalifoux, Wellesley, Mass., assignor to Wellesley Research Associates, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 739,670, Aug. 2, 1991. This application Jul. 6, 1992, Ser. No. 908,366
Int. Cl.⁵ A61C *5/08*
U.S. Cl. 433—221 **21 Claims**



1. A dental post for insertion into a tooth bore having walls which comprises:

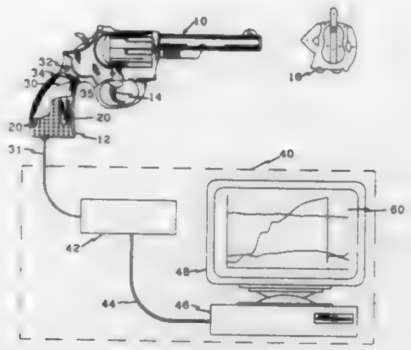
a stem section having means for attaching a dental prosthesis,

a bottom section attached to said stem section having a plurality of randomly positioned cutting projections extending outwardly from a surface of said bottom section, whereby when the post is inserted in a tooth bore, said projections extend into said walls.

5,316,479
FIREARM TRAINING SYSTEM AND METHOD

John D. E. Wong, Ontario; Curtis C. Tugnum, Alberta, and James P. Logan, Ontario, all of Canada, assignors to National Research Council of Canada, Canada

Continuation-in-part of Ser. No. 699,903, May 14, 1991, abandoned. This application Jan. 7, 1993, Ser. No. 1,442
Int. Cl.⁵ F41A *33/00*
U.S. Cl. 434—11 **21 Claims**



1. A firearm training system for use in combination with a firearm having a grip and a trigger, comprising:

force transducing means for detecting a hand grip force pattern applied to the grip of the firearm by a weapon hand of a shooter and a relative position of the trigger; wherein the grip force pattern consists of a side grip force and a front-to-back grip force applied by the weapon hand to a side surface and at least one of the front and back surfaces of the grip respectively, and the force transducing means separately detects the side grip force, the front-to-back grip force and the relative position of the trigger; and

display means for separately displaying as a function of time a relative value of the respective front-to-back grip force, side grip force and the relative position of the trigger.

20. A method of training a shooter by determining the grip pattern and trigger pull of a weapon hand operating a firearm having a grip and a trigger, comprising the step of:

detecting simultaneously a front-to-back grip force and a side grip force applied by the weapon hand of the shooter to at least one of the front and back surfaces and a side surface of the grip respectively and a relative position of the trigger; and

graphically and separately displaying as a function of time the relative values of the front-to-back grip force and the side grip force respectively and a relative position of the trigger for a selectively time period including a firing of the firearm.

5,316,480
PORTABLE MULTIPLE MODULE SIMULATOR APPARATUS

Thayne N. Ellsworth, 3838 McGonigull, Boise, Id. 83703

Filed Feb. 10, 1993, Ser. No. 16,117
Int. Cl.⁵ G09B *9/00*
U.S. Cl. 434—29 **11 Claims**

1. A portable multiple module simulator apparatus comprising:

multiple roadable trailers attached together to form a platform;

an exoskeleton covering enclosing said multiple roadable trailers;

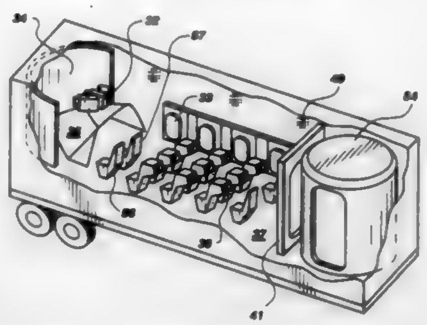
multiple simulator modules formed on said roadable trailers;

said simulator modules having means for accommodating more than one person;

said simulator modules having means for providing visual, auditory, and motion stimuli which simulate various real-life and pre-recorded experiences;

said simulator modules having image gathering means attached to external supports with means that provide movement for said external supports;

viewing screens are located within said modules and connected to said external image gathering means to impart real-time point-of-access imagery from the environment surrounding said simulator.



5,316,481
SYSTEM FOR DISPLAYING AND SELECTING HAIR DYE SHADES

John Louise, New York, N.Y., and Thomas Rushing, Denville, N.J., assignors to Clairol, Inc., New York, N.Y.

Filed Feb. 11, 1993, Ser. No. 16,397
Int. Cl.⁵ G09B *19/00*
U.S. Cl. 434—99 **16 Claims**

1. A hair dye selection and display shelf system comprising:

(a) a first plurality of hair dye products arranged by dye color shade graduation along a first axis of a display shelf wherein the lightest dye color shade is at one end of said display shelf along said first axis and the darkest dye color shade is at a distal end;

(b) a second plurality of hair dye products arranged by duration of hair dye effect along a second axis of said display shelf perpendicular to said first axis, wherein the shortest duration of hair dye effect is at one end of said display shelf along said second axis and the longest duration of effect is at a distal end;

(c) indicia for distinguishing between said dye color shades and said dye durations is provided on at least one of said display shelf and said hair dye products; and

(d) hair dye shade selection means connected to said display shelf comprising a plurality of natural hair color shades and a plurality of resulting hair dye color shades for identifying a resulting hair dye color shade when a selected natural hair color shade is treated with a hair dye product of selected dye color shade and selected duration of effect.

5,316,482
VOCABULARY BOARD GAME

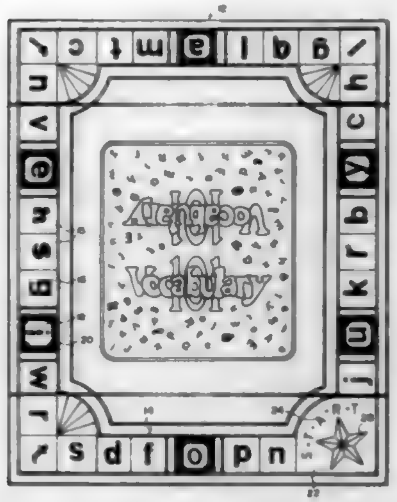
Kirk R. Bryson, 434 Lillian Blvd., Holbrook, N.Y. 11741

Filed Oct. 5, 1992, Ser. No. 956,169
Int. Cl.⁵ G09B *19/22*
U.S. Cl. 434—129 **12 Claims**

1. A vocabulary board game, which comprises:

a) a game board having a continuous path around its perimeter divided into consecutive spaces, each of said spaces bearing one letter of the alphabet with the vowel letters having a black border and a starting position space with the word "start" and a star at one corner of said game board; and

b) a plurality of playing pieces one for each of the game players, said playing pieces being of a size to fit within each of said spaces on said game board, each said playing



piece is a vowel cube identified on all sides of said vowel cube by one of the vowels, a, e, i, o, u and y.

5,316,483

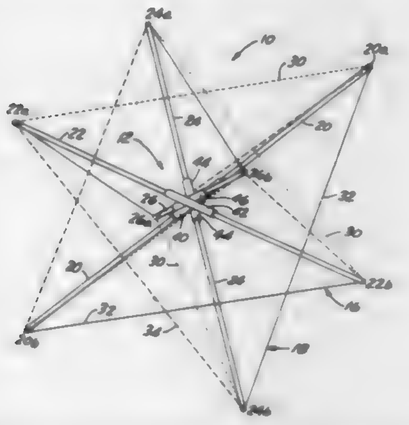
GEOMETRIC DISPLAY DEVICE AND METHOD OF DEMONSTRATING GEOMETRIC SHAPES

Richard B. Esterle, 605 E. 11th St. - Apartment 1A, New York, N.Y. 10009

Filed Feb. 10, 1993, Ser. No. 15,777

Int. Cl.⁵ G09B *23/04*

U.S. Cl. 434—211 **15 Claims**



1. A device for demonstrating geometric shapes comprising a support,

a plurality of tubes supported by and extending through said support and being positioned adjacent to each other in a predetermined spatial orientation and movable relative to the support and to each other,

a plurality of cords extending through said tubes thereby defining a plurality of geometric shapes,

wherein movement of said tubes relative to the support and to each other varies the geometric shapes displayed by said cords.

5,316,484

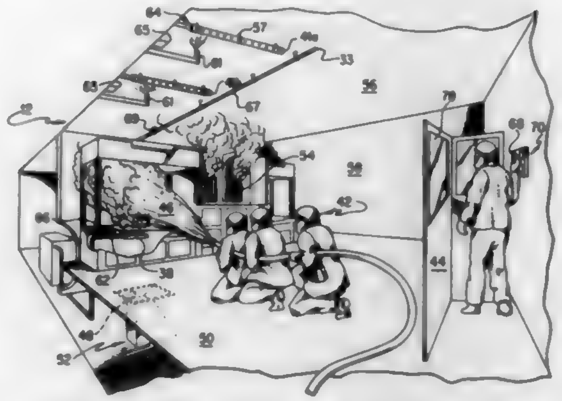
FLASHOVER SIMULATION FOR FIREFIGHTER TRAINING

Mark R. Layton, Severna Park; Ramon L. Palmer, Jr., Cockeysville, both of Md., and Lester L. Smith, Shrewsbury, Pa., assignors to AAI Corporation, Cockeysville, Md.

Continuation of Ser. No. 703,101, May 22, 1991, Pat. No. 5,181,851. This application Jul. 16, 1992, Ser. No. 914,107

Int. Cl.⁵ G09B *19/00*

U.S. Cl. 434—226 **8 Claims**



1. A flashover simulation system for use with a firefighter trainer, comprising:

a burn room having a ceiling portion and a main burner mounted in said burn room;

at least one auxiliary burner positioned adjacent to said ceiling portion, the auxiliary burner being selectively operable to burn fuel supplied thereto from a fuel reservoir;

a fuel igniter positioned adjacent to the auxiliary burner; and

control means operable to effect fuel delivery to said auxiliary burner independently of fuel delivery to the main burner upon attainment of a predetermined monitored operational parameter.

5,316,485

LEARNING MACHINE

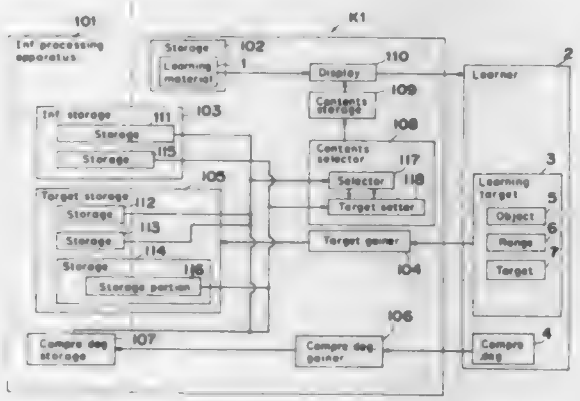
Atsushi Hirose, Sanda, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1993, Ser. No. 9,636

Claims priority, application Japan, Feb. 3, 1992, 4-017365

Int. Cl.⁵ G09B *7/00*

U.S. Cl. 434—322 **5 Claims**



1. A computerized learning machine including an information processing apparatus, said information processing apparatus comprising:

a learning material storage for storing a learning material for each of learning items;

a learning item information storage for storing information on contents of the learning material;

a learning target gainer for gaining a learning target of a learner from the learner;

a learning target storage for storing the learning target gained from the learner by said learning target gainer;

a comprehension degree gainer for gaining from the learner a learning comprehension degree of the learner for each of the learning items;

a comprehension degree storage for storing the learning comprehension degree gained from the learner by said comprehension degree gainer;

a learning contents selector for selecting, on the basis of contents stored in said learning item information storage, said learning target storage and said comprehension degree storage, learning contents including the learning items to be learned by the learner and the learning target for each of the learning items;

a learning contents storage for storing the learning contents selected by said learning contents selector; and

a learning material display which sequentially fetches, on the basis of the learning contents stored in said learning contents storage, the learning material from said learning material storage so as to display the learning material to the learner.

5,316,486

CONNECTOR ASSEMBLY FOR FILM CIRCUITRY

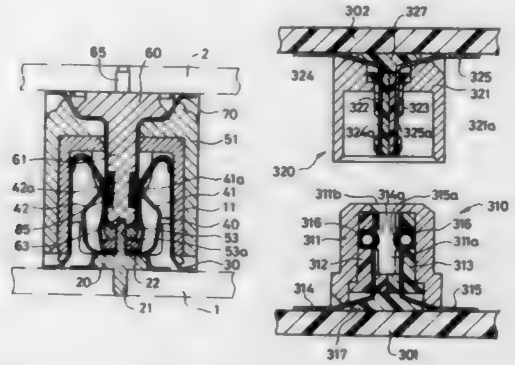
Mitsuho Tanaka; Akira Katsumata, and Hiroshi Arisaka, all of Tokyo, Japan, assignors to KEL Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 689,348, Apr. 22, 1991, Pat. No. 5,156,553. This application Jun. 16, 1992, Ser. No. 899,688

Claims priority, application Japan, Jun. 17, 1991, 3-171680; Jun. 17, 1991, 3-171681; Jun. 17, 1991, 3-171682; Jun. 17, 1991, 3-171683; Jun. 17, 1991, 3-171684

Int. Cl.⁵ H01R *9/09*

U.S. Cl. 439—62 **51 Claims**



1. A connector assembly for film circuitry comprising matable plug and receptacle connector members, the receptacle member including an insulating housing having a mating face and a circuit board engaging face, and providing a plug receiving cavity opening to the mating face; a channel section receptacle spring member of hard material having a base and side walls upstanding from opposite sides of the base, film circuit pressing protuberances on said opposite side walls at locations remote from the base and extending inwardly of the channel, providing a channel mouth, the receptacle spring being mounted in the housing with the channel mouth opening towards the mating face; a film circuit mounted in the housing in taut condition and having a medial portion inserted in the channel and mating contact areas extending over the protuberances away from the mating face and opposite end portions extending out of the channel over respective channel side walls; means provided on the receptacle connector adjacent the base of the receptacle spring for securing the medial portions of the film circuit adjacent the base and means for securing the end portions of the film circuit within the housing, extending outside the channel section and remote from the mating face so that the film circuit extends throughout the cavity in taut condition with tips of opposite ends thereof extending out of the housing exposed to view from the mating face for connection to a circuit board;

the plug connector comprising a plug housing having a mating face and a circuit board engaging face a plug-like film circuit supporting member; and, a film circuit supported on the film circuit supporting member and having mating contact areas extending away from the mating face in taut condition towards the circuit board engaging face, at least one resiliently compressible spring means extending longitudinally of the film circuit supporting member behind the mating contact areas of the film circuit at locations aligned with the protruberances, in a fully mated condition of the connector whereby, on mating the plug and receptacle members, the film circuit supporting member carrying the film circuit is received in the channel mouth between the protuberances flexing resiliently the side walls apart so that the protuberances and the compressible spring press between them corresponding contact areas of the two film circuits together into engagement to effect stable electrical connection between respective conductive tracks thereof.

5,316,487

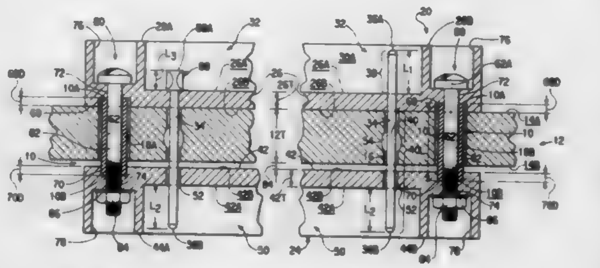
SPACER FOR BOARD MOUNTED CONNECTORS

Stephen L. Clark, Dillsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 820,026, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 515,544, Apr. 24, 1990, abandoned, which is a continuation of Ser. No. 271,154, Nov. 14, 1988, abandoned. This application Mar. 18, 1993, Ser. No. 33,444

Int. Cl.⁵ H01R *23/72*

U.S. Cl. 439—78 **50 Claims**



1. Connector apparatus comprising:

a first connector having a base with an outer surface thereon, a predetermined plurality of pins extending from the outer surface of the base of the header, each pin having a tip thereon, each pin having a predetermined length measured from the outer surface of the base to the tip of the pin,

a second connector having a base with an inner and an outer surface thereon, the base of the second connector having a predetermined thickness dimension associated therewith and an array of apertures therein, the apertures corresponding in number and location to the number and location of the pins extending from the outer surface of the base of the first connector, the pins being receivable into the apertures in the base of the second connector;

a spacer receivable in abutting contact between the outer surface of the base of the first connector and the outer surface of the base of the second connector, the spacer having a predetermined axial dimension associated therewith, the axial dimension being selected such that when the spacer, first connector, and the second connector are secured together, the end of the pins extend from the inner surface of the base of the second connector for a predetermined distance L;

the spacer has an axial bore therethrough, the first connector and the second connector each have a mounting bore therethrough, the bores in the spacer, the first connector and the second connector being coaxially disposed when the first connector, the spacer and the second connector are secured together; and

means for securing together the spacer, the first connector and the second connector, the securing means comprising a bolt extensible through the registered bores in the spacer, the first connector and the second connector and a nut attachable to the bolt.

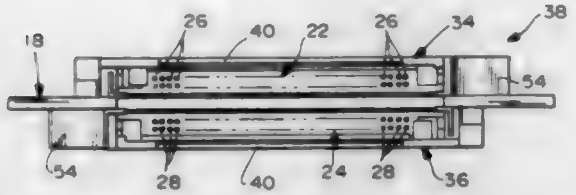
5,316,488
CONNECTOR APPARATUS FOR IC PACKS

Michael J. Gardner, Pleasanton; Jerry D. Kachlic, Milpitas, both of Calif., and Paul M. O'Brien, County Clare, Ireland, assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 4, 1993, Ser. No. 71,799

Int. Cl.⁵ H01R *9/09*

U.S. Cl. 439—79 **11 Claims**



1. In a connector apparatus for providing interconnection between two IC packs and a printed circuit board, including

header connector means for mounting on the printed circuit board, into which the two IC packs are inserted and from which they are ejected, and

ejector means on the header connector means having actuator means for moving the IC packs from inserted positions to ejected positions,

wherein the improvement in said ejector means comprises:

two independent ejector units, each having a separate frame adapted to attach to the header connector means and a separate actuator for moving a respective one of the IC packs from its inserted position to its ejected position; and

complementary interengaging latch means between the separate frames for holding the ejector units in juxtaposition for conjoint attachment to the header connector means.

5,316,489
SURFACE MOUNT ELECTRICAL CONNECTOR

Jerry D. Kachlic, Milpitas, Calif., and AnYong C. Seong, Jurong East, Singapore, assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 965,640, Oct. 23, 1992, Pat. No. 5,269,694.

This application Jul. 21, 1993, Ser. No. 95,616

Int. Cl.⁵ H01R *13/00, 4/58*

U.S. Cl. 439—79 **18 Claims**

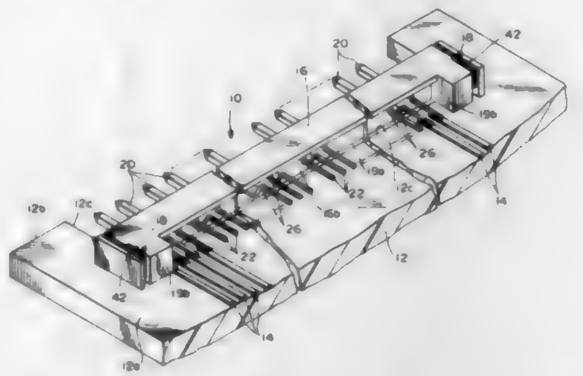
1. An electrical connector for mounting on one side of a printed circuit board, comprising:

an elongated dielectric housing having a lower surface adapted to be positioned adjacent and generally parallel to said printed circuit board and an upper surface generally parallel to said lower surface, said housing having a plurality of terminal receiving cavities therein and at least one generally elongated recess in said housing extending in a direction generally perpendicular to and between said upper and lower surfaces, said recess being defined by a pair of sidewalls and including a projection extending into said recess from one of said sidewalls to create a stop shoulder extending toward the other sidewall and in a direction generally parallel to said printed circuit board;

a resilient, metal locking clip positioned in said recess, said locking clip including

resilient locking means for insertion into said printed circuit board in order to lock said electrical connector thereto upon movement of said connector in a board mounting direction generally perpendicular to said printed circuit board and

resilient retention means for retaining said clip to said housing within said recess, said retention means including a cantilevered projection extending from a generally planar portion of said clip and out of the plane of said generally planar portion in a direction generally parallel to said board mounting direction, said clip being configured so that the end of said projection snaps under said shoulder upon insertion into said recess in a direction parallel to said board mounting direction in order to retain said locking clip in said recess.



5,316,490
MODULAR ELEMENT FOR AN ELECTRICAL POWER DISTRIBUTION DUCT

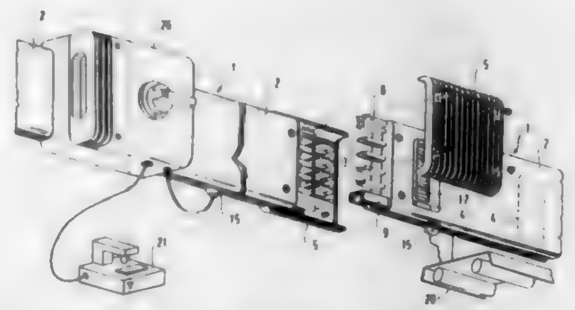
Michel Clemence; Christian Barocci, both of Saint Marcellin, and Christian Dupoux, Pont-En-Royans, all of France, assignors to Société en Nom Collectif: Normabarre, Saint Marcellin, France

Filed Oct. 15, 1992, Ser. No. 961,357

Claims priority, application France, Oct. 16, 1991, 9112752

Int. Cl.⁵ H01R *13/44, 25/00*

U.S. Cl. 439—114 **13 Claims**



1. A modular element for electrical power distribution ducting comprising: an elongated box section structure, conducting electrical power distribution bars arranged inside said box section, distribution openings in said box section structure for lateral access to said distribution bars, a closing-off protective device closing off at least one of said openings in the absence of a tapping therein, said box section structure being composed of two beam members, each beam member having two longitudinal grooves, respective longitudinal edges of two pre-shaped strips having a U-shaped cross section engaged elastically into said longitudinal grooves to thereby become fixedly retained inside said longitudinal grooves of said beam members, said pre-shaped strips together with said beam members defining therebetween a longitudinal cavity, medium power electrical power distribution bars being housed inside said longitudinal cavity, and at least one of said beam members forming a grounding conductor for said ducting.

5,316,491
ELECTRONIC APPARATUS, CARD-TYPE ELECTRONIC COMPONENT USED WITH THE ELECTRONIC APPARATUS, AND ELECTRONIC SYSTEM WITH EXPANDING APPARATUS FOR EXPANDING FUNCTION OF ELECTRONIC APPARATUS

Youji Satou; Katumaru Sasaki; Ryo Hosoya, all of Tokyo; Koichi Kaji, Hidaka, and Kanji Inoue, Tokorozawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

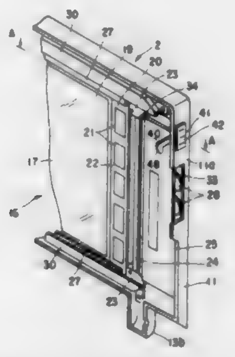
Continuation of Ser. No. 900,974, Jun. 18, 1992, abandoned.

This application Sep. 8, 1993, Ser. No. 118,481

Claims priority, application Japan, Jul. 19, 1991, 3-056489; Jul. 29, 1991, 3-059508; Jul. 29, 1991, 3-187988; Jul. 30, 1991, 3-190207; Sep. 6, 1991, 3-226832; Nov. 28, 1991, 3-314830; Nov. 30, 1991, 3-317177; Jan. 10, 1992, 4-003371; Jun. 11, 1992, 4-152421

Int. Cl.⁵ H01R *13/00*

U.S. Cl. 439—159 **19 Claims**



1. An electronic apparatus comprising:

a box-shaped body;

a card-shaped electronic device to be loaded in the body;

an operating opening portion formed by cutting an edge of the body to a given size and externally accessible by a finger;

a card storing section formed in the body and having an inlet opening open to the operating opening portion, for storing the card-shaped electronic device inserted through the inlet opening; and

an ejection mechanism for ejecting the card-shaped electronic device from the card storing section;

said ejection mechanism including:

a card receiver arranged within the card storing section, for receiving the card-shaped electronic device inserted through the inlet opening, the card receiver having a pressing portion for abutting against a front end of the card-shaped electronic device received by the receiver and being movable in an insertion direction of the card-shaped electronic device between a first position wherein the card-shaped electronic device received by the receiver is stored in the card storing section and a second position wherein a rear end portion of the card-shaped electronic device received by the receiver projects outward from the inlet opening and the operating opening portion;

a drawer member attached to the receiver and movable in the insertion direction between a pushed-in position and a drawn-out position, the drawer member having an operating end portion allowing a finger to be hooked, the operating end portion being located within the operating opening portion when the drawer member is moved to its pushed-in position while the card receiver is in its first position and outwardly projecting through the operating opening portion when the drawer member is moved to its drawn-out position while the card receiver is in its first position; and

connecting means for engaging the card receiver and the drawer member when the drawer member is moved to the drawn-out position so as to move the card receiver from the first position to the second position in accordance with the movement of the drawer member from the drawn-out position toward the inlet opening.

5,316,492
PLUG-IN CONNECTION FOR HIGH-VOLTAGE PLASTIC CABLE

Jacobus M. Schaareman, Delft, Netherlands, assignor to NKF Kabel B.V., Mc Delft, Netherlands

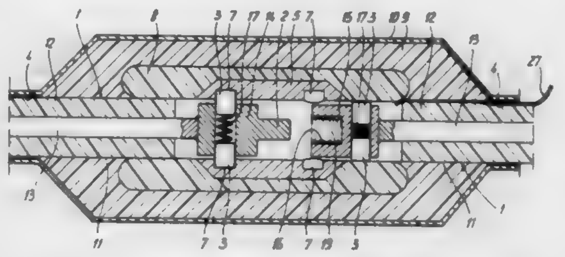
PCT No. PCT/NL90/00060, § 371 Date Nov. 22, 1991, § 102(e) Date Nov. 22, 1991, PCT Pub. No. WO90/13933, PCT Pub. Date Nov. 15, 1990

PCT Filed May 2, 1990, Ser. No. 772,357

Claims priority, application Netherlands, May 3, 1989, 8901138

Int. Cl.⁵ H01R *13/52*

U.S. Cl. 439—206 **32 Claims**



1. A high-voltage, plastic-insulated cable joint for field assembly to a high-voltage cable termination of a cable end of a stiff, heavy, solid-insulated, high-voltage cable rated for voltages in excess of about 50 kV and having an insulated conductor surrounded with a plastic insulation sheath, said high-voltage termination having a second conductor and also being rated for voltages in excess of 50 kV, said cable joint comprising:

a) at least two pluggable conductor-connecting elements one for said cable end and one for said cable termination;

b) an elastic, stretchable electrical sleeve insulator having:

i) an electrically conducting, annular, stress-controlling body defining an interior, open-ended, connection chamber for said conductor-connecting elements, said connection chamber having opposed open ends, said stress-controlling body being operative to screen conductor-connecting elements received in said connection chamber through said open ends; and

ii) an annular insulating body surrounding said stress-controlling body and having first and second insulator body passages opening into said connection chamber open ends, said insulator body passages each making a substantially air-tight close-sliding fit with said insulated first conductor and said second conductor, respectively, whereby said conductors fitted with said conductor-connecting elements can be received through said insulator body passages into said connection chamber;

said sleeve insulator being field assemblage with said cable end and said cable termination; and

iii) air-venting means to remove air from said connection chamber during assembly of said cable joint;

wherein said conductor-connecting elements include a self-locking mechanism actuatable in said connection chamber by relative movement of said cable end toward said cable termination mechanically to lock said cable end in position with respect to said cable termination.

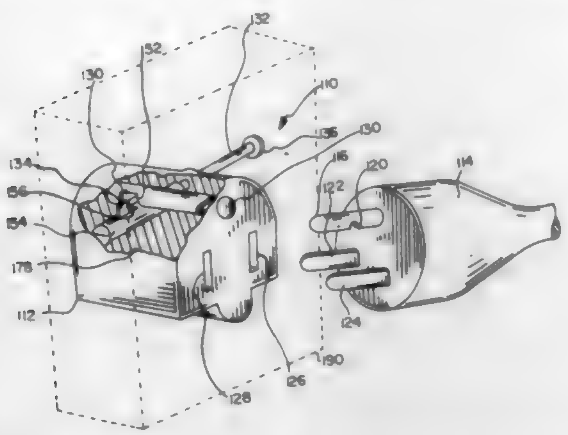
5,316,493
ELECTRIC CORD PLUG FASTENER AND METHOD

David A. Sowers, Coral Springs, Fla., assignor to BSD Enterprises, Inc., Coral Springs, Fla.

Filed Aug. 7, 1991, Ser. No. 741,730

Int. Cl.^{5} H01R *4/50*

U.S. Cl. 439—346 **35 Claims**



1. A female electric cord plug for fastening to a male electric cord plug having at least one prong, wherein said at least one prong has a longitudinal axis and at least one cut out portion, comprising:

at least one prong receiving opening having a longitudinal axis along which said prong receiving opening receives said at least one prong,

prong engaging means in the form of at least one cut out portion engaging member which can enter said prong receiving opening and engage said cut out portion, wherein said cut out portion engaging member can exit said prong receiving opening and disengage said cut out portion and wherein said cut out portion engaging member comprises a slidable shaft positioned essentially perpendicular to said longitudinal axis of said prong receiving opening and a cantilever structure having two ends and being cantilevered from said shaft to protrude laterally from said shaft, said shaft being positioned to pass adjacent to said prong receiving opening, said shaft being slidable substantially axially relative to said prong receiving opening such that said laterally protruding cantilever structure enters and exits said prong receiving opening to engage and disengage said cut out portion by sliding said shaft.

5,316,494
SNAP ON PLUG CONNECTOR FOR A UHF CONNECTOR

James R. Flanagan, Harrisburg, and Michael S. Garland, Columbia, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 5, 1992, Ser. No. 908,699

Int. Cl.^{5} H01R *13/627*

U.S. Cl. 439—352 **12 Claims**

1. An electrical plug for connection to a jack, comprising:

a plug portion for termination of a coaxial cable,

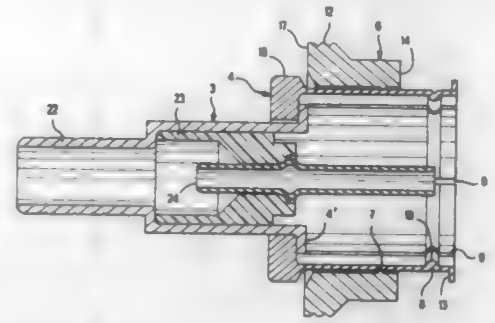
a coupling ring encircling the plug portion and adapted to encircle a threaded jack, at least a portion of the coupling ring being enlargeable radially,

a projection on the coupling ring facing inwardly, the projection biasing the coupling ring radially when riding over threads of the threaded jack,

an external catch on the coupling ring,

a grip member encircling the coupling ring and being moveable forwardly relative to the coupling ring to a position encircling the enlargeable portion of the coupling ring,

an inward facing catch member on the grip member in registration with said external catch, whereby said grip member encircles the enlargeable portion of the coupling ring to limit the radial expansion thereof.



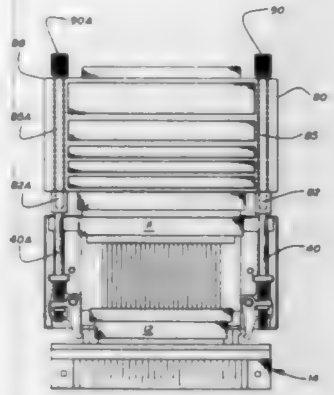
5,316,495
LATCHING SYSTEM FOR ELECTRICAL CONNECTORS

Robert H. Frantz, Newville, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jan. 15, 1993, Ser. No. 4,867

Int. Cl.^{5} H01R *13/62*

U.S. Cl. 439—372 **8 Claims**



1. A system for releasably securing a first connector to a confronting second connector, comprising:

a pair of catches spaced apart along said second connector:

a pair of pivotably-mounted latching members mounted on said first connector, each latching member being pivotable between a latched position in which it is latched to a corresponding one of said catches and a released position in which it is free of said corresponding latch;

a pair of manually-rotatable shaft members secured to said first connector for controlling actuation of said latching members between said latched and released positions thereof;

the end of each of said shaft members which is remote from its corresponding latching member containing a threaded bore;

said system comprising a third connector mated with said first connector; and

a pair of additional threaded shaft members each mounted on said third connector and threadingly engaging one of said bores in said shaft members, to permit turning of said shaft members of said first connector by turning of said additional threaded shaft members.

5,316,496
CONNECTOR FOR FLAT CABLES

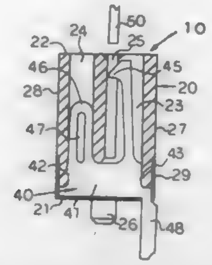
Akira Imai, Yokohama, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 24, 1993, Ser. No. 21,916

Claims priority, application Japan, Feb. 28, 1992, 4-018201; Mar. 23, 1992, 4-023928

Int. Cl.^{5} H01R *13/00*

U.S. Cl. 439—495 **14 Claims**



1. An electrical connector for flat cables comprising:

a connector housing having a longitudinal axis and a plurality of contact receiving sections therein which are spaced along said axis;

each said contact receiving section comprises first and second apertures along a top surface of said connector housing and a contact insertion aperture along a bottom surface of said connector housing, said contact insertion aperture being larger than said first and second apertures for insertion of an electrical contact member at said bottom surface, said top surface further including an elongated cable insertion aperture which transects each said second aperture;

each of said contact receiving sections includes a contact member, said contact member includes, a solder post, a resilient contact arm disposed in each said first aperture, and a holder projection having a through-hole, wherein each said holder projection is disposed in one of said second apertures;

whereby upon insertion of a flat flexible cable the leads thereof engage said contact arms for electrical continuity therewith.

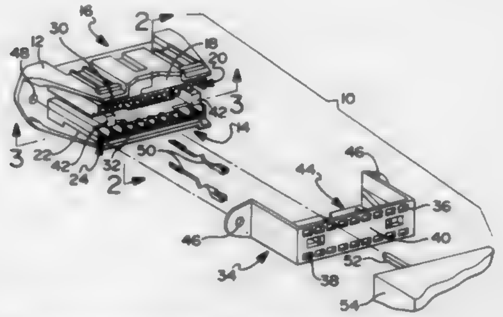
5,316,497
ELECTRICAL CONNECTOR

John N. Topolewski, Westland, and Jeffrey A. Burnside, Dearborn Heights, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jun. 24, 1993, Ser. No. 82,085

Int. Cl.^{5} H01R *13/62*

U.S. Cl. 439—752 **2 Claims**



1. An electrical connector comprising:

a main body portion having a front side, a rear side, an inner upper wall portion and an inner lower wall portion;

a first plurality of bores formed in part from said inner upper wall portion;

a second plurality of bores formed in part from said inner lower wall portion;

said inner upper wall portion including a plurality of nonflexible, non-movable, internal upper shoulder portions, with each one of said internal upper shoulder portions protruding into an associated one of said bores of said upper row of bores;

said inner lower wall portion including a plurality of nonflexible, non-movable internal lower shoulder portions, each one of said lower shoulder portions protruding into an associated one of said bores of said lower row of bores;

each bore of said upper and lower rows of bores being adapted to slidably receive therein a terminal element inserted therein from said front side of said main body portion;

each one of said internal shoulder portions being adapted to engage a portion of an associated one of said terminal elements inserted within its associated bore to thereby prevent said terminal element from being pulled from said rear side of main body portion out of said main body portion

wherein said inner upper wall portion includes a plurality of upper rib portions, with each one of said upper rib portions protruding into an associated one of said bores;

wherein said inner lower wall portion includes a plurality of lower rib portions, with each one of said lower rib portions protruding into an associated one of said bores of said lower row of bores;

each one of said upper and lower rib portions being operable to help facilitate electrical connection between a terminal element inserted within each one of said bores and a terminal member protruding into an associated one of said bores by forcing said terminal member into electrical contact with said terminal element inserted within said associated one of said bores.

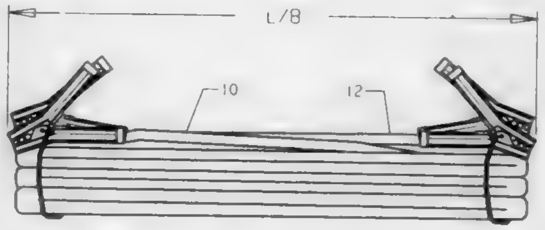
5,316,498
BATTERY BOOSTER CABLE STORAGE SYSTEM

Joseph Hooper, 5201 Branson Rd., Poteau, Okla. 74953

Filed Jun. 14, 1993, Ser. No. 75,377

Int. Cl.^{5} H01R *11/24*

U.S. Cl. 439—501 **7 Claims**



1. A battery booster cable storage system comprising:

two elongated battery booster cables each having a predetermined length L;

each of said battery booster cables having a stranded wire electrical conductor that extends its length and they are each surrounded by a layer of insulation, said stranded wire electrical conductors having a first end and a second end;

four alligator clamp assemblies each formed from a pair of elongated handles having a jaw with teeth formed on one of their ends, a pivot pin connects said pair of handles intermediate their length, said pivot pin passes through a coiled spring that functions to keep said jaws clamped together, an insulator hand grip is removably received on each handle;

the respective first and second ends of said stranded wire electrical conductors being connected to only one of the handles of an alligator clamp assembly;

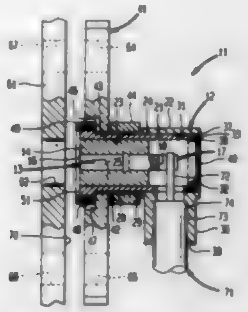
said battery booster cables being folded back and forth into a predetermined shape that is substantially linear and having a folded length no greater than L/3; and

means for holding said folded booster cables in said substantially linear configuration comprising a closed loop elastic member directly secured to one of the alligator clamp assemblies at each end of said substantially linear folded shape.

5,316,499
COAXIAL CONNECTOR WITH ROTATABLE MOUNTING FLANGE

Anthony R. Scannelli, Stoneham; Donald G. Gartzke, Ipswich, and Christopher Lewis, Southboro, all of Mass., assignors to Dynawave Incorporated, Georgetown, Mass.

Filed Jan. 21, 1993, Ser. No. 7,645
Int. Cl.^{5} H01R *13/74*
U.S. Cl. 439—534 **19 Claims**

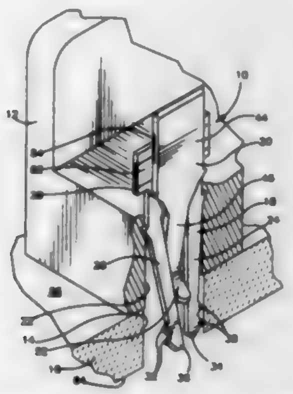


1. A coaxial cable connector comprising:
an annular outer conductor means having an inner cylindrical surface and an outer cylindrical surface defining an annular recess;
an inner conductor disposed coaxially within said outer conductor means;
an annular insulator retained between said inner conductor and said outer conductor means and engaging said inner cylindrical surface; and
an annular mounting the flange plate rotatably mounted on said outer conductor means and projecting radially outwardly therefrom, said annular mounting flange plate defining a plurality of fastener holes and having an inner portion rotatably received by said annular recess.

5,316,500
FASTENER FOR A PRINTED CIRCUIT BOARD MOUNTED CONNECTOR

John T. Vanaleck, and Alan L. Roath, both of Madison, Ohio, assignors to Ohio Associated Enterprises, Inc., Painesville, Ohio

Filed Jan. 11, 1993, Ser. No. 2,659
Int. Cl.^{5} H01R *13/73*
U.S. Cl. 439—567 **6 Claims**

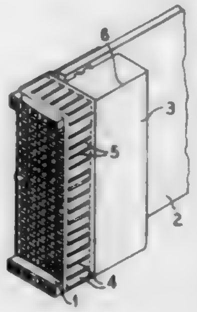


1. A fastener for securing a connector body over a hole in a printed circuit board comprising:
a) a clip fixed in the body including a pair of resilient arms extending beyond the body having engagement means near free ends of the arms for engaging the inner surfaces of the hole, wherein the arms converge in an unengaged condition toward each other near their free ends to retract the engagement means from contact with the hole; and
b) a wedge supported by the body for sliding non-rotational motion along the clip toward the free ends of the arms, including a portion extending between the arms for spreading the arms and engagement means as the wedge slides toward the free ends of the arms to engage the clip with an inner surface of the hole.

5,316,501
SHIELDED MULTIPOLAR CONNECTOR

Eduard Mair, München, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
PCT No. PCT/DE91/00828, § 371 Date Apr. 29, 1993, § 102(e) Date Apr. 29, 1993, PCT Pub. No. WO92/08261, PCT Pub. Date May 14, 1992

PCT Filed Oct. 23, 1991, Ser. No. 50,036
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1990, 9015255[U]
Int. Cl.^{5} H01R *13/658*
U.S. Cl. 439—607 **8 Claims**

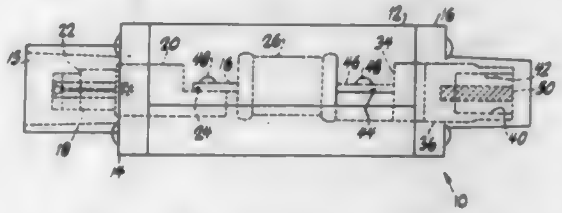


1. A multipole plug connector comprising plug contact elements and connecting elements on a rear side of the plug connector for incoming leads, the plug connector and the connecting elements being surrounded by a shielding jacket, with the exception of an insertion side of the plug connector, the shielding jacket being produced from at least one feathered shielding plate which is in the form of a strip, is provided with lateral slots and is bent around the plug connector and the connecting elements in an overlapping manner; overlapping ends of the shielding plate making contact with one another; and, in the region of the lateral slots, corresponding bending edges of the shielding plate lie along a respective side edge of the plug connector extending in an insertion direction.

5,316,502
ELECTRICAL CONNECTOR WITH CIRCUIT PROTECTION

Farkas Loet, Freeport, N.Y., assignor to Union Connector Co., Inc., Roosevelt, N.Y.

Filed Apr. 10, 1992, Ser. No. 867,252
Int. Cl.^{5} H01R *83/68*
U.S. Cl. 439—621 **6 Claims**

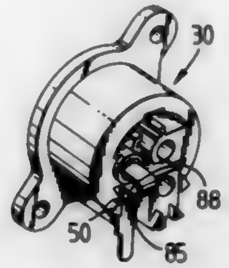


1. A portable circuit protection component for use in a power distribution network to couple power cables to one another, the component comprising:
a portable enclosure formed to include at least two electrical connector mountings;
a male electrical connector mounted in one of the electrical connector mountings;
a female electrical connector mounted in the other of the electrical connector mountings; and
a circuit protection device mounted within the enclosure and electrically coupling the male electrical connector to the female electrical connector;
the male and female electrical connectors having first and second safety elements, respectively, of predetermined dimensions, the predetermined dimensions being set independently within the range of dimensions of the respective male and female connectors, and corresponding to a power rating for the circuit protection device; and wherein:
the first safety element comprises an opening having a cross-section of the predetermined dimensions and formed to extend in the direction of the longitudinal axis of the male electrical connector, and is adapted to mate only with a second safety element having compatible dimensions, upon coupling of the male electrical connector with a female electrical connector of one of the power cables including a second safety element; and
the second safety element comprises a safety pin having a cross-section of the predetermined dimensions and mounted to extend in the direction of the longitudinal axis of the female connector, and is adapted to mate only with a first safety element having compatible dimensions, upon coupling of the female electrical connector with a male electrical connector of another one of the power cables including a first safety element.

5,316,503
ELECTRICAL CONNECTORS

Ray Thompson, Dudley, and Robert W. Taylor, Chipstead, both of Great Britain, assignors to Cliff Electronic Components Limited, Surrey, United Kingdom

Filed Nov. 17, 1992, Ser. No. 977,766
Claims priority, application United Kingdom, Nov. 18, 1991, 9124465
Int. Cl.^{5} H01R *13/42*
U.S. Cl. 439—740 **18 Claims**

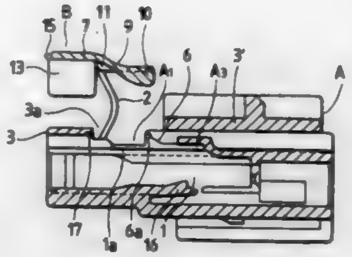


1. An electrical connector comprising a body in which an electrical contact element is retained in a longitudinal chamber extending within the body, said body having a first retaining means which engages a second retaining means integrally formed on the contact element when received in the chamber, said engagement between the first and second retaining means being effected by inserting the element longitudinally into the chamber in a first orientation and rotating the element about its longitudinal axis and relative to the body to a second orientation in which the contact element is restrained from longitudinal displacement relative to the body, and said body comprising an integrally formed third retaining means which is engageable by an integral extension of the contact element in its second orientation to restrain said contact element from rotating relative to the body.

5,316,504
ELECTRICAL CONNECTOR WITH REAR HOLDER

Keishi Jinno, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed May 25, 1993, Ser. No. 66,232
Claims priority, application Japan, May 25, 1992, 4-132399
Int. Cl.^{5} H01R *13/514*
U.S. Cl. 439—752 **2 Claims**

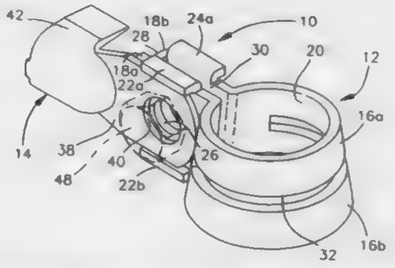


1. An electrical connector comprising:
a connector housing in which a plurality of terminal accommodating chambers are formed, each terminal accommodating chamber having a flexible engagement arm to prevent terminals form being disengaged from said connector housing, each terminal accommodating chamber having an opening portion defined by cutting out an outer peripheral wall of said connector housing; and
rear holder integrally connected to said connector housing through a hinge belt, said rear holder being provided with a plurality of movable arms, said movable arms including a plurality of terminal engagement portions which are corresponded to said terminal accommodating chambers, said rear holder being engaged with said connector housing in one of provisionally connected state and a real connected state,
wherein a fitting guide projection provided with each movable arm is positioned at an inlet portion of a fitting guide recess formed on said outer peripheral wall in a terminal insertion direction when said rear holder is in said provisionally connected state so that said fitting guide projection is dislocated form a path of insertion of said terminal, and said fitting guide projection is guided along a tapered guide surface of said fitting guide recess to deform said movable arm so as to insert said terminal engagement portion to said path of insertion of said terminal.

5,316,505
STAMPED BATTERY TERMINAL CONNECTOR

LeRoy E. Kipp, Port Huron, Mich., assignor to Prestolite Wire Corporation, Farmington Hills, Mich.

Filed Jul. 31, 1992, Ser. No. 923,145
Int. Cl.^{5} H01R *4/42*
U.S. Cl. 439—762 **21 Claims**



1. An electrical connector for a battery post comprising:
a main terminal having one end, an opposite end and a frustoconical gripping portion interposed said one end and said opposite end, said frustoconical gripping portion having a substantially annular shape so as to define an axial opening therethrough, said axial opening having a central

axis, said frustoconical gripping portion of said main terminal having a circumferentially extending slot; and

means for constricting said frustoconical gripping portion about said battery post, said constricting means being operable to cause a clamping action by said frustoconical gripping portion about said battery post;

whereby as said constricting means constricts said frustoconical gripping portion said circumferentially extending slot enables said frustoconical gripping portion to generate a clamping force.

5,316,506
TERMINAL FOR FIXING WIRES

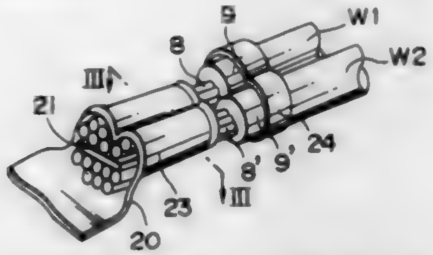
Akira Ito, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Nov. 20, 1992, Ser. No. 979,223

Claims priority, application Japan, Nov. 26, 1991, 3-310770

Int. Cl.⁵ H01R *4/18*

U.S. Cl. 439—879 **5 Claims**



1. A terminal including a core wire-fixing barrel which is approximately U-shaped so as to have side walls and an interior surface and is crimped on two or more core wires inserted thereinto, said terminal comprising:

a tab having upper and lower surfaces with serrations formed thereon, said tab being disposed along a boundary between said core wires so that said serrations shear an oxide film formed on said core wires in contact with said upper and lower surfaces of said tab and remove said oxide film from said core wires, whereby said core wires are electrically connected with each other via said tab;

wherein said tab comprises a rectangular-shaped piece of conductive metal which is inserted in between the side walls of the core wire-fixing barrel so as to be separate and spaced apart from the side walls and the entire interior surface.

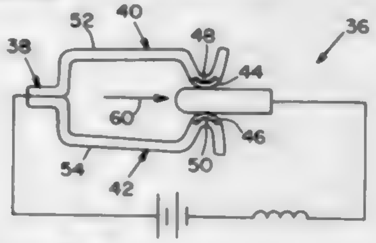
5,316,507
NOBEL METAL AND SOLID-PHASE LUBRICANT COMPOSITION AND ELECTRICALLY CONDUCTIVE INTERCONNECTOR

Patrick O. Capp, Woonsocket, R.I., assignor to Metallon Engineered Materials Corporation, Pawtucket, R.I.

Division of Ser. No. 661,872, Feb. 27, 1991, Pat. No. 5,236,628. This application Apr. 30, 1993, Ser. No. 56,289

Int. Cl.⁵ H01R *3/08*

U.S. Cl. 439—886 **14 Claims**



1. An electrically conductive interconnector for an electronic circuit, comprising:

a) a bulk electrical conductor;

b) a diffusion barrier bonded to a surface of the bulk electrical conductor, whereby significant diffusion of the bulk electrical conductor across the diffusion barrier is prevented; and

c) a contact layer bonded to the diffusion barrier, the contact layer being formed of an electrically conductive composition including a noble metal component and a solid-phase lubricant component, the solid-phase lubricant component being present in an amount sufficient to cause the electrically conductive composition to have a coefficient of friction which is significantly less than the coefficient of friction of the noble metal component without causing the electrically conductive composition to be significantly less malleable than the noble metal component.

wherein the electrically conductive diffusion barrier includes nickel.

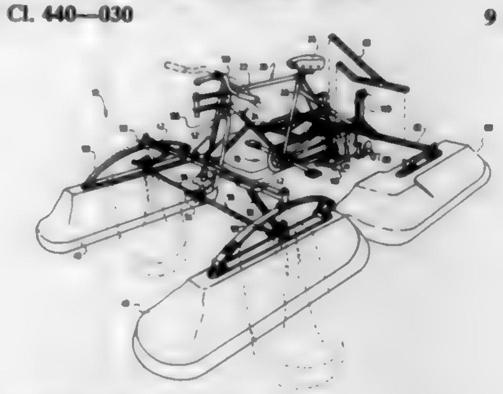
5,316,508
WATER BICYCLE

Angelo Landucci, 16350, chemin St-Roch, Tracy, Quebec, Canada J3P 5N3

Filed Jan. 14, 1993, Ser. No. 4,239

Int. Cl.⁵ B60F *3/00*

U.S. Cl. 440—030 **9 Claims**



1. A water bicycle comprising:

a main frame;

a pair of steerable front pontoons operatively secured to said main frame and so connected as to remain substantially parallel to each other;

means for steering said front pontoons;

a front suspension located between said front pontoons and said main frame for improving stability and absorbing wave, movement said front suspension comprising a laterally extending frame member and a generally longitudinally extending leaf spring mounted between each front pontoon and respective lateral end of said laterally extending frame member, said laterally extending frame member comprising a pair of releasably secured side members, one of the side members extending from each side of the main frame whereby each of said front pontoons along with a respective side member and leaf spring can be removed as a unit from said main frame;

two rear pontoons substantially parallel to each other and rigidly secured to said main frame;

a pedal mechanism located on said main frame;

water propulsion means for propelling said bicycle in water; and

transmission means for mechanically connecting said pedal mechanism to said water propulsion means.

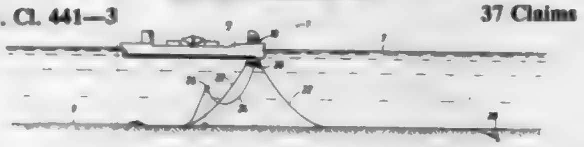
5,316,509
DISCONNECTABLE MOORING SYSTEM

L. Terry Boatman, Katy; Charles O. Ethridge, Houston, both of Tex.; Kristen I. Pedersen, Hendersonville, N.C., and Peter F. Poranski, Sr., Houston, Tex., assignors to Sofec, Inc., Houston, Tex.

Filed Sep. 27, 1991, Ser. No. 767,026

Int. Cl.⁵ B63B *21/52*

U.S. Cl. 441—3 **37 Claims**



1. An improved detachable vessel mooring system including a vessel having a vertically aligned turret rotatably secured to its hull such that said hull and turret may rotate with respect to each other with the bottom end of said turret facing downwardly toward the sea and including a buoyant mooring element and a plurality of mooring lines extending between and connected to said mooring element and the sea floor and including a selectively operable hydraulic connector assembly having a collet flange hub mounted at the top of said mooring element and hydraulically powered collet connector mounted to the bottom of said turret wherein the improvement comprises,

an extension member coupled to said collet connector selectively latched to said collet flange hub.

means for selectively applying a force to said extension member in a direction away from said collet connector and said collet flange hub such that said extension member moves a distance away from said collet connector, said force on said extension member being coupled to said collet connector thereby creating tension between said collet connector and said collet flange hub, and

means for locking said extension member at said distance away from said collet connector, thereby maintaining said tension between said collet connector and said collet flange hub when said force on said extension member is no longer applied.

5,316,510
METHOD AND DEVICE FOR RECYCLING COATED GLASS

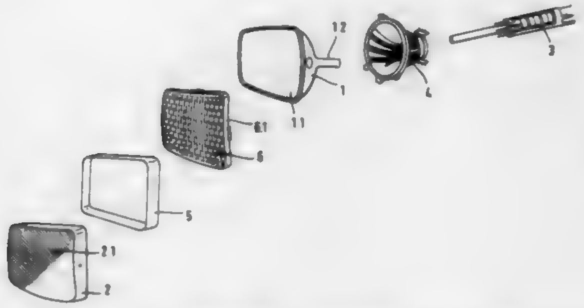
Johann Mühlberger, Syrgenstein; Eberhard Gläser, Aichwald, and Stefan Maier, Gerlingen, all of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 24, 1992, Ser. No. 919,195

Claims priority, application European Pat. Off., Jul. 25, 1991, 91112464.2

Int. Cl.⁵ H01J *9/50*

U.S. Cl. 445—2 **13 Claims**



1. A method for recycling of coated glass of a cathode ray tube, said method comprising the steps of:

venting the cathode-ray tube;

crushing the cathode ray tube;

sorting metal parts and crushed glass of the crushed cathode-ray tube;

transferring the crushed glass into a mixing unit;

mixing the crushed glass for a predetermined time period;

during said mixing step, adding liquid to the crushed glass and cleaning the crushed glass with the liquid;

circulating the liquid by pumping;

separating contaminants, washed off by the liquid, from the liquid by a process selected from the group of allowing the contaminants to settle and filtering the contaminants; and

removing the cleaned crushed glass from the mixing unit.

5,316,511
METHOD FOR MAKING A SILICON FIELD EMISSION DEVICE

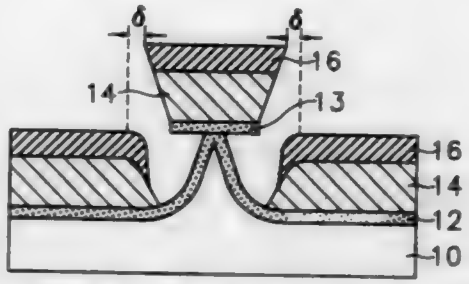
Kangok Lee, Kyunggi, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea

Filed Mar. 2, 1993, Ser. No. 25,094

Claims priority, application Rep. of Korea, Nov. 25, 1992, 92-22357

Int. Cl.⁵ H01J *9/02*

U.S. Cl. 445—24 **1 Claim**



1. A method for making a silicon field emission device comprising the steps of:

forming thermal oxide masks by photo-etching after thermal oxidation of a high density silicon substrate;

carrying out reactive ion etching on said silicon substrate to form conical emitters by means of said thermal oxide masks;

carrying out a thermal oxidation process to form said plane emitters to have sharp tips;

forming insulating films self-aligned through said masks;

carrying out a densification process at a high temperature to shrink each thickness of said masks and insulating films in the vertical and horizontal directions;

forming gate electrodes to enclose one part of said insulating films by depositing a gate metal layer on said insulating films having the thickness shrank through said process sequence; and

carrying out lift-off to remove simultaneously said upper layers including said mask.

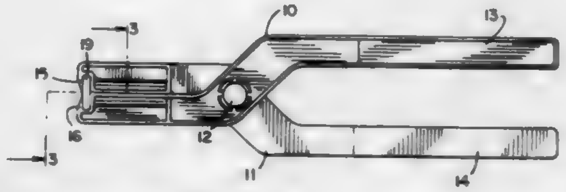
5,316,512
LAMP PULLER

William Ell, N87 W17785 Shepherd Dr., Menomonee Falls, Wis. 53051

Filed Mar. 1, 1991, Ser. No. 663,540

Int. Cl.⁵ H01J *9/50;* **B23P** *19/04;* **B25B** *7/02*

U.S. Cl. 445—61 **5 Claims**



1. A lamp puller, comprising

a pair of jaws joined together at a pivot, the jaws each having a handle portion on one side of the pivot and a working end on the other side of the pivot,

the jaws each having a wedge portion on the working end that closes with the wedge portion of the other jaw as the jaws are closed, the wedge portion of each jaw having a semicircular notch with a wedge edge, and

the jaws each having a recess inward of the wedge portion and opposing a like recess in the other jaw to define a pocket to receive the bulb of a lamp when the jaws are closed.

5,316,513
ELECTROTHERMAL COLOR-VARYING DEVICE AND TOY UTILIZING THE SAME

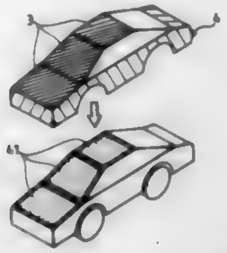
Tanehiro Nakagawa, Nagoya; Yoshiaki Ono, Gifu; Tsutomu Tomatsu; Takeo Yamaguchi, both of Nagoya; Kyoji Aoyama, Aichi, and Toshiaki Tanaka, Yokkaichi, all of Japan, assignors to The Pilot Ink Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 750,244, Aug. 27, 1991, abandoned. This application Aug. 18, 1993, Ser. No. 107,907

Claims priority, application Japan, Aug. 31, 1990, 2-231050; Oct. 12, 1990, 2-107362[U]; Nov. 18, 1990, 2-120360[U]; Jan. 26, 1991, 3-57671[U]; Jun. 26, 1991, 3-183052

Int. Cl.⁵ A63H *33/00, 29/22, 33/22*

U.S. Cl. 446—14 5 Claims



1. A toy formed of a substrate and comprising an electrothermal color-varying device and a thermally color-varying layer comprising a thermally color-varying material, said color-varying material comprising a composition of an electron-donating color forming organic compound, an electron-accepting compound and an organic medium reversibly inducing a color developing reaction of said two compounds; said electrothermal color varying device comprising an electrothermal heat generating member comprising a sintered material based on $BaTiO_3$ and having a flat front surface and an opposed back surface, the electrothermal heat generating member being formed with electrodes at said front and back surfaces and being positioned with said front surface in close contact with a back surface of the toy substrate, wherein color change is induced in said color-varying layer by electric current supply to said heat-generating member,

i) a positive temperature coefficient on the electric resistance at least within a temperature range of 25° C. to 65° C., and a steep increase of resistance with increase in temperature, whereby the amount of generated heat decreases with the increase in resistance to enable self-control of temperature,

ii) a volume resistivity at 25° C. (ρ_{25}) within a range of 9.8×10^{-3} to $2.97\times10^5\times\Omega$-cm; and

iii) a ratio ρ_{65}/ρ_{25} of the volume resistivity at 65° C. to that at 25° C. within a range indicated by $5\leqq\rho_{65}/\rho_{25}\leqq200$, which is adapted to generate heat by the application of a voltage of 0.8 to 40 V, and of which saturated heating temperature is self-controlled at an arbitrary temperature within a range of 25° C. to 65° C.

5,316,514
TOY VEHICLE AND LAUNCHER SYSTEM

Steven Ellman, Brooklyn; Fredric Ellman, New York; Julius Ellman, Brooklyn, all of N.Y., and John C. Fusi, New Providence, N.J., assignors to Matchbox Toys (USA) Ltd., Moonachie, N.J.

Filed Feb. 13, 1992, Ser. No. 834,865

Int. Cl.⁵ A63H *29/00*

U.S. Cl. 446—26 26 Claims

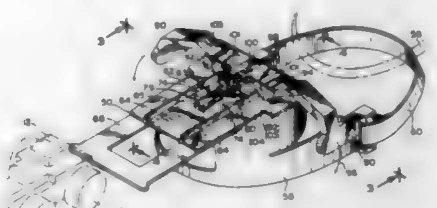
1. A toy vehicle and launcher system comprising:

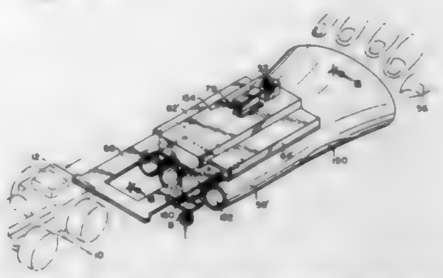
(A) a motor-driven toy vehicle having a wind-up spring-driven motor to provide forward motion thereof;

(B) a launcher for mounting said vehicle, said launcher having releasable locking means for precluding forward motion of said vehicle; and

(C) biasing means, separate and independent from and in addition to said motor, for providing said vehicle with forward motion immediately upon release of said locking means, said biasing means including a spring and a retractable spring-loaded piston; and

(D) means for retracting said piston against said spring and for winding said motor as said vehicle is mounted on said launcher with a backward motion.





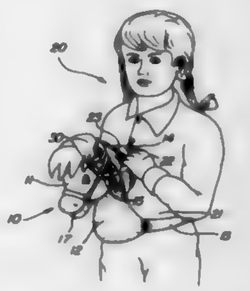
5,316,515
WAIST ATTACHING HOBBY HORSE

Greg Hyman, Pound Ridge, N.Y.; Lawrence Reiner, Ft. Lee, N.J.; Martin J. Caveza, Redondo Beach, and Roger A. Newbold, Garden Grove, both of Calif., assignors to Mattel, Inc., El Segundo, Calif.

Filed Aug. 17, 1992, Ser. No. 930,579

Int. Cl.⁵ A63H *33/00*

U.S. Cl. 446—28 9 Claims



1. A waist supported play animal comprising:
an animal head and neck portion;
a belt coupled to said neck portion for user waist attachment;
a rein switch supported within said head having rein attachment means on each side thereof, said rein switch including;
  an elongated housing having an elongated interior cavity formed therein;
  an elongated switch bar having opposed ends and having said rein attachment means supported at said opposed ends;
  spring support means coupled to said switch bar urging said switch bar forwardly within said interior cavity;
  a switch supported by said switch bar and having a rearwardly extending actuator; and
  limit means for limiting the rearward travel of said switch bar;
a rein having end portions coupled to said rein attachment means;
a motion switch supported within said head portion;
a plurality of pressure responsive switches disposed within said head portion and actuatable by user touch and manipulation of said head in proximity thereto; and
sound means, having means for producing a plurality of stored audible sounds, coupled to said rein switch, said motion switch and said plurality of pressure responsive switches to select one or more of said sounds in response to actuation thereof.

5,316,516
ANIMATED SINGING TOY BIRD WITH EXTERNAL STIMULUS SENSOR

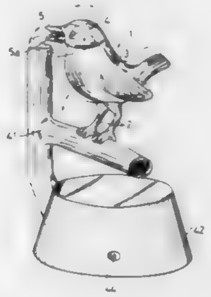
Shinya Saitoh, Shiroi, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

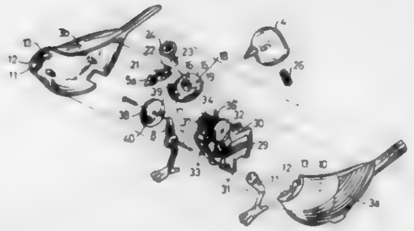
Filed Jul. 20, 1992, Ser. No. 917,485

Claims priority, application Japan, Apr. 21, 1992, 4-033480[U]; Jun. 3, 1992, 4-044413[U]

Int. Cl.⁵ A63H *3/28, 11/00*

U.S. Cl. 446—175 5 Claims





1. A toy bird comprising:
a leg section including a pair of legs;
a body section arranged so as to be longitudinally moved with respect to said leg section;
a head section arranged so as to be rotatably moved with respect to said body section;
a driving unit arranged in said body section and including a motor with an output shaft for actuating said body section and head section; and
an actuating means for actuating said driving unit;
said actuating means including a sensor for detecting an external stimulus and a control circuit electrically connected to said driving unit and said sensor;
said driving unit including a first rotating shaft operatively coupled with the output shaft of said motor, first and second cam members being mounted on said first shaft, respectively, and a third cam member being drivingly connected to said first shaft and arranged so as to rotate about an axis parallel to said first shaft;
said head section including a bill constructed so as to be openable, an engagement rod fixed to a lower portion of said head section and extending downwardly therefrom, and a vertically movable shaft member connected to said bill, said engagement rod being at the lower end thereof disengageably abutted against an outer surface of said first cam member, said shaft member being abutted at the lower end thereof against an outer surface of said second cam member;
one of said pair of legs being provided at an upper portion thereof with an engagement element which repeatedly engages with and disengages from said third cam member during rotation of said third cam member.

5,316,517
COIN DISPENSING DEVICE

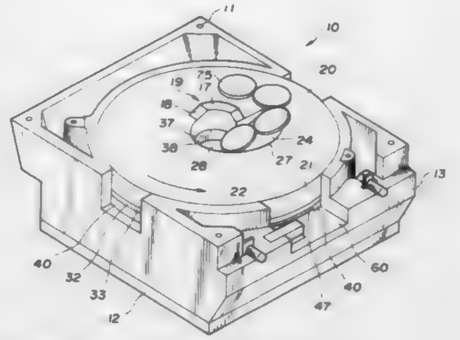
Kazumii Chiba, 367-1-401, and Clarence Y. T. Cheng, 102 Sunnywell Sankei-en 367-2, both of Honmokumotomachi, Naka-ku, Yokohama-shi, Japan

Filed Jun. 18, 1992, Ser. No. 900,930

Claims priority, application Japan, Oct. 14, 1991, 3-293561

Int. Cl.⁵ G07D *1/00*

U.S. Cl. 453—57 22 Claims



1. A coin dispensing device comprising:
means for storing loose coins;
first rotary means associated with a central feed aperture for receiving a loose coin from said loose coin storing means and feeding the loose coin into said central feed aperture so that coins are fed one-by-one;
stationary means for defining an elongated slot associated with said central feed aperture essentially at the inner end thereof for receiving the loose coin fed therethrough, said elongated slot forming a dispensing path for the loose coins fed from said central feed aperture;
second rotary means for pushing out the loose coins in said elongated slot toward a dispensing outlet, said second rotary means carrying pushing means movable across said elongated slot for exerting feeding force to the loose coin within said elongated slot for pushing out the coin within said elongated slot one-by-one;
driving means for rotatingly driving said first and second rotary means; and
feed means incorporated in said first rotary means for sweeping the loose coins on said first rotary means into said central feed aperture, said feed means including an arcuate and tapered side wall having radial dimension progressively varying from a first circumferential end having the maximum radial dimension to a second circumferential end having the minimum radial dimension, the taper angle down toward said central feed aperture being increased from said first end to said second end, so that the loose coin is scooped at a position in the vicinity of said first circumferential end substantially in a one-by-one basis and fed toward the central feed aperture by the progressively increasing taper angle of said tapered side wall.

5,316,518
CLEAN CONTAINMENT ROOM CONSTRUCTION

John G. Challenger, Newbury, United Kingdom, assignor to Clean Room Construction (London) Ltd., London, United Kingdom

Filed Jan. 29, 1993, Ser. No. 11,174

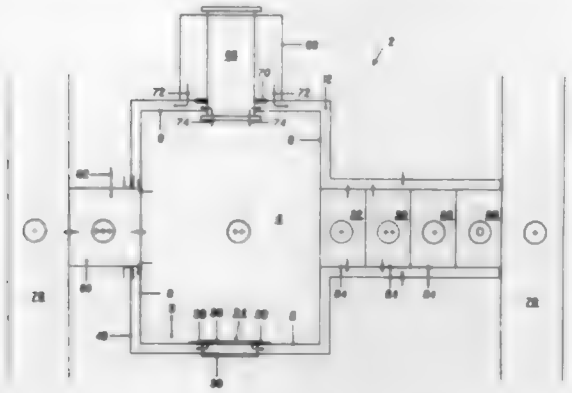
Claims priority, application United Kingdom, Jan. 31, 1992, 9202154

Int. Cl.⁵ F24F *7/007*

U.S. Cl. 454—187 8 Claims

1. A clean containment room construction which comprises a work room having a floor, walls and a ceiling, an isolation

void which surrounds the walls and the ceiling of the work room, air-circulating means which maintains a circulation of air in the work room which is always at a positive pressure with respect to atmospheric pressure, and air-evacuating means which maintains air in the isolation void which is always at a negative pressure with respect to atmospheric pressure whereby air in the work room can leak into the isolation void but air in the isolation void cannot leak into the atmosphere, and whereby air in the isolation void cannot leak into the work room, and an entrance section with interlocking doors defining a first entrance area which is maintained at atmospheric pressure, a second entrance area which is maintained at a pressure above atmospheric pressure, a third entrance area which is maintained at a pressure above atmospheric pressure, and a fourth entrance area which is maintained at a pressure above atmospheric pressure, and the pressure in the third entrance area being higher than the pressure in the second and fourth entrance areas.



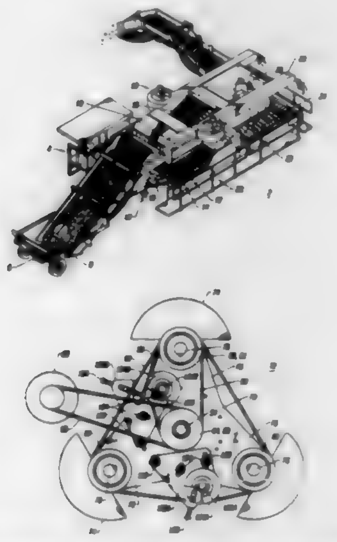
5,316,519
MULTIPLE WEIGHT DRUM SHAKER

Howard B. Johnson, Woodland, Calif., assignor to Johnson Farm Machinery Company, Inc., Woodland, Calif.

Filed May 7, 1992, Ser. No. 879,499

Int. Cl.^{5} A01F *11/00*

U.S. Cl. 460—96 **25 Claims**



20. An apparatus for disengaging fruit from stem portions of a harvested crop, the apparatus comprising:
a drum rotatable about a first axis;
a plurality of tines of varied stiffness extending radially from the drum;
means coupled to the drum for rotationally oscillating the drum, said oscillation means comprising:
at least three rotatable counterweights at a given axial end of the drum and arranged in a common plane, each counterweight having an axis of rotation spaced part form the first axis and spaced apart from a center of mass of the counterweight; and
means for rotating the counterweights in a phased relationship;
wherein rotating the counterweights causes cyclical rotational acceleration and deceleration of the drum and tines, thereby disengaging the fruit.

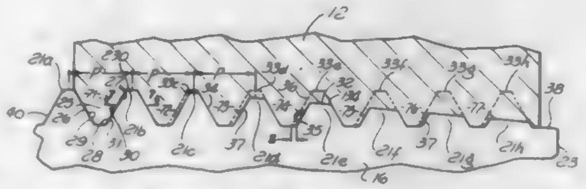
5,316,520
FORMATION OF THREADS WITH VARYING PITCH

William P. Green, 3570 E. Lombardy Rd., Pasadena, Calif. 91107

Filed Jun. 25, 1992, Ser. No. 904,499

Int. Cl.^{5} B21K *1/64*

U.S. Cl. 470—18 **46 Claims**



1. Apparatus for forming a thread and thread groove having a predetermined varying pitch, comprising:
a tool body;
a plurality of pre-forming projections on said tool body for producing in a work piece by relative rotary and axial movement of the tool body and work piece a partially formed thread and thread groove which do not have said predetermined varying pitch;
one or two final thread shaping projections also carried by said tool body and operable by relative rotary and axial movement of said body and work piece, at a varying rate of axial advancement per revolution, to reshape said partially formed thread and groove to a form having said predetermined varying pitch; and
drive means for moving said work piece and tool body both rotatively and axially relative to one another to produce said partially formed thread and thread groove, and for moving said work piece and tool body both rotatively and axially relative to one another at a varying rate of axial advancement per revolution to reshape the partially formed thread and groove to said predetermined varying pitch form.

5,316,521
TEXTURED OIL-FREE BOWLING LANE SURFACE

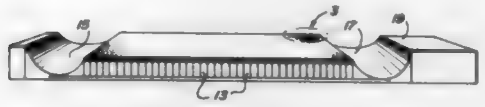
Fred P. Ayre, Jr., 321 E. Fairview, Bethlehem, Pa. 18017

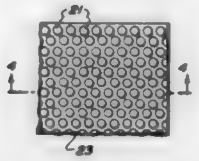
Filed Dec. 31, 1991, Ser. No. 815,387

Int. Cl.^{5} A63D *1/04*

U.S. Cl. 473—115 **23 Claims**

1. An improved bowling lane surface adapted for oil-free operation comprising:
(a) a bowling lane having an upper lane surface adapted for contact with and support of a moving bowling ball said surface being formed from a synthetic polymer material having a characteristic lubricity with respect to the surface of a bowling ball and disposed structurally as at least a layer upon an upper portion of the bowling lane,
(b) said upper surface of said synthetic polymer material having a variable profile including a plurality of interspersed closely spaced relative high points and relative low points,
(c) the high points being spaced within an average distance of adjacent high points that provides continuous support by said high points of the surface of a bowling ball passing over the surface without substantial up-and-down motion of the ball as a whole as it traverses said surface, and
(d) the low points being vertically spaced on the average from the high points a distance that prevents the surfaces of the bowling ball supported by the high points from contacting such low points said high points having a total surface area that provides an average coefficient of friction with a bowling ball less than the coefficient of friction of a smooth surface made of the same material with respect to a similar bowling ball.





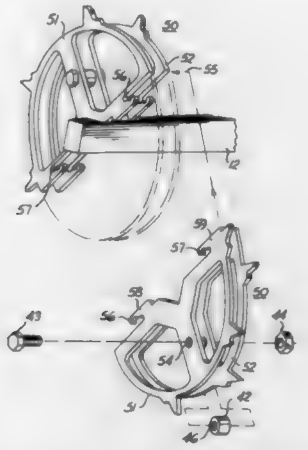
5,316,522
AXIALLY-ENGAGED, ABRASION-RESISTANT SPLIT SPROCKET ASSEMBLY

John J. Carbone, Metairie, and James O. Gundlach, New Orleans, both of La., assignors to The Laitram Corporation, Harahan, La.

Filed Mar. 3, 1993, Ser. No. 26,555

Int. Cl.^{5} F16H *55/12*

U.S. Cl. 474—95 **33 Claims**



1. A sprocket wheel assembly for a linked conveyor belt and mountable on a shaft, comprising interfitted sectorial wheel sections having first and second sides, each of said sectorial wheel sections extending between the first and second sides from an inner edge forming part of a noncircular shaft-accommodating opening to an outer circumferential belt-driving edge, each of said sectorial wheel sections spanning a sector from a first end to a second end, the first end including an integral tab portion and the second end including an integral tab-receiving portion for interfitting with a mating tab-receiving portion and a tab portion of an adjacent sectorial wheel section in abutting relationship along an interface straight through the interfitted sectorial wheel sections from the first side to the second side, the sprocket wheel assembly further including means for removably securing adjacent interfitted sectorial wheel sections together to form a sprocket wheel, said means for removably securing being spaced apart from the shaft and removably engaging the sprocket wheel sections primarily on the first and second sides at the tab portions of adjacent interfitted sectorial wheel sections and removably retaining the adjacent sectorial wheel sections flush.

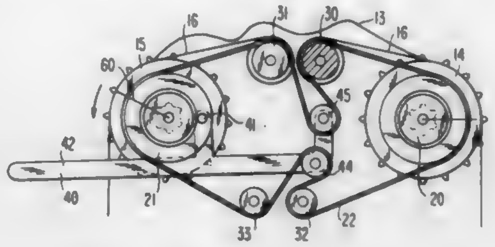
5,316,523
SPROCKET CONTROL APPARATUS

Gerard J. Verdonck, Gistel, Belgium, assignor to Summagraphics N.V., Gistel, Belgium

Filed Sep. 25, 1991, Ser. No. 766,438

Int. Cl.^{5} F16H *7/14*

U.S. Cl. 474—118 **21 Claims**



1. An arrangement for adjusting the angular position of a sprocket wheel that is rotatably mounted on a first axis, comprising a pulley, means for mounting said pulley for rotation with said sprocket wheel, a belt, a holding means for selectively holding said held stationary at a location spaced from said axis, said belt being positioned to extend around said pulley from said spaced location in first and second courses of said belt between said pulley and said spaced location, and adjusting means for simultaneously changing the lengths of said belt in equal and opposite amounts in said first and second courses when said belt is held stationary at said spaced location.

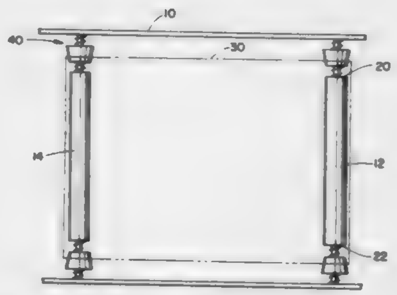
5,316,524
EDGE GUIDE SYSTEMS FOR BELT TRACKING

Chee-Chiu J. Wong, Fairport, and Walter J. Sanborn, West Henrietta, both of N.Y., assignors to Xerox Corporation, Stamford, N.Y.

Filed Dec. 28, 1992, Ser. No. 997,392

Int. Cl.^{5} F16H *7/00*

U.S. Cl. 474—151 **21 Claims**



1. An apparatus for controlling the lateral alignment of a belt arranged to move in a predetermined path, comprising:
a first roll arranged to support a portion of the belt passing thereover, said first roll having first and second ends;
a frame to which said first roll is mounted; and,
a first centering assembly for the belt, said first centering assembly being located adjacent said first roll, said first centering assembly comprising:
a first rotating member located adjacent said first end of said first roll,
a first resilient member located between said first rotating member and said frame,
a second resilient member located between said first rotating member and said frame,

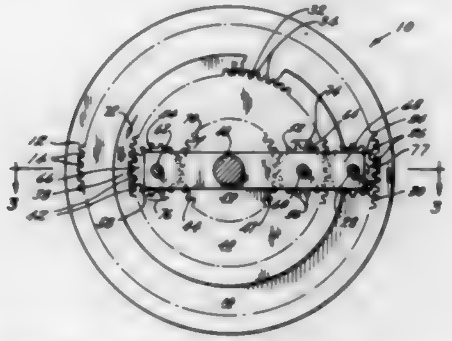
a second rotating member located adjacent said second end of said first roll,

a third resilient member located between said first roll and said second rotating member, and

a fourth resilient member located between said second rotating member and said frame, wherein said first and second rotating members urge the belt to an equilibrium position on said first roll.

5,316,525
FULCRUM GEAR ASSEMBLY

Gerald O'Keefe, 6 Stoneybrook Dr., Williston, Vt. 05495
Filed Jul. 14, 1992, Ser. No. 913,242
Int. Cl.^{5} F16H *3/50*
U.S. Cl. 475—331 **11 Claims**



1. A fulcrum gear assembly comprising:

first input gear means having a plurality of first gear teeth along the periphery thereof;

input shaft means extending from at least one surface of said first gear means at about the center thereof, said input shaft means for rotation in unison with said first gear means;

second input gear means having a plurality of second gear teeth along the periphery thereof and having a plurality of third gear teeth along the periphery thereof opposite said second gear teeth;

input hub means extending from one surface of said second gear means, said input hub means disposed about said input shaft, said input hub means for rotation in unison with said second gear means;

third gear means having a plurality of fourth gear teeth along the periphery thereof, said third gear means disposed between said first and second gear means, wherein said fourth gear teeth mesh with said first and second gear teeth;

first alignment shaft means extending from one surface of said third gear means at about the center thereof, said first alignment shaft means for rotation in unison with said third gear means;

fourth gear means having a plurality of fifth gear teeth along the periphery thereof, said fourth gear means disposed between said first and second gear means, wherein said fifth gear teeth mesh with said first and second gear teeth, said fourth gear means being opposite said third gear means;

second alignment shaft means extending from one surface of said fourth gear means at about the center thereof, said second alignment shaft means for rotation in unison with said fourth gear means;

fifth fixed gear means having a plurality of sixth gear teeth along the periphery thereof;

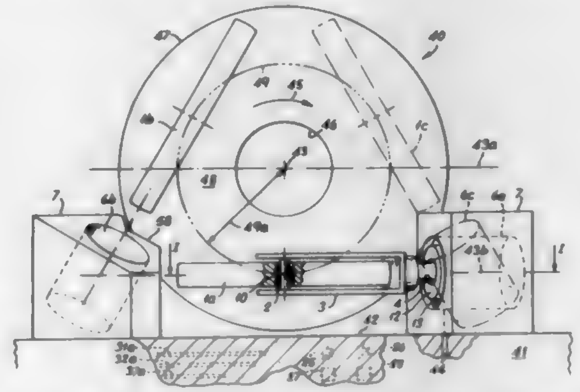
sixth output gear means having a plurality of seventh gear teeth along the periphery thereof, said sixth gear means disposed between said second and fifth gear means, wherein said seventh gear teeth mesh with said third and sixth gear teeth;

output shaft means extending from one surface of said sixth gear means at about the center thereof, said output shaft means for rotation in unison with said sixth gear means; and

alignment means having a channel wherein said first alignment shaft means, said second alignment shaft means and said output shaft means are disposed.

5,316,526
TRANSMISSION OF THE TOROIDAL-RACE ROLLING-TRACTION TYPE

Thomas G. Fellows, Barnet, England, assignor to Torotrak (Development) Limited, United Kingdom
PCT No. PCT/GB91/01155, § 371 Date Dec. 22, 1992, § 102(e) Date Dec. 22, 1992, PCT Pub. No. WO92/01175, PCT Pub. Date Jan. 23, 1992
PCT Filed Jul. 12, 1991, Ser. No. 960,445
Claims priority, application United Kingdom, Jul. 13, 1990, 9015438
Int. Cl.^{5} F16H *15/08*
U.S. Cl. 476—10 **9 Claims**



1. A variator for a transmission of the toroidal-race rolling-traction type, said variator comprising a set of rollers (**1**) transmitting tractions between an input disc (**51**,) and an output disc (**40**), wherein each roller of the set of rollers (**1**) is positioned hydraulically by means of an attached double-acting piston working within a hydraulic cylinder (**5**, **6**,), all the cylinders being disposed on the same side of a common plane (**43***a*) including a common axis of rotation of the discs.

5,316,527
COLLAPSIBLE SUPPORT FOR RUNNING IN PLACE EXERCISING

Gregory Lekhtman, 1260 Dr. Penfied Ave., Apt. 902, Montreal, Quebec, Canada H3G 1B6
Filed Jun. 18, 1992, Ser. No. 900,850
Int. Cl.^{5} A63B *26/00*
U.S. Cl. 482—41 **11 Claims**

1. A collapsible support for running in place exercising comprising:

handle means;

spacer means having a first end and a second end; and base means;

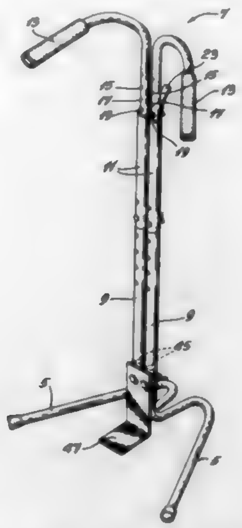
said handle means, spacer means and base means comprising tubular members;

said handle means being disconnectably connectable to said first end of said spacer means; and

said base means being disconnectably connectable to said second end of said spacer means;

said spacer means comprising two spacer tubes, each spacer tube having a first end and a second end corresponding with the first end and the second end of said spacer means, said spacer tubes extending in straight, abutting, side-by-side relationship between said first ends and said second ends thereof;

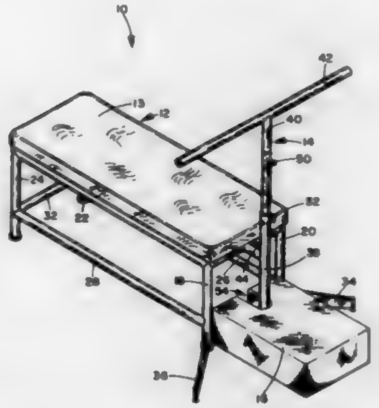
said base means including two base tubes, each base tube having a first portion, adjacent a second end of a respective spacer tube, said first portions of said base tubes extending in alignment with said spacer tubes, and each base tube having a second portion, extending from a respective one of said first portions, and at right angles thereto;



L-shaped bracket means having a vertical section and a horizontal section, said vertical section being connected to said first portions of said base tubes and said horizontal section extending in alignment with said second portions of said base tubes but in a direction opposite thereto.

5,316,528
FITNESS APPARATUS USABLE FOR MULTIPLE AEROBIC AND ANAEROBIC EXERCISE ROUTINES

Joseph A. Ziparo, Liverpool, N.Y., assignor to Full Range, Inc., E. Syracuse, N.Y.
Filed Jan. 21, 1993, Ser. No. 6,767
Int. Cl.^{5} A63B *22/04*
U.S. Cl. 482—52 **17 Claims**



1. An exercise device useful for performing a variety of aerobic and isometric fitness routines, said device comprising:

a) a bench having front and rear ends, longitudinal and transverse axes, a user supporting surface lying in a substantially horizontal first plane, and a plurality of downwardly projecting, horizontally spaced supports, each of said supports being of substantially equal length and having lower ends in a second plane substantially parallel with said first plane;

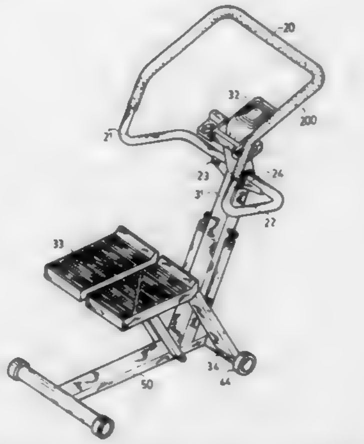
b) a pair of stability supports fixedly connected to and extending outwardly, at a predetermined obtuse angle with respect to the longitudinal axis of said bench, from a respective pair of said downwardly projecting supports positioned at said front end of said bench;

c) user stability means having a first hollow, tubular member of predetermined diameter extending perpendicularly upwards from a lower end in said second plane to an upper end, means rigidly connecting said member to said front end of said bench, a second tubular member slidingly engaging said first tubular member, said second tubular member having first and second opposite ends, said first end being positioned within said first tubular member and said second end being positioned a predetermined distance above said first end, and a third tubular member having opposite ends and a linear axis, said third tubular member being perpendicularly, fixedly connected to said second end of said second tubular member at substantially the midpoint of said third tubular member such that said linear axis of said third tubular member is substantially parallel with said transverse axis of said bench; and

d) a modular step positioned adjacent said user stability means opposite said front end of said bench, said step having planar top and bottom surfaces and a front wall, a rear wall, and a plurality of sidewalls integral with and extending between said top and bottom surfaces, said front wall being positioned adjacent said front end of said bench, said step further having a notch of predetermined width formed in said front wall and said top and bottom surfaces of said step for positioning said step around said first tubular member of said stability means and flush with said front end of said bench.

5,316,529
EXERCISE MECHANISM

Leon Wang, 58, Ma Yuan West St., Taichung, Taiwan
Filed Mar. 2, 1993, Ser. No. 24,746
Int. Cl.^{5} A63B *22/04*
U.S. Cl. 482—53 **2 Claims**



1. A stair step simulator type exercise mechanism comprising a base including a pair of extensions extended laterally outward therefrom and each having a free end portion, a sleeve rotatably engaged on each of said extensions, a barrel rotatably engaged on each of said extensions, and a wheel coupled to each of said barrels such that said base is easily movable relative to the stationary support surface, said foot pedals being fixed to said sleeves respectively such that said foot pedals are pivotally coupled to said base, a post extended upward from said base, a pair of brackets fixed to said post, and a support member secured to said brackets, said support member being disposed with a slope relative to said post for supporting an upper portion of a user.

5,316,530

DOWNHILL-SKI TRAINING APPARATUS

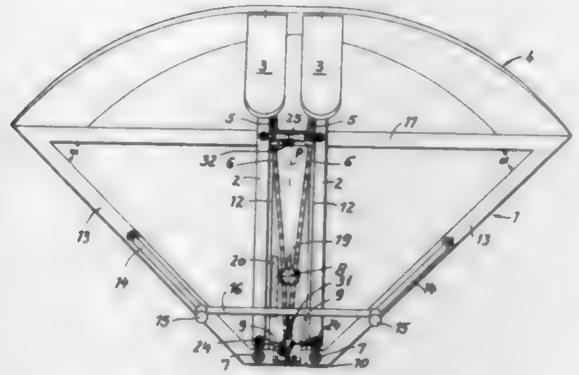
Detlef Römer, Am Kirchlöh 2, W-5970 Plettenberg, Fed. Rep. of Germany

Filed Apr. 9, 1993, Ser. No. 46,006

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1992, 4212239

Int. Cl.^{5} A63B *69/18*

U.S. Cl. 482—71 18 Claims



1. A downhill-ski training apparatus comprising:

a base having a front side and a back side;

an arcuate track fixed on the back side of the base and having an elevated central region and a pair of down-sloping side regions symmetrically flanking the central region;

a pair of like elongated ski beams each having a front end at the front side and a rear end riding on the track at the rear side;

respective foot pads adapted to support a user's feet on the rear beam ends;

respective front pivots coupling the front beam ends to the front side of the base for movement of each the beams on the base about a respective vertical axis and a respective generally horizontal axis generally parallel to the respective beam, whereby each beam can be pivoted about its respective vertical axis from a center position with its rear end on the central region of the track to two flanking side positions with its rear end on the respective side regions of the track with the beams normally moving together and one of the beams always lying outside the other;

respective elongated elastically extensible spring elements each having a rear end fixed to the rear end of the respective beam and a front end to the front side of the base;

means including at least one deflecting member engageable with the spring elements between their ends for urging the beams toward the respective center positions and for resisting movement into the side positions with a force increasing as distance from the center position increases, whereby outward displacement of the outside ski will be resisted with substantially greater force than outward displacement of the inside ski; and

respective fixed-length links each having one end fixed to the respective beam at a location offset thereon from the respective horizontal and vertical axes and another end fixed to the base and each extending transversely of the respective horizontal and vertical axes, the links being oriented such that on pivoting of the respective beams into the side positions the beams are tipped about their horizontal axes to an extent generally proportional to the angle of deflection from the respective center positions.

5,316,531

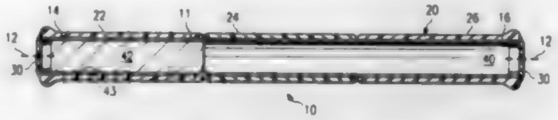
HAND HELD WEIGHTED DEVICES FOR AEROBIC EXERCISE

Wayman R. Spence, Waco, Tex., assignor to WRS Group, Inc., Waco, Tex.

Filed Jun. 3, 1992, Ser. No. 892,786

Int. Cl.^{5} A63B *21/06*

U.S. Cl. 482—93 12 Claims



1. A hand-held weighted device comprising:

a single rigid tube having a first end, a second end, an exterior surface, and a hollow interior;

said tube having a length sufficient for at least three non-overlapping, contiguous grip sections;

a solid weight fixedly mounted in said hollow interior and adjacent to said first end of said tube;

said weight disposed in only a portion of said length of said hollow interior of said tube;

a resilient coating suitable for gripping disposed on all portions of said exterior surface;

said coating defining a first protrusion at said first end, a second protrusion at said second end, and said grip sections;

said grip sections having a grip surface which is free of protrusions and of a substantially uniform diameter;

said grip surface extending from said first protrusion to said second protrusion; and

wherein said grip sections are of substantially equal lengths.

5,316,532

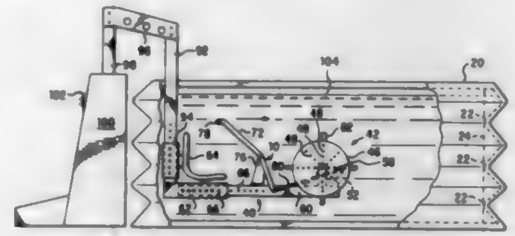
AQUATIC EXERCISE AND REHABILITATION DEVICE

Brian R. Butler, 2727 Hillview Dr., Broomall, Pa. 19008

Filed Aug. 12, 1993, Ser. No. 105,758

Int. Cl.^{5} A63B *21/008, 22/06*

U.S. Cl. 482—111 10 Claims



1. An aquatic exercise and rehabilitation apparatus, comprising an exercise cycle having a frame, a seat, a pedal assembly, a pair of drive shafts and an oscillatable handlebar assembly,

(a) said pedal assembly having two inner and two outer concentrically interconnected discs, each adapted with a plurality of transverse receptors disposed therethrough;

(b) said inner discs being rotatably mounted to an axle which in turn is fixedly mounted to said frame, and said inner discs each being connected to one of said outer discs by means of a bridge member such that rotation of either disc will effect rotation of the other; the ends of said bridge member being partially disposed within said receptors to accomplish said connection;

(c) said receptors of said outer discs having disposed therein crank arms with foot pedals attached thereto; and

(d) said handlebar assembly having two levers pivotally connected to said frame; said levers each being pivotally connected to said drive shafts which are in turn pivotally connected to said bridge members such that operation of either said handlebar assembly or said pedal assembly will effect movement of the other;

(e) whereby said exercise cycle may be adapted for use by individuals with unilaterally or bilaterally diminished mobility or range of motion of the upper or lower extremities by mounting said bridge members and said crank arms at various radial distances from the center of said inner and outer disc to achieve various lengths of lever and crank arm travel.

5,316,533

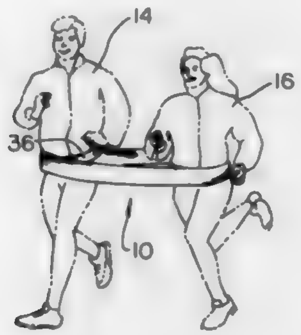
BAND FOR DANCING AND EXERCISING

Jon J. Hoker, 8614 Vista View, Dallas, Tex. 75243

Filed Nov. 27, 1992, Ser. No. 982,610

Int. Cl.^{5} A63B *21/02*

U.S. Cl. 482—121 6 Claims



1. An excercising device, comprising:

a resilient, stretchable band element capable of encircling at least two rigid objects and including an interior side and an exterior side, said band element having a continuous circumferential extent large enough to accommodate one or more rigid objects within the circular opening defined by said continuous circumferential extent, first and second belt means for encircling each said two rigid objects, respectively, wherein said rigid objects are vertically oriented, each of said first and second belt means including,

a first end and a second end;

a first connecting means, located at said first end of said belt means, for connecting with a second end connecting means; and

a second connecting means, located at said second end of said belt means, for connecting with said first end connecting means, and

third connecting means for connecting said belt means to said resilient, stretchable band element; and further comprising

fourth connecting means, located on the inside circumferential surface of said resilient, stretchable band element, for connecting said resilient, stretchable band element to said third connecting means of said first belt, means and

fifth connecting means, located on the inside circumferential surface of said resilient, stretchable band element, and being circumferentially spaced from said fourth connecting means for connecting said resilient, stretchable band element to said third connecting means of said second belt, means

such that at least one of the two rigid objects can exert an outwardly directed first force against a first portion of said interior side of said resilient, stretchable band element, and

such that a second portion of said interior side of said resilient, stretchable band element exerts an inwardly directed second force against another of the at least two rigid objects, at least one of said rigid objects is a human.

5,316,534

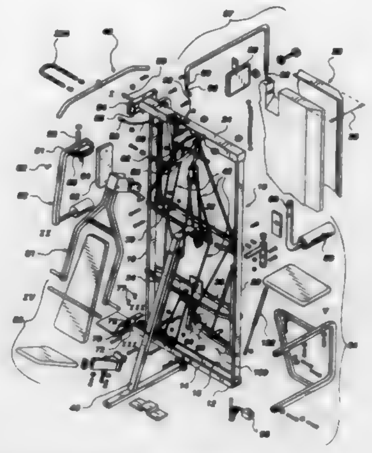
MULTIPURPOSE EXERCISE MACHINE

William T. Dalebout, Logan, and Ken C. Jones, Hyde Park, both of Utah, assignors to Proform Fitness Products, Inc., Logan, Utah

Filed Feb. 14, 1992, Ser. No. 835,783

Int. Cl.^{5} A63B *21/00*

U.S. Cl. 482—133 13 Claims



1. An exercise machine comprising:

a frame for positioning on a support surface;

a first guide attached to said frame;

a cable movably trained about said first guide for movement relative to said frame by a user in the performance of exercise; and

a resistance system secured to said frame means, said resistance system including:

a lever member rotatably mounted at a proximal end to said frame,

a second guide attached proximate the distal end of said lever member, said cable being trained about said second guide to move with respect thereto,

said lever member further including a curved member,

a moveable connector secured to said lever member to be continuously moveable along said curved member between a first position proximate said frame and a second position proximate said guide,

an adjustment member secured to said lever member and operably associated with said moveable connector for positioning said moveable connector intermediate said first position and said second position, and

a resistance mechanism rotatably secured at one end to said frame and to said moveable connector at the other end the distance between said one end and said other end being independent of the position of said moveable connector along said lever member.

5,316,535

UNIVERSAL EXERCISE APPARATUS

Ray Bradbury, 500 E. Fairmount Rd., Burbank, Calif. 91501

Filed Sep. 21, 1992, Ser. No. 937,117

Int. Cl.^{5} A63B *21/00*

U.S. Cl. 482—135 1 Claim

1. A home gym body-building device of the anaerobic type capable of exercising upper, middle and lower parts of the body essentially consisting of the combination of:

a selective mobile base having two portions foldable with respect to each other into operative positions respectively, said mobile base comprising a first supporting means including a bottom surface and side edges perpendicular to said bottom surface;

a frame including a first end intermediately connected to the base, said frame further including a second supporting means at a second end;

said first and second supporting means are adapted so that when said device is in a first operative formation said bottom surface of said first supporting means contacts a horizontal supporting surface and said second supporting means is inoperative, and when said device is in a second operative formation one of said side edges of the first supporting means and said second supporting means contact the horizontal supporting surface;

a single endless cable movably carried on said frame comprising a resilient tube enclosing a load-bearing chain;

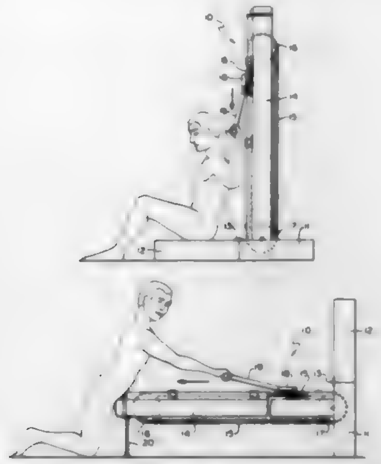
adjustable mechanical tension means operably connected with said single endless cable for placing a resistance load thereon;

a pair of spaced-apart pulleys rotatably mounted on said frame in frictional contact with said single endless cable;

a carriage movably mounted on said frame between said pulleys and releasably engageable with said single cable via said tube so as to move in unison therewith against said resistance load;

handles carried on said carriage; and

said tension means includes friction pads movably engageable with a selected one of said pulleys adapted to regulate tension on said cable.



5,316,536

PHOTORECEPTOR DRUM SUBSTRATE AND A METHOD OF MANUFACTURING THE SAME

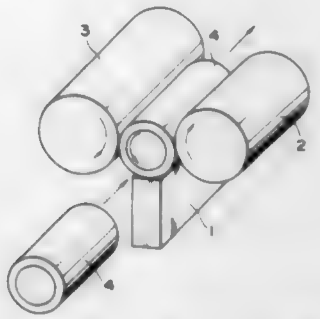
Tadashi Aiura; Takahiro Nose; Shunichi Umemoto, and Kenji Hayashi, all of Shimonoseki, Japan, assignors to Kabushiki Kaisha Kobe Seiko SHO, Kobe, Japan

Filed Mar. 27, 1992, Ser. No. 858,866

Claims priority, application Japan, Mar. 28, 1991, 3-091292

Int. Cl.⁵ G03G *05/10*

U.S. Cl. 492—58 **3 Claims**



1. A photoreceptor drum substrate comprising a cylindrically formed drum of aluminum or aluminum alloy polished at its outer surface by centerless polishing, prepared by extruding a blank made of aluminum or aluminum alloy, then drawing said blank to obtain a drum with less than 0.1% of bending of the entire length and satisfying a relation for wall thickness t, outer diameter ϕ and yield strength $\sigma_{0.2}$ of $t^2 \times \sigma_{0.2/\phi} \geqq 0.2$ and then applying centerless polishing to the outer surface of the resulting drum.

5,316,537

METHOD AND DEVICE FOR BENDING THE END TABS OF BLANKS FOR PRODUCING RIGID FLIP-TOP CIGARETTE PACKETS

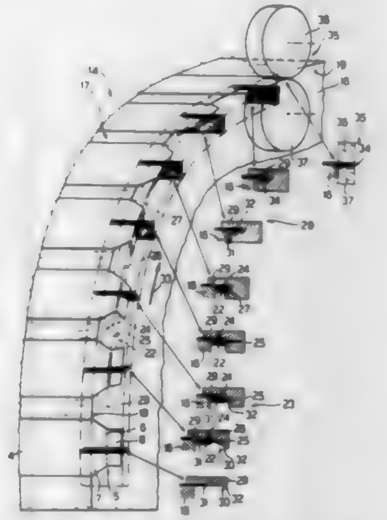
Giorgio Vaccari, and Antonio Gamberini, both of Bologna, Italy, assignors to G. D Societa' Per Azioni, Bologna, Italy

Filed Feb. 14, 1992, Ser. No. 836,104

Claims priority, application Italy, Feb. 26, 1991, B091A [illegible]

Int. Cl.⁵ B31B *3/36*

U.S. Cl. 493—179 **8 Claims**



1. A method of bending the end tabs (5) of blanks (4) for producing rigid flip-top cigarette packets, each end tab (5) constituting an end portion of a respective blank (5) and having an intermediate transverse bend line (6) defining, on the end tab (5), an inner portion (7) and an outer portion constituting a stiffening tab (8);

said method comprising the steps of successively feeding the blanks (4) onto a conveyor (16), with the respective end tabs (5) projecting from a lateral edge (18) of the conveyor (16);

feeding each blank (4) continuously by the conveyor (16) along a given bending path (20) and in a direction (33) parallel to said bend line (6);

and bending the stiffening tab (8) of each blank (4) in a U about said bend line (6) as the blank (4) is fed by the conveyor (16) along the bending path (20);

each blank (4) being made to cooperate, along a portion of the bending path (20), with a first lateral surface (24) of a first guide element (22) internally supporting the inner portion (7) of the end tab (5), and with a second guide element (29) having a surface (30) facing said end tab (5) which comprises a first longitudinal portion (31) externally cooperating with the inner portion (7) of the end tab (5), and a second longitudinal portion (32) cooperating externally with the stiffening tab (8);

the second longitudinal portion (32) being helical in shape, and winding over an arc of 180° in relation to the first longitudinal portion (31), for bending the end tab (5) in a U;

each end tab (5), thus bent, being stabilized by means of pressing;

each end tab (5) being made to travel, as it advances along an output portion (28) of the bending path (20), with its stiffening tab (8) in contact with a second lateral surface (27) of said first guide element (22);

the second lateral surface (27) being helical in shape, and substantially parallel to and facing the second longitudinal portion (32).

5,316,538

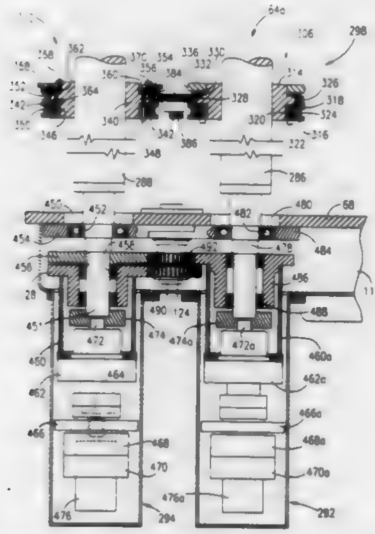
ADJUSTABLE SLOTTER WHEEL RETROFIT APPARATUS FOR BOX BLANK MAKING MACHINES

Alan M. Hill, Topeka, and William R. Meeks, Lawrence, both of Kans., assignors to Lawrence Paper Company, Lawrence, Kans.

Continuation of Ser. No. 924,627, Aug. 3, 1992, abandoned, which is a division of Ser. No. 835,534, Feb. 14, 1992, Pat. No. 5,181,899. This application Mar. 29, 1993, Ser. No. 38,995

Int. Cl.⁵ B31B *1/20, 1/25*

U.S. Cl. 493—355 **4 Claims**



1. A scoring/slotting assembly comprising:

first and second elongated rotatable shafts connected by a drive assembly providing means for rotating said shafts at fixed relative angular velocities,

said first shaft carrying a scoring wheel assembly including a first ring gear presenting outboard teeth, said first ring gear presenting an inner face and an opposed outer face with first gear teeth extending between the first ring gear inner and outer faces,

said second shaft carrying a slotting wheel assembly including a pull ring coupled with an adjustable blade, means for mounting said pull ring and for allowing rotation of said pull ring and adjustable blade around said shaft, and a second ring gear presenting outboard teeth, said second ring gear being coupled with said pull ring for rotation therewith, said second ring gear presenting an inner face and an opposed outer face, with second gear teeth extending between said second ring gear inner and outer faces;

said first and second gear teeth being located in opposition to each other on said first and second shafts,

a rotatable transfer gear mounted in direct simultaneous meshing engagement with said first and second gear teeth of said first and second ring gears; and

a first compensator mechanism coupled with said first shaft and means for interrupting said fixed relative angular velocities to cause said transfer gear to rotate said second ring gear and adjustable blade into a new angular relationship with said second shaft.

5,316,539

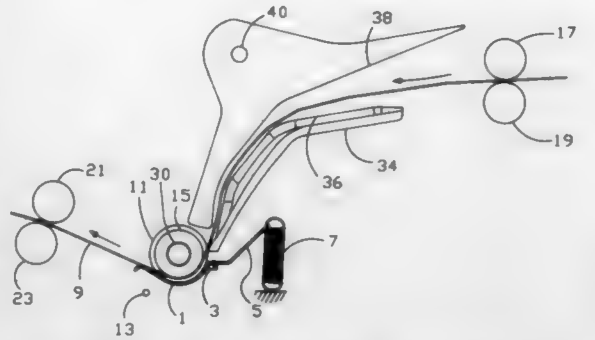
SELF-ADJUSTING PAPER RECURLER

Michael C. Leemhuis, Nicholasville, and Daniel J. Westhoff, Georgetown, both of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Sep. 1, 1992, Ser. No. 938,726

Int. Cl.⁵ B31B *1/36*

U.S. Cl. 493—459 **8 Claims**



1. Apparatus for decurling sheet material comprising a pivoting first guide surface in the form of an arc; a second guide surface located opposite said arc of said first guide surface, said arc of said first guide surface being spaced from said second guide surface a distance greater than the thickness of sheet material to be decurled in the unpivoted position of said first guide surface; pivot apparatus integral with the first guide surface to pivot said first guide surface toward and away from said second guide surface, the extreme position toward said second guide surface being said unpivoted position; means biasing said first guide surface to pivot on said pivot apparatus; means to drive said sheet material to first contact said second guide surface and to then move between said first guide surface and said second guide surface; said first guide surface, said pivot apparatus and said biasing means providing resistance to pivoting away from said second guide surface which is overcome in proportion to the rigidity of the sheet material being decurled so that such pivoting is greater with more rigid sheet materials.

5,316,540

APPARATUS AND METHOD FOR SEPARATING MICROSCOPIC UNITS IN A SUBSTANTIALLY CONTINUOUS DENSITY GRADIENT SOLUTION

John D. McMannis, Evergreen, Colo., and Nicholas London, Evington, United Kingdom, assignors to Cobe Laboratories, Lakewood, Colo.

Filed Jan. 13, 1993, Ser. No. 3,559

Int. Cl.⁵ B04B *11/00*

U.S. Cl. 494—37 **16 Claims**

1. A method for separating a plurality of at least one type of an microscopic unit from an microscopic unit-containing fluid, comprising the steps of:

providing a centrifuge;

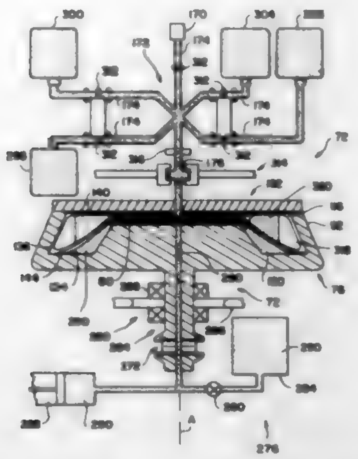
positioning a processing container in said centrifuge;

rotating said centrifuge and said processing container;

providing a substantially continuous density gradient solution to said processing container;

providing said microscopic unit-containing fluid to said processing container;

separating said plurality of microscopic units from remaining portions of said microscopic unit-containing fluid based upon a density of said microscopic units within said substantially continuous density gradient solution; and



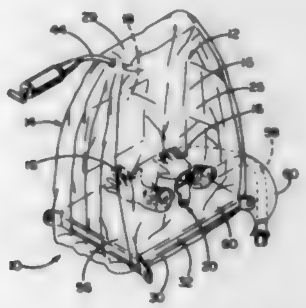
harvesting said plurality of separated microscopic units from said processing container during at least a portion of said rotating step.

5,316,541

ENCLOSURE FOR SURGICAL PROCEDURES

William B. Fischer, 10203 Country Club Rd., Woodstock, Ill. 60098

Filed Jan. 19, 1993, Ser. No. 5,569
Int. Cl.⁵ A61G *10/00;* **A61B** *19/00*
U.S. Cl. 600—21 **21 Claims**



1. A surgical enclosure for preventing infection and the transmission of viruses during a procedure on an anatomical structure comprising:

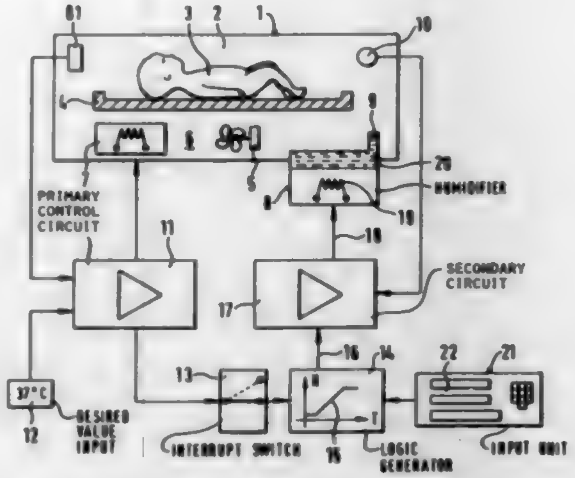
a disposable collapsible tent defining a volume for containing surgical instruments and having at least portions that are transparent;
a support structure supporting said tent such that said tent is held in a position that defines said volume;
at least one pair of surgical gloves extending inwardly into said volume and forming a seal with said tent for permitting access to and manipulation of surgical instruments in said volume; and,
adhesive means operatively connected to the exterior of said tent; said adhesive means defining a sealed access area which may be cut to provide an access opening for performing said surgical procedure from inside said volume.

5,316,542

COUPLED CONTROL OF OPERATING PARAMETERS OF AN INCUBATOR

Jochim Koch, Ratzeburg, Fed. Rep. of Germany, and Stefan Frembgen, Pittsburgh, Pa., assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Feb. 11, 1993, Ser. No. 16,537
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1992, 4204398
Int. Cl.⁵ A61G *11/00*
U.S. Cl. 600—22 **11 Claims**



1. An incubator for controlling an environment for an infant, the incubator comprising:

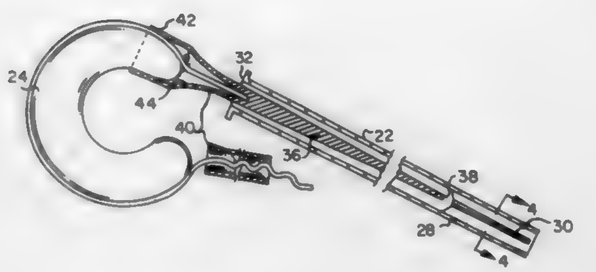
a housing having a base and an enclosure mounted on said base for defining an enclosed space adapted to the infant and wherein the environment for the infant is controlled;
said housing defining an equipment compartment;
circulating means mounted in said equipment compartment for circulating incubator air through said enclosed space;
first parameter means for imparting a first physical change to the environment within said enclosed space measurable as a first operating parameter of said environment;
second parameter means for imparting a second physical change to the environment within said enclosed space measurable as a second operating parameter of said environment;
sensing means for sensing said first operating parameter and for supplying a first signal indicative of the actual value of said first operating parameter;
desired value generator means for supplying a second signal indicative of a desired value of said first operating parameter;
primary control circuit means for comparing said first and second signals and for driving said first parameter means to set and maintain said first operating parameter in dependence upon the comparison of said first and second signals;
logic generator means for defining a functional relationship between said first and second operating parameters;
said logic generator means being connected to said primary control circuit for receiving one of said first and second signals as a control value and for generating an output sequence signal based on said functional relationship and said control value with said output sequence signal defining a desired value of said second operating parameter; and,
secondary circuit means connected to said logic generator means for generating a drive signal for driving said second parameter means based on said output sequence signal.

5,316,543

MEDICAL APPARATUS AND METHODS FOR TREATING SLIDING HIATAL HERNIAS

Mark A. Eberbach, Tampa, Fla., assignor to Cook Incorporated, Bloomington, Ind.

Filed Nov. 27, 1990, Ser. No. 619,886
Int. Cl.⁵ A61F *2/00*
U.S. Cl. 600—37 **35 Claims**



1. Apparatus for the repair of sliding hiatal hernias through laparoscopic techniques comprising:

a tubular sleeve;
a conically shaped guide with an essentially pointed forward end positionable within the sleeve;
a prosthesis coupled to the guide; and
means for securing the prosthesis around the esophagus of a patient immediately beneath the patient's diaphragm whereby the prosthesis assumes a generally torus shape.

5,316,544

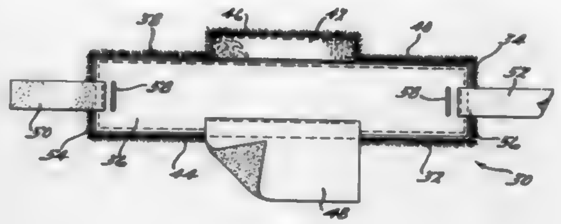
SPLINT PAD

Thomas S. McAninch, Detroit, Mich., assignor to Detroit Receiving Hospital & University Health Center, Detroit, Mich.

Continuation of Ser. No. 836,777, Feb. 13, 1992, abandoned. This application Jun. 2, 1993, Ser. No. 71,329
Int. Cl.⁵ A61F *5/00, 5/37*
U.S. Cl. 602—5 **20 Claims**

1. A pad removably attachable about the thigh support ring of a leg splint to protect a patient's thigh from irritating contact therewith, said pad being substantially rectangular in shape having a top, bottom and two opposing sides and comprising:

a backing material substantially covered on one surface thereof by a cushioning material, said cushioning material being interposed between the thigh support ring of said leg splint and the patient's thigh when said pad is attached about said splint ring;
a first pair of mating fastening means each fixedly attached to the surface of said backing material opposite said cushioning material, said first pair of fastening means extending from said top and bottom of said backing material to fasten about said ring on the side of said ring opposite the patient's thigh;



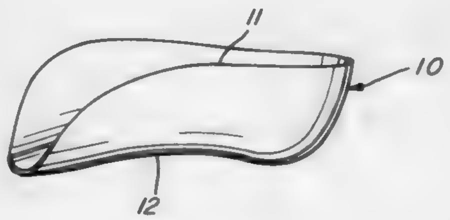
a second pair of mating fastening means each fixedly attached to the surface of said backing material opposite said cushioning material, said second pair of fastening means extending outwardly from said opposite sides of said backing material to fasten substantially transversely over said first pair; and
said pad being sized so as to prevent contact of the patient's thigh with said thigh support ring.

5,316,545

POLYMERIC ORTHOTIC DEVICES AND METHOD OF FORMATION

Julian H. Cherubini, Newton, Mass., assignor to Nicole A. and Alexandra Cherubini, Newton, Mass.

Continuation of Ser. No. 755,833, Sep. 6, 1991, abandoned. This application Nov. 30, 1992, Ser. No. 982,877
Int. Cl.⁵ A61F *5/00*
U.S. Cl. 602—7 **6 Claims**



1. A method of forming an orthotic device comprising,

- selecting a polymeric material preform having a first, nonplanar orthotic shape and having a memory imparted to said preform, said preform being selected to be molded over a predetermined body area of larger configuration than said first orthotic shape,
- molding said preform to conform to said body area under conditions which retain said memory,
- wherein said preform being formed by a molding step and processed to provide a memory in said preform in a first shape when said orthotic device is stretched form said first shape,
- and stretching said preform from said first shape to mold said preform to said body.

5,316,546

JOINT

Leif Lindh, Klockar Malms Vag 13, S-182 34 Danderyd, and Peter Kohler, Apelvagen 27, S-182 75 Stocksund, both of Sweden

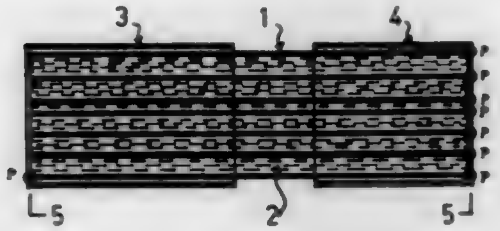
PCT No. PCT/SE90/00696, § 371 Date Apr. 30, 1992, § 102(e) Date Apr. 30, 1992, PCT Pub. No. WO91/06267, PCT Pub. Date May 16, 1991

PCT Filed Oct. 26, 1990, Ser. No. 854,985

Claims priority, application Sweden, Oct. 31, 1989, 8903645

Int. Cl.^{5} A61F *5/01*

U.S. Cl. 602—16 **6 Claims**



1. A hinge for supporting, protecting and/or controlling an anatomical joint, comprising first and second sets of flexible, substantially planar, elongated strip-shaped elements mutually slidable in a plane-to-plane contacting relationship, supporting members for carrying said elements, at least one of said sets of strip-shaped elements being comprised of resilient strip elements having a degree of springiness and stiffness, and resiliently flexible in their longitudinal directions about hinge axes located in the plane of the respective strips substantially perpendicular to the longitudinal direction of the strips, said one set of elements being substantially rigid against bending about an axis perpendicular to their planes and longitudinal directions of said first set of strip-shaped elements, said second set of strip-shaped elements having a lesser degree of springiness and stiffness that said first set of resilient strip-shaped elements with the elements of said first set interleaved with the elements of said second set and the elements of said second set contacting, guiding and supporting the resilient strip-shaped elements of said first set thereof on opposite sides of and coincident with said hinge axes, said elements of said second set thereof having substantially the same longitudinal extension as the resilient elements of said first set thereof so that upon flexing the hinge the spacing of the strip-shaped element is maintained constant along substantially the whole extension of the strip-shaped elements and in that at least one of the strip-shaped elements of said first and second sets thereof is fixed at its opposite ends and means enabling said supporting members to move, when the body joint is flexed or extended, along curves dependent on the magnitude of flexion and extension, and which curves are determined by the hinge movement.

5,316,547

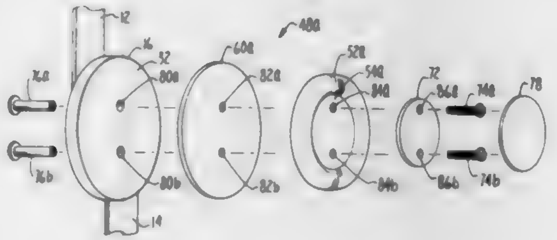
ORTHOPEDIC BRACE HAVING PNEUMATIC PADS

Richard E. Gildersleeve, Escondido, Calif., assignor to Smith & Nephew Donjoy, Inc., Carlsbad, Calif.

Filed Jul. 1, 1992, Ser. No. 907,160

Int. Cl.^{5} A61F *5/00*

U.S. Cl. 602—26 **18 Claims**



1. An orthopedic brace positionable on the body of a user comprising:

- a rigid hinge surface joining two rigid arms, said hinge surface positionable opposite a knee condyle of the user and adaptable to apply pressure thereto;
- a first sheet of an elastically deformable film positionable between said surface and the body of the user;
- a second sheet of an elastically deformable film positionable between said first sheet and the body of the user;
- a first seam sealingly joining said second sheet to said first sheet, thereby defining at least a portion of an outer perimeter of a first substantially fluidtight bladder between said first and second sheets, wherein said first bladder is formed substantially in the shape of a toroid;
- a second seam sealingly joining said second sheet to said first sheet, thereby defining at least a portion of an outer perimeter of a second bladder between said first and second sheets, said second bladder in fluid isolation from said first bladder;
- a volume of fluid contained within said first bladder, said volume of fluid sufficient to provide said first bladder with a height greater than the height of said second bladder.

5,316,548

Patent Not Issued For This Number

5,316,549

Patent Not Issued For This Number

5,316,550

PROSTHESIS WITH FLEXIBLE INTRAMEDULLARY STEM

Mark Forte, 11 Oak La., Pine Brook, N.J. 07058

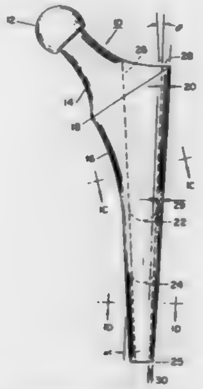
Division of Ser. No. 434,514, Nov. 14, 1989, Pat. No. 5,092,899, which is a continuation-in-part of Ser. No. 849,172, Apr. 7, 1986, abandoned. This application Jan. 3, 1992, Ser. No. 817,467

Int. Cl.^{5} A61F *2/32*

U.S. Cl. 623—23 **20 Claims**

1. A hip prosthesis comprising:

- a stem for implantation into a femur, said stem having a proximal end and a distal end, said stem having a longitudinally extending tapered bore therein defined by a surrounding wall and extending from said proximal end at least part way to said distal end, said stem having a lateral side and a medial side, and a longitudinal slit directly extending from said proximal end along said wall at said lateral side and being in communication with said bore; and



- a femoral head for implantation into a hip socket and connected with said stem at the medial side thereof.

CHEMICAL

5,316,551

OXIDATIVE HAIR DYEING PROCESS WITH CATALYTIC PRETREATMENT

Gottfried Wenke, Woodridge, Conn., assignor to Clairol Incorporated, New York, N.Y.

Division of Ser. No. 666,108, Mar. 7, 1991, Pat. No. 5,100,436. This application Jan. 3, 1992, Ser. No. 817,005

Int. Cl.⁵ A61K *7/13*

U.S. Cl. 8—406 **2 Claims**

1. A hair treatment package in kit form comprising;

(a) a pretreatment solution for stabilizing human hair against oxidation of cystine to cysteic acid comprising an aqueous solution of a transition metal ion complexed with a noncoloring but catalytically effective amount of a chelating agent selected from the group consisting of 2,2'-dipyridyl and o-phenanthroline, whereby the subsequent steps for oxidative dyeing of hair are less damaging to the hair; and

(b) an oxidative hair dye mixture.

5,316,552

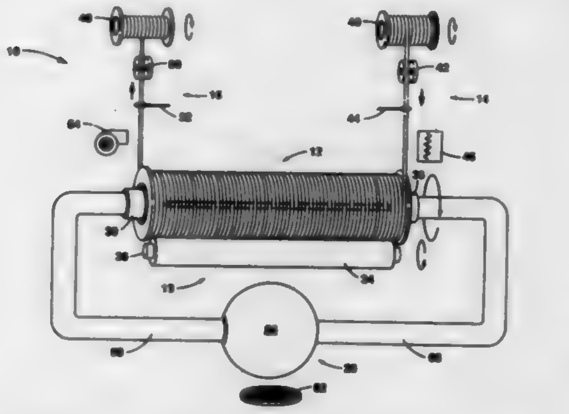
LINE MARKING APPARATUS

Warren J. Jasper, 127 Donna Pl., Cary, N.C. 27513, and David C. Falk, 6808 Greystone Dr., Raleigh, N.C. 27615

Filed Dec. 14, 1992, Ser. No. 989,699

Int. Cl.⁵ D06P *7/00;* **B08B** *3/12;* **D06F** *3/00*

U.S. Cl. 8—471 **22 Claims**



1. A method for marking an advancing line at predetermined increments comprising:

(a) providing a roller tube having an outer surface with an elongated slot formed therein communicating wit the interior of the roller tube, wherein the elongated slot extends generally axially between a supply end and a take-up end of the roller tube;

(b) winding the advancing line around the roller tube such that the unmarked line crosses the elongated slot at predetermined increments,

(c) supplying a disperse dye in a fluid state to the interior of the roller tube; and

(d) forcing the disperse dye to exit the elongated slot in the roller tube and contact the line overlying the elongated slot to mark the line at predetermined increments as the line is being advanced.

5,316,553

DYESTUFFS FOR THE DYEING OF SYNTHETIC POLYAMIDES

Bansi L. Kaul, Biel-Benken, Switzerland, and Angelos-Elie Vougioukas, Louis, France, assignors to Sandoz Ltd., Basle, Switzerland

Division of Ser. No. 374,511, Jun. 30, 1989, Pat. No. 5,037,448. This application Jul. 26, 1991, Ser. No. 736,149

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3821981

Int. Cl.⁵ C09B *69/02;* **C08G** *69/48;* **D06P** *1/39, 3/24*

U.S. Cl. 8—639 **15 Claims**

1. A dye salt of the formula

$$F.(A)_n$$

or a mixture of such salts, wherein

F is the anion of an anionic azo dye,

A is a cation containing one 2,2,6,6-tetramethylpiperidinum-4 group, one, two or three 2,2,6,6-tetramethylpiperidyl-4groups and at least one aliphatic, cycloaliphatic or carbonyl-subtituted aromatic group, and

n is 1, 2, 3 or 4.

5,316,554

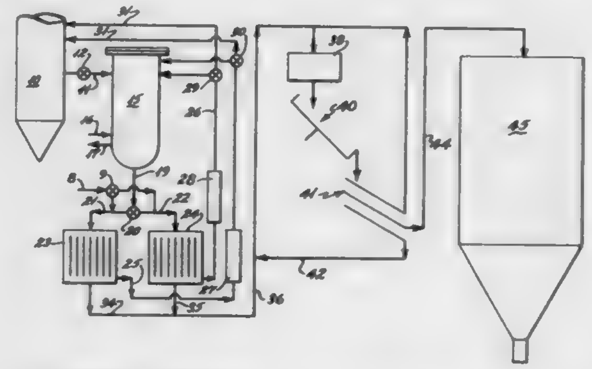
METHOD FOR PROCESSING CRYSTALLINE AMMONIUM CARBAMATE

Charles N. Hansen, 1448 South 1700, Salt Lake City, Utah 84108-2602

Continuation-in-part of Ser. No. 892,924, Jun. 3, 1992, abandoned. This application Jul. 28, 1993, Ser. No. 102,991

Int. Cl.⁵ B01D *9/00;* **C01B** *3/00;* **C07C** *273/00*

U.S. Cl. 23—300 **26 Claims**



1. A method comprising:

providing a solution containing ammonium carbamate, water, ammonia and urea;

cooling said solution to a temperature of from about 15° C. to about 30° C. while maintaining said solution at a pressure above about 50 psig; and

crystallizing ammonium carbamate crystals from the cooled solution.

5,316,555

MOLTEN CARBONATE FUEL CELL ELECTROLYTE TOUGHENING

Estela T. Ong, Chicago, and Kenneth E. Hrdina, Glenview, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 3, 1992, Ser. No. 970,563

Int. Cl.⁵ H01M *27/20*

U.S. Cl. 29—623.1 **22 Claims**

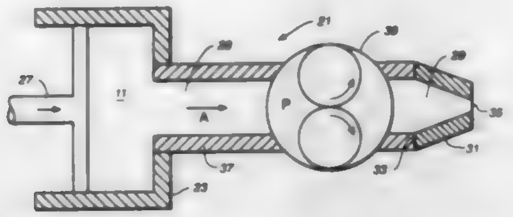
1. A porous matrix for molten alkali metal carbonates electrolytes, said matrix comprising lithium aluminate particulates and about 5 to about 50 volume percent, based upon the volume of solids, of electrically nonconductive, active electrolyte compatible fibers having an average diameter of about 1 to

about 50 microns and having an average length greater than about 5 times the average diameter.

5,316,556
APPARATUS AND METHOD FOR EXTRUDING SHEAR THINNING MATERIAL

Jerry L. Morris, San Jose, Calif., assignor to Valence Technology, Inc., San Jose, Calif.

Filed Mar. 30, 1993, Ser. No. 40,225
Int. Cl.^{5} H01M *6/18, 6/50*
U.S. Cl. 29—623.3 **18 Claims**



1. An apparatus for extruding a shear thinning material, comprising:
- a source of homogeneous shear thinning material;
- a nozzle having an opening at one end through which the homogeneous shear thinning material is extruded;
- means for transporting the homogeneous shear thinning material from the source of shear thinning material and out the opening of the nozzle; and
- a passage, at least a portion of which extends through the nozzle, through which passage the shear thinning material travels from the source of shear thinning material to the opening of the nozzle, the passage having a non-increasing cross-sectional area arranged to subject all material traveling through the passage to a non-decreasing shear, the portion of the passage extending through the nozzle having a decreasing cross-sectional area.

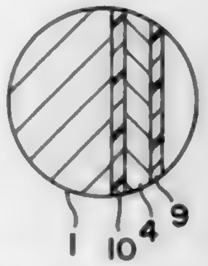
9. A method for extruding a shear thinning material, comprising the steps of:
- transporting a homogeneous shear thinning material through a passage from a source of homogeneous shear thinning material to an extrusion opening of a nozzle while subjecting the homogeneous shear thinning material to a non-decreasing shear stress, the homogenous shear thinning material being transported from the source to the nozzle through a first portion of the passage having a non-increasing cross-sectional area, the homogenous shear thinning material being transported from the first portion of the passage to the extrusion opening through a portion of the passage in the nozzle having a decreasing cross-sectional area while being subjected to an increasing shear stress; and
- extruding the homogenous shear thinning material through the extrusion opening at a substantially constant rate.

10. A method for manufacturing a laminate battery, comprising the steps of:
- transporting a homogeneous shear thinning cathode material comprised of an active cathodic material, a conductive filler material, and an electrolyte material from a source of homogenous shear thinning material to an extrusion opening of a nozzle while subjecting the homogeneous shear thinning cathode material to a non-decreasing shear stress;
- transporting the homogenous shear thinning cathode material through the nozzle while subjecting the homogenous shear thinning material to an increasing shear stress;
- extruding the homogeneous shear thinning cathode material through the extrusion opening at a substantially constant rate;
- forming a layer of the homogeneous shear thinning cathode material on a conductive substrate material;
- applying electrolyte material over the layer of homogeneous shear thinning cathode material to form an electrolyte layer; and
- applying anode material over the electrolyte layer.

5,316,557
MANUFACTURING PROCESS OF ALKALINE CELL

Akira Iwase, Osaka; Hirofumi Iwaki, Katano; Toshikazu Kaneko, Hirakata; Isao Kubo, Kadoma, and Koichi Sato, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 17, 1993, Ser. No. 32,613
Claims priority, application Japan, Mar. 17, 1992, 4-059958
Int. Cl.^{5} H01M *10/28*
U.S. Cl. 29—623.5 **7 Claims**



1. A manufacturing process of alkaline cells in which cathode molds are closely contacted against an internal wall of a cathode container, comprising:
- coating a conductive paint containing a conductive material comprising a carbon-system on an area of the internal wall of said cathode container, on which the cathode molds are contacted, and
- heating said cathode container by applying electromagnetic induction-heating to perform at least drying of said paint and/or curing of said paint coating in order to form a conductive film on the internal wall of said cathode container.

5,316,558
CATALYTIC CLEAN-COMBUSTION-PROMOTER COMPOSITIONS FOR LIQUID HYDROCARBON FUELS USED IN INTERNAL COMBUSTION ENGINES

Frank Gonzalez, 601 Jeferson, Suite 320, Houston, Tex. 77002
Continuation-in-part of Ser. No. 608,526, Nov. 2, 1990, Pat. No. 5,141,524. This application Aug. 19, 1992, Ser. No. 932,063
Int. Cl.^{5} C10L *1/22*
U.S. Cl. 44—340 **2 Claims**

1. A liquid petroleum derived diesel fuel composition comprising
- a basic diesel fuel for compression ignition engines and
- a catalytic clean combustion promoter composition comprising by volume:

an aromatic amine selected from the group consisting of n-ethyl aniline and diethylaniline	from 1 to 20%
a ketone solvent selected from the group consisting of ethyl isoamyl ketone and n-amyl ketone	from 1 to 85%,
a cosolvent selected from the group consisting of diacetone alcohol and methyl amyl alcohol	from 1 to 85%,
a catalytic medium comprising 1-methyl-2-pyrrolidone	from 1 to 45%,
and	
a nitroparaffin compound selected from the group consisting of 1-nitropropane, 2-nitropropane, and nitroethane	from 1 to 85%

said catalytic clean combustion promoter composition is present in micro volumetric concentrations between 400 to 2,500 parts per million (ppm) relative to the volume of the basic diesel fuel, regardless whether the chemical components are in the lower or upper percentage range by volume ratio.

2. A liquid petroleum derived unleaded gasoline fuel composition comprising
- a basic unleaded gasoline fuel for spark ignition engines and
- a catalytic clean combustion promoter composition comprising by volume:

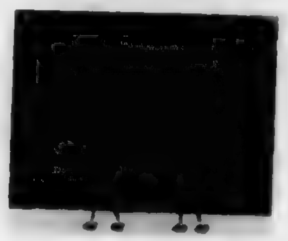
a ketone solvent selected from the group consisting of ethyl isomyl ketone and n-amyl ketone	from 1 to 55%,
a selected from the group consisting of diacetone alcohol and methyl amyl alcohol	from 1 to 60%,
a catalytic medium comprising 1-methyl-2-pyrrolidone	from 1 to 30%,
an aromatic amine selected from the group consisting of n-ethylaniline and diethylaniline	from 1 to 30%,
an ether selected from the group consisting of MTBE, ETBE, and TAME,	from 1 to 85%,
and	
a nitroparaffin compound selected from the group consisting of 1-nitropopane, 2-nitropropane, and nitroethane	from 1 to 35%.

said catalytic clean combustion promoter composition is present in micro volumetric concentrations between 400 to 2,500 parts per million (ppm) relative to the volume of the basic unleaded gasoline, regardless whether the chemical components are in the lower or upper percentage range by volume ratio.

5,316,559
DICING BLADE COMPOSITION

Harold R. Klievoneit, Mesa; Augustine G. Esposito, Phoenix, and Robert C. Runyon, Sun City West, all of Ariz., assignors to St. Florian Company

Filed Dec. 18, 1991, Ser. No. 809,310
Int. Cl.^{5} B24B *1/00*
U.S. Cl. 51—295 **21 Claims**



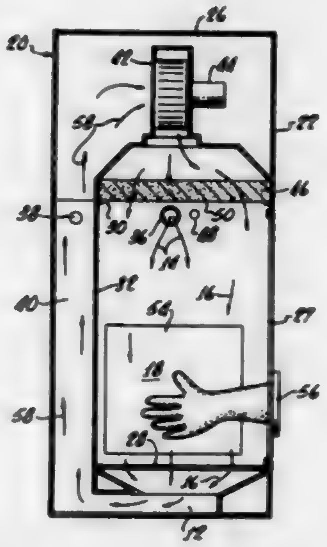
1. A dicing saw blade for cutting wafers into die, said dicing saw blade comprising in combination:
- a) an aluminum hub; and
- b) a dicing blade electroplated upon said hub, said dicing blade being of a composition including at least nickel, diamond grit and silicon carbide whiskers.

5,316,560
ENVIRONMENT CONTROL APPARATUS

Wilfried Krone-Schmidt, Fullerton, Calif., and James R. Markle, Palm Harbor, Fla., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 19, 1993, Ser. No. 33,906
Int. Cl.^{5} B01D *50/00, 46/00*
U.S. Cl. 55—385.2 **5 Claims**

1. An apparatus for controlling at least the cleanliness and humidity of a dehumidified gas within a sealable chamber configured to accommodate a workpiece and associated instrumentation, said apparatus comprising:
- a sealable chamber comprising a frame defined by vertical exterior walls forming a generally rectangular parallelopiped having at least one set of its horizontal edges mutually joined by a horizontal wall;
- an internal structure comprised of interior walls defining an enclosed workspace and nested within said frame such that a pair of mutually opposed horizontal interior walls having one set of opposed edges connected by one vertical interior wall are spaced apart from said vertical exterior walls to form, in combination with both opposing and contiguous internal surfaces of said vertical exterior walls, a duct enclosed by said interior walls and surrounding the exterior of said enclosed workspace on three sides;
- an HEPA filter constituting the upper one of said pair of mutually opposed horizontal interior walls, said HEPA filter having an outlet side adjacent said enclosed workspace and an inlet side;
- a perforated floor constituting the lower one of said pair of horizontal interior walls;
- a blower disposed within the sealable chamber on said inlet side of said HEPA filter and external to said workspace, positioned for circulating a dehumidified gas through said HEPA filter, thence in laminar flow through said enclosed workspace, thence out of said enclosed workspace through said perforated floor, thence along said duct and back to said blower;
- purge means comprising an inlet valve disposed within said enclosed workspace communicating with an external source of the dehumidified gas, and an exhaust valve disposed within the sealable chamber through which water vapor-bearing atmosphere is expelled from said frame;
- an airlock and door sealably communicating between said enclosed workspace and the exterior of said frame for emplacing and withdrawing a workpiece into and from said enclosed workspace;
- at least one glove port communicating between said enclosed workspace and the exterior of said frame, and configured to sealably accommodate an arm and hand of an operator for permitting manipulation of said workpiece and instrumentation within said enclosed workspace; and
- a transparent window interposed between said enclosed workspace and the exterior of said frame for permitting observation of the interior of said enclosed workspace by an operator employing said at least one glove port.



5,316,561

APPARATUS FOR MANUFACTURING A COMPOSITE STRAND FORMED OF REINFORCING FIBERS AND OF ORGANIC THERMOPLASTIC MATERIAL

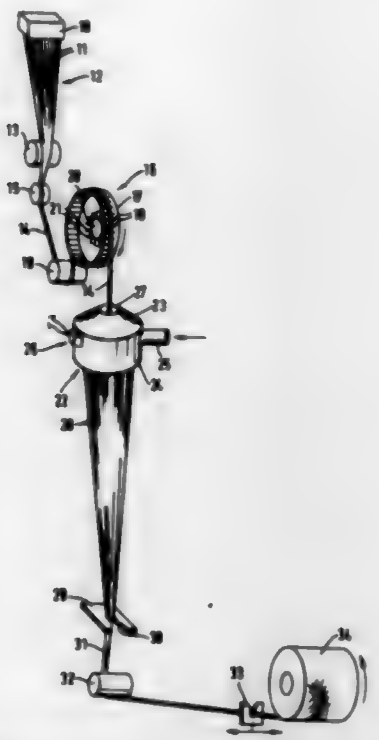
Giordano Roncato; Robert Fedorowsky, both of Aix les Bains; Philippe Boissonnat, Barby, and Dominique Loubinoux, Chambery, all of France, assignors to Vetrotex France, Chambery

Filed Mar. 16, 1992, Ser. No. 852,279

Claims priority, application France, Mar. 19, 1991, 91 03273

Int. Cl.^{5} C03B *37/022*

U.S. Cl. 65—1 **16 Claims**



1. In an apparatus for manufacturing a composite strand (31, 50, 73), composed of a first installation comprising at least one die (10, 35), which is supplied with glass and heated by Joule effect, and which is perforated at the bottom with a plurality of orifices from which continuous filaments (11, 36, 72) are drawn, and of a second installation comprising at least one drawing head (42, 51, 84), which is supplied under pressure with organic thermoplastic material in the molten state, and comprising a central passage through which said glass filaments (11, 36, 72) are drawn, said at least one drawing head (42, 51, 84) comprising at least one conduit (25, 43, 52) for supplying said organic material, which is connected to a chamber (53) that opens onto a plurality of orifices (55) on its bottom side, and through which the organic material is extruded to produce continuous filaments (28, 47, 56), the improvement comprising a hood which shields each of the at least one drawing head and includes:

a) a top part (23, 40, 62) which fits immediately above said at least one drawing head and contains an opening (27, 44, 63) at its top which is disposed coaxially to the central passage, the top part of the hood being externally formed of one or more plates (23, 40, 62), which are inclined relative to the vertical centerline of the central passage; and

b) a bottom part which is formed of a wall (24, 41, 70) immediately surrounding said at least one drawing head and extending below the bottom of the said at least one drawing head.

5,316,562

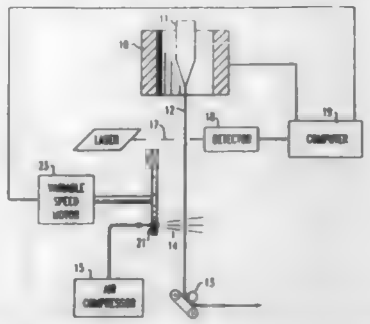
OPTICAL FIBER TENSION MONITORING TECHNIQUE

David H. Smithgall, East Windsor, N.J., and Alan T. Woodward, Lilburn, Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 799,224, Nov. 27, 1991, Pat. No. 5,228,893. This application Jul. 6, 1992, Ser. No. 909,238

Int. Cl.^{5} C03B *37/023*

U.S. Cl. 65—3.11 **10 Claims**



1. A method for making optical fiber comprising the steps of:

heating in a furnace an optical fiber perform to a partially molten condition;

drawing an optical fiber from the partially molten preform;

as the fiber is being drawn, directing air at a portion of the fiber as a succession of air pulses, the pulses having frequency near the natural frequency of the portion of the fiber;

varying the frequency of the air pulses so as to produce a resonance of the frequency of vibration of the optical fiber portion with the air pulse frequency at a specific air pulse frequency;

detecting said resonance of the frequency of vibration of the optical fiber with the air pulse frequency, thereby indicating that the air pulse frequency that produces said resonance equals the natural frequency of the fiber portion;

and monitoring changes of the natural frequency of the optical fiber portion, thereby to monitor changes of tension applied to the optical fiber portion.

5,316,563

VACUUM DEGASSING METHOD AND ITS APPARATUS

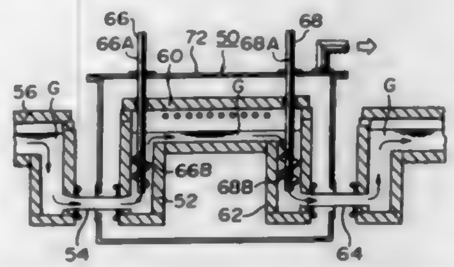
Kazuhiko Ishimura; Fumiaki Saito; Masaaki Yoshikawa; Misao Okada, and Shinsuke Nakajima, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 19, 1993, Ser. No. 5,798

Claims priority, application Japan, Jan. 20, 1992, 4-007694

Int. Cl.^{5} C03B *5/173*

U.S. Cl. 65—32.5 **4 Claims**



1. A vacuum degassing method for degassing molten glass, the method comprising the steps of:

sucking a heated molten substance in a storage tank into a vacuum degassing vessel through an uprising pipe which connects the storage tank and the vacuum degassing vessel by maintaining the vacuum degassing vessel at a negative pressure;

degassing the molten substance wherein the degassed molten substance flows down to a guiding duct through a downfalling pipe which connects the vacuum degassing vessel and the guiding duct;

restraining a first flow quantity of the molten substance rising in the uprising pipe by rotation of a first screw means positioned in said uprising pipe; and

controlling a second flow quantity of the degassed molten substance flowing in the downfalling pipe by rotation of a second screw means positioned in said downfalling pipe;

wherein a quantity of the molten substance in the vacuum degassing vessel is maintained at an amount which prevents an overflow of molten substance in the vacuum degassing vessel.

5,316,564

METHOD FOR PREPARING THE BASE BODY OF A REFLECTING MIRROR

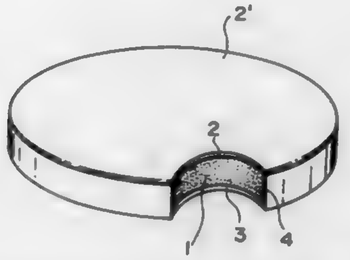
Tatsumasa Nakamura, Saitama; Yoshiaki Ise, Fukui, and Yoshiaki Okamoto, Kanagawa, all of Japan, assignors to Shin-Etsu Quartz Co., Ltd., Tokyo and Okamoto Optics Work, Inc., Kanagawa, both of Japan

Filed Oct. 30, 1991, Ser. No. 785,103

Claims priority, application Japan, Apr. 23, 1991, 3-119258; May 10, 1991, 3-135536

Int. Cl.^{5} C03B *23/20, 23/00;* **G02B** *5/08, 7/192*

U.S. Cl. 65—36 **1 Claim**



1. A method for the preparation of a light-weight base body of a reflecting mirror which comprises the steps of:

(a) bonding by fusion a pre-shaped porous foamed disc body of fused quartz glass or high-silica glass having a bulk density in the range from 0.1 to 1 g/cm^3 on one surface with a front plate of transparent fused quartz glass or high-silica glass having an optically flat or curved surface at the surface opposite to the optically flat or curved surface;

(b) bonding by fusion a plate or fused quartz glass or high-silica glass to the surface of the porous foamed disc body opposite to the surface to which the front plate is bonded; steps (a) and (b) being carried out separately or simultaneously; and

(c) after steps (a) and (b) are completed, then bonding on air-tight sealing layer to the side surface of the porous foamed disc body, which air-tight sealing layer is formed by applying a sheet of fused quartz glass or high-silica glass to the side surface and heating the sheet of fused quartz glass or high-silica glass to cause bending and fusion-bonding of the sheet to the side surface of the porous foamed disc body.

5,316,565

CARBOTHERMIC REDUCTION PRODUCT GAS TREATMENT

Robert M. Kibby, P.O. Box 277, Florence, Ala. 35631

Continuation-in-part of Ser. No. 809,314, Dec. 18, 1991, abandoned. This application Apr. 26, 1993, Ser. No. 52,649

Int. Cl.^{5} C22B *21/02*

U.S. Cl. 75—10.27 **20 Claims**

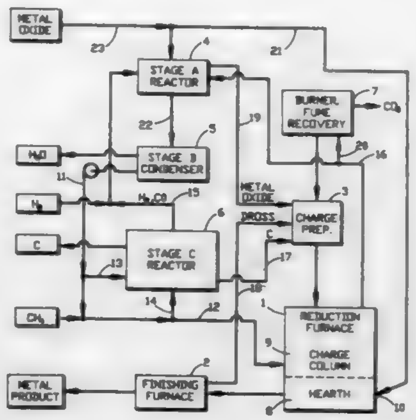
1. A process for producing metal comprising the steps:

A. reacting a carbonaceous reductant with an oxide of a metal while providing heat input sufficiently high to produce said metal and a gas containing carbon monoxide;

B. separating said gas produced in step A from said metal;

C. recovering said metal from Step B;

D. reacting the carbon monoxide in said gas separated from the said metal with hydrogen at a temperature below 560 deg. C. to produce carbon and water;



E. separating said carbon from said water produced in step D; and

F. discharging said water separated in step E from the production system employing the method comprising steps A through E,

whereby the amount of carbon oxide gases emitted to the atmosphere is less than would be emitted without employing steps D, E and F.

5,316,566

LIQUID STEEL BATH REHEATING METHOD

Jacques Defays, Neuville-en-Condroz, Belgium, assignor to Cockerill Sambre S.A., Seraing, Belgium

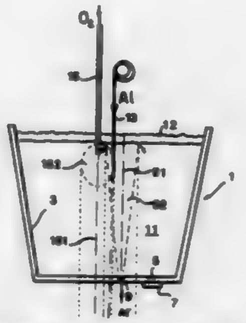
PCT No. PCT/BE91/00044, § 371 Date Dec. 10, 1992, § 102(e) Date Dec. 10, 1992, PCT Pub. No. WO92/00391, PCT Pub. Date Jan. 9, 1992

PCT Filed Jun. 28, 1991, Ser. No. 949,820

Claims priority, application Belgium, Jun. 29, 1990, 9000673

Int. Cl.^{5} C21C *5/52*

U.S. Cl. 75—10.39 **12 Claims**



1. In a method for metallothermically reheating a liquid steel bath (11) contained in a metallurgical vessel (1) and having a scoria zone at its surface, comprising the steps of introducing into the bath a metallic fuel and injecting below the surface of the bath an oxidizing gas and a stirring gas, wherein a current resulting from the injection of a stirring gas is created in the bath (11), via a means (9) separate from means (15) for injecting the oxidizing gas and wherein the metallic fuel (13) is introduced into the current, so that it is brought into contact with the oxidizing gas, the combination wherein the axes of injection of the oxidizing gas and of the stirring gas are out of alignment with respect to each other, and the injection of the stirring gas generates an ascending current in the liquid steel

bath, this current becoming descending at the location of injection of the oxidizing gas.

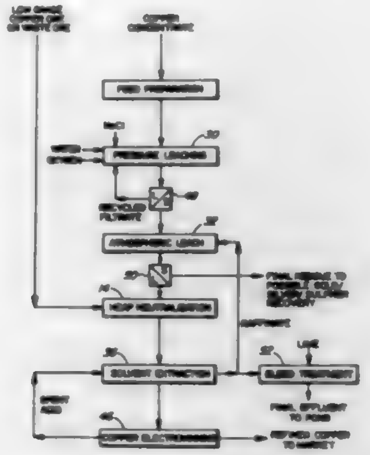
5,316,567
HYDROMETALLURGICAL COPPER EXTRACTION PROCESS

David L. Jones, Delta, Canada, assignor to Cominco Engineering Services Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 901,097, Jun. 19, 1992, Pat. No. 5,223,024. This application Mar. 22, 1993, Ser. No. 35,233

Int. Cl.^{5} C22B *1/00*

U.S. Cl. 75—743 **12 Claims**



1. A process for the extraction of copper from a sulphide copper ore or concentrate, comprising the steps of:

subjecting the ore or concentrate to a first leaching in the presence of oxygen and an acidic chloride solution as lixiviant;

subjecting the product from said first leaching to a second leaching with an acidic sulphate solution to produce a leach liquor containing copper sulphate in solution; and

reducing the acidity of said leach liquor by effecting percolation leaching of a bed of copper ore with said leach liquor, whereby the pH of the leach liquor is raised.

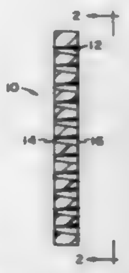
5,316,568
METHOD AND APPARATUS FOR PRODUCING FLUID FLOW

Melvin H. Brown, R.R. 2, Box 299, Morning Sun, Iowa 52640

Filed Dec. 15, 1992, Ser. No. 991,216

Int. Cl.^{5} B01D *53/22, 53/24*

U.S. Cl. 95—31 **23 Claims**



1. A method suitable for generating power comprising:

(a) providing at least one porous membrane with small pores therethrough of a size and shape to utilize random motion of molecules in a gas to flow gas through the wall predominantly in one direction; and

(b) producing power by means responsive to the flow of gas through said wall.

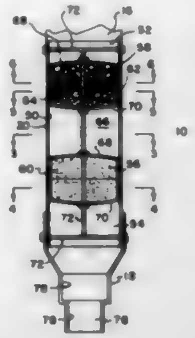
5,316,569
DEVICE FOR FILTERING SEWER GASES

Frederick W. Heunermund, 1390 S. Hulgan Cir., DeSoto, Tex. 75115

Filed Jul. 27, 1993, Ser. No. 98,118

Int. Cl.^{5} B01D *53/04*

U.S. Cl. 96—134 **2 Claims**



1. A device for filtering sewer gases, comprising:

a main body member having an inner wall spanning between an open top adapted for connection to a vent top and an open bottom;

lower and upper filter medium chambers disposed within the inner wall of the main body member, the lower chamber containing carbon as a filter medium and the upper chamber containing copper steel wool as a filter medium;

an adapter member fixed to the main body member open bottom and having walls adapted for connection to a house sewer vent;

with the lower and upper filter medium chambers being vertically spaced within the main body member and separated by an air gap;

with each said chamber formed by upper and lower, stainless steel, perforated bowls locating the filter media within the main body member; and

with the bowls being fixed within the main body member by copper support rods.

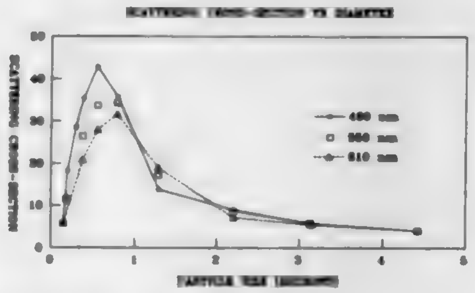
5,316,570
STABLE HEAVY METAL FREE ZIRCON PIGMENTS FOR USE IN PLASTICS AND PAINTS AND METHOD FOR COLORING THEREOF

Robert P. Blonski, North Royalton, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Sep. 28, 1992, Ser. No. 951,391

Int. Cl.^{5} C08K *3/00*

U.S. Cl. 106—451 **3 Claims**



1. Stable pigment particles comprising:

praseodymium doped zirconium silicate particles, at least about 50 percent by volume of which range from about 0.2 to about 2.5 μ in size.

5,316,571
ALUMINA-SPINEL TYPE MONOLITHIC REFRACTORIES

Takashi Yamamura; Yoshihisa Hamazaki, both of Okayama; Toshihiko Kaneshige; Makoto Nanba, both of Bizen, and Yukitoshi Kubota, Akaiwa, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

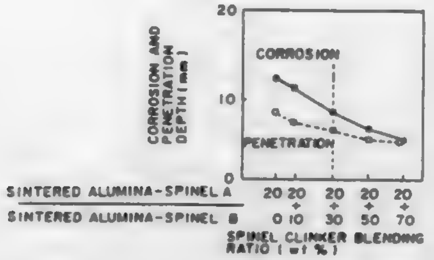
PCT No. PCT/JP91/01528, § 371 Date Sep. 23, 1992, § 102(e) Date Sep. 23, 1992, PCT Pub. No. WO92/18440, PCT Pub. Date Oct. 29, 1992

PCT Filed Nov. 7, 1991, Ser. No. 927,266

Claims priority, application Japan, Apr. 16, 1991, 3-84121

Int. Cl.^{5} C04B *28/06, 35/44*

U.S. Cl. 106—692 **5 Claims**



1. A monolithic refractory containing an alumina-spinel clinker characterized in that said refractory consists essentially of

(a) from 80 to 92 percent by weight of an alumina-spinel clinker having a $MgO:Al_2O_3$ molar ratio ranging from 0.14:1.86 to 0.6:1.4, and

(b) from 8 to 20 percent by weight of alumina cement.

5,316,572
METHOD OF MANUFACTURING CONCRETE FOR PLACEMENT IN AIR NOT REQUIRING CONSOLIDATION

Hajime Okamura, Urayasu; Koichi Maekawa, Hino, and Kazumasa Ozawa, Tokyo, all of Japan, assignors to NMB Ltd., Tokyo, Japan

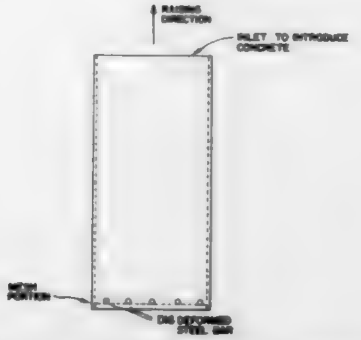
PCT No. PCT/JP90/00758, § 371 Date Aug. 5, 1991, § 102(e) Date Aug. 5, 1991

Continuation of Ser. No. 730,902, Aug. 5, 1991, abandoned. This PCT application Jun. 11, 1990, Ser. No. 947,971

Claims priority, application Japan, Dec. 11, 1989, 1-318729

Int. Cl.^{5} C04B *7/02*

U.S. Cl. 106—714 **5 Claims**



1. Concrete composition for placement in air without requiring consolidation, which excels in fluidity and shows little segregation and high deformability, comprising:

portland cement in a mixture of at least one of blast-furnace slag powder, expansive agent, fly ash, silica powder and natural mineral powder, in quantity of 400–700 kg/m^3;

water in a quantity of not more than 175 kg/m^3;

a water-soluble polymer in such a quantity as will yield a viscosity in a range of 5 to 2,000 centipoises when dissolved in 1,000 g of water at 20° C. and 0.003–0.014 wt. % on the basis of the amount of water used; and

an air-entraining, water-reducing agent of an admixture that reduces the quantity of mixing water required to produce concrete at a given consistency of 12% or greater in a quantity of 0.1 to 2% by dry weight based on the amount of said portland cement mixture, wherein said concrete is free of an anti-foaming agent.

5,316,573
CORROSION INHIBITION WITH CU-BTA

Vlasta A. Brusic, Amawalk; Gerald S. Frankel, Ossining; Tina A. Petersen, Millwood, all of N.Y.; Benjamin M. Rush, Berkeley, Calif., and Alejandro G. Schrott, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1992, Ser. No. 849,856

Int. Cl.^{5} C09D *5/08*

U.S. Cl. 106—14.16 **17 Claims**

1. An aqueous solution for forming a corrosion inhibiting film on a non-passivating, non-noble metal or alloy thereof comprising benzotriazole and derivatives thereof and Cu^{+2} ions in small concentrations sufficient for forming a Cu(I)-benzotriazole film without promoting dissolution of said non-noble metal or alloys thereof.

5,316,574
ERASABLE INK COMPOSITION FOR WRITING ON IMPERVIOUS SURFACE

Hisanori Fujita, and Mikihiko Nakanishi, both of Osaka, Japan, assignors to Sakura Color Products Corporation, Osaka, Japan

Filed Jan. 19, 1993, Ser. No. 5,975

Claims priority, application Japan, Jan. 17, 1992, 4-006707

Int. Cl.^{5} C09D *11/00*

U.S. Cl. 106—20 A **18 Claims**

1. An erasable ink composition for writing on an impervious writing surface comprising:

an organic solvent selected from the group consisting of an aliphatic alcohol of 1–4 carbons and a monoalkyl ether of a glycol of 2–4 carbons;

a resin selected from the group consisting of polyvinyl butyral resin, acrylic resin, styrene-acrylic copolymer resin, styrene-maleic acid copolymer resin, shellac resin and rosin-maleic acid copolymer resin in an amount of 1–20% by weight;

a pigment in an amount of 1–30% by weight; and

a polyoxyethylene polyoxypropylene monoalkyl ether which is liquid at normal temperatures as a separating agent in an amount of 5–20% by weight.

5,316,575
PIGMENTED, LOW VOLATILE ORGANIC COMPOUND, INK JET COMPOSITION AND METHOD

Bruce A. Lent, Oak Park, and Adrian M. Lorin, Wilmette, both of Ill., assignors to Videojet Systems, International, Inc., Wood Dale, Ill.

Filed Oct. 8, 1992, Ser. No. 958,267

Int. Cl.^{5} C09D *11/02*

U.S. Cl. 106—20 R **8 Claims**

1. An ink composition suitable for ink jet printing operations comprising an aqueous resin solution and an organic pigment, said composition being substantially free of volatile organic compounds, said aqueous resin solution comprising water and a resin that is soluble in water at a basic pH and insoluble in water at an acidic pH, and a sufficient amount of a basic pH adjusting agent to render the resin soluble in the water, the ink composition having the following characteristics for use in ink jet printing systems: (1) a viscosity from about 1.6 to about 7.0 centipoises at 25° C.; (2) an electrical resistivity from about 50

to about 2000 ohm-cm; and (3) a sonic velocity from about 1200 to about 1300 meters/second.

5,316,576
HIGH PERFORMANCE PIGMENTS OF LOW OIL ABSORPTION: PREPARATION, PROPERTIES AND END-USE APPLICATIONS

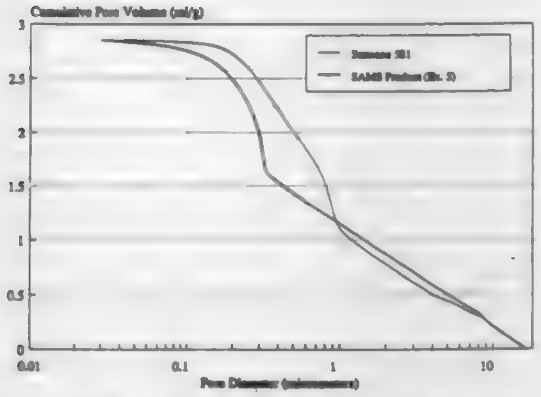
Gary M. Freeman, Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 819,637, Jan. 10, 1992, Pat. No. 5,186,746, which is a continuation of Ser. No. 567,563, Aug. 15, 1990, abandoned. This application Mar. 13, 1992, Ser. No. 851,407

The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.

Int. Cl.⁵ C01B *33/26*

U.S. Cl. 106—483 **14 Claims**



1. A sodium aluminosilicate pigment having the following empirical formula in terms of oxide constituents:

$(0.01\text{–}0.5)\ Na_2O{:}Al_2O_3{:}\ (2.01\text{–}3.0)\ SiO_2{:}\ (1.3\text{–}3.0)\ H_2O,$

said pigment being produced by the hydrothermal reaction of a sodium silicate and a clay in an aqueous medium at a ratio of sodium silicate (B) to clay (C) of 0.1:1 to 0.5:1,
said pigment being characterized by having a pore volume structure of at least 2.0 ml/gm, a relatively narrow pore size distribution wherein the pore diameters range from 0.2 to 0.7 microns and are centered near a pore diameter of 0.3 microns as depicted in FIGS. 6 and 9, an oil absorption of less than about 115 gm/100 gm and an average stokes equivalent particle diameter of 0.5–0.7 microns as determined by x-ray sedigraph,
said hydrothermal reaction being carried out using a carefully controlled combination of reaction conditions including a batch reaction mixture comprising

$(0.2\text{–}0.5)\ Na_2O{:}Al_2O_3{:}\ (2.30\text{–}2.83)\ SiO_2.$

5,316,577
PLASTICALLY DEFORMABLE METALLIC MIXTURES AND THEIR USE

Shy-Hsien Wu, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Feb. 3, 1992, Ser. No. 829,306

Int. Cl.⁵ B01J *13/00;* **C08L** *1/26*

U.S. Cl. 106—197.1 **27 Claims**

1. A plastically deformable mixture which comprises finely divided metal powder, 1.2–2% water-miscible organic solvent, 3–10% organic binding agent consisting of polysaccharide, 9–15% water, 0.5–5% anionic dispersing agent, and 0.5–5% nonionic surfactant.

5,316,578
PROCESS AND APPARATUS FOR PRODUCING STARCH MELT AND PRODUCTS OBTAINABLE BY THIS PROCESS

Friedrich S. Buehler, Thusis; Josef Casanova, Bonaduz; Hansjörg Ernst, Domat/Ems, and Hans-Joachim Schultze, Chur, all of Switzerland, assignors to Ems-Inventa AG, Switzerland

Filed May 28, 1992, Ser. No. 890,563

Claims priority, application Fed. Rep. of Germany, May 29, 1991, 41176286

Int. Cl.⁵ C08L *3/04, 3/06, 3/08*

U.S. Cl. 106—210 **30 Claims**

1. A process for the production of a homogeneous, thermoplastically processible starch melt comprising
a. introduction of a chemically modified starch into a first intake zone of an extruder and conveyance of said starch to a second receiving zone,
b. addition of a prehomogenized, anhydrous liquid mixture of plasticizer, emulsifier, and at least one additive, mixing and subsequent conveyance of said starch and said liquid mixture through said second receiving zone at a first elevated temperature to form a blended mixture thereof,
c. destructurization, in a third destructurization zone, of said modified starch, without adding any water, and conveyance of said blended mixture therethrough at a second elevated temperature to form said homogeneous, thermoplastically processible melt,
d. degassing of said melt in and conveyance of said melt through a fourth degassing zone at a third elevated temperature and under reduced pressure to form a degassed melt, and
e. extrusion of said degassed melt through a die at a fourth elevated temperature and elevated pressure.

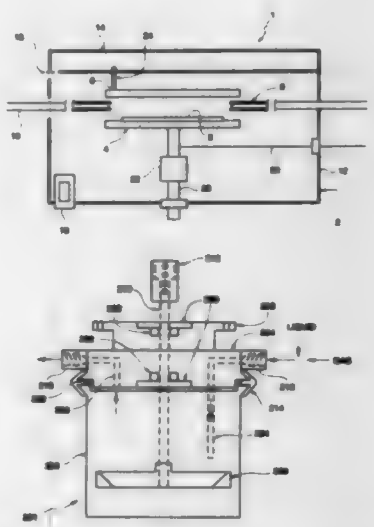
5,316,579
APPARATUS FOR FORMING A THIN FILM WITH A MIST FORMING MEANS

Larry D. McMillan; Carlos A. Paz de Araujo, and Tom L. Roberts, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 807,439, Dec. 31, 1991, which is a continuation-in-part of Ser. No. 660,428, Feb. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 290,468, Dec. 27, 1988, abandoned. This application May 4, 1992, Ser. No. 877,749

Int. Cl.⁵ B05C *11/04*

U.S. Cl. 118—50 **8 Claims**



1. Apparatus for forming a ferroelectric, super-conducting, or high dielectric constant thin film, said apparatus comprising:

a source of a liquid, said liquid comprising one or more chemical elements;
an enclosure;
liquid introduction means for introducing liquid from said liquid source into said enclosure;
rotating blade means in said enclosure for turning said liquid into a mist; and
thin film forming means for utilizing said mist to form a ferroelectric, super-conducting, or high dielectric constant thin film comprising said one or more chemical elements, said thin film forming means including vacuum means for creating a vacuum to withdraw said mist from said enclosure and for drawing said liquid into said enclosure through said introduction means.

5,316,580
METHOD AND APPARATUS FOR PRODUCING PARTS BY SELECTIVE SINTERING

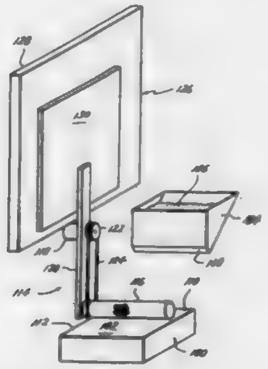
Carl R. Deckard, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 541,788, Jun. 21, 1990, Pat. No. 5,132,143, which is a division of Ser. No. 105,316, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 920,580, Oct. 17, 1986, Pat. No. 4,863,538. This application Jul. 10, 1992, Ser. No. 911,879

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.⁵ B05C *11/02*

U.S. Cl. 118—110 **6 Claims**



1. A device for distributing dispensed powder as a layer over a region of a target area, comprising:
a drum;
means for moving the drum from one end of the region to another end of the region with a desired spacing between said region and drum; and
means for rotating the drum counter to the direction of movement of the drum from said one end to said other end, said drum being operable when counter-rotated and moved from said one end to said other end to contact the powder and eject powder in said direction of movement to leave a layer of powder between the drum and said one end having a thickness of approximately said desired spacing.

5,316,581
LIQUID APPLICATOR TO ACTIVATE ADHESIVE

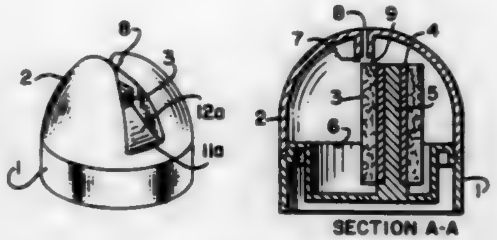
Tadeusz Staniszewski, 33 Karen Pl., Budd Lake, N.J. 07828

Filed Sep. 14, 1992, Ser. No. 944,304

Int. Cl.⁵ B05C *1/02, 11/105*

U.S. Cl. 118—246 **31 Claims**

1. A device for moistening an adhesive coating on a thin workpiece with a moistening agent, comprising:
a housing for holding said moistening agent;
an applicator means mounted in said housing and having a lateral surface for carrying and applying said moistening agent to said workpiece, said lateral surface being at least partially accessible by said workpiece, said lateral surface being curved; wherein
said applicator means comprises a material having as a property the ability to carry said moistening agent by capillary action;



said housing has a slot with a pair of opposing upright walls leading toward an opening for exposing said lateral surface at least partially, said opening having a limited size for preventing exposure of said lateral surface throughout most of said slot, so that loss of the agent through said opening is limited.

5,316,582
APPARATUS FOR CONTINUOUSLY APPLYING A LIQUID TO A WEB

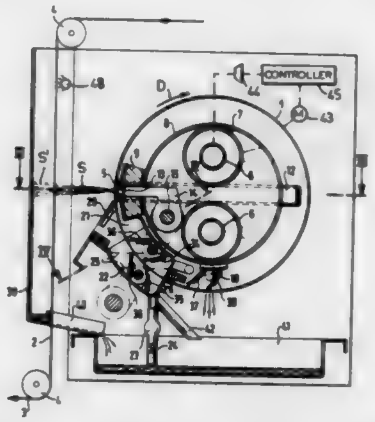
Friedrich Dübel, Krefeld, Fed. Rep. of Germany, assignor to Wako Walzen Konstruktion System GmbH, Krefeld, Fed. Rep. of Germany

Filed Sep. 21, 1992, Ser. No. 948,210

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1991, 9111789[U]

Int. Cl.⁵ B05B *15/04;* **B05C** *5/00*

U.S. Cl. 118—301 **10 Claims**



1. An apparatus for continuously applying a liquid to a web, the apparatus comprising:
a nozzle having an elongated opening and directed at the web;
a strip slidable steplessly along the opening of the nozzle to vary the length thereof;
a foraminous transfer screen displaceable transversely between the web and the nozzle opening and having a back face turned toward the nozzle and a front face turned toward the web;
longitudinally extending scrapers flanking the nozzle and pressing the back face of the screen against the nozzle;
back and front troughs engaging the respective faces of the screen and defining therewith back and front chambers;
respective back and front steplessly displaceable pistons in the troughs, engaging the respective screen faces, and each defining an end wall for the respective chamber;
supply means for filling the chambers with a treatment liquid, whereby the liquid will wet the respective face of the

screen over an area determined by the position of the pistons;

means for supplying a gas to the nozzle to blow the gas through the nozzle opening and through the screen and thereby transfer liquid carried by the screen to the web; and

control means connected to the pistons and to the strip for varying the lengths of the chambers and nozzle opening.

5,316,583

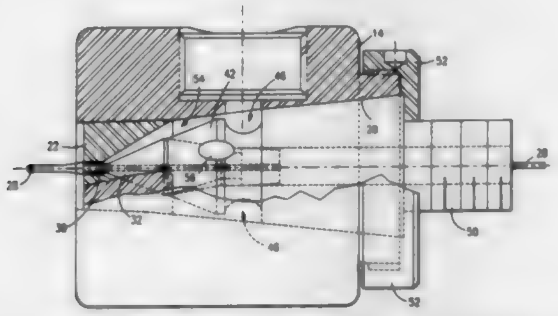
CROSS-HEAD DIE WITH IMPROVED FLOW DISTRIBUTION

James A. Milliman, P.O. Box 109, Camden, N.Y. 13316

Continuation-in-part of Ser. No. 788,429, Nov. 6, 1991, abandoned. This application Dec. 2, 1992, Ser. No. 984,693

Int. Cl.^{5} B05C *3/15*

U.S. Cl. 118—405 **11 Claims**



1. A die assembly of the cross-head type for applying an essentially uniform layer of fluid coating material to a continuous filament of substantially constant diameter as it is drawn through said assembly, said assembly comprising:

a) a cross-head body having front and rear ends, a first, through axial bore substantially concentric about a central, longitudinal axis, a radial bore communicating with said axial bore at an intermediate position therein;

b) a die member having an external surface matingly engaged with a portion of said first axial bore extending from said front end of said body for at least a portion of the distance to said intermediate position, said die member having an internal surface terminating at a central orifice of predetermined diameter, greater than said constant diameter, positioned coaxially with said central axis substantially at said body front end;

c) a tip holder having a second through axial bore defining an internal surface, front and rear ends, a central, longitudinal axis, and an external surface including:

  i) a forward portion tapering outwardly from said front toward said rear end of said tip holder;

  ii) an annular groove extending entirely about the periphery of said tip holder immediately rearwardly of said forward portion; and

  iii) a body engagement portion extending from immediately rearwardly of said groove toward said tip holder rear end and matingly engaged with said first axial bore from immediately rearward of said intermediate position toward said body rear end;

d) a tip having a third through axial bore with a central, longitudinal axis and a diameter less than said predetermined diameter and slightly greater than said constant diameter, and an external surface including a rear portion matingly engaged with at least a portion of said second axial bore extending rearwardly from said tip holder front end, and a front portion extending forwardly from said tip holder front end toward said die member orifice;

e) means releasably holding said tip holder in assembled relation with said body with the longitudinal axis of each of said first, second and third axial bores coaxial with said die member orifice; and

f) means defining a flow passage between said annular groove and said die member orifice, whereby said molten material may flow from said radial bore, about the periphery of said annular groove and through said flow passage to form a uniform coating layer on said filament as said material and filament exit said die member orifice.

5,316,584

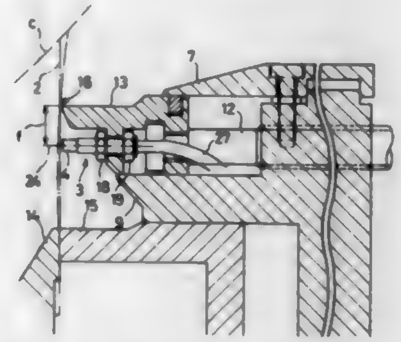
COATING SYSTEM WITH BLADE ADJUSTMENT

Manfred Ueberschär, Nattheim, and Sergio Giuste, Heidenheim, both of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 14, 1992, Ser. No. 990,063

Int. Cl.^{5} B05C *11/04*

U.S. Cl. 118—712 **6 Claims**



1. A coating blade adjustment apparatus comprising:

a blade having a working edge at one end thereof;

a mounting for said blade, said mounting being structured and arranged to retain said blade at the other end of the blade from said working edge;

a support element for the blade, said support element having a support edge and being positioned between said blade working edge and said mounting; and

a measuring sensor between the support edge of the support element and said mounting in the area within or on the support element for measuring the spacing of the blade from the sensor, whereby said spacing can be controlled by an adjustment means.

5,316,585

METHOD FOR FABRICATING SUPERCONDUCTING MATERIALS AND SUPERCONDUCTIVE THIN FILMS

Yukio Okamoto, Sagamihara; Toshiyuki Aida, Chofu; Katsuki Miyauchi, Hino; Kazumasa Takagi, Tokyo; Tokuumi Fukazawa, Tachikawa, and Shinji Takayama, Mitaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 288,750, Aug. 5, 1988, Pat. No. 4,950,642. This application Jul. 24, 1990, Ser. No. 560,844

Claims priority, application Japan, Aug. 7, 1987, 62-196186; Oct. 7, 1987, 62-251497

Int. Cl.^{5} C23C *14/00*

U.S. Cl. 118—719 **15 Claims**

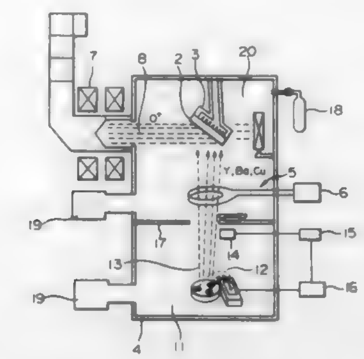
1. An apparatus for fabricating a superconducting thin film comprising:

en evaporation chamber for generating a stream of vapor of metal elements;

plasma generating means for generating an oxygen plasma;

a reaction chamber for reacting said stream of vapor of the metal elements with said oxygen plasma on a substrate without further heat-treatment; and

a differential pumping mechanism including a throttle plate separating said evaporation chamber and said reaction chamber from each other and an evacuating pump provided for each chamber and evacuating said evaporation chamber to a higher vacuum than said reaction chamber.



5,316,586

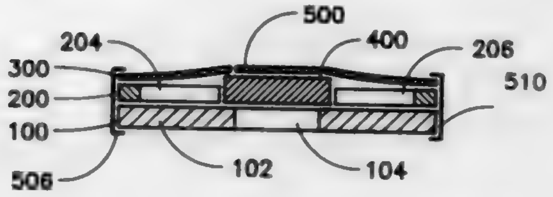
SILICON SAMPLE HOLDER FOR MOLECULAR BEAM EPITAXY ON PRE-FABRICATED INTEGRATED CIRCUITS

Michael E. Hoenk, Pasadena; Paula J. Grunthaner, and Frank J. Grunthaner, both of Glendale, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 26, 1992, Ser. No. 905,018

Int. Cl.^{5} C23C *14/24*

U.S. Cl. 118—728 **15 Claims**



1. Apparatus for holding an integrated circuit, said integrated circuit comprising a thin planar substrate of a particular type of semiconductor material, said apparatus comprising:

top and bottom planar plates comprising said type of semiconductor material;

means for drawing said top and bottom planar plates toward one another whereby to sandwich said planar substrate between said top and bottom planar plates.

5,316,587

WATER SOLUBLE BLAST MEDIA CONTAINING SURFACTANT

Benny S. Yam, Holmdel; Amy L. Joseph, Hopewell; Anthony E. Winston, East Brunswick, all of N.J., and Keith A. Jones, Yardley, Pa., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jan. 21, 1993, Ser. No. 6,658

Int. Cl.^{5} B08B *7/00*

U.S. Cl. 134—7 **22 Claims**

1. A method of blast cleaning a solid surface comprising; propelling an abrasive blast media against a solid surface by means of a water-containing pressurized fluid stream to strip contaminants from said surface, said blast media comprising water soluble abrasive particles and a surfactant.

5,316,588

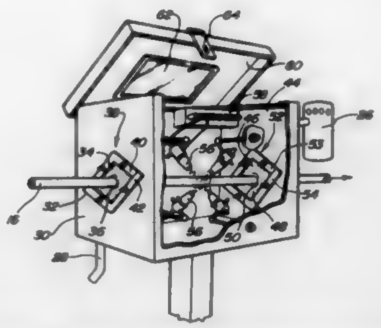
SYSTEM FOR SPRAYING MATERIAL ON TUBING AND RECLAIMING EXCESS MATERIAL

James E. Dyla, Bloomfield Hills, Mich., assignor to AMCOL Corporation, Dearborn, Mich.

Filed Jun. 16, 1992, Ser. No. 897,989

Int. Cl.^{5} B08B *9/02*

U.S. Cl. 134—9 **19 Claims**



12. A method of treating tubing in an enclosed environment, said method comprising the steps of:

(1) wiping said tubing as said tubing enters an enclosure;

(2) spraying material onto the exterior surface of said tubing within said enclosure; and

(3) wiping said tubing as said tubing exits said enclosure; each of said wiping steps comprising using wipes which are biased against end walls of said enclosure.

5,316,589

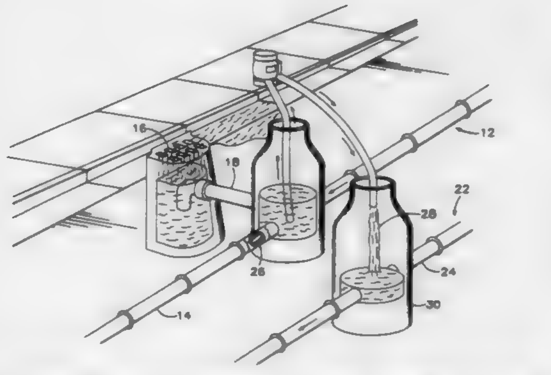
METHOD FOR CONTROLLING STREET SURFACE POLLUTANTS

Frederick W. Krieger, Jr., 2510 Woolsey, Berkeley, Calif. 94705

Filed Jun. 24, 1992, Ser. No. 903,788

Int. Cl.^{5} B08B *3/00*

U.S. Cl. 134—10 **3 Claims**



1. A method for collecting and treating pollutants from the surface of a street comprising the steps of:

a. providing a sanitary sewer system for collecting, diverting and treating sanitary wastes;

b. providing a storm sewer system, said storm sewer system including a first portion for collecting surface water runoff from said street surface, and a second portion communicating with said first storm sewer portion, said storm sewer second portion for receiving and diverting said surface water runoff from said first storm sewer portion to a remote location, said storm sewer system isolating said surface water runoff from said sanitary sewer system;

c. temporarily sealingly isolating said second storm sewer portion from said first storm sewer portion;

d. flushing the surface of said street with flushing water to collect and remove surface pollutants therefrom;

e. collecting said flushing water and surface pollutants in said storm sewer first portion; and

f. transferring said flushing water and surface pollutants from said storm sewer first portion to said sanitary sewer; and

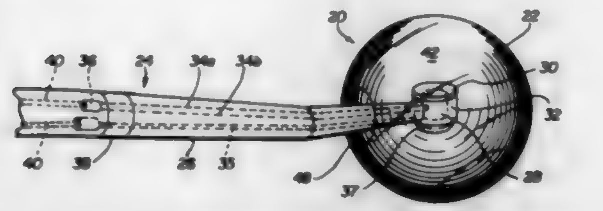
g. treating said collected surface pollutants in said sanitary sewer system.

5,316,590
METHOD FOR CLEANING AND LUBRICATING A DENTAL HANDPIECE WITH A DISPOSABLE CONTAINER

Gary G. Schneck, Algonquin, Ill., assignor to Gendex Corporation, Des Plaines, Ill.

Filed Feb. 22, 1993, Ser. No. 20,659
Int. Cl.^{5} B08B *3/00*

U.S. Cl. 134—26 **3 Claims**



1. A method of cleaning and lubricating a dental handpiece that includes a handle, a head for mounting a turbine, and channels for allowing fluids to travel from the handle to the head, said method comprising the steps of:

(a) providing a disposable container having an opening sized to receive the head of the dental handpiece therethrough;

(b) inserting the head of the dental handpiece through the opening in the disposable container with at least a portion of the handle projecting outwardly of the disposable container;

(c) passing one of a cleaning fluid and a lubricating fluid through said channels from said handle to said head until said fluid is expelled from said head, and

(d) collecting the expelled fluid and any materials carried therewith along an inner surface of the disposable container, said opening being sized such that said expelled fluid and any materials carried therewith are substantially retained in said disposable container.

5,316,591
CLEANING BY CAVITATION IN LIQUEFIED GAS

Sidney C. Chao, Manhattan Beach; Edna M. Purer, Los Angeles; Thomas B. Stanford, San Pedro, and Carl W. Townsend, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 10, 1992, Ser. No. 927,443
Int. Cl.^{5} C02F *1/46*

U.S. Cl. 134—34 **23 Claims**

1. A process for removing undesired material from a chosen substrate comprising the steps of:

(a) placing said substrate containing said undesired material in a cleaning chamber provided with cavitation-producing means;

(b) introducing into said cleaning chamber a liquefied gas formed by applying a pressure of about 100 atmospheres (103.3 Kg/cm^2) or less at a temperature of less than about 50° C. to a liquefiable gas selected from the group consisting of carbon dioxide, nitrous, oxide, sulfur hexafluoride, and xenon and contacting said substrate containing said undesired material with said liquefied gas at a temperature below the critical temperature of said gas; and

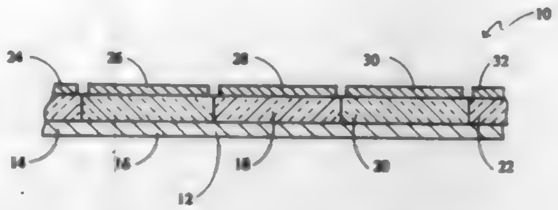
(c) exposing said liquefied gas in said cleaning chamber to said cavitation-producing means for a period of time sufficient to remove said undesired material from said substrate.

5,316,592
SOLAR CELL ROOFING ASSEMBLY

Thomas L. Dinwoodie, 2550 Benvenue, Berkeley, Calif. 94704

Filed Aug. 31, 1992, Ser. No. 938,437
Int. Cl.^{5} H01L *31/042;* **H02N** *6/00*

U.S. Cl. 136—244 **7 Claims**



1. A solar roofing assembly, comprising:

a roofing membrane;

a plurality of insulation blocks disposed as a continuous layer on top of the roofing membrane; and

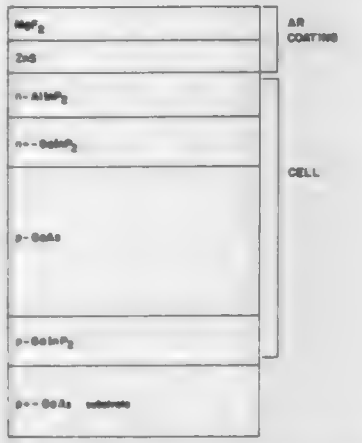
a plurality of photovoltaic modules disposed as a layer directly on top of the plurality of insulation blocks, whereby the photovoltaic modules serve as ballast for the insulation and membrane layers below.

5,316,593
HETEROJUNCTION SOLAR CELL WITH PASSIVATED EMITTER SURFACE

Jerry M. Olson, Lakewood, and Sarah R. Kurtz, Golden, both of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Nov. 16, 1992, Ser. No. 977,109
Int. Cl.^{5} H01L *31/072, 31/0304*

U.S. Cl. 136—262 **20 Claims**



1. A high-efficiency heterojunction solar cell comprising:

(a) a substrate;

(b) an absorber layer comprising GaAs supported by said substrate;

(c) an emitter layer in contact with said absorber layer; wherein said emitter layer comprises $Al_yGa_xIn_{1-y-x}P$, where x+y is in the range of 0.47 to 0.57; and wherein said emitter layer has a band gap energy of at least 1.8 ev; and

(d) a passivating window layer on said emitter layer, wherein said window layer comprises $Al_{y'}Ga_{x'}In_{1-y'-x'}P$, where x'+y' is in the range of 0.47 to 0.57,

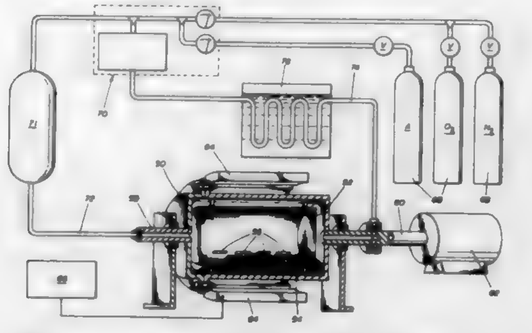
wherein said absorber layer and said emitter layer are of opposite conductivity types; and wherein y is less than y'.

5,316,594
PROCESS FOR SURFACE HARDENING OF REFRACTORY METAL WORKPIECES

Willard E. Kemp, Houston, Tex., assignor to Fike Corporation, Blue Springs, Mo.

Continuation-in-part of Ser. No. 467,050, Jan. 18, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 763,339
Int. Cl.^{5} C23C *8/10*

U.S. Cl. 148—281 **11 Claims**



1. A process of forming a hardened outer shell on a zirconium alloy workpiece comprising the following steps:

providing a bed of pulverulent metal oxide material having an affinity for oxygen at least as great as zirconium;

fluidizing said bed by providing a flow of an inert gas stream through said pulverulent material for a predetermined fluidizing period; said gas stream containing oxygen for at least a portion of the fluidizing period of an amount less than around 5 percent by mole;

placing the zirconium alloy workpiece within said fluidizing bed; and

heating said fluidized bed to a predetermined temperature over at least around 1200 F. for a predetermined time period to form a hard zirconium oxide surface layer on the outer exposed surface of said workpiece.

5,316,595
PROCESS FOR PRODUCING MAGNETS HAVING IMPROVED CORROSION RESISTANCE

Takaki Hamada; Tetsuji Hayakawa, and Yutaka Matsuura, all of Osaka, Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Continuation of Ser. No. 360,101, Jun. 1, 1989, Pat. No. 5,089,066, which is a division of Ser. No. 818,238, Jan. 13, 1986, Pat. No. 4,837,114, which is a continuation-in-part of Ser. No. 812,992, Dec. 24, 1985, abandoned. This application Aug. 5, 1991, Ser. No. 740,442

Claims priority, application Japan, Dec. 24, 1984, 59-278489; Jan. 18, 1985, 60-7949; Jan. 18, 1985, 60-7950; Jan. 18, 1985, 60-7951; May 23, 1985, 60-110793; May 23, 1985, 60-110794; Sep. 10, 1985, 60-200890; Nov. 20, 1985, 60-260769; Nov. 20, 1985, 60-260770; Nov. 20, 1985, 60-260771
Int. Cl.^{5} G11B *5/70*

U.S. Cl. 148—302 **8 Claims**

1. A permanent magnet which has been produced by the process comprising:

providing a sintered permanent magnet body consisting essentially of 10–30 at % R, wherein R is at least one element selected from the group consisting of Nd, Pr, Dy, Ho and Tb or a mixture of at least one said element and at least one other element selected from the group consisting of La, Ce, Sm, Gd, Er, Eu, Tm, Yb, Lu, Pm and Y, 2–28 at % B and at least 42 at % Fe, and wherein at least 50 vol % of the entire magnet material body consists of Fe-B-R type tetragonal crystal structure; and

forming a low gas permeability anticorrosive coating film layer on the permanent magnet material body means of vapor deposition so that corrosive subatances do not remain in the resultant permanent magnet, thereby improving the corrosion resistance of the resultant permanent magnet,

in which said anticorrosive thin film is formed of at least one compound selected from the group consisting of oxides, nitrides, and carbides, and mixtures thereof.

5,316,596
ROLL SHELL MATERIAL AND CENTRIFUGAL CAST COMPOSITE ROLL

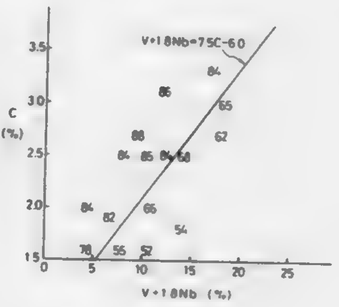
Yoshihiro Kataoka, Chiba, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP92/00400, § 371 Date May 7, 1993, § 102(e) Date May 7, 1993, PCT Pub. No. WO93/05192, PCT Pub. Date Mar. 18, 1993

PCT Filed Mar. 31, 1992, Ser. No. 50,394

Claims priority, application Japan, Sep. 12, 1991, 3-260486; Sep. 26, 1991, 3-273597; Oct. 24, 1991, 3-303832
Int. Cl.^{5} C22C *38/36*

U.S. Cl. 148—321 **12 Claims**



1. A shell material for a roll composed of C: 1.5∼3.5%, Si: 1.5% or less, Mn: 1.2% or less, Cr: 5.5∼12.0%, Mo: 2.0∼8.0%, V: 3.0∼10.0%, Nb: 0.6∼7.0%, and satisfies the following formulae (1) and (2):

$$V + 1.8\ Nb \leqq 7.5\ C - 6.0\ (\%) \tag{1}$$

$$0.2 \leqq Nb/V \leqq 0.8 \tag{2}$$

and remainder of Fe and inherent impurities.

5,316,597
A NUCLEAR REACTOR COMPRISING A REACTOR VESSEL AND STRUCTURAL MEMBERS MADE OF AN AUSTENITIC STAINLESS STEEL HAVING SUPERIOR RESISTANCE TO IRRADIATION-INDUCED SEGREGATION

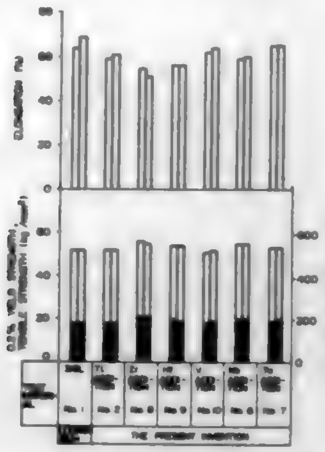
Takahiko Kato, Katsuta; Shinzo Ikeda, Ibaraki; Yasuhisa Aono, Hitachi; Masakiyo Izumiya, Mito; Kiyotomo Nakata, Katsuta; Isao Masaoka, Hitachi, and Heishichiro Takahashi, Sapporo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1992, Ser. No. 936,647
Claims priority, application Japan, Sep. 3, 1991, 3-222992
Int. Cl.^{5} C22C *38/48*

U.S. Cl. 148—327 **17 Claims**

1. A nuclear reactor comprising a reactor vessel and structural members made of an austenitic stainless steel having a superior resistance to irradiation-induced segregation, said steel consisting, by weight, of: 0.001 to 0.008% C, not more than 1% Si; not more than 2% Nm; 15 to 22Cr; 8 to 15% Ni; at least one additive selected from the group consisting of Ti more than 0.2% but not more than 0.6%, Zr more than 0.2% but not more than 1.14%, Hf more than 0.2% but not more than 2.24%, V more than 0.2% but not more than 0.64%, Nb more than 0.5% but not more than 1.17%, and Ta more than

0.5% but not more than 2.27%; and the balance Fe and incidental impurities, said at least one additive being in a solid



solution state, said steel having a wholly austenitic structure substantially free of carbide.

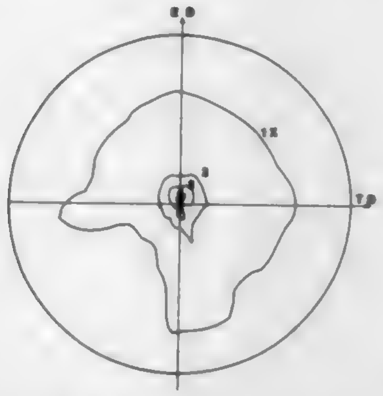
5,316,598
SUPERPLASTICALLY FORMED PRODUCT FROM ROLLED MAGNESIUM BASE METAL ALLOY SHEET

Chin-Fong Chang, Morris Plains, and Santosh K. Das, Randolph, both of N.J., assignors to Allied-Signal Inc., Morristownship, Morris County, N.J.

Division of Ser. No. 732,012, Jul. 18, 1991, Pat. No. 5,129,960, which is a continuation-in-part of Ser. No. 586,179, Sep. 21, 1990, Pat. No. 5,078,807. This application May 29, 1992, Ser. No. 890,199

Int. Cl.^{5} C22F *1/00;* **C22C** *23/00*

U.S. Cl. 148—420 **4 Claims**



1. Superplastically formed product produced from rolled magnesium base metal alloy sheet by a process comprising the steps of:

a. compacting a rapidly solidified magnesium based alloy powder to produce a billet, said alloy being defined by the formula $MG_{bal}Al_aAn_bX_c$, wherein X is at least one element selected from the group consisting of manganese, cerium, neodymium, praseodymium, and yttrium, "a" ranges from about 0 to 15 atom percent, "b" ranges from about 0 to 4 atom percent, "c" ranges from about 0.2 to 3 atom percent, the balance being magnesium and incidental impurities, with the proviso that the sum of aluminum and zinc present ranges from about 2 to 15 atom percent, and having a microstructure comprised of a uniform cellular network solid solution phase of a size ranging from 0.2–1.0 μm together with precipitates of magnesium and aluminum containing intermetallic phases of a size less than 0.1 μm;

b. forming said billet into a rolling stock; and

c. rolling said rolling stock into sheets, said rolling step further comprising the steps of:
   (i) preheating said rolling stock to a temperature ranging from 200° C. to 300° C.;
   (ii) rolling said preheated rolling stock at a rate ranging from 25 to 100 rpm;
   (iii) adjusting the roll gaps to produce a reduction of 2 to 25% per pass; and
   (iv) repeating steps (i) to (iii) at least once to produce said sheet with thickness ranging from 0.014 to 0.095" said sheet having an ultimate tensile strength of at least 400 MPa.

(d) forming said sheet into a complex shape at a strain rate ranging from 10^{-1} to 10^{-2}/S, and at a temperature ranging from 275° C. to 300° C.

5,316,599
METHOD OF PRODUCING NI-TI INTERMETALLIC COMPOUNDS

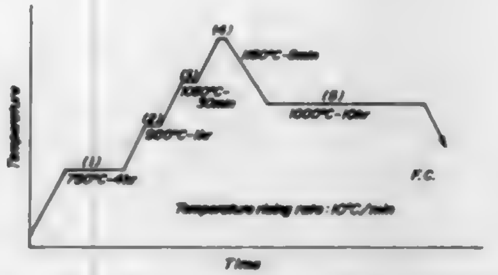
Kazuo Ebato; Masaomi Tsuda, and Tsutomu Oomori, all of Kanagawa, Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 610,435, Nov. 7, 1990, abandoned. This application Jul. 9, 1992, Ser. No. 912,120

Claims priority, application Japan, Nov. 20, 1989, 1-299673

Int. Cl.^{5} C22C *1/00*

U.S. Cl. 148—512 **1 Claim**



1. A method of producing Ni-Ti intermetallic compounds by alternately laminating plural Ni foils and Ti foils one upon the other, rolling the laminate to a final product thickness and then subjecting it to a heat treatment to form Ni-Ti intermetallic compound having Ni content of 48–55 atomic %, which comprises the steps of:

(a) subjecting the laminate to a rolling for thickness adjustment in which the laminate is rolled at a draft of not less than 30% to join laminated foils to each other and then rolled to render a thickness of each foil into 3–20 μm;

(b) subjecting the rolled laminate to a preliminary solid phase diffusion heat treatment at a temperature of 650°–780° C. for 1–10 hours;

(c) subjecting to a solid phase diffusion heat treatment at a temperature of 781°–955° C. for 1–10 hours;

(d) subjecting to a first liquid phase diffusion heat treatment at a temperature of 956°–1110° C. for 10 minutes to 1 hour to render only a portion having a Ti content of more than 50 at %;

(e) subjecting to a second liquid phase diffusion heat treatment at a temperature of 1111°–1240° C. for 1 to 10 minutes to render only a portion having a Ni content of more than 50 at %; and

(f) finally subjecting to a soaking heat treatment at 1000°–1100° C. for 1 to 10 hours.

5,316,600
ENERGETIC BINDER EXPLOSIVE

May L. Chan, Ridgecrest, Calif.; Edward M. Roy, Socorro, N. Mex., and Alan Turner, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1992, Ser. No. 947,009

Int. Cl.^{5} C06B *45/10*

U.S. Cl. 149—19.4 **3 Claims**

1. A castable explosive composition consisting essentially of about 80% by weight of an explosive solid selected from the group consisting of cyclotetramethylene tetranitramine (HMX) and cyclotrimethylene trinitromine (RDX); 8%±1% weight percent Glycidyl Azide Polymer (GAP); 1.0±0.5 weight percent of a curative selected from the group consisting of multifunctional isocyanate (N-100), hexamethylene diisocyanate (MHDI), and isophorone diisocyanate (IPDI); 8.05±1.0 weight percent Trimethylolethane trinitrate (TMETN); and 2.00±0.5 weight percent of an energetic plasticizer selected from the group consisting of Trimethylene glycol dinitrate (TEGDN), bisdinitropropyl formal and acetal mixture (BDNPF/A).

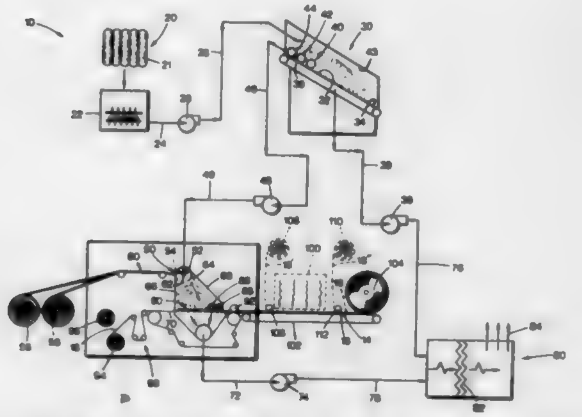
5,316,601
FIBER BLENDING SYSTEM

Carl Hebbard, Federal Way; Lee E. Perdelwitz, Jr., Tacoma, and Paul G. Gaddis, Renton, all of Wash., assignors to Absorbent Products, Inc., Simpsonville, N.C.

Filed Oct. 25, 1990, Ser. No. 603,336

Int. Cl.^{5} B32B *31/06, 31/26*

U.S. Cl. 156—62.2 **41 Claims**



1. A method of forming a mate of cellulosic fibers and synthetic fibers, comprising the steps of:

hammermilling cellulosic material into cellulosic fibers in a chamber;

metering a metered amount of synthetic fibers;

introducing the metered amount of synthetic fibers into the chamber with the cellulosic fibers;

blending the cellulosic fibers with the metered amount of synthetic fibers in the chamber to form a fiber blend and forming pills of balled-up synthetic fibers and cellulosic fibers from the synthetic fibers and cellulosic fibers;

dispersing the fiber blend and pills from the chamber through apertures of a fiber dispersed; and

collecting the dispersed fiber blend and pills on a fiber collector to form a planar mat comprising pills of balled-up cellulosic and synthetic fibers wherein portions of the fibers of the pills extend in an upward direction relative to the plane of the mat.

5,316,602
METHOD FOR MANUFACTURING CERAMIC GREEN SHEET LAMINATE FOR AN ELECTRONIC COMPONENT

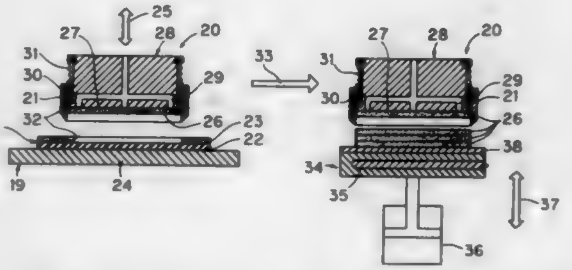
Toshihiko Kogame, and Mitsuro Hamuro, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 9, 1991, Ser. No. 682,346

Claims priority, application Japan, Apr. 19, 1990, 2-103530

Int. Cl.^{5} B32B *31/00;* **C09J** *5/00*

U.S. Cl. 156—64 **8 Claims**



1. A method of manufacturing a laminate of ceramic green sheets for forming a laminated ceramic electronic component, comprising the steps of:

a) preparing a long composite which comprises a long carrier film and a green ceramic layer continuously formed on only one side of the long carrier film along its longitudinal direction;

b) continuously guiding said long composite successively to a printing station where a conductor film is printed on the surface of said green ceramic layer with conductive paste, a drying station where said printed conductor film is dried, and a punching station, while maintaining said long composite extended in said longitudinal direction with said green ceramic layer thereon;

c) at said punching station, (1) punching said green ceramic layer and conductor film, at a predetermined location thereon with respect to the conductor film, so as to define a punched ceramic green sheet adapted for forming a laminated ceramic electronic component, and thereafter (2) lifting and separating said ceramic green sheet from said carrier film while continuously handling said ceramic green sheet and without substantially cutting said carrier film; and

d) maintaining said continuous handling of said ceramic green sheet while stacking said ceramic green sheet at a stacking location,

wherein said continuous handling of said ceramic green sheet is maintained by punching said ceramic green sheet with a punching head and then employing the same punching head to stack the ceramic green sheet at the stacking location, the stacking location and punching location being immediately adjacent to each other and the stacking location being on said punching head and said punching head holding said ceramic green sheet continuously following said punching step so as to form a stack with other such ceramic green sheets also held continuously after punching.

5,316,603

EASILY OPENABLE SEALED CONTAINER AND PROCESS FOR PRODUCING THE SAME

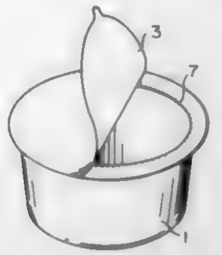
Seigo Akazawa, and Tadao Takagaki, both of Yokohama, Japan, assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Division of Ser. No. 629,907, Dec. 19, 1990, Pat. No. 5,176,314. This application Jan. 13, 1992, Ser. No. 823,371

Claims priority, application Japan, Dec. 25, 1989, 1-337571; Jan. 19, 1990, 2-010220; Mar. 30, 1990, 2-080968; Mar. 30, 1990, 2-080969; May 10, 1990, 2-118771

Int. Cl.^{5} B65B *7/28*

U.S. Cl. 156—69 **4 Claims**



1. A process for producing an easily openable sealed container, which comprises

(1) applying a bearer to a container main body having a flange with a backside and a sealing surface side, at the innermost circumferential portion of the backside of the flange portion, wherein the main body consists of a multilayer sheet comprising a sealing layer and an adjacent layer contacting therewith, the lamination strength between the sealing layer and the adjacent layer is 300–2,000 g/25 mm width and the sealing layer has a thickness of 10–100 μm,

(2) applying an ultrasonic treatment to the flange portion from the sealing surface side by using an ultrasonic horn having a head provided with micro-projections in dots having pitch intervals of 0.3–0.8 mm, to form microdents on the sealing surface of the flange portion of the main body, and

(3) heat-sealing the whole sealing surface of the flange portion with a lid so that the sealing strength between the sealing layer of the flange portion of the main body and the lid is larger than the lamination strength between the sealing layer and the adjacent layer of the main body.

5,316,604

PROCESS FOR THE PREPARATION OF THERMOPLASTIC SANDWICH STRUCTURES

Barry M. Fell, Hummelstown, Pa., assignor to Hexcel Corporation, Pleasanton, Calif.

Continuation of Ser. No. 844,547, Mar. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 622,253, Dec. 4, 1990, abandoned. This application Sep. 13, 1993, Ser. No. 120,028

Int. Cl.^{5} B32B *31/26*

U.S. Cl. 156—82 **11 Claims**

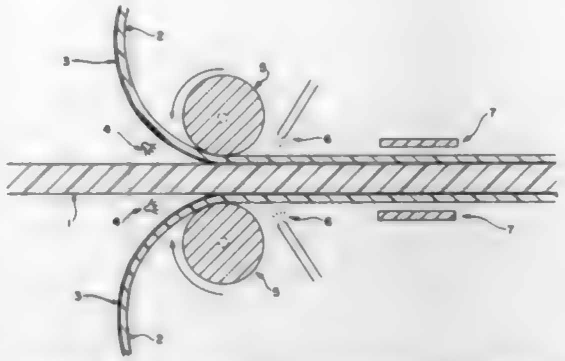
1. A process for the continuous preparation of honeycomb sandwich materials by adhering one or more skins to a thermoplastic honeycomb core without causing collapse or deformation of the core comprising:

(a) supplying the thermoplastic honeycomb core to a heating zone;

(b) supplying a facing sheet comprising a layer of thermoplastic material at least at the surface of said facing sheet facing to said honeycomb core;

(c) applying heat in said heating zone via a non-contacting heat source to the exposed surface of said layer of the thermoplastic material of said facing sheet and to the exposed surface of said thermoplastic honeycomb core to raise the temperature of said exposed surfaces to the fusion temperature of the thermoplastic materials; and

(d) essentially simultaneously and continuously joining the heated thermoplastic honeycomb core, the heated layer of thermoplastic material and the facing sheet and applying pressure to the resulting sandwich structure sufficient to cause the facing sheet to be fusion bonded to the thermoplastic honeycomb core via said thermoplastic layer but insufficient to cause deformation or collapse of the honeycomb core.



5,316,605

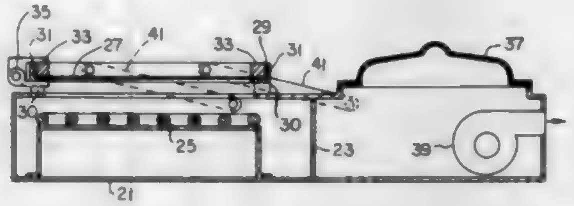
METHOD OF MANUFACTURING AND INFLATABLE FIGURE FROM FLEXIBLE PLASTIC SHEET MATERIAL

Zoran Rakonjac, Burbank, Calif., and Martin Tucker, 11960 Borden Ave., San Fernando, Calif. 91340, assignors to Martin Tucker, San Fernando, Calif., a part interest

Filed Jun. 15, 1992, Ser. No. 897,928

Int. Cl.^{5} B32B *31/04*

U.S. Cl. 156—145 **5 Claims**



1. A method of forming a hollow three dimensional inflatable figure out of flexible plastic sheet material, comprising the steps of:

(a) providing a porous mold member having a major shape-defining surface area, and at least one convex projection extending from said major surface area to define a localized protruding portion of the surface contour on the inflatable figure; said convex projection extending from said major surface area a substantially greater distance than the projection distance of the corresponding surface contour on the figure after inflation; said convex projection having a thickness dimension extending in a direction parallel to said major surface area; the thickness dimension of said projection being less than the corresponding dimension on the figure after inflation;

(b) heating a flexible plastic sheet to a softened condition wherein the sheet can be reformed into a three dimensional configuration;

(c) draping the softened plastic sheet over the porous mold member;

(d) applying a suction force to the porous mold member, to thereby draw the still softened sheet against the mold member surface whereby the sheet is reconfigured to the three dimensional shape of the mold member; repeating steps a through d, using a second flexible plastic sheet and a differently configured mold member;

(e) adhesively attaching peripheral edge areas of the first and second sheets together to form an inflatable figure, and

(f) pressurizing the inflatable figure to reconfigure the aforementioned convex projection to a desired surface contour.

5,316,606

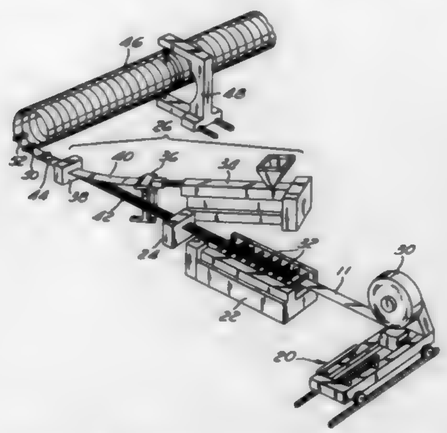
METHOD OF FABRICATING A METAL PIPE WITH AN INTEGRALLY FORMED LINER

James R. Andre, Newport Beach, Calif., assignor to W. E. Hall Company, Newport Beach, Calif.

Filed Jul. 26, 1991, Ser. No. 736,108

Int. Cl.^{5} B29C *47/02;* **B32B** *31/30*

U.S. Cl. 156—201 **16 Claims**



8. A method for forming polymer laminated metal pipe comprising the steps of:

(a) providing sheet steel having a co-extruded polymer layer of ethylene acrylic acid and polyethylene/ethylene acrylic acid blend applied on at least one surface thereof;

(b) passing said sheet steel through a profile former to form tapered channels and seam members therein;

(c) disposing an anchor partially within said tapered channel, said anchor comprising a first portion which is disposed within said tapered channel and a second portion which is disposed in laminar juxtaposition to the sheet steel proximate said tapered channel; and

(d) bonding a polyethylene liner having a thickness greater than said co-extruded polymer layer to said co-extruded polymer layer and to the second portion of said anchor, the polyethylene/ethylene acrylic acid blend of the co-extruded polymer layer bonding to the polyethylene of the liner so as to securely attach the liner to the sheet steel;

(e) forming said sheet steel into a section of pipe.

5,316,607

METHOD FOR FABRICATING AN OSTOMY DEVICE WITH A CONVEX ADHESIVE FACEPLATE AND PROTECTIVE SHIELD

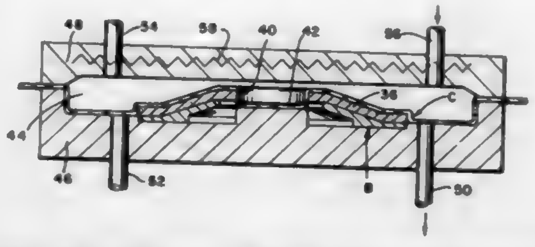
Kenneth A. Johnsen, Piscataway, and Keith T. Ferguson, Scotch Plains, both of N.J., assignors to E. R. Squibb & Sons, Princeton, N.J.

Division of Ser. No. 723,467, Jun. 28, 1991, abandoned, which is a continuation of Ser. No. 399,829, Aug. 28, 1989, abandoned. This application Mar. 4, 1992, Ser. No. 846,783

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—212 **8 Claims**

1. A method for fabricating a faceplate for an ostomy device of the type including a collection pouch having an inlet and being designed to be affixed to the body by the faceplate, the method comprising the steps of: forming an annular disk having a planar peripheral portion and a convex central portion with a central opening, placing the disk within a vacuum chamber, placing a substantially planar wafer of adhesive adjacent one side of the disk, placing a substantially planar sheet of plastic to form a shield adjacent the wafer so as to separate the chamber into first and second portions, evacuating the first portion of the chamber to draw the sheet against a surface of the chamber, heating said surface to soften the plastic sheet, evacuating the second portion of the chamber to remove substantially all of the air between the disk and sheet, releasing the vacuum in the first portion of the chamber to press the softened plastic sheet against the wafer and toward the disk, said shield having a substantially wrinkle-free surface, with a contour substantially identical to the contour of the disk, the faceplate being adapted to thereafter be connected to the collection pouch such that the inlet aligns with the central opening of the disk.



5,316,608

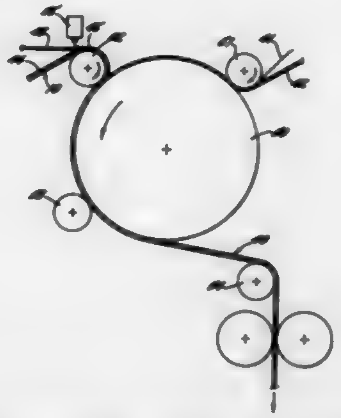
WEATHERABLE PROTECTIVE SURFACING FILM

Don O. Ocampo, and Emery A. Palmer, both of Charlotte, N.C., assignors to Rexham Industries Corp., Matthews, N.C.

Division of Ser. No. 354,814, May 22, 1989, Pat. No. 5,108,836. This application Jan. 27, 1992, Ser. No. 826,009

Int. Cl.^{5} B44C *1/165*

U.S. Cl. 156—230 **11 Claims**



10. A method of forming a weatherable protective surface layer on a substrate which comprises

providing a composite sheet material comprising a carrier layer and a weatherable protective film bonded to said carrier layer, said weatherable protective film having a unitary structure comprised of an acrylic polymer/-fluoropolymer composition and having a concentration gradient through its cross-section such that one surface of the film has a greater concentration of said fluoropolymer to impart weather-resistant properties to the film and the opposite surface has a greater concentration of said acrylic polymer to impart self-bonding properties to the film, and wherein said one surface of the film having a greater concentration of fluoropoymer is releasably bonded to said carrier layer so that said self-bonding opposite surface of the film is exposed;

positioning the exposed self-bonding surface of said film against said substrate surface and applying heat and pressure to bond said film to said substrate; and

stripping said carrier layer from the composite material to thereby leave the protective film on the surface of the substrate.

5,316,609

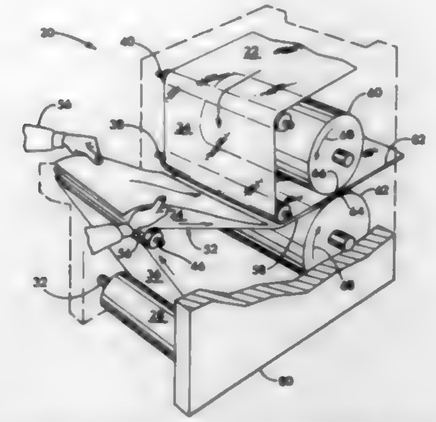
ENCAPSULATING LAMINATOR

James E. Guither, Madison, and Francis A. Wadzinski, Poynette, both of Wis., assignors to Pro-Tech Engineering Co., Inc., Madison, Wis.

Filed Nov. 18, 1992, Ser. No. 978,323

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—301 **16 Claims**



12. A method of encapsulating a substantially planer article between two sheets of laminating film, comprising the steps of:

a) supplying a lower sheet of laminating film to turn about a lower idler roller and an upper sheet of laminating film to an infeed roller rearward of the idler roller to bring the upper film and the lower film together in parallel relation;

b) directing in a feed direction the parallel sheets of laminating film through a pair of opposed heated rollers spaced rearwardly from the infeed roller;

c) placing a sheet article having a front end and a rear end on the portion of the lower film sheet which extends between the lower idler roller and the infeed roller;

d) feeding the rear end of the article past the infeed roller between the upper laminating film and the lower laminating film forward of the opposed heated rollers;

e) applying a force to the front end of the article to feed the article at a speed which is slower in the direction than the speed of the laminating films to effect slippage of the article with respect to the films to position the article as desired between the sheets; and

f) releasing the article, thus allowing it to be fed between the opposed film sheets and sealed therebetween by the heated rollers.

5,316,610

BONDING APPARATUS

Tomohiro Tamaki; Kenzo Hatada; Hiroaki Fujimoto, all of Osaka, and Yoshinobu Takeshita, Kagoshima, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Electronics Corporation, Osaka, Japan

Filed Dec. 18, 1992, Ser. No. 992,909

Claims priority, application Japan, Dec. 26, 1991, 3-344303

Int. Cl.^{5} B27G *11/02;* **B31F** *5/04;* **B32B** *31/24*

U.S. Cl. 156—379.6 **8 Claims**

1. A bonding apparatus comprising:

(a) a mounting stand onto which an opaque wiring substrate with wires on its top surface is placed:

(b) a depression jib for depressing against the wiring substrate a semiconductor chip with bump electrodes on its undersurface, the semiconductor ship being set in place on the wiring substrate that is placed on the mounting stand;

(c) pressure means for pressurizing the depression jib downward; and

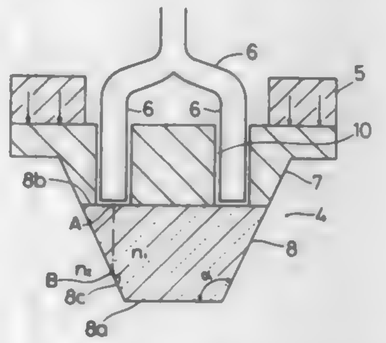
(d) light feed means for sending out a light ray upon a photo-curing resin having the property of insulation, the photo-curing resin being supplied between the wiring substrate and the semiconductor chip;

wherein:

the depression jig has a depression chip of a light ray transmission material and a holder for holding the depression chip;

the holder has a portion defining a penetration through which the light ray fed by the light feed means vertically passes;

the top surface of the depression chip is a flat incident surface upon which the light ray which has passed through the penetration is incident; the undersurface of the depression chip is a flat depression surface for depressing the semiconductor chip against the wiring substrate, said flat depression surface being greater in area than the area of the semiconductor chip; and the side surfaces of the depression chip are reflective surfaces so that the light ray which was incident upon the incident surface and has entered the depression chip is reflected from one of the reflective surfaces onto the depression surface, an obtuse angle being formed between the depression surface and each of the reflective surfaces;



the incident surface and the depression surface of the depression chip are parallel with each other, and the relationship among the angle formed between the depression surface and the reflective surfaces of the depression chip: α, the index of refraction of light relative to the light ray transmission material making up the depression chip: n_1, and the index of refraction of light relative to a layer outside the depression chip: n_2 is that $\sin \alpha > n_2/n_1$;

one side of the depression surface of the depression chip is greater than one corresponding side of the semiconductor chip by a given length: L, the other sides of the depression surface are greater than the other corresponding sides of the semiconductor chip by the given length: L, respectively, and the relationship among the given length: L, the thickness of the semiconductor chip: t, and the angle formed between the depression surface and an outgoing light ray emitted from the depression surface: β is that $L \geqq 2g/\tan \beta$; and

the light feed means hardens the photo-curing resin by sending out the light ray which falls upon the incident surface of the depression chip, enters the depression chip, is emitted out of the depression surface, and reaches the photo-curing resin.

5,316,611

METHOD OF FORMING REUSABLE SEAMLESS MANDRELS FOR THE FABRICATION OF HOLLOW FIBER WOUND VESSELS

Daniel J. Moser, Magna, Utah, assignor to Edo Corporation, Fiber Science Division, Salt Lake City, Utah

Division of Ser. No. 909,045, Jul. 6, 1992. This application May 4, 1993, Ser. No. 58,284

Int. Cl.^{5} B65H *81/00*

U.S. Cl. 156—425 **6 Claims**

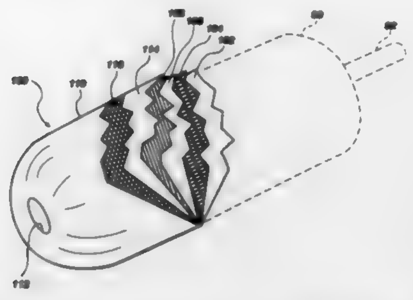
1. A reusable and collapsible mandrel suitable for forming seamless and hollow fiber wound hollow vessels upon, the mandrel comprising:

means for conducting a gas under pressure to the interior of the mandrel;

a first gas impermeable layer capable of retaining a gas within the interior of the mandrel;

at least a first fiber reinforcement layer, comprising a low angle helical wind ply, capable of limiting the expansion of the mandrel when pressurized gas is introduced therein such that as the pressure inside the mandrel is increased as the material forming the vessel is added to the outer surface of the reusable and collapsible mandrel, the mandrel maintains its desired shape;

a second gas impermeable layer capable of retaining a gas within the interior of the mandrel;



a second fiber reinforcement layer, comprising a hoop wind ply, capable of limiting the expansion of the mandrel when pressurized gas is introduced therein such that as the pressure inside the vessel is increased the mandrel maintains its desired shape; and

an outer release surface providing a surface to receive the materials of the seamless and hollow fiber wound hollow vessel formed thereon, the outer release surface means formed exteriorly of the gas impermeable layers and the fiber reinforcement layers, the gas impermeable layers and fiber reinforcement layers all being formed without any seams and such that the reusable and collapsible mandrel can be removed from a completed seamless and hollow fiber wound hollow vessel and be reused to form a plurality of seamless and hollow fiber wound vessels.

5,316,612

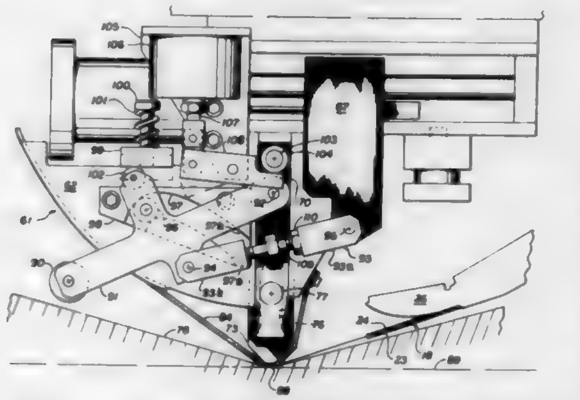
TAPE COMPACTOR

David A. Peterson, and Michael N. Grimshaw, both of Milford, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 27, 1993, Ser. No. 68,008

Int. Cl.^{5} B32B *31/08*

U.S. Cl. 156—493 **20 Claims**



1. An improved tape laying machine having a tape head movable along a horizontal path for depositing composite tape on a tape laydown surface, wherein the head includes a tape structure transported to a tape laydown point, where a main compactor is movable with respect to the head and the head also has a tail compactor, the improvement comprising:

a horizontal reference plane defined on the tape laydown surface;

a housing, mounted to said tape laying head, and movable therewith relative to said reference plane in a tape laying direction;

a substantially vertical centerline defined on said housing;

a first slider vertically movable on said housing;

a second slider, horizontally movable on said housing;

means for moving said second slider in forward and reverse directions;

main compactor means movably mounted on said housing along said vertical centerline, for compacting composite tape with respect to a tape laydown point defined on said horizontal reference plane;

means for biasing said main compactor means away from said housing;

a first elongate link, having opposite ends, and pivotally connected at one end to said first slider about a first horizontal pivot axis;

a tail compactor, connected at the other end of said first elongate link, and positioned at a location trailing the laydown point as tape is laid;

a second elongate link, having opposite ends, and pivotally connected at one end to said second slider about a second horizontal pivot axis;

means for pivotally connecting the other end of said second elongate link to said first elongate link about a third horizontal pivot axis;

means for governing movement of said first elongate link through a portion of its pivotal movement; and

lifting means for lifting said main compactor means against said biasing means in response to first slider movement;

wherein said first, second, and third pivot axes are parallel to one another, and

whereby, as the second slider is initially moved in the forward direction by the second slider moving means, the first slider will move upwardly causing the lifting means to contact the main compactor means, and the tail compactor will move forward along a tail compactor path, having a horizontal component of movement, towards the vertical centerline, and

whereby, as the second slider continues movement in the first direction, the first slider will continue to move upwardly, thereby causing the lifting means to lift said main compactor means, while the tail compactor will move forward into contact with the tape at the tape laydown point.

5,316,613

DEFINITE LENGTH TRANSFER ADHESIVE DISPENSER

Bruce E. Samuelson, Stillwater, and Susan M. Butzer, Eagan, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1991, Ser. No. 755,660

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—540 **30 Claims**

1. In combination, a definite length transfer adhesive dispenser for repeatedly applying a predetermined length of a transfer adhesive to a substrate, and a supply roll of said transfer adhesive comprising a supply core having inner and outer cylindrical surfaces and a through opening defined by the cylindrical inner surface, a length of backing strip wound around said core and having first and second major surfaces with said transfer adhesive releasably attached to said first major surface and with said second major surface coated with a release means;

said transfer adhesive dispenser comprising:

a housing having a housing axis, a base wall, side walls, and surfaces defining an open end, an inner surface and an outer surface adapted to be manually grasped,

a supply roll hub having a supply hub axis, an arcuate periphery about said supply hub axis and axially spaced ends, one of said ends being fixed to said base wall with the axis of the supply hub being generally perpendicular to the axis of the housing,

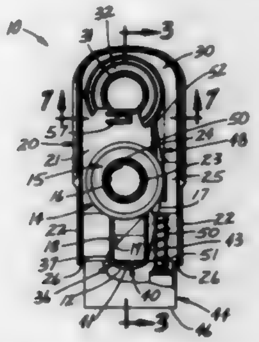
said inner surface of said supply core being journaled on said periphery of said supply roll hub, and said dispenser including means for restricting free rotation of said supply roll about said hub,

a take-up assembly comprising:

a take-up hub having an axis, an arcuate periphery about said take up hub axis, and axially spaced ends, one of said ends being fixed to said base wall with the axis of the take-up hub being generally perpendicular to the axis of the housing, and

a take-up core having inner surfaces journaled on said periphery of said take-up hub and having a portion of said backing strip wound thereon after application of said transfer adhesive to the substrate, said take-up core adapted to rotate about said take-up hub in an advancing direction;

path means defining a path for said backing strip from said supply roll to said take-up core, application means generally adjacent the open end of said housing comprising an application member including an application surface having a first end fixed to said base wall and a second end remote from said base wall and being situated in a plane generally perpendicular to said axis of said housing and forming a length of said path for said backing strip, said application surface being adapted to engage a predetermined length of the second major surface of said backing strip to generally define the predetermined length of the transfer adhesive;



an actuation member having a distal surface and being mounted for manually actuated reciprocal movement relative to said housing in a direction generally parallel to said housing axis being a projecting position with said distal surface projecting past said open end of said housing to afford positioning the application surface opposite the substrate and a retracted position with said application surface and said distal surface of said actuation member generally aligned so that the predetermined length of transfer adhesive on the backing strip may be pressed into contact with the substrate positioned opposite said application surface, and

advancing means between said actuation member and said take-up assembly for advancing said predetermined length of said backing strip and transfer adhesive along said path to position said predetermined length of backing strip along said application surface,

so that upon movement of said actuation member from said projecting position to said retracted position, said advancing means advances the predetermined length of said backing strip and transfer adhesive along said path to position said predetermined length of said backing strip and transfer adhesive along said application surface, and the application surface may be pressed against the substrate to cause the transfer adhesive to adhere to the substrate and upon movement of the actuation member from the retracted position to the projecting position, the transfer adhesive that was pressed against the substrate tears from the backing strip.

5,316,614

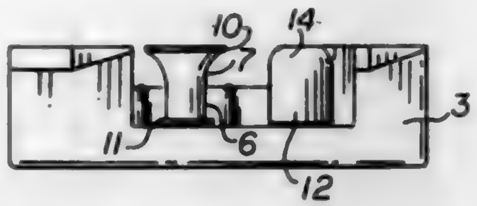
TAPE APPLICATOR FOR MASKING CARPET EDGE

Doyle S. Phillips, 2321 Newcastle, Cardiff, Calif. 92007

Continuation-in-part of Ser. No. 880,747, May 12, 1992, abandoned. This application Jan. 28, 1993, Ser. No. 10,076

Int. Cl.⁵ B32B *31/00*

U.S. Cl. 156—574 **11 Claims**



1. A tool for laying a length of tape along the edge of a structure and for wrapping a lateral portion of said tape around said edge, said tool comprising:

a base having a substantially flat under-surface for riding above said structure;

said base defining a cavity opening into said flat under-surface;

a tape-laying roller rotatively mounted into said cavity about a first axis substantially parallel to said flat under-surface and substantially perpendicular to said edge;

said tape-laying roller comprising a cylindrical section, and a flaring, circular portion expanding radially and axially from one end of said cylindrical portion, said cylindrical portion having a peripheral wall extending out of said cavity beyond said under-surface; and

means for feeding said length of tape between said structure and said tape-laying roller when said flat under-surface is run along said edge of the structure,

said means for feeding comprise:

means for bending said lateral portion of said tape away from said edge prior to said tape engaging said tape-laying roller.

5,316,615

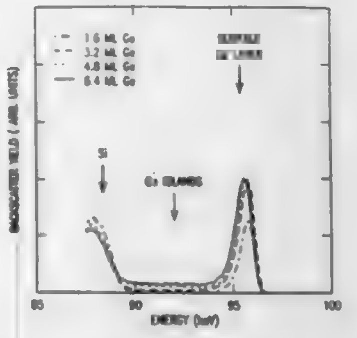
SURFACTANT-ENHANCED EPITAXY

Matthew W. Copel, Katonah, and Rudolf M. Tromp, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 498,236, Mar. 23, 1990, abandoned. This application Mar. 9, 1993, Ser. No. 28,644

Int. Cl.⁵ C30B *25/18*

U.S. Cl. 117—95 **12 Claims**



1. A process for depositing a layer of a first crystallizable material on a target surface of a substantially-single-crystalline-portion of a second material to produce a multi-atomic-layer, essentially-epitaxial layer of the first material on the second material, the method comprising the steps of:

(a) exposing the target surface of the second material to a vacuum;

(b) directing a gaseous flux comprising a multivalent surfactant element onto the target surface to deposit the surfactant element on the target surface with a coverage of at least approximately one monolayer;

(c) directing a gaseous flux comprising the first material onto the target surface bearing the multivalent surfactant element, the multivalent surfactant element facilitating a layer-by-layer epitaxial growth of the first material on the target surface of the second material.

5,316,616

DRY ETCHING WITH HYDROGEN BROMIDE OR BROMINE

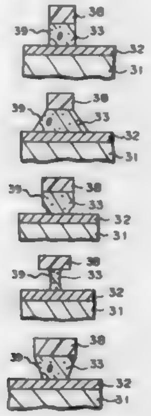
Moritaka Nakamura, Yokohama; Takashi Kurimoto, Hashima, and Katsuhiko Iizuka, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 670,516, Mar. 18, 1991, abandoned, which is a continuation of Ser. No. 307,710, Feb. 8, 1989, abandoned. This application May 27, 1993, Ser. No. 68,615

Claims priority, application Japan, Feb. 9, 1988, 63-026654; Jul. 19, 1988, 63-178244; Sep. 28, 1988, 63-240940; Nov. 15, 1988, 63-286880

Int. Cl.⁵ H01L *21/306*

U.S. Cl. 156--643 **6 Claims**



1. A process for selectively etching a phosphorus-doped n-type polycrystalline silicon, single crystalline silicon or silicide, comprising:

providing an etching mask over the material to be etched, said material being selected from the group consisting of phosphorus-doped n-type polycrystalline silicon, phosphorus-doped single crystalline silicon and phosphorus-doped silicides, to expose an area of the material to be etched; and

providing a plasma of an etching gas in contact with said area of the material to be etched, said etching gas containing hydrogen bromide, bromine or a combination thereof as a main reactive component that reacts with said material to be etched, whereby said exposed area of said material to be etched is selectively etched to form an etched portion and a side wall along a periphery of said etching mask;

wherein the material to be etched is at a temperature of −40° C. to +50° C. during said etching so as to form a side wall having an inclination angle of less than 90°, and

wherein said etched portion has a width at the surface in contact with the substrate which is larger than the width of the etching mask at the surface in contact with the etched portion, and said side wall is planar.

5,316,617

THIN FILM MAGNETIC HEAD AND METHOD OF MANUFACTURING THE SAME

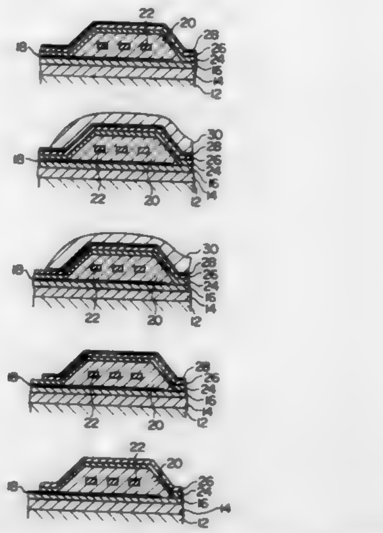
Takashi Kawabe; Moriaki Fuyama, both of Hitachi; Shinji Narishige, Hiratsuka; Akira Onuma; Tetsuya Okai, both of Hitachi; Yutaka Sugita, Tokorozawa, and Shin-ichi Hara, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 691,844, Apr. 26, 1991, abandoned. This application May 5, 1993, Ser. No. 57,020

Claims priority, application Japan, Apr. 27, 1990, 2-110501

Int. Cl.⁵ B44C *1/22;* C23F *1/00*

U.S. Cl. 156—643 **15 Claims**



1. A method for patterning a material comprising aluminum oxide using an overlying mask pattern, comprising exposing portions of said material not covered by said overlying mask pattern to an ion beam in an etching gas atmosphere comprising a first hydrocarbon fluoride gas expressed by the following general formula:

CnHxFy (where $n \geqq 1$, $x+y=2n+2$, $x<0$, $y<0$, and $x \geqq y$).

5,316,618

ETCHING METHOD FOR OBTAINING AT LEAST ONE CAVITY IN A SUBSTRATE

Harald T. G. van Lintel, Enschede, Netherlands, assignor to Westonbridge International Limited, Dublin, Ireland

PCT No. PCT/EP91/00426, § 371 Date Nov. 12, 1991, § 102(e) Date Nov. 12, 1991, PCT Pub. No. WO91/14181, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 7, 1991, Ser. No. 784,430

Claims priority, application Switzerland, Mar. 16, 1990, 00872/90-9

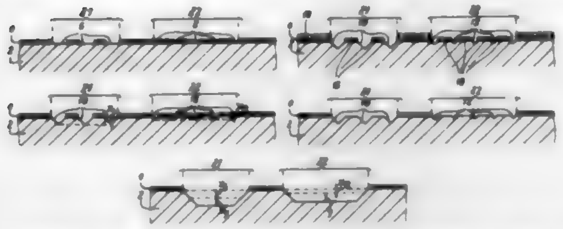
Int. Cl.⁵ H01L *21/00*

U.S. Cl. 156—644 **20 Claims**

1. An etching method for obtaining at least one cavity in a layer, said method comprising:

a first step of anisotropic etching of said layer in at least one zone in which a cavity is to be formed through an etching pattern of a first mask partially covering said zone so as to form in said zone a set of V-grooves extending into said layer in a direction perpendicular to a surface of said layer, the depths of said V-grooves being defined by the etching pattern of said first mask; and,

a second step of anisotropic etching of said layer through a second mask leaving said zone fully exposed so as to form said cavity in said zone, said cavity having a total depth



which depends on the depths of the V-grooves formed in said zone during said first etching step.

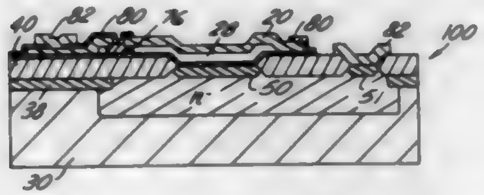
5,316,619
CAPACITIVE SURFACE MICROMACHINE ABSOLUTE PRESSURE SENSOR AND METHOD FOR PROCESSING

Carlos H. Mastrangelo, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 5, 1993, Ser. No. 13,919

Int. Cl.^{5} H01L *21/306;* B44C *1/22*

U.S. Cl. 156—644 **8 Claims**



1. A method for producing a surface micromachined capacitive absolute pressure sensor, comprising the steps of:

a. masking the surface of a semiconductor substrate so as to expose a selected area thereof;

b. selectively doping the selected area of the substrate so as to define a first conductive electrode section of the capacitive sensor;

c. conformally depositing a first sacrificial layer covering at least the first electrode section of the substrate and circumferential sections of the mask that define the selected area;

d. conformally depositing a polysilicon diaphragm layer over the first sacrificial layer;

e. selectively doping the diaphragm layer at least in the area generally coextensive with the first electrode section in the substrate so as to make the diaphragm conductive, thereby forming a second electrode section of the capacitive sensor;

f. selectively etching an access opening through said diaphragm layer and into the sacrificial layer;

g. selectively wet etching through the access opening, and removing the first sacrificial layer in an area juxtaposed with the first and second electrode sections so as to define a diaphragm cavity generally coextensive with the removed portion of the first sacrificial layer;

h. freeze-drying the wet etchant within the diaphragm cavity;

i. removing the wet etchant from the diaphragm cavity through the access opening by sublimation, thereby preventing the capillary deflection of the polysilicon diaphragm as the wet etchant is removed; and

j. selectively depositing a plug within and for sealing the access opening without coating or substantially reducing the volume of the diaphragm cavity adjacent the first electrode section; whereby the deflection of the diaphragm layer responsive to variations between the ambient pressure and the pressure sealed within the sealed diaphragm cavity causes a corresponding change in the capacitance between the first and second electrode sections.

5,316,620
METHOD AND AN APPARATUS FOR POLISHING WAFER CHAMFERS

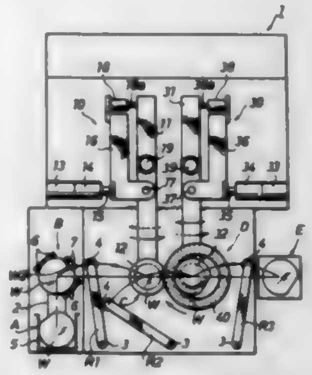
Fumihiko Hasegawa, Urawa; Tatsuo Ohtani; Hiroshi Kawano, both of Fukushima, and Masayuki Yamada, Shirakawa, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1993, Ser. No. 7,888

Claims priority, application Japan, Jan. 24, 1992, 4-032859

Int. Cl.^{5} B44C *1/22;* H01L *21/306, 21/463*

U.S. Cl. 156—645 **14 Claims**



1. A method for polishing peripheral chamfers of a semiconductor wafer comprising steps of:

(a) turning about its axis of rotation at a relatively high rate a cylindrical cup-shaped rotatory buff having an internal polish groove formed in the inner wall surface thereof, said groove describing a circle normal to the axis of rotation of said cylindrical buff and having a profile complementary to the profile of the chamfered wafer edge;

(b) disposing the wafer inside the turning cylindrical buff in a manner such that the wafer lies in the plane defined by the circle of said internal polish groove;

(c) turning said wafer circumferentially at a relatively low rate; and

(d) moving said wafer radially to press the wafer edge into the running internal polish groove with an appropriate pressure.

5,316,621
METHOD OF PULPING WASTE PRESSURE-SENSITIVE ADHESIVE PAPER

Osamu Kitao; Masaru Tsuji; Masatoshi Okuda; Shunichi Uchimura, and Jun-ichirou Tanaka, all of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

PCT No. PCT/JP91/01366, § 371 Date Jun. 18, 1992, § 102(e) Date Jun. 18, 1992, PCT Pub. No. WO92/07137, PCT Pub. Date Apr. 30, 1992

PCT Filed Oct. 7, 1991, Ser. No. 862,539

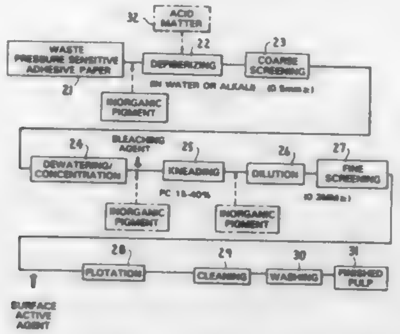
Claims priority, application Japan, Oct. 19, 1990, 2-283024; Oct. 29, 1990, 2-293260; Oct. 31, 1990, 2-296457; Dec. 12, 1990, 2-401636

Int. Cl.^{5} D21B *1/08*

U.S. Cl. 162—4 **20 Claims**

1. A method of pulping waster pressure-sensitive adhesive paper comprising the steps of: defiberizing the waste pressure-sensitive adhesive paper; forming a suspension of the defiberized waste pressure-sensitive adhesive paper; diluting said defiberized suspension of waste pressure-sensitive adhesive paper; coarse screening the diluted suspension with a screen having a slit width of below 0.5 mm to form a first accept fraction; dewatering the first accept fraction so that the first accept fraction has a solid matter consistency of 15 to 40% by weight; kneading the dewatered accept fraction by mechanical

agitation under conditions such that the temperature difference between the dewatered accept fraction before and after the mechanical agitation is below 12° C. and foreign matters contained therein are granulated; diluting the kneaded accept fraction so that it has a pulp consistency of below 5%; fine screening the diluted accept fraction with a screen having a slit width of below 0.2 mm to form a second accept fraction; mixing the second accept fraction with a surface active agent; subjecting the mixture of the second accept fraction and the surface active agent to foam flotation separation by air agitation to form a pulp; cleaning the pulp to remove heavy and light foreign matters therefrom; washing the pulp; and recovering the pulp as useable recycled fibers.



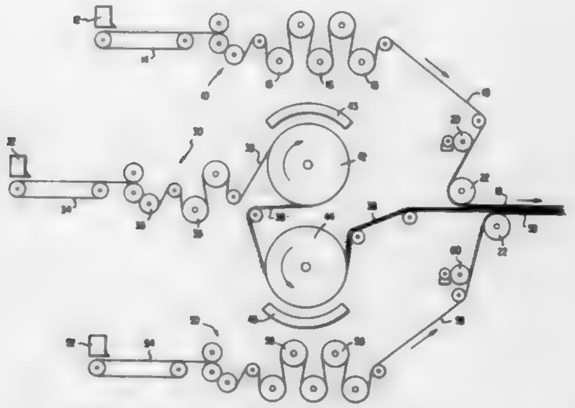
5,316,622
EMBOSSED OR DIMPLED COMBINED BOARD

Vladislav A. Babinsky, 440 Viola Rd., Apt. 19, Spring Valley, N.Y. 10977, and Warren G. Mumford, 24 Willis Ave., Cornwall-On-Hudson, N.Y. 12520

Filed Jul. 16, 1992, Ser. No. 914,088

Int. Cl.^{5} B31F *1/07*

U.S. Cl. 162—109 **16 Claims**



1. A method of making an embossed paperboard web of indefinite length, the method including the steps of, continuously feeding a paperboard web of indefinite length and having two opposite surfaces to a first rotating vacuum drum, said first rotating vacuum drum having a plurality of vacuum openings on its surface, one surface of said paperboard web passing in surface contact with and over a limited annular portion of said first vacuum drum, to thereby form a first set of embossments on one side of said web by said web being partially drawn into said vacuum openings and deformed, feeding the opposite surface of said web, after the web leaves said first drum, to and over a limited angular extent of a second rotating vacuum drum, said second vacuum drum having a plurality of vacuum openings on its surface, to thereby form a second set of embossments on the other side of said web, said openings on said second vacuum drum being larger then said openings on said first vacuum drum, to thereby produce an embossed paperboard web having discrete convex embossments on both surfaces thereof.

5,316,623
ABSORBANCE AND PERMANENT WET-STRENGTH IN TISSUE AND TOWELING PAPER

Herbert H. Espy, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 9, 1991, Ser. No. 803,862

Int. Cl.^{5} D21H *17/72*

U.S. Cl. 162—164.3 **17 Claims**

1. A method for improving the absorbency of wet-strength paper made with between about 0.1% and about 2% of a neutral-to-alkaline-curing wet-strength resins, that comprises adding a water soluble carboxyl-containing polymer and a substantially non-thermosetting poly(tertiary amino)amide-epichlorohydrin resin to an aqueous suspension of cellulosic paper stock that contains one or more wet-strength resins selected from the group comprising poly(secondary amino)amide-epichlorohydrin, poly(tertiary amino)amide-epichlorohydrin, poly(tertiary amino)ureylene-epichlorohydrin, polyalkylenepolyamine-epichlorohydrin, poly(diallylamine)-epichlorohydrin, and poly(alkyldiallylamine)-epichlorohydrin resins, in which:

the carboxyl-containing polymer is selected from the group consisting of carboxymethylcellulose (CMC), carboxymethylhydroxyethylcellulose (CMHEC), carboxymethylhydroxypropylcellulose (CMHPC), carboxymethylguar (CMG), carboxymethyl-locust bean gum (CMLB), carboxymethylstarch (CMS), acrylamide-acrylic acid copolymers, and the alkali metal salts or the ammonium salts of CMC, CMHEC, CMHPC, CMLB, CMS, and acrylamide-acrylic acid copolymers;

and the substantially non-thermosetting poly(tertiary amino)amide-epichlorohydrin resin is the reaction product of epichlorohydrin with (1) a poly(tertiary amino)amide selected from the group consisting of a polyamide resulting from the reaction of a dicarboxylic acid having between 2 and about 10 carbon atoms and a polyamine selected from the group consisting of alkylbis(omega-amino)alkylamines having the structure $H_2N—(CH_2)_m—N(R')—(CH_2)_m—NH_2$ in which m is 2 or 3 and R′ is an alkyl group containing 1 and 3 carbon atoms and (2) polyamides derived from polyalkylenepolyamines having two primary amine groups and the remainder secondary, of structure $H_2N—[(CH_2)_m—NH]_p—(CH_2)_m—NH_2$ in which m is between 2 and 6 inclusive, and p is between 1 and about 4; the reaction of the acid with 2) being followed by methylation of the poly(secondary amino)amide to a poly(tertiary amino)amide; the mole ratio of epichlorohydrin per formula equivalent of tertiary amine groups in the poly(tertiary amino)amide being between about 0.05 and about 0.35 to 1; and in which between about 0.25 and about 1 part by weight of the non-thermosetting poly(tertiary amino)amide-epichlorohydrin resin is used per part of the wet-strength resin, and between about 0.5 and about 1.2 parts by weight of the carboxyl-containing polymer are used per part of the total of said wet-strength resin and said substantially non-thermosetting resin.

5,316,624

METHOD AND APPARATUS FOR HIGH DENSITY PAPER

Jean-Guy Racine, Grand'Mere, Canada, assignor to Stone-Consolidated Inc., Canada

Continuation of Ser. No. 596,403, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 403,777, Sep. 8, 1989, abandoned, which is a continuation of Ser. No. 118,176, Nov. 9, 1987, abandoned, which is a continuation of Ser. No. 942,393, Feb. 9, 1987, abandoned, which is a continuation of Ser. No. 826,818, Feb. 6, 1987, abandoned, which is a continuation of Ser. No. 649,986, Sep. 13, 1984, abandoned. This application Mar. 23, 1992, Ser. No. 855,476

Int. Cl.⁵ D21F *11/00*

U.S. Cl. 162—205 **12 Claims**

1. A process for making paper which is adapted to receive print or graphics which process comprises the steps:

(1) preparing a pulp furnish of fibers,

(2) providing a pressed wet paper web prepared from said furnish having a moisture content greater than 15% by weight,

(3) soft calendering said wet paper web while maintaining the moisture content of said web at a level greater than 15% by weight, said soft calendering occurring at a calendering pressure and temperature sufficient to increase the density of the web by at least about 10% yet insufficient to cause galvanizing of the paper web, and

(4) subsequently treating said calendered web to further reduce its moisture content.

5,316,625

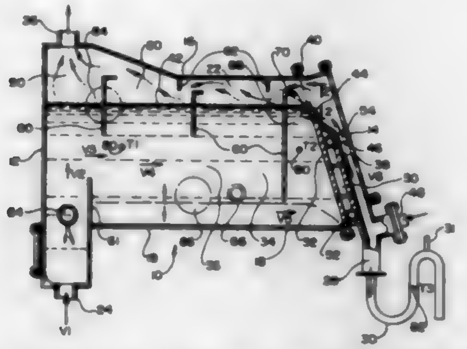
APPARATUS FOR SEPARATING A PARTIALLY MISCIBLE SOLVENT FROM WATER

George E. Anderson, Champlin, Minn., assignor to Crown Iron Works Company, Roseville, Minn.

Filed Jun. 3, 1993, Ser. No. 72,032

Int. Cl.⁵ B01D *3/38, 17/028;* **C02F** *1/08*

U.S. Cl. 202—176 **24 Claims**



1. An apparatus for separating a partially miscible solvent from a contaminated water stream, said apparatus comprising:

(a) a fully enclosed containment vessel having an internal volume bounded by a plurality of walls, said walls of said vessel defining a width, a length and a height of said internal volume, said internal volume further having a first end and a second end at each end of said length;

(b) means for feeding said contaminated water stream into said containment vessel proximate said first end of said internal volume;

(c) means for discharging a solvent rich vapor stream proximate said first end of said internal volume;

(d) means for discharging a purified water stream proximate said second end of said internal volume;

(e) a dam separating said internal volume into a phase separation zone and a falling film stripping zone, said dam located proximate said second end of said internal volume, positioned between said first end of said internal volume and said means for discharging a purified water stream, said dam including a wall sealably disposed across the entire width of said internal volume and extending upward to a terminal location from the bottom of said internal volume over a portion of the height of said internal volume, wherein in use said dam determines a maximum liquid level in said phase separation zone approximately equal to the height of said dam with any additional liquid added to said phase separation zone resulting in a film of liquid flowing over said dam into said falling film stripping zone;

(f) said falling film stripping zone including an inclined surface whereon said film of liquid flows toward said means for discharging a purified water stream;

(g) means for heating said film of liquid as it flows toward said means for discharging a purified water stream; and

(h) said phase separation zone including a plurality of baffles disposed therein extending across the entire width of said internal volume from an elevation higher than the height of said dam downward to a terminal location above the bottom of said internal volume, wherein, in use, said baffles cause mixing of said liquid in said phase separation zone as said liquid progresses from said means for feeding contaminated water to said falling film stripping zone, said baffles further trapping any of said solvent which phase separated due to immiscibility with said contaminated water.

5,316,626

PROCESS AND APPARATUS FOR THE PRODUCTION OF FRESH WATER USING SOLAR ENERGY

Blondel Guy, 58 rue Catoire, 59185 Provin, France

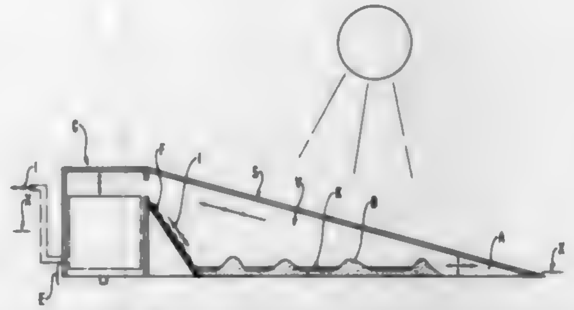
PCT No. PCT/FR90/00646, § 371 Date Mar. 13, 1992, § 102(e) Date Mar. 13, 1992, PCT Pub. No. WO91/04228, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 11, 1990, Ser. No. 838,277

Claims priority, application France, Sep. 15, 1989, 89 12137

Int. Cl.⁵ B01D *3/02;* **C02F** *1/14*

U.S. Cl. 203—10 **9 Claims**



1. In a process for the production of fresh water from water containing impurities using solar energy, said process comprising providing an installation constituted by a structure oriented toward the sun and permeable to solar radiation, forming a greenhouse including a preheating and reheating chamber and an evaporation chamber, and comprising means for introducing water containing impurities into said greenhouse and means for withdrawing fresh water therefrom and introducing said water containing impurities into said greenhouse to be evaporated by the at least indirect influence of solar radiation in air trapped under said structure, said air being relayed to a heat exchanger so that vapors it carries will be condensed and collected, said heat exchanged air being removed via passageways and said condensed fresh water being withdrawn therefrom, the improvement wherein the evaporation of said water containing impurities is carried out on mounds of capillary material scattered and distributed over the entire span of the evaporation chamber.

5,316,627

PROCESS FOR PRODUCING ODORLESS DIMETHYL ETHER

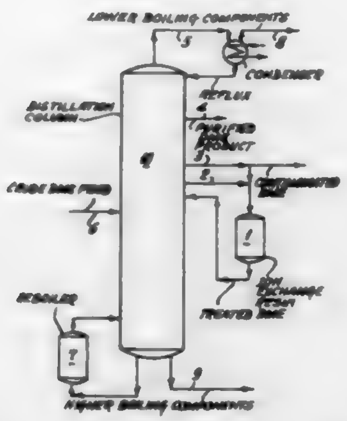
Hartmut Hammer, Cologne, Fed. Rep. of Germany, assignor to RWE-DEA Aktiengesellschaft fuer Mineraloel und Chemie, Fed. Rep. of Germany

Filed Oct. 1, 1992, Ser. No. 955,083

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1991, 4132993

Int. Cl.⁵ B01D *3/14, 15/04;* **C07C** *41/42*

U.S. Cl. 203—34 **5 Claims**



1. In a process for producing odorless dimethyl ether by catalytic dehydration of methanol in a catalytic reaction zone and subsequent purification of the resultant crude dimethyl ether product stream by distillation in a separate distillation zone, the improvement which comprises treating the dimethyl ether reaction product from the catalytic reaction zone with an acidic ion exchange resin.

5,316,628

PROCESS AND DEVICE FOR THE SIMULTANEOUS TRANSFER OF MATERIAL AND HEAT

Jean-Claude Collin, Marsinval-Verneiul; Joseph Larue, Chambourcy; Alexandre Rojey, Garches, and Jean-Charles Viltard, Marly le Roi, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison Cedex, France

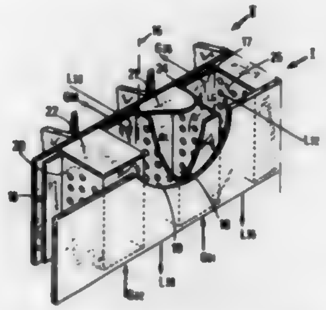
PCT No. PCT/FR90/00490, § 371 Date Apr. 24, 1991, § 102(e) Date Apr. 24, 1991, PCT Pub. No. WO91/00141, PCT Pub. Date Jan. 10, 1991

PCT Filed Jun. 29, 1990, Ser. No. 656,169

Claims priority, application France, Jun. 30, 1989, 89 08856

Int. Cl.⁵ B01D *3/28*

U.S. Cl. 203—72 **18 Claims**



1. A process for simultaneously exchanging material and heat, the material exchange being made between a gas phase and at least one liquid phase by contact of the phases and passage of the gas phase and of the at least one liquid phase in opposite directions, characterized in that the material exchange is effected by causing said at least one liquid phase to flow over a substantially vertical or inclined wall of a corrugated spacer plate having perforations therethrough and by causing at least a fraction of said gas phase to traverse simultaneously said perforations in a substantially ascending direction and to contact said at least one liquid phase, said material exchange being made in a compartment (I) which includes a plurality of said spacer plates having perforations and defining material exchange passages, said compartment (I) having a common wall with at least one compartment (II) having imperforate vertical spacer plates so that a heat exchange is effected simultaneously with the material exchange by circulating a heat exchange fluid (F) in said compartment (II), the heat exchange being achieved between the phases in compartment (I) and the heat exchange fluid (F) circulating in compartment (II); said compartment (I) having a lower end and an upper end, the gas phase entering said compartment (I) at the lower end and then ascending a subcompartment defined by a substantially vertical or inclined wall of a corrugated spacer plate, said subcompartment being closed at the upper end of the compartment (I) so that the gas phase is directed into another adjacent subcompartment via said perforations to effect the material exchange with the at least one liquid phase, a gas phase being discharged from said another subcompartment at the upper end of the compartment (I) and at least one liquid phase being discharged from said another subcompartment at the lower end of the compartment (I).

9. A device for simultaneously effecting a material exchange between a gas phase (G) and at least one liquid phase (L) by counter-current contact and for effecting heat exchange between said phases and at least one heat exchange fluid (F), said device comprising several essentially flat, vertical plates separated by corrugated spacer plates constituting at least two alternating series (I) and (II) of compartments, the compartments of the second series (II) being traversed by a heat exchange fluid (F) exchanging heat with the at least one liquid phase (L) and the gas phase (G) in a first series (I) of compartments, the first series (I) and the second series (II) of compartments having at least a common wall, the corrugated spacer plates located in the compartments of the first series (I) having perforations, and forming waves defining passages with an essentially vertical direction and means for traversing the compartments in the first series (I) counter-current-wise with the at least one liquid phase (L) and the gas phase (G), at least a portion of the gas phase (G) passing through said perforations and the at least one liquid phase flowing over a substantially vertical or inclined wall of a corrugated spacer plate having said perforations; the corrugated spacer plates located in the second series (II) of compartments being imperforate; said compartments of the first series (I) each having a lower end and an upper end, means for introducing the gas phase into the lower end of the compartments in the first series (I) so that the gas phase initially ascends a subcompartment defined by a substantially vertical or inclined wall of a corrugated spacer plate, said subcompartment being closed at the upper end of a compartment of the series (I) so that the gas phase is directed into another adjacent subcompartment via the perforations to effect material exchange with the at least one liquid phase and means for discharging a gas phase from the another subcompartment at the upper end of the compartment of the series (I).

5,316,629

PROCESS FOR MAINTAINING ELECTROLYTE FLOW RATE THROUGH A MICROPOROUS DIAPHRAGM DURING ELECTROCHEMICAL PRODUCTION OF HYDROGEN PEROXIDE

Arthur L. Clifford, Everett; Derek J. Rogers; Dennis Dong, both of Kingston, all of Canada, assignors to H-D Tech Inc., Sarnia, Canada

Filed Sep. 20, 1991, Ser. No. 763,096

Int. Cl.⁵ C25B *15/02*

U.S. Cl. 204—83 **8 Claims**

1. A method of maintaining constant or increasing electrolyte flow rate through the pores of a microporous polymer film cell separator or diaphragm during the operation of an electrochemical cell for the production of an alkaline hydrogen peroxide solution comprising:

- A) maintaining a concentration of a stabilizing agent in said electrolyte sufficient to complex with or solubilize a substantial proportion of the transition metal compounds or ions, or other metal compounds or ions present as impurities in said electrolyte and
- B) periodically shutting down said cell, lowering the pH of said electrolyte to about 7, and recirculating said electrolyte containing a concentration of a stabilizing agent sufficient to complex with or solubilize a substantial portion of the transition metal compounds or ions, or other metal compounds or ions present as impurities in said electrolyte.

5,316,630
METHODS FOR CHROMATOGRAPHY ANALYSIS

Purnendu K. Dasgupta, Lubbock, Tex., assignor to Dionex Corporation, Sunnyvale, Calif.

Filed Mar. 30, 1993, Ser. No. 40,014

Int. Cl.^{5} G01N *27/26, 27/447, 30, 02;* **B01D** *15/08*

U.S. Cl. 204—180 **26 Claims**

1. A method of normalizing variabilities between chromatograms of standard and sample chromatography runs, said variabilities associated with sample injection, said variabilities resulting from differences in the sample injection volume that alter the sample chromatograms, said method comprising the steps of:

(1) creating a chromatogram of at least one standard of known concentration, and at least one chromatogram for a sample of unknown concentration, said chromatograms being generated utilizing a detection method which results in a change in the detector output as a result of a difference between the sample diluent and the system running buffer;

(2) determining for each said chromatogram an area of the water dip peak, the standard peaks and the sample peaks;

(3) using the relationship between the area of the water dip of the standard run and the area of the water dip of the sample run to correlate the sample concentration with the standard concentration.

5,316,631
METHOD FOR FABRICATING A MAGNETIC RECORDING MEDIUM

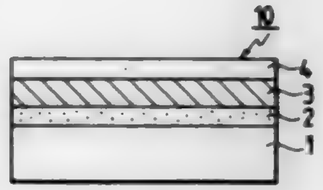
Toshio Ando, Fujisawa, and Toshikazu Nishihara, Zama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 480,446, Feb. 15, 1990, abandoned. This application Aug. 11, 1992, Ser. No. 927,715

Claims priority, application Japan, Feb. 16, 1989, 1-35070; Feb. 28, 1989, 1-47880

Int. Cl.^{5} C23C *14/34*

U.S. Cl. 204—192.2 **2 Claims**



1. A method for fabricating a magnetic recording medium which comprises forming a Cr undercoat layer on a substrate and further forming a Co alloy thin film on the undercoat layer by sputtering, wherein said undercoat layer is formed by sputtering in an atmosphere of a mixed gas of argon and oxygen at a total pressure of from 10 to 20 mTorr and at a partial pressure of oxygen of from 1 to 20% based on the total pressure whereby from 4 to 50 atomic percent of the oxygen is incorporated in the undercoat layer.

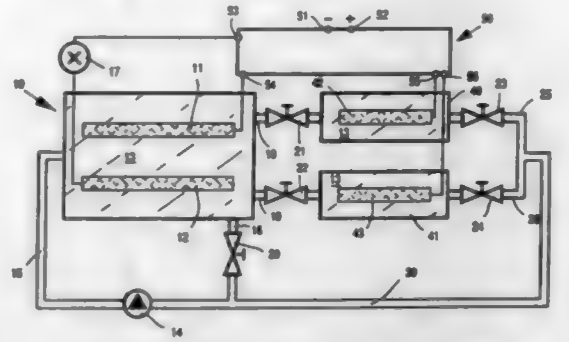
5,316,632
METHOD FOR IMPROVING EFFICIENCY OF ELECTRO-CHEMICAL CELLS

Dieter Remppel, P.O. Box 1749, Canmore, Alberta T0L 0M0, Canada

Continuation-in-part of Ser. No. 735,349, Jul. 24, 1991, abandoned. This application Apr. 22, 1993, Ser. No. 50,803

Int. Cl.^{5} H01M *10/26;* **C25F** *5/00*

U.S. Cl. 204—146 **6 Claims**



1. A process for selectively and cyclically controlling dissolution and inhibition of a metallic electrode immersed in an aqueous electrolyte solution in a cell, comprising:

(a) electrodepositing a passivating layer onto said electrode so as to inhibit dissolution thereof;

(b) electrolytically removing said passivating layer from said electrode so as to provide an active electrode surface;

(c) electrodepositing an activating layer onto said active electrode surface so as to enhance the dissolution of said electrode and thereby increase energy production from said cell; and

(d) electrolytically removing said activating layer from said electrode surface so as to provide an electrode surface receptive to electrodeposition of a further said passivating layer.

5,316,633
METHOD AND APPARATUS FOR MEASURING SENSITIZATION OF STRUCTURAL MEMBERS

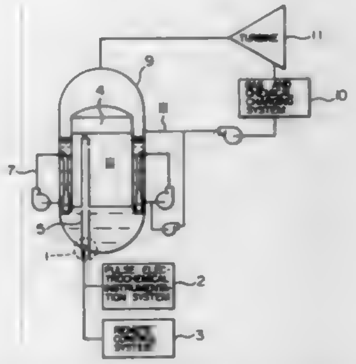
Masanori Sakai, Hitachi; Noriyuki Ohnaka, Katsuta; Masakiyo Izumiya, Mito, and Shigeo Hattori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1992, Ser. No. 916,692

Claims priority, application Japan, Jul. 23, 1991, 3-205632

Int. Cl.^{5} G01N *27/26;* **G21C** *17/00*

U.S. Cl. 204—153.11 **18 Claims**



1. A method of electrochemically measuring the sensitization of a structural member corresponding to the intergranular stress corrosion cracking susceptibility of the structural member, comprising the steps of:

applying a series of potential pulse signals from an electrochemical measurement system to an area of said structural member within an electrochemical cell in a system to be monitored;

measuring the current generated by electrochemical reaction of the structural member in the system to be monitored due to application of each potential pulse signal; and

determining the sensitization of the structural member corresponding to the intergranular stress corrosion cracking susceptibility of the structural member on the basis of the obtained current-potential curve.

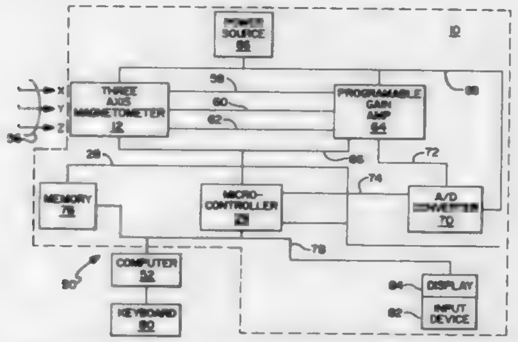
5,316,634
PORTABLE MAGNETIC FIELD ANALYZER FOR SENSING ION SPECIFIC RESONANT MAGNETIC FIELDS

Bruce R. McLeod, Bozeman, Mont., assignor to Life Resonances, Inc., Bozeman, Mont.

Filed Jun. 16, 1992, Ser. No. 899,490

Int. Cl.^{5} B65D *85/18;* **G01R** *33/022*

U.S. Cl. 204—155 **17 Claims**



17. A method of analyzing a magnetic field comprising the steps of:

measuring an ambient magnetic field having components from both ac and dc magnetic field sources with a portable three-axis magnetometer to output a measurement signal having a dc signal plus a plurality of frequency harmonic components;

an analog-to-digital convertor for digitizing said output signal;

storing at least one cyclotron resonance frequency in a memory storage means;

with a microcontroller means connected to said memory storage means and adapted to receive said digitized output signal, processing said digitized output signal by fast fourier transform and comparing said measurement signal with said at least one cyclotron resonance frequency; and

notifying a user of the results of said comparison.

5,316,635
ZIRCONIUM ISOTOPE SEPARATION USING TUNED LASER BEAMS

Lawrence W. Green, Deep River, and Glenn McRae, Point Alexander, both of Canada, assignors to Atomic Energy of Canada Limited/Energie Atomique du Canada Limitee, Ottawa, Canada

Filed May 22, 1992, Ser. No. 886,943

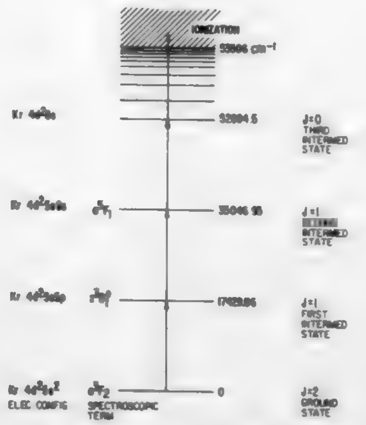
Int. Cl.^{5} B01D *5/00*

U.S. Cl. 295—157.22 **21 Claims**

1. A method for selectively photoionizing odd mass Zr atoms in a vapour comprising odd and even mass Zr atoms, comprising the steps of:

irradiating said vapour with a linearly polarized resonant first laser pulse at a wavelength effective to raise the energy of Zr atoms from the $J=2$ ground state to a $J=1$ first intermediate state;

irradiating said vapour with a linearly polarized resonant second laser pulse at a wavelength effective to raise the energy of Zr atoms by a transition from said $J=1$ first intermediate state to a $J=1$ second intermediate state in which the $m=0$ sublevel is substantially unpopulated with even mass Zr atoms, said transition having sufficient hyperfine interaction to establish a substantially isotropic population distribution of odd mass Zr atoms among the magnetic sublevels of said $J=1$ second intermediate state;



irradiating said vapour with a linearly polarized resonant third laser pulse at a wavelength effective to raise the energy of Zr atoms from said $J=1$ second intermediate state to a third intermediate state;

irradiating said vapour with electromagnetic radiation effective to ionize Zr atoms in said third intermediate state.

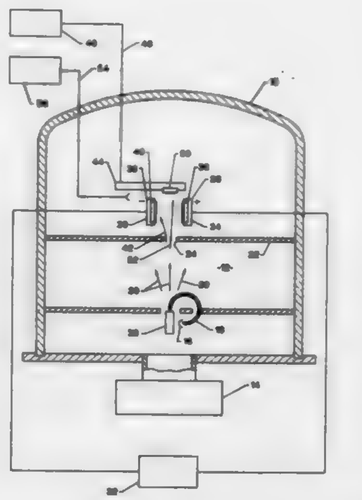
5,316,636
PRODUCTION OF FULLERENES BY ELECTRON BEAM EVAPORATION

Rointan F. Bunshah, Playa del Rey; Shyankay Jou, Santa Monica; Shiva Prakash, Santa Barbara, and Hans J. Doerr, Westlake Village, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 12, 1992, Ser. No. 928,994

Int. Cl.^{5} C06B *31/00*

U.S. Cl. 204—157.47 **8 Claims**



1. A process for producing C_{70} and higher fullerenes comprising the steps of:

providing a carbon target in an electron beam evaporation zone;

maintaining a vacuum in said evaporation zone;

bombarding said carbon target with an electron beam of sufficient energy to evaporate carbon atoms from said target to form a vapor of evaporated carbon atoms or clusters;

depositing said evaporated carbon atoms or clusters onto a substrate to form carbon soot which contains fullerenes wherein said depositing of said evaporated carbon atoms or clusters comprises the steps of:

providing an anode substrate and a cathode substrate at spaced locations within said evaporation zone;

applying an electrical potential between said anode and cathode substrate to provide said anode with a positive electrical potential and to provide said cathode with a negative electrical potential;

separating said fullerenes from said carbon soot.

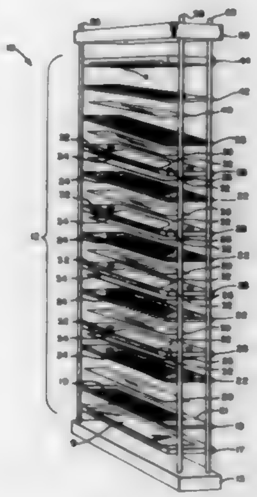
5,316,637
ELECTRODEIONIZATION APPARATUS

Gary C. Ganzi, Lexington; Frederick Wilkins, Pepperill; Anthony J. Giuffrida, Andover, and Christopher Griffin, Merrimack, all of Mass., assignors to IP Holding Company, Wilmington, Del.

Continuation of Ser. No. 628,338, Dec. 17, 1990, abandoned. This application Aug. 28, 1992, Ser. No. 938,329

Int. Cl.⁵ B01D *61/44*

U.S. Cl. 204—182.4 **164 Claims**



1. An electrodeionization apparatus comprising at least one ion concentrating compartment positioned adjacent to at least one ion depleting compartment, the ion depleting compartment comprising an ion exchange resin positioned between an anion exchange membrane and a cation exchange membrane, the membranes having a conductance, wherein at least one membrane, comprises means for allowing an increase in the transfer of large or highly charged ions across the membrane on an equivalent weight basis of at least 25%, when subjected to an increase in voltage across the membrane causing an increase in electric current across the membrane of the order of two times or less.

48. An electrodeionization apparatus comprising at least one ion concentrating compartment positioned adjacent to at least one ion depleting compartment, the ion depleting compartment comprising an ion exchange resin positioned between an anion exchange membrane and a cation exchange membrane, the membranes having a conductance, wherein at least one membrane comprises an ion exchange resin selected from the group consisting of anion exchange resins that are crosslinked at less than about 6% and cation exchange resins that are crosslinked at less than about 8%.

5,316,638
TREATMENT OF CARBOHYDRATES

Peter Jackson, 8 Oslars Way, Fulbourn Cambridge, Great Britain CB1 5DS

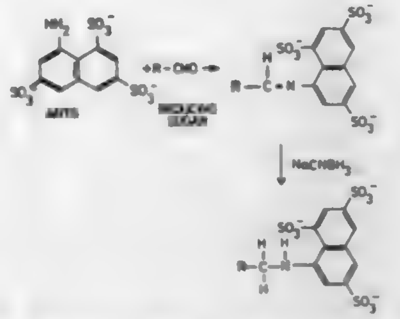
PCT No. PCT/GB90/01449, § 371 Date Mar. 27, 1992, § 102(e) Date Mar. 27, 1992, PCT Pub. No. WO91/05265, PCT Pub. Date Apr. 18, 1991

PCT Filed Sep. 20, 1990, Ser. No. 844,571

Claims priority, application United Kingdom, Sep. 27, 1989, 8921818

Int. Cl.⁵ C25B *7/00*

U.S. Cl. 204—182.8 **15 Claims**



1. A method of quantitatively analyzing unchanged carbohydrate substance mixtures, comprising transferring onto a porous membrane by a blotting technique carbohydrate substances labelled with a changed fluorescent labelling reagent which have been run on an electrophoretic gel.

5,316,639
DIELECTRIC MATERIAL USED FOR AN OZONE GENERATOR AND A METHOD OF FORMING A FILM TO THE DIELECTRIC MATERIAL

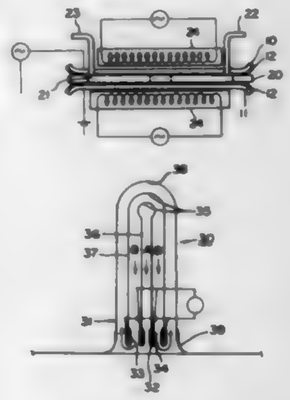
Sachiko Okazaki, 20-11, Takaidohigashi 2-Chome, Suginami-ku, Tokyo 168; Masuhiro Kogoma, 15, Shimoniikura, Wakou-shi, Saitama 351-1, and Masahiro Hirakawa, Ibaraki, all of Japan, assignors to Sachiko Okazaki, Tokyo; Masuhiro Kogoma, Saitama and Sumitomo Precision Products Co., Ltd., Hyogo, all of Japan

Continuation-in-part of Ser. No. 754,159, Sep. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 533,394, Jun. 5, 1990, abandoned. This application Dec. 7, 1992, Ser. No. 989,480

Claims priority, application Japan, Jun. 5, 1989, 1-143610

Int. Cl.⁵ C23C *14/00*

U.S. Cl. 204—192.12 **4 Claims**



1. In an assembled ozone generator which comprises first and second electrodes which are spaced apart so as to define an electric discharge gap therebetween, and a dielectric material on said first electrode so as to provide an exposed surface which faces said electric discharge gap, a method of applying a few μm thick protective film of SiN_2 on said exposed surface of said dielectric material which comprises the steps of: (a) passing a reaction gas at a pressure of between 10^{-2} Torr and atmospheric pressure through said electric discharge gap, said reaction gas comprising an inert gas and a starting gas, and (b) applying a high voltage between said first and second electrodes to provide a glow discharge therebetween at said pressure and cause said starting gas to deposit a protective film of SiN_2 on the exposed surface of said dielectric material.

5,316,640
FABRICATING METHOD OF MICRO LENS

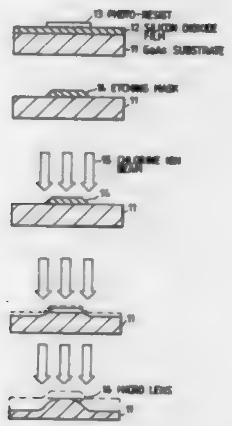
Shinichi Wakabayashi; Hitomaro Tougou, both of Kawasaki; Yukio Toyoda, Tokyo, and Yoshimasa Ohki, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 9, 1992, Ser. No. 896,018

Claims priority, application Japan, Jun. 19, 1991, 3-147238; Sep. 5, 1991, 3-225714

Int. Cl.⁵ H01L *21/00*

U.S. Cl. 204—192.34 **8 Claims**



1. A fabricating method of a micro lens comprising:

a step of forming a first film on a compound semiconductor substrate, said first film having a slower etching rate than that of said compound semiconductor substrate;

a first etching step of forming an etching mask having a tapered surface at the peripheral edge thereof by etching said first film until a vertical cross section of said first film is changed into a substantially trapezoidal shape; and

a second etching step of etching both said compound semiconductor substrate and said etching mask by exposing said compound semiconductor substrate and said etching mask to a particle beam irradiation which is substantially normal to surfaces of said compound semiconductor substrate and said etching mask until said etching mask is completely removed by said particle beam, thereby causing said second etching step to progress at different rates for each of said compound semiconductor substrate and said etching mask in such a manner so that said etching mask is etched slowly while said compound semiconductor substrate is etched faster due to the difference in their respective etching rates, resulting in the formation of a semi-spherical micro lens on a surface of said compound semiconductor substrate.

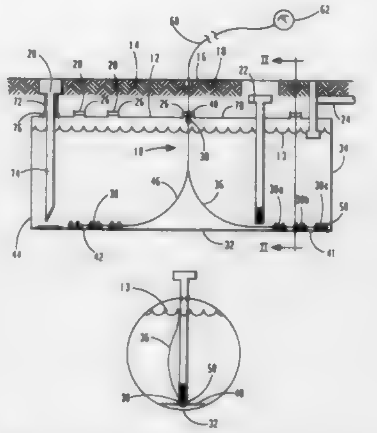
5,316,641
STORAGE TANK INTERNAL CORROSION PREVENTION ANODE APPARATUS AND METHOD

Robert L. Wright, 3415 Custer Rd., Suite 130, Plano, Tex. 75023; Tom C. Norman, and Timothy C. Norman, both of Athens, Tex., assignors to Robert L. Wright, Plano, Tex.

Filed Dec. 16, 1992, Ser. No. 991,243

Int. Cl.⁵ C23F *13/00*

U.S. Cl. 204—197 **19 Claims**



1. An internal corrosion prevention anode device for insertion into a liquid holding storage tank of the type formed of steel and having a closed top and having a bottom with one or more low points into which an electrolytic solution will collect, said anode device comprising:

(a) an opening into said closed top of said storage tank;

(b) an anode sized for insertion through said opening and having a rounded cross-sectional shape so that said anode rolls toward to the low point in said storage tank;

(c) an elongated electrical conductor attached to said anode, having a sufficient length for extending from said top to said bottom of said tank and having sufficient flexibility along said length to permit said anode to roll to one of said one or more low points in said tank; and

(d) a cap sized for closing said opening and constructed for electrically connecting said elongated electrical conductor to said top of said storage tank to complete an electrical circuit from said anode at said bottom to said top of said tank.

5,316,642
OSCILLATION DEVICE FOR PLATING SYSTEM

David J. Young, Jr., Phoenix; Scott L. Randall, Mesa; Scott D. Shaw, Chandler, and Andrew F. Wylde, Tempe, all of Ariz., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 22, 1993, Ser. No. 52,496

Int. Cl.⁵ C25D *17/06, 17/16, 21/06, 21/10*

U.S. Cl. 204—198 **4 Claims**

1. An apparatus for electroplating substrates comprising:

a holder for mounting substrates thereon;

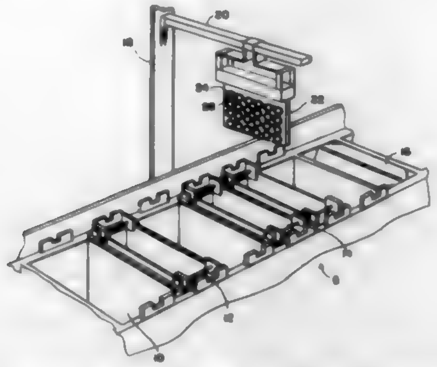
means for oscillating the holder when the holder is placed in an electroplating tank to electroplate substrates, said means for oscillating comprising

pulleys;

a belt mounted on the pulleys thereby linking the pulleys;

a motor, wherein the motor rotatably moves one of the pulleys such that the rotary motion of the one pulley is transferred to other pulleys through the belt mounted thereon;

a tooling plate, wherein said tooling plate is attached to the holder and to pulleys other than the one pulley that is



rotated by the motor, said tooling plate being rotatably moved when the pulleys are rotatably moved.

5,316,643
APPARATUS FOR THE STORAGE AND CONVERSION OF ENERGY

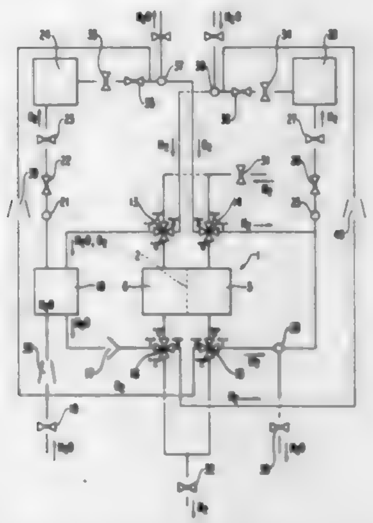
Jochen Ahn, Freiburg, and Konstantin Ledjeff, Bad Krozingen, both of Fed. Rep. of Germany, assignors to Fraunhofer Gesellschaft zur Forderung der angewandten Forschund e.v., Fed. Rep. of Germany

Continuation of Ser. No. 751,444, Aug. 30, 1991, abandoned. This application Jul. 2, 1992, Ser. No. 908,907

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027655

Int. Cl.^{5} C25B *9/00*

U.S. Cl. 204—265 8 Claims



1. An apparatus for performing both an electrolytic operation and a fuel cell operation, comprising:

an electrochemical cell having an anode compartment, a cathode compartment and a cation exchange membrane as the electrolyte, said anode compartment having a bifunctional oxidation electrode and said cathode compartment having a bifunctional reduction electrode;

a hydrogen tank storing hydrogen;

an oxygen tank storing oxygen;

a first valve that connects the hydrogen tank to the anode compartment to supply hydrogen to the anode compartment during the fuel cell operation, and connects the hydrogen tank to the cathode compartment to store hydrogen from the cathode compartment in the hydrogen tank during the electrolytic operation; and

a second valve that connects the oxygen tank to the cathode compartment to supply oxygen to the cathode compartment during the fuel cell operation, and connects the oxygen tank to the anode compartment to store oxygen from the anode compartment during the electrolytic operation.

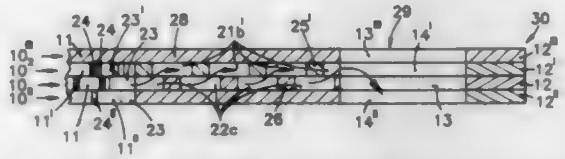
5,316,644
HIGH PRESSURE ELECTROCHEMICAL CELL STRUCTURE

William A. Titterington, Stratham, N.H., and Andrei Leonida, West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 19, 1992, Ser. No. 900,998

Int. Cl.^{5} C25B *11/03*

U.S. Cl. 204—284 8 Claims



1. An electrochemical cell electrode plate structure comprising a laminar assembly of at least two substantially identically configured plate-shaped components of an electrically conductive high-strength material having first major surfaces that are juxtaposed with one another in said assembly, and oppositely facing second major surfaces,

each of said components including a central portion having a multitude of fluid-flow spaces that communicate with spaces of the respective other of said components in said assembly, and a solid frame portion integral with and circumferentially surrounding said central portion and provided with at least one through aperture therein that opens onto said first and second major surfaces and is aligned with said aperture of the other of said components in said assembly to form a continuous fluid-flow conduit therewith, and

said frame portion of each of said components having at least one discontinuous partial channel therein that is situated between said aperture and said central portion and opens onto said first major surface, said discontinuous partial channels of said two components communicating with one another in said assembly to complement each other into a continuous passage that establishes communication between said aperture and at least one of said spaces of said central portion of one of said components.

5,316,645
PLASMA PROCESSING APPARATUS

Atsushi Yamagami; Nobuyuki Okamura, both of Kawasaki; Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-Ken; Haruhiro H. Goto, and Tadashi Shibata, both of Sendai, all of Japan, assignors to Canon Kabushiki Kaisha; Applied Materials Japan Inc. and Tadahiro Ohmi, Tokyo, Japan

Continuation of Ser. No. 898,371, Jun. 15, 1992, abandoned, which is a continuation of Ser. No. 741,767, Aug. 7, 1991, abandoned. This application Feb. 17, 1993, Ser. No. 22,599

Claims priority, application Japan, Aug. 7, 1990, 2-207537

Int. Cl.^{5} C23C *14/34*

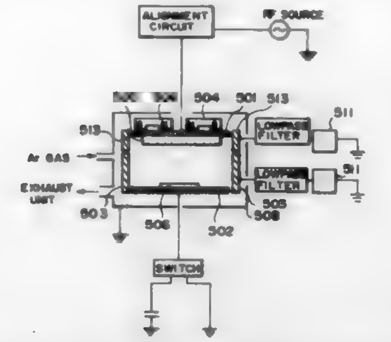
U.S. Cl. 204—298.06 7 Claims

1. A plasma processing apparatus comprising:

a first electrode connectable with a plasma generating power source;

a second electrode capable of supporting a substrate to be subjected to a plasma-involving surface treatment;

a third electrode divided into plural portions enclosing a space between said first and second electrodes and having separate potentials applied to said plural portions all said electrodes being positioned in an evacuatable chamber; and



potential control means for independently controlling the potentials of said third electrode.

5,316,646
CONTROLLING APPARATUS FOR CONTINUOUS ELECTROLYTIC ION WATER PRODUCING APPARATUS

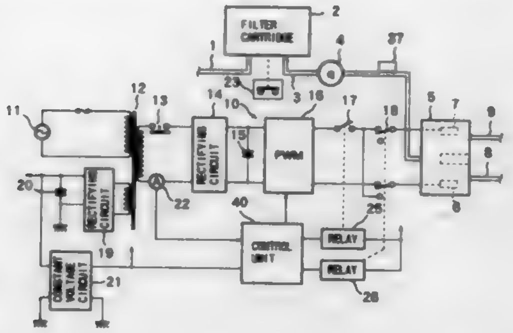
Kazuyoshi Arai, Atsugi, Japan, assignor to Janix Kabushiki Kaisha, Japan

Filed Sep. 14, 1992, Ser. No. 944,439

Claims priority, application Japan, Sep. 10, 1991, 3-289525

Int. Cl.^{5} B01D *17/06*

U.S. Cl. 204—306 7 Claims



1. A control apparatus for controlling a continuous electrolytic ion water producing apparatus which includes an electrolytic cell, a pair of negative and positive electrodes accommodated in said electrolytic cell, a water pipe line for introducing water to said electrolytic cell and a filter cartridge disposed in said water pipe line for removing residual chlorine from water passing through said water pipe line, said control apparatus comprising:

a flow rate sensor disposed in the water pipe line for detecting flow rate of water passing through the water pipe line;

a power source circuit for applying a DC voltage between the negative and positive electrodes;

a range change-over switch for selecting said DC voltage;

a power source switch for said power source circuit; and

control means for judging whether or not an electrolyzing operation should be performed on the basis of the flow rate detected by said flow rate sensor and said selected DC voltage and for controlling said power source switch in accordance with the judgement, said control means comprising water flow totalizing means for determining a cumulative amount of water passed through the water pipe line, and filter life judging means for judging the remaining useful service life of the filter cartridge from said cumulative amount of water.

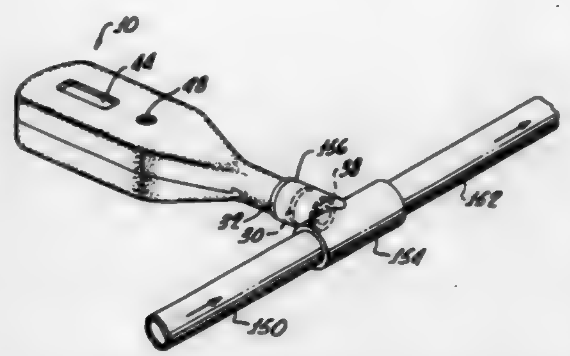
5,316,647
PORTABLE OXYGEN ANALYZER

Michael D. Martell, Temecula, and Dale A. Conrad, Riverside, both of Calif., assignors to Martell Medical Products, Inc., Temecula, Calif.

Filed Aug. 26, 1992, Ser. No. 936,107

Int. Cl.^{5} G01N *27/404*

U.S. Cl. 204—415 7 Claims



1. In combination with patient breathing therapy apparatus including a therapy tube for transmitting a respiratory therapy breathing mixture to a patient, and a "T" fitting in said therapy tube adjacent a patient and having first and second legs connected to said tube and a third connecting leg, a self-contained, palm size, hand held secondary oxygen monitoring device, said self-contained monitoring device being configured and arranged to be held in one hand and to be inserted into and removed from said "T" fitting by manipulation with a single hand, to enable monitoring of the oxygen content of the breathing mixture adjacent a patient, said monitoring device comprising:

a generally rectangular housing having an elongated body section adapted to fit the palm of a hand,

an elongated tubular neck forming an oxygen sensor receptacle section of relatively small diameter, said neck having a free outer end slidably insertable into and removably received within said third connecting leg of said "T" fitting,

said body section having a thickness and width greater than said sensor receptacle section diameter,

a housing transition section integral with both said body section and tubular neck, said housing transition section being smoothly tapered from a first portion thereof adjacent said body section that has a configuration and dimensions of said body section to a second portion thereof adjacent said neck that has a configuration and dimensions of said neck,

electrical control and display circuitry mounted within said body section,

said circuitry including a circuit board having a tapered section in said housing transition section, having an end positioned at an inner end of said tubular neck,

a socket means on said end of said circuit board tapered section,

said housing being configured and arranged to form a handle for the monitoring device and to provide a mounting an enclosure for said electrical control and display circuitry, and

an elongated tubular oxygen sensor slidably inserted into and received within said sensor receptacle section and having a plurality of contact pins received in said socket means, whereby said tubular neck forms a connector fitting for connecting the monitoring device to said "T" fitting.

5,316,648

ELECTROCHEMICAL MEASURING CELL FOR DETECTING GASES AND VAPORS

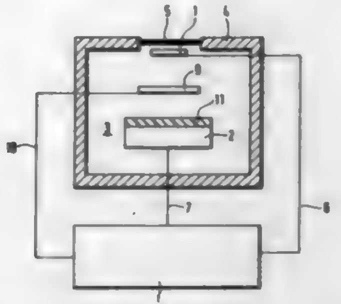
Uwe Kühn, Wesenberg; Herbert Kiesele, and Stephan Haupt, both of Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 11, 1992, Ser. No. 943,678

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1991, 4130690; Oct. 12, 1991, 4133831

Int. Cl.^{5} G01N *27/26*

U.S. Cl. 204—415 13 Claims



1. An electrochemical measuring cell for detecting and determining gaseous and vaporous component substances in a measuring sample, the measuring cell comprising:

a housing having an opening directed toward an ambient containing the sample to be detected and defining a measuring chamber;

an electrolyte contained in said chamber and said electrolyte including an additive for promoting an electrochemical reaction during measurement;

a membrane permeable to said component substances and mounted on said housing for closing off said chamber with respect to the ambient;

said membrane being impermeable to the electrolyte and said additive contained therein;

a measuring electrode and a counter electrode disposed in said chamber so as to be in spaced relationship to each other;

said measuring electrode being made of metal M^o or a metal alloy containing said metal M^o as a main constituent;

said additive containing metal ions M^{n+} dissolved in said electrolyte;

said metal ions M^{n+} being ions of said metal M^o; and,

said additive being selected to have an oxidation number (n) equal to or greater than 2 and said additive being further selected so as to cause a synproportioning reaction to take place between said metal M^o and said metal ions M^{n+} dissolved in said electrolyte.

5,316,649

HIGH FREQUENCY REFERENCE ELECTRODE

James W. Kronberg, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 5, 1991, Ser. No. 665,640

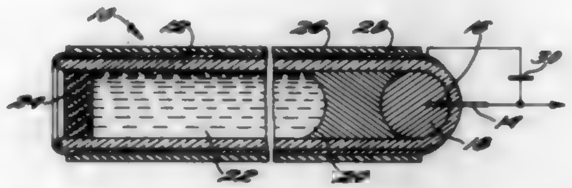
Int. Cl.^{5} G01N *27/30, 27/32*

U.S. Cl. 204—435 12 Claims

1. A device for use in electrochemical measurements of a fluid, comprising:

first measuring means for measuring a reference potential and producing a reference potential signal, said first measuring means having a first active portion and a first axis;

second measuring means carried by said first measuring means for producing a redox potential signal, said second measuring means having a second active portion and a second axis, said second measuring means carried by said first measuring means so that said first and second axes are coaxial, said first and said second active portions having a common geometric axis, said first and second active portions adapted to contact with said fluid when said device is placed in said fluid; and



means for capacitively coupling said reference potential signal to said redox potential signal.

5,316,650

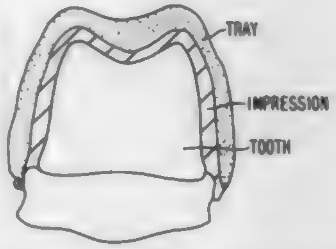
ELECTROFORMING OF METALLIC GLASSES FOR DENTAL APPLICATIONS

Menahem Ratzker, 1131 University Blvd., West Silver Spring, Md. 20902; David S. Lashmore, 5506 Woodlyn Rd., Frederick, Md. 21701, and John A. Tesk, 13446 Pond Filed Ct., Highland, Md. 20777

Filed Feb. 19, 1993, Ser. No. 19,489

Int. Cl.^{5} C25D *1/10*

U.S. Cl. 205—67 15 Claims



1. In a process of electroforming a metal to produce a dental prosthesis, the improvement comprising employing as said metal a metallic glass alloy of cobalt and phosphorus containing 8–30% by weight of phosphorus.

5,316,651

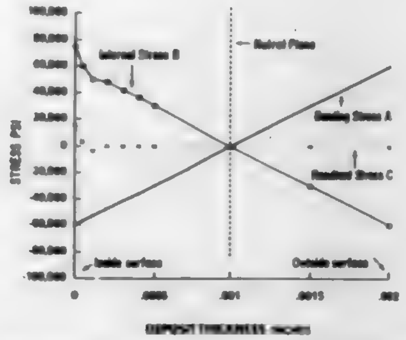
PROCESS FOR PREPARING SELECTIVELY STRESSED ENDLESS BELTS

William G. Herbert; David J. Hogle, both of Williamson; Steven J. Grammatica, Penfield; Peter J. Schmitt, Ontario, all of N.Y.; Ronald E. Jansen, Estes Park, Colo., and Mark S. Thomas, Williamson, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1991, Ser. No. 801,997

Int. Cl.^{5} C25D *1/00*

U.S. Cl. 205—67 13 Claims



1. A process for preparing a metal belt, comprising electroforming an endless metal belt with a controlled internal stress and while electroforming, adjusting at least one operating parameter selected from the group consisting of electroforming bath temperature, current density, agitation, and stress reductor concentration, thereby causing said internal stress to increase, compressively, from a radially inner surface of said belt to a radially outer surface of said belt.

5,316,652

METHOD FOR MANUFACTURING IRON-ZINC ALLOY PLATED STEEL SHEET HAVING TWO PLATING LAYERS AND EXCELLENT IN ELECTROPAINTABILITY AND PRESSFORMABILITY

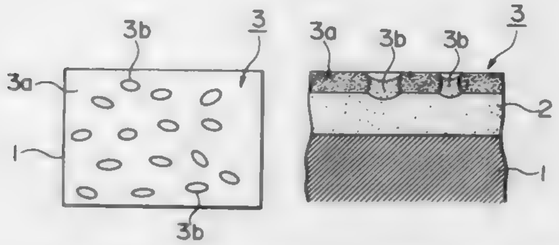
Masaru Sagiyama; Masaki Abe; Akira Hiraya; Junichi Inagaki, and Masaya Morita, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 764,010, Sep. 23, 1991, abandoned. This application Feb. 22, 1993, Ser. No. 20,657

Claims priority, application Japan, Oct. 8, 1990, 2-270171

Int. Cl.^{5} C25D *5/00*

U.S. Cl. 205—177 21 Claims



1. A method for manufacturing an iron-zinc alloy plated steel sheet having two plating layers and excellent in electropaintability and press-formability, which comprises the steps of:

passing a steel sheet through a zinc dip-plating bath having a temperature within a range of from 450° to 480° C. and having a chemical composition comprising:

aluminum: from 0.10 to 0.15 wt. %, and

the balance being zinc and incidental impurities, to apply a zinc dip-plating treatment to said steel sheet, so as to form, on at least one surface of said steel sheet, a zinc dip-plating layer having a plating weight within a range of from 30 to 120 g/m^2 per surface of said steel sheet; then

heating said steel sheet, on the surface of which said zinc dip-plating layer has thus been formed, to a temperature within a range of from 420° to 520° C. to apply an alloying treatment to form, on said at least one surface of said steel sheet, an alloying-treated iron-zinc alloy dip-plating layer, said alloying-treated iron-zinc alloy dip-plating layer having on the surface thereof fine irregularities comprising numerous fine concavities and numerous fine convexities, and said alloying-treated iron-zinc alloy dip-plating layer having an iron content within a range of from 7 to 15 wt. % relative to said alloying-treated iron-zinc alloy dip-plating layer and having a plating weight within a range of from 30 to 120 g/m^2 per surface of said steel sheet; then

applying a temper rolling treatment at a reduction rate within a range of from 0.3 to 1.5% to said steel sheet, on the surface of which said alloying-treated iron-zinc alloy dip-plating layer having said fine irregularities has thus been formed, to level said numerous fine convexities on the surface of said alloying-treated iron-zinc alloy dip-plating layer, so as to form, on said at least one surface of said steel sheet, an alloying-treated iron-zinc alloy dip-plating layer as a lower layer having said numerous fine concavities on the surface thereof; and then

applying an iron-zinc alloy electroplating treatment to said steel sheet, on the surface of which said alloying-treated iron-zinc alloy dip-plating layer as the lower layer having said numerous fine concavities has thus been formed, with an electric current density within a range of from 50 to 150 A/dm^2 in an acidic electroplating bath having a PH value within a range of from 1.0 to 4.0 and a temperature within a range of from 40° to 70° C. and having a chemical composition comprising:

iron ions: from 0.50 to 1.75 mole/l, and

zinc ions: from 0.05 to 0.35 mole/l,

where, the ratio of the concentration of said iron ions to the concentration of said zinc ions being within a range of from 5 to 20,

to form, on said alloying-treated iron-zinc alloy dip-plating layer as the lower layer, an iron-zinc alloy electroplating layer as an upper layer having a plating weight within a range of from 1 to 10 g/m^2 per surface of said steel sheet.

5,316,653

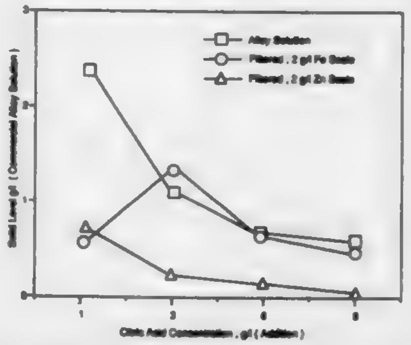
MINIMIZATION OF MOUNDS IN IRON-ZINC ELECTROGALVANIZED SHEET

Chyang J. Wu, Monroeville, and Jack E. Manack, Murrysville, both of Pa., assignors to USX Corporation, Pittsburgh, Pa.

Filed Jul. 30, 1992, Ser. No. 922,994

Int. Cl.^{5} C25D *3/56*

U.S. Cl. 205—245 6 Claims



1. A method of producing on an elongated steel sheet or strip base a substantially mound-free electroplated coating of zinc-iron alloy from an electrolyte bath comprising chloride ions and a soluble anode source of iron and zinc ions, which method comprises substantially preventing scaling or iron oxide particles from the iron-containing anode and maintaining a maximum amount of total solids in the bath at about 0.5 grams per liter of the bath during electroplating of the coating by adding to the bath citric acid in an amount from about 2 grams per liter to about 6 grams per liter of bath solution.

5,316,654

PROCESSES FOR THE MANUFACTURE OF ENRICHED PITCHES AND CARBON FIBERS

Donald C. Berkebile, deceased, late of Ashland, Ky.; Catherine Berkebile, Administratrix, 324 Squires Rd., Lexington, Ky. 40515; Donald M. Lee, 92 S. Altamont Rd., Huntington, W. Va. 25701; Larry D. Veneziano, 2690 Velma Ct., Simi, Calif. 93065; Joseph J. Lauer, 421 Bellefonte Princess, Ashland, Ky. 41101; Roy E. Booth, P.O. Box 630003, Dallas, Tex. 75265; William P. Hettinger, 203 Meadowlark Rd., Russell, Ky. 41101, and Willard Jones, 1931 B Pinehurst Ct., Allentown, Pa. 18103

Filed Sep. 13, 1985, Ser. No. 776,179

Int. Cl.^{5} C10C *1/00*

U.S. Cl. 208—39 29 Claims

1. An improved process for the production of enriched pitch from a catalytic pitch, which process comprises treating said catalytic pitch in a wiped-film evaporator system comprising a wiped-film evaporator and a means for recovering enriched pitch, delivering said enriched pitch to the inlet of said means for recovering enriched pitch at a pressure that is equivalent to a vertical distance between the outlet of said wiped-film evaporator and the inlet of said means for recovering enriched pitch

of about 10 feet to about 40 feet, and maintaining the wiped-film evaporator system at operating conditions that will provide said enriched pitch.

5,316,655

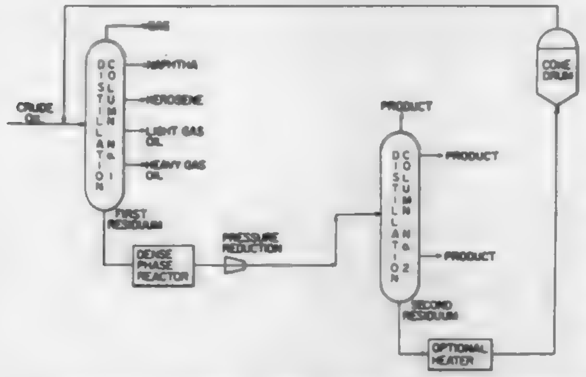
PROCESS FOR MAKING LIGHT HYDROCARBONACEOUS LIQUIDS IN A DELAYED COKER

Stephen C. Paspek, Broadview Hts.; Christopher P. Eppig, Cleveland Hts.; Jeffrey B. Hauser, Middleburgh Hts., and Carl Polisena, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 482,255, Feb. 20, 1990, Pat. No. 5,068,027, and a continuation-in-part of Ser. No. 482,304, Feb. 20, 1990, abandoned. This application Nov. 13, 1991, Ser. No. 792,016

Int. Cl.⁵ C10G *9/26*

U.S. Cl. 208—131 **21 Claims**



1. A process for making a light hydrocarbonaceous liquid in a delayed coker, said delayed coker including at least one coke drum, the process comprising:

(A) providing a hydrocarbonaceous feed for said coke drum and heating said feed to a temperature in the range of about 800° F. to about 1200° F. to provide an intermediate product; and

(B) introducing said intermediate product into said coke drum, operating said coke drum for a sufficient period of time to convert said intermediate product to a final product comprising said light liquid and coke, and separating said light liquid from said coke;

step (A) being conducted in combination with either step (A)(i) or step (A)(ii);

step (A)(i) comprising maintaining said feed during step (A) in an enclosed space in the absence of externally supplied water or hydrogen and subjecting said feed to a pressure that is at least about 500 psig and is sufficient to maintain the specific gravity of the contents of said enclosed space at a level of at least about 0.05 for an effective period of time to convert said feed to said intermediate product, said intermediate product containing fractions having a lower boiling point than the initial boiling point of said feed and/or a higher boiling point than the final boiling point of said feed, then reducing the pressure on said intermediate product to a pressure below about 500 psig prior to step (B);

step (A)(ii) comprising contacting said intermediate product from step (A) prior to and/or during step (B) with at least one stripping material and dissolving at least part of said intermediate product in said stripping material, said stripping material having been preheated to a temperature of at least about 900° F. and in excess of the temperature to which said feed is heated during step (A), said stripping material being in a gaseous state at said preheated temperature and atmospheric pressure.

5,316,656

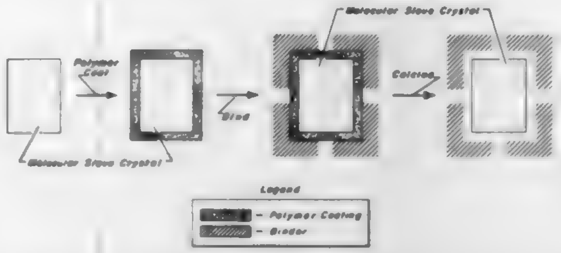
HYDROCARBON CONVERSION PROCESSES WITH MOLECULAR SIEVE AGGLOMERATES HAVING IMPROVED TRANSPORT PROPERTIES

Regis J. Pellet, Croton-On-Hudson, and Frank P. Gortsema, Pleasantville, both of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 519,972, May 7, 1990, Pat. No. 5,168,082. This application May 20, 1991, Ser. No. 702,487

Int. Cl.⁵ C10G *45/64, 11/05*

U.S. Cl. 208—120 **5 Claims**



1. In a hydrocarbon conversion process of catalytic cracking or catalytic dewaxing comprising contacting the hydrocarbon under hydrocarbon converting conditions with molecular sieve agglomerates to afford a hydroconverted product, the improvement comprising using molecular sieve agglomerates with improved transport properties prepared by the method comprising coating molecular sieve particles with an organic polymer, fixing the organic polymeric coating to the surface of the molecular sieve particles so as to produce a non-migratory coating thereon, binding the coated molecular sieve particles with a binding agent which is at least one inorganic oxide, forming the agglomerates of molecular sieve particles, and removing the organic polymeric coating by calcination.

5,316,657

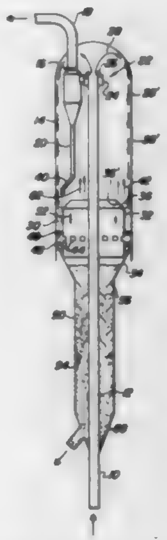
FCC PROCESS FOR DE-GASSING SPENT CATALYST BOUNDARY LAYER

Randy J. Zinke, Carol Stream, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 27, 1992, Ser. No. 983,063

Int. Cl.⁵ C10G *11/18*

U.S. Cl. 208—161 **9 Claims**



1. A product and catalyst recovery method for a hydrocarbon conversion process that contacts a hydrocarbon-containing feedstream with a particulate catalyst, said method comprising:

(a) contacting said hydrocarbon-containing feedstream with said catalyst in a confined reaction zone;

(b) discharging said catalyst from said confined reaction zone into a reactor vessel and establishing a localized region in said reactor vessel through which a downwardly flowing stream of catalyst passes at a higher density relative to the average catalyst density throughout said reactor vessel;

(c) receiving at least a portion of said downwardly flowing stream of catalyst in a vertically-extended de-gassing zone having an inlet and maintaining a downwardly increasing density gradient for the catalyst in said de-gassing zone;

(d) passing at least a portion of the catalyst from a higher density region of said de-gassing zone into a stripping zone;

(e) contacting said catalyst in said stripping zone with a stripping fluid;

(f) passing stripping gas and recovered hydrocarbons from said stripping zone such that stripping gas and recovered hydrocarbons by-pass said de-gassing zone; and

(g) recovering a stripped catalyst from said stripping zone.

5,316,658

PROCESS FOR THE PRODUCTION OF LOW-SULFUR DIESEL GAS OIL

Masaru Ushio; Tamio Nakano; Minoru Hatayama; Katuhiko Ishikawa, and Masaru Sato, all of Yokohama, Japan, assignors to Nippon Co., Ltd. and Nippon Petroleum Refining Co., Ltd., Japan

Filed Jul. 15, 1992, Ser. No. 914,847

Claims priority, application Japan, Jul. 19, 1991, 3-203505; Dec. 20, 1991, 3-355157

Int. Cl.⁵ C10G *45/04*

U.S. Cl. 208—216 R **6 Claims**

1. A process for the production of a low-sulfur diesel gas oil from a petroleum distillate having a sulfur content of 0.1 to 2.0% by weight and a boiling point of 150° to 400° C., the process comprising contacting the petroleum distillate with hydrogen in the presence of a hydro-treating catalyst which has at least one metal or its oxide or sulfide and a porous carrier, wherein said metal or its oxide or sulfide has a hydro-treating activity and is supported on said porous carrier, at a temperature of 350° to 450° C., and a pressure of 45 to 100 kg/cm^2 in the first step to thereby produce materials having a sulfur content of 0.05% by weight or lower, and contacting further the materials issued from the first step with hydrogen in the presence of a hydro-treating catalyst which has at least one metal or its oxide or sulfide and a porous carrier, wherein said metal or its oxide or sulfide has a hydro-treating activity and is supported on said porous carrier, at a temperature of 200° to 300° C., and a pressure of 45 to 100 kg/cm^2 in the second step to thereby produce the low-sulfur diesel gas oil having a Saybolt color number of −10 or higher and a sulfur content of 0.05% by weight or less, wherein the metal of the hydro-treating catalyst in each step is selected from the group consisting of chromium, molybdenum, tungsten, cobalt, nickel and iron, and wherein lighter fractions are not removed from the materials produced in the first step before said materials are subjected to the second step.

5,316,659

UPGRADING OF BITUMEN ASPHALTENES BY HOT WATER TREATMENT

Glen B. Brons, Phillipsburg; Michael Siskin, Morristown, both of N.J., and Kazimierz O. Wrzeszczynski, Media, Pa., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 2, 1993, Ser. No. 42,033

Int. Cl.⁵ C10C *3/00;* **C10L** *1/00*

U.S. Cl. 208—39 **5 Claims**

1. A process for producing hydrocarbons from recovered bitumen from tar sands or petroleum hydrocarbons which comprises mixing the bitumen with a deasphalting solvent to yield a deasphalted oil and a residual solid asphaltene, separating the residual solid asphaltene from the deasphalted oil, and heating the solid asphaltene fraction with superheated water at temperatures of from 300° to 425° C.

5,316,660

HYDRODELAYED THERMAL CRACKING PROCESS

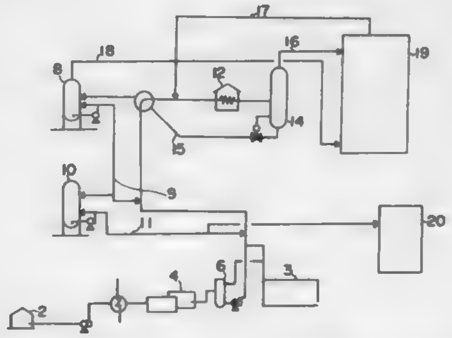
Masaya Kuno, 7-13, Tsuruma 1-chome, Machida City, Tokyo, Japan

Continuation-in-part of Ser. No. 791,532, Nov. 14, 1991, abandoned. This application Feb. 12, 1993, Ser. No. 19,813

Claims priority, application Japan, Nov. 15, 1990, 2-307135

Int. Cl.⁵ C10G *65/00, 65/10*

U.S. Cl. 208—76 **4 Claims**



1. A process for hydrodelayed thermal cracking in combination with hydrostripping, which comprises:

feeding crude oil from a surge tank to a crude oil stripper via a feed line;

separating said crude oil into a lighter fraction and a heavier fraction in said crude oil stripper;

subjecting said lighter fraction to hydrodesulfurization;

feeding said heavier fraction from said crude oil stripper to a first storage tank;

hydrothermally cracking said heavier fraction for at least 10 minutes under a hydrogen pressure in said first storage tank without adding a catalyst;

introducing a bottom residue of said first storage tank into a second storage tank or said feed line, and subjecting a cracked and vaporized fraction of said first storage tank to hydrodesulfurization;

hydrothermally cracking said residue introduced into said second storage tank under a higher hydrogen pressure than said hydrogen pressure of said first storage tank without adding a catalyst;

subjecting a portion of a bottom residue of said second storage tank to hydrodemetallization, hydrodesulfurization and hydrocracking, and introducing another portion of said bottom residue of said second storage tank into said feed line; and

supplying hydrogen into said surge tank to facilitate pressurizing said crude oil in said surge tank.

5,316,661

PROCESSES FOR CONVERTING FEEDSTOCK ORGANIC COMPOUNDS

Ralph M. Dessau, Edison, N.J.; Robert K. Grasselli, Chadds Ford; Rudolph M. Lago, Yardley, both of Pa., and John G. Tsikoyiannis, Princeton, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 910,861, Jul. 8, 1992. This application Apr. 16, 1993, Ser. No. 47,137

Int. Cl.^{5} C07C *5/333*

U.S. Cl. 208—46 **16 Claims**

1. A process for converting feedstock organic compounds to conversion products which comprises passing said feedstock into a reaction zone which contains a catalytically active structure comprising a film of interconnected zeolite crystals bonded to a substrate surface;

wherein said catalytically active structure is prepared by a process comprising contacting the substrate with a crystallization reaction mixture capable of forming the zeolite;

and wherein said crystallization reaction mixture comprises a H_2O/YO_2 molar ratio of at least about 25 when the reaction mixture has a YO_2/X_2O_3 ratio of greater than about 400, a H_2O/YO_2 molar ratio of at least about 35 when the YO_2/X_2O_3 ratio is greater than about 150 and less than about 400, and a H_2O/YO_2 molar ratio of at least about 45 when the YO_2/X_2O_3 ratio is less than about 150; and Y is a tetravalent element and X is a trivalent element.

6. A process for the dehydrogenation of light paraffins which comprises contacting a hydrocarbon feedstream comprising C_2 to C_5 paraffins under dehydrogenation conditions in a reaction zone with a catalyst composition comprising a dehydrogenation metal-containing non-acidic film of interconnected zeolite crystals having the structure of ZSM-5 bonded to a substrate surface, wherein the film bonded to the substrate surface is prepared from a reaction mixture comprising an H_2O/YO_2 ratio of at least about 25 when the reaction mixture has a YO_2/X_2O_3 ratio of greater than about 400, a H_2O/YO_2 molar ratio of at least about 35 when the YO_2/X_2O_3 ratio is greater than about 150 and less than about 400, and a H_2O-$/YO_2$ molar ratio of at least about 45 when the YO_2/X_2O_3 ratio is less than about 150; and Y is a tetravalent element and X is a trivalent element.

5,316,662

INTEGRATED DISENGAGER STRIPPER AND ITS USE IN FLUIDIZED CATALYTIC CRACKING PROCESS

Ismail B. Cetinkaya, Palatine, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 613,037, Nov. 15, 1990, Pat. No. 5,158,669. This application Oct. 27, 1992, Ser. No. 966,777

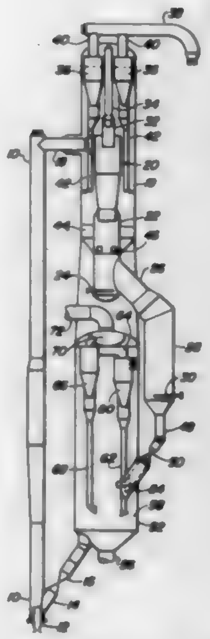
The portion of the term of this patent subsequent to Oct. 27, 2009, has been disclaimed.

Int. Cl.^{5} C10G *11/18*

U.S. Cl. 208—113 **24 Claims**

1. A fluid catalytic cracking apparatus comprising:
(a) a reactor vessel;
(b) a tubular riser having an inlet end for receiving feed and catalyst and an outlet end;
(c) an elongated disengaging vessel located in said reactor vessel having an upper end and a lower end, means for tangentially directing the outlet end of said riser into an upper end of said disengaging vessel, and a gas outlet at the top of said disengaging vessel, said lower end of said disengaging vessel having an open bottom wherein the outermost portion of said open bottom is unoccluded to permit unobstructed fluid and particulate flow;
(d) a stripping vessel located directly below said disengaging vessel, said stripping vessel having an inlet in open communication with said open bottom of said disengaging vessel and an outlet for withdrawing catalyst from the stripping vessel;
(e) means for adding stripping gas to said stripping vessel; and,
(f) a segregation zone located in said stripping vessel comprising means for dissipating turbulent flow below said open bottom of said disengaging vessel.

16. A process for the fluidized catalytic cracking (FCC) of an FCC feedstream, said process comprising:
(a) passing FCC catalyst and said FCC feedstream to a riser reaction zone and contacting said feedstream with said FCC catalyst in said riser reaction zone to convert said feedstream to product vapors;
(b) discharging a mixture of said product vapors and spent FCC catalyst from said riser directly into a disengaging vessel and directing said mixture tangentially into said disengaging vessel to form an inner and outer vortex in said disengaging vessel;
(c) emptying catalyst particles in closed communication from the bottom of said disengaging vessel directly into the top of a subadjacent stripping vessel;
(d) injecting a stripping gas into said stripping vessel and contacting said catalyst particles with said stripping gas to desorb hydrocarbons from said catalyst particles;
(e) discharging a gaseous stream of desorbed hydrocarbons and stripping gas upwardly from said stripping vessel, dissipating the turbulent flow of fluid and catalyst particles at the top of said stripping vessel, and passing said desorbed hydrocarbons and stripping gas out of the top of said stripping vessel and into the bottom of said disengaging vessel;



(f) maintaining a relatively dense bed of catalyst below the top of said stripping vessel;
(g) withdrawing said product vapors and said gaseous stream from the top of said disengaging vessel through an outlet;
(h) passing said product vapor and said gaseous stream from said outlet to a separator to recover additional catalyst particles;
(i) recovering a product stream from said separator; stripping catalyst particles from said separator to remove entrained hydrocarbons;
(k) removing spent FCC catalyst from the lower end of said stripping vessel and transferring said spent catalyst to a regeneration zone;
(l) regenerating said FCC catalyst in said regeneration zone by the oxidative removal of coke; and,
(m) transferring FCC catalyst from said regeneration zone to said riser reaction zone.

5,316,663

PROCESS FOR THE TREATMENT OF HALOGENATED HYDROCARBONS

Robert B. James, Jr., Northbrook, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jan. 13, 1992, Ser. No. 819,737

The portion of the term of this patent subsequent to May 24, 2011, has been disclaimed.

Int. Cl.^{5} C01G *45/04*

U.S. Cl. 208—262.1 **8 Claims**

1. A process for treating a halogenated organic stream to produce a hydrogenated hydrocarbonaceous stream having a reduced level of halogen and an anhydrous stream comprising a hydrogen halide which process comprises the steps of:
(a) contacting said halogenated organic stream, a hydrogen-rich, gaseous recycle stream and a recycle stream comprising unreacted halogenated organic compounds with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions to increase the hydrogen content of said halogenated organic stream and to thereby produce hydrogen halide;
(b) condensing at least a portion of the resulting effluent from said hydrogenation reaction zone to produce said hydrogen-rich gaseous recycle stream and a liquid stream comprising hydrogenated hydrocarbonaceous compounds and hydrogen halide;
(c) separating said liquid stream comprising hydrogenated hydrocarbonaceous compounds and hydrogen halide to produce an anhydrous stream comprising hydrogen halide and a stream comprising hydrogenated hydrocarbonaceous compounds and unreacted halogenated organic compounds; and
(d) separating said stream comprising hydrogenated hydrocarbonaceous compounds and unreacted halogenated organic compounds to produce said recycle stream comprising unreacted halogenated organic compounds and said hydrogenated hydrocarbonaceous stream having a reduced level of halogen.

5,316,664

PROCESS FOR RECOVERY OF HYDROCARBONS AND REJECTION OF SAND

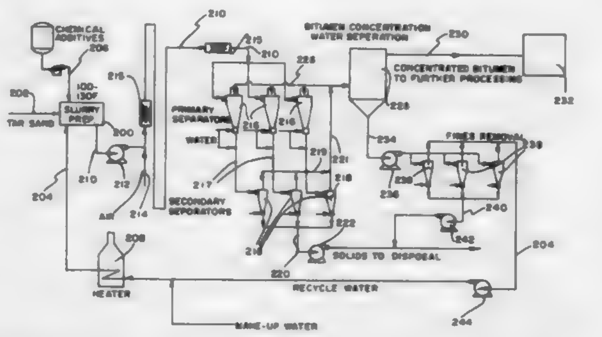
Armand A. Gregoli, Tulsa; John A. Hamshar, Owasso; Daniel P. Rimmer, Broken Arrow, all of Okla., and Erdal Yildirim, Calgary, Canada, assignors to Canadian Occidental Petroleum, Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 782,106, Oct. 24, 1991, which is a continuation-in-part of Ser. No. 341,772, Apr. 21, 1989, Pat. No. 5,083,613, which is a continuation of Ser. No. 311,133, Feb. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 218,840, Jul. 14, 1988, Pat. No. 5,000,872, which is a continuation-in-part of Ser. No. 114,204, Oct. 27, 1987, Pat. No. 4,978,365, which is a continuation-in-part of Ser. No. 934,683, Nov. 24, 1986, Pat. No. 4,725,287. This application Oct. 23, 1992, Ser. No. 965,196

Int. Cl.^{5} C10G *1/04*

U.S. Cl. 208—390 **83 Claims**

26. A process for the extraction and recovery of a hydrocarbon from water wet tar sands comprising:
(a) introducing a water wet tar sand and water into a conditioning zone to form a tar sand slurry having a temperature ranging from about 100° F. to about 130° F.;
(b) agitating the formed tar sand slurry of step (a) to form an agitated tar sand slurry;
(c) aerating the formed agitated tar sand slurry to form an aerated tar sand slurry comprising a first mixture including first fines, first water, first hydrocarbon and first solids;
(d) separating in a primary separating zone the first solids from the first hydrocarbon and first water and first fines of the aerated tar sand slurry to produce a second mixture comprising a second hydrocarbon, a second fines, and a second water;
(e) separating the second hydrocarbon from the second mixture of step (d) to produce a third mixture comprising third fines, third water, and third solids;
(f) introducing the first solids into a secondary separating zone to produce a fourth mixture comprising fourth fines, fourth water, fourth hydrocarbon, and fourth solids;
(g) separating in the secondary separating zone the fourth solids from the fourth fines, fourth water and fourth hydrocarbon;
(h) passing the fourth fines, the fourth water and fourth hydrocarbon into the conditioning zone of step (a);



(i) introducing the fourth solids into a tertiary separating zone to produce a fifth mixture comprising fifth fines, fifth water, fifth hydrocarbons and fifth solids;
(j) separating in the tertiary separating zone the fifth solids from the fifth fines, fifth water and fifth hydrocarbon; and
(k) admixing the fifth fines, the fifth water and fifth hydrocarbon with the fifth solids prior to said introducing step (f).

5,316,665

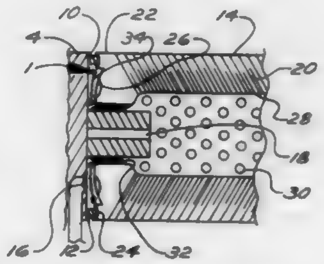
PRE-FILTER OIL INSPECTION SCREEN

Robert M. Hart, R.D. 1, Box 172, East Nassau, N.Y. 12062

Filed Oct. 16, 1992, Ser. No. 962,138

Int. Cl.^{5} B01D *35/02*

U.S. Cl. 210—85 **6 Claims**



6. An oil filter and pre-filter consisting of:
a cannister-type oil filter of the type commonly used for filtering the lubricating oil of an internal combustion engine, said oil filter having an outer housing that surrounds a filter material, said oil filter being cylindrical in shape and having a first end, a second end and a longitudinal axis that extends between said first and second ends, said first end including an annular gasket located proximate the periphery of said first end, said gasket forming a recess with said first end, said first end also including a plurality of spaced oil inlet ports located inwardly of said gasket, said first end further including a center bore having interior threads; and
a pre-filter placed onto the first end of the oil filter, said pre-filter being in the form of a generally planar screen of wire mesh material having an outer diameter less than an inner diameter of the gasket of said oil filter, said screen having a center aperture that has a diameter that is equal to or greater than the diameter of the bore in the first end of the oil filter and wherein the screen has a top surface

and a bottom surface and a plurality of apertures that extend continuously through and between said top and bottom surfaces and where the pre-filter is placed onto the first end of the oil filter in a concentric manner, the bottom surface of the pre-filter is coaxially surrounded by the gasket and the outer housing of the oil filter and is located substantially within said recess with the top and bottom surfaces of the screen substantially perpendicular to the longitudinal axis of the filter so that a plurality of the screen's apertures overlie and are aligned with and adjacent to the oil filter's oil inlet ports.

5,316,666

BLOOD PROCESSING SYSTEMS WITH IMPROVED DATA TRANSFER BETWEEN STATIONARY AND ROTATING ELEMENTS

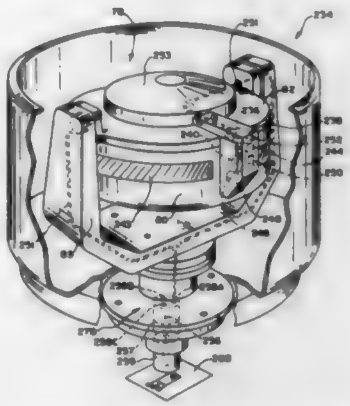
Richard I. Brown, Northbrook, and John T. Foley, Wheeling, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 965,082, Oct. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 814,403, Dec. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 748,244, Aug. 21, 1991, which is a continuation of Ser. No. 514,995, May 26, 1989, Pat. No. 5,104,526, which is a continuation of Ser. No. 9,179, Jan. 30, 1987, Pat. No. 4,834,890.

This application Aug. 19, 1993, Ser. No. 108,550

Int. Cl.^{5} B01D *21/26;* G01D *5/34*

U.S. Cl. 210—85 **25 Claims**



1. A system for transmitting a control signal between two elements moving relative to each other on a blood separation centrifuge comprising

first means on one of the elements for sensing an operating condition that is subject to change and for generating a first output signal that varies according to changes in the sensed operating condition and for emitting a modulated energy according to the first output signal to the other element without mechanical contact with the other element, and

second means on the other element for detecting the modulated energy emitted by the first means including means for demodulating the detected energy to generate a second output signal that, like the first output signal, varies according to the changes in the sensed operating condition.

5,316,667

TIME BASED INTERFACE DETECTION SYSTEMS FOR BLOOD PROCESSING APPARATUS

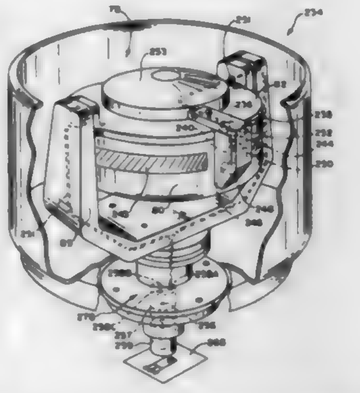
Richard L. Brown, Northbrook, and John T. Foley, Wheeling, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 965,081, Oct. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 814,403, Dec. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 748,244, Aug. 21, 1991, which is a continuation of Ser. No. 514,995, May 26, 1989, Pat. No. 5,104,526, which is a continuation of Ser. No. 9,179, Jan. 30, 1989, Pat. No. 4,834,890.

This application Aug. 19, 1993, Ser. No. 109,008

Int. Cl.^{5} B01D *21/26*

U.S. Cl. 210—85 **30 Claims**



1. A system for monitoring the interface region between cellular constituents and plasma in a blood separation chamber comprising

sensor means for emitting upon the interface region energy that is absorbed by the cellular constituent portion of the interface and detecting the intensity of the energy that is not absorbed by the interface region to generate an unabsorbed intensity output signal,

means for moving the interface region relative to the sensor means during a prescribed time period, and

first means for measuring variations in the unabsorbed intensity output signal over the prescribed time period and generating a time based output.

5,316,668

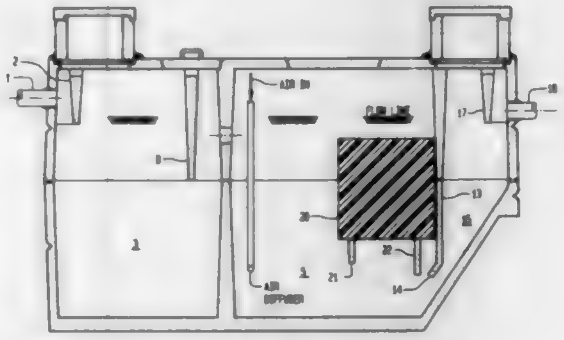
WASTEWATER TREATMENT PLANT AND APPARATUS

Nianfa Tang, Richmond Hts., Ohio, assignor to JET, Inc., Cleveland, Ohio

Filed Dec. 22, 1992, Ser. No. 17,701

Int. Cl.^{5} C02F *3/12*

U.S. Cl. 210—151 **15 Claims**



1. A wastewater treatment plant, comprising:

A) a pretreatment chamber;

B) an aeration chamber;

C) a settling chamber;

D) a first wall common to the pretreatment chamber and the aeration chamber and separating the pretreatment chamber from the aeration chamber;

E) a second wall common to the aeration chamber and the settling chamber and separating the aeration chamber from the settling chamber;

F) an inlet means for introducing wastewater into the pretreatment chamber from outside the wastewater treatment plant;

G) an outlet means for conducting wastewater from the settling chamber to outside the wastewater treatment plant; and

H) aeration means located in the aeration chamber for aerating wastewater in the aeration chamber;

I) the first wall including first passage means for conducting wastewater flow from the pretreatment chamber into the aeration chamber;

J) the second wall including second passage means for conducting wastewater flow from the aeration chamber into the settling chamber, the second passage means providing the only means for conducting wastewater flow between the aeration chamber and the settling chamber;

K) the outlet means establishing a wastewater level within the pretreatment chamber, aeration chamber, and settling chamber;

L) the inlet means, first passage means, second passage means, and outlet means defining a general wastewater flow direction within the wastewater treatment plant;

M) The aeration chamber including a floor, a first substantially straight support wall, and a second substantially straight support wall, the first support wall and the second support wall being attached to the aeration chamber and oriented substantially perpendicular to the general wastewater flow direction and substantially parallel to the first wall and the second wall;

N) the first support wall being shorter than the second support wall;

O) the first support wall being located closer than the second support wall to the first wall and the second support wall being located closer than the first support wall to the second wall;

P) the second wall having a top and a bottom, the bottom of the wall being located near to the floor of the aeration chamber and including an angled portion terminating the bottom of the second wall and pointing toward the aeration chamber; and

Q) the angled portion of the second wall and the floor of the aeration chamber having a gap disposed therebetween, the gap defining the second passage means.

5,316,669

Patent Not Issued For This Number

5,316,670

FILTERING DEVICE FOR AQUARIUMS

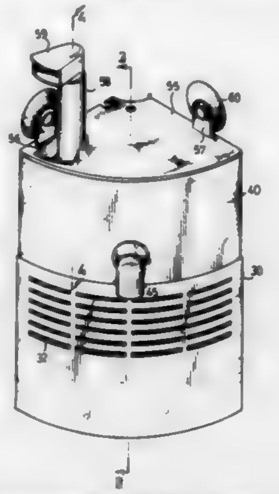
Chia W. Yao, No. 7, Tzu Li I St., Nan Kang Industrial Dist., Nan Tou City, Taiwan

Filed Sep. 9, 1992, Ser. No. 942,978

Int. Cl.^{5} A01K *63/04*

U.S. Cl. 210—169 **4 Claims**

1. A filtering device for an aquarium comprising a base, a lower housing engaged on said base and including a plurality of first openings formed in a bottom portion thereof for communicating with said base and including a front portion having a plurality of second openings formed therein, a casing coupled to said front portion of said lower housing and including a front surface and a rear surface each having a plurality of third openings formed therein and in fluid communication with said second openings of said lower housing wherein water contained in said aquarium may flow into said base via said first, second and third openings, an upper housing disposed above said lower casing and said casing, a cap engaged on said upper housing, a tube engaged in said lower housing for communicating said base to said upper housing, a connector disposed in said upper housing and including a first stub in fluid communication with said tube and a second stub in fluid communication with said first stub and extended upward through said cap, a pump motor engaged on said first stub for drawing water contained in said base, a mouth connected to said pump motor through a hole in a front surface of said upper housing, and a pipe extended through said base and extended upward into said tube for supplying air into said tube, wherein said water contained in said base is drawn into said aquarium via said tube and said connector and said mouth, and said water is caused to move upward through said tube and said second stub of said connector and to flow into said aquarium by said air when said motor is not energized.



5,316,671

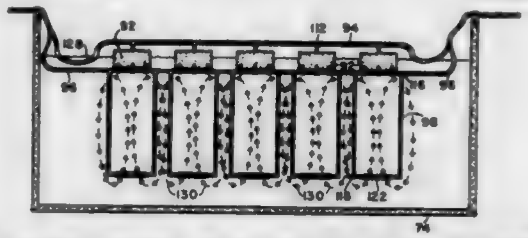
SUBMERSIBLE AERATION TRAIN AND AERATION APPARATUS FOR BIOLOGICAL PURIFICATION OF SEWAGE

D. Thomas Murphy, 584 Mililani Dr., Kihei, Hi. 96753

Filed Jan. 21, 1993, Ser. No. 6,967

Int. Cl.^{5} B01D *21/28*

U.S. Cl. 210—220 **19 Claims**



1. Aeration apparatus adapted to be used with a liquid filled basin having a bottom floor comprising; a plurality of assemblies arranged in parallel each comprising: aeration means for aerating liquid in said basin, said aeration means being configured and arranged to discourage entanglement between said parallel assemblies, inflatable float means having a top and a bottom side, means to inflate and deflate said float means, means to attach said aeration means to said bottom side of said float means, said float means and said aeration means being together configured and arranged so as to be movable between a first and second position, said first position being with said float means floating on the surface of said liquid filled basin with said aeration means being suspended above said bottom floor of said liquid filled basin and below said float means, said second position being with said float means being submerged beneath the surface of said liquid filled basin and said aeration means being substantially in contact with the bottom of said basin,

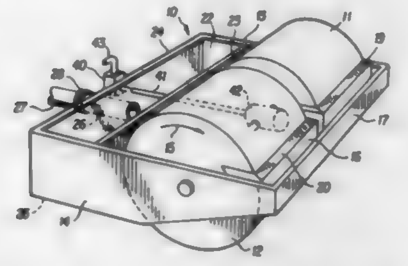
whereby,

when said inflatable float means is inflated, said float means and said aeration means assume their said first position

and
when said float means is deflated, said float means and said aeration means assume their said second position.

5,316,672
DEVICE FOR SKIMMING OIL FROM WATER

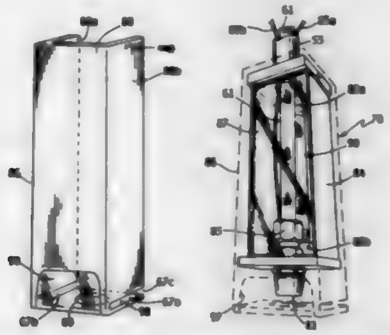
Donald L. Wilson, Crossville, Ill., and Jerry C. Trippe, Fairfax Station, Va., assignors to Elastec, Inc., Crossville, Ill.
PCT No. PCT/US90/04197, § 371 Date Feb. 24, 1992, § 102(e) Date Feb. 24, 1992, PCT Pub. No. WO91/05112, PCT Pub. Date Apr. 18, 1991
PCT Filed Jul. 26, 1990, Ser. No. 856,158
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.
Int. Cl.^{5} E02B *13/04*
U.S. Cl. 210—242.3 **2 Claims**



1. A device for removing oil from the surface of water comprising:
a frame having a front, a back, and two sides;
drum means mounted on said frame for rotation about an axis, said axis being parallel to the front of said frame;
a collection trough forming the front of said frame,
a reservoir trough spaced apart from the drum and forming the back of said frame, said drum means and said reservoir trough being proportioned and arranged to provide all of the buoyancy necessary to float said device on water in an oil-removing attitude;
blade means bearing against said drum means and arranged to direct oil from said drum means into said collection trough;
motive means arranged to drive said drum means in a direction whereby oil floating on water is drawn backwardly beneath the drum means;
and channel means extending between said collection trough and said reservoir trough.

5,316,673
SPOUT ASSEMBLY FOR SELF-SERVICE PURIFIED WATER DISPENSER

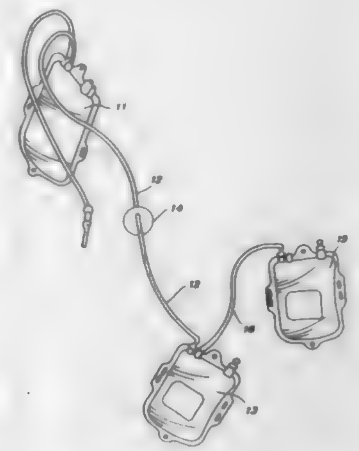
Michael J. Kohlmann, and Randall K. Williams, both of Edina, Minn., assignors to Harmony Brook, Inc., Burnsville, Minn.
Filed Mar. 11, 1992, Ser. No. 849,210
Int. Cl.^{5} C02F *1/32*
U.S. Cl. 210—251 **6 Claims**



1. An apparatus for self-service delivery of purified water to consumers, containing a source of water, means for purifying the water, and means for delivering purified water to a container through a dispensing nozzle housed in a dispensing spout assembly, said dispensing spout assembly comprising:
a conduit transparent to ultraviolet light, containing an inlet, at an upper end thereof, for receiving purified water, and an exit, at a bottom end thereof, fluidly connected to said dispensing nozzle;
means for irradiating water within said conduit with ultraviolet light of sufficient wavelength and intensity to destroy substantially all microorganisms therein;
an outer enclosure, encompassing said conduit and said dispensing nozzle, said outer enclosure containing a front panel, two side panels, and a bottom panel, said bottom panel being an extension of said front panel and positioned generally perpendicular to said front panel and downwardly away from the two side panels, and also downwardly away from said dispensing nozzle, whereby purified water may exit from said dispensing spout assembly and whereby said dispensing nozzle may be protected from contact with contaminated objects;
an inner enclosure, substantially opaque to ultraviolet light, encompassing said conduit and said irradiating means on three sides along the length of said conduit, said inner enclosure being encompassed by said outer enclosure;
a glass plate, substantially opaque to ultraviolet light, attached to said inner enclosure to form a fourth side encompassing said conduit and said irradiating means along the length of said conduit, whereby a purifying treatment of ultraviolet irradiation may be applied to water in said dispensing spout assembly.

5,316,674
DEVICE FOR PROCESSING BLOOD FOR HUMAN TRANSFUSION

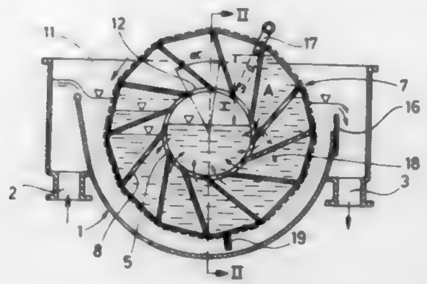
David B. Pall; Thomas C. Gsell, both of Glen Cove, and Brian T. Muellers, Rockville Centre, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.
Continuation of Ser. No. 609,574, Nov. 6, 1990, Pat. No. 5,152,905, which is a continuation-in-part of Ser. No. 405,977, Sep. 12, 1989, abandoned. This application Aug. 21, 1992, Ser. No. 933,309
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.^{5} B01D *29/00, 35/00*
U.S. Cl. 210—257.1 **9 Claims**



1. A device for the collection and processing of a blood product comprising a first container and at least one second container connected thereto, wherein a porous medium barring passage of red blood cells is interposed between the first container and the second container, the porous medium permitting platelets to pass therethrough until red blood cells block the porous medium.

5,316,675
ROTATABLE ANNULAR HOLLOW DISC FOR FILTERING LIQUIDS

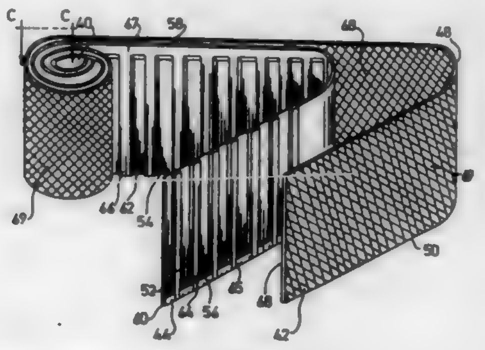
Rune Frykhult, Stockholm, Sweden, assignor to Ingeniorsfirman R. Frykhult AB, Stockholm, Sweden
PCT No. PCT/SE91/00113, § 371 Date Jun. 30, 1992, § 102(e) Date Jun. 30, 1992, PCT Pub. No. WO91/12066, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 18, 1991, Ser. No. 861,983
Claims priority, application Sweden, Feb. 16, 1990, 9000571
Int. Cl.^{5} B01D *33/23*
U.S. Cl. 210—327 **3 Claims**



1. An apparatus for filtering liquid, such as fiber pulp suspensions, comprising:
at least one rotatable annular hollow filter disc with two opposed side walls of filter material adapted to be at least partly immersed in a body of a liquid to be filtered;
a plurality of circumferentially spaced support arms extending within the hollow filter disc, the side walls of filter material being supported by the support arms; and
at least one support member extending substantially circumferentially along each side wall of filter material of the filter disc, each support member being attached to the support arms and comprising a single piece of wire extending around the center of the filter disc, the side wall of filter material being supported between the support arms by the wire support member, wherein the wire support member on each side of the filter disc extends in a spiral around the center of the filter disc.

5,316,676
COILED FILTER STRIP WITH UPSTREAM AND DOWNSTREAM BUTT ENDS

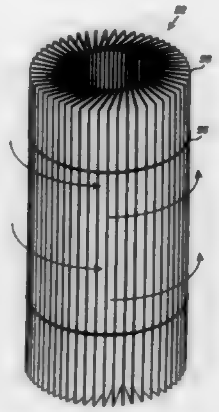
Mordeki Drori, P.O.B. 21538, Tel Aviv, Israel
Continuation of Ser. No. 567,638, Aug. 15, 1990, Pat. No. 5,174,895, which is a continuation of Ser. No. 297,496, Jan. 17, 1989, Pat. No. 5,015,379. This application Dec. 28, 1992, Ser. No. 997,172
Claims priority, application Israel, Mar. 16, 1988, 85762
The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.
Int. Cl.^{5} B01D *27/07*
U.S. Cl. 210—411 **21 Claims**



1. A filter element, comprising:
at least one filter strip having first and second lengthwise-extending edges, said at least one filter strip being rolled in close engagement to form a coil having a longitudinal axis, the first and second edges of said coiled at least one filter strip forming first and second ends of said coil, one of the ends of said coil defining the inlet end of said coil and the inlet edge of said filter strip during filtering operation, receiving fluid to be filtered, and the other of the ends of said coil defining the outlet end of said coil and the outlet edge of said at least one filter strip during filtering operation, through which filtered fluid leaves the coil strip;
said at least one filter strip having at least a first and a second surface, said first surface having a continuous protrusion of generally undulating configuration and said second surface being substantially free of protrusions, such that when said at least one filter strip is coiled, said first and second surfaces are brought together in close engagement and define therebetween upstream and downstream extending chambers separated by said protrusions, said upstream extending chambers opening at the inlet end of said coil and said downstream extending chambers opening at the outlet end of said coil,
the ridge of said protrusion on said first surface and the face of said second surface being configured such that when in contact with one another, filter pathways of predetermined size are created extending between said upstream and downstream extending chambers for fluid flow from the upstream chambers to the downstream chambers and for accumulation of particles of larger size than said pathways in said upstream extending chambers during filtering operation.

5,316,677
PLEATED FILTERING SLEEVE FOR ROTATIONAL FLOW FILTER SYSTEMS

Harold H. Harms, II, Palm Beach Gardens, Fla., assignor to Harmsco, Inc., Riviera Beach, Fla.
Continuation-in-part of Ser. No. 695,404, May 3, 1991, Pat. No. 5,174,896, which is a continuation-in-part of Ser. No. 543,326, Jun. 25, 1990, Pat. No. 5,196,119. This application Jul. 23, 1992, Ser. No. 918,236
Int. Cl.^{5} B01D *27/06*
U.S. Cl. 210—455 **2 Claims**



1. A filter cartridge for use in a filtering system, said filtering system having an inlet chamber surrounding the filter cartridge and an outlet chamber in fluid communication with an interior portion of the filter cartridge, said cartridge comprising;
pleated filter media having a series of pleats arranged to slant in a slant direction opposite a flow direction in the inlet chamber, wherein each pleat is formed by a first pleat leg adjacent in the slant direction to a second pleat leg, each pleat slanting up to 30° relative to a line transversed to a periphery of the filter cartridge, wherein the spacing between each pleat expands towards the periphery of the filter cartridge.

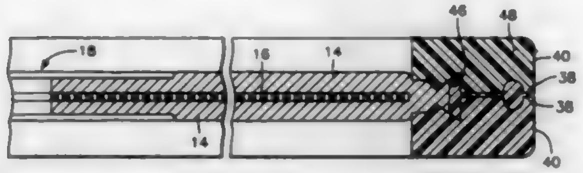
5,316,678
FILTER CELL SEAL ASSEMBLY

Herbert F. Heaslip, Cottekill, N.Y., assignor to Stavo Industries, Inc., Kingston, N.Y.

Filed May 13, 1992, Ser. No. 882,416

Int. Cl.^{5} B01D *29/39*

U.S. Cl. 210—486 **10 Claims**



1. A filter cell comprising:

two identical edge seal rings,

at least two filter media disc covers located between said two edge seal rings with a support member interposed between said at least two filter media disc covers,

each edge seal ring including a radially innermost ridge, a radially outermost ridge and a central ridge located between said radially innermost ridge and said radially outermost ridge, said respective central ridges being welded to each other to secure said two filter media cell covers between said two edge seal rings.

5,316,679
ELUTION OF ANTIMONY FROM SOLID PHASES USING CONCENTRATED SULFURIC ACID CONTAINING DILUTE HYDROCHLORIC ACID

Ronald L. Bruening, Salt Lake City, Utah, assignor to IBC Advanced Technologies, Inc., Provo, Utah

Filed May 13, 1993, Ser. No. 61,488

Int. Cl.^{5} B01D *15/04*

U.S. Cl. 210—634 **16 Claims**

1. A method for the removal of antimony ions from solid phases having an affinity for antimony ions which comprises,

(a) contacting said solid phase having said antimony ions affixed thereto with an aqueous eluent solution comprising a mixture of a concentrated solution of sulfuric acid and a dilute solution of hydrochloric acid thereby quantitatively stripping antimony ions from the solid phase and

(b) removing said eluent containing said antimony ions from contact with said solid phase.

5,316,680
MULTIMODAL CHROMATOGRAPHIC SEPARATION MEDIA AND PROCESS FOR USING SAME

Jean M. J. Frechet; Frantisek Svec, and Vladimir Smigol, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 21, 1992, Ser. No. 964,404

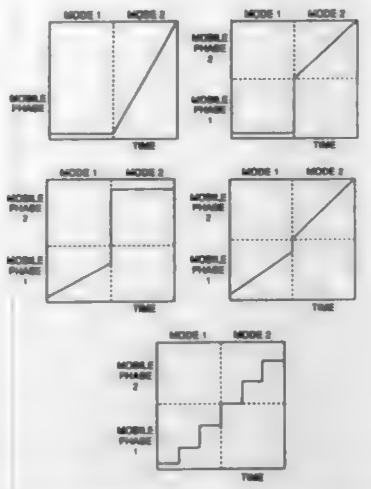
Int. Cl.^{5} B01D *15/08*

U.S. Cl. 210—635 **21 Claims**

1. A process for separating different molecules from a sample containing at least two different molecules comprising:

(1) adding the sample to a chromatographic column containing a separation medium, said separation medium comprising a porous material having at least two different ranges of pore size with each pore size range containing a different surface group having a different functionality as compared to the surface group in the other pore size range,

(2) using the different surface groups within the different pore size ranges, to separate the different molecules from each other and the sample, said separation being carried out using at least 2 modes of chromatographic separation in a consecutive manner so as to separate during each mode of chromatographic separation a different molecule from the sample.



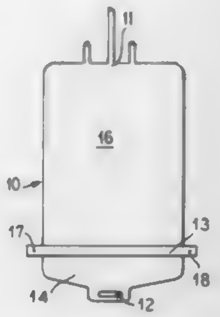
5,316,681
METHOD OF FILTERING BODY FLUID USING A RINSE CHAMBER BAG

Margaret Serres, Wauconda, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Nov. 6, 1992, Ser. No. 972,702

Int. Cl.^{5} B01D *37/00, 61/00*

U.S. Cl. 210—645 **12 Claims**



1. A method for filtering a body fluid comprising the steps of:

isolating a volume of solution in a first chamber of a container;

collecting a body fluid in a second chamber of the container;

passing the body fluid through a filter; and

rinsing the filter with the isolated volume of solution.

5,316,682
GAS MICRONIZER AND PURIFICATION SYSTEM AND RELATED METHODS

Gene E. Keyser, and Ellis O. Barnes, both of Jacksonville, Fla., assignors to Key Solutions, Inc., Jacksonville, Fla.

Filed Mar. 25, 1993, Ser. No. 37,993

Int. Cl.^{5} B01D *61/00*

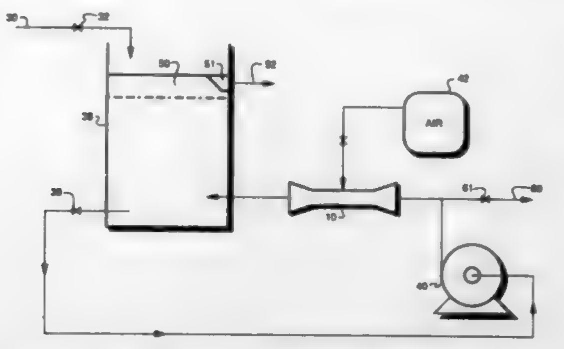
U.S. Cl. 210—649 **35 Claims**

28. A method of treating a liquid contained in a vessel, the method comprising the steps of:

a. providing a porous membrane having a surface and an average pore size less than one micron;

b. withdrawing liquid from the vessel;

c. causing relative movement between the withdrawn liquid and the surface of the membrane to achieve a relatively velocity therebetween of at least 10 ft/sec;



d. returning the liquid into the vessel, and

e. maintaining quiescent conditions within the vessel.

5,316,683
METAL EXTRACTION BY ION EXCHANGE

Guy G. Haesebroek, Mortsel, and Achille J. De Schepper, Lichtaart, both of Belgium, assignors to n.v. Union Miniere s.a., Marcinelle, Belgium

PCT No. PCT/BE91/00027, § 371 Date Oct. 8, 1992, § 102(e) Date Oct. 8, 1992, PCT Pub. No. WO91/17274, PCT Pub. Date Nov. 14, 1991

PCT Filed Apr. 3, 1991, Ser. No. 937,899

Claims priority, application Belgium, Apr. 27, 1990, 9000459

Int. Cl.^{5} C22B *3/00;* **B01J** *45/00*

U.S. Cl. 210—688 **30 Claims**

1. Process for extracting at least one metal selected from the group consisting of Ge, Ga, In, As, Sb, Bi, Pt, Pd, Ni and Co from an acid aqueous solution containing said at least one metal, comprising contacting the acid aqueous solution with a solid ion exchanger at a pH at which the ion exchanger absorbs said at least one metal, said ion exchanger being the reaction product of a carrier material that has been obtained by amidoalkylation of a crosslinked styrene-copolymer and subsequent hydrolysis of the amidoalkylation product, with

(a) an aldehyde and

(b) 8-hydroxyquinoline and/or an 8-hydroxyquinoline derivative, and optionally

(c) a swelling agent and/or a solvent.

5,316,684
PROCESS FOR REDUCTION OF HEXAVALENT CHROMIUM

John L. Morico, 268 Willow St., Hew Haven, Conn. 06511

Continuation-in-part of Ser. No. 563,840, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 357,881, May 30, 1989, abandoned. This application Sep. 19, 1991, Ser. No. 762,643

Int. Cl.^{5} C02F *1/70, 9/00*

U.S. Cl. 210—757 **6 Claims**

1. A process for reducing hexavalent chromium in aqueous solution containing cyanide or cyanide compounds, comprising the steps of:

(a) adding to said solution, in at least the stoichiometric amount for reaction with all the cyanide present, at least one material selected from the group consisting of an aldehyde and water-soluble bisulfite addition reaction product compounds of the aldehyde;

(b) supplying an acid to the reaction mixture in an amount sufficient to accelerate release of the cyanide from said cyanide compounds;

(c) reacting said selected material and said cyanide until said cyanide has been converted into nontoxic materials;

(d) adding a peroxide compound in an amount sufficient to reduce said hexavalent chromium to trivalent chromium; and

(e) reacting said peroxide and said hexavalent chromium until said hexavalent chromium has been reduced to trivalent chromium.

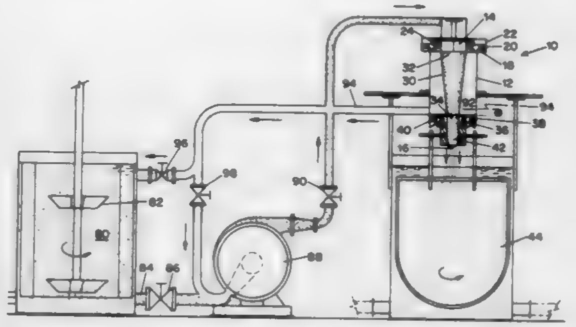
5,316,685
METHOD AND APPARATUS FOR SEPARATING SOLIDS FROM LIQUID CONTAINING SAME

Peter Stein, Caracas, Venezuela, assignor to Grana, Inc., New York, N.Y.

Filed Jul. 30, 1992, Ser. No. 922,997

Int. Cl.^{5} B01D *21/26*

U.S. Cl. 210—787 **7 Claims**



1. A method of continuously separating solids from liquid in a liquid-solid slurry comprising:

continuously rotating a separator mesh having a frusto-conical shape having a top and bottom with upwardly diverging mesh walls having inner and outer sides, extending from the top to the bottom, a top inlet, a bottom outlet and a generally open center generally about its central axis, said axis being arranged generally vertically, said mesh having a mesh clearance smaller than the size of the solids;

wiping tangentially the inner side of the mesh wall of the separator mesh during rotation with a stationary wiper; and

introducing a liquid-solid slurry into the center of the rotating separator mesh;

creating a squeezing pressure differential between the inside of the mesh and the outside of the mesh by pumping the slurry under pressure into the inside of the mesh and suctioning the liquid out of the outside of the mesh;

whereby the pressure differential will cause rotation of the mesh, which with the wiping action of the inner mesh wall during continuous rotation and the force of gravity on the slurry, will cause liquid to pass through the mesh and solids to pass through the bottom outlet of the separator mesh.

5,316,686
PERFLUOROALKYLETHER TERTIARY ALCOHOLS

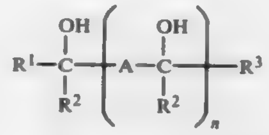
Carl E. Snyder, Jr., Trotwood; Lois J. Gschwender, Kettering; Kalathil C. Eapen, and Grace J. Chen, both of Fairborn, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Wright-Patterson Air Force Base, Ohio

Filed Jan. 11, 1993, Ser. No. 3,064

Int. Cl.^{5} C10M *131/10*

U.S. Cl. 252—54 **5 Claims**

1. Perfluoroalkylether tertiary alcohols of the formula:



$$R^1-\underset{R^2}{\overset{OH}{C}}-\left(A-\underset{R^2}{\overset{OH}{C}}\right)_n-R^3$$

wherein R^1 and R^3 are perfluoroalkyl groups having from one to fifty carbon atoms or perfluoroalkylether groups having 2–50 carbon atoms and 1–49 oxygen atoms; R^2 is a perfluoroalkylether group having 3–50 carbon atoms and 1–48 oxygen atoms; A is a perfluoroalkylene group containing 2–30 carbon atoms or perfluoroalkyleneether groups having 2–30 carbon atoms and 1–29 oxygen atoms; and n is an integer having a value ranging from zero to ten; and wherein said alcohol contains at least 12 carbon atoms per molecule.

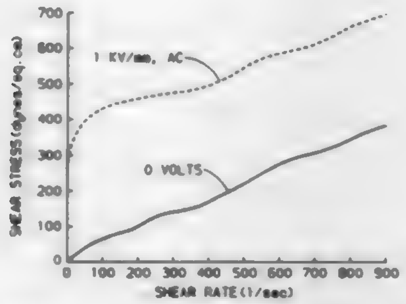
5,316,687
ELECTRORHEOLOGICAL COMPOSITIONS INCLUDING $A_{1+x}ZR_2SI_xP_{3-x}O_{12}$

Raymond L. Bloink, Swartz Creek, and Bob R. Powell, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1991, Ser. No. 702,973

Int. Cl.^{5} C10M *171/00, 169/04*

U.S. Cl. 252—71 **7 Claims**



1. An electrorheological composition comprising:
- a solid phase present in an amount ranging from about 5 to about 50 percent by volume of said composition comprising a material having the formula $A_{1+x}Zr_2Si_xP_{3-x}O_{12}$, where A is a monovalent ion, and X ranges from about 0 to about 3; and
- a liquid phase comprising a dielectric fluid, said composition being substantially free of water and effective to produce an electrorheological response in the presence of an electric field.

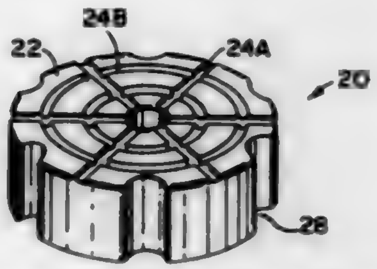
5,316,688
WATER SOLUBLE OR DISPERSIBLE FILM COVERED ALKALINE COMPOSITION

Elizabeth J. Gladfelter, Falcon Heights; Tina O. Outlaw, Inver Grove Heights; James L. Copeland; Rhonda K. Schulz, both of Burnsville; Daniel K. Boche, Eagan, and Jeff W. Peterson, Minnetonka, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed May 14, 1991, Ser. No. 699,688

Int. Cl.^{5} C11D *17/00*

U.S. Cl. 252—90 **55 Claims**



1. A multidose alkaline cleaning article comprising:
(a) a solid detergent composition having a pH greater than 10.5 when diluted to a 1 wt-% aqueous solution said detergent comprising a source of alkalinity, said alkalinity source selected from the group consisting of a silicate, an alkali metal hydroxide, a phosphate, a carbonate, and mixtures thereof; and
(b) a continuous multilayer polymeric film, dispersible or soluble in aqueous liquids, covering the solid detergent composition, said multilayer film comprising an inner alkaline pH stable and aqueous soluble film and an outer layer resistant to aqueous dissolution and effective in providing mechanical strength wherein said multilayer film remains mechanically stable and aqueous soluble or dispersible after exposure to the solid detergent composition.

43. A method of using a multidose alkaline cleaning article comprising:
(a) a solid detergent composition having a pH greater than 10.5 when diluted to a 1 wt-% aqueous solution said detergent comprising a source of alkalinity, said alkalinity source selected from the group consisting of a silicate, an alkali metal hydroxide, a phosphate, a carbonate, and mixtures thereof; and
(b) a continuous multilayer polymeric film, dispersible or soluble in aqueous liquids, said multilayer film covering the solid detergent composition and multilayer film comprising an inner alkali pH stable and aqueous soluble film and an outer layer resistant to aqueous dissolution and effective in providing mechanical strength wherein said film remains aqueous soluble or dispersible and mechanically stable after exposure to the solid alkaline detergent, said method comprising the step of applying water to said article to dissolve or disperse a portion of said polymer film and to contact said solid detergent to create a use-dilution solution.

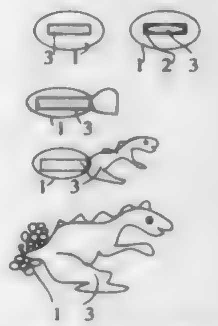
5,316,689
TOY SOAP CONTAINING COMPRESSED SPONGE WHICH POPS OUT DURING USE

Dennis A. Farrell, 33 Hollow Oak Rd., Chappaqua, N.Y. 10514

Filed Apr. 19, 1991, Ser. No. 687,275

Int. Cl.^{5} C11D *17/04*

U.S. Cl. 252—92 **6 Claims**



1. A novelty soap comprising a soap shell enclosing a supercompressed sponge novelty item which pops out when said soap shell has worn away sufficiently to allow water to dampen said sponge.

5,316,690
HYDROCHLOROFLUOROCARBONS HAVING OH RATE CONSTANTS WHICH DO NOT CONTRIBUTE SUBSTANTIALLY TO OZONE DEPLETION AND GLOBAL WARMING

Chien C. Li, Erie, N.Y., assignor to Allied Signal Inc., Morristownship, Morris County, N.J.

Continuation-in-part of Ser. No. 687,342, Apr. 18, 1991, Pat. No. 5,158,617. This application Aug. 16, 1991, Ser. No. 746,449

Int. Cl.^{5} C07C *19/08;* **C11D** *7/30, 7/50*

U.S. Cl. 252—172 **6 Claims**

1. A hydrochlorofluorocarbon having an OH rate constant between about 8 and about 25 cm^3/molecule/sec$\times$1-0^{--}selected from the group consisting of $CFH_2CFClCF_2H$,

$CF_2HCFHCFClH$, $CF_3CFHCClH_2$, CFH_2CFHCF_2Cl, and $CFClHCH_2CF_3$.

5,316,691
DETERGENT COMPOSITION CONTAINING AN ALKALINE PULLULANASE FROM BACILLUS FERM BP-3048

Taeko Sone; Masaki Tosaka; Katsuhisa Saeki; Katsutoshi Ara; Katsuhiko Deguchi, and Kazuaki Igarashi, all of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 681,007, Apr. 5, 1991, abandoned. This application Oct. 13, 1992, Ser. No. 960,262

Claims priority, application Japan, Apr. 5, 1990, 2-91179; Apr. 6, 1990, 2-91563

The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.

Int. Cl.^{5} C11D *1/00, 17/00, 3/00;* **C12N** *9/44*

U.S. Cl. 252—174.12 **2 Claims**

1. A detergent composition comprising 0.1–10 wt. % alkaline pullulanase B and 0.5–60 wt. % surfactant, wherein said alkaline pullulanase B has the following enzymological characteristics:

1) action

acts on pullulan and soluble starch to produce mainly maltotriose from pullulan and mainly maltotetraose and maltopentaose from soluble starch, and also acts on glycogen to produce maltotetraose and maltopentaose;

2) substrate specificity

acts on pullulan, soluble starch, and glycogen;

3) working pH and optimum pH range

the working pH on pullulan being in the range of 5–12 with an optimum pH in the range of 8.5–10, and the working pH on soluble starch being in the range of 4–12 with an optimum pH in the range of 7–9.5;

4) pH stability

stable in the pH range of 6–10.5 against pullulan, and in the pH range of 4–12 against soluble starch (treatment conditions: 45° C., 10 minutes);

5) working temperatures and optimum temperature Acts on pullulan and soluble starch at the temperature range of 10°–65° C. with an optimum temperature being about 50° C.;

6) thermal stability

quite stable up to 45° C. (treatment condition: in 10 mM glycine-NaCl-NaOH buffer solution, at pH 9.5 for 30 minutes);

7) Molecular weight

200,000±5,000 daltons as determined by sodium dodecylsulfate (SDS) electrophoresis;

8) effects of metal ions

pullulanase activities being adversely effected by Hg^{2+}, Mn^{2+} and Pb^{2+}, and α-amylase activities are adversely affected by Hg^{2+}, Mn^{2+}, Pb^{2+}, Zn^{2+} and Cd^{2+};

9) effects of surfactants

activities being scarcely adversely affected by surfactants such as linear alkylbenzene sulfonate, sodium polyoxyethylene alkyl sulfate, sodium α-olefin sulfonate, sodium α-sulfonated fatty acid ester, sodium alkyl sulfonate, sodium dodecyl sulfate, soaps and Softanol (trade-mark), said alkaline pullulanase B being produced by a process comprising culturing a microorganism producing an alkaline pullulanase which is named as Bacillus sp. KSM-AP 1378 deposited as FERM BP-3048, and isolating the alkaline pullulanase B from the cultured medium.

5,316,692
SILICONE CONTAINING HARD SURFACE SCOURING CLEANSERS

Vivian B. John, Sully, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed May 5, 1992, Ser. No. 878,600

Claims priority, application United Kingdom, Jun. 13, 1991, 9112748; Oct. 10, 1991, 9121488

Int. Cl.^{5} C11D *1/03, 1/66*

U.S. Cl. 252—174.15 **8 Claims**

1. A hard surface scouring, cleanser composition comprising at least one surfactant, an abrasive substance, an organosiloxane component and water characterised in that the organosiloxane component comprises both (A) a dimethylsiloxane having from 2 to 10 silicon atoms, and (B) a polydiorganosiloxane having at least one unit of the general formula $(CH_3)_nRSiO_{[3-n/2]}$ in which n is 1 and R represents a hydrocarbon group selected from alkyl groups having from 12 to 20 carbon atoms and the styryl group, any remaining units being those represented by the general formula $(CH_3)_mSiO_{[4-m/2]}$ in which m has a value of 2 or 3.

5,316,693
LIQUID CRYSTAL COMPOSITION AND INFORMATION DISPLAY APPARATUS USING THE LIQUID CRYSTAL COMPOSITION

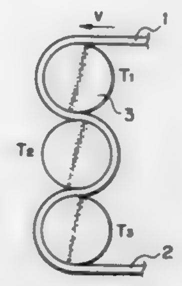
Kimihiro Yuasa; Motohisa Ido, and Ryusuke Watanabe, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1992, Ser. No. 866,343

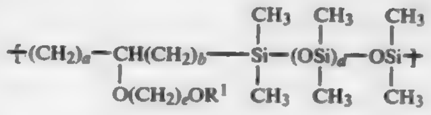
Claims priority, application Japan, Apr. 18, 1991, 3-112112

Int. Cl.^{5} C09K *19/52, 19/12, 19/20, 19/34*

U.S. Cl. 252—299.01 **12 Claims**



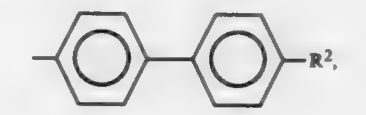
1. A liquid crystal composition, comprising: a liquid-crystalline copolymer selected from (a) a liquid-crystalline copolymer comprising a repeating unit represented by the following formula [I]

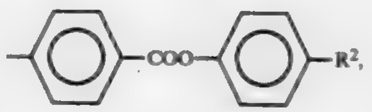

[I]

$$\left[(\mathrm{CH_2})_a-\underset{\mathrm{O(CH_2)_eOR^1}}{\mathrm{CH}}(\mathrm{CH_2})_b-\underset{\mathrm{CH_3}}{\overset{\mathrm{CH_3}}{\mathrm{Si}}}-(\mathrm{O}\underset{\mathrm{CH_3}}{\overset{\mathrm{CH_3}}{\mathrm{Si}}})_d-\mathrm{O}\underset{\mathrm{CH_3}}{\overset{\mathrm{CH_3}}{\mathrm{Si}}}\right] \quad [I]$$

wherein

each of a and b is an integer of 2 to 5, d is an integer of 0 to 3, e is an integer of 1 to 20, and R^1 is





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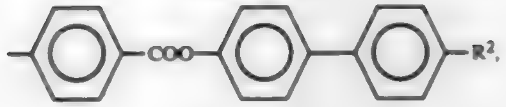
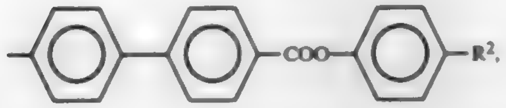
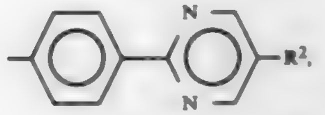
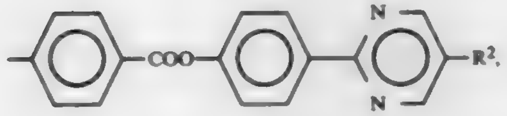
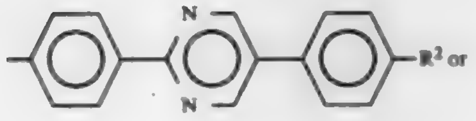
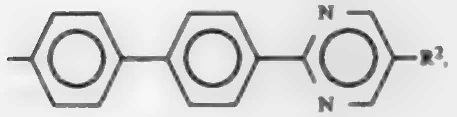




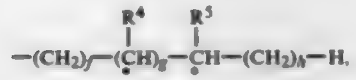








R^2 is $-COOR^3$, $-OR^3$ or $-OCOR^3$,
R^3 is

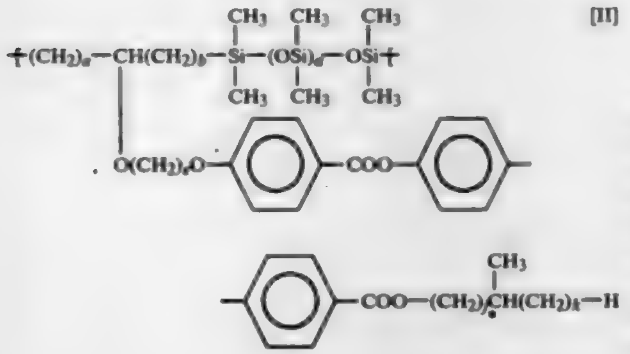


$$-(CH_2)_f-(\overset{R^4}{\underset{*}{C}}H)_g-\overset{R^5}{\underset{*}{C}}H-(CH_2)_h-H,$$

- * indicating an asymmetric carbon atom, each of R^4 and R^5 being methyl group or a halogen atom, f being an integer of 0 to 10, g being an integer of 0 or 1 and h being an integer of 1 to 11 with the proviso that when R^5 is methyl group, h is not an integer of 1,

and

(b) a liquid-crystalline copolymer comprising a repeating unit represented by the following formula [II] and a repeating unit represented by the following formula [III]



[II]

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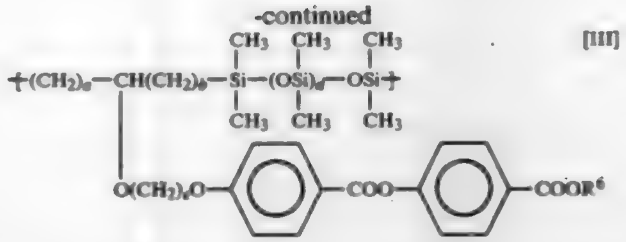
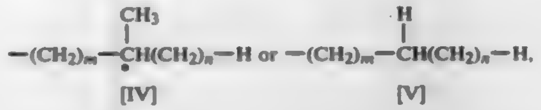


[III]

wherein

- *, a, b, d and e are as defined above, j is an integer of 0 to 3, k is an integer of 2 to 7, R^6 is an optically active group represented by the following formula [IV] or an optically inert group represented by the following formula [V]



$$-(CH_2)_m-\overset{CH_3}{\underset{*}{C}}H(CH_2)_n-H \text{ or } -(CH_2)_m-\overset{H}{C}H(CH_2)_n-H,$$

[IV] [V]

- * being as defined above, m being an integer of 0 to 3, and n being an integer of 2 to 7,

the repeating unit [II] and the repeating unit [III] being present in the liquid-crystalline copolymer (b) in a molar ratio [II]/[III] of 1/99 to 99/1;

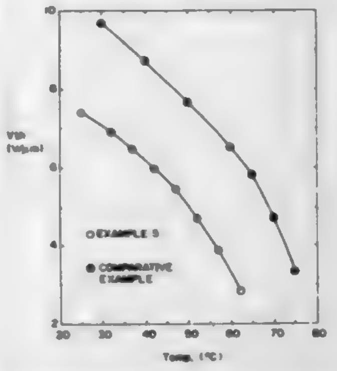
and a low molecular weight liquid-crystalline compound, the liquid crystal composition containing 5 to 99% by weight of the liquid-crystalline copolymer based on the total of the liquid-crystalline copolymer and the low molecular weight liquid-crystalline compound.

5,316,694

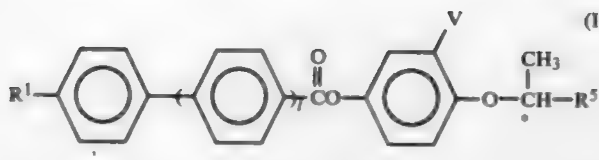
ANTIFERROELECTRIC LIQUID CRYSTAL COMPOSITION

Katsuyuki Murashiro; Makoto Kikuchi, and Shinichi Saito, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

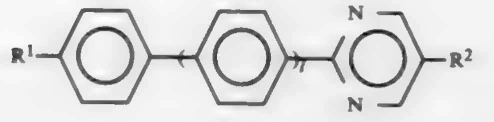
Filed Mar. 25, 1993, Ser. No. 36,882
Claims priority, application Japan, Mar. 27, 1992, 4-102041
Int. Cl.⁵ C09K *19/34, 19/52, 19/12;* **G02F** *1/13*
U.S. Cl. 252—299.61 **2 Claims**



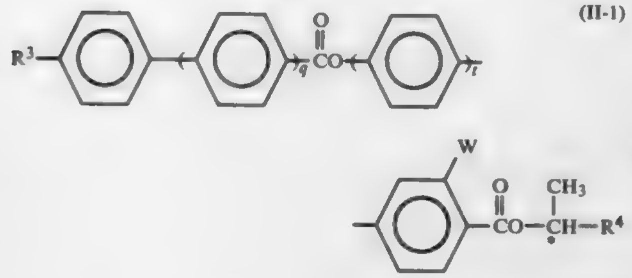
1. An antiferroelectric liquid crystal composition comprising at least three components, the first component of which is at least one compound selected from the group consisting of compounds expressed by the following formula (I-1) or (I-2) and having no antiferroelectric phase, the second component of which is at least one compound selected from the group consisting of compounds expressed by the following formula (II-1) and having an antiferroelectric phase, and the third component of which is at least one compound selected from the group consisting of compounds expressed by the following formula (II-2) and having an antiferroelectric phase, the mixing proportions of said first, second and third components being, by weight, 1to 30%, 30 to 94% and 5 to 40%, respectively;



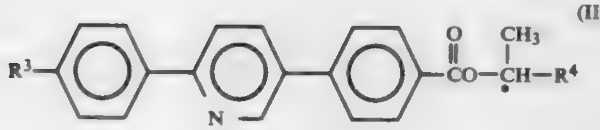
(I-1)



(I-2)



(II-1)



(II-2)

wherein R^1 represents a linear alkyl group or alkoxy group of 1 to 18 carbon atoms; R^2 represents an alkyl group or alkoxy group of 1 to 18 carbon atoms; R^3 represents a linear alkyl group or alkoxy group of 1 to 18 carbon atoms; R^4 represents an alkyl group or alkoxy group of 2 to 18 carbon atoms; R^5 represents an alkyl group or alkoxy group of 2 to 18 carbon atoms; V and W each independently represent a hydrogen atom, a halogen atom or a cyano group; l, q and t each represent 0 or 1, and a symbol * indicates an asymmetric carbon atom.

5,316,695

USE OF POLYMERIC CATALYST IN SYNTHESIS OF SOL-GEL DERIVED CERAMIC MATERIALS

Garth L. Wilkes, and Anthony B. Brennan, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Aug. 10, 1989, Ser. No. 392,189
Int. Cl.⁵ B01J *13/00;* **C03C** *3/06*
U.S. Cl. 252—315.6 **14 Claims**

8. A composition adapted to form a ceramic material via sol-gel synthesis which comprises a metal alkoxide and a catalytically effective amount of a polymeric catalyst for the sol-gel synthesis.

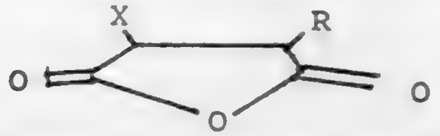
5,316,696

COMPOSITION

Bernard Tury, Manchester, England, assignor to Imperial Chemical Industries PLC, London

Filed Apr. 29, 1991, Ser. No. 692,862
Claims priority, application United Kingdom, Apr. 30, 1990, 9009625
Int. Cl.⁵ C10M *133/22;* **C23F** *11/14*
U.S. Cl. 252—394 **15 Claims**

1. A composition for protecting metals which comprises
(a) a liquid poly(oxyalkylene) glycol derivative obtained by alkoxylation of a mono-, di- or polyhydroxy compound; and
(b) A long chain anhydride selected from the group consisting of compounds having the following formula:



and a long chain of phthalic anhydride in which said long chain substituent is defined as R;

wherein
R is a long chain hydrocarbyl radical containing at least 6 carbon atoms which is linear or branched, saturated or unsaturated, having a molecular weight of at least 100;
X is hydrogen alkyl, aryl, alkoxy or aryloxy group;
wherein component (b) is present from 0.01 to 30% by weight of the composition.

5,316,697

CONDUCTIVE, PARTICULATE, FLUORINE-DOPED ZINC OXIDE

Bruce R. Palmer, and James W. Kauffman, both of Edmond, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 24, 1993, Ser. No. 36,528
Int. Cl.⁵ H01B *1/06;* **C23C** *16/00*
U.S. Cl. 252—518 **16 Claims**

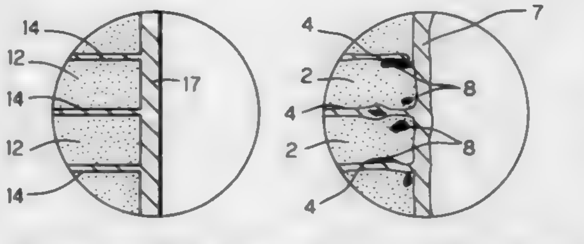
1. A process for forming a conductive, particulate, fluorine-doped, zinc oxide product which is doped throughout, said process comprising the step of reacting vapor phase reactants in a vapor phase oxidation system at a temperature sufficient to form said conductive, particulate, fluorine-doped, zinc oxide product which is doped throughout, said vapor phase reactants consisting essentially of:
elemental zinc vapor;
at least one fluorine source; and
at least one water source.

5,316,698

COPPER PASTE FOR INTERNAL CONDUCTOR OF MULTILAYER CERAMIC ELECTRONIC COMPONENT

Hiroji Tani, and Kazuhito Ohshita, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 11, 1993, Ser. No. 2,620
Claims priority, application Japan, Jan. 9, 1992, 4-21919
Int. Cl.⁵ H01B *1/00, 1/02*
U.S. Cl. 252—512 **5 Claims**



1. Copper paste for an internal conductor of a multilayer ceramic electronic component, comprising copper powder having a mean particle size of 0.5 to 2 μm and particle size range of 0.3 to 4 μm, an organic vehicle and a solvent, said copper powder being 40 to 60 percent by weight of said copper paste and said organic vehicle and solvent being 60 to 40 percent by weight of said copper paste.

5,316,699

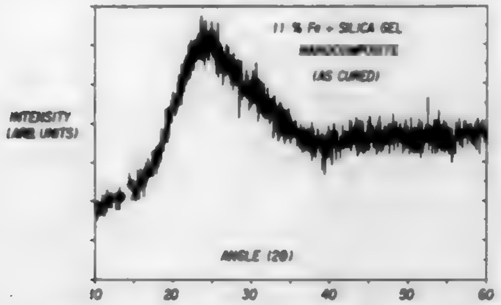
PROCESS FOR THE CONTROLLED PREPARATION OF A COMPOSITE OF ULTRAFINE MAGNETIC PARTICLES HOMOGENEOUSLY DISPERSED IN A DIELECTRIC MATRIX

Joseph J. Ritter, Mt. Airy, and Robert D. Shull, Boyds, both of Md., assignors to The United States of America as repesented by the Secretary of Commerce, Washington, D.C.

Filed Mar. 28, 1990, Ser. No. 501,981

Int. Cl.^{5} G02B *5/20;* **B01J** *13/00;* **C08L** *83/00*

U.S. Cl. 252—584 **17 Claims**



1. A process for synthesizing a bulk material having magnetic particles dispersed in an non-magnetic matrix, comprising the steps of:

- a) polymerizing silicon alkoxide in solution with at least one iron compound to form a gel;
- b) curing said gel to form a porous hydrolyzed silicon product which contains iron;
- c) subsequently contacting the porous hydrolyzed silicon product with an oxidizing agent at a temperature below 400° C. to convert said iron to a ferrimagnetic state; and
- d) after exposing said product to said oxidizing agent, contacting said product with a reducing agent to convert said iron to a paramagnetic state, wherein said reducing agent is hydrogen gas and water.

9. A process for synthesizing a bulk material having magnetic particles dispersed in an non-magnetic matrix, comprising the steps of:

- a) polymerizing silicon alkoxide in solution with at least one iron compound to form a gel;
- b) curing said gel to form a porous hydrolyzed silicon product which contains iron;
- c) subsequently contacting the porous hydrolyzed silicon product with a reducing agent at a temperature below 400° C. to convert said iron to a superparamagnetic state; and
- d) after contacting said product with said reducing agent, contacting said product with a nitriding agent to convert said iron to a ferromagnetic state.

5,316,700

METHOD AND APPARATUS FOR REMOVING EXCESS LENS FORMING MATERIAL

Paul J. Soye, Evanston, Ill., and Samuel Loshaek, Longboat Key, Fla., assignors to Wesley-Jessen Corporation, Chicago, Ill.

Filed Nov. 2, 1992, Ser. No. 970,357

Int. Cl.^{5} B29D *11/00*

U.S. Cl. 264—1.1 **8 Claims**

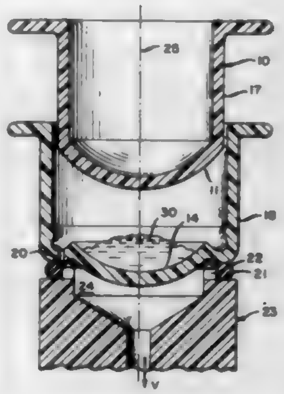
1. In a process for molding both sides of a contact lens comprising the steps of:

- a. providing a first mold half having a convex lens molding surface;
- b. providing a second mold half having a concave lens molding surface, said mold halves being matable to form a contact-lens-shaped cavity and an annular cavity surrounding the contact-lens-shaped cavity, the annular cavity having at least two openings in fluid communication with the environment outside the mated mold halves;
- c. depositing lens forming material on the concave lens forming surface in excess of the amount needed to fill the contact-lens-shaped cavity;
- d. mating the mold halves to form the contact-lens-shaped cavity filled with contact lens forming material and the annular cavity containing excess contact lens forming material; and
- e. curing the contact lens forming material to form a contact lens in the contact-lens-shaped cavity;

the improvement comprising:

- f. before the step e. curing is completed, producing differential gas pressure across the openings in the annular cavity to substantially remove the excess lens forming material from the annular cavity.

4. Apparatus for molding both sides of a contact lens comprising:



- a. a first mold half having a convex lens molding surface having a first axis and a first structure extending substantially parallel to said first axis;
- b. a second mold half having a concave lens molding surface having a second axis and a second structure extending substantially parallel to said second axis;
  said second structure being capable of enclosing at least part of said first structure, said mold halves being capable of mating to form a contact-lens-shaped cavity and an annular cavity having a bottom surrounding said contact-lens shaped cavity; and
- c. first and second openings in the annular cavity in fluid communication with the environment surrounding the mold halves when mated said first opening comprising space between the first and second structures and said second opening comprising a hole in the bottom of the annular cavity.

5,316,701

MULTIAXIS ROTATIONAL MOLDING PROCESS

LeRoy Payne, 3300 Nicholas La., Molt, Mont. 59057

Division of Ser. No. 707,656, May 30, 1991, Pat. No. 5,188,845, which is a continuation-in-part of Ser. No. 417,502, Oct. 5, 1989, Pat. No. 5,022,838, which is a continuation-in-part of Ser. No. 271,686, Nov. 16, 1988, Pat. No. 4,956,133, which is a continuation-in-part of Ser. No. 202,267, Jun. 6, 1988, Pat. No. 4,956,135, which is a continuation-in-part of Ser. No. 890,742, Jul. 30, 1986, Pat. No. 4,749,533, which is a division of Ser. No. 766,498, Aug. 19, 1985, Pat. No. 4,671,753. This application Sep. 24, 1992, Ser. No. 950,135

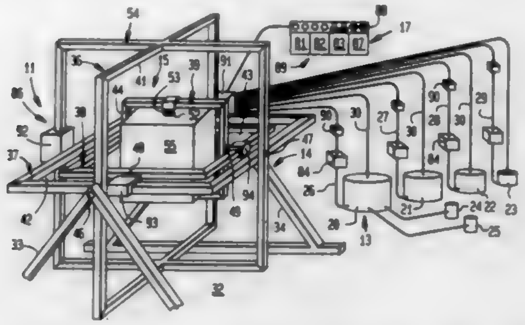
The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.^{5} B28B *1/02;* **B29C** *33/40, 45/00;* **B29D** *11/00*

U.S. Cl. 264—1.5 **3 Claims**

1. A method of continuously forming an integrally molded structure in a multiaxis rotational molding operation including the steps of rotating a multisection mold assembly about at least three axes, flowing a first freshly formed polymerizable mixture over surfaces of an enclosed mold cavity within said multisection mold assembly, monitoring said flowing of said

first mixture over said mold cavity surfaces and formation of a first resin therefrom through optical fibers extending through said mold sections, flowing a second freshly formed polymerizable mixture over said first resin formed within said mold cavity with said first mixture, monitoring said flowing of said second mixture and formation of a second resin therefrom through optical fibers extending through said mold sections, flowing a third freshly formed polymerizable mixture over said second resin formed within said mold cavity with said second mixture, monitoring said flowing of said third mixture and formation of a third resin therefrom through optical fibers extending through said mold sections, continuing said rotation of said multisection mold assembly throughout said steps of said continuous molding operation while monitoring individually each axis rotation of said multisection mold assembly, and coordinating said monitored flowing of each mixture and said monitored formation of each resin with each monitored axis rotation in a preselected profile to form said integrally molded structure of said first, second, and third resins, separating said mold sections of said multisection mold assembly after said integrally molded structure has achieved structural integrity within said mold cavity, removing said integrally molded structure from said separated mold sections and repeating said steps to form a multiplicity of said integrally molded structures of said first, second, and third resins on a continuing basis.



5,316,702

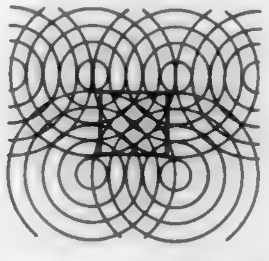
METHOD OF PRODUCING DURABLE BONDS BETWEEN AN OPTICAL PREFORM AND AN OPTICAL RESIN LAYER CAST ON THE PREFORM SURFACE

Ronald D. Blum, Roanoke, Va.; Amitava Gupta, San Marino, and Steve Bennington, Poway, both of Calif., assignors to InnoTech, Inc., Roanoke, Va.

Filed Jul. 20, 1992, Ser. No. 915,209

Int. Cl.^{5} B29D *11/00*

U.S. Cl. 264—1.7 **13 Claims**



1. A method of casting an ophthalmic optic comprising:

providing a mold, an optical preform and a polymerizable resin disposed between said mold and said optical preform, wherein said preform and said resin interact to produce a contact angle between said resin and said preform of from about 20 degrees to about 45 degrees; and

curing said polymerizable resin.

7. A method of casting an ophthalmic optic comprising:

providing a mold and an optical preform, said preform having a surface with a regular pattern of grooves, said regular pattern of grooves comprising a grid formed by intersecting curves or lines imprinted on said surface of said optical preform, said grid being formed by a series of repeating regions each completely bounded by said intersecting curves or lines, each region having an area between 0.0001 sq mm and 0.04 sq mm,

providing a polymerizable resin between said optical preform and said mold such that said polymerizable resin contacts said regular pattern of grooves on said optical preform; and

curing said polymerizable resin.

5,316,703

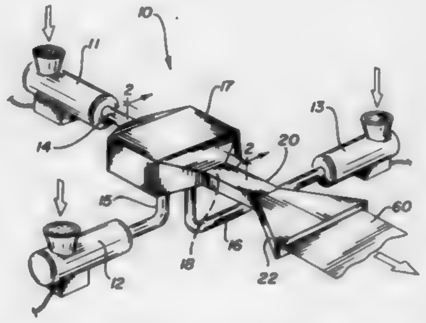
METHOD OF PRODUCING A LAMELLAR POLYMERIC BODY

Walter J. Schrenk, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 643,611, Jan. 22, 1991, Pat. No. 5,217,794. This application Jan. 19, 1993, Ser. No. 5,267

Int. Cl.^{5} B29C *47/06*

U.S. Cl. 264—1.3 **32 Claims**



1. A method for the production of a lamellar reflective polymeric body comprising the steps of:

providing a first stream of a first heat plastified polymeric material and a second stream of a second heat plastified polymeric material,

encapsulating discrete portions of said first polymeric material in said second polymeric material by coextruding said polymeric materials to form a plurality of ribbon-like layers of said first polymeric material within a matrix of said second polymeric material, thereby forming said reflective polymeric body, which ribbon-like layers are substantially continuous in a first plane parallel to one of the major surfaces of said body and discontinuous in a second plane transverse to said first plane,

and wherein said layers of said first polymeric material have their major interfaces aligned substantially parallel to the major surfaces of said body such that at least 30% of light incident on said body is reflected, the individual layers of said first polymeric material in said body, and those portions of said second polymeric material sandwiched between said individual layers of said first polymeric material, having an optical thickness of not more than 0.09 micrometers or not less than 0.45 micrometers, and wherein said first and second polymeric materials differ from each other in refractive index by at least about 0.03.

5,316,704

PROCESS FOR FABRICATING FULL SIZED EXPANSILE HYDROGEL INTRAOCULAR LENSES

Yading Wang, Arcadia; Stephen O. Zhou, Hacienda Heights, and Thomas P. Richards, Los Angeles, all of Calif., assignors to Kabi Pharmacia Ophthalmics Inc., Monrovia, Calif.

Filed Sep. 28, 1992, Ser. No. 951,775

Int. Cl.^{5} B29D *11/00*

U.S. Cl. 264—2.6 **15 Claims**

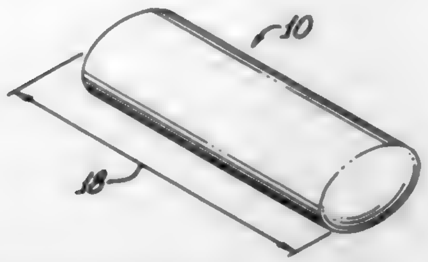
1. A process for fabricating expansile hydrogel intraocular

lenses having reduced size for small incision insertion, said process comprising the steps of:

providing a dehydrate hydrogel intraocular lens formed of hydrogel forming polymer;

deforming said dehydrate hydrogel intraocular lens to provide a deformed dehydrated hydrogel intraocular lens sufficiently reduced in size to insert through a 4 mm surgical incision; and

cooling said deformed dehydrated hydrogel intraocular lens to a temperature below said elastic deformation temperature of said hydrogel forming polymer, thereby freezing said deformed dehydrated intraocular lens at its reduced size, said deformed dehydrated hydrogel intraocular lens being capable of hydrating to a full size intraocular lens having an optical diameter of from about 6 mm to about 12 mm.



5,316,705
PROCESS FOR THE PRODUCTION OF CELLULOSE ESTER FIBRETS

Samuel S. McNair, Jr., Pembroke, and David M. Gault, Blacksburg, both of Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 627,082, Dec. 14, 1990, Pat. No. 5,175,276. This application Aug. 27, 1992, Ser. No. 936,430

The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.

Int. Cl.^{5} C08B *3/22, 3/26, 3/28;* **B29C** *67/24*

U.S. Cl. 264—5 **8 Claims**

1. A process for the production of fibrillar cellulose ester material, said fibrillar cellulose ester material produced thereby being substantially free of chips and pills, said process comprising the steps of:

providing a dope comprising a cellulose ester, a solvent for said cellulose ester, and a nonsolvent for said cellulose ester. said solvent and said nonsolvent being miscible;

attenuating said dope, under conditions of high shear, whereby a slurry of fibrillar cellulose ester material is formed;

thickening said slurry by the removal of a portion of said solvent and said nonsolvent; and

separating said solvent from said thickened slurry by directly contacting said thickened slurry with saturated steam provided from a non-autogenous source.

5,316,706
METHOD OF MANUFACTURING JOINTLESS CATHETER

Ketan P. Muni, San Jose, and Michael S. Williams, Cupertino, both of Calif., assignors to Advanced Cardiovascular Systems, Santa Clara, Calif.

Filed Aug. 5, 1992, Ser. No. 926,998

Int. Cl.^{5} B29C *35/12, 47/88*

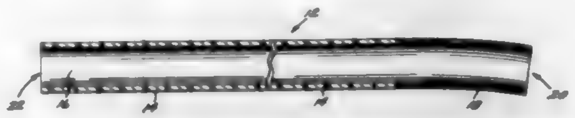
U.S. Cl. 264—25 **6 Claims**

1. A method for forming a jointless catheter having differentiated physical characteristics along its length, comprising the steps of:

selecting a cold-crystallizable thermoplastic material that is extrudable in its amorphous state;

extruding said material in the form of said catheter; and

causing selected portions of said catheter to undergo cold-crystallization whereby said portions that undergo cold-crystallization are rendered stiffer and more kink resistant and any portions not having undergone cold-crystallization remain relatively soft and pliable.



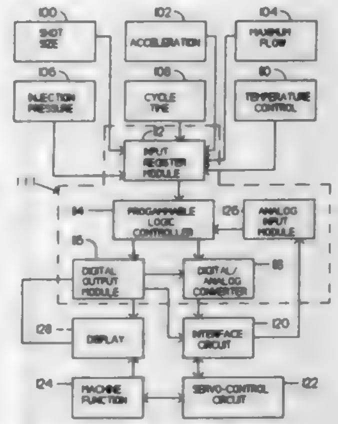
5,316,707
INJECTION MOLDING APPARATUS CONTROL SYSTEM AND METHOD OF INJECTION MOLDING

Virgil V. Stanciu, Rocky River; Jack R. Peshek, Avon Lake; Faurice D. Neece, Lyndhurst; Erik R. Kubulins, Strongsville, and Branko Logozar, Cleveland, all of Ohio, assignors to Tempcraft, Inc., Cleveland, Ohio

Filed Sep. 5, 1991, Ser. No. 755,150

Int. Cl.^{5} B29C *45/76*

U.S. Cl. 264—40.1 **28 Claims**



1. A process for molding patterns or parts from a fluid molding material using an injection molding apparatus having a source of fluid molding material and an injection ram acting to force said fluid molding material into a molding die under pressure, and a control means for initiating and controlling an injection cycle of said injection molding apparatus, comprising the steps of:

1) storing a die recipe in at least one memory means associated with a programmable logic controller forming a part of said control means, said die recipe defining an injection cycle for a particular molding die to be used in the injection molding process, wherein said die recipe includes predetermined values of variable process parameters of said injection cycle,

2) selecting a die recipe corresponding to a particular molding die from said memory means, wherein said die recipe is downloaded into said control means with said predetermined values of said variable process parameters being utilized by said programmable logic controller to generate control signals representative of desired values of said variable process parameters,

3) initiating an injection cycle wherein operation signals indicative of the actual values of said variable process parameters will be supplied to said control means, and

4) controlling said injection cycle by regulating the injection of said fluid molding material with said operation signals being driven toward equilibrium with said control signals such that said variable process parameters of said injection cycle simulate the predetermined values of said die recipe.

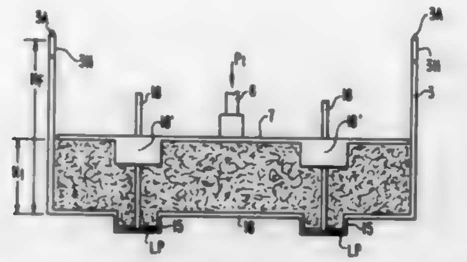
5,316,708
METHOD FOR MAKING PRODUCTS MADE FROM RECYCLED VEHICLE TIRES

Terence Drews, 130 Teton La. #8, Mankato, Minn. 56001

Continuation-in-part of Ser. No. 583,327, Sep. 17, 1990. This application Jan. 15, 1992, Ser. No. 821,937

Int. Cl.^{5} B29C *43/02*

U.S. Cl. 264—40.5 **17 Claims**



1. Process of making building block members comprising:

mixing liquid natural latex material with shredded vehicle tire parts to form an uncured mixture with the liquid natural latex substantially coating the tire parts,

placing a predetermined portion of the uncured mixture into a mold form,

applying a predetermined pressure to the portion of the uncured mixture in the mold form to compress the same to a predetermined level within the mold form,

maintaining the predetermined pressure and level of the portion of the uncured mixture for a predetermined time period during which the latex cures and hardens to form a building block member from the mixture.

5,316,709
METHOD OF MAKING A DIPPER STICK FOR AN EXCAVATOR FROM HIGH STRENGTH POLYMERIC COMPOSITE MATERIALS

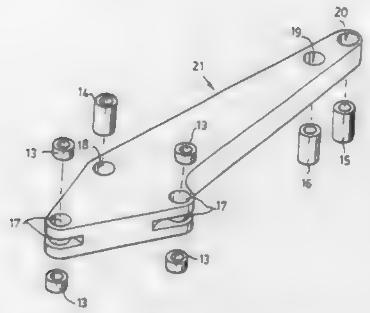
Jae I. Ko; Jae W. Lee; Yoon M. Lee; En J. Jean; Chun K. Kim, and Jin Kim, all of Changwon, Rep. of Korea, assignors to Samsung Heavy Industries Co., Ltd., Rep. of Korea

Division of Ser. No. 728,100, Jul. 10, 1991, Pat. No. 5,245,770. This application Dec. 11, 1992, Ser. No. 963,564

Claims priority, application Rep. of Korea, Jul. 13, 1990, 90-10658; Jun. 22, 1991, 91-10418

Int. Cl.^{5} B29C *67/20*

U.S. Cl. 264—51 **10 Claims**



1. A manufacturing method for a dipper stick comprising a box shaped structure including an outer casing member formed of a high strength polymeric composite material, and an inner filler comprising polyurethane foam and disposed inside said outer casing member in order to be integrated with said outer casing member, and a plurality of bushing holders made of polymeric composite material and disposed at respective connecting portions of said box shaped structure in order to be integrated with said box shaped structure, said dipper stick connected at said respective connecting portions to a bucket, a boom, dipper and bucket cylinders and a link, respectively, said manufacturing method comprising the steps of:

forming each said bushing holder by a filament winding process and forming said inner filler comprising said polyurethane foam;

assembling each said bushing holder with said inner filler in order to provide a first assembly; and

arranging said first assembly in a cavity of a mold of a resin transfer molding system, and then forming said outer casing member of said box shaped structure by a resin transfer molding process in which liquid polymeric composite material is transferred to said mold and a curing treatment is carried out.

5,316,710
PROCESS FOR PRODUCING CERAMIC HONEYCOMB STRUCTURAL BODIES

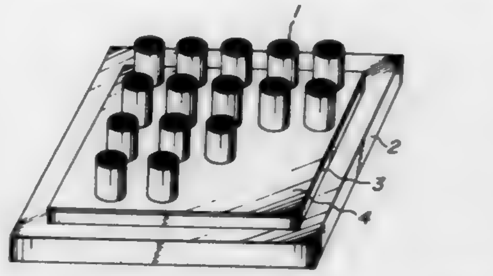
Yuji Tasaki, Nagoya, and Yukihisa Wada, Aichi, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 21, 1992, Ser. No. 947,468

Claims priority, application Japan, Sep. 30, 1991, 3-251658

Int. Cl.^{5} C04B *33/32*

U.S. Cl. 264—57 **3 Claims**



1. A process for producing a ceramic honeycomb structural body, comprising the steps of:

placing a green ceramic honeycomb structural body on a ceramic plate in a state that a cell-open end face of the honeycomb structural body contacts the ceramic plate, said ceramic plate being composed mainly of heat-resistive inorganic fibers and having a bulk density of not less than 1.00 g/cm^3, the ceramic plate having one of a cordierite coating layer and mullite coating layer formed on a surface thereof; and

firing the green ceramic honeycomb structural body.

5,316,711
PROCESS FOR PRODUCING ARTICLES FROM POLYMERS CONTAINING AROMATIC IMIDE LINKAGES

James L. Throne, 158 Brookside Blvd., Hinckley, Ohio 44233-9676

Filed Apr. 20, 1993, Ser. No. 50,543

Int. Cl.^{5} B29C *67/24*

U.S. Cl. 264—68 **44 Claims**

1. A process for producing shaped or molded articles made of polymer particles containing aromatic imide linkages, said process comprising the steps of:

(a) introducing said polymer particles into heating means for heating said polymer particles, said heating means comprising an enclosed chamber having a rotatable blade therein;

(b) heating said polymer particles to a forming temperature by rotating said blade in said chamber;

(c) discharging said polymer particles into a shaping device; and

(d) pressurizing said polymer particles in said shaping device until said polymer particles consolidate into the shape of said shaping device.

5,316,712
PROCESS FOR PRODUCING SOLID COSMETICS

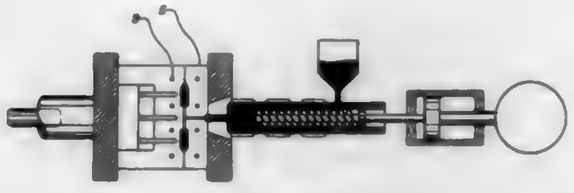
Atsushi Ono, Tokyo; Yasumasa Oki, Tokorozawa, and Jugoro Okumura, Tokyo, all of Japan, assignors to JO Cosmetics Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1992, Ser. No. 964,023

Claims priority, application Japan, Apr. 3, 1992, 4-125297

Int. Cl.⁵ B29C *45/47, 45/53;* **B29K** *91/00*

U.S. Cl. 264—102 **4 Claims**



1. A process of producing a solid cosmetic by molding, comprising continuously repeating the steps of feeding a cosmetic base containing a powder and an oil as main ingredients into a heating cylinder from a hopper, said heating cylinder incorporating a screw or a plunger therein, causing said cosmetic base to be heated and then injected into a clamped single- or plural-cavity mold by a forward movement of the screw or the plunger, and cooling the thus-injected cosmetic base to solidify in the mold.

5,316,713
RUBBER TUBE MANUFACTURE, WITH FILM LAMINATE OVERWRAP

Edward Koster, Mississauga, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Aug. 26, 1992, Ser. No. 935,319

Int. Cl.⁵ B29C *41/00;* **B29D** *23/22*

U.S. Cl. 264—209.1 **17 Claims**

1. A process for the manufacture of tubular rubber articles comprising:

a) forming a tube of uncured rubber on a mandrel;

b) wrapping the tubular rubber by winding with a film laminate comprising

i) at least one layer of a heat stabilized, oriented nylon film having a thickness of from 13 to 50 μm and having a shrinkage of 2 to 10% in the machine direction, laminated to

ii) at least one heat stabilized film selected from the group consisting of

(A) an oriented nylon film having a thickness of from 13 to 50 μm and having a shrinkage of 2 to 10% in the machine direction, and

(B) a cast nylon film having a thickness of from 15 to 155 μm and having a shrinkage of 0.5 to 1.5% in the machine direction;

c) curing the rubber at an elevated temperature;

d) cooling the tube; and

e) removing the film laminate from the tube.

5,316,714
METHOD OF IMPROVING SLIPPERINESS OF POLYESTER FILM USING A MONODISPERSED GLYCOL SUSPENSION OF INORGANIC OXIDE PARTICLES

Tadahiro Yoneda, Ibaraki; Saburo Nakahara, Takatsuki; Mitsuo Takeda, Suita, and Midori Kamo, Nishinomiya, all of Japan, assignors to Nippon Shokujai Kagaku Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 21,791, Mar. 4, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 322,185

Claims priority, application Japan, Mar. 7, 1986, 61-48456; Sep. 12, 1986, 61-213725; Sep. 25, 1986, 61-224838; Jan. 22, 1987, 62-11248

Int. Cl.⁵ B29C *47/00*

U.S. Cl. 264—210.6 **15 Claims**

1. In a method for improving the slipperiness of a polyester film which comprises using a glycol slurry of fine inorganic oxide particles as a raw material for polyester film formation and preparing a film containing 0.005 to 2% by weight, based on the polyester, of the fine particles, the improvement wherein the glycol slurry of the fine particles is a monodispersed suspension in a glycol of spherical fine particles of an amorphous inorganic oxide having an average particle diameter of 0.05 to 5 micrometers and a relative particle size standard deviation of 1.0 to 1.5 and containing glycol bonded to surfaces of the spherical fine particles.

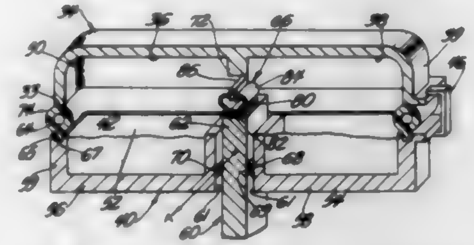
5,316,715
METHOD AND APPARATUS FOR PRODUCING MULTI-COLOR SHELLS UTILIZING AN INDEXING DIVIDER MOLD

John D. Gray, Union, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed May 8, 1992, Ser. No. 881,724

Int. Cl.⁵ B29C *39/12, 41/18*

U.S. Cl. 264—245 **13 Claims**



1. A method of molding a single-piece multi-color plastic shell, the method including the steps of:

heating an open-ended mold to a temperature near a fusing temperature of a plastisol material,

disposing the mold vertically above charge box means having at least two color plastisol sources and having an extendable and movable divider wall between the two color plastisol sources;

moving the mold against the charge box means in a predetermined draw direction,

connecting the charge box means to the mold to form a closed system with the divider wall separated from the mold,

moving and extending the divider wall relative to the charge box means to contact the mold and separate the mold into first and second color casting surfaces,

thereafter rotating the charge box means and mold in a powder casting sequence to concurrently release plastisol charges of separate colors onto each casting surface by gravity to build up a single piece multi-color plastic shell of desired shape and size on the casting surfaces of the mold.

5,316,716
MOLD RELEASING RESIN COMPOSITION AND MOLDING OF CURABLE RESIN USING THE SAME

Shinichi Sato; Morio Oohasi, and Hiroshi Inomata, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

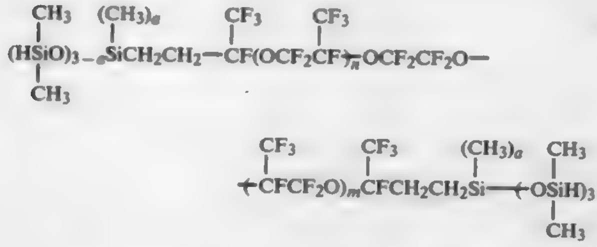
Filed Jun. 12, 1992, Ser. No. 897,385

Claims priority, application Japan, Jun. 12, 1991, 3-168856

Int. Cl.⁵ B29C *33/58, 33/64*

U.S. Cl. 264—338 **20 Claims**

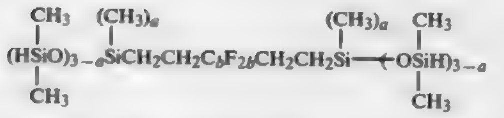
1. A mold releasing composition comprising at least one compound represented by formula (1) or (2):



(1)

$$\underset{CH_3}{\overset{CH_3}{(HSiO)}}_{3-a}\overset{(CH_3)_a}{Si}CH_2CH_2-\overset{CF_3}{CF}(OCF_2\overset{CF_3}{CF})_nOCF_2CF_2O-$$

$$-(\overset{CF_3}{CF}CF_2O)_m\overset{CF_3}{CF}CH_2CH_2\overset{(CH_3)_a}{Si}-(\underset{CH_3}{\overset{CH_3}{OSiH}})_{3-a}$$



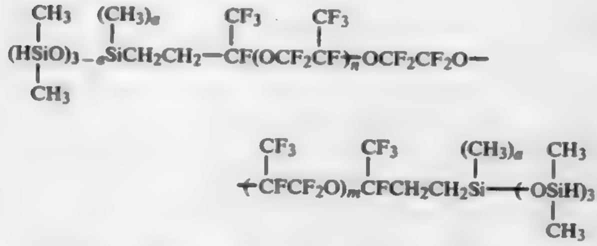
(2)

$$\underset{CH_3}{\overset{CH_3}{(HSiO)}}_{3-a}\overset{(CH_3)_a}{Si}CH_2CH_2C_bF_{2b}CH_2CH_2\overset{(CH_3)_a}{Si}-(\underset{CH_3}{\overset{CH_3}{OSiH}})_{3-a}$$

wherein letter a is an integer of from 0 to 2, n and m are integers meeting n+m=0 to 8, and b is an integer of from 4 to 12.

2. A process of molding a curable resin, comprising the steps of:

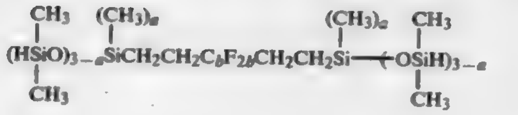
applying a composition comprising at least one compound represented by formula (1) or (2):



(1)

$$\underset{CH_3}{\overset{CH_3}{(HSiO)}}_{3-a}\overset{(CH_3)_a}{Si}CH_2CH_2-\overset{CF_3}{CF}(OCF_2\overset{CF_3}{CF})_nOCF_2CF_2O-$$

$$-(\overset{CF_3}{CF}CF_2O)_m\overset{CF_3}{CF}CH_2CH_2\overset{(CH_3)_a}{Si}-(\underset{CH_3}{\overset{CH_3}{OSiH}})_{3-a}$$



(2)

$$\underset{CH_3}{\overset{CH_3}{(HSiO)}}_{3-a}\overset{(CH_3)_a}{Si}CH_2CH_2C_bF_{2b}CH_2CH_2\overset{(CH_3)_a}{Si}-(\underset{CH_3}{\overset{CH_3}{OSiH}})_{3-a}$$

wherein letter a is an integer of from 0 to 2, n and m are integers meeting n+m=0 to 8, and b is an integer of from 4 to 12, to the inner surface of a silicone rubber mold,

curing the composition thereat,

admitting a curable resin into the mold,

causing the resin to cure in the mold, and

removing the cured resin from the mold.

5,316,717
PROCESS FOR MAKING GELATINE FILMS

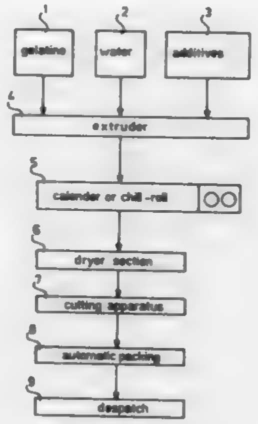
Peter Koepff, Heidelberg; Klaus Bräumer, Eberbach; Helmuth Stahl, Michelstadt, and Eberhard Dick, Beerfelden-Gammelsbach, all of Fed. Rep. of Germany, assignors to Deutsche Gelatine-Fabriken Stoess AG, Eberbach, Fed. Rep. of Germany

Filed Aug. 26, 1991, Ser. No. 679,081

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843844

Int. Cl.⁵ B29C *47/34, 55/02*

U.S. Cl. 264—564 **17 Claims**



1. Process for making sheet gelatine from powdered gelatine, wherein the powdered gelatine with the addition of 5 to 40% by weight of water in relation to the total mass is plasticized by the application of shearing forces at an elevated pressure of 5 to 250 bar and an elevated temperature of 40° to 200° C., the plasticized mass is pressed in the form of a film through a slotted die, the film is drawn off the slotted die under tension to produce a taut film, the taut film is dried to produce a finished film and the film is cut into single sheets of sheet gelatine.

5,316,718
COMPOSITE ELECTRODE FOR ELECTROCHEMICAL PROCESSING HAVING IMPROVED HIGH TEMPERATURE PROPERTIES AND METHOD FOR PREPARATION BY COMBUSTION SYNTHESIS

Jainagesh A. Sekhar, Cincinnati, Ohio, assignor to Moltech Invent S.A., Luxembourg

Filed Jun. 14, 1991, Ser. No. 715,547

Int. Cl.⁵ B22F *3/16*

U.S. Cl. 419—19 **5 Claims**

1. A method of making a net shaped electrode suitable for electrochemical processing and having improved oxidation resistance, electrical conductivity and thermal conductivity at temperatures above 1000° C., which comprises:

selecting a particular or fibrous filler material from the group consisting of molybdenum silicide, silicon carbide, titanium carbide, boron carbide, boron nitride, zirconium boride, cerium oxide, cerium oxyfluoride, and mixtures thereof, so as to provide said electrode with improved oxidation resistance and thermal and electrical conductivity above 1000° C.;

providing a uniform admixture designed to cause the formation of an adherent oxide layer on the surface of said electrode during said electrochemical processing, said admixture containing from about 40% to about 90% by weight of a particulate or fibrous combustible mixture which, when ignited forms an interconnecting network of a ceramic or metal ceramic composite, and from about 10% to about 60% by weight of said particulate or fibrous filler material;

compacting said admixture into said net shape in a die under a pressure of about 5 to 25 ksi (about 3.5 to about 17.6 kg/mm^2);

removing said net shape from said die;

igniting said combustible mixture whereby to obtain a dimensionally stable composite electrode; and

forming an adherent oxide layer on the surface of said electrode, after said electrode is put into service, said oxide layer lending to said electrode, said high resistance to oxidation and said stable electrical conductivity at temperatures above 1000° C.

5,316,719

APPARATUS FOR PRODUCING A SUBSTANCE UTILIZING AGRAVIC EFFECT

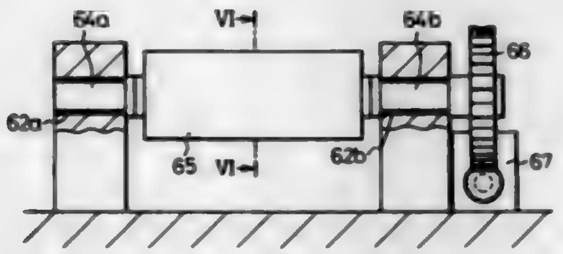
Masao Kubota, 22-7, Narimasu 2-chome, Itabashi-ku, Tokyo, Japan

Division of Ser. No. 465,194, Feb. 20, 1990. This application Feb. 17, 1993, Ser. No. 18,119

Claims priority, application Japan, Jun. 28, 1988, 63-158117; Jun. 26, 1989, 1-160896

Int. Cl.^{5} C22C *1/02*

U.S. Cl. 420—590 **2 Claims**



1. An apparatus for producing a substance utilizing an agravic effect, comprising: a bearing housing fixedly set on the ground; a bearing provided on the bearing housing; a rotary shaft supported for revolution in a horizontal position in the bearings; a closed container attached to the rotary shaft for revolving the substance contained therein; said container and said substance having coincident centers; and a mechanism for rotating the rotary shaft; the mechanism for revolving the rotary shaft rotating the rotary shaft in one direction so as to meet an inequality:

$$|\omega| \leq \sqrt{x \cdot g/r} \text{ (radian/sec)}$$

where ω (radian/sec) is the angular velocity of the container, g (mm/s^2) is gravitational acceleration, r (mm) is the distance between a unit mass and an axis of rotation of the container rotating about its own axis, and x is the upper limit of the ratio between a residual centrifugal force acting on the unit mass at each cycle and the terrestrial gravity (gravitational acceleration g).

5,316,720

LASER SHOCK AND SINTERING METHOD FOR PARTICULATE DENSIFICATION

Lyle B. Spiegel, Woodland Hills, and William E. McDermott, Rancho Palos Verdes, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Nov. 20, 1992, Ser. No. 979,024

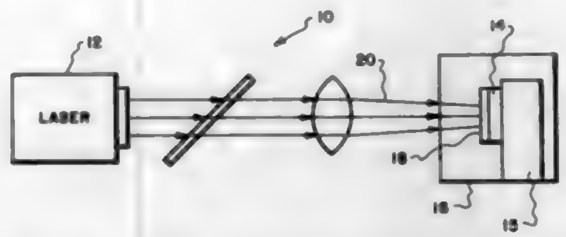
Int. Cl.^{5} B22F *1/00*

U.S. Cl. 419—48 **6 Claims**

1. A method of forming an article of manufacture comprising:

(a) generating a pressure pulse with a laser;

(b) producing a pressure condition at a surface of discrete powder particles, thereby driving a stress wave into and through the particles;



(c) heating a surface portion of said discrete powder particles via partial absorption by said particles of a laser generated beam; and

(d) densifying the particles by the effect of the imparted stress wave and surface heating;

(e) sintering the article.

5,316,721

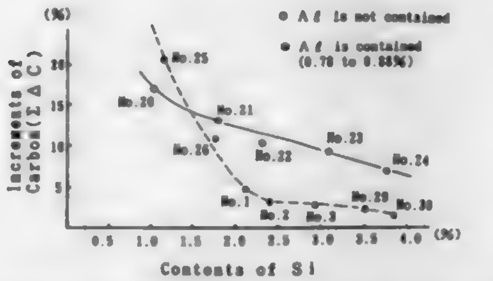
HEAT-RESISTANT ALLOY HAVING HIGH CREEP RUPTURE STRENGTH UNDER HIGH-TEMPERATURE LOW-STRESS CONDITIONS AND EXCELLENT RESISTANCE TO CARBURIZATION

Junichi Sugitani; Masahiro Inui; Koji Tsuchida, all of Hirakata, and Teruo Yoshimoto, Suita, all of Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Dec. 30, 1991, Ser. No. 814,154

Int. Cl.^{5} C22C *38/34, 30/00*

U.S. Cl. 420—50 **4 Claims**



1. A heat-resistant alloy having a high creep rupture strength under high-temperature low-stress conditions and an excellent resistance to carburization, said alloy consisting essentially of, in % by weight, from 0.44% inclusive to less than 1.5% of C, more than 2% to less than 3% of Si, more than 0% to less than 2% of Mn, more than 20% to less than 30% of Cr, more than 25% to less than 40% of Ni, more than 0.6% to less than 2% of Al, and the balance being Fe and inevitable impurities.

5,316,722

CORROSION RESISTANT TI-CR-NI ALLOY CONTAINING A PLATINUM GROUP METAL

Yasuaki Sugizaki; Keiji Ueda; Hiroshi Satoh; Hidetoshi Nishimoto; Tatsuya Yasunaga, and Takashi Yashiki, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

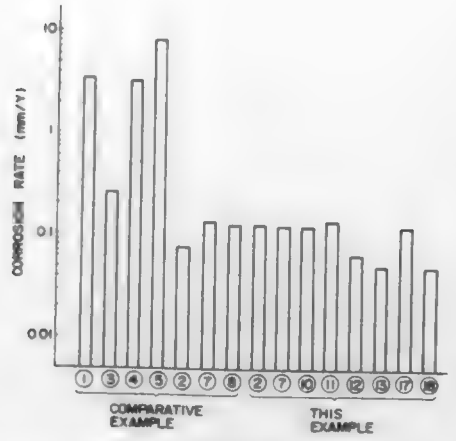
Filed Jul. 9, 1992, Ser. No. 911,077

Int. Cl.^{5} C22C *14/00*

U.S. Cl. 420—421 **1 Claim**

1. A corrosion resistant Ti based alloy comprising:

Cr: 0.005–2.0 wt %, Ni: 0.005–2.0 wt %, and further comprising one of more of elements selected from the group consisting of



Ru: 0.005–2.0 wt %,
Os: 0.005–2.0 wt %,
Rh: 0.005–2.0 wt %, and
Pd: 0.005–2.0 wt %,
Pt: 0.005–2.0 wt %,
Ir: 0.005–2.0 wt %

the balance of Ti and inevitable impurities.

5,316,723

MASTER ALLOYS FOR BETA 21S TITANIUM-BASED ALLOYS

Frederick H. Perfect, deceased, late of Wyomissing, Pa. by Marjorie L. Perfect, executor , assignor to Reading Alloys, Inc., Robesnoia, Pa.

Filed Jul. 23, 1992, Ser. No. 918,242

Int. Cl.^{5} C22C *27/04*

U.S. Cl. 420—429 **4 Claims**

1. A master alloy, comprising about 55–75% Mo, 6–16% Cb, 1–15% Al, 0.1–5% Si, 0–1% O_2, 0–1% C, 0–1% N_2, and balance Ti.

5,316,724

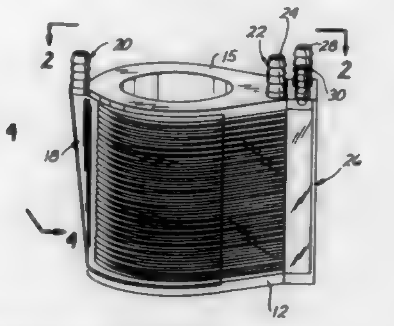
MULTIPLE BLOOD PATH MEMBRANE OXYGENATOR

Wilfred F. Mathewson, Dana Point; Richard L. Bringham, San Clemente; Philip L. Ritger, El Toro, and David Karshmer, Redwood City, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 794,318, Nov. 14, 1991, abandoned, which is a division of Ser. No. 331,479, Mar. 31, 1989, abandoned. This application Sep. 15, 1992, Ser. No. 945,998

Int. Cl.^{5} A61M *1/14*

U.S. Cl. 422—48 **16 Claims**



1. A blood oxygenator comprising:

a housing formed with a blood outlet, a gas inlet and a gas outlet;

a cylindrical support core having an outer surface and contained within the housing;

a cylindrically shaped bellows having a plurality of pleats defining a plurality of blood receiving channels, said cylindrically shaped bellows having an outer wall disposed about the outer surface of the core;

means communicating with the cylindrically shaped bellows for delivering blood to each of the blood receiving channels;

a plurality of gas permeable hollow fiber membranes positioned in each of the blood receiving channels, each of the hollow fiber membranes having a first open end in communication with the gas inlet and an opposing second open end in communication with the gas outlet; wherein a gas enters each hollow fiber membrane through the first open end and exits at the second open end; and

a plurality of circumferential and uninterrupted blood flow passageways within the blood receiving channels, the blood flow passageways defined between the outer wall of the cylindrically shaped bellows and the plurality of hollow fiber membranes, the blood flow passageways in fluid communication with the blood outlet.

5,316,725

REAGENT SYSTEM FOR THE IMPROVED DETERMINATION OF WHITE BLOOD CELL SUBPOPULATIONS

Edward L. Carver, Jr., 18 Lisa Dr., Oxford, Conn. 06483; Diane D. Carver, Oxford, and Mary P. Skiptunas, Naugatuck, both of Conn., assignors to Edward Lawrence Carver, Jr., Oxford, Conn.

Filed Jun. 7, 1991, Ser. No. 711,965

Int. Cl.^{5} G01N *1/28*

U.S. Cl. 422—61 **29 Claims**

1. A reagent kit for use in the automated or semi-automated differential analysis of white blood cells comprising:

(a) a predetermined volume of a lytic reagent composition, for stromatolyzing red blood cells and selectively shrinking white blood cells into at least three subpopulations; and

(b) an isotonic blood diluent, wherein the lytic reagent composition comprises:

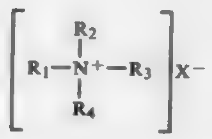
an aqueous solution of active lytic reagents selected from the group consisting of

(a) an admixture of at least one different group (A) aliphatic quaternary ammonium compound with at least one group (B) aromatic, heterocyclic or zwitterionic quaternary ammonium compound;

(b) an admixture of at least one group (A) aliphatic quaternary ammonium compounds with at least one group (C) heterocyclic quaternary ammonium compound; and

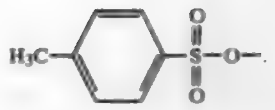
(c) an admixture of at least one group (C) heterocyclic quaternary ammonium compound with at least one group (B) aromatic, heterocyclic or zwitterionic quaternary ammonium compound; wherein

the group (A) quaternary ammonium compound is represented by the formula:

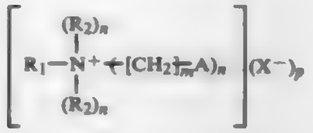


$$\left[\begin{array}{c} R_2 \\ | \\ R_1-N^+-R_3 \\ | \\ R_4 \end{array}\right]X^-$$

wherein R_1 is a long chain alkyl group containing from 10 to 20 carbon atoms, R_2, R_3 and R_4 are short chain alkyl groups containing from 1 to 6 carbon atoms, and X is an ion selected from the group consisting of halide, sulfate, phosphate, nitrate ions, and

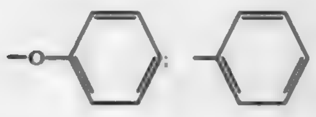


the group (B) quaternary ammonium compound is represented by the formula:



$$\left[R_1-\overset{\overset{\textstyle (R_2)_n}{|}}{\underset{\underset{\textstyle (R_2)_n}{|}}{N^+}}\leftarrow[CH_2]_m A)_n\right](X^-)_p$$

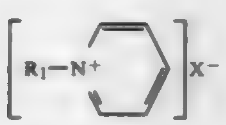
wherein R_1 is a long chain alkyl group comprising from 8 to 20 carbon atoms, R_2 is an alkyl group containing 1 to 6 carbon atoms, m is an integer from 1 to 4, A is a radical selected from the group consisting of:



or $-SO^-{}_3$,

n is an integer from 0 to 1, such that when n=0, the remaining (N) bonds form part of a heterocyclic ring, X is an ion selected from the group consisting of halide, phosphate, sulfate and nitrate ions and p is an integer from 0 to 1;

the group (C) quaternary ammonium compound is represented by the formula



wherein R_1 is a long chain alkyl radical comprising from 10 to 20 carbon atoms, and X is an ion selected from the group consisting of halide, sulfate, phosphate and nitrate ions;

wherein the individual quaternary ammonium compound components of said lytic reagent are present in a ratio and quantity sufficient to effect at least a three component differential separation of white blood cells;

and the isotonic blood diluent has a predetermined pH and osmolality.

5,316,726

AUTOMATED IMMUNOASSAY ANALYZER WITH PICTORIAL DISPLAY OF ASSAY INFORMATION

Arthur L. Babson, Chester; Arthur F. Ross, Mendham, both of N.J.; Douglas R. Olson, Doylestown, Pa.; Gershon Giter, Highland Park, Minn., and Victor R. Huebner, Newtown Square, Pa., assignors to Cirrus Diagnostics, Inc., Chester, N.J.

Continuation of Ser. No. 735,528, Jul. 26, 1991, abandoned. This application Dec. 4, 1992, Ser. No. 986,883

Int. Cl.^{5} G01N *21/13, 21/76, 21/01*

U.S. Cl. 422—65 **11 Claims**

11. In an automated chemical analysis instrument having multiple stations for performing different functions on samples contained in test vessels, a pathway connecting each of the stations along which the test vessels are transported from one station to the next, and a device located at an end of the pathway for detecting a parameter for each of the samples contained in the test vessels, the improvement comprising:

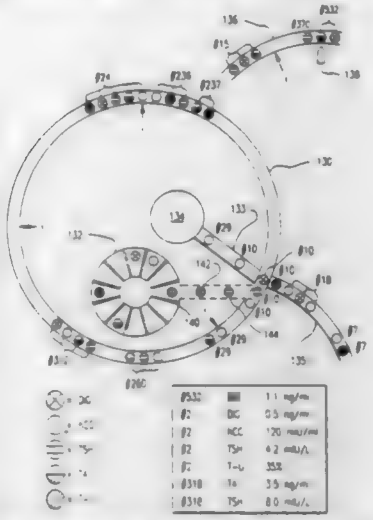
a display;

means for assessing the state of operation of each of said multiple stations;

means for tracking the progress of each of said test vessels on said pathway connecting each of the different stations;

means for detecting a parameter of each of the test vessels; and

means for presenting a pictorial image on said display of said pathway connecting said multiple stations, said pathway connecting each of the different stations, and said test vessels, said means for presenting providing both a numerical presentation of said detected parameter and a pictorial presentation of the position of each of said test vessels on said pathway connecting each of the different stations, said means for presenting being supplied with status information from said means for assessing and said means for tracking and numerical information from said means for detecting.



5,316,727

MEASURING APPARATUS

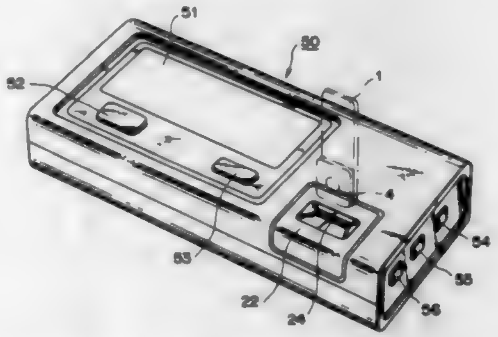
Yoshiro Suzuki, Yamanashi; Hitoshi Tanaka, Yokohama; Noriyuki Kurihara, Chigasaki, and Yutaka Saito, Yokosuka, all of Japan, assignors to Terumo Kabushiki Kaisha and Yamatake-Honeywell Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 578,641, Sep. 7, 1990, abandoned. This application Aug. 28, 1992, Ser. No. 936,079

Claims priority, application Japan, Sep. 8, 1989, 1-231538; Sep. 8, 1989, 1-231539; Sep. 8, 1989, 1-231541; Sep. 8, 1989, 1-231543

Int. Cl.^{5} G01N *21/01*

U.S. Cl. 422—68.1 **9 Claims**



1. A system which measures the constituent concentration of a specimen, comprising:

a test piece having a test material which develops coloring as a result of a reaction with the constituents of said specimen, said test piece also including a first opening on one side thereof and a second opening on the other side thereof at a location corresponding to said first opening, said first opening provided for applying a specimen to said test material;

a measuring apparatus for receiving the test piece, said measuring apparatus including:

test piece detection means for detecting that said test piece has been loaded into a main body of the apparatus;

irradiation means for irradiating said test piece with light when the loading of said test piece is detected by said test piece detection means;

judgment means for detecting whether or not an intensity of light reflected from said test piece is within a predetermined range and for judging whether or not the reflected light is reflected through said second opening;

notifying means for notifying that a measurement using said test piece is impossible when said judgment means judges that the reflected light is not reflected through said second opening;

detection means for detecting the intensity of light emitted by said irradiation means and reflected through said second opening; and

measurement means for determining the constituent concentration of said specimen on the basis of the intensity of the reflected light detected by said detection means.

5,316,728

AUTOMATED SYNTHESIZING APPARATUS

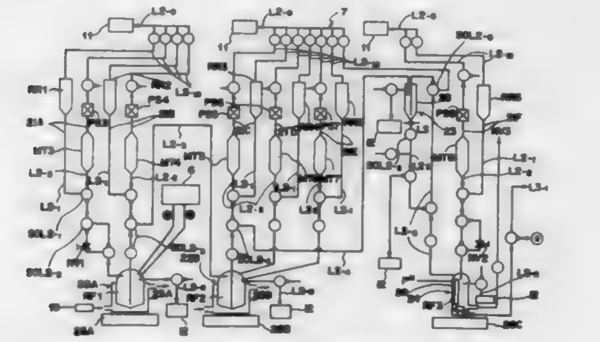
Nobuyoshi Hayashi, Kawanishi, and Tohru Sugawara, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 796,300, Nov. 22, 1991, abandoned, which is a division of Ser. No. 321,748, Mar. 10, 1989, Pat. No. 5,164,159. This application May 3, 1993, Ser. No. 55,786

Claims priority, application Japan, Mar. 11, 1988, 63-59004

Int. Cl.^{5} G01N *35/00*

U.S. Cl. 422—70 **10 Claims**



1. A chemical reaction unit, comprising:

a supply unit having a plurality of reservoirs for containing raw material, reagents and solvents, liquid metering devices for measuring a quantity of the raw material, reagents and solvents, said liquid metering devices having liquid sensors for sensing a predetermined quantity of the raw material, reagents and solvents, fluid flow lines extending from said liquid metering devices for delivery of the raw material, reagents and solvents, and a plurality of solenoid valves in said fluid flow lines for selective opening and closing thereof;

a plurality of concentrating and reaction vessels, said vessels being fluidly connected to said fluid flow lines of said supply unit for receiving raw material, reagents and solvents therefrom, said vessels having a double-walled structure such that each of said vessels have an interior space and an annular space surrounding said interior space;

a concentration sensor for detecting the presence or absence of vapor in each of said concentrating and reaction vessel mounted on each said concentrating and reaction vessel;

a heating and cooling medium circulation unit for circulating a heat exchange medium to and from said annular spaces of said concentrating and reaction vessels;

a computer control means connected to and for controlling each of said units, said sensors and said solenoid valves;

a transfer means for fluidly interconnecting and selectively transferring fluids back and forth between said plurality of concentrating and reaction vessels, said transfer means comprising fluid flowlines and solenoid valves in said fluid flowlines connected to said computer control means; and

a separating means for receiving liquids from said concentrating and reaction vessels and separating the received liquids, and at least one drying tube, connected with said separating means, defining a means for drying liquids separated in said separating means and returning the liquids to said concentrating and reaction vessels, wherein said transfer means fluidly interconnects said separating means and said at least one drying tube with said concentrating and reaction vessels for selectively transporting fluids from said concentrating and reaction vessels to said separating means and from said at least one drying tube to said concentrating and reaction vessels.

5,316,729

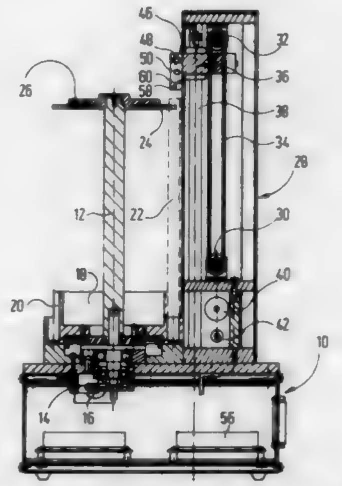
ERYTHROCYTE SEDIMENTATION RATE MEASURING APPARATUS

Helmut Orth, Ludwigsburger Str. 78, D-W7120 Bietigheim-Bissingen; Joachim Horrer, Stöcklestr. 13, D-W7400 Tubingen, Fed. Rep. of Germany, and Dietmar Holst, Schurwaldstr. 4, D-W7327 Adelberg, all of Fed. Rep. of Germany

Filed Nov. 27, 1992, Ser. No. 982,313

Int. Cl.^{5} G01N *33/00*

U.S. Cl. 422—73 **8 Claims**

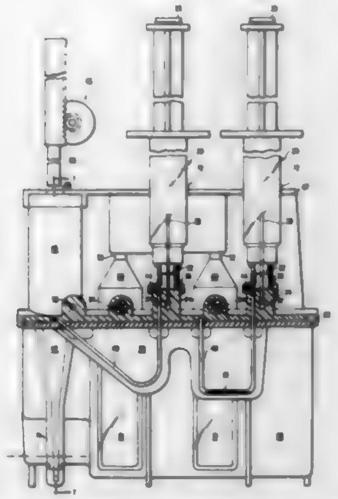


1. An apparatus for measuring erythrocyte sedimentation rate, comprising test cell support means (**18, 20, 24, 26**) adapted to position at least one test cell (**22**) in parallel orientation with respect to the vertical direction, comprising a measuring head (**36**) measuring the optical density of blood and including at least one light barrier (**48, 52**), comprising head drive means (**34, 40**) for providing relative movement between the test cell support means and the measuring head in a direction parallel to the positioning direction of the test cells (**22**), a position sensor (**42, 76**) providing a position signal corresponding to the relative position of said at least one test cell (**22**) and measuring head (**36**), and an evaluating processor (**74**) which receives the output signals of the measuring head (**36**) as well as the position signal and continuously stores (**84**) the output signals of the measuring head (**36**) and the associated position signals and compares the stored position signals with at least one reference curve (**6, 90; 94-100**) and from this comparison extrapolates a presumable final value of the position of the interphase defined between the serum and the blood cake and also determines the sedimentation rate.

5,316,730
DISPOSABLE CARTRIDGE FOR INVESTIGATING PHYSICAL PROPERTIES OF BLOOD

Joseph W. Blake, Norwalk, Conn.; Robert Cousineau, Hartsdale, N.Y.; Mark Rosen, Hackensack, N.J., and William Watson, Greenwich, Conn., assignors to XYLUM Corporation, Scarsdale, N.Y.

Filed Dec. 7, 1992, Ser. No. 987,469
Int. Cl.⁵ G01N *11/04, 11/08, 33/49*
U.S. Cl. 422—73 **19 Claims**



14. A disposable cartridge for measuring physical properties of blood comprising:

a water compartment supporting a platform, said platform having at least one fluidic coupling, and having a guide for positioning at least one syringe holding a blood sample into said fluidic coupling which forms a sealed assembly therewith;

at least one testing station located on said platform for subjecting blood flowing from said syringe to a test condition, and connected to discharge tested blood in said waste compartment; and,

conduit means connecting said at least one syringe to said test station.

5,316,731
DEVICE FOR COLLECTION AND PROCESSING OF BIOLOGICAL SAMPLES

W. Juergen Schrenk, Cranbury, and Shelby J. Hall, Hamilton, both of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed Nov. 9, 1992, Ser. No. 973,734
Int. Cl.⁵ B01L *3/00;* B03B *5/00*
U.S. Cl. 422—101 **10 Claims**

1. A container, comprising:

a first chamber;

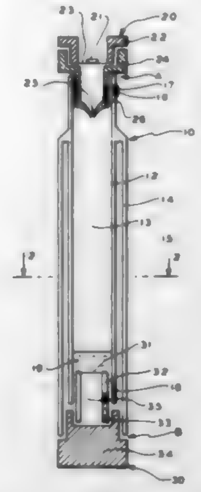
a second chamber, wherein said second chamber surrounds said first chamber and is concentric with said first chamber, and wherein said first chamber is defined by an inner wall and said second chamber is defined by said inner wall and an outer wall, and wherein said inner wall protrudes above said second chamber, said container being under vacuum;

a first means for selectively placing the first chamber in fluid flow communication with said second chamber;

a second means for introducing material into the first chamber without releasing the vacuum of said second chamber;

retaining means in the first chamber for retaining a solid component of a mixture of solids and liquid which is introduced into the first chamber; and

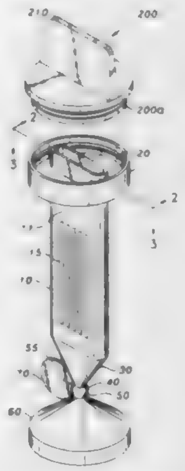
means for selectively placing the interior of the container in communication with the atmosphere outside said container, whereby after introduction of a mixture of solids and liquid into said container, liquid passes through the retaining means and through said first means for selectively placing the first chamber in fluid flow communication with the second chamber, and into said second chamber with the solids being retained on said retaining means.



5,316,732
EXTRACTION VIAL

Albert Golukhov, Mountain View; Josefina T. Baker, Cupertino, and Richard S. Matusewicz, San Jose, all of Calif., assignors to Smithkline diagnostics, Inc., San Jose, Calif.

Filed Jul. 1, 1992, Ser. No. 907,359
Int. Cl.⁵ B01L *3/00*
U.S. Cl. 422—102 **4 Claims**



1. A vial suitable for use with an extraction liquid, comprising:

a reservoir portion defining a chamber consisting of a pair of spaced, flat, generally parallel walls, the walls being compressible;

a neck portion integral with the reservoir portion at a first end of the reservoir portion, the neck portion defining an opening into the reservoir portion and a channel surrounding the opening;

a nozzle portion integral with the reservoir portion at a second end of the reservoir portion, the nozzle portion narrowing to a leading end and including a passage connecting with the chamber and the leading end;

a sealing closure connected to the leading end by a line of weakness so as to close the leading end;

a base integral with the sealing closure located opposite from the nozzle portion, the base including a support surface generally perpendicular to a central axis of the vial for stably supporting the vial in a generally vertical, upright position;

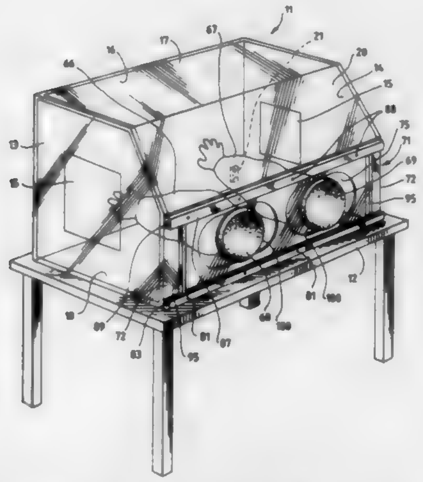
a support tab integral with and extending between the nozzle portion and the base; and

a cap including a portion adapted to be snugly received and removably rigidly maintained within the channel.

5,316,733
CLEAN BOX WITH SLIDING ARMS

Gordon H. Rune, Mundelein, and Bruce A. Wojtysiak, Grandwood Park, both of Ill., assignors to Piper Plastics, Inc., Libertyville, Ill.

Filed Apr. 15, 1992, Ser. No. 868,992
Int. Cl.⁵ B01L *7/00*
U.S. Cl. 422—104 **25 Claims**



1. In a clean box having a substantially air-tight enclosure generally defining a volume of space, said enclosure including manipulating means, composed of a web of flexible, substantially air-impermeable material for permitting the handling by a body part in contact with said web of an object within said enclosure, the improvement comprising:

(A) a first substantially rigid surface forming part of said enclosure;

(B) a second substantially rigid surface with a substantially air-tight connection to said manipulating means and lying in close proximity and parallel to and in part in a overlapping relationship with said first rigid surface, said first and second rigid surfaces having respectfully first and second openings therethrough, with said first and second openings being aligned with each other and of different sizes, with said web passing through said openings, and with said first opening being larger than said second opening and with said second opening being substantially a circle and said first opening being substantially an oval, with the smaller dimension of said oval being at least as large as about the diameter of said circle;

(C) moving means, coupled to said first rigid surface of said enclosure and said manipulating means, for permitting the lateral movement of substantially all of said manipulating means and said second rigid surface in a substantially linear direction relative to said first surface; and

(D) sealing means, coupled to said moving means and said enclosure, for preventing the passage of a substantial amount of air between the remainder of said enclosure including said first rigid surface and said manipulating means as said manipulating means moves relative to said remainder of said enclosure.

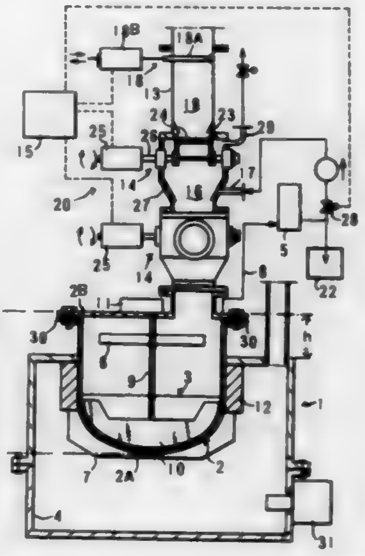
5,316,734
APPARATUS FOR CONVERTING SYNTHETIC RESIN INTO OIL

Takuo Yamaguchi, Naruto, Japan, assignor to USS Co., Ltd., Tokushima, Japan

Continuation of Ser. No. 627,271, Dec. 14, 1990, abandoned. This application Nov. 4, 1992, Ser. No. 971,301

Claims priority, application Japan, Mar. 31, 1990, 2-86412; Apr. 3, 1990, 2-89677; Jun. 16, 1990, 2-158327; Jun. 16, 1990, 2-158328

Int. Cl.⁵ C08F *2/00;* B01J *8/04;* B01F *15/06;* F22B *9/06*
U.S. Cl. 422—135 **15 Claims**



1. An apparatus for converting synthetic resin into oil, comprising:

a heating vessel having a body portion with upper, middle and lower portions;

a heating furnace for heating said vessel and having a top wall extending across the top of said heating furnace, said heating vessel having at least the lower portion of said body portion within said furnace and having at least the upper portion of said body portion projecting out of said furnace through said top wall into ambient atmosphere surrounding said furnace;

a feeding means for feeding solid synthetic resin into said heating vessel, said feeding means having a feed conduit means connected to said heating vessel, an upstream and a downstream valve in said conduit means and spaced from each other along said conduit means for defining a temporary storage chamber between said valves, and control means connected to said valves for holding said downstream valve closed while opening said upstream valve to admit synthetic resin to said temporary storage chamber and then closing said upstream valve, and then holding said upstream valve closed while opening said downstream valve, thereby feeding the synthetic resin to said heating vessel without opening said heating vessel to the atmosphere; and

a stirring means in said heating vessel having a rotating shaft extending down into said vessel, a blade means on the lower end of said shaft, and a driving motor connected to said shaft for rotating said shaft to rotate said blade means in said vessel, said blade means being a blade extending radially of said shaft and having a lower edge conforming in shape to the shape of an inner surface of the lower portion of said body portion of said vessel and positioned sufficiently close to said inner surface for scraping any material which may accumulate on said inner surface during operation of said apparatus from said inner surface.

5,316,735

APPARATUS FOR PRODUCING GRANULATED PRODUCTS

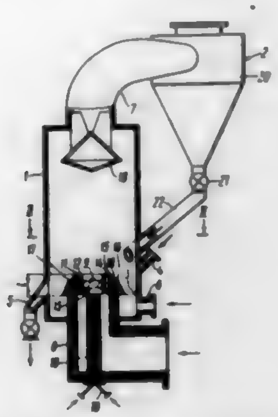
Oleg R. Ivanov, Rizhsky proezd, 5, kv. 57; Mikhail I. Snegirev, 1 Perevedenovsky pereulok, 12, kv. 84; Makhail K. Chistyakov, Verkhoyanskaya ulitsa, 6, korpus 1, kv. 302, all of Russian Federation, Moscow; Vladimir M. Razhev, 1 mikroraion, 26, kv. 25; Vládimir I. Budantsev, 1 mikroraion, 24, kv. 35, both of Russian Federation, Uvarovo; Jury I. Kipriyanov, Slavyansky bulvar, 7, korpus 1, kv. 90, Russian Federation, Moscow; Viktor A. Zaitsev, deceased, late of Russian Federation, Moscow; by Galina M. Zaitseva, administrator, and by Natalya V. Zaitseva, administrator, both of Dmitrovskoe shosse, 37, korpus 1, kv. 172, Russian Federation, Moscow

PCT No. PCT/SU91/00273, § 371 Date Sep. 23, 1992, § 102(e) Date Sep. 23, 1992, PCT Pub. No. WO92/10283, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 12, 1990, Ser. No. 927,381

Int. Cl.^{5} B01J *8/18;* **F27B** *15/00*

U.S. Cl. 422—143 **8 Claims**



1. An apparatus for producing granulated products, comprising a substantially vertical cylindrical casing having a longitudinal axis, a lower part and an upper part, gas-distributing grating means comprising a horizontal grating situated in the lower part of the casing, first pipe means for supplying granules to said casing above said grating, first gas-supply pipe means below said grating for supplying gas to said grating to cause said granules to form a fluidized bed of a given height above the grating, second gas supply pipe means entering the lower part of the casing for supplying gas to cause granules from said fluidized bed to form an annular curtain of granules above the fluidized bed, nozzle means entering the lower part of the casing and disposed inside said second gas supply means for receiving and spraying a pulp or a melt onto granules in the annular curtain, an axially disposed gas-discharging pipe means disposed in the upper part of the casing for allowing the discharge of gas from the casing, said second gas supply pipe means being arranged along said axis of the casing and having an upper end face through which gas is supplied to the casing, said upper end face extending a distance above the grating, said gas-distributing grating means further comprising an internal truncated cone and an external truncated cone coaxially disposed to one another and defining an annular gap therebetween, said internal cone being secured around the upper end face of the second gas supply pipe means, said external cone being secured on the grating and having an upper end face extending above said grating a distance which is less than the distance the upper end face of the second gas supply pipe means extends above the grating, said nozzle means comprising swirler means below an upper end of said nozzle means for promoting uniformity of spraying of the pulp or melt sprayed through the nozzle means, said swirler means positioned internally of said second gas supply means and comprising a tube with a swirling element inside and wherein said tube defines an annular gap with said second gas supply pipe means, baffle cone means situated in the upper part of the casing in front of the axial gas-discharging pipe means for deflecting gas entraining granules, and separation means for separating granules from effluent gases.

5,316,736

APPARATUS FOR REACTING A GAS AND A PARTICULATE MATERIAL IN AN ENCLOSURE, AND METHOD FOR OPERATING SAID APPARATUS

Jean Vidal, Ville D'Avray; Philippe Payen, La Celle St Cloud; Jean-Claude Semedard, Paris, and Jean-Xavier Morin, Neuville Aux Bois, all of France, assignors to Stein Industrie, Velizy-Villacoublay, France

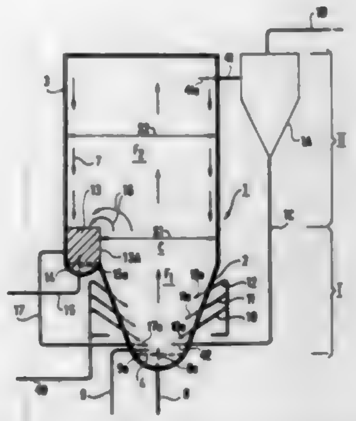
PCT No. PCT/FR91/00325, § 371 Date Dec. 12, 1991, § 102(e) Date Dec. 12, 1991, PCT Pub. No. WO91/16130, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 18, 1991, Ser. No. 778,089

Claims priority, application France, Apr. 20, 1990, 90 05060

Int. Cl.^{5} F27B *15/08*

U.S. Cl. 422—145 **7 Claims**



1. In an apparatus for performing an exothermal or an endothermal reaction comprising a reactor including an enclosure having a wall, a top and a bottom, said reaction being between at least one gas and at least one particulate material and said apparatus further comprising at least one means for introducing particulate material and at least one means for introducing fluidization gas into said reactor enclosure having respective introduced flow rates of said particulate material and said fluidization gas with said gas velocity being higher than the velocity of the particulate material, 4 to 12 m/sec thereby establishing a fast upward flow of gas and particulate material inside the reactor enclosure and defining a fast fluidized bed, means for directing a mixture of the reaction gas and the particulate material reaching the top of the reactor enclosure into a separator, means for exhausting the gas produced by the reactor, and means for recycling the particulate material from the separator to the bottom of the reactor enclosure, and wherein the reactor comprises:

a) a lower zone (I) having a top and a bottom comprising a fast fluidized bed F_1 with a mean upward gas velocity V_1 under empty conditions and at full load in a range of 4.8 m/s to 12 m/s and said fluidized bed F_1 having a height such that a gas residence time through said lower zone (I) lies in a range of 0.25 seconds to 4 seconds;

b) a higher zone (II) having a top and a bottom and being above said lower zone (I) and of a cross section S_2;

c) mean for flowing an additional fluidization gas upwards within said enclosure with a velocity in the range of 0.3 m/s to 2.5 m/s under empty conditions and at full load, defining a dense fluidized bed adjacent to the top of said lower zone (I) and being laterally separated therefrom and being disposed adjacent to at least a part of said wall of said reactor enclosure and receiving both particulate material coming upwards from the top of the lower zone, adjacent thereto, and particulate material falling down from said higher zone (I) along said part of said wall thereof; and

(d) at least one means for reinjecting particulate material from said dense fluidized bed, at a dense fluidized bed zone, to the bottom of said lower zone (I); the improvement comprising: said higher zone (II) comprising a fast fluidized bed F_2 with an upward gas velocity V_2 of the fluidization gas under empty conditions and at full load being in a range of 4 m/s to 10 m/s, and having a ratio of said upward velocity V_2 to the velocity V_1 of the fluidization gas of fluidized bed F_1 in said lower zone being in a range of $\frac{1}{2}$ to 1/1.2, and said fluidized bed F_2 having a height of said higher zone (II) such that a residence time of the fluidization gas in said higher zone (II), at full load, lies in a range of 2 seconds to 10 seconds, and having a concentration P at the top of the higher zone (II) of the reactor enclosure of not less than 2 kg/m^3; and wherein a reinjection rate of said means for reinjecting particulate material from the dense fluidized bed zone is greater than the quantity

$$q=P\times V_2\times S_2,$$

and wherein a ratio (S_2/S_1) of said cross section S_2 to a cross section S_1 of the lower zone (I) at a level of the dense fluidized bed zone (13) lies in a range of 1.20 to 2.

5,316,737

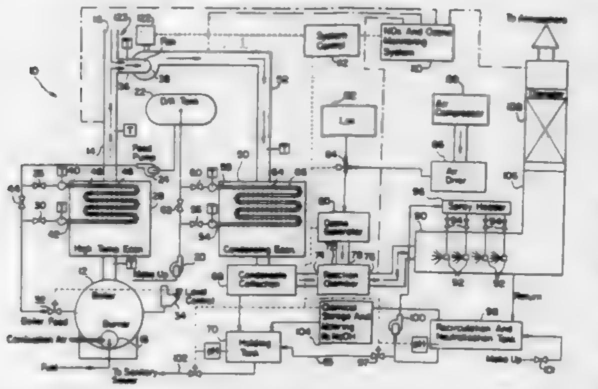
PROCESS FOR REMOVING NO_x AND SO_x FROM EXHAUST GAS

Arthur P. Skelley, Pittsburgh; James C. McMichael, Monroeville; James T. Cobb, Jr., Pittsburgh; Wesley M. Rohrer, Jr., Pittsburgh; Phillip E. Custer, II, Pittsburgh, and Taha M. Elsubki, Pittsburgh, all of Pa., assignors to Cannon Boiler Works, Inc., New Kensington, Pa.

Continuation of Ser. No. 807,242, Dec. 16, 1991, abandoned, which is a division of Ser. No. 751,728, Aug. 29, 1991, Pat. No. 5,206,002. This application Jul. 1, 1993, Ser. No. 85,620

Int. Cl.^{5} B01D *51/00*

U.S. Cl. 422—170 **6 Claims**



1. Apparatus for removing nitrogen and sulfur oxides from the exhaust gas of a chemical process comprising,

heat exchangers

means for conveying exhaust gas containing nitrogen and sulfur oxides from a combustion process through said heat exchangers to remove heat from the exhaust gas thereby lowing the temperature of the exhaust gas to an elevated temperature,

means for measuring the volumetric flow and temperature of the exhaust gas and the concentrations of the nitrogen oxides and the sulfur oxides in the exhaust gas conveyed from the heat exchangers,

means for lowering the temperature of the exhaust gas from the elevated temperature to a temperature for condensing the water vapor in the exhaust gas to remove the moisture from the exhaust gas,

a source of ozone,

a first chamber for mixing the exhaust gas, lowered in temperature, and the ozone to convert the nitrogen and sulfur oxides in the exhaust gas to higher order nitrogen and sulfur oxides,

control means for regulating the supply of ozone to said first chamber from said source of ozone to mix the exhaust gas in said first chamber with ozone in a preselected molar ratio of ozone to the nitrogen and sulfur oxides in the exhaust gas, said control means including means for determining the volume and concentrations of ozone to be supplied to said first chamber to obtain said preselected molar ratio based on the volumetric flow of exhaust gas to said first chamber,

means for monitoring mixing of the ozone in said first chamber to assure substantially complete conversion of all the nitrogen and sulfur oxides in the exhaust gas to N_2O_5 and higher order sulfur oxides and substantially complete conversion of all of the ozone in said first chamber so that exhaust gas containing substantially all nitrogen and sulfur oxides converted to N_2O_5 and higher order sulfur oxides is emitted from said first chamber,

a spray/absorption chamber for receiving the exhaust gas stream containing N_2O_5 and the higher order sulfur oxides,

an array of spray nozzles mounted in said spray/absorption chamber and connected to a source of reagent liquid solution,

valve means for generating a mist-like spray of droplets having a preselected particle size of reagent from said spray nozzles into the exhaust gas to transform N_2O_5 and higher order sulfur oxides to dilute acids including HNO_3 and H_2SO_4,

said spray/absorption chamber containing a preselected concentration of reagent solution for absorbing the dilute acids and converting the dilute acids to solids including nitrates and sulfates containing the contaminants removed from the exhaust gas,

means for conveying the exhaust gas substantially free of the contaminants from said spray/absorption chamber, and

means for monitoring the exhaust gas conveyed from said spray/absorption chamber to detect the presence of nitrogen oxides and ozone so that in the event nitrogen oxides or ozone is detected said control means is actuated to adjust said molar ratio to complete oxidation of the nitrogen oxides to N_2O_5 in said first chamber.

5,316,738

EXHAUST GAS CONVERTER DEVICE

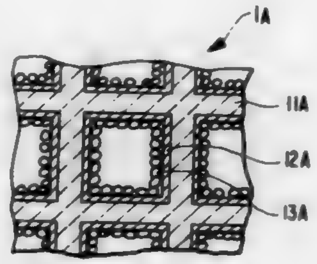
Takao Kojima; Ken Minoha, and Masaru Yamano, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 640,349, Jan. 11, 1991, abandoned. This application Mar. 19, 1993, Ser. No. 35,495

Claims priority, application Japan, Jan. 12, 1990, 2-5672; Aug. 6, 1990, 2-208373

Int. Cl.^{5} B01D *53/34*

U.S. Cl. 422—180 **7 Claims**



1. An exhaust gas converter device comprising

a first shell and a second shell separated from the first shell, connected in series along a gas stream;

a poisoning-preventive material provided in the first shell having an exhaust gas inlet, said poisoning-preventive material being a ceramic material comprising a compound containing at least one element selected from the group consisting of the Group IIa elements of the periodic table or comprising said compound and another ceramic compound; and

a catalyst provided in the second shell having an exhaust gas outlet, said catalyst comprising a catalyst support and a noble metal catalytic component deposited on the catalyst support wherein the poisoning-preventive layer is formed on the support in an amount of from 5 to 200 grams per liter of the support.

5,316,739
METHOD AND APPARATUS FOR SURFACE TREATMENT

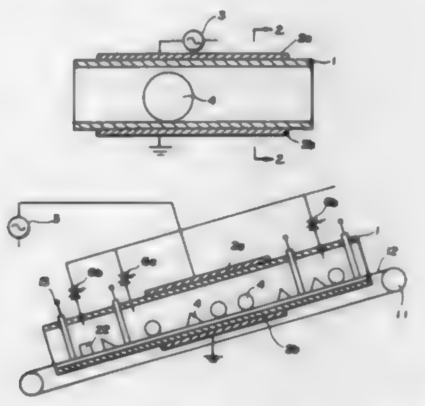
Masato Yoshikawa, Tokyo; Yukihiro Kusano, Tokorozawa; Setsuo Akiyama, Sagamihara; Kazuo Naito, Kawasaki; Satiko Okazaki, Tokyo, and Masuhiro Kogoma, Wako, all of Japan, assignors to Bridgestone Corporation; Satiko Okazaki, both of Tokyo and Masuhiro Kogoma, Wako, all of Japan

Filed Aug. 19, 1992, Ser. No. 932,382

Claims priority, application Japan, Aug. 20, 1991, 3-232180; Aug. 20, 1991, 3-232182; Aug. 20, 1991, 3-232183; Jun. 15, 1992, 4-180290; Jun. 15, 1992, 4-180292

Int. Cl.⁵ B01J *19/08*; H05H *1/24*

U.S. Cl. 422—186.05 **46 Claims**



1. An apparatus for treatment of an object, comprising:

an insulating vessel in which an object to be treated is placed;

a plasma generator, connected to the insulating vessel including:

a gas inlet on said insulating vessel;

an electric source; and

electrodes mounted to said insulating vessel and connected to the electric source; and

means for rolling the object which is in the insulating vessel such that a surface of the objected is uniformly treated by plasma from the plasma generator as the object rolls in the insulating vessel.

5,316,740
ELECTROLYTIC CELL FOR GENERATING STERILIZATION SOLUTIONS HAVING INCREASED OZONE CONTENT

Forrest A. Baker, Albuquerque, and Wesley L. Bradford, Los Alamos, both of N. Mex., assignors to Los Alamos Technical Associates, Inc., Albuquerque, N. Mex.

Filed Mar. 26, 1992, Ser. No. 857,731

Int. Cl.⁵ B01J *19/12*

U.S. Cl. 422—186.07 **6 Claims**

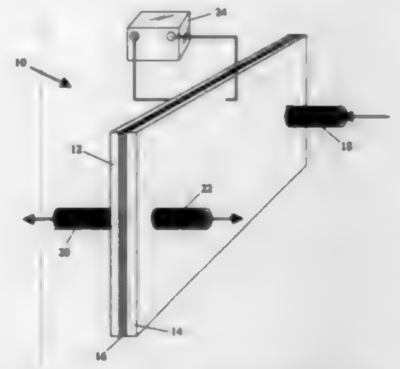
1. An apparatus for generating a mixed oxidant stream including ozone, said apparatus comprising:

anode means comprising a substantially planar first surface;

cathode means comprising a substantially planar second surface, said second surface being parallel to said first surface;

means for maintaining an electrical potential between said first and second surfaces;

means for causing an electrolytic solution to flow between said first and second surfaces and to be subsequently divided into cathode and anode streams, said anode stream comprising the portion of said electrolytic solution that was caused to flow between said first and second surfaces adjacent to said first surface, said flow means further comprising means for varying the rate of flow of said electrolytic solution in response to a control signal;



means for defining a electrochemical interaction zone bounded by said first and second surfaces in which said electrolytic solution undergoes electrochemical interactions, said zone being shaped such that electrolytic solution caused to flow through said interaction zone by said flow means has substantially the same residence time in said interaction zone independent of the path taken through said interaction zone; and

means for measuring a parameter correlated to the ozone in said anode stream and for generating said control signal so as to maintain the ozone concentration within predetermined limits.

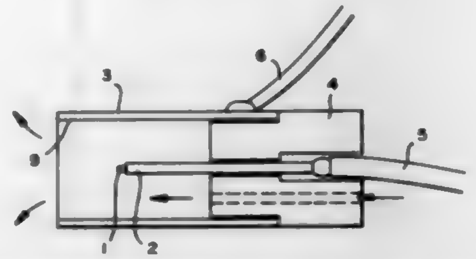
5,316,741
OZONE GENERATOR

Peter B. Sewell, Woodlawn, and Richard J. Luscombe-Mills, Portland, both of Canada, assignors to Zontec Inc., Prescott, Canada

Filed May 30, 1991, Ser. No. 707,818

Int. Cl.⁵ B01J *11/12*

U.S. Cl. 422—186.21 **11 Claims**



1. An electrode structure for an ozone generator comprising an active electrode and a counter electrode, said electrodes each having terminal portions for connection to a high voltage DC source, said electrodes being mounted in spaced apart relation and insulated from one another, said active electrode having a tip portion with a blunt end face disposes at a predetermined distance from said counter electrode, the shape of said end face and its distance from said counter electrode being selected so that for a corona current of 100 μA the local current density at the tip is about 5×10^{-2} A/cm².

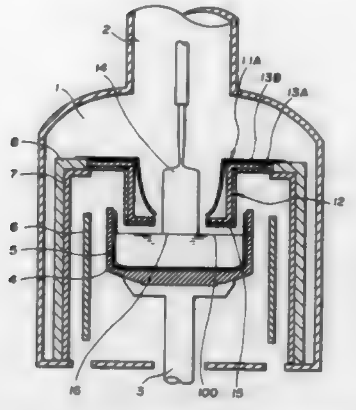
5,316,742
SINGLE CRYSTAL PULLING APPARATUS

Junsuke Tomioka, Hiratsuka; Kazunori Nagai, Miyasaki, and Akihiro Matsuzaki, Hiratsuka, all of Japan, assignors to Komatsu Electronic Metals Co., Ltd., Hiratsuka, Japan

Filed Oct. 8, 1991, Ser. No. 772,928

Int. Cl.⁵ C30B *15/14*

U.S. Cl. 117—217 **21 Claims**



1. A single crystal pulling apparatus, comprising:

a crucible charged with a raw material;

heater means for melting said raw material;

pulling means for immersing a seed crystal in the melted raw material and pulling a resulting single crystal while growing the single crystal;

first screen means in the shape of a hollow cylinder, said first screen means having a double-layered structure in which one layer facing the crucible is made of a heat absorbent material and another layer is made of a heat insulator material, an upper end of said first screen means being formed with an outwardly extending flange, a lower end of said first screen means being formed with an inwardly extending flange, said first screen means surrounding a single crystal pulling zone such that the inwardly extending flange is positioned in the crucible below an upper end of the crucible and near a surface of the melt in the crucible; and

second screen means positioned inside and spaced from the first screen means, a vertical section of said second screen means being in parabolic shape, a center portion of said second screen means being open such as to surround the single crystal pulling zone, an upper end of said second screen means being formed with an outwardly extending flange covering the outwardly extending flange of said first screen means.

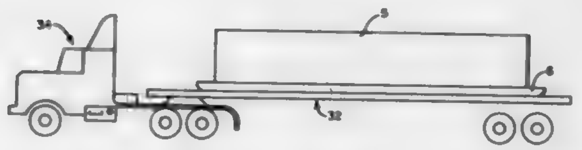
5,316,743
DIESEL FUEL CRACKING UNIT

Ralph W. LeBlanc, 7910 Windward Ct., New Orleans, La. 70128, and Robert M. Bingham, 2212 Albert St., #220, Jefferson, La. 70121

Filed Sep. 28, 1992, Ser. No. 951,783

Int. Cl.⁵ B01D *11/04*

U.S. Cl. 422—256 **4 Claims**



1. A portable refinery for refining waste oil or petroleum into diesel fuel, said portable refinery comprising:

a. transportable skid means for supporting said portable refinery, said transportable skid means being stationary relative to said portable refinery;

b. waste oil and petroleum reservoir means for holding and storing liquid waste oil and petroleum received from a source external to said transportable skid means, said waste oil and petroleum reservoir means being connected to said transportable skid means;

c. refining vessel means for holding and refining waste oil or petroleum, said refining vessel means being connected to said waste oil and petroleum reservoir means, said refining vessel means having inlet means for receiving liquid waste oil and petroleum, said refining vessel means having a top and a bottom, said refining vessel means having condenser means connected thereto for condensing gaseous hydrocarbons produced by said refining vessel means, said refining vessel means having accumulator means connected thereto for removing and collecting water and other impurities in said liquid waste oil and petroleum which settle to said bottom of said refining vessel means,

d. heater means for providing heat to said refining vessel means, said heater means being connected to said refining vessel means;

e. preheater means connected to said transportable skid means for preheating said liquid waste oil and petroleum from said waste oil and petroleum reservoir means prior to said liquid waste oil and petroleum reaching said refining vessel means, said preheater means being connected to said heater means to heat said preheater means, said preheater means having an inlet means for receiving said liquid waste oil and petroleum from said waste oil and petroleum reservoir means and an outlet means for discharging said liquid waste oil and petroleum which has been preheated, said outlet means of said preheater means being connected to said inlet means of said refining vessel means,

f. diesel fuel storage tank means for holding and storing diesel fuel, said diesel fuel storage tank means being connected to said refining vessel means,

g. dewatering means for removing water from diesel fuel, said dewatering means being connected to receive said liquid waste oil and petroleum from said diesel fuel storage tank means, and remove water from said liquid waste oil and petroleum and convey said water-removed liquid waste oil and petroleum to a diesel reservoir tank means;

h. first pump means connected to said transportable skid means for pumping diesel fuel from said diesel fuel reservoir means to said heater means, said first pump means having inlet means connected to said diesel reservoir tank means and outlet means connected to said heater means;

i. second pump means including a first pump for pumping said waste oil and petroleum from said waste oil and petroleum reservoir means to said inlet means of said preheater means, and a second pump being connected to said preheater means and to said refining vessel means for pumping said preheated waste oil and petroleum from the preheater means to said refining vessel means; and

j. level control means connected to said refining vessel means and connected to said second pump means for maintaining the level of liquid waste oil and petroleum in said refining vessel means at a preset level, said level control means activating said second pump means to pump liquid waste oil and petroleum into said refining vessel means when the level of liquid waste oil and petroleum in said refining vessel means is below said preset level to raise the level of liquid waste oil and petroleum in said refining vessel to said preset level.

5,316,744

ABSORPTION COLUMN WITH EXTERNAL MIXING FOR ABSORPTION OF ACETYLENE

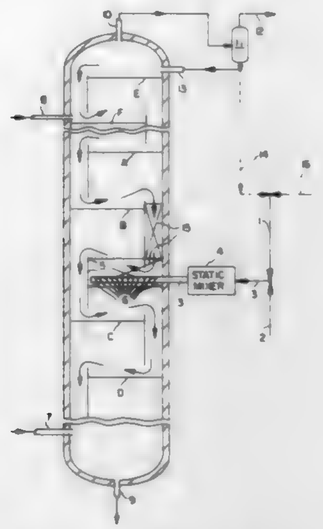
Peter-Clemens Haehn, Geretsried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Division of Ser. No. 980,886, Nov. 24, 1992, which is a continuation of Ser. No. 933,538, Aug. 24, 1992, abandoned. This application Apr. 14, 1993, Ser. No. 46,298

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1991, 4127987

Int. Cl.⁵ B01F *3/00;* B01D *11/04*

U.S. Cl. 422—257 **7 Claims**



1. An absorption system suitable for removing acetylene from a crude gas containing mostly C$_2$ hydrocarbons including acetylene, said absorption column comprising a plurality of plates, a feed pipe at the bottom of the column for crude gas, a feed pipe at the top of the column for fresh or regenerated absorption agent, an outlet at the top of the column for a substantially acetylene-free gas stream, an outlet at the bottom of the column suitable for loaded absorption agent an internal mixing chamber (5), open on the top, installed between two plates (B, c), a feed pipe (3) suitable for a mixture of absorption agent and substantially acetylene-free liquid C$_2$ stream and/or a partial stream of reflux condensate recovered from a condenser in communication with said outlet at the top of the column, said feed pipe (3) leading into said internal mixing chamber, external mixing means outside of said column suitable for mixing said substantially acetylene-free liquid C$_2$ stream and/or the partial stream of the reflux condensate with the absorption agent, and an opposite end of said feed pipe (3) in communication with said external mixing means.

5,316,745

HIGH PRESSURE STERILIZATION APPARATUS AND METHOD

Edmund Y. Ting, and Chidambaram Raghavan, both of Kent, Wash., assignors to Flow International Corporation, Kent, Wash.

Filed Jan. 28, 1993, Ser. No. 10,636

Int. Cl.⁵ A23L *3/015*

U.S. Cl. 422—295 **19 Claims**

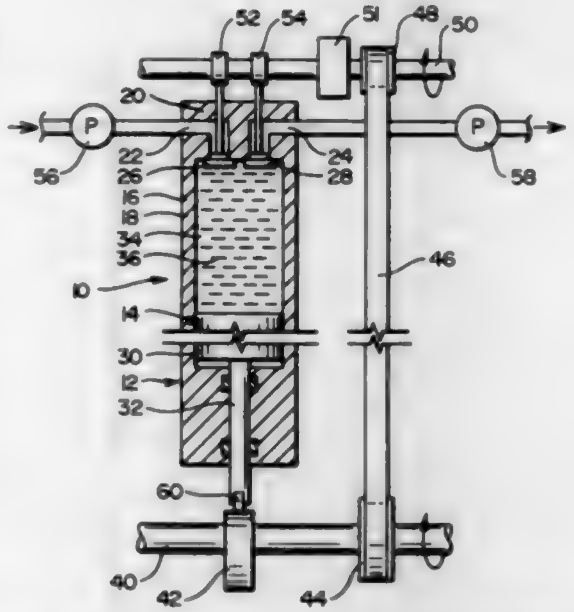
1. An apparatus to sterilizer a material, said apparatus, comprising:

a. a cylinder and plunger assembly comprising two pressurizing components, namely a cylinder component and a plunger component, said cylinder component comprising a cylinder housing defining a compression chamber, and said plunger component comprising a plunger mounted in said cylinder housing;

b. actuating means comprising:

i. pressurizing power means to cause movement of said assembly on a power stroke path where at least a portion of at least one of said cylinder component and said plunger component moves on a compression stroke to reduce volume of said chamber so as to pressurize material in said chamber to a high pressure level, and move on a return stroke to expand the volume in said chamber so as to reduce the pressure level in said chamber;

ii. intake and discharge means to cause movement of said assembly on a discharge and intake stroke path where at least a portion of at least one of said cylinder component and said plunger component moves on a discharge stroke to reduce the volume of the chamber by a relatively greater amount relative to said power stroke path to discharge sterilized material from said chamber and to move on an intake stroke to expand the volume of said chamber to admit material to be sterilized into said chamber;



c. material inlet and outlet means arranged to direct the material to be sterilized into said chamber on said intake stroke and to discharge the sterilized material from said chamber on said discharge stroke.

5,316,746

HIGH PURITY IRON OXIDE AND METHOD FOR PRODUCTION HEREOF

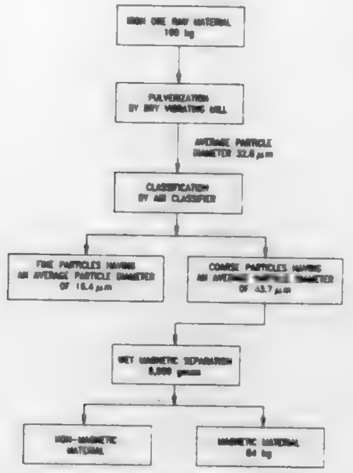
Yuuki Narita; Takero Ito, and Shuetsu Ogasawara, all of Tokyo, Japan, assignors to Kawasaki Steel Corporation and Kawatetsu Mining Co., Ltd., both of Japan

Continuation of Ser. No. 830,664, Feb. 4, 1992, abandoned. This application Apr. 16, 1993, Ser. No. 48,968

Claims priority, application Japan, Feb. 5, 1991, 3-100547; Feb. 5, 1991, 3-100548

Int. Cl.⁵ C01G *49/02*

U.S. Cl. 423—151 **11 Claims**


IRON ORE RAW MATERIAL 100 kg
PULVERIZATION BY DRY VIBRATING MILL
AVERAGE PARTICLE DIAMETER 32.6 μm
CLASSIFICATION BY AIR CLASSIFIER
FINE PARTICLES HAVING AN AVERAGE PARTICLE DIAMETER OF 18.4 μm
COARSE PARTICLES HAVING AN AVERAGE PARTICLE DIAMETER OF 43.7 μm
WET MAGNETIC SEPARATION 8,000 gauss
NON-MAGNETIC MATERIAL
MAGNETIC MATERIAL 64 kg

10. A method of producing iron oxide powder comprising pulverizing iron ore into powder, classifying the pulverized powder and wet magnetic separating non-magnetic particles from the classified powder.

5,316,747

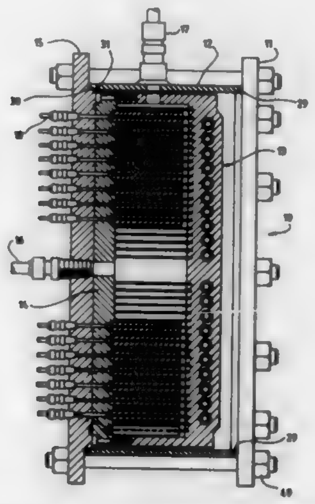
METHOD AND APPARATUS FOR THE SELECTIVE OXIDATION OF CARBON MONOXIDE IN A HYDROGEN-CONTAINING GAS MIXTURE

Eric G. Pow, Vancouver; Mihai Talaba, Surrey; Leonard McNeilly, Burnaby; David S. Watkins, Coquitlam, and Donald A. Lines, Vancouver, all of Canada, assignors to Ballard Power Systems Inc., North Vancouver, Canada

Filed Oct. 9, 1992, Ser. No. 959,070

Int. Cl.⁵ C10K *1/34*

U.S. Cl. 423—247 **8 Claims**



1. A method for the selective oxidation of carbon monoxide to carbon dioxide, said carbon monoxide being present in a gaseous mixture, said method comprising the steps of:

introducing a first amount of oxygen-containing gas into a gaseous mixture comprising hydrogen, carbon dioxide and carbon monoxide;

contacting said gaseous mixture with a catalyst in a reaction chamber having a first inlet and an outlet, said catalyst promoting oxidation of carbon monoxide to carbon dioxide; and

introducing a further amount of oxygen or an oxygen-containing gas mixture into said reaction chamber through at least one secondary inlet located between said first inlet and said outlet.

5,316,748

PHOSPHORIC ACID MANUFACTURING WITH CONVERTED WATERS

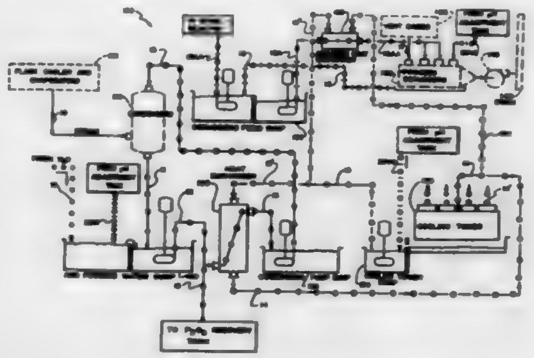
Gordon F. Palm, and R. George Hartig, both of 2729 Oakland Ave., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 727,606, Jul. 9, 1991, abandoned, and a continuation-in-part of Ser. No. 782,989, Oct. 28, 1991, and a continuation-in-part of Ser. No. 669,643, Mar. 14, 1991, Pat. No. 5,171,452. This application Dec. 14, 1992, Ser. No. 990,052

The portion of the term of this patent subsequent to Dec. 15, 2009, has been disclaimed.

Int. Cl.⁵ C01B *25/16;* C02F *1/52*

U.S. Cl. 423—320 **20 Claims**



1. In wet-process phosphoric acid manufacturing productive of waste gypsum and water containing soluble fluorides, metal salts, and radioactive compositions as contaminants, wherein

said waste gypsum was slurried and stacked for drainage into a pond of water, said drainage water having a pH of at most about 2 and containing said dissolved contaminants as well as residual phosphoric acid,

the improvement comprising superseding the aforesaid acid gypsum pond drainage by slurrying waste gypsum with, and thereby limiting gypsum stack drainage to, water substantially freed of said dissolved contaminants and having a more nearly neutral pH of about 6 to 7.

5,316,749

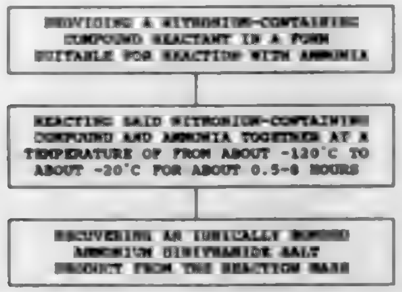
PROCESS FOR FORMING AMMONIUM DINITRAMIDE SALT BY REACTION BETWEEN AMMONIA AND A NITRONIUM-CONTAINING COMPOUND

Robert J. Schmitt, Redwood City; Jeffrey C. Bottaro, Mountain View; Paul E. Penwell, Menlo Park, and David C. Bomberger, Belmont, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 30, 1991, Ser. No. 737,757

Int. Cl.^{5} C01B *21/20*

U.S. Cl. 423—395 **26 Claims**


PROVIDING A NITRONIUM-CONTAINING COMPOUND REACTANT IN A FORM SUITABLE FOR REACTION WITH AMMONIA
REACTING SAID NITRONIUM-CONTAINING COMPOUND AND AMMONIA TOGETHER AT A TEMPERATURE OF FROM ABOUT -120°C TO ABOUT -20°C FOR ABOUT 0.5-8 HOURS
RECOVERING AN IONICALLY BONDED AMMONIUM DINITRAMIDE SALT PRODUCT FROM THE REACTION MASS

1. A process for the formation of ammonium dinitramide salt which comprises reacting ammonia with a nitronium-containing compound at a temperature at which ionically bonded ammonium dinitramide salt will form.

5,316,750

HYDROCARBON COMBUSTION PROCESS IN WHICH THE CARBON DIOXIDE PRODUCED IS PREVENTED FROM DISPERSING ONTO THE ATMOSPHERE, AND A PLANT FOR ITS IMPLEMENTATION

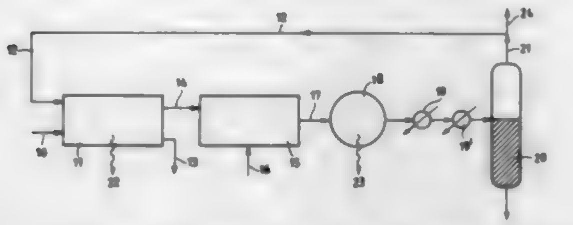
Eduardo Szegu, Via Cardano 8, Milan, and Giuseppe Biardi, Via Casartelli 7, Malnate (Varese), both of Italy

Filed Jul. 2, 1991, Ser. No. 724,938

Claims priority, application Italy, Jul. 5, 1990, 20370 A/90

Int. Cl.^{5} C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—451 **3 Claims**



1. A process for combusting methane for producing energy, comprising:

in a first stage, partially reacting at a temperature in the range of from 500° to 800° C., feed streams consisting essentially of methane and carbon dioxide, wherein said carbon dioxide is produced in a second stage, thereby causing the following reactions to occur:

$$CH_4+CO_2 \rightarrow 2CO+2H_2 \tag{1}$$

$$CH_4+CO_2 \rightarrow 2C+2H_2O \tag{2}$$

$$CO_2+H_2 \rightarrow CO+H_2O \tag{3}$$

in which the C is present as carbon and the CH_4, CO_2, CO, H_2 and H_2O are present as a gaseous mixture;

separating the carbon from the gaseous mixture and forwarding the gaseous mixture to said second stage;

in said second stage, completely combusting the CH_4, CO and H_2 in said gaseous mixture with oxygen in an absence of nitrogen and thereby converting said gaseous mixture into a converted gaseous mixture of CO_2 and H_2O;

separating the H_2O from said converted gaseous mixture to obtain a stream of CO_2; and

totally recycling said stream of CO_2 to said first stage, but for excess CO_2, which is purged from said stream upstream of said first stage.

5,316,751

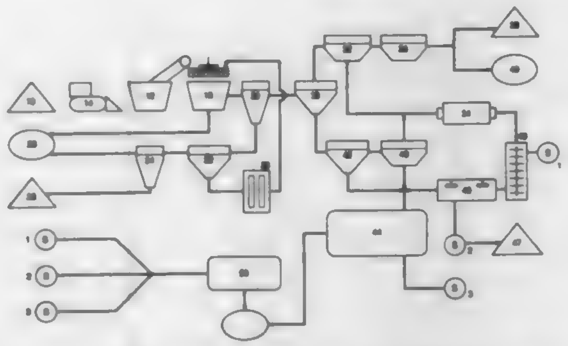
METHODS FOR MINE TAILING CLEAN-UP USING RECOVERY TECHNOLOGIES

Gordon Kingsley, 10 Bonnie Pl., Pleasant Hill, Calif. 94523, and Richard E. Peterson, 537 Valley St., San Francisco, Calif. 94131

Filed Feb. 11, 1991, Ser. No. 652,568

Int. Cl.^{5} C01G *1/12*

U.S. Cl. 423—571 **23 Claims**



1. A method for remediation of sites on which are deposited mine tailings having metals and metal compounds with a substantial proportion of the tailing comprising complex sulfide tailings comprising the steps:

(a) separating sands and slimes from larger materials;

(b) separating sands from slimes;

(c) depositing slimes at a site location suitable for immersing slimes in water with means for drawing water from the top surface of the slimes;

(d) depositing sands at a site location with means for extracting percolated water from under the sands;

(e) spraying the surface of the sands with a water solution having a leaching agent wherein the sands have metals and metal compounds that are contacted by the water solution having the leaching agent;

(f) injecting the slimes with a water solution having a leaching agent, wherein the slimes have metals and metal compounds that are contacted by the water solution having leaching agent;

(g) draining water with leached metal compounds from under the sands;

(h) drawing water with leached metal compounds from the top surface of the slimes; and

(i) recovering metal compounds from the water drawn from the sand and slimes.

13. A method of in situ remediation of sites having zones contaminated with metals and metal compounds having a composition including metal oxides and metal sulfides comprising the steps of:

(a) installing hydrogeologically engineered extraction wells, under zones contaminated with metals and metal compounds;

(b) sprinkling the site with water containing a benign chelating agent wherein the water and chelating agent percolate through the zones;

(c) contacting the metal oxides and metal sulfides in the zones with water containing the chelating agent;

(d) extracting water from the extraction wells;

(e) recovering metal salt compounds from the water containing the chelating agent; and

(f) recycling the water containing the chelating agent to the sprinkling step.

5,316,752

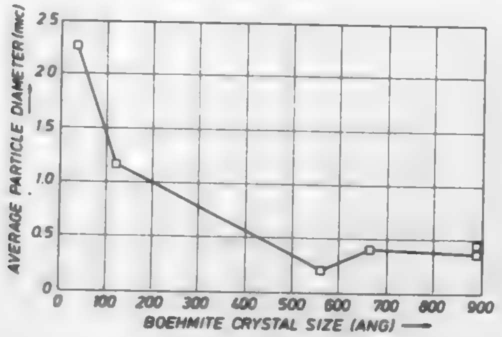
PROCESS FOR PREPARING MIXED OXIDES

Ronald L. Beggs, Leander; Duane J. Lewis, and David A. Barclay, both of Austin, all of Tex., assignors to Vista Chemical Company, Houston, Tex.

Filed Apr. 26, 1991, Ser. No. 692,002

Int. Cl.^{5} C01B *13/14*

U.S. Cl. 423—593 **9 Claims**



1. A process for preparing a mixed oxide containing an alumina species comprising:

forming an intimate mixture of a fluid medium, a boehmite alumina having a specific surface area of from about 4 to about 150 m^2/g and a compound having the formula M_xA_y wherein M is selected from the group consisting of metals, silicon, boron, arsenic and tellurium, A is selected from the group consisting of oxygen and anions, x is from 1 to 4 and y has a value satisfying said formula depending on the valence of M;

treating said mixture to form a uniform sol;

removing said fluid medium and recovering a product containing said hydrated alumina and said compound dehydrating said product at a temperature of from about 900 to about 1200° C.; and de-agglomerating said product using a relatively mild grinding technique to form a powdered mixed oxide.

5,316,753

ZEOLITE SSZ-35

Yumi Nakagawa, Kensington, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Filed Oct. 9, 1992, Ser. No. 959,205

Int. Cl.^{5} C01B *33/26;* **B01J** *29/06*

U.S. Cl. 423—706 **22 Claims**

1. A zeolite having a mole ratio of an oxide selected from silicon oxide, germanium oxide and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide, iron oxide, titanium oxide, boron oxide and mixtures thereof greater than about 15 and having the X-ray diffraction lines of Table II.

5,316,754

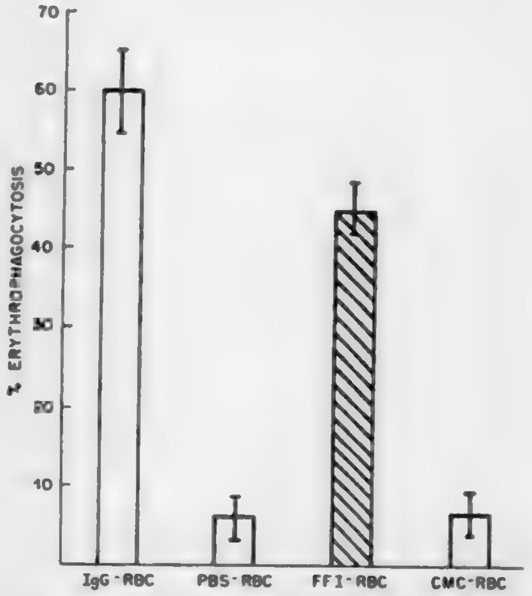
IN VITRO ASSAY OF MESANGIAL CELL-DERIVED RECEPTORS FOR ADVANCED GLYCOSYLATION ENDPRODUCTS

Helen Vlassara, New York, and Anthony Cerami, Shelter Island, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 749,444, Aug. 23, 1991, Pat. No. 5,202,424, which is a continuation-in-part of Ser. No. 453,958, Dec. 20, 1989, abandoned, which is a division of Ser. No. 91,534, Sep. 3, 1987, Pat. No. 4,900,747, which is a continuation-in-part of Ser. No. 907,747, Sep. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Jan. 28, 1993, Ser. No. 10,268

Int. Cl.^{5} C07K *3/00;* **C12Q** *1/00;* **A01N** *37/52;* **A61K** *31/155*

U.S. Cl. 424—2 **28 Claims**



1. A method for measuring the presence of advanced glycosylation endproducts in a biological sample comprising the steps of:

A. preparing at least one biological sample suspected of containing said advanced glycosylation endproducts;

B. preparing at least one corresponding binding partner directed to said samples, said binding partner comprising at least one receptor protein for said advanced glycosylation endproducts derived from the mammalian mesangial cells, said receptor comprising at least one receptor protein reactive with AGEs, characterized as follows:

(a) it has a molecular mass from 30 to 50 kD;

(b) it is reactive with AGE-BSA, AGE-RNAse, AGE-collagen I and AGE-BSA reduced with $NaBH_4$ and has a binding affinity of $2.0 \pm 0.4 \times 10^{-6} M^{-1}$ (kD=500 nM);

(c) it is non-reactive with BSA, collagen I, RNAse or chemically synthesized FFI-BSA; and

(d) it is present on mesangial cell membranes prior to purification;

C. placing a detectable label on a material selected from the group consisting of said sample, a ligand to said binding partner and said binding partner;

D. placing the labeled material from Step C in contact with a material selected from the group consisting of the material from Step C that is not labeled; and

E. examining the resulting sample of Step D for the extent of binding of said labeled material to said unlabeled material.

5,316,755

COMPOSITIONS OF IODOPHENOXY ALKANES AND IODOPHENYL ETHERS FOR VISUALIZATION OF THE GASTROINTESTINAL TRACT

Carl R. Illig, Phoenixville; Eugene R. Cooper, Berwyn; John L. Toner, Downingtown; Donald A. Upson, West Chester; Brent D. Douty, Coatesville; Thomas J. Caulfield, Audubon, all of Pa.; Edward R. Bacon, East Greenbush, N.Y.; Kimberly G. Estep, Albany, N.Y.; Kurt A. Josef, Clifton Park, N.Y.; Shaughnessy Robinson, Clifton Park, N.Y., and Paul P. Spara, Fairport, N.Y., assignors to Sterling Winthrop Inc., Malvern, Pa.

Filed Feb. 2, 1993, Ser. No. 12,189

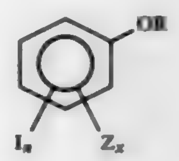
The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.^{5} A61K *31/085*

U.S. Cl. 424—5 **29 Claims**

1. An orally or rectally administerable aqueous x-ray contrast composition for visualization of the gastrointestinal tract comprising:

from about 0.001 to about 75% w/v of a contrast agent having the formula, or a pharmaceutically acceptable salt thereof



wherein

Z = H, halo, C_1–C_{20} alkyl, cycloalkyl, lower alkoxy, cyano, where the alkyl and cycloalkyl groups can be substituted with halogen or halo-lower-alkyl groups;

R = methyl, ethyl, propyl, C_9–C_{25} alkyl, cycloalkyl, or halo-lower-alkyl, optionally substituted with halo, fluoro-lower-alkyl, aryl, lower-alkoxy, hydroxy, carboxy, lower-alkoxy carbonyl or lower-alkoxy-carbonyloxy,

$$(CR_1R_2)_p—(CR_3{=}CR_4)_mQ, \text{ or}$$
$$(CR_1R_2)_p—C{\equiv}C—Q;$$

R_1, R_2, R_3 and R_4 are independently lower-alkyl, optionally substituted with halo;

x is 1–4;

n is 1–5;

m is 1–15;

p is 1–10; and

Q is H, lower-alkyl, lower-alkenyl, lower-alkynyl, lower-alkylene, aryl or aryl-lower alkyl

said contrast agent being in the form of an aqueous dispersion in said compostion wherein said dispersion contains from about 0.01 to about 15% w/v of at least one surfactant selected from the group consisting of trimethylammonium bromide, sodium lauryl sulfate, sodium heptadecyl sulphate, an alkyl benzenesulphonic acid, sodium butylnaphthalene sulfonate and sulphosuccinate and zwitterionic surfactants.

5,316,756

NMR IMAGING USING PARAMAGNETIC CHELATES HAVING HYDROXYALKYL-SUBSTITUTED AMIDE GROUPS

Heinz Gries; Franz-Josef Renneke, and Hanns-Joachim Weinmann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

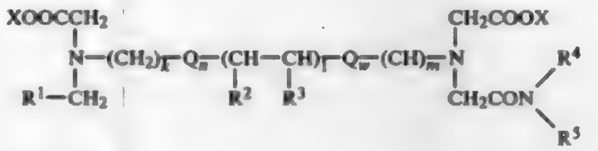
Division of Ser. No. 627,143, Jul. 2, 1984, abandoned. This application Apr. 13, 1990, Ser. No. 515,761

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3324235

Int. Cl.^{5} A61B *5/055;* **C07F** *5/00*

U.S. Cl. 424—9 **27 Claims**

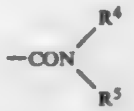
1. In a method of performing NMR imaging of a patient, comprising administering to the patient an effective amount of a diagrastically NMR constrast medium, the improvement wherein the NMR contrast medium is a compound of the formula



$$\text{XOOCCH}_2\text{—N(CH}_2\text{R}^1\text{)—(CH}_2)_k\text{—Q}_n\text{—(CH(R}^2\text{)—CH(R}^3\text{))}_l\text{—Q}_w\text{—(CH)}_m\text{—N(CH}_2\text{COOX)—CH}_2\text{CON(R}^4\text{)(R}^5\text{)}$$

wherein

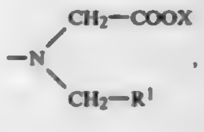
R^1 is COOX or



$$\text{—CON(R}^4\text{)(R}^5\text{)}$$

R^2 and R^3 are the same or different and each is hydrogen, C_{1-7}-alkyl, phenyl or benzyl, or one of

R^2 or R^3 is



$$\text{—N(CH}_2\text{—COOX)(CH}_2\text{—R}^1\text{)},$$

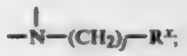
or

R^2 or R^3 together form a trimethylene or tetramethylene group;

R^4 is C_{2-7}-alkyl substituted by 1–5 hydroxy groups;

R^5 is hydrogen, C_{1-7}-alkyl or C_{2-7}-alkyl substituted by 1–5 hydroxy groups;

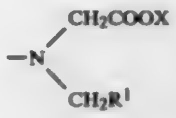
Q is an oxygen or sulfur atom or



$$\text{—N(—)—(CH}_2)_j\text{—R}^x;$$

j is an integer of 1 to 4;

R^x is hydrogen, C_{1-4}-alkoxy, or COOX or, when $j > 1$, it can also be



$$\text{—N(CH}_2\text{COOX)(CH}_2\text{R}^1\text{)}$$

k and m are the same or different and each is a number 0 to 2;

l is a number 1 or 2;

n and w are the same or different and each is 0 or 1;

wherein n and w can both be 1, only when k and m are both 2; and

each X independently is H or a metal ion equivalent;

or a salt thereof with a physiologically acceptable organic base;

and wherein at least one X is an ion of atomic numbers 21–29, 42, 44 or 58–70.

5,316,757

SYNTHESIS OF POLYAZAMACROCYCLES WITH MORE THAN ONE TYPE OF SIDE-CHAIN CHELATING GROUPS

A. Dean Sherry, Dallas, Tex., and Jeroen van Westrenen, Amsterdam, Netherlands, assignors to Board of Regents, The University of Texas System, Austin, Tex.

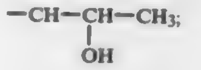
Continuation-in-part of Ser. No. 615,619, Nov. 19, 1990, which is a continuation-in-part of Ser. No. 357,193, May 25, 1989, abandoned, and a continuation-in-part of Ser. No. 291,053, Dec. 28, 1988, Pat. No. 4,983,376, Continuation-in-part of Ser. No. 7,729, Jan. 27, 1987, which is a continuation-in-part of Ser. No. 662,075, Oct. 18, 1984, Pat. No. 4,639,365. This application Dec. 13, 1991, Ser. No. 808,845

Int. Cl.^{5} A61K *49/02;* **C07F** *9/38*

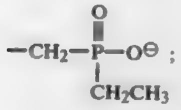
U.S. Cl. 424—9 **11 Claims**

1. A MRI contrast agent consisting essentially of a complex of a paramagnetic lanthanide (III) cation with 1,4,7,10-tetraazacyclododecane-(N,N″-diacetic acid)-(N′-R^1)-(N‴-R^2) or salt thereof, where R^1 and R^2 are independently selected from the group consisting of

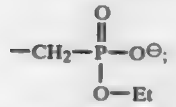
$$\text{—CH}_2\text{—CH}_2\text{—OH;} \qquad \text{(a)}$$



$$\text{—CH—CH(OH)—CH}_3; \qquad \text{(b)}$$



$$\text{—CH}_2\text{—P(=O)(—O}^\ominus\text{)—CH}_2\text{CH}_3 ; \qquad \text{(c)}$$



$$\text{—CH}_2\text{—P(=O)(—O}^\ominus\text{)—O—Et;} \qquad \text{(d)}$$

$$\text{—CH}_2\text{—PO}_3{}^{2-}\text{; and} \qquad \text{(e)}$$

$$\text{—H.} \qquad \text{(f)}$$

5,316,758

ORAL COMPOSITION

Seiji Morishima, Odawara, and Yoji Yamazaki, Hiratsuka, both of Japan, assignors to Lion Corporation, Tokyo, Japan

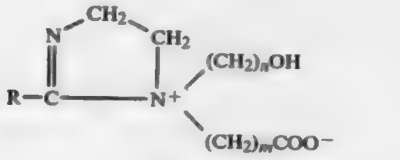
Filed Nov. 5, 1992, Ser. No. 971,586

Claims priority, application Japan, Nov. 6, 1991, 3-318535

Int. Cl.^{5} A61K *7/16, 7/22*

U.S. Cl. 424—54 **15 Claims**

1. An oral composition comprising triclosan and an amphoteric surface active agent having the following general formula (1):



(1)

wherein R represents an alkyl group having 1 to 18 carbon atoms, and n and m are independently an integer of from 1 to 10, wherein triclosan is present in an amount from 0.001 to 1.0% by weight and said amphoteric surface active agent is present in an amount of from 0.01 to 10% by weight of the total weight of the composition.

5,316,759

AGONIST-ANTAGONIST COMBINATION TO REDUCE THE USE OF NICOTINE AND OTHER DRUGS

Jed E. Rose, Venice, and Edward D. Levin, Los Angeles, both of Calif., assignors to Robert J. Schaap, Los Angeles, Calif., a part interest

Continuation-in-part of Ser. No. 231,092, Aug. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 840,072, Mar. 17, 1986, Pat. No. 4,846,199. This application Mar. 23, 1992, Ser. No. 855,868

Int. Cl.^{5} A61K *49/00, 31/44, 31/13*

U.S. Cl. 424—10 **25 Claims**

1. A pharmacologic composition for the treatment and reduction of nicotine dependency said composition comprising:

a) nicotine present in the composition in an amount which would provide a desired pharmacologic effect and at least partially satiate the needs for the nicotine by the user of the composition, and

b) mecamylamine acting as an antagonist to the nicotine present in the composition in an amount sufficient to at least partially block the pharmacologic effects of the nicotine, the relative amount of the nicotine and the relative amount of the mecamylamine being present in the composition so that there is always a substantial systemic level of the mecamylamine present when there is a substantial systemic level of the nicotine present in the blood of a user of the composition, the nicotine and the mecamylamine being administered in the proper amounts and in a proper ratio to preclude intoxication and to also reduce a derivation of any pleasure of a subject to whom administered and to also prevent a state of withdrawal from the nicotine in the subject, such that the nicotine is complemented by the mecamylamine to occupy a greater number of receptors of the user of the nicotine than would be occupied by the nicotine alone and with the nicotine and the mecamylamine having opposing effects with regard to receptor stimulation but common effects with respect to attenuation of response to the nicotine due to receptor occupancy, at least one of the nicotine or the mecamylamine being provided in a form so as to be administered by a technique other than that to which the user was accustomed to administering the nicotine.

5,316,760

MOUTH-CARE PRODUCTS

Gerard Voerman, Ridderkerk, Netherlands, assignor to Rodriso Holding B.V., Ridderkerk, Netherlands

Continuation of Ser. No. 613,655, Jan. 2, 1991, abandoned. This application Jan. 11, 1993, Ser. No. 2,542

Claims priority, application Netherlands, May 9, 1988, 8801214

Int. Cl.^{5} A61K *7/26*

U.S. Cl. 424—58 **4 Claims**

1. A mouthcare composition consisting essentially of:

(a) an extract of leaves of *Urtica dioica* in a concentration of 0.1–3.0% by weight; and

(b) an extract of fruits of *Juniperus communis* in a concentration of 0.1–2.0% by weight,

wherein (a) and (b) together total 1.8% by weight.

5,316,761

COSMETIC GEL STICK COMPOSITIONS

Judy Brazinsky, Kearny, N.J., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 504,497, Apr. 4, 1990, abandoned. This application Mar. 17, 1992, Ser. No. 852,588

Int. Cl.^{5} A61K *07/32, 7/48*

U.S. Cl. 424—65 **11 Claims**

1. A transparent, essentially crystal-free cosmetic gel stick composition consisting essentially of by weight of the composition from about 60 to about 90% of an aliphatic polyhydric alcohol having from 2 to 6 carbons and from 2 to 6 hydroxyl

groups; from about 3 to about 8% soap; from about 1 to about 7% of a water-soluble emollient selected from the group consisting of polyoxyethylene ethers of fatty alcohols, polyoxyethylene, polyoxypropylene ethers of fatty alcohols having less than 20 mol percent polyoxypropylene based on the total mols of polyoxyalkylene, and polyoxyethylene glycols having 20 to 200 mols ethylene oxide, the fatty alcohol moiety having from about 8 to about 22 carbons and the average number of alkylene glycol ether units being at least about 20; from about 10 to about 20% water; from about 1 to about 5% of a water-dispersible emollient that is a polyoxyethylene ether of a branched chain fatty alcohol, the fatty alcohol moiety having from about 8 to about 22 carbons and the average number of ethylene glycol ether units being from 1 to about 6, and an alkalinity material in an amount effective to prevent the growth of crystals in said transparent gel stick composition for a period of at least one month at 115° F.

5,316,762

EMULSION POLYMERIZED POLYMER

Sinan Kiamil, Basingstoke, United Kingdom, assignor to Scholl plc, Windsor, United Kingdom

Filed Nov. 21, 1991, Ser. No. 796,538

Int. Cl.^{5} A61K *47/32*

U.S. Cl. 424—78.35 **7 Claims**

1. An adhesive polymer derived from polymerizing in an aqueous emulsion a composition comprising:

- a substantially water-insoluble monomer (A) comprising C_{2-12} alkyl ester of acrylic or methacrylic acid; with
- a substantially water-insoluble polar monomer (B)(1) comprising a mono substituted acrylamide or methacrylamide, or an N-alkyl substituted acrylamide or methacrylamide wherein the alkyl group contains at least 3 carbon atoms; and/or
- a substantially water-insoluble polyfunctional monomer (B) (2) comprising an alkanediyldiester, which in the presence of a substantially water-soluble surfactant consisting essentially of ammonium or alkyl substituted ammonium salt of stearic acid, is converted to a substantially water-insoluble form after polymerization of monomers (A) and (B).

5,316,763

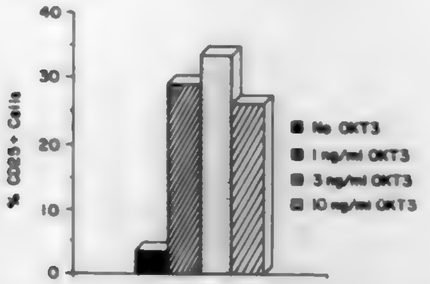
SHORT-TERM ANTI-CD3 STIMULATION OF LYMPHOCYTES TO INCREASE THEIR IN VIVO ACTIVITY

Augusto C. Ochoa, Washington, D.C.; Cynthia Loeffler, Woodbury, Minn.; Walter Urba, Gaithersburg, and Dan L. Longo, Kensington, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C. and Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 728,107, Jul. 10, 1991, abandoned. This application Jul. 10, 1992, Ser. No. 910,835

Int. Cl.^{5} A61K *35/14, 45/05;* **C12N** *5/06*

U.S. Cl. 424—85.2 **16 Claims**



1. A method of enhancing the in vivo immunotherapeutic activity of lymphocytes comprising:

(a) stimulating the lymphocytes in vitro by means of culturing said lymphocytes with an anti-CD3 monoclonal antibody for less than about 24 hours, optionally in the presence of interleukin-2 (IL-2), to form stimulated lymphocytes;

(b) infusing the stimulated lymphocytes into a tumor-bearing mammal, wherein said stimulated lymphocytes are infused into said mammal without substantial further in vitro culture; and

(c) administering an amount of IL-2 to the mammal effective to induce proliferation of said stimulated lymphocytes in vivo; whereby the immunotherapeutic activity of the lymphocytes is enhanced in vivo, resulting in a decrease in the tumor burden by at least about 20%.

5,316,764

CANINE PARVOVIRUS VACCINES

Jill Walsh, Houghton, England, assignor to AKZO N.V., Arnhem, Netherlands

Continuation of Ser. No. 319,804, Mar. 6, 1989, abandoned, which is a continuation of Ser. No. 823,333, Jan. 28, 1986, Pat. No. 4,810,494. This application Feb. 25, 1993, Ser. No. 25,713

Claims priority, application United Kingdom, Jan. 30, 1985, 8502399

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.^{5} A61K *39/12, 39/23*

U.S. Cl. 424—89 **16 Claims**

1. A vaccine for immunization against canine parvovirus infections comprising an immunologically effective amount of canine parvovirus derived from strain 154, CNCM number I-404 and having the immunogenic characteristic of eliciting an antibody response in pups having maternally derived antibodies against canine parvovirus, and a pharmaceutically acceptable carrier.

5,316,765

USE OF COENZYME Q_{10} IN COMBINATION WITH HMG-COA REDUCTASE INHIBITOR THERAPIES

Karl A. Folkers, Austin; Per H. Langsjoen, Temple, and Richard A. Willis, Austin, all of Tex., assignors to Karl Folkers Foundation for Biomedical and Clinical Research, Austin, Tex.

Continuation-in-part of Ser. No. 404,228, Sep. 7, 1989, Pat. No. 5,082,650. This application Sep. 19, 1991, Ser. No. 762,312

The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.

Int. Cl.^{5} A61K *45/00, 31/405, 31/35, 31/12*

U.S. Cl. 424—94.1 **4 Claims**

1. A method for ameliorating reductions of coenzyme Q_{10} in cardiomyopathy patients receiving an HMG-CoA reductase inhibitor comprising administering concurrently with said HMG-CoA reductase inhibitor coenzyme Q_{10} at a concentration sufficient to raise serum levels of coenzyme Q_{10} to at least 2.0 μg/ml.

5,316,766

THROMBOSIS TREATMENT WITH FIBRINOLYTICS AND PROSTACYCLINS

Berthold Baldus; Bernhard Maass; Bernd Müller, and Werner Witt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 316,841, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 941,444, Dec. 15, 1986, abandoned. This application Feb. 6, 1990, Ser. No. 474,689

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544663

Int. Cl.^{5} A61K *37/54, 37/547, 31/215*

U.S. Cl. 424—94.63 **24 Claims**

1. A pharmaceutical composition useful for thrombosis treatment comprising an effective amount of a fibrinolytic agent and an amount of a carbacyclin effective to inhibit thrombocyte aggregation.

5,316,767

WHITENING COSMETIC COMPOSITION

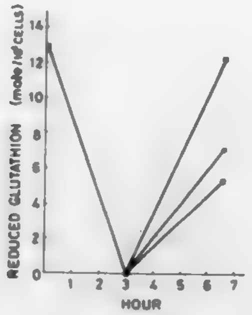
Takahiro Hara, Machida; Seigo Takasawa, Hatano; Yoshiharu Yokoo, Sagamihara, all of Japan, and Tadayasu Furukawa, Chesterfield, Mo., assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Continuation of Ser. No. 765,624, Sep. 25, 1991, abandoned. This application Dec. 3, 1992, Ser. No. 985,535

Claims priority, application Japan, Sep. 28, 1990, 2-259384

Int. Cl.^{5} A61K *6/00*

U.S. Cl. 424—401 **8 Claims**



1. A whitening composition comprising

(a) a compound selected from the group consisting of:
  (i) γ-L-glutamyl-L-cystine,
  (ii) γ-L-glutamyl L-cysteine disulfide,
  (iii) oxidized glutathione,
  (iv) γ-L-glutamyl-L-cystine acylated at the amino group with a straight or branched, saturated or unsaturated, alkanoyl group containing 1 to 20 carbon atoms, or with a benzoyl or naphthoyl group,
  (v) γ-L-glutamyl-L-cysteine disulfide acylated at the amino group with a straight or branched, saturated or unsaturated, alkanoyl group containing 1 to 20 carbon atoms, or with a benzoyl or naphthoyl group, and
  (vi) oxidized glutathione acylated at the amino group with a straight or branched, saturated or unsaturated, alkanoyl group containing 1 to 20 carbon atoms, or with a benzoyl or naphthoyl group,

wherein said compound is present at a concentration of 0.001–10% (W/W); and

(b) a cosmetically acceptable component.

5,316,768

PHARMACEUTICAL COMPOSITIONS HAVING ANTIVIRAL ACTIVITY AGAINST HUMAN CYTOMEGALOVIRUS

Bronwyn G. Hughes, and Steven G. Wood, both of Orem, Utah, assignors to Murdock International Corporation, Springville, Utah

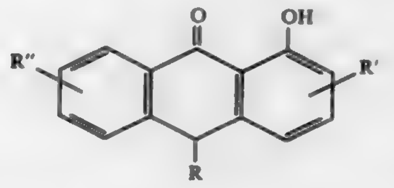
Division of Ser. No. 635,361, Dec. 28, 1990, abandoned. This application Sep. 11, 1992, Ser. No. 943,748

Int. Cl.^{5} A61K *35/78*

U.S. Cl. 424—433 **6 Claims**

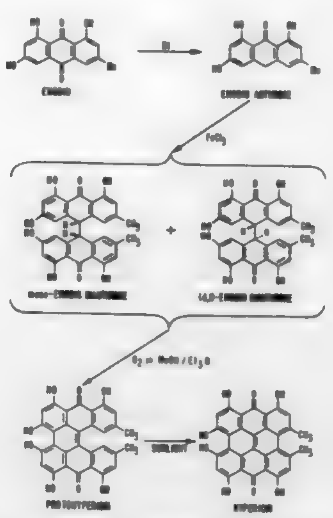
1. A method for treating a viral disease caused by human cytomegalovirus comprising:

(a) obtaining a therapeutically effective dose of an antiviral compound which is a dimer of two compounds of the formula



wherein R is 2H or =O; R′ is OH, H, or COOH (single substitution); and R″ is OH, HH, or alkyl (single or multiple substitution); and pharmaceutically acceptable salts thereof, said antiviral compound having antiviral activity in humans against a viral disease caused by human cytomegalovirus; and

(b) administering the antiviral compound to a patient.



5,316,769

DRUG FOR PREVENTING AND TREATING FISH DISEASES

Satoru Nakano, Tsuchiura; Takeo Oshima, Tokyo; Masaaki Okada, and Kiyohiko Kunugita, both of Tsukuba, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP90/01612, § 371 Date Aug. 27, 1992, § 102(e) Date Aug. 27, 1992, PCT Pub. No. WO91/09611, PCT Pub. Date Jul. 11, 1991

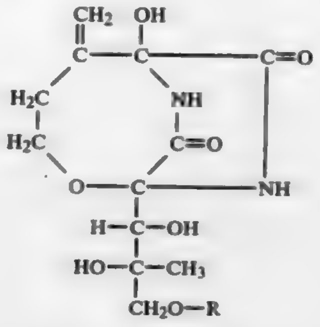
PCT Filed Dec. 11, 1990, Ser. No. 859,708

Claims priority, application Japan, Dec. 27, 1989, 1-342111

Int. Cl.^{5} A23K *1/17*

U.S. Cl. 424—442 **4 Claims**

1. A fish food which is a moist pellet prepared from a mixture of fish mince and formulated feed, containing a compound of the formula:



where R is an alkanoyl group; a benzoyl group optionally having one or more substituent groups selected from the group consisting of lower alkyl groups, halogen atoms, penylacetyl group and cyclohexanecarbonyl group.

5,316,770

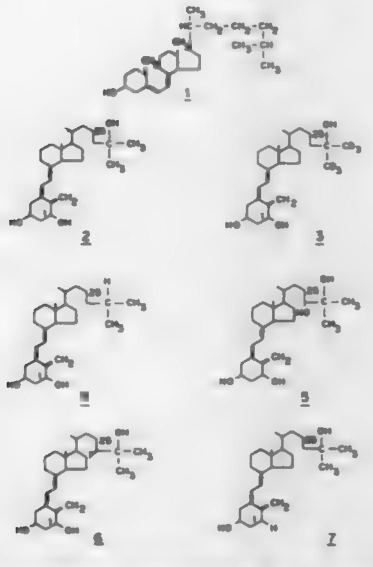
VITAMIN D DERIVATIVE FEED COMPOSITIONS AND METHODS OF USE

Hardy M. Edwards, Jr., Winterville, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 630,748, Dec. 20, 1990, Pat. No. 5,154,925, which is a continuation of Ser. No. 311,540, Feb. 16, 1989, abandoned. This application Mar. 31, 1992, Ser. No. 861,109

Int. Cl.⁵ A61K *31/59*

U.S. Cl. 424—442 **5 Claims**



1. A method for enhancing phytate phosphorus utilization in an animal comprising administering to the animal an effective amount of a vitamin D_3 derivative selected from the group consisting of 1,25-dihydroxycholecalciferol; 1,25-dihydroxy-26,27-hexadeuterocholecalciferol; 1-hydroxycholecalciferol; 1,24,25-trihydroxycholecalciferol; 1,25-dihydroxy-24-fluorocholecalciferol and mixtures thereof, in combination with animal feed containing 1.3% calcium by weight or less and between 0.4 and 0.9% by weight phosphorus.

5,316,771

METHOD OF AMPHIPHATIC DRUG LOADING IN LIPOSOMES BY AMMONIUM ION GRADIENT

Yechezkel Barenholz, and Gilad Haran, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Israel

Continuation of Ser. No. 413,037, Sep. 27, 1989, Pat. No. 5,192,549, which is a continuation of Ser. No. 250,687, Sep. 29, 1988, abandoned. This application Dec. 18, 1992, Ser. No. 992,997

The portion of the term of this patent subsequent to Mar. 9, 2010, has been disclaimed.

Int. Cl.⁵ A61K *37/22*

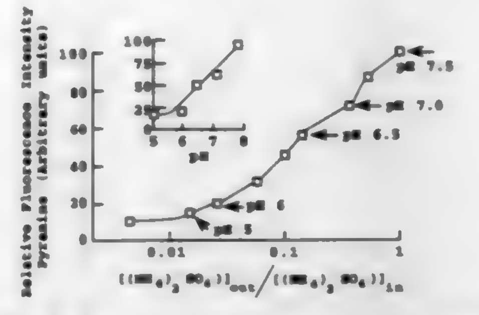
U.S. Cl. 424—450 **2 Claims**

1. A method for loading into liposomes, an amphiphatic compound having a protonatable amine group, said method comprising:

(a) preparing a suspension of liposomes having a greater concentration of ammonium ions inside the liposomes than outside the liposomes, where said preparing includes treating the liposomes to reduce their sizes,

(b) adding said compound to the liposome suspension, and

(c) by said adding, achieving uptake of the compound into the liposomes, to a final concentration of compound within the liposomes which is greater than that outside the liposomes.



5,316,772

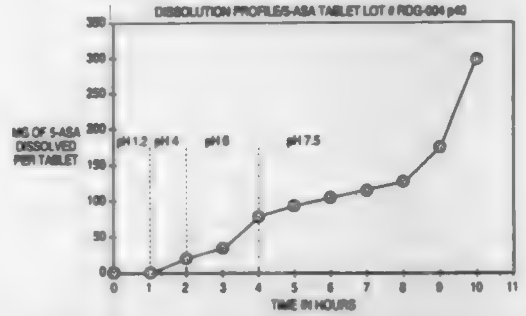
BILAYERED ORAL PHARMACEUTICAL COMPOSITION WITH PH DEPENDENT RELEASE

Raymond W. Jurgens, Jr., Roswell; Roger D. Graben, Powder Springs, and Adnan S. Sabir, Marietta, all of Ga., assignors to Solvay & Cie, S.A. (Societe Anonyme), Brussels, Belgium

Continuation-in-part of Ser. No. 649,707, Dec. 19, 1990, abandoned. This application Dec. 2, 1991, Ser. No. 801,358

Int. Cl.⁵ A61K *9/24, 9/58, 9/62, 9/16*

U.S. Cl. 424—472 **55 Claims**



1. An oral pharmaceutical composition comprising a core, a first inner layer coating on the core, and a second inner layer coating on the first inner layer coating, wherein the core, the first inner layer coating and the second inner layer coating each contain at least one drug, said at least one drug consisting of one or several drugs, either in combination and dispersed throughout each inner layer, or with separate drugs in the core, the first inner layer and the inner second layer, the composition effecting delivery of said at least one drug to both the small and large bowel, and the first inner layer coating comprises a coating agent consisting essentially of acrylic resin and releases said at least one drug at a pH of 5 through 8, and the second inner layer coating comprises a coating agent consisting essentially of a cellulose derivative, polyvinyl acetate phthalate, or polyvinyl acetate phthalate mixed with a plasticizer, and releases said at least one drug at a pH of 3 through 6;

wherein said core comprises a concentration of said at least one drug of from 20–60%, said first inner layer coating comprises a concentration of said at least one drug of from 15–45% and a percentage of coating agent of between 12.3–48.7%, and said second inner layer comprises a concentration of said at least one drug of from 15–45% and a percentage of coating agent of between 31.6–49.9%.

5,316,773

PARTICULATE PREPARATION CONTAINING A FLOURRACIL DERIVATIVE AND HYDROXYPROPYLMETHYL-CELLULOSE

Toru Nishibayashi; Yoshihiro Ishizue; Kozo Ishida, and Masanori Kubo, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP91/00951, § 371 Date Mar. 16, 1992, § 102(e) Date Mar. 16, 1992, PCT Pub. No. WO92/01453, PCT Pub. Date Feb. 6, 1992

PCT Filed Jul. 17, 1991, Ser. No. 842,195

Claims priority, application Japan, Jul. 19, 1990, 192112

Int. Cl.⁵ A61K *9/14, 47/38*

U.S. Cl. 424—499 **5 Claims**

1. A solid preparation of 3-[3-(6-benzoyloxy-3-cyano-2-pyridyloxycarbonyl)-benzoyl]-1-ethoxymethyl-5-fluorouracil having enhanced water solubility consisting essentially of 3-[3-(6-benzoyloxy-3-cyano-2-pyridyloxycarbonyl)-benzoyl]-1-ethoxymethyl-5-fluorouracil and about 0.05 to 3 parts by weight of hydroxypropylmethylcellulose per part of the 3-[3-(6-benzoyloxy-3-cyano-2-pyridyloxycarbonyl)-benzoyl]-1-ethoxymethyl-5-fluorouracil, said solid preparation being prepared by dissolving the 3-[3-(6-benzoyloxy-3-cyano-2-pyridyloxycarbonyl)benzoyl]-1-ethoxymethyl-5-fluorouracil and hydroxypropylmethylcellulose in an organic solvent, and then removing the organic solvent to form an amorphous powder.

5,316,774

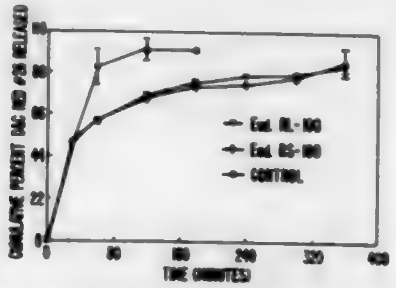
BLOCKED POLYMERIC PARTICLES HAVING INTERNAL PORE NETWORKS FOR DELIVERING ACTIVE SUBSTANCES TO SELECTED ENVIRONMENTS

Robert P. Eury, Half Moon Bay, and Rajesh Patel, San Mateo, both of Calif., assignors to Advanced Polymer Systems, Inc., Redwood City, Calif.

Continuation of Ser. No. 541,111, Jun. 20, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 806,860

Int. Cl.⁵ A61K *9/14, 9/10, 47/32, 47/38*

U.S. Cl. 424—501 **51 Claims**



1. A composition for the controlled release of an active substance, said composition comprising polymeric particles present in a liquid carrier non-degrading to said polymeric particles, wherein the polymeric particles each define a network of internal pores having therein (1) the active substance and (2) a blocking agent having physical and chemical characteristics selected to degrade and release the active substance from the internal pores in response to changes in external conditions and wherein the liquid carrier is selected to inhibit degradation of the blocking agent to maintain the active substance within the pores, wherein the blocking agent is selected from the group consisting of polymeric and non-polymeric enterosoluble materials.

5,316,775

METHOD OF TREATING HEPATITIS B INFECTION

Sudhakar S. Wagle, Mequon, Wis.; Thomas Steinbach, Houston, Tex.; Carl H. Lawyer, Mequon, Wis.; William J. Hermann, Jr., Sealy, Tex., and Ali A. S. Gawish, Mequon, Wis., assignors to Kremers-Urban Company, Mequon, Wis.

Continuation-in-part of Ser. No. 803,844, Dec. 4, 1991, and a continuation-in-part of Ser. No. 780,084, Oct. 15, 1991, abandoned, said Ser. No. 803,844, is a continuation-in-part of Ser. No. 728,267, Jul. 11, 1991, abandoned, which is a continuation of Ser. No. 228,364, Aug. 4, 1988, Pat. No. 5,055,296, said Ser. No. 780,084, is a continuation-in-part of Ser. No. 728,267, Jul. 11, 1991, abandoned, which is a continuation of Ser. No. 228,364, Aug. 4, 1988, Pat. No. 5,055,296. This application Apr. 19, 1993, Ser. No. 49,511

Int. Cl.⁵ A61K *35/407*

U.S. Cl. 424—553 **5 Claims**

1. A method of treating hepatitis B viral infection comprising:

administering to a mammal having hepatitis B infection a therapeutically effective amount of a mammalian liver extract referred to as KU 10,001, the extract being heat stable, insoluble in acetone and soluble in water.

5,316,776

FERMENTATION METHOD

David Annuk, Baulkham Hills; Peter L. Voigt, Wodonga, and Sameul F. Marshall, Cheltenham, all of Australia, assignors to Arnott's Biscuits Limited, Homebush, Australia

Continuation of Ser. No. 59,109, Jun. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 696,023, Jan. 29, 1985, abandoned. This application Feb. 14, 1989, Ser. No. 311,426

Claims priority, application Australia, Jan. 31, 1984, PG3390

Int. Cl.⁵ A21D *8/00*

U.S. Cl. 426—18 **26 Claims**

1. A process for the production of a fermented milled grain substrate useful in bakery products, said process comprising:

(i) providing a pumpable, aqueous slurry of milled grain;

(ii) delivering a volume of said slurry, into a fermentation vessel;

(iii) fermenting said slurry subsequent to an initial inoculation with lactic acid-producing bacteria;

(iv) monitoring a condition of said slurry, which condition is a function of the fermenting of said slurry;

(v) removing a portion of said flurry when said condition reaches a pre-determined value;

(vi) adding further slurry of milled grain to said vessel to replace the portion removed, which further slurry is non-sterile and wherein;

(vii) steps (iv), (v) and (vi) are repeated to maintain steady state fermentation conditions within the vessel, with the bacteria levels within the vessel being substantially maintained by bacteria growth within the vessel, without addition of further lactic acid-producing bacteria.

5,316,777

LID OF CONTAINER AND CONTAINER FOR INSTANT FOODS USING THE SAME

Takashi Toyoda; Yasuji Hosono; Takashi Funato; Takashi Miyaji, all of Ibaraki; Yukio Kohama, Kanagawa; Kazunori Yamada, Kanagawa; Toshiaki Watanabe, Kanagawa, and Chiaki Kanai, Kanagawa, all of Japan, assignors to Oji Yuki Goseishi Co., Ltd., Tokyo and Tokai Aluminum Foil Co., Ltd., Yokohama, both of Japan

Filed Apr. 16, 1992, Ser. No. 869,188

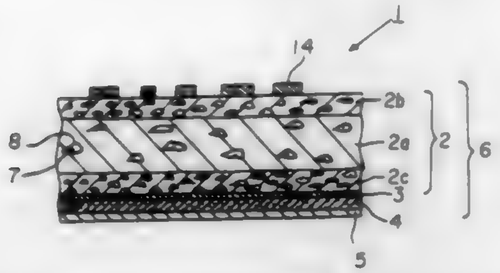
Claims priority, application Japan, Apr. 19, 1991, 3-088733; Apr. 23, 1991, 3-092439

Int. Cl.⁵ B32B *3/26;* **B65D** *85/72*

U.S. Cl. 426—87 **35 Claims**

16. A container for an instant food which can be cooked by pouring hot water into the container, which is sealed with a stripping lid having a lug at the periphery thereof for easy

stripping from the container, said lid comprising a laminated sheet having, in sequence order, (1) a base layer, (2) an adhesive layer, (3) an aluminum foil layer having a thickness of from 3 to 25 μm, and (4) a heat-sealable resin layer, wherein said base layer comprises a stretched resin film having microvoids therein and having an axis of greatest thermal expansion coefficient, and wherein said lug is formed in such a manner that the direction of stripping indicated by the lug should be set within a range of ±45° with respect to the direction of greatest thermal expansion coefficient of said base layer when heated from 30° C. up to 80° C. at a rate of temperature rise of 10° C./min for 5 minutes, said base layer having a thermal expansion coefficient in said axis direction of from 0.40 to 1.0%, as measured by heating from 30° C. up to 80° C. at a rate of temperature rise of 10° C./min for 5 minutes.



5,316,778

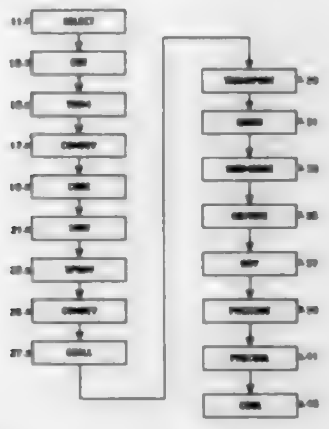
METHOD FOR PROCESSING LEAFY VEGETABLES FOR EXTENDED STORAGE

John K. Hougham, Carmel, Calif., assignor to Global Prepcorp, Salinas, Calif.

Filed Nov. 29, 1991, Ser. No. 800,494

Int. Cl.^{5} A23L *1/025*

U.S. Cl. 426—324 **20 Claims**



1. A method of processing leafy vegetables for extended shelf-life, wherein the method comprises:

tearing the leaves from the stem while including residual stem tissue with the leaves; and

packaging the leaves in a master container.

5,316,779

FOAM-LIMITING DRINKING CUP AND METHOD

Booker W. Morey, 2512 Cowper St., Palo Alto, Calif. 94301

Filed Sep. 16, 1991, Ser. No. 760,704

Int. Cl.^{5} A23L *2/38;* **B65D** *25/14*

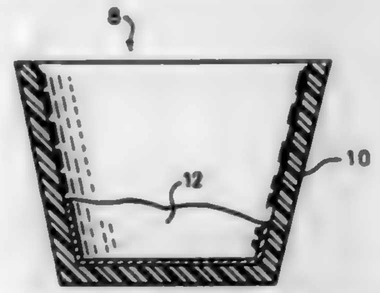
U.S. Cl. 426—329 **18 Claims**

1. A container comprising a drinking cup, a coating comprising a food grade antifoaming agent that inhibits the formation of bubbles on a liquid during agitation by reducing surface tension and elasticity thereof affixed to the cup at the inner surface of the cup in an amount effective for accelerating the rate of collapse of a foam head produced by pouring a ready-to-drink aspartame-containing carbonated soft drink beverage which foams when poured into the cup and decreasing the time required to fill the cup without overflowing the same, the antifoaming agent affixed to the cup being present in an amount such that said antifoaming agent has a significantly smaller effect on the rate of collapse of a foam head on bear produced by pouring beer into the cup than on the rate of collapse of said foam head produced by pouring said soft drink beverage into the cup such that the foam head on beer poured into the cup will be retained for a longer time than the foam head on the soft drink beverage poured into the cup, thus allowing the coated cup to be used to serve the soft drink beverage or beer, which coating does not change the taste of carbonated beverage poured into the cup.

7. A method of speeding the filling of a drinking cup with a beverage that foams and forms a foam head when poured comprising,

providing a drinking cup,

applying a coating comprising a food grade antifoaming agent that inhibits the formation of bubbles on a liquid during agitation by reducing surface tension and elasticity thereof at the inner surface of the drinking cup in an amount effective to accelerate the rate of collapse of a foam head produced by pouring a ready-to-drink aspartame-containing carbonated soft drink beverage which foams when poured into the cup, the antifoaming agent being present in an amount such that the antifoaming agent has a significantly smaller effect on the rate of collapse of a foam head on beer produced by pouring beer into the cup than on the rate of collapse of said foam head produced by pouring said soft drink beverage into the cup such that the foam head on beer poured into the cup will be retained for a longer time than the foam head on the ready-to-drink aspartame-containing carbonated soft drink beverage poured into the cup, thus allowing the coated cup to be used to serve the soft drink beverage or beer,



pouring a beverage into the drinking cup which beverage forms a foam head when poured, the collapse of which foam head is accelerated by the antifoaming agent permitting an increase in filling speed of the drinking cup without overflow, the taste of the beverage poured into the cup being unchanged by the coating.

5,316,780

METHOD FOR EXTRACTING CHOLESTEROL FROM EGG YOLK

Scott C. Stouffer, Evanston; Lisa J. Majeres, Chicago, and Wibul Charintranond, Elmhurst, all of Ill., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed Oct. 14, 1992, Ser. No. 960,910

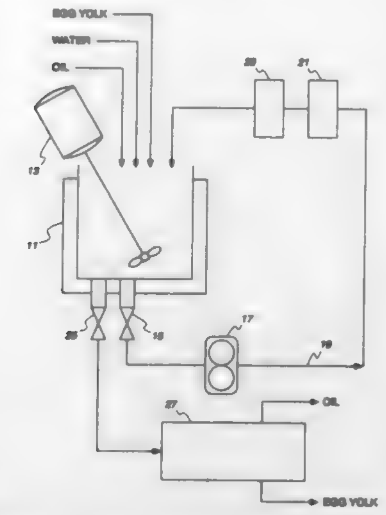
Int. Cl.^{5} A23L *1/32*

U.S. Cl. 426—424 **5 Claims**

1. A method for extracting cholesterol from egg yolk comprising:

(a) providing a mixture of egg yolk solids, water and oil;

(b) subjecting said mixture to moderate shear extraction conditions which prevent the formation of oil-in-water emulsions by repetitively pumping said mixture in a flowing stream through a conduit provided with at least one orifice having a diameter of from about $\frac{3}{16}$ inch to about $\frac{1}{8}$ inch for a 1 inch conduit and proportionally equivalent orifice sizes for other conduit sizes and at least one screen which is from about 40 to about 50 mesh, U.S. standard sieve size mounted transversely to said flowing stream on the downstream side of said orifice, wherein each part of said mixture is caused to pass through said orifice and said screen a number of times equivalent to passing through a series of orifices and screens equivalent to from about 10 to about 35 pairs of orifices and screens; and



(c) separating said mixture into separate water and oil phases, wherein at least about 70% of the cholesterol from said egg yolk is retained in the oil phase and the egg solids are retained in the water phase.

5,316,781

BREWING DEVICE FOR A COFFEE MACHINE AND METHOD OF PRODUCING COFFEE

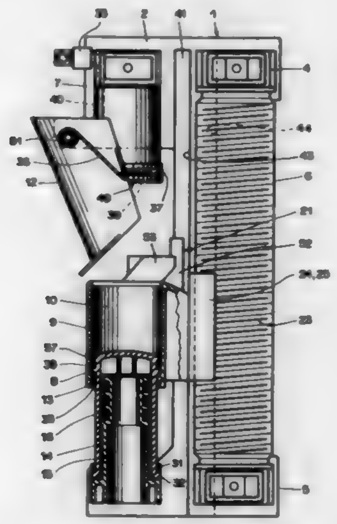
André Lüssi; Hans Zarbuchen, both of Wabern, and Jürg von Gunten, Grosshöchstetten, all of Switzerland, assignors to Sintra Holding AG, Switzerland

PCT No. PCT/CH92/00155, § 371 Date Mar. 25, 1993, § 102(e) Date Mar. 25, 1993, PCT Pub. No. WO93/02605, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 28, 1992, Ser. No. 30,219

Int. Cl.^{5} A47J *31/00;* **A23F** *5/00*

U.S. Cl. 426—433 **10 Claims**



1. Brewing device for a coffee machine comprising a vertically disposed brewing cylinder (9) having a cylindrical bore (10), upper and lower pistons (7, 8) closing the cylindrical bore (10) to form a brewing chamber (11), said brewing cylinder (9) and said lower piston (8) being displaceable relative to one another and the upper piston (7) along a brewing cylinder axis, said brewing cylinder (9) having an upper and lower end and being movable in the vertical direction, a frame (1) for supporting said brewing device, said upper piston (7) being fixed to said frame (1), a pivotable hopper (12) for introducing coffee powder into the bore at the upper end of the brewing cylinder, said lower piston (8) being disposed freely displaceably along the bore (10) of the brewing cylinder (9) and having a hollow cylinder-shaped shaft (14) with an inner surface facing away from the brewing cylinder (9), retaining stop means located at the lower end of the brewing cylinder for retaining the lower piston (8) in the bore (10) of the brewing cylinder (9), a cylinder-shaped connecting piece (15) fixed to the frame (1) situated opposite the upper piston and having an outer surface for guiding the inner surface of the lower piston shaft (14) when the brewing cylinder moves downward, blocking means (16, 17, 18, 19, 20) between said inner surface and said outer surface for temporarily blocking relative movement of the lower piston (8) with respect to the brewing cylinder, a stripping device (21) for removing coffee remaining on the lower piston, and means for activating said stripping device as soon as the upper end of the brewing cylinder (9) by its downward movement is essentially flush with an upper end face of the lower piston (8).

5,316,782

PRODUCT AND PROCESS OF MAKING A PRODUCT FLAVORED USING A BY-PRODUCT OF ALCOHOL PRODUCTION

Joseph A. Zimlich, III, Louisville, Ky., assignor to Brown-Forman Beverage Company, Louisville, Ky.

Filed Oct. 21, 1992, Ser. No. 964,088

Int. Cl.^{5} A23K *1/06;* **A23L** *1/105*

U.S. Cl. 426—624 **59 Claims**

1. A process of treating a thin stillage portion produced during the production of alcohol comprising:

(a) adjusting pH of the thin stillage portion to between about 7 to about 11;

(b) maintaining the pH-adjusted thin stillage portion at a temperature of between about 130° F. to about 210° F. for about 4 to about 14 hours and concentrating the cooked, pH-adjusted thin stillage portion to obtain a viscous product; and

(c) drying the viscous product of said step (b) to obtain a substantially free-flowing solid product.

5,316,783

PARBOILED RICE PRODUCT AND METHOD OF MAKING SAME

Cynthia P. Kratochvil, Seabrook; Yah Hwa E. Lin, Houston, and Thomas J. Novak, Kingwood, all of Tex., assignors to Uncle Ben's, Inc., Houston, Tex.

Filed Nov. 20, 1992, Ser. No. 979,809

Int. Cl.^{5} A23L *1/182*

U.S. Cl. 426—627 **18 Claims**

10. A method for the preparation of parboiled rice, which comprises (a) steeping brown rice to a moisture content sufficiently high that the rice starch is capable of being substantially fully gelatinized; and (b) exposing the rice to a hot gaseous medium flow at a temperature and for a time such that the rice starch is gelatinized and the surface of the rice is dried in substantial part, wherein the hot gaseous medium is hot air.

5,316,784
PROCESS FOR THE PRODUCTION OF A SOLID PHASE MATRIX COATED WITH AN IMMUNOLOGICALLY ACTIVE SUBSTANCE

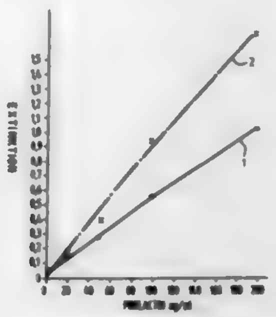
Eberhard Maurer, Weilheim, and Rolf Deeg, Bernried, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 545,175, Jun. 28, 1990, abandoned. This application Dec. 21, 1992, Ser. No. 994,487

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1989, 39233421

Int. Cl.^{5} B05D *3/06;* **G01N** *33/53, 33/543*

U.S. Cl. 427—2 **13 Claims**



1. Process for the production of a solid phase matrix coated with an immunologically active substance, comprising the steps of:

a) adsorptively coating a carrier material selected from the group consisting of polyamide, polyacrylamide, polyester, polycarbonate, polyvinylchloride, polymethylacrylate, polystyrene and copolymers of polystyrene, with a mixture of (a) an immunologically active substance and (b) a linking or bridging compound which contains at least two functional groups which can be photoactivated and at least one moiety which interacts adsorptively to link the immunologically active substance to the carrier material in the absence of radiation capable of photoactivating said at least two functional groups, thus producing a coated carrier material, and

b) subsequently irradiating the coated carrier material to intermolecularly cross-link the immunologically active substance and the carrier material via the linking or bridging.

5,316,785
METHOD AND APPARATUS OF FORMING A COATING FILM ON AN INNER SURFACE OF A PANEL OF A CATHODE RAY TUBE

Kunihiko Yanai; Yasuo Tanaka, and Yasunori Niwa, all of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 766,509

Claims priority, application Japan, Sep. 28, 1990, 2-259570

Int. Cl.^{5} B05D *5/06*

U.S. Cl. 427—72 **9 Claims**

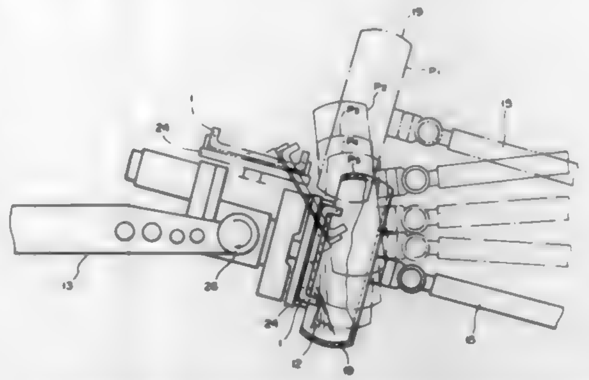
1. A method of forming a coating film on an inner surface of a panel of a cathode ray tube comprising the steps of:

(a) holding said panel of said cathode ray tube such that the inner surface of said panel is directed upwardly;

(b) disposing an injection nozzle by a robot so as to inject a slurry containing composition to be coated into the inner surface of said panel by means of said injection nozzle;

(c) rotating said panel on its own axis to uniformly coat said slurry on the inner surface of said panel; and

(d) revolving said panel downwardly to a position where the inner surface is inclined downwardly, and moving a recovering hood in an opposing relation to the inner surface of said panel in synchronism with the revolving of said panel, said hood being concave and open to said panel, said hood moving downwardly with said panel during revolving of said panel and oriented toward said panel thereby to recover extra slurry within said panel into said recovering hood during the downward revolving of said panel.



5,316,786
METHOD FOR THE TREATMENT OF STEEL-HYBRID PRINTED CIRCUIT BOARDS

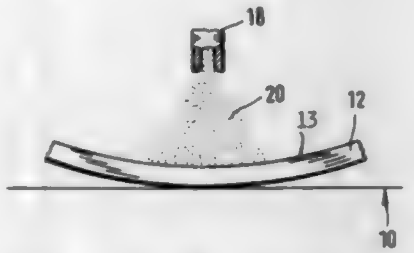
Norbert von der Lippe, Moers; Rudolf Graener, Erkrath, and Peter Sommer, Frechen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 9, 1992, Ser. No. 820,069

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1991, 4100393.4

Int. Cl.^{5} C23C *26/00*

U.S. Cl. 427—96 **10 Claims**



1. A method of pre-treating steel-hybrid circuit boards which are to be provided on one surface with coatings of pastes which are to be burnt in, and which, due to different thermal stresses developed in the materials of the coatings and in the circuit boards during the burn-in process, would tend to warp, said method comprising mechanically pre-stressing the circuit board, prior to the application of the coating, to provide a desired, controlled curvature of the circuit board which compensates for any warping due to the different thermal stresses developed during a subsequent burn-in process, and then coating and firing.

5,316,787
METHOD FOR MANUFACTURING ELECTRICALLY ISOLATED POLYIMIDE COATED VIAS IN A FLEXIBLE SUBSTRATE

Richard F. Frankeny, Austin, and Ronald L. Imken, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 691,627, Apr. 25, 1991, abandoned, which is a division of Ser. No. 533,262, Jun. 4, 1990, Pat. No. 5,065,227. This application Nov. 17, 1992, Ser. No. 978,309

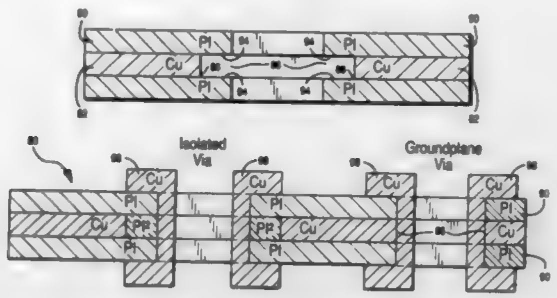
Int. Cl.^{5} C23C *26/00*

U.S. Cl. 427—97 **8 Claims**

1. A method for producing electrically isolated vias in a flexible substrate comprising the steps of:

forming at least one aperture in a laminate to produce at least one via hole, said laminate comprising a metal core laminated by layers of an organic material;

etching said via holes to remove some metal core material exposed in said via holes, thereby creating an exposed core which includes exposed metal and inner organic surfaces;



hydrolyzing said inner organic surfaces;

permeating said via holes with a polyimide solution;

removing excess polyimide solution from said via holes; and

baking said laminate to produce adhesion between said exposed core and said polyimide solution.

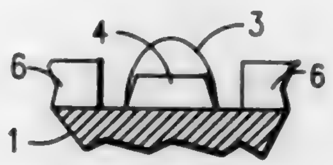
5,316,788
APPLYING SOLDER TO HIGH DENSITY SUBSTRATES

Eric P. Dibble, Endicott; Steven L. Hanakovic, Vestal; Voya R. Markovich, Endwell, all of N.Y.; Daniel S. Niedrich, Kasson, Minn.; Gary P. Vlasak, Owego, N.Y.; Richard S. Zarr, Apalachin, N.Y., and Richard C. Senger, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 26, 1991, Ser. No. 736,380

Int. Cl.^{5} B05D *1/00*

U.S. Cl. 427—98 **10 Claims**



1. A method of providing solder on an electrically conductive metallic land located on the surface of a dielectric substrate, said method comprising:

providing a dielectric substrate having an electrically conductive metallic land of a first width located on a surface thereof;

applying a quantity of solder mask material onto said surface of said dielectric substrate at a spaced distance from said conductive metallic land to define a perimeter area on said surface of said dielectric substrate around said land;

depositing a first layer of metal or alloy onto said conductive metallic land, said perimeter area and at least part of said solder mask material;

applying, exposing and developing a quantity of photoresist material onto said first layer of metal such that said photoresist material does not cover the portion of said first layer of metal located on said conductive metallic land and said perimeter area, said portion of said first layer of metal having a second with greater than said first width of said metallic land;

depositing a second layer of solder-dissolvable metal or alloy onto said portion of said first metal not covered by said photoresist material such that said solder-dissolvable metal or alloy will have a width equal to said second width;

removing said photoresist;

applying a quantity of molten solder onto said deposited second layer of solder-dissolvable metal or alloy to cause said solder-dissolvable metal or alloy to become dissolved into said molten solder such that the resulting solder solution, including both said solder and said solder-dissolvable metal or alloy, will contract to substantially only said first width of said conductive metallic land; and cooling said contracted solder solution to substantially solidify said solder.

5,316,789
METHOD OF WATER-PROOFING A CONNECTED PORTION OF ELECTRIC WIRES

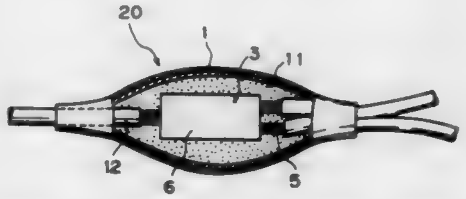
Yasuyuki Ookuma; Fujio Ogawa; Yoshiyuki Hattori; Takamichi Miyamukai, and Takayuki Sakakura, all of Mie, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed May 5, 1992, Ser. No. 878,688

Claims priority, application Japan, May 9, 1991, 3-133566

Int. Cl.^{5} B05D *5/12*

U.S. Cl. 427—117 **2 Claims**



1. A method of water-proofing a connected portion of electric wires, said connected portion including stripped ends and sheathed portions adjacent to ends of the electric wires, said method comprising the steps of:

dropping an amount of a water-proof insulation adhesion sealing agent, sufficient to seal said connected portion of the electric wires, onto a water-proof sheet having a desired size and made of a water-proof insulation material to form a deposit of the sealing agent thereon;

embedding said connected portion in said deposit; and

winding said water-proof sheet around said connected portion,

wherein said step of dropping the water-proof insulation adhesion sealing agent onto the water-proof sheet further comprises the steps of:

arranging an injector of the water-proof insulation adhesion sealing agent above said water-proof sheet, said injector having a nozzle which ejects said adhesion sealing agent by air pressure during up and down strokes;

converting the air pressure to pulsed positive and negative pressures;

dropping said adhesion sealing agent to form a deposit on said water-proof sheet by pulsed positive pressure during a down stroke of said nozzle; and

controlling a bottom face of said adhesion sealing agent in said ejector by pulsed negative pressure when stopping said dropping step during an up stroke of said nozzle.

5,316,790
TUNGSTEN DISULFIDE MODIFIED EPOXY

Jimmy C. Chan, Granger, and Betty H. Kocsis, South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Feb. 5, 1993, Ser. No. 14,297

Int. Cl.^{5} B32B *15/08*

U.S. Cl. 427—142 **4 Claims**

1. A method of restoring a damaged surface on a metal substrate to return the damaged surface to a functional condition, said method comprising the steps of:

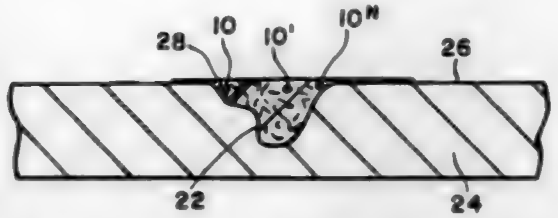
mixing a filler material consisting essentially of epoxy resin and tungsten disulfide having a ratio of 10:1;

applying a quantity of filler material on said damaged surface;

uniformly raising the temperature of said metal substrate over a time period of at least sixty minutes to a cure temperature of at least 300 degrees F. for said epoxy resin to allow any volatiles in said filler material to be released without effecting the porosity thereof;

maintaining the temperature of said epoxy resin at the cure temperature of at least ninety minutes to fully cure the resin and develop a solid filler without any significant porosity that could allow deterioration of the metal substrate and having a coefficient of friction of 0.03; and

machining any excess cured epoxy from said damaged surface to establish said functional surface.



5,316,791

PROCESS FOR IMPROVING IMPACT RESISTANCE OF COATED PLASTIC SUBSTRATES

Bruce M. Farber, La Mirada, and William C. Harbison, Mission Viejo, both of Calif., assignors to SDC Coatings Inc., Anaheim, Calif.

Filed Jan. 21, 1993, Ser. No. 6,633

Int. Cl.⁵ B05D *5/06*

U.S. Cl. 427—464 **25 Claims**

1. A process for improving the impact resistance of a plastic substrate, comprising:

applying an aqueous polyurethane dispersion having a pH in the range of about 7 to about 9, a solids content in the range of about 5% to about 40%, and a particle size in the range of about 10 to about 100 nanometers, to at least one surface of the plastic substrate, wherein the polyurethane is formed by condensation of a multi-functional isocyanate with an anionic diol and a polyol selected from the groups consisting of polyether diols and polyester diols;

at least partially curing the aqueous polyurethane dispersion by air drying at ambient temperature to form a primer layer;

applying an abrasion resistant coating composition over the polyurethane primer layer, wherein the abrasion resistant coating composition consists of a silicon-based resin or an acrylic-based resin; and

curing the abrasion resistant coating composition to form a protective abrasion resistant hard coat.

5,316,792

METHOD AND PROCESS FOR THE STABILIZATION OF RESIN COATED PARTICULATES

David N. Harry, and Sharif Sharif, both of Midland, Tex., assignors to Benchmark Research and Technology, Inc., Midland, Tex.

Division of Ser. No. 924,488, Aug. 4, 1992. This application Jun. 4, 1993, Ser. No. 71,483

Int. Cl.⁵ B05D *7/00;* **E21B** *43/26;* **C09K** *3/00*

U.S. Cl. 427—221 **15 Claims**

1. A process of manufacturing, free-flowing particulates, useful as carrying-fluid compatible proppants in the hydraulic fracturing of subterranean formations and, likewise, as carrying-fluid compatible gravel in gravel-packed well completions, comprising the steps of:

heating particulate substrates to a temperature above the melting point of a heat curable resin;

adding said resin to said heated substrates;

mixing said resin said substrates; and then

reacting said heated substrates and said resin with a formaldehyde source-metal compound (FS-MC) complex; and

cooling said coated particulates.

5,316,793

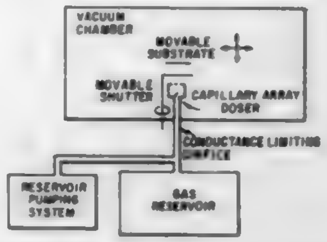
DIRECTED EFFUSIVE BEAM ATOMIC LAYER EPITAXY SYSTEM AND METHOD

Robert M. Wallace, Dallas, and Bruce E. Gnade, Rowlett, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 27, 1992, Ser. No. 919,685

Int. Cl.⁵ C23C *16/00*

U.S. Cl. 427—248.1 **16 Claims**



1. A method of forming an atomic or molecular layer on a substrate comprising the steps of:

(a) placing a substrate in an evacuated chamber;

(b) evacuating said chamber to a pressure of less than about 10^{-9} Torr; and

(c) injecting precursor gases into said chamber, sufficient to react with available sites on said substrate to form a layer on said substrate, into said chamber from a location in said chamber adjacent said substrate to form said atomic or molecular layer at the surface of said substrate while maintaining said pressure in said chamber in regions thereof distant from said substrate.

13. A system for forming an atomic or molecular layer on a substrate comprising:

(a) an evacuated chamber;

(b) an evacuating device coupled to said chamber for evacuating said chamber to a pressure of less than about 10^{-9} Torr;

(c) a reservoir for injecting one or more predetermined precursor gases into said chamber from a location in said chamber closely adjacent said substrate to form said atomic or molecular layer at the surface of said substrate while maintaining said pressure in said chamber in regions thereof distant from said substrate;

(d) an orifice coupled to said reservoir for limiting conductance of gases from said reservoir; and

(e) a capillary doser coupled to said orifice and extending into said chamber adjacent said substrate for directing said precursor gases principally at said substrate.

5,316,794

METHOD FOR SERVICING VACUUM CHAMBER USING NON-REACTIVE GAS-FILLED MAINTENANCE ENCLOSURE

David K. Carlson, Santa Clara, and Norma B. Riley, Pleasanton, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Dec. 11, 1992, Ser. No. 989,248

Int. Cl.⁵ C23C *16/00*

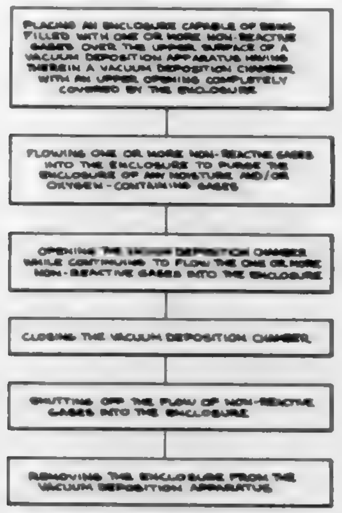
U.S. Cl. 427—248.1 **9 Claims**

1. A process for providing access to the interior of a vacuum deposition chamber in a vacuum deposition apparatus through a cover on said chamber without exposing residues within said chamber to moisture and/or oxygen-containing gases which comprises:

a) placing over the upper surface of said vacuum deposition apparatus containing said vacuum deposition chamber an

enclosure which has a bottom opening large enough to completely cover said cover on said chamber, and which is capable of being filled with one or more non-reactive gases;

b) flowing one or more non-reactive gases into said enclosure to purge moisture and/or oxygen-containing gases from said enclosure;


PLACING AN ENCLOSURE CAPABLE OF BEING FILLED WITH ONE OR MORE NON-REACTIVE GASES OVER THE UPPER SURFACE OF A VACUUM DEPOSITION APPARATUS HAVING THEREIN A VACUUM DEPOSITION CHAMBER WITH AN UPPER OPENING COMPLETELY COVERED BY THE ENCLOSURE
FLOWING ONE OR MORE NON-REACTIVE GASES INTO THE ENCLOSURE TO PURGE THE ENCLOSURE OF ANY MOISTURE AND/OR OXYGEN-CONTAINING GASES
OPENING THE VACUUM DEPOSITION CHAMBER WHILE CONTINUING TO FLOW THE ONE OR MORE NON-REACTIVE GASES INTO THE ENCLOSURE
CLOSING THE VACUUM DEPOSITION CHAMBER
SHUTTING OFF THE FLOW OF NON-REACTIVE GASES INTO THE ENCLOSURE
REMOVING THE ENCLOSURE FROM THE VACUUM DEPOSITION APPARATUS

c) then removing said cover through one or more openings in one or more sidewalls of said enclosure to thereby open said vacuum deposition chamber while continuing to flow said one or more non-reactive gases into said enclosure;

d) servicing the interior of said vacuum deposition chamber;

e) closing said vacuum deposition chamber;

f) then shutting off said flow of non-reactive gases into said enclosure; and

g) then removing said enclosure from said apparatus.

5,316,795

HALOGEN-ASSISTED CHEMICAL VAPOR DEPOSITION OF DIAMOND

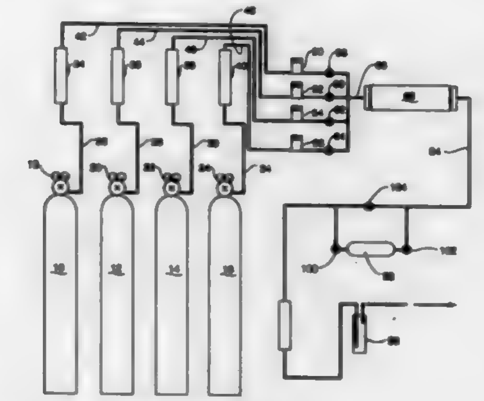
Donald E. Patterson; Robert H. Hauge; C. Judith Chu, and John L. Margrave, all of Houston, Tex., assignors to Houston Advanced Research Center, The Woodlands, Tex.

Continuation-in-part of Ser. No. 528,804, May 24, 1990, Pat. No. 5,071,677. This application May 7, 1991, Ser. No. 696,769

The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.

Int. Cl.⁵ C23C *16/00*

U.S. Cl. 427—249 **84 Claims**



1. A method of depositing diamond on a substrate, said method comprising:

providing a gas mixture comprising a halogen-containing species, a hydrogen-containing species and a carbon-containing species; and

flowing said gas mixture at a temperature of from about 250° C. to about 750° C. but without pretreatment for activation of said gas mixture to a high energy level, over a substrate heated to a temperature of from about 250° C. to about 750° C., so as to deposit diamond on at least a portion of said substrate.

5,316,796

PROCESS FOR GROWING A THIN METALLIC FILM

Nobuyoshi Awaya, Isehara, and Yoshinobu Arita, Atsugi, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 665,610

Claims priority, application Japan, Mar. 9, 1990, 2-56586; Oct. 15, 1990, 2-273274

Int. Cl.⁵ C23C *16/04, 16/06*

U.S. Cl. 427—252 **8 Claims**

1. A thermal chemical vapor deposition process for growing a smooth metallic film of copper or gold on a substrate, the process comprising:

(a) providing a starting material composed of a β-ketonato type metal complex of gold or copper in a container provided with heating means to evaporate the starting material;

(b) preparing a carrier gas mixture which is composed of hydrogen as a reducing gas and at least one electron donating substance which bonds with the starting material by donating an electron to the starting material to form a molecular compound which is a hydrate or an alcoholate;

(c) passing a flow of the carrier gas mixture through the starting material contained in the heated container, which heated container is connected with a reaction chamber, to form the molecular compound in situ immediately before the molecular compound is supplied to the reaction chamber;

(d) introducing the flow of the carrier gas carrier mixture which includes the molecular compound immediately into the reaction chamber and onto a surface of a heated substrate disposed in the reaction chamber, said surface being at least partially covered with metal; and

(e) depositing a smooth metallic film of gold or copper onto metal portions of the surface of the substrate by thermally decomposing the molecular compound and any remaining starting material under temperature conditions effective for such thermal decomposition.

5,316,797

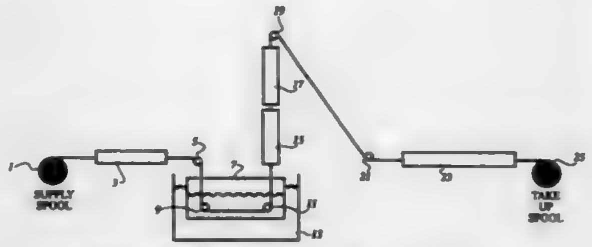
PREPARING REFRACTORY FIBERREINFORCED CERAMIC COMPOSITES

David A. Hazlebeck, El Cajon; Frederick C. Montgomery, Escondido, and Holger H. Streckert, San Diego, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Jul. 13, 1990, Ser. No. 553,904

Int. Cl.⁵ B05D *3/02, 1/36*

U.S. Cl. 427—376.2 **11 Claims**



1. A method for producing a refractory fiber-reinforced ceramic composite, said method comprising:

applying a substantially uniform yttrium oxide coating having a thickness no greater than about 2 microns onto each of a plurality of continuous refractory fibers in the form of a multifilament tow by carrying out the following steps:

(a) immersing a multifilament tow containing a plurality of continuous individual fibers of refractory oxide, nitride or carbide in a reservoir of liquid medium containing yttrium 2-ethoxyethoxide in 2-ethoxyethanol for a time sufficient to allow said individual fibers to become thoroughly coated therewith;

(b) drying said coated fibers under an inert atmosphere and at a temperature of 350°-500° C. to substantially remove any residual liquid medium from said coatings;

repeating steps (a) and (b) with said liquid medium so as to increase the total thickness of said coating adhering to each individual fiber without bridging therebetween;

heating said dried fibers under oxidizing conditions at a temperature between about 500°-900° C. to convert substantially all of said yttrium ethoxyethoxide into a substantially continuous, yttrium oxide coating of uniform thickness; and

embedding a plurality of said tows of uniformly coated individual fibers in a continuous phase ceramic matrix to create a high strength composite having high temperature resistance, with said plurality of coated tows constituting from about 40 to 60 volume percent of said ceramic composite.

5,316,798
METHOD OF MAKING A CYLINDRICAL SLEEVE STRUCTURE, PARTICULARLY COVER FOR AN OFFSET CYLINDER IN A ROTARY PRINTING MACHINE

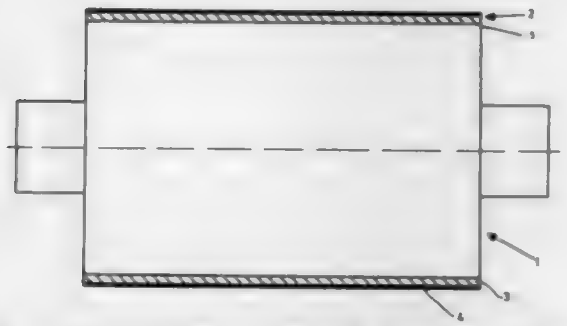
Udo Tittgemeyer, Arnsberg, Fed. Rep. of Germany, assignor to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 494,129, Mar. 15, 1990, abandoned. This application Apr. 6, 1992, Ser. No. 864,407

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3908999

Int. Cl.^{5} B05D *1/36*

U.S. Cl. 427—409 **13 Claims**



1. A method of making a cylindrical sleeve structure, said cylindrical sleeve structure having a cylindrical carrier (5) and a seamless, unitary, volume compressible coating layer (3) on said carrier (5), said method comprising

providing the cylindrical carrier (5);

providing a thixotropic base substance which includes an expanding agent, and a curing agent, and optionally an agent for controlling gelling of said thixotropic base substance;

rendering said thixotropic base substance liquid; and

applying said liquid thixotropic base substance on the cylindrical carrier (5) while

(a) rotating the carrier and

(b) relatively axially moving the carrier with respect to the substance as said substance is being applied,

thereby applying said substance on the carrier (5) in essentially spiral layer form in a condition in which said substance is still spreadable and sufficiently flowable to form said seamless, unitary, volume compressible coating layer (3) on the carrier (5).

5,316,799
METHOD FOR APPLYING PAINT WITH A WATER REPELLANT COMPOSITION

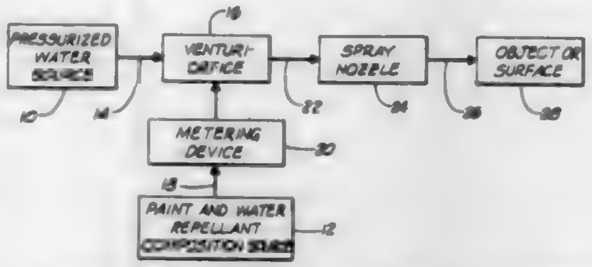
Dean E. Brunken, Edmond, and Arnulf P. Hagen, Noble, both of Okla., assignors to Advanced Chemical Technologies, Inc., Oklahoma City, Okla.

Filed Oct. 30, 1992, Ser. No. 969,658

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.^{5} B05D *1/02*

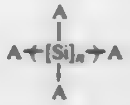
U.S. Cl. 427—421 **52 Claims**



1. A method for treating a siliceous and or carbon central object with a mixture of a water based paint and a water repellant composition, comprising the steps of:

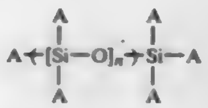
mixing an effective amount of the water resistant composition with the water based paint to obtain a mixture of paint and water resistant composition;

applying the mixture of paint and water resistant composition to an object after the water repellant composition and the paint are mixed; and wherein the water repellant composition comprises a silane or siloxane or combinations thereof, wherein the Silane has the general formula:



$$A\!-\!\!\left[\underset{A}{\overset{A}{\mathrm{Si}}}\right]_n\!\!-\!A$$

wherein the siloxane has the general formula:



$$A\!-\!\!\left[\underset{A}{\overset{A}{\mathrm{Si}}}-O\right]_n\!\!-\!\underset{A}{\overset{A}{\mathrm{Si}}}-A$$

wherein Si is silicon; 0 is oxygen; n is a positive integer; and A is selected from the group consisting of H, R, X, or Y wherein

H is a hydrogen atom;

R is selected from the group consisting of an alkyl containing from about 1 to about 30 carbon atoms, an alkenyl group, an aryl group, a cycloalkyl group, a cycloalkenyl group, an arylalkyl group, an arylalkenyl group, or any substituted group thereof wherein the cyclo substituent contains from about 4 to about 8 carbon atoms, the alkyl substituent contains up to about 8 carbon atoms and the alkenyl substituent contains up to about 8 carbon atoms;

X is selected from a group consisting of a halogen, hydroxyl group, OR group wherein O is oxygen, a carboxylic group, or RNR or RNH wherein N is nitrogen;

Y is selected from a group consisting essentially of an alkyl group containing from about 1 to about 30 carbon atoms, an alkenyl group, an aryl group, a cycloalkyl group, a cycloalkenyl group, an arylalkyl group, an arylalkenyl group, or any substituted group thereof, wherein the cyclo substitutent contains from about 4 to about 8 carbon atoms, the aklyl substituent contains up to about 8 carbon atoms and the alkenyl substituent contains up to about 8 carbon atoms.

5,316,800
SPRAYING OF LIQUIDS

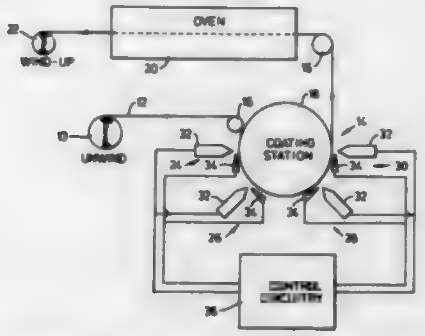
Timothey J. Noakes, Clwyd; Ian D. Pavey, Sussex, and Christopher S. Jeffs, Reading, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 9, 1991, Ser. No. 742,741

Claims priority, application United Kingdom, Aug. 9, 1990, 9017476; Aug. 9, 1990, 9017477; Aug. 9, 1990, 9017478

Int. Cl.^{5} B05D *1/06*

U.S. Cl. 427—466 **32 Claims**



1. A method of coating a substrate, comprising: supplying an extended nozzle with liquid to form a continuous film of liquid lengthwise of the extended nozzle;

moving the substrate and the nozzle relative to one another in a direction other than parallel to the direction of nozzle extension;

generating from the nozzle, by means of the application of a high electrical potential, a plurality of generally parallel ligaments of liquid which are simultaneously drawn out from the nozzle by preponderantly electrostatic forces; and

directing the ligaments towards the substrate so that the ligaments deposit on the substrate as generally parallel ligaments and/or in the form of generally parallel streams of droplets (derived from breaking up of the ligaments) and thereafter merge to form a coating on the substrate surface.

18. Apparatus for coating a substrate, said apparatus comprising:

an extended nozzle;

means for supplying liquid to the nozzle so that, in use, a continuous film of liquid is formed lengthwise of the extended nozzle;

means for effecting relative movement between the nozzle and a substrate to be coated in a direction which is other than parallel to the direction of nozzle extension;

high voltage circuit means for simultaneously drawing out, by preponderantly electrostatic forces, a plurality of generally parallel ligaments of liquid from said continuous liquid film; and

means locating the nozzle relative to the substrate in such a way that the ligaments deposit on the substrate as generally parallel ligaments and/or in the form of generally parallel streams of droplets (derived from breaking up of the ligaments) and thereafter merge to form a coating on the substrate surface.

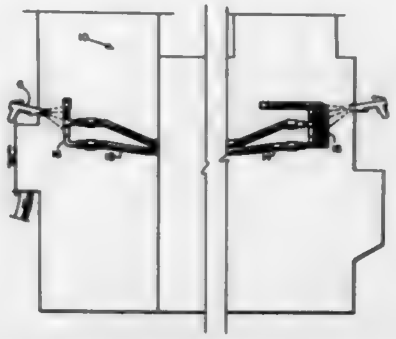
5,316,801
ELECTROSTATIC POWDER COATING METHOD FOR INSULATING THE SERIES LOOP CONNECTIONS OF A DYNAMOELECTRIC MACHINE

James F. Hopeck, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1992, Ser. No. 981,519

Int. Cl.^{5} B05D *1/06*

U.S. Cl. 427—486 **4 Claims**



1. A method of electrically insulating the series loop connections of a dynamoelectric machine comprising the steps of:

electrically grounding the series loop connections;

spraying an electrostatically charged epoxy powder on the series loop connections from a position in front or to either side of the series loop connections enabling the powder to electrostatically wrap about the series loop connections including along the back sides thereof between the series loop connections and an end face of the dynamoelectric machine to form a layer of insulation thereon of a substantially uniform selected thickness about the series loop connections; and

curing the epoxy powder spray-coated on the series loop connections.

5,316,802
METHOD OF FORMING COPPER FILM ON SUBSTRATE

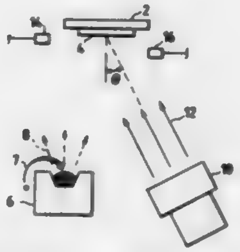
Akinori Ebe; Kiyoshi Ogata; Satoshi Nishiyama; Naoto Kuratani, and Taizo Okazaki, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Jun. 4, 1992, Ser. No. 892,378

Claims priority, application Japan, Feb. 20, 1992, 4-070389; Mar. 24, 1992, 4-066239; Apr. 7, 1992, 4-084299

Int. Cl.^{5} B05D *3/06*

U.S. Cl. 427—533 **3 Claims**



1. A method of controlling a crystal orientation of a copper thin film, comprising the steps of:

irradiating a surface of a substrate with inert gas ions, and adjusting the dosage of said inert gas ions to control the crystal orientation of the (111) face of the subsequently formed copper thin film; and

forming said copper thin film on said substrate by a vapor deposition process.

5,316,803

METHOD FOR FORMING ELECTRICAL INTERCONNECTIONS IN LAMINATED VIAS

Russell T. White, Jr., Conklin, and Robert E. Ruane, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1992, Ser. No. 988,850

Int. Cl.⁵ B05D *3/06, 5/12*

U.S. Cl. 427—554 **16 Claims**

1. A method for forming electrical interconnections in vias connecting at least two circuitized organic polymeric substrates which comprises:

(a) providing a composite containing at least two circuitized organic polymeric substrates superimposed upon each other; wherein said organic polymeric substrates contain dielectric material selected from the group consisting of thermoplastic resins and thermosetting resins;

(b) laser drilling vias into said substrates to thereby cause metallic circuit lines contained within each substrate to melt and form a fused mass protruding a short distance out of the side of the drilled vias; and

(c) then plating said drilled vias with a conductive metal to thereby provide said interconnections.

5,316,804

PROCESS FOR THE SYNTHESIS OF HARD BORON NITRIDE

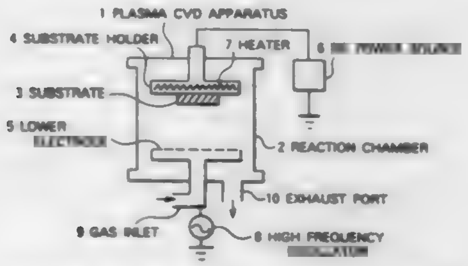
Tadashi Tomikawa; Nobuhiko Fujita; Shyoji Nakagama, and Akira Nakayama, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 7, 1991, Ser. No. 741,615

Claims priority, application Japan, Aug. 10, 1990, 2-210214; May 28, 1991, 3-123611

Int. Cl.⁵ B05D *3/06;* **C23C** *14/34*

U.S. Cl. 427—569 **13 Claims**



1. A process for the gaseous synthesis of hard boron nitride films which comprises depositing a hard boron nitride film consisting of cubic boron nitride of substantially a single phase on the surface of a substrate from a gaseous phase containing F atoms.

5,316,805

LIQUID CRYSTAL DEVICE

Yukio Hanyu, Atsugi, and Masanobu Asaoka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 529,509, May 29, 1990, Pat. No. 5,192,596.

This application Nov. 25, 1992, Ser. No. 981,432

Claims priority, application Japan, Jun. 2, 1989, 1-141395; Jun. 2, 1989, 1-141396; Jun. 22, 1989, 1-160278; Apr. 24, 1990, 2-109658

Int. Cl.⁵ G02F *1/1337*

U.S. Cl. 428—1 **3 Claims**

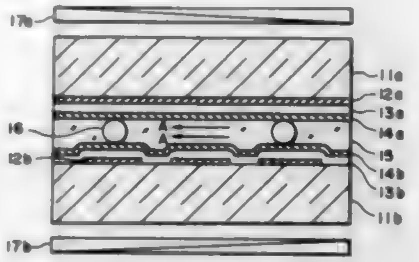
1. A method of alignment control of a chiral smectic liquid crystal, comprising:

providing two substrates,

forming a film of a polyimide having a fluorine-containing substituent in its diamine-originated moiety on at least one of the two substrates,

rubbing the polyimide film in one direction,

disposing the two substrates parallel to each other with the polyimide film disposed inside, and



disposing a chiral smectic liquid crystal between the two substrates so that molecules of the liquid crystal adjacent to the polyimide film are aligned with an inclination to the polyimide film.

5,316,806

INFORMATION MEMORY MEDIUM AND INFORMATION RECORDING/HOLDING PROCESS MAKING USE OF THE MEDIUM

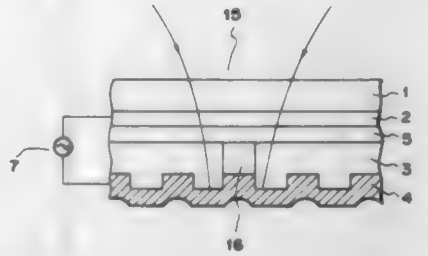
Kazuo Yoshinaga, Machida, and Koichi Sato, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 712,553, Jun. 10, 1991, abandoned.

This application Dec. 3, 1992, Ser. No. 985,437

Claims priority, application Japan, Jun. 12, 1990, 2-151707; May 21, 1991, 3-144137

Int. Cl.⁵ C09K *19/00*

U.S. Cl. 428—1 **10 Claims**



1. An information memory medium comprising a recording layer containing a polymeric liquid crystal having a ferroelectric chiral smectic phase in which the electric-field response times at two temperature points selected in a temperature region of said ferroelectric chiral smectic phase differ by a factor of at least 200 times, and a lower temperature point between said two points has a higher temperature than the glass transition temperature of said polymeric liquid crystal, and wherein said polymeric liquid crystal has a high-temperature side transition temperature ranging from 50° to 250° C.

5,316,807

ARTIFICIAL FROND FOR USE WITH ARTIFICIAL PLANTS

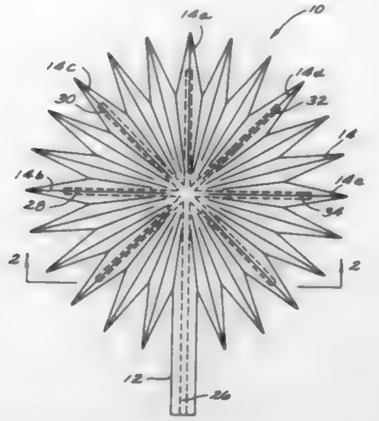
Steven L. Hill, Tucson, Ariz., assignor to The Larson Company, Tucson, Ariz.

Filed Sep. 18, 1992, Ser. No. 947,104

Int. Cl.⁵ A41G *1/00*

U.S. Cl. 428—17 **28 Claims**

1. An artificial frond for use with artificial plants, said artificial frond comprising an integral sheet of flexible polymeric material having at least one reinforcing means embedded therein, said polymeric material comprising a flexible polymeric foam, said integral sheet being formed generally in the shape of a frond having a central elongate stem portion and a plurality of elongate leaves extending outwardly from said stem portion, said reinforcing means being sufficient to maintain the structural integrity of said artificial frond.



5,316,808

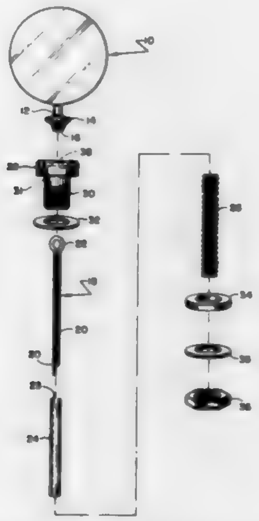
GUARDED VEHICLE HOOD ORNAMENT

Harold Prunty, 1022 Hilltop Rd., Waterloo, Iowa 50701

Filed Mar. 5, 1993, Ser. No. 27,279

Int. Cl.⁵ B60R *13/00*

U.S. Cl. 428—31 **6 Claims**



5. A vehicle hood ornament assembly for deterring or preventing theft of the medallion that is part of the assembly, said assembly comprising:

a. a medallion with a tail section extending downwardly and having an eye in said section;

b. a mounting base having a top surface and a lower portion with an opening extending through the base and the lower portion to receive the tail section of the ornament with the medallion engaged on the top surface of the base, said opening being narrower at the top surface to form a shoulder in the opening near the top;

c. a cotter pin having a head portion and legs terminating in lower ends that are bendable outwardly and upwardly, the head being engageable with the eye in the tail section and when so engaged the cotter pin extends through the opening in the mounting base;

d. a cylindrical sleeve surrounding the cotter pin and extending into the opening in the mounting base, said sleeve having a notch on each side of its upper end to receive the head portion of the cotter pin in the notches so that the sleeve covers a majority of the head portion;

e. a helical spring received in the opening in the mounting base with the upper end of the spring engageable with the shoulder in the opening, the cotter pin and sleeve extending through the spring with the ends of the cotter pin bent upwardly and outwardly beneath the spring to bias the medallion against the mounting base; and

f. fastening means for securing the mounting base to the hood of the vehicle.

5,316,809

TUBULAR PACKAGING CASING, PARTICULARLY SAUSAGE CASING, BASED ON CELLULOSE

Klaus-Dieter Hammer, Mainz-Mombach, and Manfred Siebrecht, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Fed. Rep. of Germany

Filed May 15, 1991, Ser. No. 700,400

Claims priority, application Fed. Rep. of Germany, May 16, 1990, 4015659

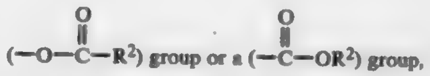
Int. Cl.⁵ A22C *13/00*

U.S. Cl. 428—348 **42 Claims**

1. A tubular packaging casing, comprising a cellulose base layer and a barrier layer having a weight per unit area of at least about 12 g/m² of casing surface and comprising at least one random copolymer formed from copolymerizable first vinyl monomers wherein the vinyl monomers are represented by the general formula $CH_2{=}CR^1{-}X$, wherein

R^1 denotes a methyl group or a hydrogen atom, and

X denotes a



$$(-O-\overset{\overset{\displaystyle O}{\|}}{C}-R^2)\text{ group or a }(-\overset{\overset{\displaystyle O}{\|}}{C}-OR^2)\text{ group,}$$

with R^2 denoting an alkyl group having about 1 to 20 carbon atoms,

wherein the barrier layer renders the casing substantially impermeable to water vapor and oxygen.

5,316,810

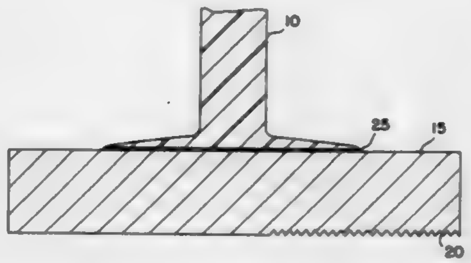
POLYMERIC STRUCTURE SECURED TO DISSIMILAR COMPONENTS

L. Keith Rogerson, No. 9 Fourth Ave., Isle of Palms, S.C. 29451

Filed Nov. 19, 1991, Ser. No. 794,991

Int. Cl.⁵ B29D *22/00*

U.S. Cl. 428—35.7 **12 Claims**



1. An improved article of manufacture, said article comprising:

a) a metallic component;

b) a polymeric structure formed about said metallic component; and

c) an interface material located between said metallic component and said polymeric structure wherein said interface material consists essentially of a polymer chemically bonded to said metallic component so that said interface material affixedly connects said metallic component to said polymeric structure.

5,316,811
PROCESS, WEB OF MATERIAL AND APPARATUS FOR PRODUCING PACKAGING BLANKS

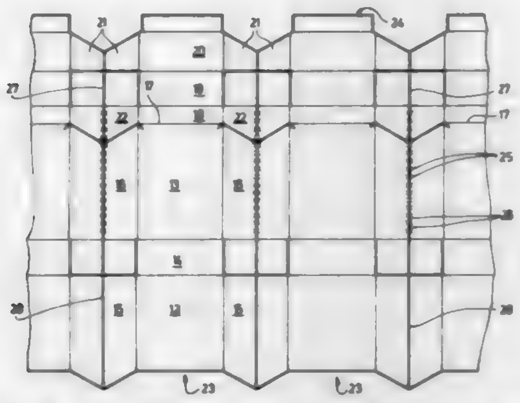
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co (GmbH & Co.), Verden, Fed. Rep. of Germany

Division of Ser. No. 427,215, Oct. 24, 1989, which is a division of Ser. No. 184,640, Apr. 21, 1988, Pat. No. 4,898,569. This application Jun. 23, 1992, Ser. No. 902,888

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716897

Int. Cl.⁵ B65D *65/28*

U.S. Cl. 428—43 **1 Claim**



1. A roll of continuous web of thin cardboard material having defined within said web a series of adjacent elongated, approximately rectangular packaging blanks for forming finished hinge-lid packs with folding tabs (16, 22) having side edges (29) which are located only inside of, and are concealed in, a finished hinge-lid pack, wherein:

- the series of elongated, approximately rectangular adjacent blanks (23) actually form the web (24) of material;
- the blanks (23) are connected to one another within said web (24) only via a plurality of residual connections (25), and are delimited from one another, while still in said web, by parallel punching cuts (27, 28), which extend transversely relative to said web (24), and by a plurality of punched portions (26) between the residual connections (25);
- each of said blanks has, facing its two adjacent blanks (23), outer pack side tabs (15) and inner pack side tabs (16), and outer lid side tabs (21) and inner lid side tabs (22), which respectively form side walls and lid side walls of the finished hinge-lid pack; and
- said residual connections (25) and said punched portions (26) are located in said web (24) only between the adjacent inner pack side tabs (16) and between said adjacent inner lid side tabs (22), so that said residual connections are completely concealed in the finished hinge-lid pack by the overlapping of said inner pack side tabs (16) and said inner lid side tabs (22) by said outer pack side tabs (15) and said outer lid side tabs (21), respectively.

5,316,812
COATED ABRASIVE BACKING

George M. Stout, Maplewood; James G. Homan, Eagan; John R. Mlinar, Coon Rapids, all of Minn., and Larry R. Wright, Ames, Iowa, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 20, 1991, Ser. No. 811,547

Int. Cl.⁵ B24D *11/00*

U.S. Cl. 428—64 **23 Claims**

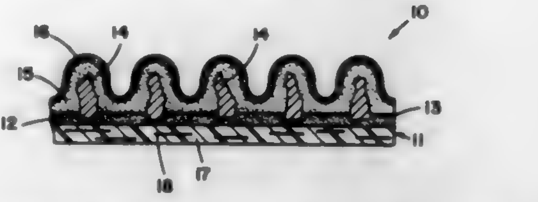
18. A coated abrasive article comprising:

(a) a backing having a working surface and a back surface, the working surface and the back surface devoid of abrasive particles, the working surface adapted to receive an abrasive coating comprising abrasive particles; wherein the backing comprises:

(i) about 60–99 wt-% of a tough, heat resistant thermoplastic binder material based upon the total weight of the backing;

(ii) an effective amount of a fibrous reinforcing material imparting stiffness, shape control and heat resistance to said backing is; and

(iii) about 1–30 wt-% of a toughening agent based upon the total weight of the backing; wherein the thermoplastic binder material, fibrous reinforcing material, and toughening agent define a hardened mixture that will not substantially deform or disintegrate under abrading conditions of at least 200° C. and at least 7 kg/cm² at the abrading interface during grinding and at least in portions of the backing having the abrasive particles attached thereto, the hardened mixture defining the working surface;



(b) a first adhesive layer applied to the working surface of the backing;

(c) an abrasive material embedded into the first adhesive layer; and

(d) a second adhesive layer applied to the abrasive material and first adhesive layer.

5,316,813
OPTICAL RECORDING MEDIUM

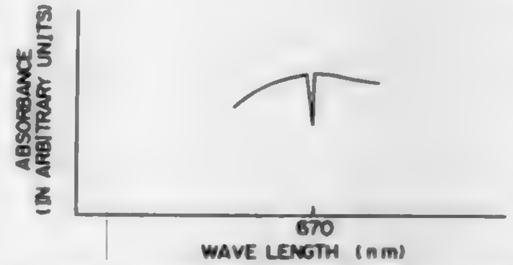
Tetsuya Nishimura; Eiji Yagyu, and Motomu Yoshimura, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1992, Ser. No. 868,232

Claims priority, application Japan, Apr. 15, 1991, 3-80345

Int. Cl.⁵ B32B *3/00*

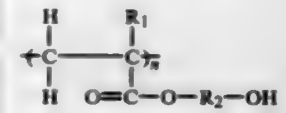
U.S. Cl. 428—64 **4 Claims**



1. An optical recording medium useful for recording by photochemical hole burning comprising:

guest molecules for an optical recording layer of at least one kind selected from a group consisting of 4-amino-2,6-bis (4-butylphenoxy)-1,5,8-trihydroxyanthraquinone, 4,8-diamino-2-(4-hexyloxyphenyl)-1,5dihydroxyanthraquinone, and 4,11-diamino-5,10-dihydro-2-(3-octyl oxy) propyl-3-oxonaphtho [2,3-f]isoindoline-1,5,10-trion; and

host molecules expressed by a general formula (1):



$$\left(\overset{H}{\underset{H}{\overset{|}{\underset{|}{C}}}}-\overset{R_1}{\underset{O=C-O-R_2-OH}{\overset{|}{\underset{|}{C}}}}\right)_n$$

(where R_1 denotes H or CH_3, R_2 denotes C_2H_4, C_3H_6 or C_4H8, and n denotes an integer).

5,316,814
OPTICAL INFORMATION RECORDING MEDIUM

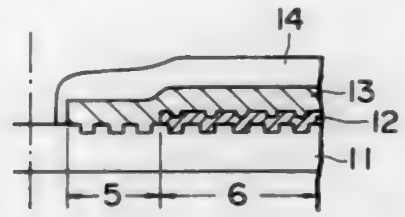
Yasuo Sawada, Machida; Toru Yashiro, Yokosuka, and Yutaka Ueda, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 12, 1992, Ser. No. 881,857

Claims priority, application Japan, May 14, 1991, 3-138475; Jul. 12, 1991, 3-198894; Aug. 30, 1991, 3-245013

Int. Cl.⁵ B32B *3/00*

U.S. Cl. 428—64 **10 Claims**



1. An optical information recording medium including a ROM area and a recordable area, comprising:

- a light-transmitting substrate with prepits and/or guide grooves formed on the surface thereof, said prepits being in said ROM area, and said guide grooves being in said recordable area,
- a light absorption layer serving as a recording layer which comprises a dye as the main component overlaid on said light-transmitting substrate, and
- a light reflection layer comprising a metallic film overlaid on said light absorption layer, each of said prepits having a substantially trapezoid cross-sectional profile, the optical phase difference ΔS_1 between a prepit portion and a non-prepit portion, represented by Equation: $\Delta S_1=2\{n_1d_1-n_2(d_1-d_2)\}$, satisfying the condition of $2.5\lambda/8<\Delta S_1<4\lambda/8$, wherein d_1 is the depth of said prepit, d_2 is the depth of said prepit portion at the interface between said light absorption layer and said light reflection layer, n_1 is the real number of the complex index of reflection of said light-transmitting substrate, n_2 is the real number of the complex index of reflection of said light absorption layer, and λ is the wavelength of a light beam for reproduction, each of said guide grooves having a substantially V-shaped cross-sectional profile, and the optical phase difference ΔS_2 between a groove portion and a land portion, represented by Equation: $\Delta S_2=2\{n_1d_1'-n_2(d_1'-d_2')\}$, satisfying the condition: $0.5\lambda/8<\Delta S_2<2.5\lambda/8$, wherein d_1' is the depth of said guide groove and d_2' is the depth of said guide groove portion at the interface between said light absorption layer and said light reflection layer.

5,316,815
TUBULAR RUBBER STRUCTURE MADE FROM USED TIRES

Benjamin A. Tripp, R.R. #2, Orangeville, Ontario, Canada L9W 2Y9

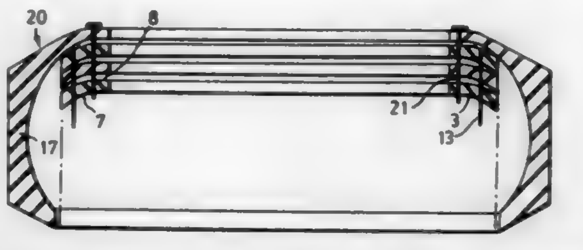
Filed May 3, 1993, Ser. No. 55,303

Int. Cl.⁵ B32B *3/10*

U.S. Cl. 428—65 **8 Claims**

1. A tubular rubber structure, comprising:

- a plurality of vehicle tire sidewalls joined together in a stacked tubular array approximately one tire width in height; and



- a vehicle tire having one sidewall removed or a vehicle tire being centrally, circumferentially split, which tire fits over the tubular array of sidewalls and is joined to it.

5,316,816
FORM BODY FOR HEAT INSULATION AND VACUUM INSULATION PANEL WITH ASYMMETRIC DESIGN

Gerhard Sextl, Geiselbach; Hans Strack, Alzenau; Roland Reuter, Darmstadt; Ilona Fuss, Maintal; Peter Kleinschmit, Hanau, and Rudolf Schwarz, Wasserlos, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 799,726, Nov. 22, 1991, abandoned, and a continuation-in-part of Ser. No. 719,365, Jun. 24, 1991, abandoned. This application Jan. 22, 1993, Ser. No. 7,129

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1990, 4019870

Int. Cl.⁵ B32B *1/06, 5/16*

U.S. Cl. 428—69 **19 Claims**

1. A shaped insulation body, produced from

(a) a finely distributed, powdery or fibrous substance with a water absorption capacity of 4 to 50% by weight at 23° C. and 85° C. relative humidity,

(b) a metal-free casing which encases said finely distributed, powdery or fibrous substance and exhibits a water-vapor permeability of 0.1 to 0.5 g/(m².d) at 23° C. and 85% relative humidity and gas permeabilities of 0.1 to 0.5 cm³/(m².d.bar) at 23° C., with the property of absorbing water up to an amount of 2 to 15% by weight without its thermal conductivity deteriorating more than 25% thereby.

5,316,817
VEHICULAR CAR MAT

Clive R. Timperley, 600 Thornton Rd. North, Ste. 207, Oshawa, Ontario, Canada L1J 6T6

Filed Nov. 30, 1992, Ser. No. 982,849

Int. Cl.⁵ B32B *1/06, 3/06*

U.S. Cl. 428—78 **4 Claims**

1. A vehicular car mat, comprising,

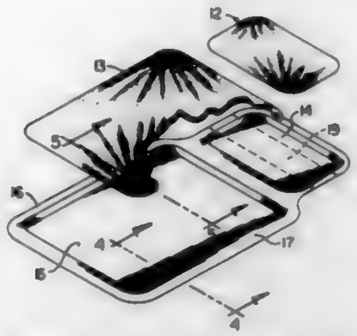
- a flexible tray support, the tray support having a top wall spaced from a bottom wall, with the top wall substantially coextensive with the bottom wall,

and

- a first recessed cup portion directed into the tray support extending from the top wall, and

a second recessed cup portion spaced from and in adjacency to the first recessed cup portion directed into the tray support from the top wall, with the first recessed cup portion and the second recessed cup portion spaced from the bottom wall,

and



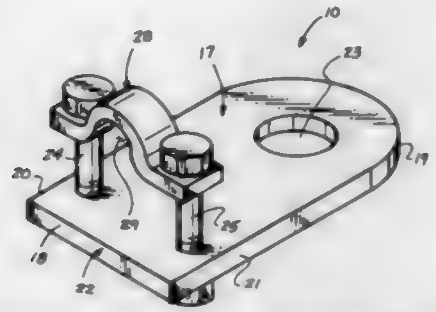
a first fibrous insert complementarily received within the first recessed cup portion, and a second fibrous insert received within the second recessed cup portion, and

the first fibrous insert and the second fibrous insert each include a plurality of fibrous layers, and each of the first and second fibrous inserts include a flexible polymeric insert base having a matrix of flexible base projections projecting below said insert base for adherence within the tray support.

5,316,818
STEERING LINKAGE REPAIR KIT

Franklin R. Hilliard, 511 E. Santa Fe Ave., Grants, N. Mex. 87020

Filed Jun. 1, 1993, Ser. No. 69,759
Int. Cl.⁵ B32B *3/06*
U.S. Cl. 428—99 **3 Claims**



1. A steering linkage repair kit arranged for cooperation with a linkage arm, having a linkage arm head and a linkage arm rod directed from the linkage arm head, wherein the repair kit comprises,

a support plate, the support plate including a continuous peripheral side wall, the side wall having a first end, a second end, a first side, and a second side, with an arm rod receiving bore directed orthogonally through the support plate in adjacency to the second end, and

clamp means mounted in adjacency to the first end for securing the linkage arm between the clamp means and the support plate, and

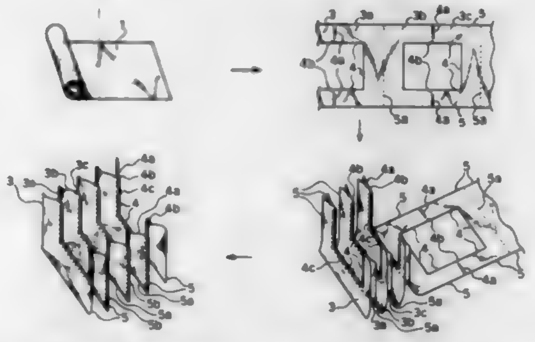
the support plate includes a top wall spaced from a bottom wall, with the clamp means including a first clamp rod and a second clamp rod orthogonally directed through the top wall and the bottom wall, with the first clamp rod having a first fastener arranged for engaging the bottom wall, and the second clamp rod having a second clamp rod fastener arranged for engaging the bottom wall, wherein the first fastener and the second fastener are arranged for respective securement to the first clamp rod and the second clamp rod respectively, and

the clamp means further includes a clamp plate, the clamp plate receiving the first clamp rod and the second clamp rod slidably therethrough, wherein the clamp plate has an arcuate recess between the first clamp rod and the second clamp rod in the clamp plate, with the arcuate recess having a concave surface in a facing relationship relative to the top wall.

5,316,819
BELLOWS AND PROCESS FOR PRODUCTION THEREOF

Takeshi Nemoto, and Teruko Nemoto, both of 19-10, Kotsubo 5-chome, Zushi 249, Japan

Filed Jun. 16, 1992, Ser. No. 899,633
Int. Cl.⁵ G12B *1/04*
U.S. Cl. 428—102 **6 Claims**



1. A bellows comprising:

a sheet material defined by a plurality of series of pieces of the same configuration of the same size, each piece having outer edges adapted to define the external configuration of the bellows and a recessed portion defined by inner edges and defining a configuration of the inner space of the bellows;

an inner connecting portion extending along said inner edges of mating adjacent pieces for interconnection therebetween;

a pair of first bridging portions extending over said mating adjacent pieces at positions in the vicinity of both ends of said inner connecting portion, said pair of first bridging portions being formed integrally with the associated portion of both of said mating adjacent pieces for maintaining integrity therebetween;

an outer connecting portion extending along said outer edges of the mating adjacent pieces for interconnection therebetween;

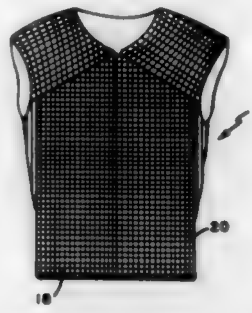
a second bridging portion extending over said mating adjacent pieces at a position in the vicinity of said outer connecting portion, said second bridging portion being formed integrally with the associated portion of both of said mating adjacent pieces for maintaining integrity therebetween.

5,316,820
FLEXIBLE COMPOSITES HAVING FLEXING RIGID PANELS AND ARTICLES FABRICATED FROM SAME

Gary A. Harpell, and Dusan C. Prevorsek, both of Morristown, N.J., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 705,679, May 24, 1991, abandoned.
This application Jun. 7, 1993, Ser. No. 72,646
Int. Cl.⁵ B32B *5/12*
U.S. Cl. 428—109 **41 Claims**

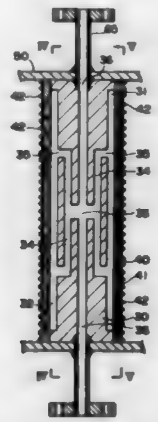
1. A flexible composite comprising one or more layers each of which comprises a flexible substrate layer having a plurality of penetration resistant planar bodies affixed to a surface thereof, said bodies having one or more flexible seams which allow one or more portions of said body to flex along said seams, wherein said bodies are positioned such that said at least one seam of a body is aligned or substantially aligned with a seam of at least one adjacent body to form a combination of continuous or semi continuous seams along which said composite may flex.



5,316,821
PARTITION PLATE FOR MULTIPLE-STAGE ADSORPTION SEPARATOR

Seiya Otani, Tokyo; Hiroaki Taniguchi, Kuki; Kei Yokoyama, Fukuyama; Yoshimi Shiroto, Yokohama; Mitsunori Shimura, Yokohama; Osamu Akimoto, Yokohama, and Masayoshi Notoya, Kawasaki, all of Japan, assignors to NKK Corporation and Chiyoda Corporation, both of Japan

Division of Ser. No. 846,198, Mar. 5, 1992, Pat. No. 5,200,075.
This application Dec. 10, 1992, Ser. No. 988,888
Claims priority, application Japan, Mar. 8, 1991, 3-069069; Mar. 8, 1991, 3-069070
Int. Cl.⁵ B01D *24/04, 24/42, 24/12;* **B32B** *3/24*
U.S. Cl. 428—131 **5 Claims**



1. A partition plate for a multiple-stage adsorption separator comprising:

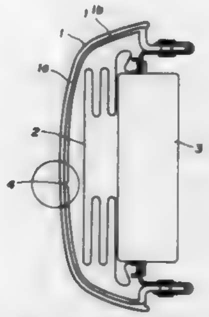
a planar body member having:
  opposing external faces having face openings,
  a peripheral edge surface having face openings,
  a first fluid conduit providing fluid communication between face openings in said opposing external faces,
  a second fluid conduit providing fluid communication between edge openings in said edge surface and between said face openings and said edge openings, and
  a raised rim extending around the periphery of each of said opposing external faces; and

a pair of perforated plates, each perforated plate covering one of said opposing external faces and having an interior surface mating with said raised rim to define an open chamber in cooperation with said one external face, and an external surface, the perforations in each of said perforated plates providing fluid communication between said external surface and said open chamber.

5,316,822
COVER FOR VEHICULAR AIR BAG

Kazuyoshi Nishijima, and Kazuo Inaba, both of Fuji, Japan, assignors to Nihon Plast Co., Ltd., Fuji, Japan

Filed Jul. 23, 1992, Ser. No. 917,329
Claims priority, application Japan, Jul. 23, 1991, 3-182390; Sep. 30, 1991, 3-251448
Int. Cl.⁵ B32B *3/10*
U.S. Cl. 428—138 **29 Claims**



1. An air bag cover for a vehicular air bag, comprising:

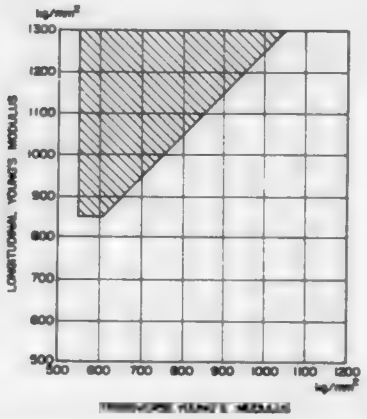
a main body formed of an ester type, ether type, or ether carbonate type thermoplastic polyurethane elastomer having a Shore A hardness of at least 80, formed in a predetermined shape by injection molding;

a skin layer disposed over said main body and formed of a polyurethane based material having a thickness of at least 15μ, adherence between said skin layer and said main body being effected by application of said skin layer over said main body in liquid form so as to induce suitable adhesion between said skin layer and said main body according to at least one of drying and curing of said skin layer.

5,316,823
MAGNETIC TAPE

Masami Etchu, Yokohama; Hisashi Hamano, Sagamihara; Masahiro Hosoi, Tokyo, and Yasuhiro Saeki, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 12, 1992, Ser. No. 833,924
Claims priority, application Japan, Feb. 21, 1991, 3-047406
Int. Cl.⁵ G11B *5/66;* **B32B** *27/06*
U.S. Cl. 428—141 **12 Claims**



1. A magnetic tape for audio cassettes, comprising a magnetic layer provided on a base film, wherein the base film is a biaxially oriented polyethylene-2,6-naphthalate film having a Young's modulus in the longitudinal direction of 850 Kg/mm²

or more, a Young's modulus in the transverse direction of 550 Kg/mm^2 or more, a surface roughness Ra in the range of 0.015 to 0.040 μm, and a thermal shrinkage rate in the longitudinal direction of 0.3% or less in a case where it was held at a temperature of 100° C. for 1 hour, and wherein the difference ($\Delta E = E_M - E_T$) between the Young's modulus (E_M) in the longitudinal direction and the Young's modulus (E_T) in the transverse direction of the base film is 250 Kg/mm^2 or more, and the density of the base film is in the range of 1.345 to 1.355 g/cm^3.

5,316,824
TREATING BUILDING MATERIALS WITH A COMPOUND CONTAINING TIN COVALENTLY BONDED TO A SILYLATING GROUP

Billy L. George, Hudson, Wis., and Katherine A. Brown-Wensley, Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 16, 1991, Ser. No. 808,364

Int. Cl.^{5} B05D *1/18;* **B32B** *21/02;* **D06N** *7/04*

U.S. Cl. 428—145 **10 Claims**

1. Method of protecting roofing material comprised of roofing granule-bearing shingles against algae streaking by applying to the roofing granules prior to their incorporation into shingles an effective amount of a compound of the general formula (I):

$$(R_nSn)—[R'—(SiX_pR''_{p-3})]_{4-n} \qquad (I)$$

wherein

R is an organic radical of the formula C_2H_{2z+1} wherein z ranges from 1 to 8,
R' is a divalent radical of an aliphatic hydrocarbon containing 2 to 20 carbon atoms,
R" is an organic radical containing 1 to 8 carbon atoms,
X is a hydrolyzable group,
n is an integer from 0 to 3, and
p is an integer from 1 to 3.

5,316,825
ANTI-FOGGING FILM MADE OF A TRANSPARENT SYNTHETIC RESIN

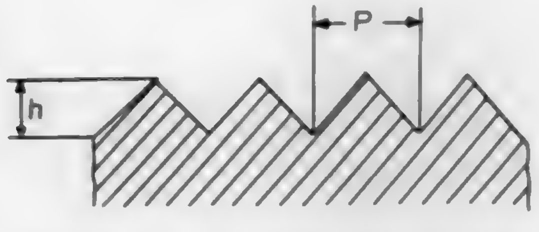
Takeyuki Nakai; Kazuyoshi Murakami, and Yoshiko Ito, all of Nagoya, Japan, assignors to Mitsubishi Kasei Vinyl Company, Tokyo, Japan

Filed Jun. 18, 1992, Ser. No. 900,466

Claims priority, application Japan, Jun. 19, 1991, 3-147574; Nov. 5, 1991, 3-288843

Int. Cl.^{5} B32B *3/00*

U.S. Cl. 428—156 **9 Claims**



1. An anti-fogging film consisting essentially of a thin film of a transparent synthetic resin, which has micro concavities of at most 20 μm in width and at most 10 μm in depth formed over the entire surface of at least one side of the thin film, the total area of the micro concavities being from 20 to 80% of the area of the film surface on which the concavities are formed.

5,316,826
BARRIER PACKAGING MATERIAL FOR INFUSION SOLUTION

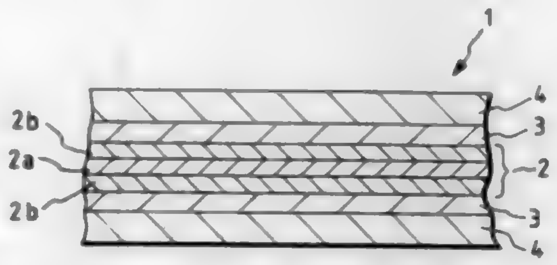
Takayuki Kotani, Iruma, and Takeshi Inuzuka, Tokyo, both of Japan, assignors to Kabushiki Kaisha Hosokawa Yoko, Japan

Continuation of Ser. No. 635,344, Dec. 28, 1990, abandoned. This application Nov. 10, 1992, Ser. No. 974,358

Claims priority, application Japan, Oct. 9, 1990, 2-270717

Int. Cl.^{5} B32B *3/00, 7/02*

U.S. Cl. 428—172 **2 Claims**



1. A barrier packaging material for an infusion solution, comprising a base material consisting of wherein the ethylene-vinyl alcohol copolymer layer is and two linear low density polyethylene layers, the ethylene-vinyl alcohol copolymer layer sandwiched between the two linear low density polyethylene layers; and a polyethylene layer and an ethylene-vinyl acetate copolymer layer directly disposed on each surface side of the base material, which have been successively extrusion-laminated in that order on both surface sides of the base material, wherein the ethylene-vinyl alcohol copolymer layer has a thickness of 5 to 30 μm, the linear low density polyethylene layer has a thickness of 5 to 60 μm, the polyethylene layer has a thickness of 5 to 40 μm, the ethylene-vinyl acetate copolymer layer has a thickness of 50 to 120 μm, the ethylene-vinyl acetate copolymer layer has a vinyl acetate content of 15 to 20 wt. % and the barrier packaging material has a thickness of 160 to 470 μm.

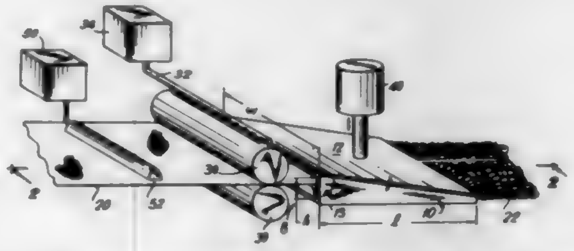
5,316,827
CRIMPED TEXTILE FIBERS AND STUFFER BOX APPARATUS AND METHODS FOR CRIMPING TEXTILE FIBERS

Michael Hill, Ascot, England, and Walter A. Nichols, Richmond, Va., assignors to Filter Materials Limited, New York, N.Y.

Division of Ser. No. 231,142, Aug. 10, 1988, Pat. No. 5,020,198. This application Mar. 7, 1991, Ser. No. 665,968

Int. Cl.^{5} D01D *5/22, 5/42*

U.S. Cl. 428—175 **4 Claims**



1. An interconnected mass of crimped textile fibers having a mean crimp frequency of from about 43 to about 60 crimps per inch and a mean crimp amplitude of from about 320 to about 430 microns.

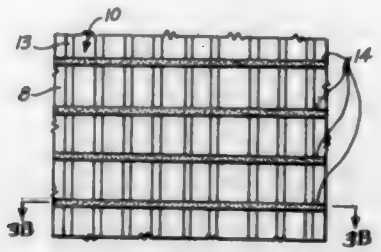
5,316,828
REINFORCED FLUTED MEDIUM AND CORRUGATED FIBERBOARD MADE USING THE MEDIUM

Ray R. Miller, 8816 Warren Dr., Gib Harbor, Wash. 98335

Filed Apr. 25, 1991, Ser. No. 691,378

Int. Cl.^{5} B32B *3/28*

U.S. Cl. 428—182 **8 Claims**



1. A fluted medium for corrugated fiberboard which comprises a plurality of discrete spaced apart lines of reinforcing material oriented transversely to the flutes on at least one surface of said medium, said reinforcing material at least partially filling the valleys of the flutes only along said spaced apart lines, the reinforcing material being absent in the portion of the valleys between said lines, whereby the flat crush strength of corrugated board made with said medium is increased in comparison to board lacking the lines of reinforcing in the flute valleys.

5,316,829
PROCESS AND APPARATUS FOR PRODUCING A GLAZING EQUIPPED WITH A PERIPHERAL FRAME BASED ON POLYMER

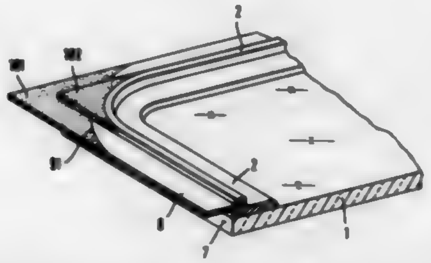
Hans Cordes; Helmut Kramm; Ludwig Schwartz, all of Aachen; Ilan Kahn, Uebach-Palenberg; Gerd Cornils, Merzenich-Girbelsrath, and Ulrich Behrend, Indes, all of Fed. Rep. of Germany, assignors to Saint Gobain Vitrage International, Courbevoie

Filed Jul. 10, 1992, Ser. No. 911,449

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1991, 4123256

Int. Cl.^{5} B32B *23/02*

U.S. Cl. 428—192 **6 Claims**



1. In a glazing to be bonded into an opening of a car body, said glazing having an in situ extruded, peripheral profile, the improvement wherein:

a) said glazing includes at least one additional polymer component to complete or replace at least a portion of the extruded profile.

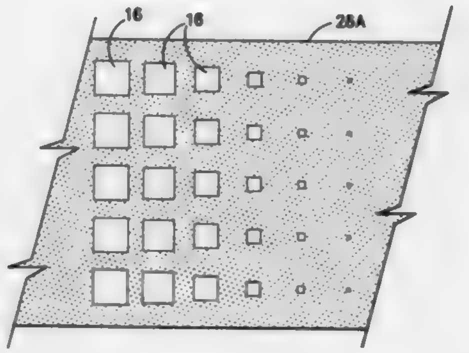
5,316,830
FABRIC HAVING NON-UNIFORM ELECTRICAL CONDUCTIVITY

Louis W. Adams, Jr., Spartanburg; Michael W. Gilpatrick, Chesnee, and Richard V. Gregory, Anderson, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 448,035, Dec. 8, 1989, abandoned. This application Feb. 11, 1992, Ser. No. 835,099

Int. Cl.^{5} B32B *3/00*

U.S. Cl. 428—195 **50 Claims**



1. A woven textile fabric, that is composed of yarns made of fibers extending in a warp direction and composed of yarns made of fibers extending in a fill direction, which exhibits relatively high, anisotropic electrical conductivity, comprised of

a. a unitary substrate comprised of a first group and a second group of individual fibers, said substrate having relatively low, isotropic electrical conductivity, and
b. an electrically conductive polymeric coating carried by at least a portion of said first group and a portion of said second group of fibers, wherein said coating carried by said first group of fibers is substantially continuous over extended portions of the circumference of said fibers comprising said first group, and wherein said coating carried by said second group of fibers is substantially discontinuous over extended portions of the circumference of said fibers comprising said second group, said latter extended portions being associated with fibers positioned on the surface of said fabric, thereby rendering said fibers comprising said first group electrically conductive, and rendering said fibers comprising said second group relatively non-conductive.

5,316,831
METALLIC PRINTED BOARD

Yukio Nakajima; Kazuhiko Imamura; Ryozo Karatsu, all of Kawasaki; Sumio Nishizaki, and Makoto Kobayashi, both of Shimotsuga, all of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 6, 1992, Ser. No. 879,009

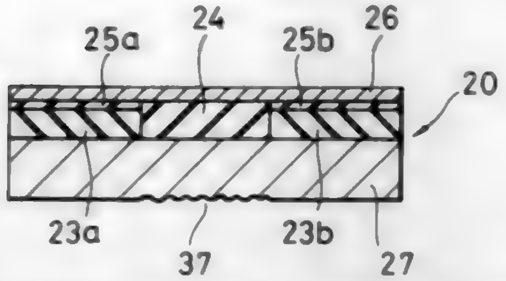
Claims priority, application Japan, May 8, 1991, 3-101681; Dec. 24, 1991, 3-340923

Int. Cl.^{5} B32B *9/00*

U.S. Cl. 428—209 **11 Claims**

1. A metallic printed board having layers including a metallic plate, an electric insulating layer and a metallic film, comprising:

a plurality of insulating regions in said electric insulating layer, said plurality of insulating regions being formed respectively of a plurality of electric insulating materials, one of said plurality of electric insulating materials having a dielectric constant which is less than or equal to 5.0, another of said plurality of electric insulating materials having a thermal resistance which is less than or equal to



2.2° C/W said plurality of insulating regions being arranged on an identical plane surface of said metallic plate.

5,316,832
BIODEGRADABLE SHEET FOR CULTURING SEWAGE DENITRIFIERS

Robert Groten, Weinheim/Steinklingen; Gerhard Heidecke, Bensheim; Thomas Mannsbart, Edingen-Neckarhausen, and Volker Siekermann, Fürth, all of Fed. Rep. of Germany, assignors to Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed May 4, 1993, Ser. No. 57,585

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1992, 4220795

Int. Cl.⁵ D03D *3/00*

U.S. Cl. 428—224 **5 Claims**

1. A biodegradable substrate in sheet form for providing a source of carbon and hydrogen in oxygen-poor water in biological water-treatment stages when covered with at least one layer of a population of spontaneously growing denitrifiers, said substrate comprising a spun-bonded non-woven fabric weighing 10 to 1500 g/m^2, said fabric including at least 50% continuous poly-ϵ-caprolactone filaments with a mean molecular weight of 20,000 to 70,000, whereby the individual filaments adhere to each other at their intersections.

5,316,833
PAPER MACHINE CLOTHING

Robert B. Davis, Framingham; Charles E. Kramer, Walpole, both of Mass.; John P. Rooney, Jr., Kalamazoo, Mich.; Chunghi H. Park, Sharon, Mass.; Dana B. Eagles, Sherborn, Mass.; Joseph G. O'Connor, Hopedale, Mass.; Chian-Hsiang Lin, Lexington, Mass.; Kathleen A. Tabis, Warwick, R.I.; Maryann C. Kenney, Foxboro, Mass., and Jeffrey A. Emond, South Windsor, Conn., assignors to Albany International Corp., Albany, N.Y.

Filed Dec. 18, 1992, Ser. No. 992,624

Claims priority, application United Kingdom, Feb. 18, 1991, 9103340; Jun. 3, 1991, 9111862

Int. Cl.⁵ D03D *3/00*

U.S. Cl. 428—225 **16 Claims**

1. In an article of paper machine clothing comprising a base fabric having a carded batt of staple fibers needled into an upper layer thereof, said staple fibers comprising a polyamide material, the improvement comprising staple fibers of a polyamide material which have been subjected to a treatment with an aqueous solution of aldehyde in the presence of a catalyst to effect partial cross-linking of the polyamide to provide a gel content thereof within the range of 0.1–75% accompanied by a reduction in crystallinity in the range of 1–65% compared with the uncrosslinked material.

5,316,834
FIBER-REINFORCED THERMOPLASTIC SHEET

Tsutomu Matsuda; Yoh Goto, both of Iwakuni, and Tatsuya Shibata, Shiki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 23, 1992, Ser. No. 872,302

Claims priority, application Japan, Apr. 23, 1991, 3-117880; May 14, 1991, 3-136990

Int. Cl.⁵ B32B *5/02*

U.S. Cl. 428—233 **22 Claims**

1. A fiber-reinforced thermoplastic sheet comprising at least one first layer formed by impregnating a woven or knitted fabric of continuous carbon fibers with a matrix resin of a thermoplastic resin and at least one second layer formed by impregnating a nonwoven fabric of a heat-resistant fiber with a matrix resin of a thermoplastic resin, the above first layer(s) and the second layer(s) being bonded by heat and pressure and being laminated integrally, the second layer having the heat-resistant fibers substantially uniformly distributed in the matrix resin in the cross section of the sheet and substantially having no voids of which the diameter exceeds the fiber diameter of the heat-resistant fibers, the nonwoven fabric used in the second layer having a fiber-entangling strength of at least 1.0 kg/mm^2 in any directions crossing at right angles.

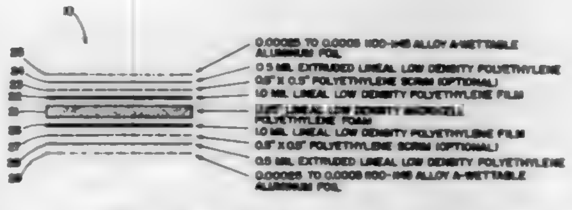
5,316,835
LOW EMISSIVITY INSULATION

Cory L. Groft, 650 Rife Rd., East Berlin, Pa. 17316, and Thomas W. Dauber, R.D. 2, Box 2387, Spring Grove, Pa. 17362

Filed Nov. 16, 1992, Ser. No. 977,043

Int. Cl.⁵ B32B *15/08, 27/12, 27/32*

U.S. Cl. 428—247 **1 Claim**


0.5 MIL EXTRUDED LINEAL LOW DENSITY POLYETHYLENE
0.5" X 0.5" POLYETHYLENE SCRIM (OPTIONAL)
1.0 MIL LINEAL LOW DENSITY POLYETHYLENE FILM
POLYETHYLENE FOAM
1.0 MIL LINEAL LOW DENSITY POLYETHYLENE FILM
0.5" X 0.5" POLYETHYLENE SCRIM (OPTIONAL)
0.5 MIL EXTRUDED LINEAL LOW DENSITY POLYETHYLENE
ALUMINUM FOIL

1. A multi-layer insulation product which achieves low emissivity ratings and enhanced product strength comprising:

a) a layer of foamed material (21),

b) three upper strengthening layers (22, 23, 24) positioned above said foamed material (21),

c) three lower strengthening layers (26, 27, 28) positioned below said foamed material (21),

d) a first metallic foil layer (25) positioned above said upper strengthening layers (22, 23, 24),

e) a second metallic foil layer (29) positioned below said lower strengthening layers (26, 27, 28), wherein said layer of foamed material (21) is comprised of polyethylene or polypropylene low density microcell foam, wherein said upper strengthening layers (22, 23, 24) comprise an inner layer of polyethylene film (22), a middle polyethylene scrim layer (23) and an outer layer of low low density polyethylene (24), wherein said lower strengthening layers (26, 27, 28) comprise an inner layer of polyethylene film (26), a middle polyethylene scrim layer (27) and an outer layer of low density polyethylene (28), wherein said first metallic foil layer (25) is comprised of aluminum foil, wherein said second metallic foil layer (29) is comprised of aluminum foil, wherein each of said layers are heat or flame bonded to each other to form a unitary product (10) which may be readily used by insulation contractors.

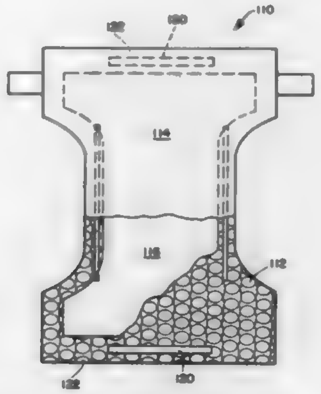
5,316,836
SPRAYED ADHESIVE DIAPER CONSTRUCTION

Timothy R. Heindel, Neenah, Wis.; Michael J. Garvey, Cordova, Tenn.; Daniel W. Dick, Paris, Tex.; Richard F. Keller, Hortonville, Wis.; Mary P. Jordan, Neenah, Wis., and Alan F. Schleinz, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenha, Wis.

Division of Ser. No. 532,309, Jul. 2, 1990, abandoned. This application Jul. 28, 1993, Ser. No. 98,181

Int. Cl.⁵ B32B *7/12*

U.S. Cl. 428—284 **9 Claims**



1. An absorbent article comprising:

an outer layer;

a liquid-permeable inner layer;

an absorbent body positioned between said inner and outer layers; and

an array of adhesive arranged to secure one or more of said layers to said absorbent body, wherein said adhesive array is composed of a plurality of juxtaposed, substantially continuous, semi-cycloidal patterns of adhesive extending substantially along a longitudinal dimension of said article.

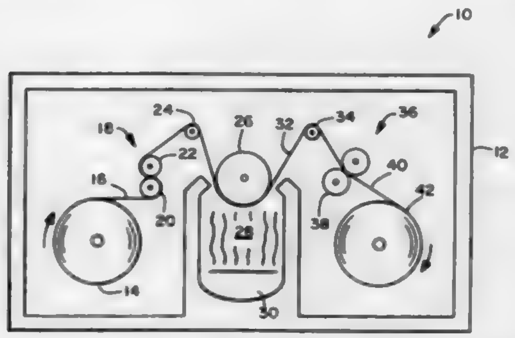
5,316,837
STRETCHABLE METALLIZED NONWOVEN WEB OF NON-ELASTOMERIC THERMOPLASTIC POLYMER FIBERS AND PROCESS TO MAKE THE SAME

Bernard Cohen, Berkeley Lake, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 9, 1993, Ser. No. 28,672

Int. Cl.⁵ B32B *15/00*

U.S. Cl. 428—285 **20 Claims**



1. A stretchable metallized nonwoven web comprising:

at least one nonwoven web of non-elastomeric thermoplastic polymer fibers, the nonwoven web having been heated and then necked so that it is adapted to stretch in a direction parallel to neck-down at least about 10 percent more than an identical untreated nonwoven web of fibers; and

a metallic coating substantially covering at least a portion of at least one side of the nonwoven web.

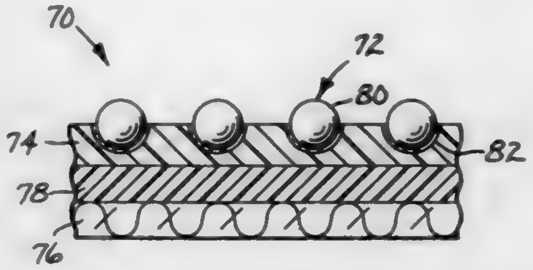
5,316,838
RETROREFLECTIVE SHEET WITH NONWOVEN ELASTIC BACKING

Michael D. Crandall, North Oaks, and Eugene G. Joseph, Arden Hills, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 768,173, Sep. 30, 1991, Pat. No. 5,238,733. This application Mar. 26, 1993, Ser. No. 37,902

Int. Cl.⁵ B32B *5/16*

U.S. Cl. 428—283 **32 Claims**



1. A retroreflective sheet comprising a monolayer of retroreflective elements partially embedded in and partially protruding from the front surface of a binder layer and a backing bonded to the back surface of said binder layer wherein said backing is elastic and comprises extensible nonwoven web comprising melt-blown microfibers each of said microfibers having at least two substantially continuous layers throughout said microfiber length comprised of at least one first layer of a low modulus material and at least one second layer of a relatively nonelastic higher modulus material capable of undergoing substantial permanent deformation.

5,316,839
HEAT RESISTANT, FLAME RESISTANT CONDUCTING SHEET HAVING AN ELECTRICAL INSULATION LAYER

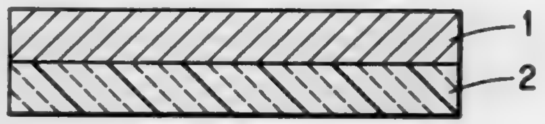
Ippei Kato, Nagaizuni, and Akiyoshi Takano, Fuji, both of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. and Mishima Paper Company Ltd., Fuji, Japan

Continuation of Ser. No. 714,873, Jun. 13, 1991, abandoned. This application May 26, 1993, Ser. No. 68,271

Claims priority, application Japan, Jul. 24, 1990, 2-193809

Int. Cl.⁵ B32B *15/14, 5/06;* **B27N** *9/00;* **D21F** *11/02*

U.S. Cl. 428—285 **4 Claims**



1. A heat- and flame-resistant conductive sheet consisting of a laminate of a conductive layer from a paper stock consisting of poly-metaphenylene isophthalamide fibrids, from 0.3 to 170 g/m^2 conducting fibers and optionally poly-metaphenylene isophthalamide floc, said conductive layer having an area resistivity of not more than 10^5 ohm/⎯ and on one or both sides of said conductive layer, an electrically insulating layer from a paper stock consisting of poly-metaphenylene isophthalamide fibrids and floc, there being no adhesive employed in the laminate.

5,316,840
WALLPAPER

Kouji Kubo, and Shigeichi Kobayashi, both of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

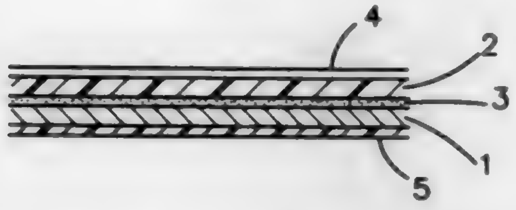
Filed Jul. 2, 1992, Ser. No. 907,621
Claims priority, application Japan, Jul. 9, 1991, 3-167911
Int. Cl.⁵ B32B *9/00*
U.S. Cl. 428—318.4 **2 Claims**

1. Wallpaper comprising flame retardant paper having laminated thereon an expanded sheet obtained by expanding at an expansion ratio of 1.5 or more a resin composition containing (A) 100 parts by weight of an ethylene-α-olefin copolymer having a melt flow rate of from 0.2 to 50 g/10 min, a density of not more than 0.91 g/cm^3, and a maximum melting peak temperature of 100° C. or higher and a heat of fusion at 100° C. or higher of 10 J/g or more as measured with a differential scanning calorimeter and (B) 60 parts by weight or more of magnesium hydroxide or a mixture of magnesium hydroxide and aluminum hydroxide at a weight ratio of from 100/0 to 20/80, wherein said ethylene-α-olefin copolymer is a copolymer obtained by copolymerizing ethylene and an α-olefin having from 3 to 18 carbon atoms in the presence of a Ziegler catalyst at a temperature of from 130° to 300° C. and at a pressure of from 300 to 3,000 kg/cm^2.

5,316,841
LAMINATED SHEET FOR A LID OF A CONTAINER FOR INSTANT FOOD COOKED WITH HOT WATER

Yukio Kohama, Washimiyamachi; Kazunori Yamada, Atsugi; Toshiaki Watanabe, and Chiaki Kanai, both of Chigasaki, all of Japan, assignors to Tokai Aluminum Foil Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 780,943, Oct. 24, 1991, abandoned.
This application Jun. 14, 1993, Ser. No. 75,906
Claims priority, application Japan, Nov. 9, 1990, 2-117850; Apr. 19, 1991, 3-26951
Int. Cl.⁵ B32B *3/26*
U.S. Cl. 428—319.1 **18 Claims**



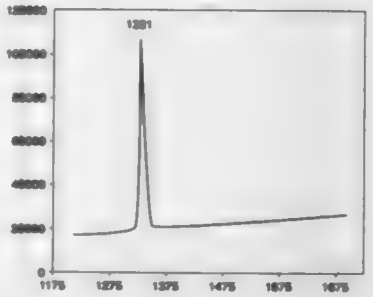
1. A peelable lid for a container of instant food adapted to be cooked by pouring hot water into the container consisting of essentially of

- a layer of metallic foil having first and second sides; and
- a layer of synthetic paper having a first side affixed to the second side of said layer of metallic foil, wherein said layer of metallic foil has an associated thermal expansion rate which is lower than that of said layer of synthetic paper such that when said lid is affixed to an open end of an instant food container and then partially peeled from the open end in order to pour hot water into the container to cook the instant food, the lid will tend to bend toward and sealingly engage the open end of the container.

5,316,842
DIAMOND/NON-DIAMOND MATERIALS WITH ENHANCED THERMAL CONDUCTIVITY

John A. Herb, Palo Alto; John M. Pinneo, Redwood City, and Clayton F. Gardinier, San Francisco, all of Calif., assignors to Crystallume, Menlo Park, Calif.

Division of Ser. No. 789,732, Nov. 8, 1991, which is a continuation of Ser. No. 704,997, May 24, 1991, which is a continuation of Ser. No. 413,114, Sep. 27, 1989, Pat. No. 5,075,095, which is a continuation of Ser. No. 204,058, Jun. 7, 1988, Pat. No. 4,882,138, which is a continuation of Ser. No. 32,167, Mar. 30, 1987, Pat. No. 4,743,073. This application Jul. 21, 1993, Ser. No. 95,314
Int. Cl.⁵ B32B *3/26*
U.S. Cl. 428—319.1 **8 Claims**



1. An article comprising:

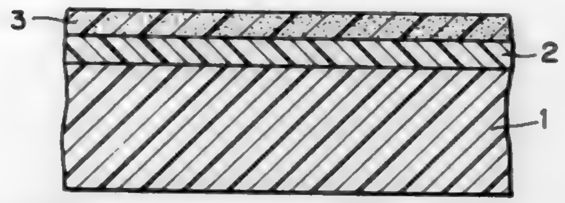
- a plurality of non-diamond particles compatible with diamond deposition, said particles preformed into a desired shape, each of said particles having first surface regions in contact with immediately adjacent other ones of said particles, each of said particles further having second surface regions spaced apart from said immediately adjacent other ones of said particles, said second surface regions of said particles defining boundaries of inter-particle voids between said immediately adjacent ones of said particles;
- infiltrated high thermal conductivity CVD diamond material continuously coating said second surface regions of said particles and comprising merged growth fronts from said second surface regions of individual immediately adjacent ones of said particles into said inter-particle voids, said high thermal conductivity CVD diamond material having an average crystallite size greater than about 15 microns, having an intensity ratio of diamond-Raman-peak-to-photoluminescence background intensity greater than about 20, a maximum intensity of the diamond Raman peak in counts/sec divided by the intensity of photoluminescence at 1270 cm^{-1} greater than about 3, a Raman sp^3 full width half maximum less than about 6 cm^{-1} and a diamond-to-graphite Raman ratio greater than about 25.

5,316,843
MATTED FILM CONTAINING A MATTING AGENT CONSISTING OF AN ORGANIC FILLER AND AN INORGANIC FILLER

Naohiko Kiryu, Urawa; Shinichi Yamamoto, Yashio; Masatoshi Tomiki, Koshigaya, and Tatuhiko Higami, Tokyo, all of Japan, assignors to Somar Corporation, Japan

Filed Nov. 20, 1990, Ser. No. 615,697
Int. Cl.⁵ B32B *5/16*
U.S. Cl. 428—323 **6 Claims**

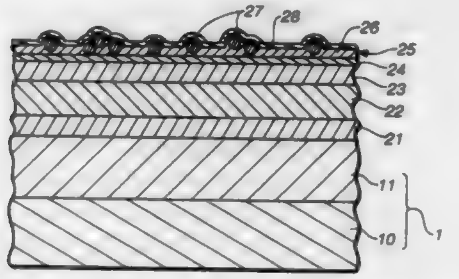
1. A writing material composite for writing upon with pen or pencil, said composite comprising a film formed of a synthetic resin, and a mat layer provided over at least one surface of said film and containing a matting agent consisting of 50–95% by weight of an organic filler having an average particle size of 10 μm or less, said organic filler being selected from the group consisting of cross-linked benzoguanamine resins, cross-linked benzoguanamine-melamine resins and crosslinked melamine resins and 5–50% by weight of a kaolin mineral filler having an average particle size of 10 μm or less.



5,316,844
MAGNETIC RECORDING MEDIUM COMPRISING AN ALUMINUM ALLOY SUBSTRATE, NOW MAGNETIC UNDERLAYERS, MAGNETIC LAYER, PROTECTIVE LAYER, PARTICULATE CONTAINING PROTECTIVE LAYER AND LUBRICANT LAYER

Hisanori Suzuki, Sunnyvale, and Takeo Matsudaira, Cupertino, both of Calif., assignors to Hoya Electronics Corporation, San Jose, Calif.

Continuation of Ser. No. 509,558, Apr. 16, 1990, abandoned.
This application Sep. 26, 1991, Ser. No. 766,968
Int. Cl.⁵ G11B *5/00*
U.S. Cl. 428—323 **18 Claims**



1. In a magnetic recording medium for contact recording having a magnetic layer, a protective layer and a lubricant layer sequentially stacked on a non-magnetic substrate of an aluminum alloy, the improvement wherein

- said magnetic recording medium also includes an underlying component between said substrate and said magnetic layer, said underlying component comprising a Cr film and one or more non-magnetic layers selected from Ta, Mo, Zn, Sn and alloys consisting of one or more elements selected from the group consisting of Ta, Mo, Zn and Sn and formed on said substrate, said Cr film being formed between said one or more non-magnetic layers and said magnetic layer,
- said substrate has a finished surface with maximum surface roughness R_{max} between 100 Å and 300 Å, having no surface protrusions or unevenness higher than 760 Å,
- said protective layer includes a first protective film and a second protective film, said first protective film being non-magnetic and formed on said magnetic layer and including one or more selected from the group consisting of metals, semiconductors, metallic compounds, and semiconducting compounds, said second protective film including an inorganic oxide film and particulates dispersed within said inorganic oxide film, said inorganic oxide film comprising at least one oxide selected from the group consisting of silicon oxides and metallic oxides, and
- a lubricant film is formed on said protective layer, the maximum surface roughness R_{max} of said magnetic recording medium being 100–300 Å, said magnetic recording medium having no surface protrusions and unevenness higher than 760 Å;

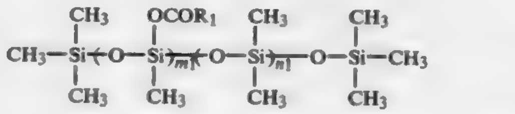
wherein said magnetic recording medium is usable for contact recording with a recording head having flying height of less than 760 Å.

5,316,845
MAGNETIC RECORDING MEDIUM COMPRISING TWO MAGNETIC LAYERS EACH LAYER COMPRISING FERROMAGNETIC POWDER, BINDER, A BRANCHED AND UNBRANCHED SILICONE, WITH CARBON BLACK IN THE UPPER LAYER

Masatoshi Takahashi; Hiroo Inaba, and Kazuaki Taga, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

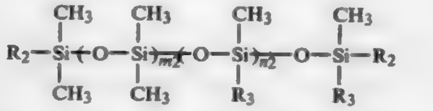
Continuation of Ser. No. 687,810, Apr. 19, 1991, abandoned.
This application Jun. 1, 1993, Ser. No. 69,681
Claims priority, application Japan, Apr. 19, 1990, 2-101568
Int. Cl.⁵ G11B *5/00*
U.S. Cl. 428—323 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic support, a lower magnetic layer and an upper magnetic layer, each of said lower and upper magnetic layers containing a ferromagnetic powder, a binder, a branched fatty acid-modified silicone represented by formula (I) and a linear fatty acid-modified silicone represented by formula (II):


(I)

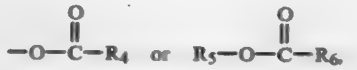
$$CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{Si}}\!\!\leftarrow\!O-\overset{\overset{OCOR_1}{|}}{\underset{\underset{CH_3}{|}}{Si}}\!\!\to_{m1}\!\!\leftarrow\!O-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{Si}}\!\!\to_{n1}\!O-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{Si}}-CH_3 \qquad (I)$$

wherein R_1 is a branched and saturated hydrocarbon group having 7 to 24 carbons, m_1 is an integer of 1 to 100, n_1 is an integer of 0 to 250, an $m_1 \geqq n_1/5$;


(II)

$$R_2-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{Si}}\!\!\leftarrow\!O-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{Si}}\!\!\to_{m2}\!\!\leftarrow\!O-\overset{\overset{CH_3}{|}}{\underset{\underset{R_3}{|}}{Si}}\!\!\to_{n2}\!O-\overset{\overset{CH_3}{|}}{\underset{\underset{R_3}{|}}{Si}}-R_2 \qquad (II)$$

wherein R_2 and R_3 each represents a methyl group or a group represented by



$$-O-\overset{\overset{O}{\|}}{C}-R_4 \quad \text{or} \quad R_5-O-\overset{\overset{O}{\|}}{C}-R_6,$$

provided that R_2 and R_3 do not represent methyl groups at the same time; R_4 and R_6 each represents an alkyl group having 1 to 20 carbon atoms; R_5 is an alkylene group having 1 to 20 carbon atoms; m_2 is an integer of 0 to 100; and n_2 is an integer of 1 to 100;

and wherein said lower magnetic layer does not contain carbon black, and said upper magnetic layer contains carbon black having a dibutyl phthalate absorption oil amount of 100 to 250 ml/100 g and an average particle diameter of 15 to 500 mμ, said carbon black being present in an amount of 0.5% to 10% by weight based on weight of ferromagnetic powder in said upper magnetic layer.

5,316,846

COATED SUBSTRATES

Naum Pinsky, Thousand Oaks, and Saulius A. Alkaitis, Los Angeles, both of Calif., assignors to Ensci, Inc., Pismo Beach, Calif.

Division of Ser. No. 398,051, Aug. 24, 1989, Pat. No. 5,112,706, which is a division of Ser. No. 272,539, Nov. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 82,277, Aug. 6, 1987, Pat. No. 4,787,125, which is a division of Ser. No. 843,047, Mar. 24, 1986, Pat. No. 4,713,306. This application Feb. 21, 1992, Ser. No. 839,373

The portion of the term of this patent subsequent to Feb. 21, 2009, has been disclaimed.

Int. Cl.^{5} B32B *17/04, 17/06, 18/00*

U.S. Cl. 428—325 **33 Claims**

1. An article comprising an acid resistant substrate other than electrically conductive, doped tin oxide, in the form of fibers or particles coated with electrically conductive, doped tin oxide.

5,316,847

BIOLOGICALLY DEGRADABLE FILMS COMPRISING ENZYME-COATED BIO-DEGRADABLE POLYMER PARTICLES

Hannu L. Suominen, Vantaa, Finland, assignor to Biodata OY, Finland

Continuation of Ser. No. 732,412, Jul. 19, 1991, abandoned, which is a division of Ser. No. 592,616, Aug. 4, 1990, Pat. No. 5,133,909. This application Dec. 30, 1992, Ser. No. 998,913

Claims priority, application Finland, Oct. 5, 1989, 894734

The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.

Int. Cl.^{5} B32B *5/16*

U.S. Cl. 428—327 **10 Claims**

1. Biologically degradable film composed of

a synthetic polymer and

biologically degradable polymer particles having a particle size smaller than about 10 μm, said biologically degradable polymer particles being homogeneously distributed in said synthetic polymer,

said particles of said biologically degradable polymer being coated with enzymes in an amount effective to degrade said biologically degradable polymer when said enzyme is exposed to moisture, said particles being further coated with an oxidizable outer coating comprising vegetable-based oil, said oil coating being present in an effective amount to prevent moisture from contacting said enzymes and thereby temporarily preventing the degradation of said biologically degradable polymer by said enzymes after said biologically degradable polymer particles have attained a particle size smaller than about 10 μm, said oil coating when oxidized allowing moisture to contact said enzymes and thereby degrade said biologically degradable polymer.

5,316,848

WATERPROOFING MEMBRANE

Keith R. Bartlett, Groveland, and Robert F. Jenkins, Wakefield, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 662,853, Mar. 1, 1991, abandoned. This application Aug. 17, 1992, Ser. No. 931,121

Int. Cl.^{5} C09J *7/02*

U.S. Cl. 428—351 **23 Claims**

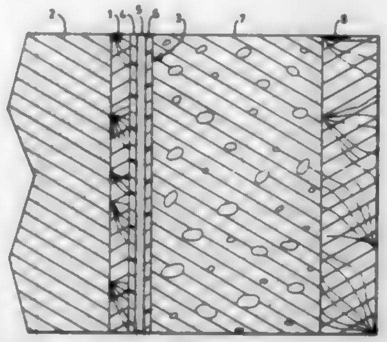
1. A waterproofing membrane laminate, comprising:

a carrier layer having first and second major faces, said first major face operative to permit said carrier layer to be disposed against a lagging form;

a styrene-isoprene-styrene adhesive layer adhered to said second major face of said carrier layer, said adhesive layer being pressure sensitive and having a penetration greater than 30 dmm (150 g. 5 sec., 70° F.) according to ASTM D 5-73;

an acrylic-based elastomeric coating layer adhered to said styrene-isoprene-styrene adhesive layer; and

said styrene-isoprene-styrene adhesive layer and said acrylic based coating layer being operative, after seven days outdoor exposure to sunlight, to provide without cracks a fully adhered bond with concrete that is wet cast against said layers and allowed to set.



5,316,849

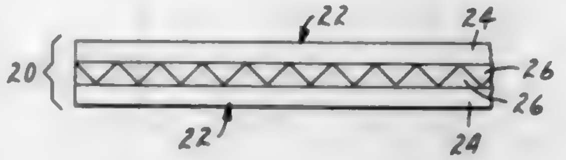
RECLOSABLE MECHANICAL FASTENER BASED ON A COMPOSITE ARTICLE

Shih-Lai Lu; James J. Kobe; John D. Moon; Maurice E. Freeman; Forrest J. Rouser; Robert V. Heiti, and Thomas E. Boettcher, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 573,321, Aug. 29, 1990, Pat. No. 5,196,266, which is a continuation-in-part of Ser. No. 427,448, Oct. 26, 1989, abandoned. This application Nov. 24, 1992, Ser. No. 981,019

Int. Cl.^{5} A44B *1/00;* **B65D** *33/16;* **B32B** *7/12*

U.S. Cl. 428—355 **8 Claims**



1. A fastening component of a reclosable mechanical fastener, which fastening component comprises:

(a) a substrate, and

(b) a fastening layer having a first major surface and a second major surface, said first major surface being adhered to said substrate, said second major surface being non-tacky, having a plurality of solid tapered elements, each element having at least one side inclined relative to a common plane at an angle sufficient to form a taper such that each element may mesh with at least one corresponding element of an identical surface of a second fastening layer, each element having a cross-section in the shape of a triangle, said triangle forming a sharp projection at the intersection of each of its two outer extending surfaces, and comprising a crosslinked polymer formed from radiation-curable, addition-polymerizable, oligomers or prepolymers having one or more like or different hard segments of mono- or poly-valent moieties containing one or more carbocyclic or heterocyclic groups or both of said moieties, wherein each of said moieties of said hard segments, when their valences are satisfied by protons, has at least one major transition temperature above 250° K., one or more like or different soft segments of mono- or poly-valent moieties, wherein each of said moieties of said soft segments has a number average molecular weight in the range of about 500 to 5000 and each of which in the form of homopolymer has a glass transition temperature below 250° K., one or more like or different monovalent moieties containing a radiation-sensitive, addition-polymerizable, functional group selected from the group consisting of acrylyl, methacrylyl, allyl, and vic-epoxy, said second major surface capable of releasably adhering to an identical second major surface of a second fastening layer.

5,316,850

PERMANENTLY STAIN RESISTANT TEXTILE FIBERS

Ralph R. Sargent, and Michael S. Williams, both of Rome, Ga., assignors to Peach State Labs, Inc., Rome, Ga.

Filed Apr. 12, 1991, Ser. No. 685,480

Int. Cl.^{5} D06M *14/04, 14/12*

U.S. Cl. 428—378 **8 Claims**

1. A permanently stain resistant fibrous material comprising a fiber of the structure fiber-A-$(Y)_n$-S, wherein:

A is an aromatic moiety that contains an electron withdrawing group other than Y, or a heteroaromatic moiety that optionally contains side groups other than Y;

Y is or contains a functional group that is covalently linked to a stain resistant material;

S is a stain resistant material that comprises a substance selected from the group consisting of a sulfonated formaldehyde condensation polymer or copolymer, polymethacrylic acid, a copolymer of methacrylic acid, and a product prepared by reacting an α-substituted acrylic acid in the presence of a novoloid resin, wherein the α-substitutent is a hydrocarbon, halogenated hydrocarbon, or sulfonated hydrocarbon of from C_1 to C_{20}, phenol, napthol, sulfonated phenol, sulfonated napthol, or halogen;

the fiber has a terminal amino, carboxyl, or hydroxyl group; and

n is 0 or 1.

5,316,851

SILICON CARBIDE COMPOSITE WITH METAL BORIDE COATED FIBER REINFORCEMENT

Milivoj K. Brun, Ballston Lake; Robert A. Giddings, Schenectady, and Svante Prochazka, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 714,417, Jun. 12, 1991, abandoned. This application Mar. 26, 1992, Ser. No. 858,367

Int. Cl.^{5} D02G *3/00*

U.S. Cl. 428—379 **7 Claims**

1. A composite comprised of reinforcement fibers from the group consisting of elemental carbon, silicon carbide, and mixtures thereof; where said fibers have a continuous coating of metal diboride from the group consisting of titanium diboride, zirconium diboride, hafnium diboride, aluminum diboride, and mixtures thereof; and a silicon carbide ceramic matrix formed by molten silicon infiltration, where said matrix contains at least a silicon carbide phase and an elemental silicon phase.

5,316,852

COATED MATERIAL AND THE USE THEREOF

Jin Mizuguchi, Fribourg; Gérald Giller, Bulle, and Alain C. Rochat, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

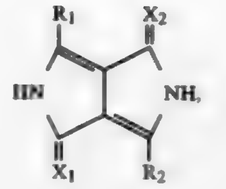
Filed Aug. 18, 1992, Ser. No. 931,914

Claims priority, application Switzerland, Aug. 26, 1991, 2495/91-0

Int. Cl.^{5} C07D *487/04;* **G03G** *5/06*

U.S. Cl. 428—411.1 **12 Claims**

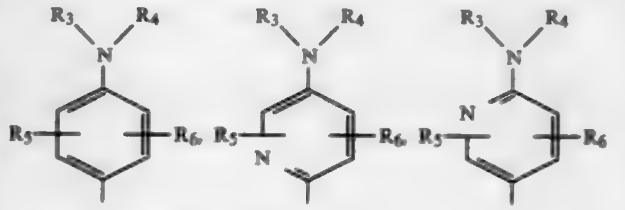
1. A coated material comprising a substrate which is coated on at least one side with a thin layer of a pyrrolopyrrole of formula I or a mixture of pyrrolopyrroles of formula I



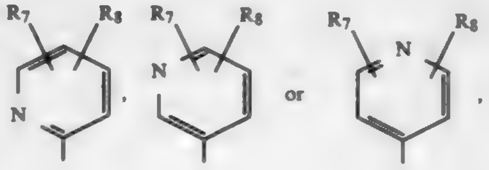
(I)

wherein

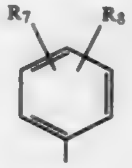
R_1 is a phenyl or pyridyl radical of formula



or is a pyridyl group of formula



R_2 is a group



or has the same meaning as R_1, and R_3 and R_4 are each independently of the other C_1–C_{18}alkyl, C_5–C_6cycloalkyl, C_1–C_{18}alkyl which is substituted by —OH or —SH, or unsubtituted phenyl, benzyl or phenylethyl, or phenyl, benzyl or phenylethyl which are substituted by halogen, C_1–C_{12}alkyl, C_1–C_{12}alkoxy, cyano or nitro, or, together with the linking nitrogen atom, are a 5- or 6-membered heterocyclic radical selected from the group consisting of pyrrolidinyl, piperidyl, pyrrolyl, imidazolyl, pyrazolyl, triazolyl, piperazinyl, morpholinyl and thiomorpholinyl,

R_5 to R_8 are each independently of one another hydrogen, halogen, C_1–C_{12}alkyl, C_1–C_{12}alkoxy, C_1–C_{12}alkylmercapto or cyano, and X_1 and X_2 are each independently of the other O or S, which compound of formula I is converted at least partially into a salt of a strong acid.

5,316,853

EXPAND TAPE

Kazutaka Shibata, and Yutaka Murakami, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 27, 1991, Ser. No. 816,398

Int. Cl.^{5} B32B *15/08, 15/04*

U.S. Cl. 428—416 **2 Claims**

1. An expand tape for use at dicing of semiconductor wafers, comprising:

an expandable synthetic resin film; and

a preform layer provided on said expandable film.

5,316,854

GLASS OR QUARTZ ARTICLES HAVING HIGH TEMPERATURE UV ABSORBING COATINGS CONTAINING CERIA

Chia-Cheng Lin, Allison Park; John D. Basil, Pittsburgh; Robert M. Hunia, Kittanning, and Peter P. Bihuniak, Franklin Township, Venango County, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 6, 1991, Ser. No. 802,914

Int. Cl.^{5} B32B *17/06, 9/00*

U.S. Cl. 428—426 **10 Claims**

1. A coated article comprising a substrate of glass or quartz and a coating having an absorbance of 1 to 3 per micron of thickness at 320 nanometers and consisting essentially of colloidal particles of cerium oxide in a silica-based matrix and having a minimum concentration on the order of 40 weight percent of cerium oxide based on the total metal oxide content of said matrix containing said cerium oxide particles, said coated article being essentially craze free and essentially optically clear at 1000° C.

5,316,855

HIGH ABRASION RESISTANCE COATING MATERIALS FROM ORGANIC/INORGANIC HYBRID MATERIALS PRODUCED BY THE SOL-GEL METHOD

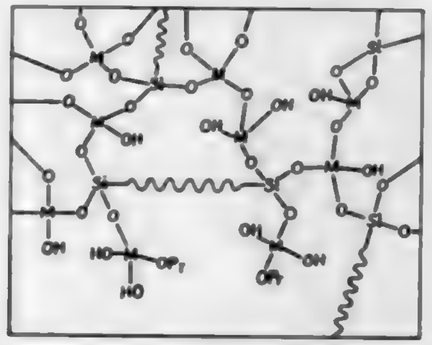
Bing Wang, and Garth L. Wilkes, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation-in-part of Ser. No. 552,632, Jul. 13, 1990, abandoned. This application Nov. 19, 1990, Ser. No. 615,569

The portion of the term of this patent subsequent to Nov. 19, 2007, has been disclaimed.

Int. Cl.^{5} B32B *9/04*

U.S. Cl. 428—447 **6 Claims**



1. A coated polymer which comprises a polymer substrate and a coating of a cured organic/inorganic hybrid material formed by the sol-gel cohydrolyzation of a metal alkoxide and a trialkoxysilane-containing organic component which contains trialkoxysilane groups at more than one location.

5,316,856

SILICON NITRIDE BASE SINTERED BODY

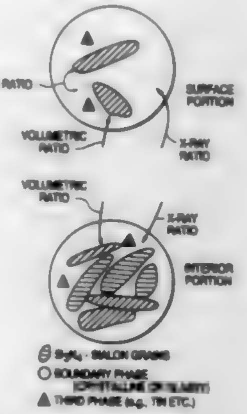
Junichiro Suzuki, and Masahide Kayukawa, both of Gifu, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 464,122, Jan. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 443,958, Dec. 1, 1989, abandoned. This application Jun. 14, 1993, Ser. No. 75,917

Claims priority, application Japan, Dec. 3, 1988, 63-306320; Jan. 12, 1989, 1-5791

Int. Cl.^{5} C04B *35/58*

U.S. Cl. 428—446 **42 Claims**



1. A sintered body of silicon nitride base having a surface portion formed integrally with an interior portion of the body, wherein the rate of decrease of the Si content in the surface portion, with respect to the Si content in the interior portion, as calculated by the formula

Rate of Decrease of Si = [{Si content in the Interior Portion −

Si content in the Surface Portion}/

Si content in the Interior Portion] ×

100 is not less than 20% by weight;

and wherein the amount of crystal grains of silicon nitride and SiAlON in the surface portion is smaller than the amount of crystal grains of silicon nitride and SiAlON in the interior portion by 30 vol % or more.

5,316,857

SHEET MATERIAL HAVING A RECOGNITION ENHANCING FEATURE

Reinhard Spiegel, Stade, Fed. Rep. of Germany, assignor to Deutsche Aerospace Airbus GmbH, Hamburg, Fed. Rep. of Germany

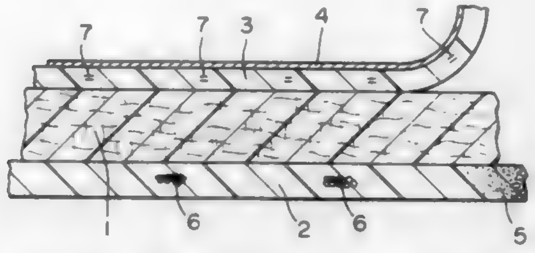
Continuation-in-part of Ser. No. 446,309, Dec. 4, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,669

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840822

Int. Cl.^{5} G01B *7/00;* **B32B** *7/06*

U.S. Cl. 428—457 **5 Claims**

1. An article of manufacture comprising a separator sheet material (2,3) and a fiber composite prepreg material (1) of a still uncured resin matrix material having reinforcing fibers embedded therein, said separator sheet material (2,3) contacting at lease one surface of said fiber composite material, said separator sheet material (2, 3) having at least one smooth surface for temporarily neutralizing the stickiness of said uncured matrix material, said separator sheet material (2, 3) comprising magnetically sensible metal means as part of said separator sheet material for recognizing the presence of remainders of said separator sheet material on or in said fiber composite material.



5,316,858

MATERIALS FOR THERMOELECTRIC AND LIGHT-HEAT CONVERSION

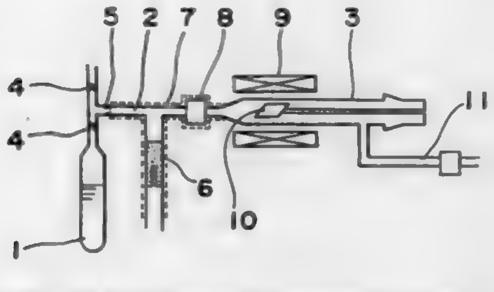
Yoshiyuki Higashigaki, Kashiwa; Yoshikazu Yoshimoto, Tenri; Tomonari Suzuki, Kashihara; Shigeo Nakajima, Nara, and Toshio Inoguchi, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 656,551, Feb. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 428,000, Oct. 30, 1989, abandoned, which is a continuation of Ser. No. 100,309, Sep. 23, 1987, abandoned, which is a division of Ser. No. 841,829, Mar. 20, 1986, Pat. No. 4,714,639. This application Aug. 3, 1992, Ser. No. 921,609

Claims priority, application Japan, Mar. 22, 1985, 60-59276; Mar. 26, 1985, 60-64571

Int. Cl.^{5} B32B *15/04*

U.S. Cl. 428—457 **3 Claims**



1. A material for converting heat energy to electric energy consisting essentially of:

graphite layers having atoms of a heavy metal intercalated between the adjoining graphite layers, said heavy metal being an element selected from the group consisting of bismuth, lead, antimony, tin and mercury,

wherein the thermoelectric power of the intercalated heavy metal atoms in the direction perpendicular to the graphite layers of said material is $\alpha=150\text{–}50\ \mu\mathrm{VK}^{-1}$ and the conductivity and the thermal conductivity of said material are $\sigma=5100\text{–}1200\ \Omega^{-1}\mathrm{cm}^{-1}$ and $\kappa=1.1\text{–}2.1\times10^{-2}\mathrm{W}\cdot\mathrm{cm}^{-1}\cdot\mathrm{K}^{-1}$, respectively.

5,316,859

SPRAY-COATED ROLL FOR CONTINUOUS GALVANIZATION

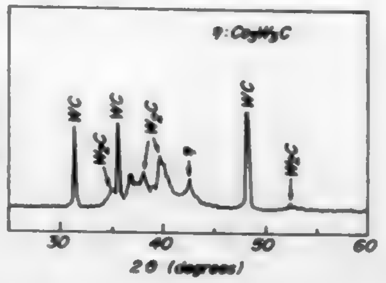
Yoshio Harada, and Kazumi Tani, both of Hyogo, Japan, assignors to Tocalo Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 859,863, Mar. 30, 1992, abandoned. This application Sep. 9, 1993, Ser. No. 124,657

Int. Cl.^{5} B21B *27/02;* **B05D** *1/10*

U.S. Cl. 428—472 **7 Claims**

1. A spray-coated roll for continuous galvanization comprising a roll drum and a spray-coated layer of a cermet material comprising WC-Co formed on an outer peripheral surface of the roll drum; said spray-coated layer containing at least one substance selected from the group consisting of intermetallic compound, amorphous W-C-Co compound and free carbon and having a structure that free W and free Co are hardly identified by X-ray diffractometry; and said intermetallic compound being selected from the group consisting of W_2C, Co_3W_3C, Co_6W_6C, Co_2W_4C, Co_2W_4C and $W_6C_{2.54}$.



5,316,860

LEATHER TREATMENT SELECTED AMPHIPHILIC COPOLYMERS

Thomas Stewart, Doylestown; Patricia M. Lesko, Lansdale, and Anton G. El A'mma, Phoenixville, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 279,181, Dec. 2, 1988, abandoned. This application Jun. 7, 1990, Ser. No. 535,228

Int. Cl.^{5} B32B *9/02, 9/04*

U.S. Cl. 428—473 **14 Claims**

1. A method for improving the properties of tanned leather comprising treating said tanned leather with at least one weight percent of an aqueous dispersion comprising a water insoluble dispersed amphiphilic copolymer formed from about 52 weight percent to about 88 weight percent to of at least one hydrophobic monomer selected from the group consisting of long chain alkyl (meth)acrylates, long chain alkoxy- or alkylphenoxy (poly ethylene oxide) (meth)acrylates, primary alkenes, vinylesters of long chain alkyl carboxylic acids and mixtures thereof, said long chain alkyl groups containing at least 6 carbon atoms, with from about 12 weight percent to about 48 weight percent of at least one copolymerizable water soluble ethylenically unsaturated acidic or basic hydrophilic comonomer, and where said hydrophilic comonomer is other than methacrylic acid when said hydrophobic monomer is 2-ethylhexyl acrylate, and where said amphiphilic copolymer has a weight average molecular weight of from about 2000 to about 100,000, and where the treated has a temper of at least 155 mils and a dynamic water resistance greater than 1000 Maeser flexes.

5,316,861

PROCESS FOR PRODUCING FLOOR OR WALL COVERINGS AND PRODUCTS OBTAINED

Daniel Marchal, Burden, Luxembourg, and Dung V. Dao, Aywaille, Belgium, assignors to Sommer S.A., Luxembourg

PCT No. PCT/BE89/00050, § 371 Date Jun. 6, 1991, § 102(e) Date Jun. 6, 1991, PCT Pub. No. WO90/06233, PCT Pub. Date Jun. 14, 1990

PCT Filed Apr. 12, 1989, Ser. No. 688,608

Claims priority, application Luxembourg, Dec. 6, 1988, 87402

Int. Cl.^{5} B32B *27/08*

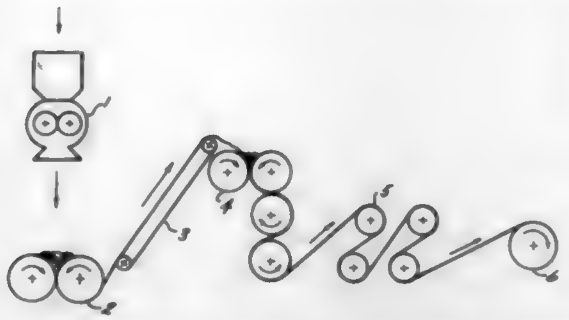
U.S. Cl. 428—516 **29 Claims**

1. A covering for a floor or wall consisting essentially of:

a lower sheet comprising a plasticized polymer, said polymer being derived from propylene monomers, said lower sheet exhibiting a tensile modulus between 5×10^7 N/M^2 and 2×10^8 N/M^2;

a decoration on the lower sheet;

an upper sheet applied on said lower sheet so that said decoration is interposed between the sheet, said upper sheet



comprising a polymer derived from propylene monomer and being translucent or transparent.

5,316,862

MAGNETIC RECORDING MEDIUM, COMPRISING MAGNETIC POWDER AND A SULFOXIDE GROUP CONTAINING VINYL CHLORIDE COPOLYMER BINDER RESIN

Tamotsu Yamamoto, Kitamoto, and Kenji Akimoto, Kawasaki, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1992, Ser. No. 833,714

Claims priority, application Japan, Feb. 18, 1991, 3-045842

Int. Cl.^{5} G11B *5/00*

U.S. Cl. 428—522 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon, said magnetic layer comprising a binder and a magnetic powder dispersed in the binder, wherein said binder is a vinyl chloride resin which contains vinyl chloride units in an amount of at least 60 mole %, has an average polymerization degree of 100–900 and contains sulfoxide groups in an amount of 1 to 7% by weight.

5,316,863

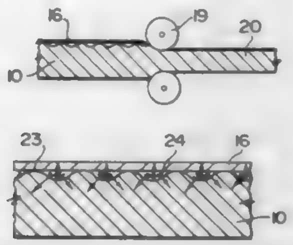
SELF-BRAZING ALUMINUM LAMINATED STRUCTURE

John J. Johnson, Batavia, Ill., and Roland S. Timsit, Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed May 18, 1992, Ser. No. 885,125

Int. Cl.^{5} B22F *7/04*

U.S. Cl. 428—548 **32 Claims**



1. A self-brazing aluminum laminated sheet structure comprising an aluminum or aluminum alloy substrate having bonded to at least one surface thereof a mixture of (i) particles of a metal capable of forming in situ a eutectic alloy with the substrate when the sheet is heated and (ii) particles of flux of melting point lower than the melting point of the eutectic and capable of removing an oxide layer from the surface of the substrate material, and an aluminum or aluminum alloy covering layer on top of said mixture of eutectic-forming metal and flux particles, said covering layer being bonded to the substrate such that the particles are encased between the covering layer and substrate, thereby protecting subsequent processing tools from damage by said metal particles.

5,316,864

SPUTTERED MAGNETIC RECORDING DISK

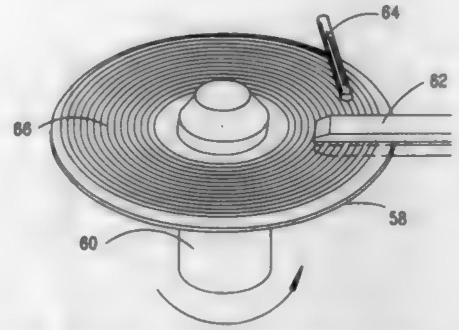
Virgle L. Hedgcoth, 1524 Hacienda Pl., Pomona, Calif. 91768

Division of Ser. No. 464,339, Jan. 12, 1990, Pat. No. 5,082,747, which is a division of Ser. No. 210,119, Jun. 22, 1988, Pat. No. 4,894,133, which is a division of Ser. No. 926,676, Nov. 3, 1986, abandoned, which is a division of Ser. No. 796,768, Nov. 22, 1985, Pat. No. 4,735,840. This application Jan. 17, 1992, Ser. No. 822,589

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.^{5} G11B *5/66, 5/72, 5/82*

U.S. Cl. 428—611 **5 Claims**



1. A magnetic thin film recording disk formed by a series of sequential sputtering processes within an environment of a low pressure inert gas, comprising:

a substrate having an outer diameter of 230 mm or less and a nickel surface layer, the substrate including aluminum, the substrate characterized by a physically abraded surface having a series of physical circumferential texturing of hills and valleys prior to any sputtering operation to encourage a circular anisotropic orientation of crystal growth during sputtering, while not interfering with fly characteristics of a recording head across the recording disk, the Ra arithmetic average radial roughness of circumferential texturing providing a magnetic switching field distribution of less than 0.20, any output of a signal recorded on the magnetic thin film recording disk will have an amplitude modulation, the amplitude modulation will be less than 25 percent (25%);

a thin film chromium nucleating layer deposited on the textured nickel surface by a first sputtering process;

a thin film magnetic layer containing a cobalt alloy deposited on the nucleating layer by a second sputtering process to provide a C axis orientation of the magnetic layer parallel to a plane containing the substrate, and

a thin film carbon protective film deposited on the magnetic layer by a third sputtering process.

5,316,865

COMPOSITE STRUCTURE WITH NBTIAL LOW HF ALLOY MATRIX AND NIOBIUM BASE METAL REINFORCEMENT

Mark G. Benz, Burnt Hills; Melvin R. Jackson, Schenectady, and John R. Hughes, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1992, Ser. No. 816,165

Int. Cl.^{5} C22C *1/09*

U.S. Cl. 428—614 **10 Claims**

1. A metal-metal composite structure adapted to use at temperature above 1,000 degrees centigrade which comprises

a body of a matrix alloy having a composition in atom percent according to the following expression:

$$Nb_{balance}\text{-}Ti_{40\text{-}48}\text{-}Al_{12\text{-}22}\text{-}Hf_{0.5\text{-}6}$$

said body having distributed therein a multitude of ductile reinforcing strand structures of a niobium base alloy having a body centered cubic crystal form to form a composite, and

said composite being ductile and having higher tensile and rupture strength at temperatures above 1,000 degrees centigrade than that of the matrix alloy.

5,316,866

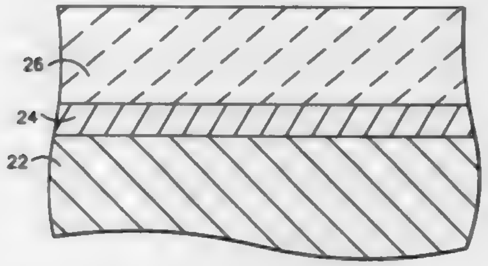
STRENGTHENED PROTECTIVE COATINGS FOR SUPERALLOYS

Edward H. Goldman, Cincinnati, and Ramgopal Darolia, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 9, 1991, Ser. No. 756,953

Int. Cl.^{5} B32B *15/00;* **C22C** *19/05*

U.S. Cl. 428—621 **9 Claims**



1. A coated superalloy component, comprising:

a substrate article formed of a superalloy; and

an adherent coating over at least a portion of the substrate, the coating being strengthenable by heat treatment, wherein the composition of the coating, in weight percent, consists essentially of about 20 weight percent cobalt, about 18 weight percent chromium, about 12 weight percent aluminum, about 6 weight percent tantalum, about 2 weight percent rhenium, about 0.05 weight percent carbon, about 0.015 weight percent boron, about 0.015 weight percent zirconium, about 0.3 weight percent yttrium, about 1 weight percent silicon, and balance nickel.

2. A coated superalloy component comprising:

a substrate article formed of a superalloy; and

an adherent coating over at least a portion of the substrate, the coating being strengthenable by heat treatment, wherein the composition of the coating, in weight percent, consists essentially of, from about 17 to about 19 percent chromium, from about 6.25 to about 6.75 percent aluminum, from about 9 to about 11 percent cobalt, from about 5.75 to about 6.25 percent tantalum, from about 1.8 to about 2.2 percent rhenium, from about 0.4 to about 0.6 percent hafnium, from about 0.2 to about 0.4 percent yttrium, from about 0.8 to about 1.2 percent silicon, from about 0.010 to about 0.020 percent zirconium, from about 0.04 to about 0.08 percent carbon, from about 0.01 to about 0.02 percent boron, balance nickel, wherein said composition provides resistance to oxidation and corrosion superior to that of the substrate article.

5,316,867

METHOD FOR ADHERING METAL COATINGS TO THERMOPLASTIC ADDITION POLYMERS

Herbert S. Chao, Schenectady, and Carol L. Fasoldt, Nassau, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 17, 1993, Ser. No. 62,264

Int. Cl.^{5} B32B *15/20*

U.S. Cl. 428—626 **20 Claims**

1. A method for metallizing a resinous substrate comprising at least one addition copolymer comprising structural groups derived from an olefinic nitrile and a conjugated diene, said method comprising the steps of:

contacting at least a portion of said surface with aqueous tetravalent cerium in a concentration of at least about 0.1 M.

non-electrolytically depositing a metal layer on said surface; and

heat treating the metal-coated surface at a temperature in the range of about 50°–80° C. for at least about 10 minutes.

5,316,868

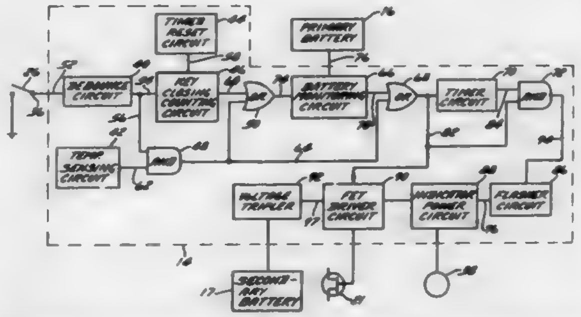
DUAL BATTERY SWITCH CIRCUIT

Thomas J. Dougherty, Waukesha, and John R. Pierson, Brookfield, both of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Jul. 21, 1992, Ser. No. 917,581

Int. Cl.^{5} H01M *10/04*

U.S. Cl. 429—9 **10 Claims**



1. An electrical power control system for a motor vehicle of the type wherein electrical power is used for motor ignition, and which system comprises a primary battery and a secondary battery, comprising:

a starter which connects the primary battery to a starter motor to start the vehicle when the starter is energized;

a starter switch operatively connected with the starter, the starter switch being configured to cause the starter to connect the primary battery to the starter motor when the starter switch is actuated;

an electrically-actuable switch, operatively connected with the starter and the secondary battery so that, when the electrically-actuable switch is closed, the starter connects the secondary battery to the starter motor to draw additional power for starting the vehicle; and

a controller connected to the electrically-actuable switch and the starter switch, which controller senses closure of the starter switch and closes the electrically-actuable switch if the starter switch has been previously actuated one or more times within a predetermined time period.

5,316,869

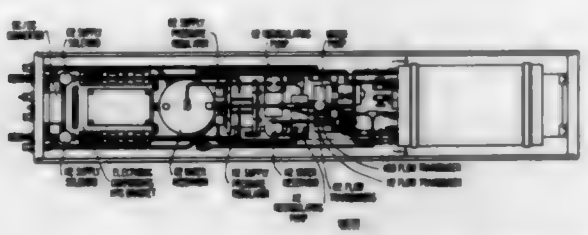
CLOSED LOOP REACTANT/PRODUCT MANAGEMENT SYSTEM FOR ELECTROCHEMICAL GALVANIC ENERGY DEVICES

John H. Perry, Jr., Riviera Beach; Abraham Person, Palm Beach Shores; Steven M. Misiaszek, Tequésta, and Donald P. Alessi, Jr., Lake Park, all of Fla., assignors to Energy Partners, Inc., West Palm Beach, Fla.

Continuation of Ser. No. 739,627, Aug. 2, 1991, Pat. No. 5,192,627. This application Mar. 8, 1993, Ser. No. 27,967

Int. Cl.^{5} H01M *8/04*

U.S. Cl. 429—19 **4 Claims**



1. A closed loop reactant/product management system for electro-chemical galvanic energy devices, the system comprising:

- a. fuel cell means comprising first and second internal reactant gas conduit means, and internal coolant liquid conduit means;
- b. first and second reactant gas supply connecting means; first inlet line means for pressure-tight gas flow connection from said first reactant gas supply connecting means to said first internal reactant gas conduit means; second inlet line means for pressure-tight gas flow connection from said second reactant gas supply connecting means to said second internal reactant gas conduit means;
- c. indirect heat exchanger means in fluid flow connection with the internal liquid flow conduit means;
- d. first liquid-gas separator and liquid reservoir means in pressure-tight fluid flow connection with the heat exchanger means and with the internal liquid flow conduit means and with the first internal gas flow conduit means;
- e. second liquid-gas separator and liquid reservoir means in pressure-tight fluid flow connection with said second internal gas flow conduit means;
- f. first gas repressurization means between said first liquid-gas separator means and said first internal reactant gas conduit means to increase the pressure of the first gas applied to said first internal gas flow conduit means; and
- g. second gas repressurization means between said second liquid-gas separation means and said second internal reactant gas conduit means to increase the pressure of the second gas applied to said second internal gas flow conduit means.

5,316,870

HEAT SUPPLY AND ELECTRIC POWER-GENERATING FUEL CELL

Shunsuke Ohga, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 26, 1992, Ser. No. 887,828

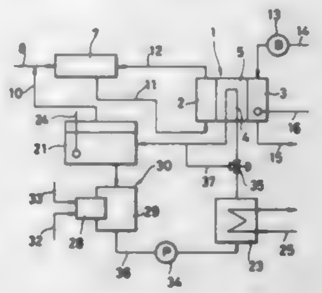
Claims priority, application Japan, May 27, 1991, 3-120521

Int. Cl.^{5} H01M *8/04*

U.S. Cl. 429—24 **6 Claims**

1. A heat supply and electric power-generating fuel cell, comprising a water-circulation system including:

- (1) a fuel cell body having a water flow path for controlling the temperature of a cell reaction to a proper temperature;
- (2) a thermometer for detecting the temperature of the cell reaction;
- (3) a water vapor separator for cooling water passed through said water flow path of said fuel cell body;
- (4) a recovery heat exchanger for constantly supplying heat to users, said heat corresponding to the difference between the temperature of the water cooled by said water vapor separator and the proper temperature of the cell reaction in said fuel cell body when the temperature of the water cooled by said water vapor separator is greater than the proper temperature of the cell reaction;
- (5) a control heat exchanger arranged on a water path connecting said water vapor separator with said recovery heat exchanger, said control heat exchanger including:
  - (a) a heat exchange portion having a path for flowing a heat transfer medium arranged therein; and
  - (b) cooling means for cooling said water passed through said control heat exchanger by air; and
- (6) a circulating pump for circulating water around a water-circulation circuit including said fuel cell body, said thermometer, said water vapor separator, said recovery heat exchanger and said control heat exchanger;



wherein an external controller controls the quantity of heat from said heating/cooling means on the basis of data from said thermometer to adjust the temperature of water heat-exchanged with said heat exchange portion when the temperature of the cell reaction during operating said fuel cell body is reduced, and controls the quantity of air supplied from said heating/cooling means toward said path of said heat exchange portion on the basis of data from said thermometer to adjust the temperature of water heat-exchanged with said heat exchange portion when the temperature of the cell reaction during operating said fuel cell body is increased.

5,316,871

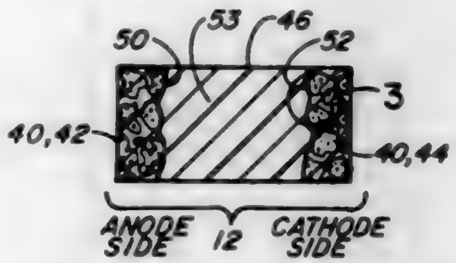
METHOD OF MAKING MEMBRANE-ELECTRODE ASSEMBLIES FOR ELECTROCHEMICAL CELLS AND ASSEMBLIES MADE THEREBY

Sundararajan Swathirajan, Troy, and Youssef M. Mikhail, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 862,691, Apr. 3, 1992, Pat. No. 5,272,017. This application Aug. 5, 1993, Ser. No. 102,189

Int. Cl.^{5} H01M *8/10, 4/96, 4/92*

U.S. Cl. 429—33 **17 Claims**



1. A method of making a combination electrolyte and electrode structure for an electrochemical cell having an electrolyte membrane of solid polymer proton conductive material with first and second spaced apart opposed surfaces and first and second electrodes at the respective first and second surface, comprising:

- a) forming a slurry of proton conductive material and at least one group of finely divided carbon particles and very finely divided catalytic particles supported on and in the carbon particles;
- b) applying the slurry onto a first surface of the membrane;
- c) applying the slurry onto a second surface of the membrane; and
- d) heating while pressing the applied slurry for a time and at a temperature and compressive load sufficient to embed at least a portion of the particles in, respectively, the surfaces of the membrane to thereby form the first and second electrodes.

5,316,872

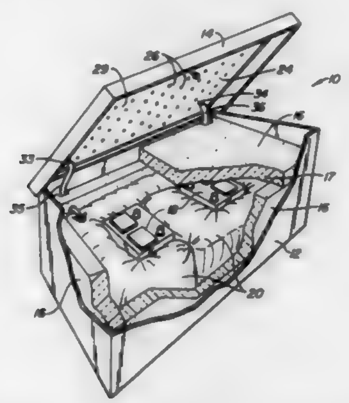
PASSIVE COOLING SYSTEM

Stephen C. Baer, Albuquerque, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.

Filed Dec. 3, 1992, Ser. No. 984,746

Int. Cl.^{5} H01M *10/50*

U.S. Cl. 429—62 **23 Claims**



1. Apparatus for controlling the internal temperature of an enclosure utilizing a quantity of water, said apparatus comprising:

- a water container located inside the enclosure and having an upper end;
- a generally flat hollow radiator having a generally horizontal configuration proximate and exterior to the enclosure above the level of the upper end of the water container, said radiator having an exposed upper surface adapted to radiate heat into the atmosphere;
- a pair of conduits symmetrically arranged for providing a pair of water flow paths from spaced-apart container entry/exit positions proximate the upper end of said water container to spaced apart radiator entry/exit positions in the radiator so that heat will be dissipated from the interior of the enclosure, if the water temperature in the container is above about 45 degrees Fahrenheit and is sufficiently warm relative to the temperature of the water in the radiator, by the relatively warm water in the container circulating upwardly from the upper end of the container through one of the conduits to one of the entry/exit positions in the radiator, through the radiator to the other radiator entry/exit position during which the water is cooled by dissipating heat into the atmosphere, and downwardly through the other conduit to the container in which the relatively cooler water temperature from the radiator sinks to the bottom to cool the interior of the housing, the circulation of water through the conduits and the radiator substantially ceasing when the water temperature is below about 45 degrees Fahrenheit and when the temperature of the water in the radiator is warmer than the temperature of the water in the container.

5,316,873

POSITION ADJUSTABLE BATTERY ADAPTER

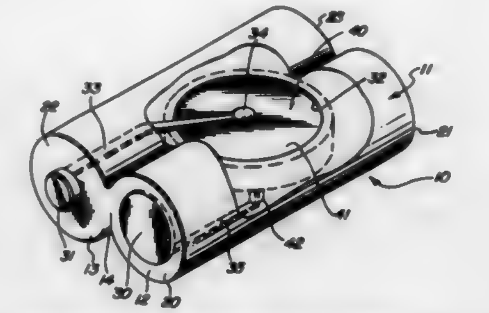
Thomas J. Scrivano, 976 Mission Dr., #4, Costa Mesa, Calif. 92626-4228

Continuation-in-part of Ser. No. 594,552, Oct. 9, 1990, Pat. No. 5,187,026. This application Jan. 15, 1993, Ser. No. 5,009

The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.

Int. Cl.^{5} H01M *2/10*

U.S. Cl. 429—96 **11 Claims**



1. A battery adapter for enabling the substitution of a generally planar battery having a pair of battery terminal surfaces in place of a pair of elongated cylindrical cells, said battery adapter comprising:

- a first generally cylindrical housing defining first and second ends and a first interior cavity for receiving a first portion of a generally planar battery,
- a first external contact terminal supported at said first end;
- a first contact spring disposed within said first interior cavity and having a first electrical connection to said first external contact terminal;
- a second generally cylindrical housing defining third and fourth ends and a second interior cavity for receiving a second portion of a generally planar battery;
- a second external contact terminal supported at said third end; and
- a second contact spring disposed within said second interior cavity and having a second electrical connection to said second external contact terminal,
- a generally planar battery being receivable within said first and second interior cavities by insertion of said first and second portions thereof such that said first and second contact springs electrically couple the pair of battery terminal surfaces to said first and second external contact terminals.

5,316,874

BATTERY CONNECTOR PROTECTION

Joseph N. Barrella, Irvington, and Stanley Lewin, New Rochelle, both of N.Y., assignors to Ultralife Batteries, Inc., Newark, N.Y.

Filed Dec. 30, 1992, Ser. No. 998,538

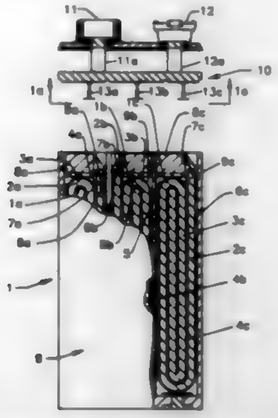
Int. Cl.^{5} H01M *2/26*

U.S. Cl. 429—161 **13 Claims**

1. A method for maintaining electrical connection integrity within a battery having one or more electrochemical cells, wherein said cells are electrically interconnected and for electrically connected to external battery terminals by conductive elements, said conductive elements being electrically connected, within said battery, to effect the electrical interconnection between the cells and/or the electrical connection to the external battery terminals and wherein the site of at least one electrical connection between said conductive elements is subject to a build up of electrical resistance; said method comprising the steps of:

- a) placing a layer of a protective viscous material, substantially inert to the cell components, between the conductive elements, prior to their connection, at said site and at least the immediate area surrounding said site;

b) effecting said at least one electrical connection such that the protective viscous material does not impede the electrical connection and wherein the protective viscous material substantially completely encloses the at least one electrical connection, whereby physical access of battery components to said site is substantially precluded.



5,316,875

SECONDARY BATTERY WITH NONAQUEOUS ELECTROLYTE AND METHOD OF MANUFACTURING SAME

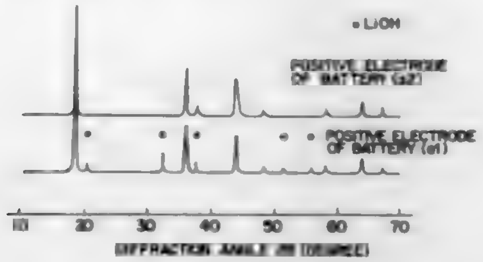
Hiroyuki Murai, Hirakata; Yasuhiko Bito, Yao; Masaki Hasegawa, Hirakata; Shuji Ito, Kadoma, and Yoshinori Toyoguchi, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 20, 1992, Ser. No. 916,967

Claims priority, application Japan, Jul. 19, 1991, 3-179319; Aug. 27, 1991, 3-215082; Feb. 18, 1992, 4-030328

Int. Cl.^{5} **H01M** *6/14, 6/16*

U.S. Cl. 429—194 **5 Claims**



1. A secondary battery comprising a positive electrode, a negative electrode and a nonaqueous electrolyte containing a lithium salt,

wherein the positive electrode is made by dipping an electrode consisting essentially of a positive active material selected from the group consisting of $LiMn_2O_4$, $LiMn_2O$, $LiCoO_2$, $LiNiO_2$, $LiFeO_2$ and γ-LiV_2O_5, in a solution containing at least one lithium-adding organic material selected from the group consisting of n-butyllithium, sec-butyllithium, tert-butyllithium, phenyllithium, and naphthyllithium,

wherein the negative electrode contains negative active material holder consisting essentially of a compound selected from the group consisting of carbon, aluminum, and aluminum alloy, which can absorb and desorb lithium ions by charging and discharging,

wherein said lithium salt is selected from the group consisting of lithium perchlorate, lithium hexafluorophosphate, lithium trifluoromethanesulfonate and lithium borofluoride, and

wherein said nonaqueous electrolyte is selected from the group consisting of propylene carbonate, ethylene carbonate, γ-buty lactone and methylacetate.

5,316,876

LITHIUM SECONDARY BATTERY

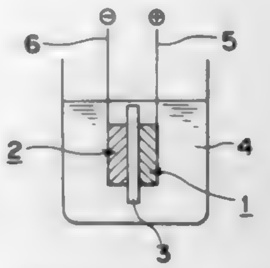
Kazuya Kuriyama, and Aya Nishino, both of Takatsuki, Japan, assignors to Yuasa Battery Co., Ltd., Osaka, Japan

Filed Jul. 15, 1992, Ser. No. 913,457

Claims priority, application Japan, Jul. 18, 1991, 3-203383

Int. Cl.^{5} **H07M** *10/40*

U.S. Cl. 429—197 **1 Claim**



1. A lithium secondary battery, in which a nonaqueous solvent is used for an electrolyte and a carbonaceous material is used for a negative electrode; the electrolyte including one or more kinds of tertiary amines, and the tertiary amines include one or more substitutents having a two or more carbon atoms.

5,316,877

ELECTROCHEMICAL CELL

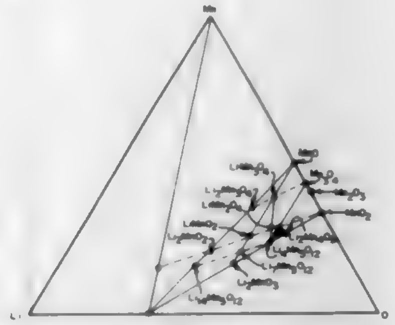
Michael M. Thackeray, and Rosalind J. Gummow, both of Pretoria, South Africa, assignors to Technology Finance Corporation (Proprietary) Limited, Transvaal Province, South Africa

Filed Aug. 27, 1993, Ser. No. 112,886

Claims priority, application South Africa, Aug. 28, 1992, 92/6544

Int. Cl.^{5} **H01M** *10/40*

U.S. Cl. 429—197 **14 Claims**



1. An electrochemical cell which comprises

a cell housing;

a cathode located in the cell housing, the cathode comprising at least one electrochemically active compound of lithium, manganese and oxygen, having a spinel-type structure and having the general formula

$$Li_1D_{x/b}Mn_{2-x}O_{4+\delta}$$

where

(i) x is a number such that $0 \leqq x < 0{,}33$;

(ii) δ is a number such that $0 \leqq \delta < 0{,}5$, with the values of x and δ being such that the oxidation state N of the manganese cation is $3{,}5 < N < 4{,}0$;

(iii) D is a mono- or multi-valent metal cation; and

(iv) b is the oxidation state of D; and

an electrolyte located in the cell housing, with the cell housing, electrolyte and cathode arranged to permit a charging potential to be applied to the cell to cause lithium from the cathode to form, in the cell housing, at least part of the anode, while the electrolyte couples the cathode electrochemically to the anode, and insulates it electronically therefrom.

5,316,878

PATTERN FORMING METHOD AND PHOTOMASKS USED THEREFOR

Tadashi Saito, and Hideyuki Jinbo, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1992, Ser. No. 894,519

Claims priority, application Japan, Jun. 19, 1991, 3-147092

Int. Cl.^{5} **G03F** *1/08;* **H01L** *21/027*

U.S. Cl. 430—5 **2 Claims**

1. A method for forming patterns, comprising the steps of:

preparing a first photomask having a first transparent part, a first rectangular opaque part having a first side and a second side perpendicular to the first side, and a phase shifter having a third side crossing the first side, the third side having a first part defined in the first rectangular transparent part, having a second part defined in the first rectangular opaque part and perpendicular to the first side;

preparing a second photomask having a second transparent part, a second rectangular opaque part corresponding to the first rectangular opaque part, and a stripe-shaped opaque part corresponding to the first part of the third side, having one end connected to the second rectangular opaque part and being wide enough to allow for misalignment between the first and second photomasks;

conducting a first exposure using the first photomask; and

conducting a second exposure using the second photomask before or after the first exposure;

wherein the first rectangular opaque part is expanded in the direction of the first side by an amount not smaller than a misalignment tolerance in the direction of the first side and is not expanded in the direction of the second side; and the second rectangular opaque part is expanded in the direction of the second side by an amount not smaller than a misalignment tolerance in the direction of the first side.

5,316,879

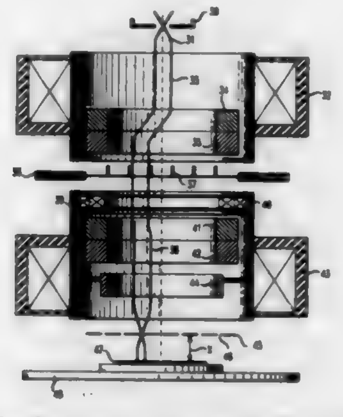
SUB-MICRON DEVICE FABRICATION USING MULTIPLE APERTURE FILTER

Steven D. Berger, and James A. Liddle, both of Chatham, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 14, 1992, Ser. No. 913,508

Int. Cl.^{5} **G03F** *9/00*

U.S. Cl. 430—5 **16 Claims**



1. Method for fabrication of a device of feature size corresponding with design rule of a maximum of 0.5 μm, comprising at least one lithographic delineation step comprising illuminating a plurality of imaging regions of a mask by an electronically scanning beam of charged particles so that imaging information is imposed on such beam by two types of mask imaging regions, differing with regard to degree of scatter imposed on such beam, so as to produce a projected image on a device in fabrication by use of a lens system including a projection lens, said particles emanating from a particle source and being accelerated to a velocity resulting in a deBroglie wavelength, λ, of a value sufficient to satisfy design rule requirements, the transmission path for patterned radiation including a "back focal plane filter", defined as positioned on the back focal plane or on some equivalent conjugate plane of such lens system, said filter including an aperture defining the pass portion of said filter,

characterized in that such beam during electronic scanning is maintained substantially on axis with regard to such projection lens by corresponding variation of the shape of such lens, in which the filter includes at least two apertures of size and separation to maintain desired image contrast and in that the delineation step entails image projection through at least two such apertures.

5,316,880

PHOTORECEPTOR CONTAINING SIMILAR CHARGE TRANSPORTING SMALL MOLECULE AND CHARGE TRANSPORTING POLYMER

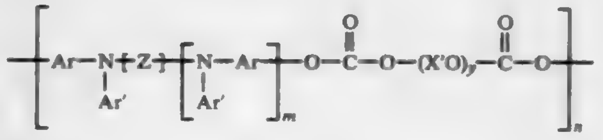
Damodar M. Pai, Fairport; John F. Yanus, Webster; William W. Limburg, Penfield, and Dale S. Renfer, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1991, Ser. No. 749,846

Int. Cl.^{5} **G03G** *5/06, 5/07*

U.S. Cl. 430—59 **8 Claims**

1. An electrophotographic imaging member comprising a charge generating layer and a charge transport layer, said charge transport layer comprising a charge transporting arylamine small molecule dissolved or molecularly dispersed in a film forming charge transporting polymer comprising charge transporting moieties in the backbone of said film forming charge transporting polymer, said charge transporting moieties having a structure substantially identical to the structure of said charge transporting small molecule, said charge transporting small molecule and said polymer having a difference in ionization potential value of less than about 0.05 electron volt, said charge transporting small molecule, said charge transporting polymer being non-absorbing to radiation in the region of intended use, said charge transporting polymer being represented by the general formula:



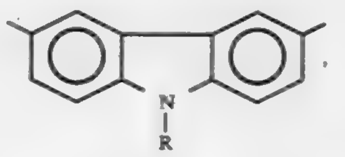
$$\left[Ar-\underset{Ar'}{\underset{|}{N}}-(Z)-\left[\underset{Ar'}{\underset{|}{N}}-Ar\right]_m-O-\overset{O}{\overset{\|}{C}}-O-(X'O)_y-\overset{O}{\overset{\|}{C}}-O \right]_n$$

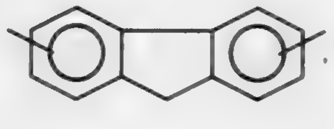
wherein:

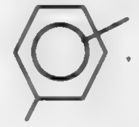
n is between about 5 and about 5,000,

m is 0 is 1,

Z is selected from the group consisting of:







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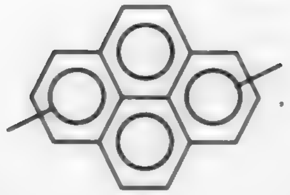
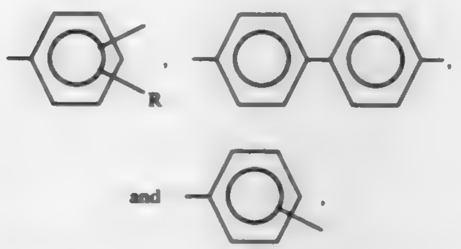


, and $-Ar-(X)_n-Ar-$

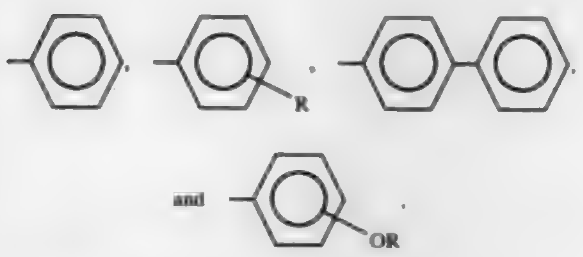
n is 0 is 1

Ar is selected from the group consisting of:



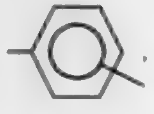
R is an alkylene radical selected from the group consisting of alkylene and iso-alkylene groups containing 2 to 10 carbon atoms,

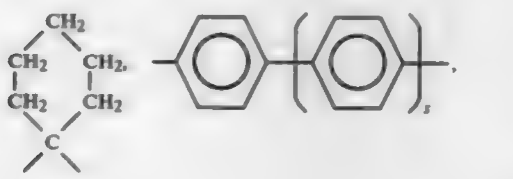
Ar′ is selected from the group consisting of:

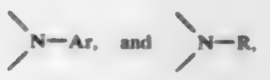


X is selected from the group consisting of:

$-CH_2-$, $-C(CH_3)_2-$, $-O-$, $-S-$,







s is 0, 1 or 2, and

X′ is an alkylene radical selected from the group consisting of alkylene and iso-alkylene groups, containing 2 to 10 carbon atoms and said charge transport layer being substantially free of electrically inactive film forming binder.

5,316,881

PHOTOCONDUCTOR FOR ELECTROPHTOGRAPHY CONTAINING BENZIDINE DERIVATIVE

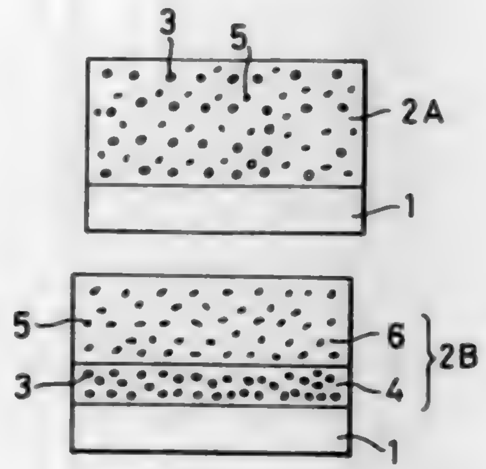
Yoichi Nakamura; Nobuyoshi Mori, and Sumitaka Nogami, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 18, 1992, Ser. No. 993,029

Claims priority, application Japan, Dec. 27, 1991, 3-345750; Jan. 5, 1992, 4-144658

Int. Cl.⁵ G03G *5/047, 5/09*

U.S. Cl. 430—59 **18 Claims**

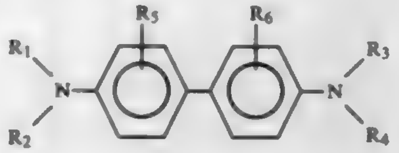


9. A photoconductor for electrophotography, comprising:

an electroconductive substrate; and

a photosensitive layer which is formed on said electroconductive substrate and which has a charge generating layer containing a charge generating substance and a charge transporting layer containing a charge transporting substance provided on one another,

wherein said charge transporting substance is a benzidine compound represented by general formula (I):



(I)

wherein R_1, R_2, R_3 and R_4 are groups selected from the group consisting of an aryl group, an alkylaryl group, an alkoxyaryl group, and a halogenated aryl group, provided that (a) R_1 and R_2 together with the nitrogen atom to which they are bonded combine and form a first condensed heterocyclic ring, or (b) R_3 and R_4 together with the nitrogen atom to which they are bonded combine and form a second condensed heterocyclic ring, or (c) both (a) R_1 and R_2 together with the nitrogen atom to which they are bonded, and (b) R_3 and R_4 together with the nitrogen atom to which they are bonded combine and form said first and second condensed heterocyclic rings, respectively, said first and second condensed heterocyclic rings each having only one heteroatom, nitrogen,

wherein R_5 and R_6 are selected from the group consisting of a hydrogen atom, an alkyl group, an alkoxy group, and a halogen atom,

wherein said first and second condensed heterocyclic rings are other than carbazole rings, and

wherein at least one of said first and second condensed heterocyclic rings is an indoline ring or a 1,2,3,4-tetrahydroquinoline ring.

5,316,882

FERRITE GREEN BEADS AND METHOD OF PRODUCING CARRIER PARTICLES

Shankar S. Bijay, and Tsang J. Chen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 746,269, Aug. 16, 1991, abandoned. This application Apr. 23, 1993, Ser. No. 53,560

Int. Cl.⁵ G03G *9/10*

U.S. Cl. 430—108 **24 Claims**

14. A method of producing magnetic carrier particles suitable for magnetic brush development of electrostatic charge patterns, comprising:

mixing unreacted metal salt particles with a dispersion of a polymer, wherein the polymer is a polyester or a polyurethane;

spray-drying the mixture of metal salt particles and polymer dispersion to obtain green beads of substantially uniform particle size and substantially spherical shape; and

firing the beads to obtain magnetic carrier particles of substantially uniform particle size and substantially spherical shape.

5,316,883

METHOD FOR CONTROLLING PRESSURE DURING IMAGE DEVELOPMENT

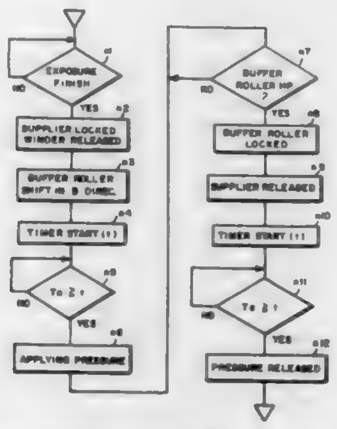
Koichi Eto, Yamatokoriyama, and Akira Tamagaki, Souraku, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 608,646, Nov. 2, 1990, abandoned. This application Apr. 21, 1992, Ser. No. 873,692

Claims priority, application Japan, Nov. 4, 1989, 1-287696

Int. Cl.⁵ G03C *1/72*

U.S. Cl. 430—138 **3 Claims**



1. A method for controlling pressure during image development, the method comprising the steps of:

exposing a photosensitive sheet coated with microcapsules containing photosetting materials and coloring dyes at an exposure section to form a latent image on the photosensitive sheet, and

superimposing the photosensitive sheet on an image receiving sheet and passing the two sheets through a press roller unit under the pressure applied by the press roller unit, thereby causing the coloring dyes to flow out from unhardened microcapsules to form an image on the image receiving sheet,

wherein the application of pressure is controlled so as to be effected when the leading edge of the latent image on the photosensitive sheet reaches the position of the press roller unit, and the application of the pressure is controlled so as to be released when the trailing edge of the latent image passes the position of the press roller unit,

wherein the photosensitive sheet is kept at a buffer section provided between the exposure section and the press roller unit until the exposure is finished and is advanced to the press roller unit from the buffer section after the exposure is finished.

wherein a time required for the leading edge of the latent image on the exposed photosensitive sheet to reach a pressure section of the press roller unit after finishing the exposure is measured by a timer means, and the press roller unit applied pressure after a period corresponding to the leading edge measured time, and

wherein a time required for the trailing edge of the latent image on the exposed photosensitive sheet to reach the pressure section of the press roller unit after finishing the exposure is measured by another timer means, and the press roller unit releases pressure at a time corresponding to the trailing edge measured time.

5,316,884

RADIATION-SENSITIVE COMPOSITIONS CONTAINING 5-INDANOL IN THE BINDER RESIN AS A COMONOMER

Medhat A. Toukhy, Barrington, R.I., assignor to OCG Microelectronic Materials, Inc., West Paterson, N.J.

Division of Ser. No. 21,634, Feb. 22, 1993, Pat. No. 5,250,653. This application Sep. 20, 1993, Ser. No. 122,953

Int. Cl.⁵ G03F *7/023, 7/30*

U.S. Cl. 430—165 **13 Claims**

1. A coated substrate comprising a substrate coated with a film of a radiation-sensitive composition comprising an admixture of at least one o-quinonediazide compound and a binder resin comprising a condensation product of at least one aldehyde source with a phenolic source comprising 5-indanol and at least one unit of a phenolic monomer selected from the group consisting of phenol, cresols, xylenols, and trimethylphenols; the amount of said o-quinonediazide compound being about 5% to about 40% by weight and the amount of said binder resin being about 60 to 96% by weight, based on the total solids content of said radiation-sensitive composition.

5. A radiation-sensitive composition comprising an admixture of at least one o-quinonediazide compound and a binder resin comprising a condensation production of at least one aldehyde source with a phenolic source comprising 5-indanol and at least one unit of a phenolic monomer selected from the group consisting of phenol, cresols, xylenols, and trimethylphenols; the amount of said o-quinonediazide compound or compounds being about 5% to about 40% by weight and the amount of said binder resin being about 60 to 95% by weight, based on the total solids content of said radiation-sensitive composition.

5,316,885

PULVERULENT INK AND PRINTING METHODS

Mitsuhiro Sasaki, and Kuniyasu Kawabe, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 12, 1991, Ser. No. 743,790

Claims priority, application Japan, Aug. 14, 1990, 2-214746; Aug. 14, 1990, 2-214747

Int. Cl.⁵ G03C *8/00, 1/72;* **G03G** *13/20, 9/00*

U.S. Cl. 430—200 **8 Claims**

1. A thermal transfer printing process which comprises:

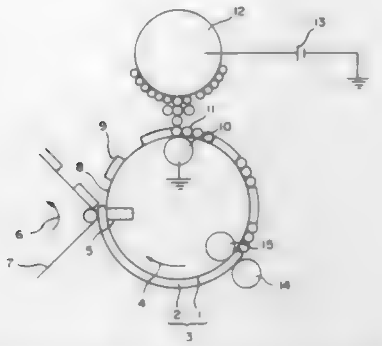
(a) transferring a portion of an ink layer disposed on one side of an insulating support to a recording medium by a thermal transfer technique, thereby uncovering a portion of said insulating support on the ink layer side thereof and forming a corresponding ink image portion on said recording medium;

(b) depositing pulvrulent ink onto said ink layer side of said insulating support in the presence of a bias voltage to thereby electrostatically adhere said pulverulent ink to said uncovered portion of said insulating support; and

(c) thermally fusing said electrostatically adhered pulverulent ink to thereby regenerate said ink layer;

wherein said pulverulent ink comprises a heat-fusible core which comprises a thermo-melting substance and a coloring matter and a shell covering the surface of said core which comprises a poly(thio)urethane resin product produced by reacting;

(1) 0 to 30 mole % of a monovalent isocyanate compound and/or a monovalent isothiocyanate compound; and
(2) 100 to 70 mole % of at least divalent isocyanate and/or at least divalent isothiocyanate compound, with
(3) 0 to 30 mole % of a compound having one active hydrogen atom capable of reacting with the isocyanate and isothiocyanate groups os (1) and (2); and

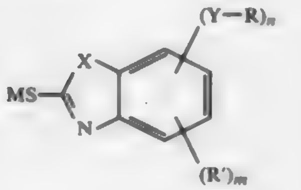


(4) 100 to 70 mole % of a compound having at least two active hydrogen atoms capable of reacting with the isocyanate and isothiocyanate groups of (1) and (2), at a molar ratio of ((1) and (2)): ((3) and (4)) in the range of 1:1 to 1:20, wherein at least 30 percent of all the linkages in said poly(thio)urethane product that were formed from the iso(thio)cyanate moieties are thermally dissociating linkages which are formed by the reaction of a phenolic hydroxyl or thio group with an isocyanate or isothiocyanate group.

5,316,886
HEAT DEVELOPABLE PHOTOSENSITIVE MATERIALS

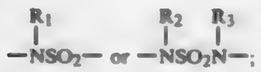
Tomoyuki Koide, and Tetsuro Kojima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 15, 1991, Ser. No. 700,282
Claims priority, application Japan, May 16, 1990, 2-125850; Aug. 1, 1990, 2-204428
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.^{5} G03C *1/34*
U.S. Cl. 430—203 **8 Claims**

1. A heat developable photosensitive material comprising a support having thereon, (i) at least one photosensitive silver halide emulsion layer which contains at least one compound selected from among the compounds represented by formulas [I] and [III]:



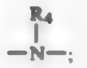
[I]

wherein Y represents



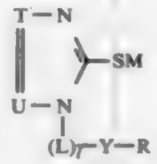
$$-\overset{R_1}{\overset{|}{N}}SO_2- \text{ or } -\overset{R_2}{\overset{|}{N}}SO_2\overset{R_3}{\overset{|}{N}}-;$$

R represents an unsubstituted alkyl group; X represents —O—, —S— or



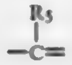
$$-\overset{R_4}{\overset{|}{N}}-;$$

M represents a hydrogen atom, an alkali metal atom, an ammonium group or a group which cleaves under alkaline conditions; R′ represents a hydrogen atom or a substituent group; R_1, R_2, R_3 and R_4 each represent a hydrogen atom or an alkyl group; n represents 1 or 2; m represents $4-n$;



[III]

wherein T and U each represent



$$-\overset{R_5}{\overset{|}{C}}=$$

or —N=; R_5 represents a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, an alkyl group, an alkenyl group, an aralkyl group, an aryl group, a carbonamido group, a sulfonamido group, a ureido group or a thioureido group; L represents an alkylene group, an alkenylene group, an aralkylene group or an arylene group; l represents 0 or 1; and Y, R and M have the same meanings as the respective groups in formula [I]; and (ii) a dye compound represented by formula [LI]:

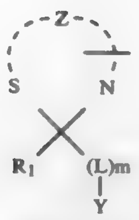
$$[\text{Dye-Y}]_n\text{-Z} \tag{LI}$$

wherein Dye represents a dye group which has been temporarily shifted to the short wave length side or a dye precursor group; Y represents a simple bond or a linking group; Z represents a group which produces a difference in the diffusibility of the compound represented by $(\text{Dye-Y})_n\text{-Z}$, or which releases Dye and produces a difference between the diffusibilities of the released Dye and $(\text{Dye-Y})_n\text{-Z}$, in accordance or in counter-accordance with a photosensitive silver salt which imagewise has a latent image; n represents 1 or 2; and when n is 2, the two Dye-Y moieties may be the same or different.

5,316,887
THERMALLY DEVELOPABLE PHOTOSENSITIVE MATERIAL

Michael J. Arnost, Andover; Efthimios Chinoporos, Cambridge; Donald A. McGowan, Bedford, and David P. Waller, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Jul. 31, 1992, Ser. No. 923,843
Int. Cl.^{5} G03C *5/54*
U.S. Cl. 430—203 **19 Claims**

1. A heat-developable color photosensitive image-recording material comprising
(a) a support carrying in one or more layers a photosensitive silver halide, a reducing agent, a thermal solvent, a binder and a color-providing material capable of releasing a diffusible color-providing moiety upon cleavage in the presence of silver ions or a soluble silver complex, said color-providing material comprising two to four groups, the same or different, the groups being represented by the general formula

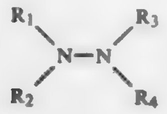


wherein Y represents a diffusible color-providing moiety; L represents a divalent organic linking group containing at least one carbon atom; m is 0 or 1; R_1 represents hydrogen, a monovalent organic radical or together with L represents the atoms necessary to complete a spiro union with the cyclic 1,3-sulfur-nitrogen group when m is 1 or together with Y represents the atoms necessary to complete a spiro union with the cyclic 1,3-sulfur-nitrogen group when m is 0; and Z represents the carbon atoms necessary to complete an unsubstituted or substituted 5- or 6-membered heterocyclic ring system provided each group represented by said formula is connected to the others by a multivalent chemical linkage which connects the groups through the N atom or through the C atoms represented by Z, and
(b) on the same or a second support, an image receiving layer capable of receiving the diffusible color-providing moiety released from said color-providing material.

5,316,888
COLOR DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT

Hiedaki Naruse, and Jiro Tsukahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 21, 1993, Ser. No. 49,392
Claims priority, application Japan, Apr. 22, 1992, 4-127904
Int. Cl.^{5} G03C *5/54*
U.S. Cl. 430—216 **3 Claims**

1. A color diffusion transfer photographic film unit comprising (1) a light sensitive sheet comprising an image receiving layer, a white reflective layer, a shading layer and at least one silver halide emulsion layer having at least one dye image forming substance, which layers are formed on a transparent support, (2) a transparent cover sheet comprising a neutralization layer and a neutralization timing layer, which layers are formed on a transparent support, and (3) a shading alkali treating composition developed between said light sensitive sheet and said transparent cover sheet, in which the image receiving layer contains a hydrazine derivative in an amount of 1.50 g/m^2 to 6.00 g/m^2 represented by the following general formula (I):



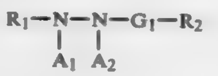
(I)

wherein R_1, R_2, R_3 and R_4 each independently represents an alkyl group having 1 to 24 carbon atoms and may combine with one another to form a ring, provided that said ring is non-aromatic heterocyclic group and that all atoms belonging to R_1, R_2, R_3 and R_4 and constituting the ring are carbon atoms, wherein one or more of R_1, R_2, R_3 and R_4 is substituted by a hydroxyl group, a sulfonic acid group of a salt thereof, or a carboxylic acid group or a salt thereof.

5,316,889
SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PHOTOGRAPHIC IMAGE FORMING METHOD USING THE SAME

Minoru Sakai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 31, 1993, Ser. No. 41,325
Claims priority, application Japan, Mar. 31, 1992, 4-103815
Int. Cl.^{5} G03C *1/06*
U.S. Cl. 430—264 **17 Claims**

1. A silver halide photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, wherein at least one of the silver halide emulsion layer and a hydrophilic colloid layer(s) adjacent thereto contains at least one hydrazine compound represented by the following general formula (I) and at least one compound selected from the group consisting of compounds represented by the following general formula (II) or (III):

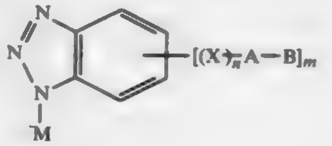


$$R_1-\underset{\underset{A_1}{|}}{N}-\underset{\underset{A_2}{|}}{N}-G_1-R_2 \tag{I}$$

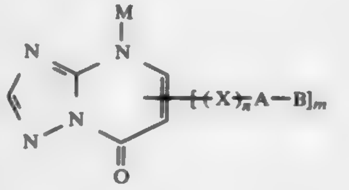
wherein R_1 represents an aliphatic or aromatic group which has a substituent having a moiety of $-O(CH_2CH_2O)_n-$, $-O-(CH_2CH(CH_3)O)_n-$ or $-O-(CH_2CH(OH)CH_2O)_n-$ (wherein n is an integer of not smaller than 3) as part of a substituent or having a moiety of a quaternary ammonium cation as part of a substituent group, G_1 represents a bivalent bonding group consisting of at least one of —CO—, —CO-CO—, —CS—, $-C(=NG_2R_2)-$, —SO—, $-SO_2-$ or $-P(O)(G_2R_2)-$; G_2 represents a single bond, —O—, —S— or $-N(R_2)-$; R_2 represents an aliphatic group, an aromatic group or a hydrogen atom, and when there are two or more R_2 groups, they may be the same or different; and one of A_1 and A_2 is a hydrogen atom, and the other is a hydrogen atom, an acyl group or an alkyl- or arylsulfonyl group, when R_1 contains said quaternary ammonium cation, the compound further has a counter anion or has an anion group at R_1 to form an inner salt;

$$Y-[(X)_n A-B]_m \tag{II}$$

wherein Y represents a group which is adsorbed to silver halide; X represents a bivalent bonding group comprising an atom or atoms selected from hydrogen, carbon, nitrogen, oxygen and sulfur atoms; A represents a bivalent bonding group; B represents an amino group which may be substituted, an ammonium group or a nitrogen-containing heterocyclic ring; m represents 1, 2 or 3; and n represents 0 or 1; and said compounds represented by formula (II) are represented by formula (II-m), (II-n), or (II-o):

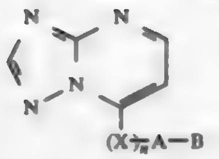


(II-m)



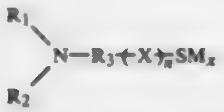
(II-n)

-continued



(II-o)

wherein M represents an alkali metal atom, an ammonium group or a group which is converted into H or an alkali metal atom under alkaline conditions; $-(X)_n-A\text{-}B$ and m are as defined in formula (II); and wherein the heterocyclic rings in the formulas may be substituted by one or more of substituent groups;



$$R_1R_2N-R_3\text{+}X\text{)}_n SM_x \quad \text{(III)}$$

wherein R_1 and R_2 each represents a hydrogen atom or an aliphatic group, or R_1 and R_2 may be combined together to form a ring; R_3 represents a bivalent aliphatic group; X represents a bivalent heterocyclic ring having at least one of heteroatom of nitrogen, oxygen and sulfur atoms; n represents 0 or 1; and M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, a quaternary ammonium, a quaternary phosphonium or an amidino group; x is 1 when M represents a monovalent atom or group and x is ½ when M represents a divalent atom; said compound may be in the form of an addition salt.

5,316,890

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okamura; Kazumi Nii, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

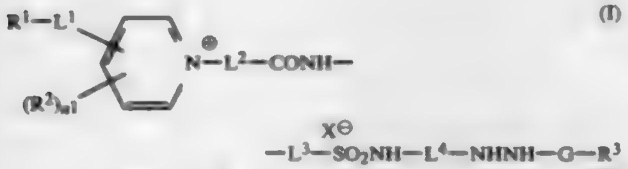
Filed Jun. 29, 1993, Ser. No. 83,256

Claims priority, application Japan, Jun. 29, 1992, 4-192748; Jul. 2, 1992, 4-175713

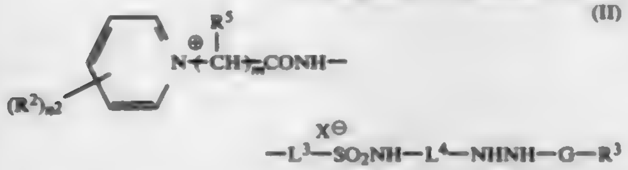
Int. Cl.^{5} G03C *1/06*

U.S. Cl. 430—264 **15 Claims**

1. A silver halide light-sensitive material comprising a support having thereon a silver halide emulsion layer and a compound selected from compounds represented by formula (I) or (II):



(I)



(II)

wherein L^1 represents —O—, —S—, —SO—, —SO_2—, —$N(R^4)$—, —$CONR^4$—, —NR^4CO—, '$OCONR^4$—, —NR^4CONR^4—, —SO_2NR^4—, NR^4SO_2— or —$NR^4SO_2NR^4$—, each of which is bonded to the pyridine ring at the right hand side thereof; L^2, L^3, and L^4 each represent a divalent aliphatic group or a divalent aromatic group; G represents —CO—, —SO_2—, —SO—, —COCO—, a thiocarbonyl group, an iminomethylene group or —$P(O)(G^1R^4)$—; G^1 represents a single bond, —O— or —NR^4—; R^1 represents an aliphatic group or an aromatic group; R^2 represents a monovalent substituent; n^1 represents 0 or an integer of from 1 to 4; R^3 represents a hydrogen atom, an aliphatic group, an aromatic group, an alkoxy group, an aryloxy group or an amino group; R^4 represents a hydrogen atom, an aliphatic group or an aromatic group; R^5 represents a monovalent group; m represents 0 or an integer of from 1 to 4; n^2 represents 0 or an integer of from 1 to 5; and X^- represents a counter anion or a counter anion moiety in an intramolecular salt; two or more R^2's, R^4's or R^5's, if any, may be the same or different.

5,316,891

FINE PATTERN FORMING METHOD

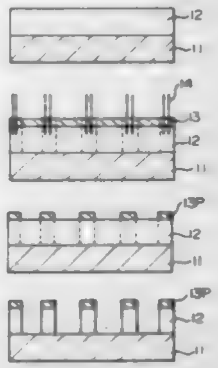
Kazuhiko Hashimoto, Moriguchi, and Masayuki Endo, Izumi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 20, 1992, Ser. No. 871,199

Claims priority, application Japan, Apr. 25, 1991, 3-095437

Int. Cl.^{5} G03C *5/00*

U.S. Cl. 430—296 **2 Claims**



1. In a fine pattern forming method comprising a step of coating a high molecular organic film onto a semiconductor substrate followed by baking, a step of coating a photosensitive solution onto the high molecular organic film, followed by baking, a step of writing a pattern by exposure to an electron beam, then developing the pattern with an aqueous alkaline solution to form a negative resist pattern, and a step of etching the high molecular organic film using this resist pattern as a mask,

the improvement wherein said photosensitive solution comprises:

a silicon-containing resin which contains silicon atoms in the principle chain, has a hydroxy group as part of the side chains, is soluble in an aqueous alkaline solution, and is selected from the group consisting of ladder-shaped polysiloxanes and ladder-shaped polysilanes; and

a crosslinking agent which forms at least two radicals upon exposure to an electron beam, which cause a three dimensional crosslinking reaction with the silicon-containing resin, said crosslinking agent being selected from the group consisting of triazines and melamines which are substituted with a chlorine atom(s).

5,316,892

METHOD FOR DEVELOPING LITHOGRAPHIC PRINTING PLATES

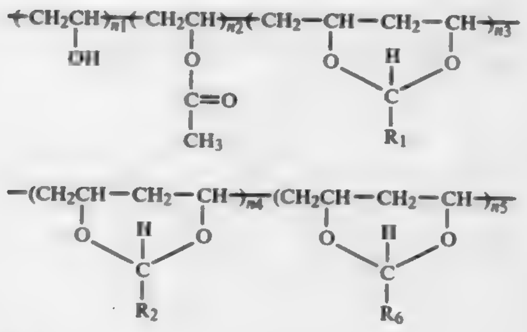
John E. Walls; Gary R. Miller, and Raymond W. Ryan, Jr., all of Fort Collins, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 23, 1992, Ser. No. 918,869

Int. Cl.^{5} G03F *7/30, 7/32, 7/021*

U.S. Cl. 430—309 **17 Claims**

1. A method of imaging a negative-working lithographic printing plate, which method comprises imagewise-exposing a lithographic printing plate comprising a support having thereon a radiation-sensitive layer, comprising a diazo resin, an acid-substituted ternary acetal polymer and an unsaturated polyester, and contacting said imagewise-exposed lithographic printing plate with an aqueous alkaline developing composition comprising (1) an organic solvent, (2) an anionic surface active agent, (3) sodium oxalate, sodium nitrate or an alkali metal tetraborate, (4) an aliphatic monocarboxylic acid containing 6 to 22 carbon atoms, (5) an aliphatic dicarboxylic acid containing 4 to 16 carbon atoms, and (6) an alkaline buffering system in an amount sufficient to provide a pH in the range of from 8 to 12; said unsaturated polyester being a copolyester of an unsaturated dicarboxylic acid and an oxyalkylene ether of an alkylidene diphenol and said acid-substituted ternary acetal polymer being represented by the formula:



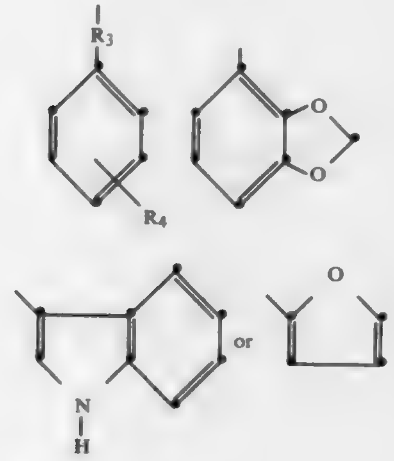
wherein

R_1 is —H, —C_nH_{2n+1} or —C_2H_{2n}—OH

where

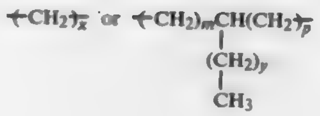
n=1-12

R_2 is



where

R_3 is



$$\text{+}CH_2\text{)}_x \text{ or } \text{+}CH_2)_m CH(CH_2\text{)}_p \text{ with } (CH_2)_y CH_3 \text{ on CH}$$

and

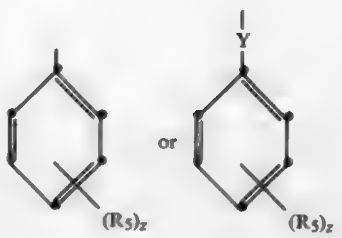
x=0-8

m=0-8

y=0-8

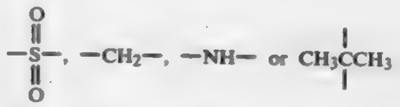
p=0-8

R_4=—H, —R_5,



in which

Y=—O—, —S—,

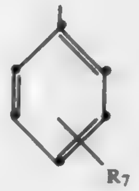


$$-\overset{O}{\underset{O}{\overset{\|}{\underset{\|}{S}}}}-,\ -CH_2-,\ -NH-\ \text{or}\ CH_3\overset{|}{\underset{|}{C}}CH_3$$

R_5=—OH, —CH_2OH, —OCH_3, —COOH or —SO_3H

z=1 to 3

R_6=—$(CH_2)_a$—COOH —$(CH_2)_a$—$COO^{\ominus}M^{\oplus}$ or



where

R_7=—COOH, —$COO^{\ominus}M^{\oplus}$, —$(CH_2)_aCOOH$, —O—$(CH_2)_aCOOH$, —SO_3H, —$SO_3^{\ominus}M^{\oplus}$, —PO_3H_2, —$PO_3^{\ominus}M_2^{\oplus}$ —PO_4H_2 or —$PO_4^{\ominus}M_2^{\oplus}$,

a=0 to 8

M=Na, K, Li or NH_4

and

n_1=0-25 mole %

n_2=2-25 mole %

n_3=10-70 mole %

n_4=10-60 mole %

n_5=10-45 mole %.

5,316,893

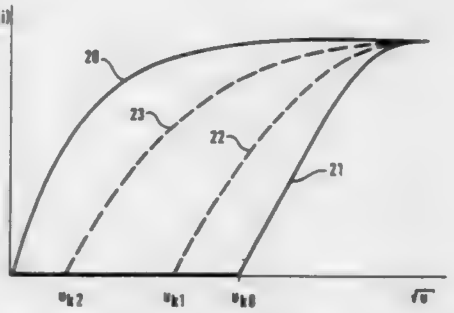
METHOD OF PRODUCING ELECTRONIC SWITCHING ELEMENT

Ernst Lüder, Pfaffenwaldring 47, 7000 Stuttgart 80, and Volker Hochholzer, Wiener Str. 11, 7000 Stuttgart 30, both of Fed. Rep. of Germany

Filed Jan. 3, 1991, Ser. No. 637,059

Int. Cl.^{5} G02F *1/03;* **G03F** *7/00*

U.S. Cl. 430—313 **7 Claims**



1. A method of producing an electronic switching element including a ground electrode, a dielectric and a counterelec-

trode and used for active control image points in liquid crystal indicators, comprising the steps of:

structuring in an etching process a tantalum ground electrode applied on a transparent substrate;

anodically oxidating the tantalum ground electrode for producing a tantalum pentoxide dielectric;

first tempering the structure in vacuum;

sputtering a material of the counterelectrode;

second tempering the structure in oxygen containing atmosphere;

structuring of an overlapping region of both electrodes by first applying of a photoresist layer on the counter electrode and then illuminating through the substrate from its rear side; and

structuring the counterelectrode in an etching process.

5,316,894

METHOD OF MAKING PRINTED WIRING BOARDS

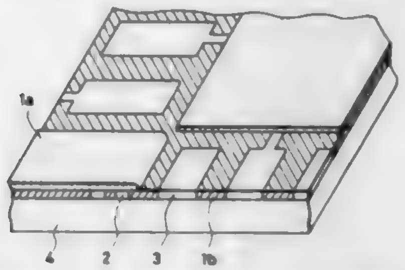
Hisaya Takahashi, and Toshihide Itoh, both of Toyama, Japan, assignors to NEC Corporation, Japan

Filed May 18, 1992, Ser. No. 885,268

Claims priority, application Japan, May 27, 1991, 120569

Int. Cl.⁵ G03F *7/26*

U.S. Cl. 430—313 **13 Claims**



1. A method for making a printed wiring board comprising the steps of applying a solder resist onto a printed wiring board on which circuits for junction and pads for surface-mounting are formed, to form a solder resist layer; grinding the surface of said solder resist layer to remove the solder resist present on said circuits and said pads and to expose the surface thereof; applying a light-sensitive solder resist to the surface of said printed wiring board to form a light-sensitive solder resist layer, drying said light-sensitive solder resist layer to form a light-sensitive solder resist film; exposing said light-sensitive solder resist film to light through a mask film carrying a desired pattern; and then dissolving the un-exposed area of said light-sensitive solder resist film with a developer to remove the same area and to cover the exposed area with the cured solder resist film.

5,316,895

PHOTOLITHOGRAPHIC METHOD USING NON-PHOTOACTIVE RESINS

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 606,231, Oct. 31, 1990, abandoned. This application Dec. 16, 1992, Ser. No. 994,049

Int. Cl.⁵ G03C *5/16*

U.S. Cl. 430—313 **26 Claims**

1. A process for applying a pattern to a workpiece used in fabricating an integrated circuit, comprising the steps of:

depositing a layer of non-photosensitive material on said workpiece said layer having a surface;

diffusing a reagent to a selected depth into the surface of said non-photosensitive material to form a reagent region;

subsequent to said diffusing step, patterning the surface with an energy source such that said reagent reacts with said non-photosensitive material to define a portion of said reagent region to be removed;

removing said portion of said reagent region to leave an exposed portion and an unexposed portion of said non-photosensitive material; and

removing said exposed portion of said non-photosensitive material by means of an etch while substantially maintaining said unexposed portion of said non-photosensitive material.

5,316,896

METHOD OF FORMING A PATTERN

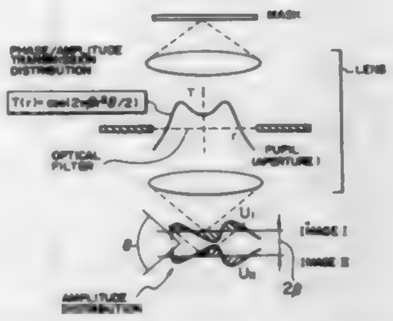
Hiroshi Fukuda, Kokubunji, and Tsuneo Terasawa, Ome, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1991, Ser. No. 765,060

Claims priority, application Japan, Oct. 24, 1990, 2-284229; Feb. 7, 1991, 3-016346; May 15, 1991, 3-110127

Int. Cl.⁵ G03C *5/00*

U.S. Cl. 430—322 **22 Claims**



1. A method of pattern formation, comprising the steps of:

projecting an exposure beam of wavelength λ on a region of a photoresist layer formed on a substrate through a projection lens of numerical aperture NA and a mask having a mask pattern, said projection lens being a diffraction-limited optical system; and

developing the photoresist layer;

wherein the projecting step includes the steps of simultaneously forming first and second images of the mask pattern having substantially the same amplitude at first and second positions, respectively, at different distances from a reference level along an exposure beam axis, and controlling a net phase difference θ between the first and second images formed at the first and second positions so that the exposure beam intensity distribution along the exposure beam axis between the first and second positions is substantially uniform.

5,316,897

METHOD AND SYSTEM FOR APPLYING A MARKING TO A SUBSTRATE, PARTICULARLY A PAINTED BORDER ADJACENT TO AND AROUND A WINDSHIELD PLATE

Aaron Shafir, Tel Aviv, Israel, assignor to Tamglass OY, Tampiere, Finland

Continuation-in-part of Ser. No. 452,471, Dec. 18, 1989, abandoned. This application Sep. 17, 1991, Ser. No. 761,159

Claims priority, application Israel, Jan. 5, 1989, 88886; Aug. 22, 1991, 99275

Int. Cl.⁵ G03C *5/04;* B32B *31/00;* B05C *9/08*

U.S. Cl. 430—397 **16 Claims**

1. A method of exposing a substrate of relatively large surface area to radiation according to a predetermined pattern recorded on a mask, comprising:

progressively recording said predetermined pattern on a mask in the form of a continuous strip;

supporting said continuous strip mask between a source of the radiation and the substrate;

and moving said radiation source and said continuous strip mask relative to said substrate to progressively scan the surface of the substrate with radiation, while at the same time moving said continuous strip mask relative to said radiation source, said continuous strip mask being progressively wound onto a take-up reel during the progressive scanning of the substrate with radiation, such that portions of the pattern on the continuous strip mask progressively become aligned with their corresponding portions of the substrate as the substrate is progressively scanned by the radiation source; said radiation source and continuous strip mask being carried by a common head which is pivotally mounted about an axis perpendicular to the surface of the substrate to be exposed; said head being moved in a plurality of rectilinear scanning lines while the head is fixed about its pivotal axis for each such scanning line, the head being pivotted before starting a scanning line where the respective scanning line requires a different orientation of the head than the preceding scanning line.

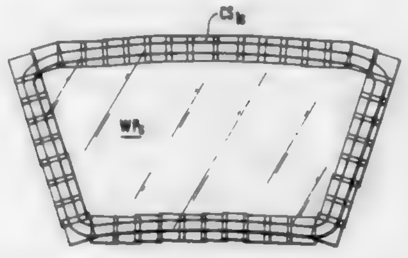
5. A method of applying a marking to an automobile glass plate, comprising the following operations:

(a) coating the surface of the automobile glass plate with an initial pattern, to include the precise surface to be occupied by a final predetermined pattern, with a liquid substance which, when subjected to a predetermined type of electromagnetic radiation, hardens and binds itself to the automobile glass plate;

(b) exposing the precise surface of the coated substance to be occupied by said final predetermined pattern to said predetermined type of electromagnetic radiation to cause said coated substance to harden and to bind itself to the automobile glass plate; and

(c) removing the portions of said coated substance not exposed to said electromagnetic radiation;

characterized in that operation (b) is performed by:



(1) progressively recording said predetermined pattern on a mask in the form of a continuous strip;

(2) supporting said continuous strip mask between a source of the radiation and the automobile glass plate;

(3) and effecting relative movement between said radiation source and said automobile glass plate to progressively scan the surface of the automobile glass plate with radiation, while at the same time moving said continuous strip mask relative to said radiation source, such that portions of the pattern on the continuous strip mask progressively become aligned with their corresponding portions of the automobile glass plate as it is progressively scanned by the radiation source.

7. Apparatus for exposing an automobile windshield of relatively large surface area to radiation according to a predetermined pattern recorded on a mask, comprising:

a source of radiation;

a mask in the form of a continuous strip having said predetermined pattern progressively recorded thereon;

means for supporting said continuous strip mask between said source of radiation and the windshield;

and means for effecting relative movement between said radiation source and said windshield to progressively scan the surface of the windshield with radiation via said mask, while at the same time moving said continuous strip mask relative to said radiation source, such that portions of the pattern on the continuous strip mask progressively become aligned with their corresponding portions of the windshield as the windshield is progressively scanned by the radiation source.

16. A system for applying a marking to an automobile glass plate, comprising:

(a) means for coating the surface of the automobile glass plate with an initial pattern, to include the precise surface to be occupied by a final predetermined pattern, with a liquid substance which, when subjected to a predetermined type of electromagnetic radiation, hardens and binds itself to the automobile glass plate;

(b) means for exposing the precise surface of the coated substance to be occupied by said final predetermined pattern to said predetermined type of electromagnetic radiation to cause said coated substance to harden and to bind itself to the automobile glass plate; and

(c) means for removing the portions of said coated substance not exposed to said electromagnetic radiation;

characterized in that means (b) includes:

(1) a source of radiation;

(2) a mask in the form of a continuous strip having said predetermined pattern progressively recorded thereon;

(3) means for supporting said continuous strip mask between said source of radiation and the automobile glass plate;

(4) and means for effecting relative movement between said radiation source and said automobile glass plate to progressively scan the surface of the automobile glass plate with radiation via said mask, while at the same time moving said continuous strip mask relative to said radiation source, such that portions of the pattern on the continuous strip mask progressively become aligned with their corresponding portions of the automobile glass plate as the automobile glass plate is progressively scanned by the radiation source.

5,316,898

SOLID BLEACHER FOR SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL AND THE PROCESSING METHOD THEREOF

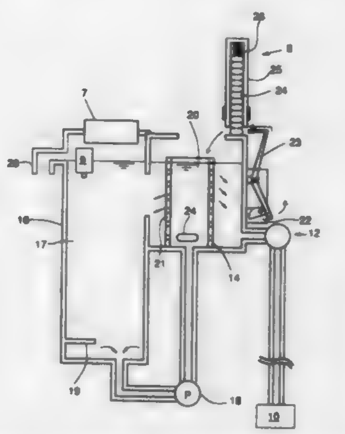
Yutaka Ueda, Hino, and Hiroshi Yamashita, Hachioji, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 24, 1993, Ser. No. 21,557

Claims priority, application Japan, Feb. 25, 1992, 4-073394

Int. Cl.⁵ G03C *5/38, 7/00, 5/42, 5/44*

U.S. Cl. 430—400 **7 Claims**



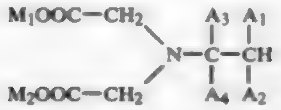
6. A process of processing a silver halide color photographic light-sensitive material comprising a support and provided thereon, a silver halide emulsion layer, comprising the steps of:

exposing the material;

developing the exposed material;

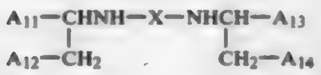
bleaching the developed material with a bleacher; and replenishing the bleacher by supplying a replenishing bleaching composition, wherein said composition is a solid composition being in the form of a tablet having a bulk density of 1.0 to 2.5 g/cm³ and containing a ferric complex salt of a compound represented by the following Formula

(A-I), (A-II), (A-IV), (A-V) or (A-VI) and a compound represented by the following Formula (II) or (III):



Formula (A-I)

wherein A_1, A_2, A_3 and A_4 independently represent a hydrogen atom, a hydroxyl group, a lower alkyl group, —COOM, —$PO_3(M_1)_2$, —CH_2COOM_2 or —CH_2OH, provided that at least one of A_1, A_2, A_3 and A_4 represents —COOM, —$PO_3(M_1)_2$, or —CH_2COOM_2, wherein M, M_1, and M_2 independently represent a hydrogen atom, an alkali metal, an ammonium group or an organic ammonium group;

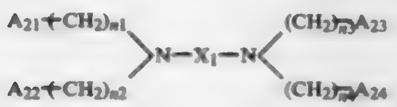


$$A_{11}-\underset{\substack{|\\ A_{12}-CH_2}}{CHNH}-X-NH\underset{\substack{|\\ CH_2-A_{14}}}{CH}-A_{13}$$

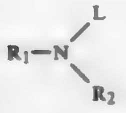
Formula (A-II)

wherein A_{11}, A_{12}, A_{13} and A_{14} independently represent —CH_2OH, —$COOM_3$ or —$PO_3(M_4)_2$; M_3 and M_4 independently represent a hydrogen atom, an ammonium group, an alkali metal or an organic ammonium group; and X represents an alkylene group having 2 to 6 carbon atoms or —$(B_1O)_n$—B_2— wherein n is an integer of 1 to 8, and B_1 and B_2 independently represent an alkylene group having 1 to 5 carbon atoms;

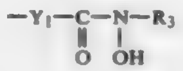
Formula (A-III)



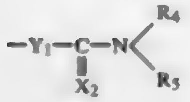
wherein A_{21}, A_{22}, A_{23} and A_{24} independently represent —CH_2OH, —$COOM_5$ or —$PO_3(M_6)_2$; M_5 and M_6 independently represent a hydrogen atom, an alkali metal, an ammonium group or an organic ammonium group; X_1 represents an alkylene group having 2 to 6 carbon atoms, a divalent cyclic organic group or —$(B_{11}O)n_5$—B_{12}— wherein n_5 is an integer of 1 to 8, and B_{11} and B_{12} independently represent an alkylene group having 1 to 5 carbon atoms; and n_1, n_2, n_3 and n_4 independently represent an integer of 1 or more;

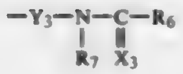


wherein R_1 and R_2 independently represent a hydrogen atom, an alkyl group or an aryl group; and L represents a group selected from the group consisting of



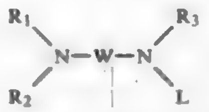
$$-Y_1-\underset{\substack{\|\\ O}}{C}-\underset{\substack{|\\ OH}}{N}-R_3$$





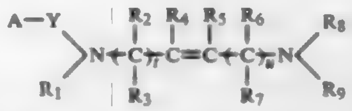
$$-Y_3-\underset{\substack{|\\ R_7}}{N}-\underset{\substack{\|\\ X_3}}{C}-R_6$$

wherein Y_1, Y_2 and Y_3 independently represent an alkylene group or an arylene group; X_2 and X_3 independently represent an oxygen atom or a sulfur atom; and R_3, R_4, R_5, R_6 and R_7 independently represent a hydrogen atom, an alkyl group or an aryl group;



Formula (A-V)

wherein R_1, R_2 and R_3 independently represent a hydrogen atom, an alkyl group or an aryl group; L is the same with those denoted in Formula (A-IV); and W represents a divalent linking group;



Formula (A-VI)

wherein R_1, R_2, R_3, R_6, R_7, R_8 and R_9 independently represent a hydrogen atom, an alkyl group or an aryl group; R_4 and R_5 independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an acyl group, a sulfamoyl group, a carbamoyl group, an alkoxycarbonyl group, an allyloxy-carbonyl group, a sulfonyl group, a sulfinyl group, an alkyl group or an aryl group, provided that R_4 and R_5 may be combined to form a 5- or 6-membered ring; A represents a carboxyl group, a phosphono group, a sulfo group, a hydroxyl group of an alkali metal salt or ammonium salt thereof; Y represents an alkylene group or an arylene group; and t and u independently represent an integer of 0 or 1;

X_2—A_2—$COOM_2$ Formula (II)

wherein X_2 represents a halogen atom, an amino group, a hydroxyl group, a methoxy group, —$COOM_2$ or —SO_3M_2; and A_2 represents an alkylene group, an alkenylene group or an arylene groups; and M_2 represents a hydrogen atom, an alkali metal, an ammonium group or an organic ammonium group;

NH_2—A_3—SO_3M_3 Formula (III)

wherein A_3 represents an alkylene group, an alkenylene group or an arylene group; and M_3 represents a hydrogen atom, an alkali metal, an ammonium group or an organic ammonium group.

5,316,899
OPTICAL RECORDING MEDIUM

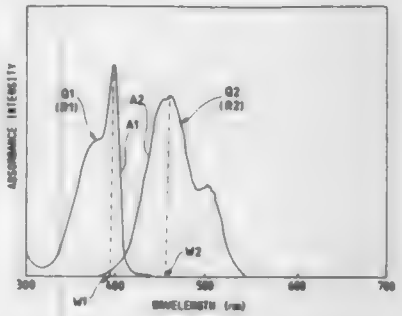
Toshiyuki Miyadera; Makoto Okano, and Fumio Matsui, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 679,489, Apr. 2, 1991, abandoned. This application Jan. 5, 1993, Ser. No. 807

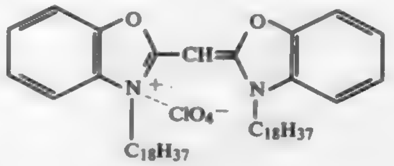
Claims priority, application Japan, Oct. 15, 1990, 2-277194

Int. Cl.^{5} G03C *1/00;* **G11B** *7/24*

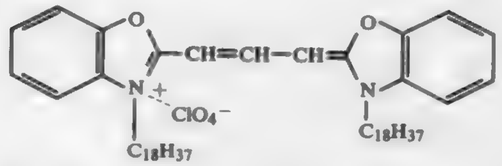
U.S. Cl. 430—495 **4 Claims**



1. An optical recording medium comprising a support having disposed on the same side thereof at least a pair of laminated recording films having a light absorption band in a predetermined wavelength region, such that said pair are within a focal depth of a semi-conductive laser, wherein one of the laminated recording film contains cyanine coloring matter represented by the following structural formula



and has a first absorption peak at a first specific wavelength and a steeper absorption slope between the first absorption peak and a point of inflection on the longer wavelength side with respect to the first absorption peak than on the shorter wavelength side thereof, and the other of the laminated recording films contains cyanine coloring matter represented by the following structural formula



and has a second absorption peak at a second specific wavelength which is in the neighborhood of the first specific wavelength and is longer than the first specific wavelength, and a steeper absorption slope between the second absorption peak and a point of inflection on the shorter wavelength side with respect to the second absorption peak than on the longer wavelength side thereof; and the steeper absorption slopes are close to each other.

5,316,900
OPTICAL RECORDING MEDIUM HAVING A CONSTANT BIREFRINGENT PROPERTY AND AN ALTERABLE PHOTOCHROMIC PROPERTY

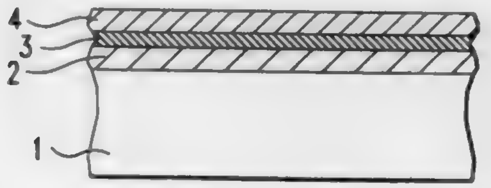
Tsuyoshi Tsujioka, Osaka; Fumio Tatezono, Hirakata; Koutaro Matsuura, Tsuzuki, and Masahiro Irie, Kasuga, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Masahiro Irie, Fukuoka, both of Japan

Continuation-in-part of Ser. No. 25,725, Mar. 2, 1993, abandoned, which is a continuation of Ser. No. 585,611, Sep. 20, 1990, abandoned. This application Oct. 15, 1993, Ser. No. 138,246

Claims priority, application Japan, Sep. 22, 1989, 1-246693; Mar. 28, 1990, 2-80125

Int. Cl.^{5} G03C *1/73;* **G11B** *7/24*

U.S. Cl. 430—495 **10 Claims**



1. An optical recording medium consisting only of:

a recording layer having a material with optical rotatory power which changes in response to information recorded in said recording layer;

a reflecting layer situated above the recording layer for reflecting a polarized light beam transmitted through both the recording layer and a birefringent layer so as to produce a reflected beam and to reintroduce the reflected beam into said birefringent layer and the recording layer; and

the birefringent layer situated between said recording layer and the reflecting layer for changing a state of the polarized light beam, said birefringent layer possessing a constant birefringence regardless of the information recorded in the recording layer.

5,316,901
NEGATIVE-ACTING SILVER HALIDE PHOTOGRAPHIC ELEMENTS HAVING EXTENDED UV EXPOSURE LATITUDE

Alberto Vacca, Carcare, and Aldo Sgarbi, Cairo Montenotte, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 13, 1992, Ser. No. 912,777

Claims priority, application Italy, Jul. 30, 1991, MI91A002108

Int. Cl.^{5} G03C *1/06*

U.S. Cl. 430—512 **7 Claims**

1. A UV sensitive negative acting silver halide photographic element comprising a support, a hydrophilic colloidal silver halide emulsion layer comprising UV sensitive negative acting silver halide grains, and one or more hydrophilic colloidal layers, wherein in said silver halide emulsion layer or in a hydrophilic colloid layer adjacent said emulsion layer there is a water soluble UV absorbing compound having at least 80% of absorption in the range of 350 to 400 micrometers.

5,316,902
MODIFICATION OF GELATIN

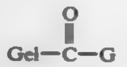
Donald P. Specht, and Kenneth G. Harbison, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 540,424, Jun. 18, 1990, Pat. No. 5,219,992. This application Jan. 4, 1993, Ser. No. 49

Int. Cl.^{5} G03C *1/76*

U.S. Cl. 430—539 **4 Claims**

1. A process for the preparation of a multilayer element having deferential hardness, said process comprising coating a support with a layer of unmodified gelatin and a layer of a modified gelatin and imbibing said layers with a hardener to harden said layers, wherein said modified gelatin has the formula:

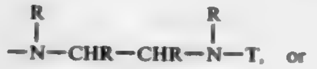


$$Gel-\overset{\substack{O\\ \|}}{C}-G$$

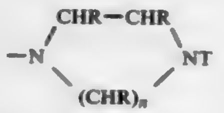
wherein Gel is a gelatin polypeptide,

$$-\overset{\substack{O\\ \|}}{C}-$$

is a carbonyl group from a free carboxyl group in aspartic acid or a glutamic acid moiety in said polypeptide, and G is

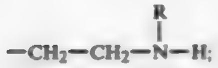


$$-\overset{\substack{R\\ |}}{N}-CHR-CHR-\overset{\substack{R\\ |}}{N}-T,$$ or



wherein

each R is independently hydrogen or a primary or secondary alkyl group of one to about four carbon atoms, n is a positive integer having a value of one to about four, and T is hydrogen or



$-CH_2-CH_2-\overset{R}{\overset{|}{N}}-H;$

said modified gelatin being further characterized by having from 1% to about 40% of the free carboxyl groups in aspartic and glutamic acid moieties in said polypeptide being substituted with G-groups;

whereby said modified gelatin has a rate of reaction with a bis reactive olefin hardener which is faster than the reaction rate of said hardener with the corresponding unmodified gelatin not having substitution with G-groups.

5,316,903

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hideki Tomiyama, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1991, Ser. No. 745,259

Claims priority, application Japan, Aug. 16, 1990, 2-216378

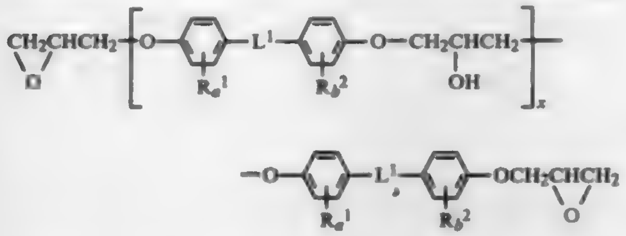
The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclaimed.

Int. Cl.⁵ G03C *1/34, 1/38, 7/392*

U.S. Cl. 430—546 **36 Claims**

1. A silver halide color photographic material which comprises in at least one photographic layer on a base at least one compound selected from the group consisting of sparingly water-soluble epoxy compounds represented by formula (I) given below and a dye-forming coupler:

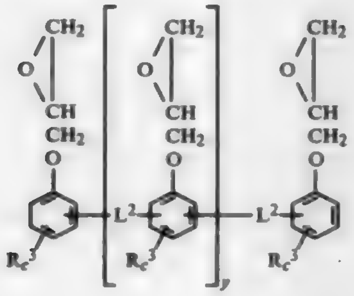
Formula (I)



wherein R^1 and R^2 each represent an alkyl group or a halogen atom, each L^1 represents a divalent aliphatic organic group, a and b each are an integer of 0 to 4, and x is a real number of 0 to 20.

19. A silver halide color photographic material which comprises in at least one photographic layer on a base at least one compound selected from the group consisting of sparingly water-soluble epoxy compound represented by formula (II) given below and a dye-forming coupler:

Formula (II)



wherein each R^3 represents an alkyl group or a halogen atom, each L^2 represents a divalent aliphatic organic group, c is an integer of 0 to 4, and y is a real number of 0 to 20.

5,316,904

AMIDE SUBSTITUTED DYE COMPOUNDS AND SILVER HALIDE PHOTOGRAPHIC ELEMENTS CONTAINING SUCH DYES

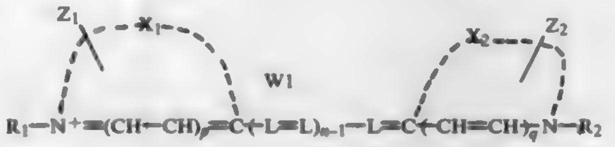
Richard L. Parton, Webster; David A. Stegman, Churchville, and Frederick J. Sauter, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1992, Ser. No. 978,589

Int. Cl.⁵ G03C *1/035, 1/14*

U.S. Cl. 430—567 **21 Claims**

1. A silver halide photographic element comprising a silver halide emulsion containing a sensitizing dye having the formula:



X_1 and X_2 each independently represent the atoms necessary to complete a benzo-condensed 5- or 6-membered heterocyclic nucleus, which, in addition to being substituted by Z_1 and Z_2 respectively, may be further substituted or unsubstituted;

n is a positive integer from 1 to 4,

p and q each independently represents 0 or 1,

each L independently represents a substituted or unsubstituted methine group;

R_1 and R_2 each independently represents substituted or unsubstituted aryl or substituted or unsubstituted alkyl,

Z_2 represents H or a substituent;

Z_1 has the formula

$$Y_1—CONR_3—^*;\ R_5R_6N—CO—Y_2—^*;\ \text{or}\ R_7—CO—NR_8—Y_2—^*$$

wherein * represents the bonding position to X_1, Y_1 and Y_2 are substituted or unsubstituted aromatic rings and R_3, R_4, R_5, R_6, R_7 and R_8 are independently H or substituted or unsubstituted lower alkyl;

W1 is a counterion as needed to balance the charge of the molecule.

4. A photographic element according to claim **1** wherein the silver halide emulsion is a tabular grain emulsion wherein at least 50% of the grain population is accounted to by tabular grains that satisfy the formula $ECD/t^2>25$, wherein ECD represents the average equivalent circular diameter of the tabular grains in micrometers, and t represents the average thickness of the grains in micrometers.

5,316,905

CULTURE MEDIUM SUPPLYING METHOD AND CULTURE SYSTEM

Junichi Mori, and Masaaki Abe, both of Tokyo, Japan, assignors to Suzuki Shokan Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 478,742, Feb. 12, 1990, abandoned, which is a continuation of Ser. No. 99,978, Sep. 23, 1987, abandoned. This application Dec. 20, 1991, Ser. No. 811,296

Claims priority, application Japan, Sep. 29, 1986, 61-228380; Aug. 19, 1987, 62-205510

Int. Cl.⁵ C12Q *3/00;* **C12M** *3/00*

U.S. Cl. 435—3 **19 Claims**

1. A culture system, comprising:

a culture medium supply section and a gas supply section;

said culture medium supply section comprising a culture medium supply and collection tank section, a culture medium flow passage switching-over section and a culture section;

said culture medium supply and collection tank section including at least first and second tanks for supplying and collecting a culture medium;

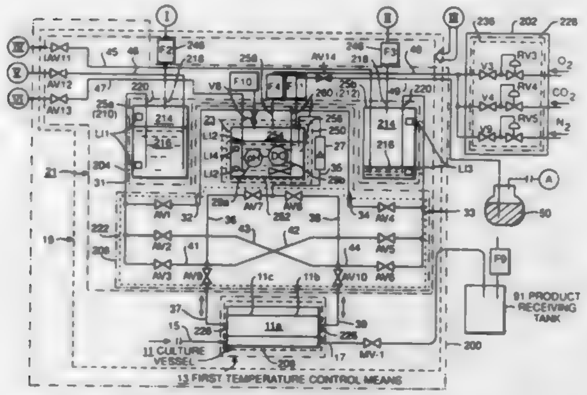
each of said tanks including a gas phase and a culture medium phase;

each of said tanks including at least one gas port connected to said gas phase and at least one culture medium port connected to said culture medium phase;

said culture section comprising at least one culture vessel, said at least one culture vessel having provided thereto at least first and second culture medium ports;

said culture medium flow passage switching-over section comprising first switching-over means, said first switching-over means including at least one culture medium port connected to said at least one culture medium port of said first tank, at least one culture medium port connected to said at least one culture medium port of said second tank, at least one culture medium port connected to said first culture medium port of said at least one culture vessel and at least one culture medium port connected to said second culture medium port of said at least one culture vessel;

said first switching-over means having formed therein a plurality of culture medium flow passages connected between said culture medium ports connected to said tanks and said culture medium ports connected to said at least one culture vessel, said culture medium flow passages being constructed such that fluid communication is provided between said culture medium phase of said first tank and said culture medium phase of said second tank via said at least one culture vessel, a first configuration of said culture medium flow passages providing said fluid communication wherein culture medium flows through said at least one culture vessel from said first culture medium port of said at least one culture vessel to said second culture medium port of said at least one culture vessel and a second configuration of said culture medium flow passages providing said fluid communication wherein culture medium flows through said at least one culture vessel from said second culture medium port of said at least one culture vessel to said first culture medium port of said at least one culture vessel;



said gas supply section comprising a gas control section and a gas flow passage switching-over section;

said gas control section including at least two gas ports;

said gas flow passage switching-over section comprising second switching-over means, said second switching-over means including at least two gas ports connected to said at least two gas ports of said gas control section respectively, at least one gas port connected to said at least one gas port of said first tank and at least one gas port connected to said at least one gas port of said second tank;

said second switching-over means having formed therein a plurality of gas flow passages, a first configuration of said gas flow passages providing a gas pressure difference between said at least two gas ports of said gas control section such that culture medium flows from said first tank to said second tank and a second configuration of said gas flow passages providing a gas pressure difference between said at least two gas ports of said gas control section such that culture medium flows from said second tank to said first tank; and

said gas control section including gas pressure regulating means for regulating gas pressures of said gas phases in said first and second tanks through said gas ports of said gas control section, gas flow rate regulating means for regulating gas flow rate of said gas phase in said first and second tanks through said gas ports of said gas control section, and gas component regulating means for regulating a volume percent of gas component of said gas phase in said first and second tanks through said gas ports of said gas control section.

13. A method of supplying a culture medium into a culture vessel in a system, said system comprising

a culture medium supply section and a gas supply section;

said culture medium supply section comprising a culture medium supply and collection tank section, a culture medium flow passage switching-over section and a culture section;

said culture medium supply and collection tank section including at least first and second tanks for supplying and collecting a culture medium;

each of said tanks including a gas phase and a culture medium phase;

each of said tanks including at least one gas port connected to said gas phase and at least one culture medium port connected to said culture medium phase;

said culture section comprising at least one culture vessel, said at least one culture vessel having provided thereto at least first and second culture medium ports;

said culture medium flow passage switching-over section comprising first switching-over means, said first switching-over means including at least one culture medium port connected to said at least one culture medium port of said first tank, at least one culture medium port connected to said at least one culture medium port of said second tank, at least one culture medium port connected to said first culture medium port of said at least one culture vessel and at least one culture medium port connected to said second culture medium port of said at least one culture vessel;

said first switching-over means having formed therein a plurality of culture medium flow passages connected between said culture medium ports connected to said tanks and said culture medium ports connected to said at least one culture vessel, said culture medium flow passages being constructed such that fluid communication is provided between said culture medium phase of said first tank and said culture medium phase of said second tank via said at least one culture vessel, a first configuration of said culture medium flow passages providing said fluid communication wherein culture medium flows through said at least one culture vessel from said first culture medium port of said at least one culture vessel to said second culture medium port of said at least one culture vessel and a second configuration of said culture medium flow passages providing said fluid communication wherein culture medium flows through said at least one culture vessel from said second culture medium port of said at least one culture vessel to said first culture medium port of said at least one culture vessel; at least two gas ports;

said gas flow passage switching-over section comprising second switching-over means, said second switching-over means including at least two gas ports connected to said at least two gas ports of said gas control section respectively, at least one gas port connected to said at least one gas port of said first tank and at least one gas port connected to said at least one gas port of said second tank;

said second switching-over means having formed therein a plurality of gas flow passages, a first configuration of said gas flow passages providing a gas pressure difference between said at least two gas ports of said gas control section such that culture medium flows from said first tank to said second tank and a second configuration of said gas flow passages providing a gas pressure difference between said at least two gas ports of said gas control section such that culture medium flows from said second tank to said first tank; and

said gas control section including gas pressure regulating means for regulating gas pressures of said gas phases in said first and second tanks through said gas ports of said gas control section, gas flow rate regulating means for regulating gas flow rate of said gas phase in said first and second tanks through said gas ports of said gas control section, and gas component regulating means for regulating a volume percent of gas component of said gas phase in said first and second tanks through said gas ports of said gas control section;

said method comprising the steps of:

a) connecting one of said gas ports of said gas control section to said at least one gas port connected to said gas phase of said first tank and connecting another gas port of said gas control section to said at least one gas port connected to said gas phase of said second tank by adjusting said gas flow passage switching-over section;

b) producing a sufficient gas pressure difference between said at least two gas ports of said gas control section to cause the culture medium to transfer between said first and second tanks; and

c) alternating said gas pressure difference by switching between said first and second configurations of said gas flow passages in response to changes in levels in said first and second tanks caused by the transfer of said culture medium, thereby continuously feeding culture medium to said at least one culture vessel.

5,316,906

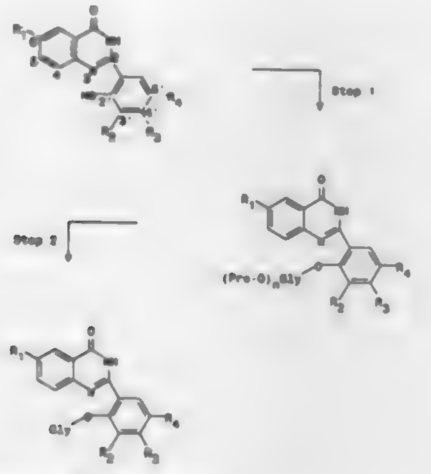
ENZYMATIC ANALYSIS USING SUBSTRATES THAT YIELD FLUORESCENT PRECIPITATES

Richard P. Haugland; Yu-zhong Zhang; Stephen T. Yue, all of Eugene, Oreg.; Ewald Terpetschnig, Baltimore, Md.; Nels A. Olson, Homer, Ak.; John J. Naleway, Eugene, Oreg.; Karen D. Larison, Eugene, Oreg., and Zhijian Huang, Eugene, Oreg., assignors to Molecular Probes, Inc., Eugene, Oreg.

Filed Aug. 23, 1991, Ser. No. 748,860

Int. Cl.^{5} C12Q *1/00;* **C08G** *63/48;* **A61K** *37/02;* **C04B** *35/00*

U.S. Cl. 435—4 **17 Claims**



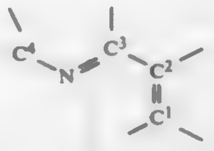
1. A substrate of the formula:

$(BLOCK\text{-}O\text{-})\text{-}X_{n}$

where BLOCK is a blocking group that is a monovalent moiety derived by removal of a hydroxy group from phosphate or sulfate, or a biologically compatible salt thereof; or a monovalent moiety derived by removal of a hydroxy group from a carboxy group of an aliphatic, aromatic or amino acid or of a peptide; or a monovalent moiety derived by removal of an anomeric hydroxy group from a mono- or polysaccharide; and is capable of being cleaved from the remainder of the substrate by action of a specific enzyme resulting in a visible precipitate of the formula:

$H\text{-}O\text{-}X_{fl}$

where X_{fl} has the structure:



where carbon atoms of $—C^1{=}C^2—$ are further joined so as to complete a first 5- or 6-membered aromatic ring which may contain at least one of the hetero atoms N, O or S,

where carbon atoms of $—C^4—N{=}C^3—$ are further joined so as to complete a second 5- or 6-membered aromatic ring that contains at least the nitrogen between C^3 and C^4 and may contain at least one additional hetero atom N, O or S,

where the first and second aromatic rings may be joined by a 5- or 6-membered bridging ring that contains at least the C^2 from the first aromatic ring and the C^3 from the second aromatic ring, which bridging ring may be saturated or unsaturated and may contain a hetero atom N, O, or S,

where each of the first and second aromatic rings may be fused to at least one additional aromatic ring that may contain at least one of the hetero atoms N, O or S, and

where each of said aromatic rings may be further modified by substitution of any hydrogens on an aromatic carbon by substituents that are halogen, nitro, cyano, aryl, lower alkyl (1–4 carbons), perfluoroalkyl (1–4 carbons), or alkoxy (1–4 carbons), or any combination thereof; and

X_{fl} is covalently linked to the oxygen —O— at C_1.

5,316,907

ENZYMATIC FLUOROMETRIC ASSAY FOR ADENYLATE CYCLASE

Keith G. Lurie, Minneapolis, Minn., and Phi Wiegn, Valhalla, N.Y., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jan. 22, 1993, Ser. No. 7,847

Int. Cl.^{5} C12Q *1/00;* **G01N** *21/76*

U.S. Cl. 435—4 **15 Claims**

1. A method measuring adenylate cyclase (AC) activity in a sample of physiological material comprising:

(a) combining a sample of physiological material comprising cAMP produced by endogenous AC and other endogenous adenine nucleotides selected from the group consisting of ATP, AMP, ADP and mixtures thereof with effective amounts of apyrase, 5'-nucleotidase and adenosine deaminase, to enzymatically eliminate said other endogenous adenine nucleotides in said sample;

(b) enzymatically converting the cAMP into AMP; and

(c) measuring the amount of AMP without the use of radioactive reagents, said amount providing a measure of the amount of cAMP and AC in said sample.

5,316,908

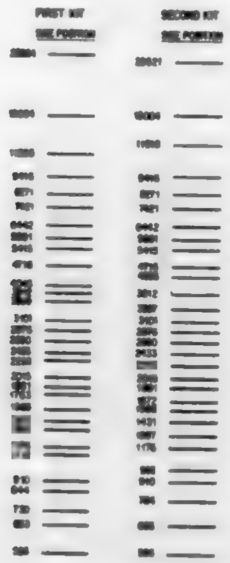
SIZE MARKERS FOR ELECTROPHORETIC ANALYSIS OF DNA

David P. Carlson; Paul C. Watkins, and Leonard Klevan, all of Gaithersburg, Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Filed Jul. 13, 1990, Ser. No. 522,406

Int. Cl.^{5} C12Q *1/68*

U.S. Cl. 435—6 **32 Claims**



1. A DNA marker system comprising at least 5 DNA restriction endonuclease digests pooled together and a single nucleic acid probe, wherein

(1) a DNA restriction endonuclease digest is a collection of DNA fragments resulting from digestion of a DNA by one or more restriction endonucleases,

(2) each restriction digest is obtained from the same DNA molecule;

(3) each restriction digest contains a first DNA fragment complementary to said probe,

(4) each restriction digest contains at least one second DNA fragment not complementary to said probe,

(5) the region of complementarity between said probe and the first DNA fragment of each digest is a double stranded segment of the first fragment, and

(6) wherein when said DNA restriction digests are separated by electrophoresis and annealed to said probe, a detectably labeled DNA marker ladder is obtained.

5,316,909

METHOD FOR INCREASING FLUORESCENCE

Yongyuan Xu, Beijing, China, assignor to Wallac Oy, Finland

Filed Mar. 13, 1992, Ser. No. 851,561

Claims priority, application Finland, Mar. 15, 1991, 911297

Int. Cl.^{5} G01N *33/545*

U.S. Cl. 435—6 **15 Claims**

1. Method based on fluorescence for quantitative assay of a bioaffinity reaction, wherein said method comprises the labelling of at least one bioaffinity component participating in a bioaffinity reaction with a lanthanide chelate, dissociating the lanthanide chelate from said component for a fluorescence measurement after the reaction, and measuring the fluorescence of the lanthanide chelate, said lanthanide being brought to a strongly fluorescent form before the fluorescence measurement by incorporating the lanthanide in an aggregated particle that comprises the lanthanide chelate and a chelate of a fluorescence-increasing ion to bring about a cofluorescence effect, said aggregates bringing about the cofluorescence effect containing the lanthanide chelate to be determined, the chelate of the fluorescence-increasing ion, free beta-diketone and a synergistic compound and being formed by applying after the reaction and dissociation successively two developer solutions, whereof the first one contains the beta-diketone in excess compared with the ions to be chelated with it and the fluorescence-increasing ion in an aqueous solution having pH below 4, and the second one contains the synergistic compound in a buffer having pH above 6.

5,316,910

BIOASSAY FOR INFLUENZA A AND B NUCLEOPROTEIN

Paul A. Rota, Decatur, and Renee A. Black, Doraville, both of Ga., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 670,791, Mar. 19, 1991, abandoned. This application Feb. 10, 1993, Ser. No. 15,739

Int. Cl.^{5} C12Q *1/00*

U.S. Cl. 435—7.1 **9 Claims**

1. A bioassay for the diagnosis of influenza in humans comprising the steps of:

i) coating a surface with a insect cell lysate comprising the nucleoprotein of influenza A or influenza B;

ii) contacting said coated surface with a blood sample from a human suspected of having influenza; and,

iii) detecting the presence or absence of a complex formed between said nucleoprotein and antibodies specific for said nucleoprotein.

5,316,911

METHOD OF DETERMINING THE PRESENCE OF ENDOTOXIN IN A SAMPLE

Leif Baek, Heinesgade 1, 4.tv., 2200 Copenhagen N, and Claus Koch, Overgaden oven Vandet 26, 1., 1415 Copenhagen K, both of Denmark

Filed Jan. 6, 1989, Ser. No. 295,213

Claims priority, application Denmark, May 20, 1987, 2558/87

Int. Cl.^{5} C12Q *1/00;* **G01N** *33/532, 33/535*

U.S. Cl. 435—7.9 **29 Claims**

1. A method of determining the presence of an endotoxin or an endotoxin-like material in a sample, wherein the endotoxin-like material is selected from the group consisting of lipopolysaccharide, oligolipopolysaccharide, lipid A, glucans, peptidoglycan, lipoteichoic acid, lipoglycans and synthetic lipid A, the method comprising:

(a) incubating a sample with a component which is from horseshoe crab amoebocyte lysate, hemolymph or a synthetic analogue thereof having substantially the same reactivity with an endotoxin or endotoxin-like material as a component occurring naturally in horseshoe crab amoebocyte lysate or haemolymph, whereby the properties of said component are altered if any endotoxin or endotoxin-like material is present in the sample so that no reaction with an antibody raised against or directed substantially only against said component or an immunological determinant thereof will take place,

(b) reacting the incubated mixture of said sample and said component from step (a) with a monoclonal antibody raised against or directed substantially only against said component or an immunological determinant thereof whereby the antibody is bound to any of said component present in the mixture, and

(c) determining the presence of any endotoxin or endotoxin-like material in the sample by detecting any bound antibody in the reaction mixture resulting from step (b), the detection of decreasing amounts of bound antibody showing the presence of an endotoxin or endotoxin-like material in the sample;

with the proviso that any of said component present after the incubation of the sample in step (a) is coupled to a solid support, or

that said antibody is coupled to a solid support or to a bridging molecule which is coupled to a solid support, or that any endotoxin or endotoxin-like material present in the sample is coupled to a solid support.

2. A method of determining the presence of an endotoxin or endotoxin-like material in a sample, wherein the endotoxin-like material is selected from the group consisting of lipopolysaccharide, oligolipopolysaccharide, lipid A, glucans, peptidoglycan, lipoteichoic acid, lipoglycans and synthetic lipid A, the method comprising:

(a) incubating a sample with a component which is from horseshoe crab amoebocyte lysate, hemolymph or a synthetic analogue thereof having substantially the same reactivity with an endotoxin or endotoxin-like material as a component occurring naturally in horseshoe crab amoebocyte lysate or haemolymph, whereby the properties of said component are altered if any endotoxin or endotoxin-like material is present in the sample so that a reaction product of said component with an endotoxin or endotoxin-like material in the sample will react with an antibody raised against or directed substantially only against said reaction product or an immunological determinant thereof,

(b) reacting the incubated mixture of said sample and said component resulting from step (a) with a monoclonal antibody raised against or directed substantially only against said reaction product or an immunological determinant thereof, whereby the antibody is bound to any of said reaction product present in the mixture, and

(c) determining the presence of any endotoxin or endotoxin-like material in the sample by detecting any bound antibody in the reaction mixture resulting from step (b), the detection of increasing amounts of bound antibody showing the presence of an endotoxin or endotoxin-like material in the sample;

with the proviso that any of said reaction product present after the incubation of the sample in step (a) is coupled to a solid support, or

that said antibody is coupled to a solid support or to a bridging molecule which is coupled to a solid support, or

that any endotoxin-like material present in the sample is coupled to a solid support.

5,316,912

POLYACRYLIC HYDRAZIDES AND THEIR APPLICATIONS AS GLYCOPROTEIN REAGENTS

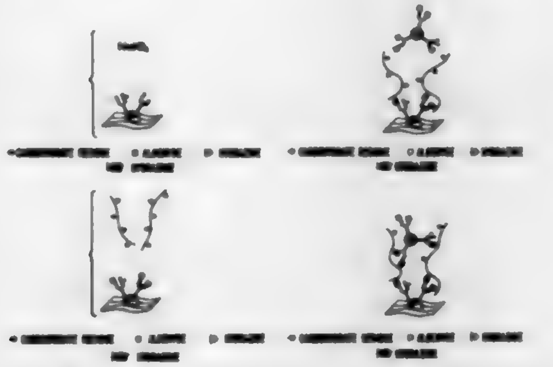
Urs Heimgartner, Höschgasse 70, 8008 Zürich; Branko Kozulic, Georg Kempfstrasse 7, 8046 Zürich, and Klaus Mosbach, Rebbergstrass 83, 8102 Oberengstringen, all of Switzerland

Filed Dec. 13, 1989, Ser. No. 448,105

Claims priority, application United Kingdom, Dec. 16, 1988, 8829470

Int. Cl.^{5} G01N *33/53, 33/543*

U.S. Cl. 435—7.9 **14 Claims**



1. A method for detection of an oxidized glycoprotein comprising the steps of:

a) binding a glycoprotein to a solid support;

b) oxidizing the bound glycoprotein with periodate to form an oxidized glycoprotein wherein aldehyde or ketone groups are formed by oxidizing carbohydrate residues of said glycoprotein;

c) reacting said oxidized glycoprotein with a polyacrylic polyhydrazide wherein said polyacrylic polyhydrazide binds to said oxidized glycoprotein, and wherein said polyacrylic polyhydrazide is a copolymer comprising repeating units possessing a hydrazide group and repeating units possessing hydroxyl groups;

d) reacting a label with said polyacrylic polyhydrazide, wherein said label contains aldehyde groups or activated ester groups which bind to said polyacrylic polyhydrazide through hydrazide groups on said polyacrylic polyhydrazide; and

e) detecting said oxidized glycoprotein bound to said support through detection of said polyacrylic polyhydrazide having said label bound thereto.

5,316,913

NEUTROPHIL LECAM-1 AS INDICATOR OF NEUTROPHIL ACTIVATION

Eugene C. Butcher, Portola Valley, Calif., and Louis J. Picker, Dallas, Tex., assignors to Stanford University, Stanford, Calif.

Filed Sep. 6, 1991, Ser. No. 755,749

Int. Cl.^{5} G01N *33/543*

U.S. Cl. 435—7.24 **9 Claims**

1. A method of detecting neutrophil activation in a mammalian host, said method comprising:

combining a blood sample with a first antibody specific for an epitope common to neutrophil and lymphocyte LECAM-1 and a second antibody specific for a sialylated Lewis X epitope on neutrophil LECAM-1 and not lymphocyte LECAM-1; and

detecting the presence of a complex between an antigen and said first and second antibodies as indicative of neutrophil activation.

5,316,914

METHOD FOR DETERMINING HUMAN COLLAGEN PEPTIDES BY WAY OF ENZYME IMMUNOASSAY

Akira Oshima, Wakayama; Kazushi Iwata, Takaoka; Yasuteru Muragaki, Wakayama; Yasuo Bai, Sakai; Eisaku Matsumoto, and Satoshi Miyamoto, both of Wakayama, all of Japan, assignors to Fuji Yakuhin Kogyo Kabushiki Kaisha, Toyama, Japan

Continuation of Ser. No. 488,440, Feb. 27, 1990, abandoned, which is a continuation of Ser. No. 022,370, Mar. 5, 1987, abandoned. This application Feb. 7, 1992, Ser. No. 831,645

Claims priority, application Japan, Sep. 4, 1986, 61-206862

Int. Cl.^{5} G01N *33/543, 33/576, 33/577*

U.S. Cl. 435—7.94 **3 Claims**

1. A method for determining human type IV collagen peptides by way of enzyme sandwich immunoassay which comprises:

(a) contacting a serum sample suspected of containing human type IV collagen peptides with a first monoclonal antibody, which is produced by a hybridoma having all of the identifying characteristics of the hybridoma deposited as FERM BP-2847, specific for human type IV collagen peptides, said first monoclonal antibody being bound to a solid phase, under conditions which allow formation of a first reaction product between said first monoclonal antibody and said type IV collagen peptides;

(b) contacting a second monoclonal antibody, which is produced by a hybridoma having all of the identifying characteristics of the hybridoma deposited as FERM BP-2846, specific for said human type IV collagen peptides and which is conjugated with an enzyme, under conditions which allow formation of a second reaction product between said second monoclonal antibody and said first reaction product;

(c) adding a substrate for said enzyme;

(d) assaying for said enzyme reaction products of said substrate; and

(e) relating the presence of said enzyme reaction products to the presence of human type IV collagen peptides in said serum sample.

5,316,915

METHOD FOR THE DETERMINATION OF ANTIBODIES AGAINST LIPOCORTINS

Michael Kraus, and Jürgen Römisch, both of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Dec. 12, 1991, Ser. No. 805,648

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040306

Int. Cl.^{5} G01N *33/543, 33/564*

U.S. Cl. 435—7.95 **18 Claims**

1. A heterogeneous immunoassay method for determining IgX antibodies directed against lipocortins, wherein X may be any of the known Ig-classes, comprising the steps of:

a) fixing a mixture of two or more purified known lipocortions to a solid support;

b) contacting a sample of a body fluid with the solid support to form an antigen-IgX complex on the solid support, wherein the lipocortin antigen of the antigen-IgX complex is fixed to the solid support of step a) and the IgX of the antigen-IgX complex is from the body fluid of step b);

c) removing unbound sample;

d) treating the antigen-IgX complex with a labeled Ig-class specific antibody or a mixture of labeled Ig-class specific antibodies; and

e) determining the amount of label bound to the solid support via antigen-IgX-labeled antibody complex as a measure of the IgX content of the sample.

5,316,916

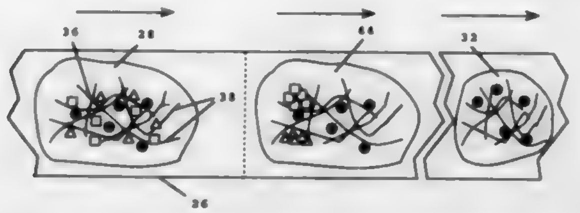
HIGH-DENSITY LIPOPROTEIN SOLID-BASE ASSAY DEVICE

Ronald M. Jones, Mountain View, Calif., assignor to Cholestech Corporation, Hayward, Calif.

Continuation of Ser. No. 729,447, Jul. 12, 1991, Pat. No. 5,213,964, and a continuation-in-part of Ser. No. 554,147, Jul. 16, 1990, Pat. No. 5,213,965. This application Mar. 19, 1993, Ser. No. 34,352

Int. Cl.^{5} C12Q *1/60;* **G01N** *31/00, 21/00*

U.S. Cl. 435—11 **3 Claims**



1. An assay device for measuring serum cholesterol associated with high-density lipoproteins (HDL) in a blood fluid sample also containing low density lipoproteins (LDL) and very low density lipoproteins (VLDL), comprising

a matrix of glass fibers effective to separate soluble from precipitated blood lipoproteins in such fluid sample, as fluid material flows through the matrix from a sample-application site to a sample-collection site in the matrix,

a reagent reservoir which includes (i) a precipitating reagent effective to selectively precipitate LDL and VLDL in the fluid sample, within a selected concentration range of the reagent, in the fluid sample and (ii) release means for releasing the reagent, as the fluid sample is introduced into the sample-application site of the matrix, at a release rate which is effective to achieve a reagent concentration in the fluid sample within said selected concentration range.

a coating on the glass fibers effective to prevent binding of HDL to the fibers in the presence of the precipitating reagent, and

an assay pad to which fluid sample collected at the sample-collection site can be transferred, said pad containing reagents effective to convert cholesterol associated with HDL to a detectable reaction product.

5,316,917

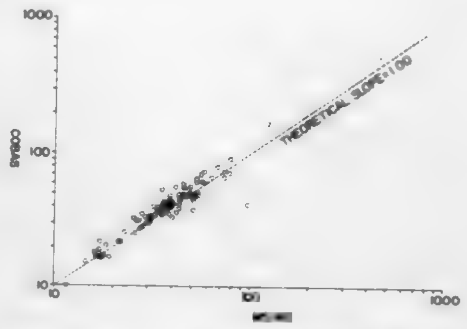
AUTOMATED ANALYSIS OF FREE L-CARNITINE AND TOTAL SHORT-CHAIN ACYLCARNITINE

Diane S. Roe, Chapel Hill, N.C., assignor to Duke University, Durham, N.C.

Filed Nov. 4, 1992, Ser. No. 971,888

Int. Cl.^{5} C12Q *1/48, 1/54;* **C12N** *9/02;* **A61K** *43/00*

U.S. Cl. 435—15 **19 Claims**



1. A method of quantifying free L-carnitine in a plurality of essentially protein-free biological fluid samples, comprising the steps of:

(a) adding a plurality of essentially protein-free biological fluid samples to a plurality of wells in a centrifugal spectrophotometric analyzer rotor; then

(b) adding to each of the plurality of samples:

(i) acetyl coenzyme A (coA) in an amount sufficient to react with essentially all the free L-carnitine in the sample to produce acetylcarnitine and free coenzyme A; and

(ii) 5,5′-dithiobis-2-nitrobenzoic acid in an amount sufficient to convert to thiophenylate essentially all free coenzyme A produced by the reaction of free L-carnitine and acetyl coenzyme A (coA); then

(c) simultaneously centrifugally combining with each of the plurality of samples carnitine acetyltransferase in an amount sufficient to start reaction of the acetyl coenzyme A with the free L-carnitine to convert essentially all free L-carnitine in the sample to acetylcarnitine and free coenzyme A; then

(d) simultaneously spectrophotometrically determining the amount of thiophenylate present in each of the plurality of samples.

5,316,918

METHOD AND APPARATUS FOR TESTING MAI (MYCOBACTERIUM AVIUM-INTRACELLULARE) FOR ANTIMICROBIAL AGENT SENSITIVITY

Robert A. Ollar, Milford, Pa., assignor to Infectech, Inc., Milford, Pa.

Continuation-in-part of Ser. No. 426,573, Oct. 24, 1989, Pat. No. 5,153,119. This application Feb. 25, 1992, Ser. No. 841,937

Int. Cl.^{5} C12Q *1/00, 1/02, 1/18;* **C12N** *1/20*

U.S. Cl. 435—34 **7 Claims**

1. A method of testing the sensitivity of MAI complex organisms to different antimicrobial agents and dosage concentrations thereof comprising:

providing a plurality of test tubes each containing an amount of an antimicrobial agent to be tested and MAI complex organisms to be assayed;

placing into each of said test tubes a separate paraffin coated slide;

incubating said test tubes; and
observing said MAI complex organism growth on said slides at discrete time intervals, whereby the minimum inhibitory concentration of said antimicrobial agent necessary to resist said MAI complex organism growth on said slides can be determined.

5,316,919

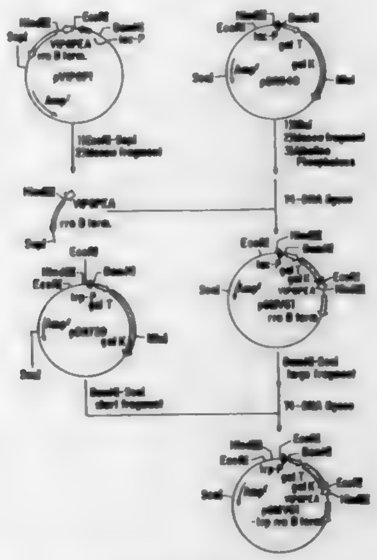
METHOD OF PRODUCING 2 KD TO 10KD PEPTIDES HAVING NO L-METHIONINE RESIDUE

Akira Kaji, 1-1-9, Daimon-cho, Higashikurume-shi, Tokyo, Japan

Division of Ser. No. 710,882, Jun. 10, 1991, Pat. No. 5,166,316. This application Aug. 7, 1992, Ser. No. 925,732

Int. Cl.^{5} A61K *37/02;* **C07K** *5/00;* **C12P** *21/06;* **C12N** *1/20*

U.S. Cl. 435—69.1 **4 Claims**



1. A method of producing a peptide having no L-methionine residue and having a molecular weight of 2,000 to 10,000, comprising;

(A) cultivating prokaryotic cells carrying a recombinant pUC plasmid which contains a trp promoter and a DNA coding for a fused protein, said fused protein comprising;
  (1) a galK protein fragment comprising 200 to 300 amino acid residues from the N terminus of the galK protein, and
  (2) an L-methionine-free peptide having a molecular weight of 2,000 to 10,000 coupled to said galK protein fragment at the C terminus thereof via an L-methionine residue;
to cause expression of said fused protein;
(B) purifying said fused protein;
(C) cleaving said purified fused protein with cyanogen bromide to yield a peptide mixture; and
(D) isolating peptides which have a molecular weight of 2,000 to 10,000 from the peptide mixture to obtain said peptide having no L-methionine residue.

5,316,920

LYMPHOCYTE ACTIVATION ANTIGEN HB15, A MEMBER OF THE IMMUNOGLOBULIN SUPERFAMILY

Thomas F. Tedder, South Natick, and Liang-Ji Zhou, Boston, both of Mass., assignors to Dana-Faber Cancer Institute, Inc., Boston, Mass.

Filed Apr. 17, 1992, Ser. No. 870,029

Int. Cl.^{5} C12N *15/13, 15/14, 5/16*

U.S. Cl. 435—69.3 **14 Claims**

13. An isolated nucleic acid comprising the coding sequence shown in SEQ ID NO: 1.

5,316,921

SINGLE-CHAIN HEPATOCYTE GROWTH FACTOR VARIANTS

Paul J. Godowski, Pacifica; Natalie A. Lokker, San Francisco, and Melanie R. Mark, San Jose, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed May 18, 1992, Ser. No. 884,811

Int. Cl.^{5} C12P *21/06;* **A61K** *37/36*

U.S. Cl. 435—69.4 **25 Claims**

1. An isolated nucleotide molecule encloding a hepatocyte growth factor (HGF) variant stabilized in single-chain form by mutagenesis within a region recognized by an enzyme capable of converting HGF into its two-chain form, said variant being capable of binding an HGF receptor and substantially lacking the ability to activate said receptor.

5,316,922

METHOD FOR INDENTIFYING AND EXPRESSING PROTEINS THAT RECOGNIZE AND ADHERE TO SPECIFIC PROBES

Stanley Brown, and Donald Court, both of Frederick, Md., assignors to The United States of America as represented by Department of Health and Human Services

Filed Apr. 15, 1992, Ser. No. 869,912

Int. Cl.^{5} G01N *33/53;* **C12Q** *1/02;* **C12N** *15/10*

U.S. Cl. 435—69.7 **12 Claims**

1. A method for generating a binding protein able to bind to a predetermined composition which comprises:
(a) generating a first pool of semi-random, double-stranded polynucleotides of between 4 and 100 triplet codons having no UGA or UAA codons in either orientation and bearing flanking complementary sticky ends which form a restriction site when joined;
(b) randomly ligating said polynucleotides to form a pool of concatamers of different lengths;
(c) inserting said concatamers into a portion of a gene encoding an external domain of a bacterial outer membrane protein to obtain a library of modified genes containing semi-random inserts, where the inserts vary in length and base composition;
(d) transforming a gram negative bacterial cell with the library of modified genes wherein the modified genes are operably linked to a promoter which functions in said cell;
(e) culturing said bacteria under conditions permitting expression and transport of proteins encoded from the modified genes including the binding protein wherein said transport is to the outer membrane; and,
(f) selecting and isolating bacteria with the ability to bind to the predetermined composition as a result of the expression of the binding protein.
(g) isolating the semi-random insert of the modified gene encoding the bacterial cell surface protein from the bacteria of step f;
(h) treating the inert with a restriction enzyme which cleaves the restriction sites formed through the complementary binding of the sticky ends to form a second pool of semi-random double stranded polynucleotides;
(i) mixing the second pool with additional semi-random double stranded polynucleotides of between 4 and 100 triplet codons having no UGA or UAA codons and having sticky ends complementary to those of the second pool so as to yield a third pool of semi-random polynucleotides;
(j) repeating steps b–g.

5,316,923

SYNTHETIC YEAST LEADER PEPTIDES

Lars Christiansen, Lyngby, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

Division of Ser. No. 406,392, Sep. 12, 1989, Pat. No. 5,162,498. This application Nov. 9, 1992, Ser. No. 973,483

Claims priority, application Denmark, Sep. 7, 1987, DK 4638/87

Int. Cl.^{5} C07K *7/10*

U.S. Cl. 435—69.9 **10 Claims**

1. An isolated DNA molecule encoding a leader peptide for secretion in yeast having the following formula:

X_1-Pro-Val-Thr-Gly-Asp-Glu-Ser-Ser-Val-Glu-Ile-Pro-Glu-Glu-Ser-Leu-Ile-X_2-Ala-Glu-Asn-Thr-Thr-Leu-Ala-X_3-X_4-X_5

wherein
X_1 is Ala or Gln;
X_2 is Ile, a peptide chain with up to 10 amino acid residues, or a peptide bond;
X_3 is a peptide chain with up to 5 amino acid residues or a peptide bond; and
X_4 and X_5 are Lys or Arg.

5,316,924

PULLULANASE, METHODS OF PRODUCING PULLULANASE AND METHODS OF SACCHARIFICATION OF STARCH USING PULLULANASE

Yoshiyuki Takasaki, Miyazaki, Japan, assignor to Research Development Corporation of Japan, Japan

Filed May 28, 1992, Ser. No. 890,518

Claims priority, application Japan, Feb. 28, 1992, 4-043336

Int. Cl.^{5} C12P *21/00, 19/16;* **C12N** *9/44*

U.S. Cl. 435—71.2 **1 Claim**

1. A method of producing pullulanase comprising:
(a) culturing in a culture medium the bacterium, accession number Ferm BP-3761, or mutants thereof *Microbacterium imperiale* capable of producing said pullulanase wherein the pullulanase has the following characteristics:
  i) a working pH of 4–9;
  ii) an optimum temperature of about 60° C.;
  iii) a pH stability of pH 4.5–10; and
  iv) being inactivated by about 10% at 50° C., by about 30% at 55° C. or by about 60% at 60° C. when a solution containing pullulanase is heated for 10 minutes; and
  v) not being inactivated when a pullulanase solution containing 1×10^{-2}M $CaCl_2$ is heated at 50° or 55° C. for 10 minutes;
b) allowing the pullulanase to accumulate in the culture medium; and
c) isolating the pullulanase from the culture medium.

5,316,925

T-CELL RECEPTOR SPECIFIC FOR ANTIGEN POLYPEPTIDES AND RELATED POLYNUCLEOTIDES

Mark M. Davis, 422 Foxborough Dr., Mountain View, Calif. 94041, and Stephen M. Hedrick, 1031 Santa Queta, Solana Beach, Calif. 92075

Continuation of Ser. No. 663,809, Oct. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 585,333, Mar. 1, 1984, abandoned. This application Dec. 3, 1992, Ser. No. 924,395

Int. Cl.^{5} C07H *15/12;* **C12P** *19/34;* **C12N** *5/16, 15/12*

U.S. Cl. 435—91.2 **47 Claims**

1. A substantially purified nucleic acid polymer coding for at least a region of a mammalian T cell receptor β subunit, which region is selected from the group consisting of the constant region, the variable region, the joining region, the diversity region, the transmembrane region, and the cytoplasmic region, said nucleic acid polymer encoding less than a full length β subunit.

19. A substantially purified oligonucleotide encoding a fragment of a mammalian T cell receptor β subunit, said oligonucleotide hybridizing selectively to one of the strands of a double stranded DNA molecule, one strand of which DNA molecule encodes the mammalian T cell receptor β subunit.

5,316,926

METHOD FOR THE MICROBIOLOGICAL PRODUCTION OF NON-ANTIGENIC HYALURONIC ACID

Karen K. Brown, Parkville, Mo.; Linda L. C. Ruiz, Haneohe, Hi.; Ivo van de Rijn, Winston-Salem, N.C.; Nathan D. Greene, Leawood, Kans.; Sandy L. Trump, De Soto, Kans.; Curtis D. Wilson, Shawnee Mission, Kans., and Sharon A. Bryant, Shawnee, Kans., assignors to Miles Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 873,245, Jun. 11, 1986, abandoned, and a continuation-in-part of Ser. No. 910,246, Sep. 18, 1986, Pat. No. 4,782,046, which is a continuation of Ser. No. 801,973, Nov. 26, 1985, abandoned, which is a division of Ser. No. 555,224, Nov. 25, 1983, abandoned. This application Nov. 22, 1991, Ser. No. 796,178

Int. Cl.^{5} G12P *19/04;* **G12N** *15/01, 1/20*

U.S. Cl. 435—101 **2 Claims**

1. A process for the production of high molecular weight hyaluronic acid with a narrow molecular weight distribution comprising
a) increasing the virulence and the hyaluronic acid generating ability of an existing strain of *Streptococcus equi* by passaging it through serologically negative horse blood,
b) growing a culture of the strain of a) in a medium free of extraneous protein in a defined medium,
c) maintaining the culture in log phase growth for at least about 24 hours by
  i) maintaining the pH of the medium between about 7 and 7.2,
  ii) maintaining the temperature at about 37° C., and
  iii) feeding at least about one weight percent of glucose, based on the total culture weight to the medium no less frequently than about every 24 hours,
d) separating the generated capsular hyaluronic acid from the cell walls by incubating the culture with at least about 0.01 weight percent, based on the total culture weight, or a sulphonate based anionic surfactant,
e) precipitating the generated hyaluronic acid from the medium containing said anionic surfactant by the addition of an aliphatic quaternary ammonium salt,
f) separating the precipitated hyaluronic acid from the anionic surfactant and ammonium salt by dissolving it in a high molarity aqueous solution of a calcium salt,
g) precipitating the hyaluronic acid from the calcium salt solution by combining the solution with a lower alcohol selected from the group consisting of ethanol and isopropanol,
h) repeatedly redissolving the reprecipitated hyaluronic acid in water, adding sufficient sodium chloride to provide at least about ten grams per liter and reprecipitating the hyaluronic acid by combining the solution with ethanol or isopropanol,
i) passing an aqueous solution of the repeatedly dissolved and precipitated hyaluronic acid through a nitrocellulose filter, and
j) treating an aqueous solution of the repeatedly dissolved and precipitated hyaluronic acid with sufficient strong acid washed activated carbon to remove any pyrogen from said hyaluronic acid as measured by the rabbit pyrogen test.

5,316,927
PRODUCTION OF MONOGLYCERIDES BY ENZYMATIC TRANSESTERIFICATION

Aleksey Zaks, Brookline, and Akiva T. Gross, Newton, both of Mass., assignors to Opta Food Ingredients, Inc., Bedford, Mass.

Continuation of Ser. No. 809,844, Dec. 18, 1991, abandoned, which is a continuation of Ser. No. 253,110, Oct. 4, 1988, abandoned. This application Sep. 9, 1992, Ser. No. 942,476

Int. Cl.^{5} **C12P** *7/64, 7/62;* **C12N** *9/20, 11/14, 11/16*

U.S. Cl. 435—134 **9 Claims**

1. A method of preparing β-acrylated monoglycerides by enzymatic transesterification of triglycerides in an alcohol medium, comprising the steps of:

a) combining a primary or secondary alkyl alcohol, as the medium, selected from the group consisting of methanol, ethanol, propanol, isopropanol, butanol, isobutanol, pentanol, isopentanol and hexanol and mixtures thereof, with triglycerides and from about 1 to about 5% by volume water;

b) adding a 1,3-regiospecific lipase to the combination formed in (a), whereby the lipase catalyzes transesterification of the triglycerides but avoids acyl migration of fatty acid moieties from the 2-position to the 1-position on said triglycerides;

c) maintaining the combination obtained in (b) under agitating conditions and at a temperature from about 20° C. to about 60° C. sufficient for transesterification to occur between the hydroxyl groups of the alcohol and two of the fatty acid groups of the triglyceride, whereby about 90% by weight of the triglycerides are converted to β-acylated monoglycerides; and

d) terminating the reaction and separating the monoglyceride product from the fatty acid ester by-product.

5,316,928
DIRECT CALCIUM MAGNESIUM ACETATE PRODUCTION

Michael C. Flickinger, Saint Paul; Richard S. Hanson, Wayzata; Frederick J. Schendel, Oakdale; Charles R. Anderson, Apple Valley, and Paul R. August, Bloomington, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 699,997, May 13, 1991, abandoned. This application Jun. 24, 1992, Ser. No. 905,170

Int. Cl.^{5} **C12P** *7/40, 7/54*

U.S. Cl. 435—136 **11 Claims**

1. A method of producing calcium magnesium acetate comprising:

growing under aerobic fermentation conditions a pure strain high temperature acetic acid-producing aerobic bacterium selected from a group consisting of *Bacillus stearothermophilus, Bacillus coagulans,* and *Bacillus acidocaldarius,* said aerobic bacterium growing at pH 4.0 and 50° C. with glucose, sucrose, xylose, lactose, monosodium glutamate, or a mixture thereof as a growth substrate in an aqueous fermentation broth having an effective amount of a growth substrate, and an amount of a neutralizing calcium and magnesium source sufficient to maintain the pH of the broth at about 4 to about 6.5 and sustain substantial production of acetic acid; and

wherein the acetic acid produced by said aerobic bacterium complexes with available calcium and magnesium ions to produce calcium magnesium acetate.

5,316,929
PROCESS FOR THE PREPARATION OF MA

Werner Aretz, Königstein/Taunus; Eberhard Ehlers, Hofheim am Taunus, and Udo Hedtmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

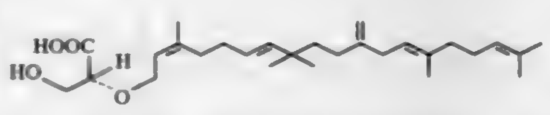
Continuation-in-part of Ser. No. 846,073, Mar. 5, 1992. This application Aug. 11, 1993, Ser. No. 104,598

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1991, 4107460

Int. Cl.^{5} **C12P** *7/42;* **C07C** *59/60;* **C12N** *9/16*

U.S. Cl. 435—146 **12 Claims**

1. A process for the preparation of the compound of the formula I



I

by enzymatic degradation of phosphoglycolipids in a glycine/-NaOH buffer using moenomycinase and an enzyme selected from MBase and phosphatase, wherein

moenomycinase has the following characteristics;

(i) the ability to cleave phosphoglycolipid antibiotics at the phosphoglycosidic linkage;

(ii) a pH optimum of 8.0 to 8.5;

(iii) a temperature optimum of 45° to 55° C.;

(iv) a K_m value of 4 to 10 mmolar based on moenomycin A as substrate; and

(v) a molecular weight of about 230,000±10,000 Dalton as determined by molecular sieve chromatography;

and MBase has the following characteristics:

(i) the ability to cleave phosphoglycolipid antibiotics at the phospholipid linkage;

(ii) a pH optimum of greater than 5.7, and

(iii) a temperature optimum of less than 37° C.

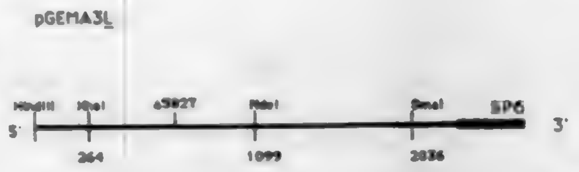
5,316,930
VIRUS RESISTANT PLANTS HAVING ANTISENSE RNA

L. Sue Loesch-Fries; Nancy J. Eagan, both of Madison, Wis.; Donald J. Merlo, Midland, Mich., and Carol Alexandrescu, Madison, Wis., assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Continuation-in-part of Ser. No. 847,425, Apr. 2, 1986, abandoned. This application Jan. 5, 1989, Ser. No. 293,905

Int. Cl.^{5} **C12N** *15/00, 5/00;* **A01H** *1/04;* **C12R** *1/41;* **C07H** *21/04*

U.S. Cl. 435—172.3 **60 Claims**



8. A DNA molecule comprising, 5' to 3', a promoter capable of initiating transcription in plant cells of a negative strand RNA complementary to a viral RNA, cDNA encoding aRNA of a plant virus having single-stranded, plus-stranded, tripartite RNA genome, and a transcript terminator capable of determining the 3' end of the transcript of said cDNA in a plant cell.

5,316,931
PLANT VIRAL VECTORS HAVING HETEROLOGOUS SUBGENOMIC PROMOTERS FOR SYSTEMIC EXPRESSION OF FOREIGN GENES

Jon Donson, Davis, Calif.; William O. Dawson, Winter Haven, Fla.; George L. Granthan, Riverside, Calif.; Thomas H. Turpen, Vacaville, Calif.; Ann M. Turpen, Vacaville, Calif.; Stephen J. Garger, Vacaville, Calif., and Laurence K. Grill, Vacaville, Calif., assignors to Biosource Genetics Corp., Vacaville, Calif.

Continuation-in-part of Ser. No. 600,244, Oct. 22, 1990, abandoned, Ser. No. 641,617, Jan. 16, 1991, abandoned, Ser. No. 737,899, Jul. 26, 1991, abandoned, and Ser. No. 739,143, Aug. 1, 1991, abandoned, said Ser. No. 600,244, is a continuation of Ser. No. 310,881, Feb. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 160,766, Feb. 26, 1988, abandoned, and Ser. No. 160,771, Feb. 26, 1988, abandoned, said Ser. No. 641,617, is a continuation of Ser. No. 347,637, May 5, 1989, abandoned, said Ser. No. 737,899, is a continuation of Ser. No. 363,138, Jun. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 219,279, Jul. 15, 1988, abandoned. This application Jul. 31, 1992, Ser. No. 923,692

Int. Cl.^{5} **C12N** *15/83;* **A01H** *5/00;* **C07H** *21/04*

U.S. Cl. 435—172.3 **38 Claims**

21. A process for systemically transcribing a nucleic acid sequence in a host plant comprising:

(a) infecting a host plant with a recombinant plant viral nucleic acid derived from a plus sense, single stranded RNA plant virus that naturally has a subgenomic promoter, the recombinant plant viral nucleic acid comprising:

a first viral subgenomic promoter operably joined to a first nucleic acid sequence that codes for a plant viral coat protein wherein the transcription of the first nucleic acid sequence is regulated by the first plant viral subgenomic promoter; and

a second plant viral subgenomic promoter operably joined to a second nucleic acid sequence which is not naturally associated with said plus sense single stranded RNA plant virus wherein transcription of the second nucleic acid sequence is regulated by the second plant viral subgenomic promoter;

wherein the first viral subgenomic promoter is heterologous to the second viral subgenomic promoter thereby enabling the recombinant plant viral nucleic acid to systemically transcribe the second nucleic acid in the host plant; and

(b) growing the infected plant wherein the second nucleic acid sequence is systemically transcribed.

5,316,932
HOMOGENEOUS DENATURED HUMAN 06-GUANINE ALKYLTRANSFERASE PREPARED BY IMMUNOAFFINITY CHROMATOGRAPHY USING MONOCLONAL ANTIBODY SPECIFIC FOR ENZYME

Darell D. Bigner, Chapel Hill, N.C., and Thomas P. Brent, Memphis, Tenn., assignors to Duke University, Durham, N.C. and St. Jude Children's Research Hospital, Memphis, Tenn.

Continuation of Ser. No. 799,877, Nov. 27, 1991, abandoned, which is a continuation of Ser. No. 703,700, May 21, 1991, abandoned, which is a continuation of Ser. No. 328,504, Mar. 24, 1989, abandoned. This application May 11, 1993, Ser. No. 59,414

Int. Cl.^{5} **C12N** *9/10;* **C07K** *3/00*

U.S. Cl. 435—193 **4 Claims**

1. A process for preparing a homogeneous preparation of denatured human O^6-guanine alkyltransferase comprising the steps of:

a) denaturing human O^6-guanine alkyltransferase;

b) contacting said denatured human O^6-guanine alkyltransferase resulting from step a) with a monoclonal antibody specific for said denatured human O^6-guanine alkyltransferase, which monoclonal antibody is bound to a substrate, so that said denatured human O^6-guanine alkyltransferase and said monoclonal antibody form an immunocomplex; and

c) eluting said denatured human O^6-guanine alkyltransferase from said substrate-bound monoclonal antibody so that said homogeneous preparation is obtained.

5,316,933
RECOMBINANT NATURAL KILLER CELL ACTIVATOR

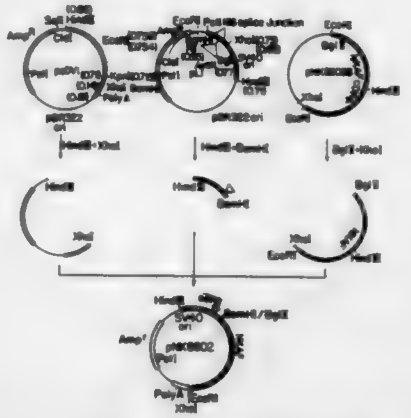
Kentaro Yoshimatsu; Yukio Ohya; Yasushi Shikata; Isao Tanaka; Yoshikazu Hasegawa; Toshio Seto, all of Ibaraki, and Toshio Osawa, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 392,841, Aug. 11, 1989, Pat. No. 5,185,431. This application Oct. 15, 1992, Ser. No. 961,521

Claims priority, application Japan, Aug. 31, 1988, 63-217599

Int. Cl.^{5} **C12P** *21/02;* **C12N** *15/70;* **C07H** *15/12*

U.S. Cl. 435—240.1 **6 Claims**



1. A cDNA coding for a recombinant natural killer cell activating factor, wherein said recombinant natural killer cell activating factor comprises a peptide of amino acid sequence:

Leu His Leu Arg Ser Glu Thr Ser Thr Phe Glu Thr Pro Leu
Gly Ala Lys Thr Leu Pro Glu Asp Glu Glu Thr Pro Glu Gln
Glu Met Glu Glu Thr Pro Cys Arg Glu Cys Glu Glu Glu Glu
Glu Trp Gly Ser Gly Ser Glu Asp Ala Ser Lys Lys Asp Gly
Ala Val Glu Ser Ile Ser Val Pro Asp Met Val Asp Lys Asn
Leu Thr Cys Pro Glu Glu Glu Asp Thr Val Lys Val Val Gly
Ile Pro Gly Cys Gln Thr Cys Arg Tyr Leu Leu Val Arg Ser
Leu Gln Thr Phe Ser Gln Ala Trp Phe Thr Cys Arg Arg Cys
Tyr Arg Gly Asn Leu Val Ser Ile His Asn Phe Asn Ile Asn
Tyr Arg Ile Gln Leu Ser Val Ser Ala Leu Asn Gln Gly Gln
Val Trp Ile Gly Gly Arg Ile Thr Gly Ser Gly Arg Cys Arg
Arg Phe Gly Trp Val Asp Gly Ser Arg Trp Asn Phe Ala Tyr
Trp Ala Ala His Gln Pro Trp Ser Arg Gly Gly His Cys Val
Ala Leu Cys Thr Arg Gly Gly Tyr Trp Arg Arg Ala His Cys
Leu Arg Arg Leu Pro Phe Ile Cys Ser Tyr.

5,316,934

EFFECTIVE THROMBOSIS MEDIATED BY HUMAN PROUROKINASE-LIKE POLYPEPTIDES WITH INCREASED BINDING AFFINITY FOR THROMBOSIS

Yoh-ichi Kobayashi, Fujisawa; Ken Watabe, Yokohama; Yukuo Mukohara; Masayuki Satoh, both of Odawara, and Hiroaki Nakamura, Kawasaki, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

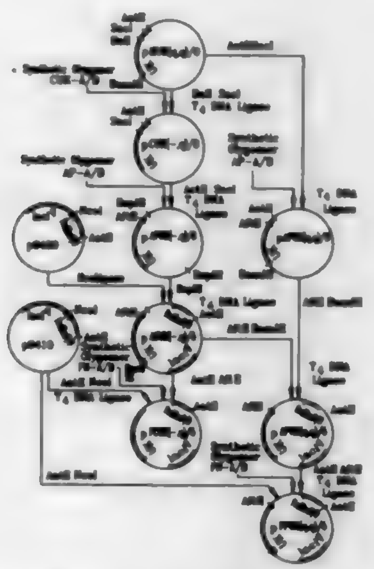
PCT No. PCT/JP90/00742, § 371 Date Feb. 12, 1991, § 102(e) Date Feb. 12, 1991, PCT Pub. No. WO90/15867, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 7, 1990, Ser. No. 651,363

Claims priority, application Japan, Jun. 13, 1989, 1-150161; May 15, 1990, 2-123163

Int. Cl.^{5} C12N *9/72, 15/58, 15/62, 15/70*

U.S. Cl. 435—215 **7 Claims**



1. A substantially pure, enzymatically-active, human prourokinase mutein comprising a human prourokinase derivative fused with an amino-terminal oligopeptide, said amino-terminal oligopeptide capable of forming a covalent bond with fibrin present in a blood clot through the enzymatic action of human blood coagulation factor XIII, wherein said prourokinase derivative is derived from the amino acid sequence Ser^1-Leu^{411} of human prourokinase and consists essentially of an amino acid sequence selected from the group consisting of

Leu^4-Leu^{411},

Leu^4-Leu^{411} in which lysine^{135} is substituted with a glutamine residue,

Leu^4-Leu^{411} in which lysine^{135} and arginine^{156} are both substituted with glutamine residues,

Leu^4-Leu^{411} in which lysine^{135} is substituted with an aspartate residue and arginine^{156} is substituted with a glutamine residue,

Leu^{144}-Leu^{411}, and

Leu^{144}-Leu^{411} in which arginine^{156} is substituted with a glutamine residue; and,

wherein said amino terminal oligopeptide is selected from the group consisting of

(Met.)Asn.Gln.Glu.Gln.Val.Ser.Pro.Leu.Thr.Leu.Leu.Lys,

(Met.)Gln.Ala.Gln.Gln.Met.Val.Gln.Pro.Gln.Ser.Pro.Val-.Ala.Val.Lys,

(Met.)Ala.Gln.Lys.Met.Val.Gln.Pro.Leu.Thr.Leu.Leu.Lys,

(Met.)Ala.Gln.Lys.Met.Val.Gln.Pro.Gln.Thr.Leu.Leu.Lys,

(Met.)Gln.Glu.Gln.Val.Ser.Pro.Gln.Thr.Leu.Leu.Lys,

(Met.)Asn.Gln.Asp.Gln.Val.Ser.Pro.Gln.Thr.Leu.Leu.Lys,

(Met.)Asn.Gln.Glu.Asn.Val.Ser.Pro.Gln.Thr.Leu.Leu.Lys, and,

(Met.)Asn.Gln.Ser.Met.Val.Ser.Pro.Gln.Thr.Leu.Leu.Lys.

5,316,935

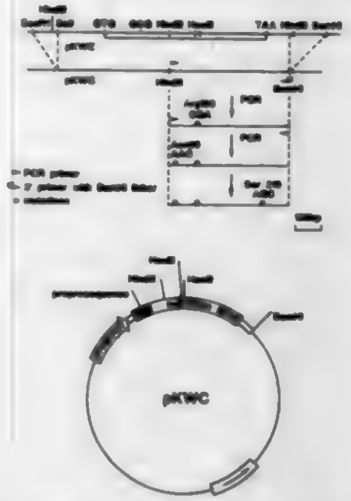
SUBTILISIN VARIANTS SUITABLE FOR HYDROLYSIS AND SYNTHESIS IN ORGANIC MEDIA

Frances H. Arnold, and Keqin Chen, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 6, 1992, Ser. No. 864,298

Int. Cl.^{5} C12N *9/50, 9/56, 15/57;* **C12P** *21/00*

U.S. Cl. 435—222 **25 Claims**



1. A substantially pure modified subtilisin enzyme having improved stability and/or catalytic activity in organic media, relative to the stability and/or catalytic activity of unmodified subtilisin enzymes in organic media, wherein said modified subtilisin enzyme is selected from among the group consisting of mature, Class I subtilisins and wherein the modification consists of an amino acid substitution at amino acid sequence position 181 of said Class I subtilisin enzyme which corresponds substantially to position 181 of the mature subtilisin BPN', said substitution consisting of N181S.

5,316,936

METHOD FOR PREPARATION OF HUMAN SERUM ALBUMIN-SENSITIZED SHEEP ERYTHROCYTES (HSA-CELL) FOR DETECTION OF PRE-S2 ANTIGEN

Jin-Nam Ko, Pipa 2, don 30 ban, Moranbong Gavok, and On-Sun Pak, Kansong dong 57 ban, Pyongchon Gyuok, both of Pyongyang, Rep. of Korea

Filed Aug. 30, 1991, Ser. No. 752,850

Claims priority, application D.P.R. of Korea, Sep. 1, 1990, 90-2439

Int. Cl.^{5} A61K *35/18*

U.S. Cl. 435—240.2 **5 Claims**

1. A method for preparing human serum albumin-sensitized sheep erythrocytes for detecting pre-S_2 antigen comprising:

(a) fixing sheep erythrocytes;

(b) adding human serum albumin in a saline solution to said fixed sheep erythrocytes;

(c) adding a 0.5 to 3% solution of chromium chloride to said fixed sheep erythrocytes and human serum albumin combination, said sheep erythrocytes, human serum albumin and chromium chloride are combined in the ratio of 3:1:1.

5,316,937

CONDITIONED MEDIUM USEFUL FOR SUSTAINING GROWTH OF COLONIC CRYPT CELLS

R. H. Whitehead; Anthony Burgess, and Hui-Hua Zhang, all of Victoria, Australia, assignors to Ludwig Institute for Cancer Research, N.Y.

Filed Mar. 16, 1992, Ser. No. 851,732

Int. Cl.^{5} C12N *5/00*

U.S. Cl. 435—240.3 **3 Claims**

1. A conditioned medium, useful for sustaining growth of colonic crypt cells, comprising a colonic crypt cell stimulating mitogen; said medium produced by culturing cell line LIM 2537 in a culture medium, wherein the cell line LIM 2537 produces said mitogen, and removing the cells of said cell line from the conditioned medium.

5,316,938

DEFINED MEDIA FOR SERUM-FREE TISSUE CULTURE

Michael J. Keen, and Nicholas T. Rapson, both of Kent, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 777,729, Oct. 16, 1991, abandoned. This application Dec. 18, 1992, Ser. No. 991,717

Claims priority, application United Kingdom, Oct. 17, 1990, 9022545

Int. Cl.^{5} C12N *5/02*

U.S. Cl. 435—240.31 **1 Claim**

1. A culture medium which comprises:

a base medium containing the amino acids, non-ferrous metal ions, vitamins, and cofactors essentially as set forth in Table I;

an osmolality of the medium within the range of about 200–350 mOsm;

at least one buffer selected from $CaCl_2.2H_2O$, $MgSO_4.7$-H_2O, $NaH_2PO_4.2H_2O$, sodium pyruvate, HEPES, and MOPS in an amount sufficient to maintain the medium within the pH range of 6.5–7.5;

about 1000–10,000 mg of mannose, fructose, glucose, or maltose;;

about 5 ml of 200 mM L-glutamine;

about 50 mg each of L-proline, L-threonine, L-methionine, L-cysteine, and L-tyrosine;

about 20–50 mg of L-ascorbic acid;

about 0.01–0.5 mg each of Vitamin B6 and Vitamin B12;

about 0.25–5 mg of a fereric or ferrous salt;

about 1 mg of zinc sulfate;

about 2.5 μg of copper sulfate;

about 10,000–100,000 IU of at least one antibiotic selected from the group consisting of polymyxin, neomycin, penicillin, and streptomycin;

about 3 μl of ethanolamine;

about 0.01–1.0 mg of putrescine;

about 5 μg–5 mg of recombinant insulin;

and sufficient water to comprise one liter of medium; provided that said medium is essentially free of proteins, carbohydrates, and lipids isolated from animal sources.

5,316,939

MICROORGANISM BELONGING TO THE GENUS RHODOCOCCUS, AND PROCESS FOR PRODUCING SEC-CEDRENOL AND CEDRENONE

Hirofumi Takigawa, Tochigi; Hiromi Kubota, Tokyo, and Susumu Ito, Tochigi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 1, 1992, Ser. No. 861,749

Claims priority, application Japan, Apr. 2, 1991, 3-94918; Jun. 4, 1991, 3-159540; Jul. 9, 1991, 3-193578

Int. Cl.^{5} C12N *1/20;* **C12P** *15/00*

U.S. Cl. 435—252.1 **1 Claim**

1. A biologically pure culture of a microorganism belonging to the genus Rhodococcus and having all the identifying characteristics of Rhodococcus sp. KSM-7358 deposited under Accession No. FERM BP-3747.

5,316,940

CONSTITUTIVE SOLUBLE METHANE MONOOXYGENASE MUTANTS OF METHANOTROPHIC BACTERIA SUCH AS *METHYLOSINUS TRICHOSPORIUM* A.T.C.C. 55314

George Georgiou, Austin; Patricia Phelps, Weir, and Gerald E. Speitel, Jr., Austin, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 24, 1992, Ser. No. 873,936

Int. Cl.^{5} C12N *1/20;* **D06M** *16/00;* **C02F** *3/00*

U.S. Cl. 435—252.1 **5 Claims**

1. A mutant methanotrophic bacterium having constitutive sMMO activity in the presence of copper ion concentrations between about 1 μM copper ion and about 18 μM copper ion, wherein the mutant methanotrophic bacterium is selected from a group consisting of *Methylosinus trichosporium, Methylococcus capsulatus, Methylosinus methanica* 81Z, *Methylosinus sporium, Methylosinus sp.* B and *Methylobacterium sp.* strain CRL26.

5,316,941

NON-HUMAN CARBONYL HYDROLASE MUTANTS, DNA SEQUENCES AND VECTORS ENCODING SAME AND HOSTS TRANSFORMED WITH SAID VECTORS

David A. Estell, San Mateo; Robert M. Caldwell, San Francisco; Richard R. Bott, Burlingame, and Thomas P. Graycar, Pacifica, all of Calif., assignors to Genencor, Inc., South San Francisco, Calif.

Division of Ser. No. 294,340, Jan. 6, 1989, Pat. No. 5,155,033. This application Apr. 29, 1992, Ser. No. 896,818

Int. Cl.^{5} C12N *15/00, 9/54, 9/56*

U.S. Cl. 435—252.3 **6 Claims**

1. DNA sequence encoding a subtilisin wherein the amino acid residue equivalent to +225 of *Bacillus amyloliquefaciens* subtilisin as shown in FIG. 3A, has been replaced with a different naturally occurring amino acid selected from the group consisting of alanine, leucine, methionine, glutamine, valine and serine.

5,316,942

PROCESS FOR THE PRODUCTION OF LOW-COST SOLUBLE HIGH-MOLECULAR WEIGHT COLLAGEN

David J. Fink, Shaker Heights, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Jun. 16, 1993, Ser. No. 78,932

Int. Cl.^{5} C07K *3/12;* **C12P** *21/00;* **C12N** *9/99;* **A61K** *37/12*

U.S. Cl. 435—273 **14 Claims**

1. A method for producing an aqueous solution of high molecular weight solubilized collagen comprising:

a. providing an aqueous ground slurry of insoluble collagen;

b. adjusting the water or solid content of said wet ground slurry whereby said insoluble collagen is at a concentration that promotes substantially maximum solubilized collagen concentration and molecular weight in a final product;

c. adjusting the pH of said slurry from Step b to obtain activity for a proteolytic enzyme added in Step d;

d. adding said proteolytic enzyme to said pH adjusted slurry and reacting at a temperature, T, and for a time, t, effective for forming a solution of high molecular weight solubilized collagen from said insoluble collagen particles;

e. controlling said reaction to obtain a high concentration of soluble collagen and a high molecular weight of said solubilized collagen by simultaneously measuring the concentration of solubilized collagen and the molecular weight of said solubilized collagen, whereby said reaction is complete when said molecular weight and said concentration are substantially maximized;

f. adding additional water and insoluble collagen to said solution containing high molecular weight solubilized collagen in Step d and mixing;

g. separating at least some of the solution containing high molecular weight solubilized collagen from the insoluble collagen and returning the insoluble collagen to Step b, whereby at least a portion of the proteolytic enzyme is recycled, and the separated solution containing high molecular weight solubilized collagen is withdrawn as product.

5,316,943
RACEMIC CONVERSION OF USING A TRANSAMINASE

Gene E. Kidman, 2172 Pierce St., Ubly, Mich. 48475; Larry E. Robinson, 126 Midway La., Vernon Hills, Ill. 60061; Mark P. Scollar, 620 Oriole La., Mt. Prospect, Ill. 60056, and Ian G. Fotheringham, 1606 Brittany Ct., Wheeling, Ill. 60090

Continuation-in-part of Ser. No. 206,622, Jun. 14, 1988, abandoned. This application Jun. 19, 1989, Ser. No. 368,480

Int. Cl.^{5} C12P *13/04*

U.S. Cl. 435—280 **20 Claims**

1. A method for the production of an optically pure L-amino acid from a D,L racemic mixture of the amino acid comprising the steps of:

i) treating the racemic mixture of the amino acid with a transaminase-producing microorganism;
ii) fermenting said racemic mixture of the amino acid and microorganism at a suitable temperature and pH for a suitable period of time; and
iii) recovering said optically pure L-amino acid.

5,316,944
ENZYMATIC RESOLUTION OF A RACEMIC MIXTURE OF GAMMA-AMINO ACIDS USING PENICILLIN ACYLASE

Alexey L. Margolin, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals, Cincinnati, Ohio

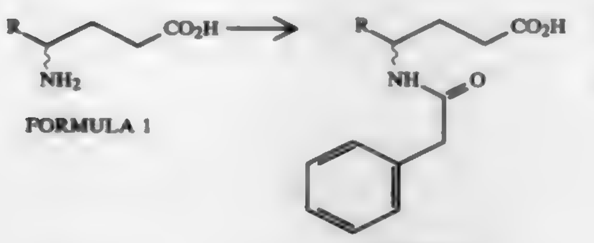
Filed Jul. 17, 1992, Ser. No. 915,446

Int. Cl.^{5} C12P *41/00*

U.S. Cl. 435—280 **4 Claims**

1. A process for the enzymatic resolution of a racemic mixture of a compound of the structure according to Formula 1 wherein R is $H_2C{=}CH{-}$, $HC{\equiv}C{-}$, or $H_2C{=}CH{-}HC{=}CH{-}$, comprising:

(a) in solution preparing a N-phenylacetyl derivative of the compound according to Formula 1, wherein R is defined as above, to produce a racemic mixture consisting of the (S)-(N-phenylacetyl) enantiomer and the (R)-(N-phenylacetyl) enantiomer of



FORMULA 1

FORMULA 2

a compound according to Formula 2, wherein R is defined as above;

(b) contacting the racemic mixture of the compound of Formula 2 with penicillin acylase at approximately room temperature to produce the (R)-enantiomer of the compound according to Formula 1;

(c) extracting the (S)-(N-phenylacetyl) enantiomer of a compound according to Formula 2 with an organic solvent thereby creating a solution having an organic layer and an aqueous layer;

(d) removing the aqueous layer of the solution containing the (R)-enantiomer of the compound according to Formula 1;

(e) hydrolyzing the (S)-(N-phenylacetyl) enantiomer of the compound according to Formula 2 to form the (S)-enantiomer of the compound according to Formula 1.

5,316,945
CELL CARRIER ARRANGEMENT

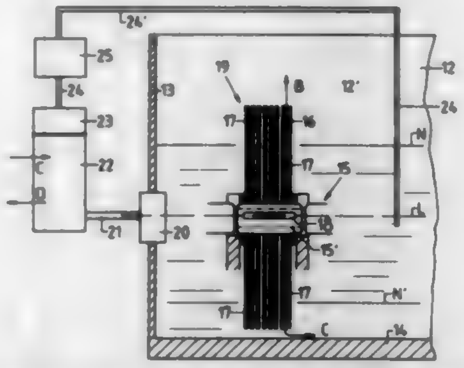
Will Minuth, Starenstrabe 2, 8403 Bad Abbach, Fed. Rep. of Germany

Filed Dec. 14, 1992, Ser. No. 989,840

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1991, 4141295; Jan. 10, 1992, 4200446

Int. Cl.^{5} C12M *1/10*

U.S. Cl. 435—285 **8 Claims**



1. A double-walled cell carrier arrangement for cultivating adhering cells, comprising a housing and at least two flat blanks connected with one another in a stacked manner on a holder and which between them form at least one gap or slot area, wherein at least one of the two blanks is produced from a material which is permeable to a respective treatment medium for said cells and the holder is a shaft or section of shaft disposed within said housing, and wherein said shaft or section of shaft is mounted rotatably around a horizontal longitudinal axis of the shaft or section of the shaft and has an opening therein connecting the gap area to a source of liquid treatment medium through an inner space of said shaft for feeding the liquid treatment medium to the gap area, and wherein the inner space is filled up to a level with the treatment medium so that the cell carrier arrangement projects the treatment medium.

5,316,946
DNA TRANSPOSON TN5SUPF IN PLASMID PBRG1310

Suhas H. Phadnis, St. Louis; Henry V. Huang, University City, and Douglas E. Berg, St. Louis, all of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 105,422, Oct. 5, 1987, Pat. No. 5,137,829. This application Jan. 22, 1990, Ser. No. 468,450

Int. Cl.^{5} C12N *15/63, 15/70*

U.S. Cl. 435—320.1 **1 Claim**

1. The plasmid pBRG1310.

5,316,947
SYNTHETIC ISOHIRUDINS WITH IMPROVED STABILITY

Peter Crause, Offenbach; Paul Habermann, Eppstein am Taunus; Dominique Tripier, Eppstein am Taunus; Wolfgang Ulmer, Eppstein am Taunus, and Gerhard Schmid, Munich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 985,110, Dec. 3, 1992. This application Jul. 29, 1993, Ser. No. 99,053

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1991, 4140381

Int. Cl.^{5} C12N *15/12, 15/63, 15/20, 15/81*

U.S. Cl. 435—320.1 **2 Claims**

1. A vector which codes for an isohirudin with the following amino acids

Glu at position 33
Gln, Glu, Asn or Asp at position 52
Glu at position 53
Gly or Ala at position 54
Asp or Glu at position 55 (SEQ ID NO. 3).

5,316,948
N^4-METHYL-2′-DEOXYCYTIDINE 5′-TRIPHOSPHATE AND ITS USE IN POLYMERASE-CATALYZED NUCLEIC ACID SYNTHESES

Reynaldo Pless, Gaithersburg, Md., assignor to Life Technologies, Inc., Gaithersburg, Md.

Filed Sep. 4, 1992, Ser. No. 941,370

Int. Cl.^{5} C12P *19/34;* **C07H** *19/06, 19/073*

U.S. Cl. 435—91.2 **6 Claims**

3. In a method of dideoxy DNA sequencing by primer extension comprising the steps of annealing a primer to a template and extending the primer wherein the reaction mixture comprises a DNA polymerase, a mixture of deoxynucleoside triphosphates and a chain-terminating nucleoside triphosphate, and wherein the improvement comprises substituting N^4-methyl-2′-deoxycytidine 5′-triphosphate for deoxycytidine 5′-triphosphate.

5,316,949
METHOD OF DETECTING THE PERMEABILITY OF AN OBJECT TO OXYGEN

Christopher Bull, Bethesda, Md., and Charles R. Barmore, Moore, S.C., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Dec. 10, 1992, Ser. No. 988,511

Int. Cl.^{5} G01N *31/00*

U.S. Cl. 436—5 **9 Claims**

1. A method of detecting the permeability of an article to oxygen, comprising the steps of:

dispersing a redox indicator in a carrier;
placing the article on the carrier;
removing residual oxygen from the carrier and the article;
photoreducing the redox indicator;
exposing the article to oxygen;

exposing the redox indicator to light for visualization of redox changes to determine the permeability of the article to oxygen.

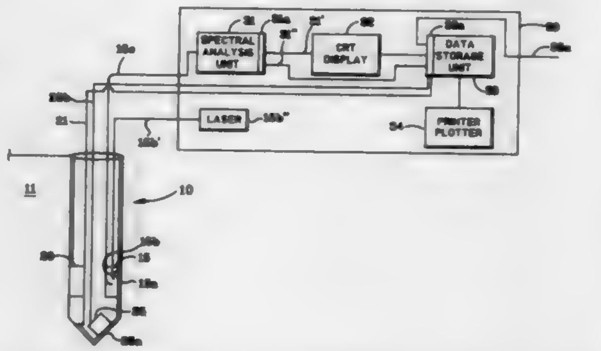
5,316,950
METHOD FOR QUANTITATIVE CALIBRATION OF IN SITU OPTICAL CHEMICAL MEASUREMENTS IN SOILS USING SOIL CLASS AND CHARACTERISTICS

Sabine E. Apitz, San Diego, and Stephen H. Lieberman, La Mesa, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1993, Ser. No. 10,024

Int. Cl.^{5} G01N *33/24, 21/64*

U.S. Cl. 436—28 **2 Claims**



1. A method for the in situ quantification of chemicals of interest in a soil sample by optical methods comprising:

determining optical chemical response factors for chemicals of interest which are added in known amounts to discrete soil matrices (types) and conditions (moisture content, for example) under controlled laboratory conditions to provide predetermined optical chemical response factor reference signals;
coupling said predetermined optical chemical response factor reference signals to a processor having the capability to store said predetermined optical chemical response factor reference signals therein;
providing a combination probe having an optical chemical sensor having the capability to produce chemical sensor signals representative of a chemical of interest in said soil sample and further having a strain gauge sensor having the capability to produce strain gauge signals representative of soil type of said soil sample;
inserting said combination probe into said soil sample;
producing said chemical sensor signals in said optical chemical sensor and said strain gauge signals in said strain gauge sensor, simultaneously and in parallel;
transmitting said chemical sensor signals and said strain gauge signals to said processor; and
correlating said chemical sensor signals and said strain gauge signals with said predetermined optical chemical response factor reference signals in said processor to provide said in situ quantification of said chemicals of interest in said soil

sample, said correlating involving the use of said strain gauge signals representative of said soil type of said soil sample to select a chemical response factor from said predetermined optical chemical response factor reference signals, said chemical response factor being indicative of a chemical of interest in a particular soil type of said soil sample, to provide said in situ quantification of said chemicals of interest from said chemical sensor signals of said soil sample.

5,316,951

METHOD FOR THE IMPROVED DETERMINATION OF WHITE BLOOD CELL SUBPOPULATIONS

Edward L. Carver, Jr.; Diane D. Carver, both of 18 Lisa Dr., Oxford, Conn. 06483, and Mary P. Skiptunas, 36 High St., Naugatuck, Conn. 06770

Division of Ser. No. 711,965, Jun. 7, 1991. This application Jul. 22, 1993, Ser. No. 94,709

Int. Cl.^{5} G01N *1/28*

U.S. Cl. 436—63 **13 Claims**

1. A method for differentiating white blood cells in a particle analyzer into at least three subpopulations comprising the steps of:

(A) supplying a whole blood sample, a volume of blood diluent and a volume of a lytic reagent composition to a particle analyzing system;

(B) rapidly admixing in the particle analyzing system the whole blood sample, the blood diluent and the lytic reagent composition in a manner sufficient to enable the differentiation of at least three subpopulations of white blood cells; and

(C) analyzing the resulting mixture in the particle analyzing system to effect at least a three component differential separation of white blood cells;

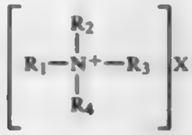
wherein the lytic reagent composition comprises:

an aqueous solution of active lytic reagents selected from the group consisting of

(a) an admixture of at least one group (A) aliphatic quaternary ammonium compound with at least one group (B) aromatic, heterocyclic or zwitterionic quaternary ammonium compound;

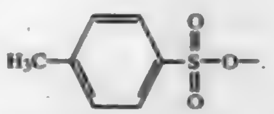
(b) an admixture of at least one group (A).aliphatic quaternary ammonium compounds with at least one group (C) heterocyclic quaternary ammonium compound; and

(c) an admixture of at least one group (C) heterocyclic quaternary ammonium compound with at least one group (B) aromatic, heterocyclic or zwitterionic quaternary ammonium compound; wherein the group (A) quaternary ammonium compound is represented by the formula:

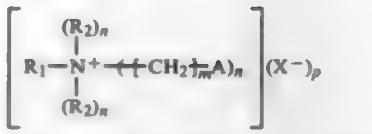


$$\left[R_1-\overset{\overset{R_2}{|}}{\underset{\underset{R_4}{|}}{N^+}}-R_3\right]X^-$$

wherein R_1 is a long chain alkyl group containing from 10 to 20 carbon atoms, R_2, R_3 and R_4 are short chain alkyl groups containing form 1 to 6 carbon atoms, and X is an ion selected from the group consisting of halide, sulfate, phosphate nitrate ions, and

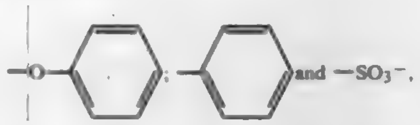


the group (B) quaternary ammonium compound is represented by the formula:



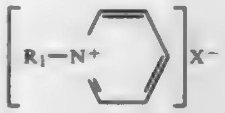
$$\left[R_1-\overset{\overset{(R_2)_n}{|}}{\underset{\underset{(R_2)_n}{|}}{N^+}}-(-(CH_2)_m-A)_n\right](X^-)_p$$

in which R_1 is a long chain alkyl group comprising from 8 to 20 carbon atoms, R_2 is an alkyl group containing 1 to 6 carbon atoms, m is an integer from 1 to 4, A is a radical selected from the group consisting of:



n is an integer from 0 to 1, such that when n=0, the remaining (N) bonds form part of a heterocyclic ring, X is an ion selected from the group consisting of halide, phosphate, sulfate and nitrate ions and p is an integer from 0 to 1;

the group (C) quaternary ammonium compound is represented by the formula



wherein R_1 is a long chain alkyl radical comprising from 10 to 20 carbon atoms, and X is an ion selected from the group consisting of halide, sulfate, phosphate and nitrate ions;

wherein the individual quaternary ammonium compound components of said lytic reagent are present in a ratio and quantity sufficient to effect at least a three component differential separation of white blood cells.

5,316,952

BLOOD SAMPLE APPARATUS AND METHOD

Owen D. Brimhall, South Jordan, Utah, assignor to Technical Research Associates, Inc., Salt Lake City, Utah

Filed Feb. 15, 1991, Ser. No. 656,562

Int. Cl.^{5} G01N *33/86*

U.S. Cl. 436—70 **14 Claims**

1. A capillary tube carrier apparatus for individually handling a sample of blood and determining the hematocrit of the sample of blood by centrifugation, said capillary tube carrier being transportable from place to place and comprising:

a basal element having an upper end and a lower end;

a capillary channel formed in said basal element between said upper end and said lower end, said capillary channel having an entrance adjacent said upper end;

an overflow reservoir adjacent said entrance to said capillary channel, said overflow reservoir being in fluid communication with said capillary channel at said entrance and extending transversely to said capillary channel to provide an increased surface area in comparison with the cross sectional area of said capillary channel;

a chamber formed adjacent said upper end for receiving a sample of blood, said chamber being in alignment with and in fluid communication with said capillary channel through said entrance;

blotter means in said chamber, said blotter means comprising an absorbent material for releasably receiving the sample of blood;

a transparent overlay for said basal element, said transparent overlay enclosing said capillary channel to form a capillary tube while selectively covering said chamber; and

centrifugation means for forcing the sample of blood from

said blotter means in said chamber through said entrance into said capillary tube and separating red blood cells from plasma in the sample of blood to provide a hematocrit of the sample of blood, said overflow reservoir receiving surplus blood from the sample of blood after said capillary tube has been filled.

5,316,953

SCREENING METHOD FOR DETECTING FETAL CHROMOSAL ABNORMALITIES

James N. Macri, 170 Sidney St., Oyster Bay, N.Y. 11771

Continuation-in-part of Ser. No. 360,603, Jun. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 349,373, May 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 311,808, Feb. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 297,481, Jan. 17, 1989, abandoned. This application Apr. 14, 1992, Ser. No. 868,160

Int. Cl.^{5} G01N *33/49, 33/493*

U.S. Cl. 436—87 **7 Claims**

1. A method for screening a pregnant woman to determine if said pregnant woman's risk of carrying a fetus with Down syndrome warrants further testing comprising:

selecting a risk cut-off level that will determine whether said pregnant woman should be offered further testing;

assigning a prior risk level for said pregnant woman's risk of carrying a fetus with Down syndrome;

measuring said pregnant woman's blood during the first trimester of pregnancy for free beta (human chorionic gonadotropin (HCG) level; and

comparing said level of free beta (HCG) to a set of reference data, containing reference values of the blood level of free beta (HCG) during the first trimester of pregnancy in: (1) pregnant women carrying Down syndrome fetuses and (2) pregnant women carrying normal fetuses said comparison in conjunction with said prior risk being indicative of whether said pregnant woman's risk of carrying a fetus with Down syndrome is greater than the selected risk cut-off level wherein a higher level of free beta (HCG) is indicative of a higher probability of carrying a fetus with Down syndrome.

5,316,954

METHODS AND APPARATUS FOR PROCESSING LIQUIDS

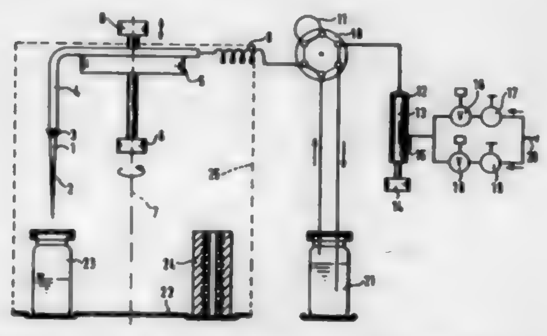
Klaus-Peter Hupe, Baden-Baden; Fred Strohmeier, Rheinmuenster; Hans-Peter Zimmermann, Karlsbad, and Werner Eberhardt, Ueberherrn, all of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 687,178, Apr. 18, 1991, abandoned. This application Nov. 5, 1992, Ser. No. 972,077

Claims priority, application European Pat. Off., Jul. 9, 1990, 90113068.2

Int. Cl.^{5} G01N *33/00*

U.S. Cl. 436—89 **19 Claims**



13. A method for stepwise performance of chemical reactions, comprising the steps of:

metering in a first direction a first solution containing a first chemical compound from a source of said first solution into a second end of a hollow, open-ended reactor compartment that is detachably coupled at a first end with a first end of a tube system;

detaching said reactor compartment containing said first chemical compound from said first end of said tube system;

metering in said first direction a second solution containing a second chemical compound from a source of said second solution into said first end of said tube system;

reattaching said reactor compartment containing said first chemical compound to said first end of said tube system; and

metering in a second direction opposite from said first direction said second solution contained in said tube system into said reactor compartment through said first end of said reactor compartment which is attached to the first end of the tube system, thereby causing said second chemical compound to come into contact and react with said first chemical compound in said reactor compartment.

5,316,955

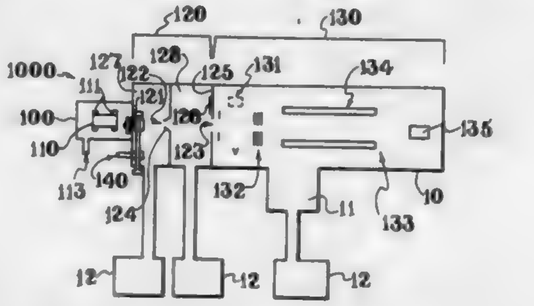
FURNACE ATOMIZATION ELECTRON IONIZATION MASS SPECTROMETRY

Steven W. Govorchin, 360 Owl Dr., Louisville, Colo. 80027

Filed Jun. 14, 1993, Ser. No. 76,537

Int. Cl.^{5} G01N *1/00*

U.S. Cl. 436—155 **18 Claims**



15. A method of elemental analysis comprising steps of

(A) providing a furnace atomization electron ionization mass spectra (FA-EI-MS) instrument, which contains a vacuum housing, attachable external to the vacuum housing a resistively heatable sample atomization chamber where a sample can be introduced and at least a part of the sample can be atomized under a blanket of an inert gas, in communication with a first interior region of the vacuum housing where at least a part of a sample atomized in said chamber can be introduced, pass through, and be directed toward a second interior region of the vacuum housing, said first region being in communication with said second interior region where at least a part of the atomized sample can pass through and be influenced by collision with a beam of electrons from an electron gun in said second region for ionizing at least a part of the atomized sample, and where at least a part of the ionized sample can further pass, be accelerated towards by means of an electric potential, and optionally be influenced by a magnetic field of and be detected by a mass filter, said first and second regions being generally under vacuum, there being an inert gas inlet attachable onto openable into the vacuum housing for introduction of inert gas when atomized sample is not being introduced into said first region, and there being a control attachable to the vacuum housing for introduction of atomized sample into said first region, such that when atomized sample is not being introduced into the vacuum housing inert gas is introduced through the inert gas inlet and when atomized sample is being introduced into the vacuum housing inert gas flow is cut off so as to create opposing flows of sample and inert gas so as to minimize pressure change in the FA-EI-MS instrument when contents of the furnace are introduced therein;

(B) providing a sample and introducing it into the resistively heatable sample atomization chamber at a temperature about or below room temperature;

(C) rapidly heating the resistively heatable sample atomization chamber to a suitable temperature, which can include to a temperature of up to about 3000 degrees Celsius, under an inert gas blanket such that at least a part of the sample becomes atomized, while introducing a small stream of pure inert gas through the inert gas inlet into the FA-EI-MS instrument;

(D) introducing atomized sample into said first region of the FA-EI-MS instrument such that it passes therethrough and into said second region where at least a part of it is ionized by the electron gun, in said second region accelerated towards by means of the electric potential and influenced by the mass filter, and detected, while stopping the small stream of pure inert gas from entering into the FA-EI-MS instrument, and

(E) analyzing the results.

5,316,956

METHOD FOR MANUFACTURING SEMICONDUCTOR LIGHT-RECEIVING ELEMENTS

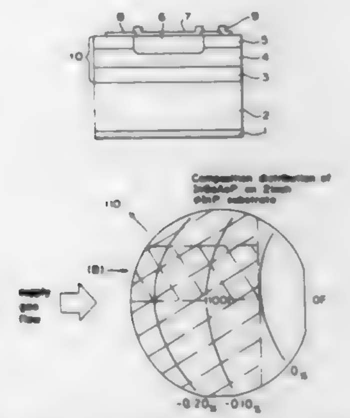
Takashi Iwasaki; Yasuhiro Iguchi, and Naoyuki Yamabayashi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 1, 1993, Ser. No. 11,747

Claims priority, application Japan, Feb. 7, 1992, 4-22954

Int. Cl.⁵ H01L *31/18*

U.S. Cl. 437—5 **11 Claims**



1. A method of manufacturing semiconductor light-receiving elements comprising the steps of;

forming an epitaxial layer including a light-receiving layer composed of at least In, Ga, and As on an N-InP substrate by supplying at least In gas, Ga gas, and As gas to a surface of the n-InP substrate from a gas supply side of a container accommodating the n-InP substrate;

forming a p-type layer in the configuration of a floating island by thermally diffusing a p-type impurity into the light-receiving layer; and

separating the n-InP substrate on which the p-type layer has been formed into semiconductor light-receiving elements so that the separation of the n-InP substrate into semiconductor light-receiving elements is carried out only in a region in which a lattice mismatch ratio Δa/a of the light-receiving layer to InP, that linearly changes from the gas supply side of the container to a downstream side thereof, is substantially within a range of −0.20% to 0%, wherein

$$\Delta a/a =$$

-continued

$$\frac{\left\{\left(\begin{matrix}\text{lattice constant of the}\\ \text{light-receiving layer}\end{matrix}\right)-\left(\begin{matrix}\text{lattice constant}\\ \text{of InP}\end{matrix}\right)\right\}}{(\text{lattice constant of InP})}\times 100\%.$$

5,316,957

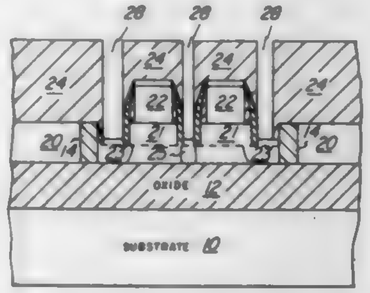
METHOD OF FORMING A RECESSED CONTACT BIPOLAR TRANSISTOR

David B. Spratt, Plano; Robert L. Virkus, Dallas; Robert H. Eklund, and Eldon J. Zorinsky, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 431,270, Nov. 3, 1989, abandoned, which is a division of Ser. No. 149,785, Jan. 29, 1988, Pat. No. 4,897,703. This application Jun. 30, 1993, Ser. No. 85,676

Int. Cl.⁵ H01L *21/265*

U.S. Cl. 437—31 **16 Claims**



1. A method for forming a transistor, comprising the steps of:

forming a base region of a first conductivity type in the upper portion of a semiconductor substrate, the remaining portion of said semiconductor substrate forming a collector region of a second conductivity type;

forming a base region of a first conductivity type in the upper portion of a semiconductor substrate, the remaining portion of said semiconductor substrate forming a collector region of a second conductivity type;

forming an emitter region in a layer of semiconductor material doped to said second conductivity type overlying said base region;

forming recesses in said base region at locations laterally spaced from said emitter region, said recesses formed by:

(a) forming an insulating layer on the surface of said layer of semiconductor material;

(b) forming a sidewall insulator on the side portions of said layer of semiconductor material; and

(c) etching recesses through at least a major portion of said base region at locations adjacent to said sidewall insulator;

introducing impurities of said first conductivity type in selected ones of said recesses to form a base contact region adjacent to said base region; and

introducing impurities of said second conductivity type in other ones of said recesses at locations laterally spaced from said base contact region to form a collector contact region adjacent to said semiconductor substrate.

5,316,958

METHOD OF DOPANT ENHANCEMENT IN AN EPITAXIAL SILICON LAYER BY USING GERMANIUM

Bernard S. Meyerson, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

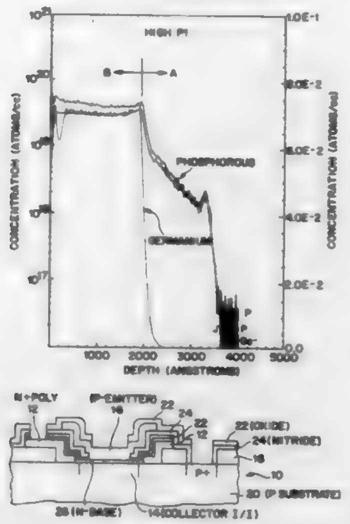
Filed May 31, 1990, Ser. No. 531,218

Int. Cl.⁵ H01L *21/20, 21/265*

U.S. Cl. 437—31 **25 Claims**

1. A method for depositing an in-situ doped n-type silicon

layer onto a substrate which comprises providing the substrate in a chemical vapor deposition reaction zone wherein the temperature in said reaction zone is about 800° C. or less and the base pressure in said zone is an ultrahigh vacuum; and introducing a gas containing silicon into said reaction zone for



the deposition of silicon on said substrate, and simultaneously therewith introducing an n dopant-containing gas and a germanium-containing gas in an amount effective for enhancing the in-situ incorporation of said n-type dopant into said silicon layer as an electronically active dopant, wherein the silicon layer contains 35 atomic percent or less of Germanium.

5,316,959

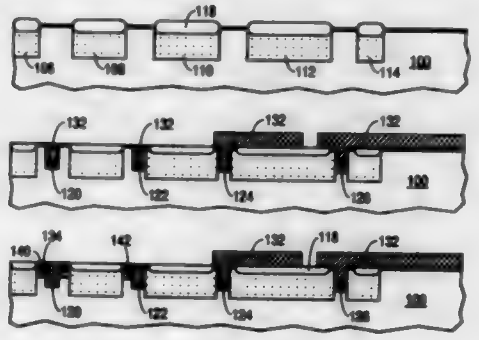
TRENCHED DMOS TRANSISTOR FABRICATION USING SIX MASKS

Sze-Hon Kwan, San Francisco; Fwu-Iuan Hshieh, San Jose; Mike F. Chang, Cupertino; Yueh-Se Ho, Sunnyvale, and King Owyang, Atherton, all of Calif., assignors to Siliconix, Incorporated, Santa Clara, Calif.

Filed Aug. 12, 1992, Ser. No. 928,909

Int. Cl.⁵ H01L *21/336*

U.S. Cl. 437—40 **8 Claims**



1. A method for forming a field effect transistor comprising:

providing a semiconductor substrate having a principal surface and being of a first conductivity type;

forming a patterned mask layer on the principal surface;

doping semiconductor regions of a second conductivity type in the portions of the substrate exposed by the mask layer, thereby forming deep body regions of the transistor;

growing an oxide layer on the portions of the principal surface exposed by the mask layer;

forming a plurality of trenches in the substrate;

forming a layer of conductive material in the trenches and over at least a part of the oxide layer, the portion of the conductive material layer in the trenches being a gate of the transistor;

forming doped first regions of the second conductivity type in the substrate extending from the portions of the principal surface not covered by the oxide layer or the layer of conductive material into the substrate;

forming doped second regions of the first conductivity type extending from the unmasked portions of the principal surface into the substrate, the first and second doped regions respectively being body and source regions of the transistor;

forming a patterned insulating layer overlying the principal surface and the conductive material layer; and

forming a patterned interconnect layer overlying the principal surface and over the patterned
insulating layer and contacting the deep body, body,
and source regions, and the gate electrode.

5,316,960

C-MOS THIN FILM TRANSISTOR DEVICE MANUFACTURING METHOD

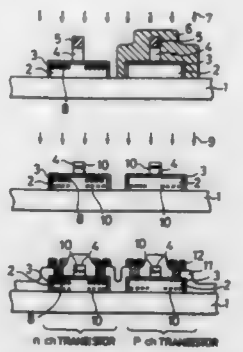
Hirofumi Watanabe, Miki, and Noriyuki Terao, Sendai, both of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics Co., Ltd., Natori, both of Japan

Continuation-in-part of Ser. No. 824,552, Jan. 23, 1992, abandoned, which is a division of Ser. No. 550,154, Jul. 9, 1990, abandoned. This application Jun. 17, 1993, Ser. No. 78,409

Claims priority, application Japan, Jul. 11, 1989, 1-178716

Int. Cl.⁵ H01L *21/265*

U.S. Cl. 437—40 **12 Claims**



1. A method for manufacturing a C-MOS thin film transistor device, comprising the steps of:

forming a first semiconductor thin film layer of intrinsic polysilicon on an insulating substrate;

etching said formed first semiconductor thin film layer to thereby form a first source-drain section for an n-channel transistor and a second source-drain section for a p-channel transistor on said insulating substrate;

thermally oxidizing said first and second source-drain sections to thereby form a thermal oxide film on a surface of each of said first and second source-drain sections;

depositing intrinsic polysilicon on said thermal oxide film and an exposed insulating substrate to thereby form a second semiconductor thin film layer of the intrinsic polysilicon on said thermal oxide film and said exposed insulating substrate;

etching said formed second semiconductor thin film layer by a photolithography etching technique, thereby forming a first gate electrode on a part of said thermal oxide film corresponding to an upper surface of said first source-drain section and a second gate electrode on a part of said thermal oxide film corresponding to an upper surface of said second source-drain section, said first gate electrode and said second gate electrode each having on an upper surface thereof a photoresist layer used to pattern said first and second gate electrodes;

masking said second source-drain section, said second gate electrode and said photoresist layer on said second gate electrode with a resist layer;

implanting an n-type impurity into an upper layer portion of said first source-drain section composed of said intrinsic polysilicon while controlling implantation energy of said n-type impurity;

removing said photoresist layer on said first gate electrode, said resist layer formed on said second source-drain section and said second gate electrode, and said photoresist layer on said second gate electrode by an oxygen plasmaashing method;

implanting a p-type impurity respectively into a lower layer portion of said first source-drain section whose upper layer portion has been implanted with said n-type impurity, a lower layer portion of said second source-drain section composed of said intrinsic polysilicon, said first gate electrode composed of said intrinsic polysilicon and said second gate electrode composed of said intrinsic polysilicon, while controlling implantation energy of said p-type impurity; and

heating an assembly of said n-channel transistor and said p-channel transistor at a predetermined temperature in an inactive atmosphere to thereby activate said implanted n-type and p-type impurities.

5,316,961

FLOATING GATE TYPE ERASABLE AND PROGRAMABLE READ ONLY MEMORY CELL, METHOD OF MAKING THE SAME, AND ELECTRICALLY ERASING AND WRITING METHOD

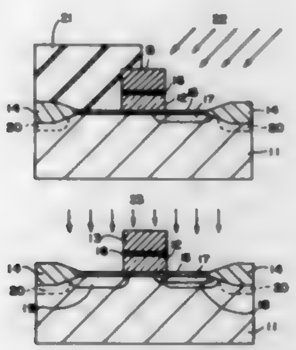
Takeshi Okazawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 13, 1991, Ser. No. 791,435

Claims priority, application Japan, Nov. 14, 1990, 2-307687

Int. Cl.⁵ H01L *21/265*

U.S. Cl. 437—43 **4 Claims**



1. A method of making a floating gate type electrically erasable and programable read only memory cell comprising the steps of:

preparing a semi-finished product built in a semiconductor substrate of one conductivity type and isolated by an isolation area with an underlying channel stopper extending on the bottom surface of said isolation area, said semi-finished product comprising a first gate insulating film on the top surface of said semiconductor substrate, a floating gate on said first gate insulating film with a second gate insulating film applied to the top surface of said floating gate, and a control gate on said second gate insulating film;

covering the top surface of said semiconductor substrate except for a selected area under which a composite drain diffusion layer is to be formed;

injecting ions of an impurity of said one conductivity type at a given acute angle with respect to the normal line which is perpendicular to the major surface of said semiconductor substrate to form a first impurity-diffusion region of said one conductivity type in said semiconductor substrate;

removing the covering material to expose the whole area of the top surface of said semiconductor substrate;

injecting ions of an impurity of the other conductivity type perpendicular to the major surface of said semiconductor substrate to form a source diffusion layer and at the same time, a drain region in said semiconductor substrate, said ions of an impurity of the other conductivity type having increased acceleration energy and density compared with said ions of an impurity of said one conductivity type.

5,316,962

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE HAVING TRENCH CAPACITORS AND VERTICAL SWITCHING TRANSISTORS

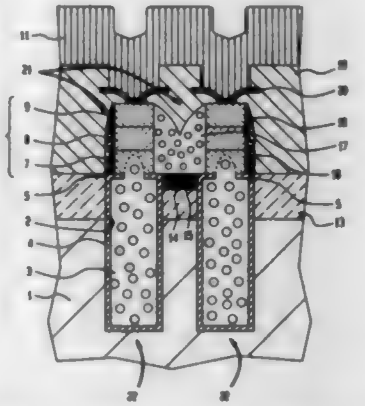
Naoto Matsuo, Ibaraki; Shozo Okada, Kobe, and Michihiro Inoue, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 731,420, Jul. 17, 1991, Pat. No. 5,181,089, which is a continuation-in-part of Ser. No. 565,049, Aug. 9, 1990, abandoned. This application Aug. 6, 1992, Ser. No. 926,847

Claims priority, application Japan, Aug. 15, 1989, 1-209646

Int. Cl.⁵ H01L *21/70, 27/00*

U.S. Cl. 437—52 **2 Claims**



1. A method for producing a semiconductor memory device having a plurality of trench capacitors and a plurality of switching transistors electrically connected to said trench capacitors, comprising the steps of: forming a plurality of trenches in a semiconductor substrate of a first conductivity type; forming a capacitor insulating film on the side portion of each of said trenches; filling said trenches with electrically conductive materials containing impurities of the first conductivity type; covering the upper face of each of said electrically conductive materials embedded in the trenches with an insulating film having an opening therein; growing a first epitaxial layer of the first conductivity type on said insulating film by the lateral epitaxial growth technique, said first epitaxial layer acting as a source region of each of said switching transistors; growing a second epitaxial layer of a second conductivity type on said first epitaxial layer, said second conductivity type being opposite to the first conductivity type and said second epitaxial layer acting as a channel region of each of said switching transistors; growing a third epitaxial layer of the first conductivity type on said second epitaxial layer, said third epitaxial layer acting as a drain region of each of said switching transistors; and forming a polycrystalline silicon layer containing impurities of the second conductivity type on said semiconductor substrate, the polycrystalline silicon layer being in contact with said first, second and third epitaxial layers.

5,316,963

METHOD FOR PRODUCING SEMICONDUCTOR DEVICE

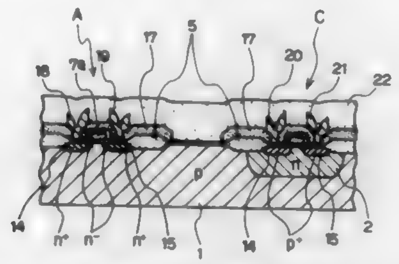
Mitsuo Kojima, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Mar. 25, 1993, Ser. No. 36,726

Claims priority, application Japan, Apr. 28, 1992, 4-110049

Int. Cl.⁵ H01L *21/70*

U.S. Cl. 437—52 **3 Claims**



1. A method for producing a semiconductor read only memory device having read only memory (ROM) cells and peripheral CMOS transistors, wherein a memory state for each of the read only memory cells is determined using a semiconductor device having flash memory cells and peripheral CMOS transistors,

the method comprising the steps of:

(a) forming a well in a semiconductor substrate for each peripheral transistor formation portion;

(b) forming an oxide film for device isolation;

(c) forming a channel stop region;

(d) performing ion implantation to ROM cell portions for low-threshold voltage adjustment;

(e) performing ion implantation to the ROM cell portions for high-threshold voltage adjustment;

(f) forming a gate electrode in each of the ROM cell portions and in each of the peripheral transistor formation portions;

(g) performing ion implantation using the gate electrode as a mask to form a lightly-doped drain;

(h) forming side walls on the gate electrode of each of transistors, and forming a source region and a drain region for each of p-channel transistors and of n-channel transistors;

(i) forming a contact hole extending through an insulating film covering each of the source and drain regions; and

(j) providing an electrode film to the contact hole,

wherein a major part of the steps utilizing masks used for manufacturing the semiconductor device having flash memory cells are used in common for manufacturing the semiconductor device having read only memory cells.

5,316,964

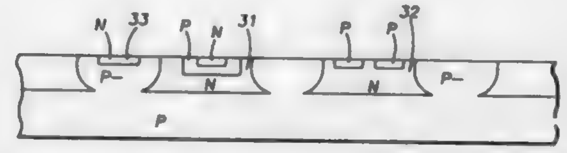
METHOD OF FORMING INTEGRATED CIRCUITS WITH DIFFUSED RESISTORS IN ISOLATION REGIONS

William H. Gross, Santa Clara County, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Continuation of Ser. No. 708,173, May 31, 1991, abandoned. This application Dec. 8, 1992, Ser. No. 988,342

Int. Cl.⁵ H01L *21/70*

U.S. Cl. 437—60 **9 Claims**



1. A method of forming a semiconductor device having a diffused resistor, said method comprising the steps of:

a) epitaxially growing at least one semiconductor region of one conductivity type on a substrate of opposite conductivity type;

b) diffusing dopants of said opposite conductivity type into said epitaxially grown semiconductor layer so as to form a lightly doped surface isolation region in which is formed at least one diffused resistor, said isolation region being formed so as to extend through said epitaxial layer to isolate areas of said one conductivity type; and

c) diffusing dopants of said one conductivity type into said lightly doped surface region of said isolation region to form said at least one diffused resistor.

5,316,965

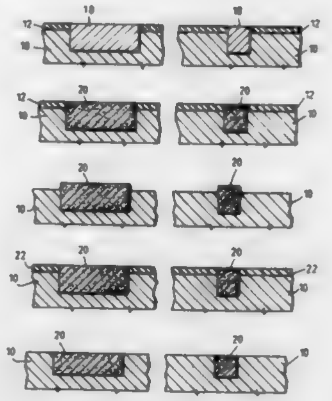
METHOD OF DECREASING THE FIELD OXIDE ETCH RATE IN ISOLATION TECHNOLOGY

Ara Philipossian, Redwood Shores, Calif.; Hamid R. Soleimani, Westborough, and Brian S. Doyle, Framington, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 29, 1993, Ser. No. 99,136

Int. Cl.⁵ H01L *21/76*

U.S. Cl. 437—70 **23 Claims**



1. A method of selectively retarding the etch rate of field oxide without retarding the etch rate of sacrificial oxide layer in the fabrication of semiconductors devices, comprising:

forming a field oxide layer on select locations of a semiconductor substrate surface;

implanting nitrogen ions into the field oxide layer;

thermally annealing the nitrided field oxide layer;

forming a sacrificial oxide layer on the semiconductor substrate surface; and

etching select areas of the sacrificial oxide layer.

5,316,966

METHOD OF PROVIDING MASK ALIGNMENT MARKS

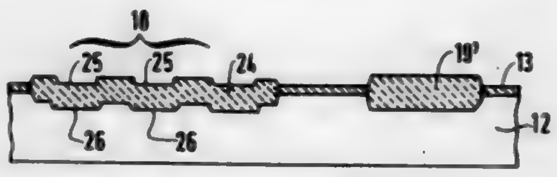
Paulus A. Van Der Plas; Herbert Lifka, and Robertus D. J. Verhaar, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 765,758, Sep. 26, 1991, abandoned. This application Aug. 3, 1993, Ser. No. 101,797

Claims priority, application France, Sep. 28, 1990, 90 11979

Int. Cl.⁵ H01L *21/302*

U.S. Cl. 437—70 **6 Claims**



1. A method of providing mask alignment marks on an active surface of a semiconductor substrate, in which first at least one layer of a material resistant to oxidation is formed on this active

surface, after which by a local etching of this layer, zones for isolation by a thick oxide, designated as a field oxide, are defined simultaneously with the alignment marks, and during a later step the zones for the isolation by field oxide and said alignment marks thus defined are subjected to a thermal oxidation, the remainder of the active surface being protected from oxidation by a remaining part of the layer of anti-oxidation material, wherein, after the local etching of the layer of anti-oxidation material and while utilizing the remaining parts of the anti-oxidation layer as a selective mask, substantially flat-bottomed depressions are formed at the surface of the substrate having a given depth at least at locations which contain the alignment marks, which locations are designated as alignment windows, the surface of the substrate is then exposed within said windows, and finally a thermal oxidation step is effected for forming the field oxide, during which the alignment marks are simultaneously covered by an oxide layer of uniform thickness.

5,316,967

METHOD FOR PRODUCING SEMICONDUCTOR DEVICE

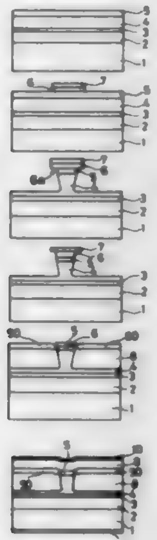
Nobuaki Kaneno; Hirotaka Kizuki; Norio Hayafuji; Tetsuo Shiba, and Hitoshi Tada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1992, Ser. No. 975,109

Claims priority, application Japan, Jan. 21, 1992, 4-31379; May 13, 1992, 4-148262

Int. Cl.^{5} H01L *21/20*

U.S. Cl. 437—105 **13 Claims**



1. A method for producing a semiconductor device comprising:

epitaxially growing a first semiconductor layer on a semiconductor substrate;

forming an insulating film pattern on said first semiconductor layer;

removing portions of said first semiconductor layer by wet etching using said insulating film pattern as a mask to leave a ridge having a reverse mesa shape;

removing opposite end portions of said insulating film pattern by etching to reduce the width of said insulating film pattern to approximately the width of said ridge;

epitaxially growing a second semiconductor layer on said first semiconductor layer on opposite sides of said ridge;

removing said insulating film pattern; and

epitaxially growing a third semiconductor layer on said ridge and said second semiconductor layer.

5,316,968

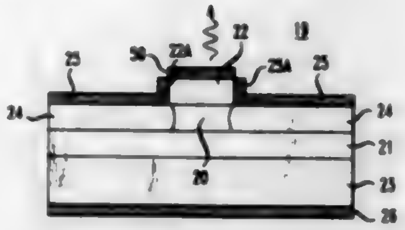
METHOD OF MAKING SEMICONDUCTOR SURFACE EMITTING LASER

Kent D. Choquette, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 857,352, Mar. 25, 1992, Pat. No. 5,212,702. This application Feb. 11, 1993, Ser. No. 16,399

Int. Cl.^{5} H01L *21/20*

U.S. Cl. 437—105 **10 Claims**



1. A method for making a semiconductor device comprising an active region peripherally surrounded with metal comprising the steps of:

providing a semiconductor substrate;

growing on said substrate an active layer for forming said active region;

growing a resistive layer overlying said active layer;

etching away a portion of said resistive layer peripherally surrounding said active region in a reduced pressure environment thereby exposing a lateral edge of said resistive layer; and

without exposing the etched substrate to atmosphere, covering with metal the etched surface of said substrate including said lateral edge of said resistive layer.

5,316,969

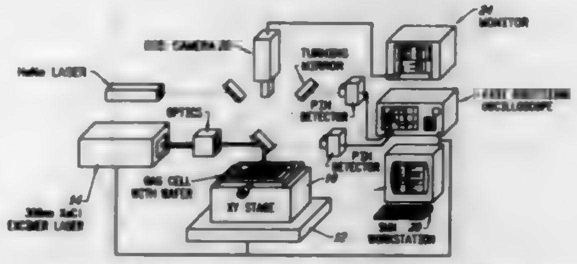
METHOD OF SHALLOW JUNCTION FORMATION IN SEMICONDUCTOR DEVICES USING GAS IMMERSION LASER DOPING

Emi Ishida, Stanford, Calif.; Thomas W. Sigmon, Hillsboro, Oreg., and William T. Lynch, Apex, N.C., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 21, 1992, Ser. No. 993,788

Int. Cl.^{5} H01L *21/223*

U.S. Cl. 437—168 **19 Claims**



1. A method of doping a surface region in a surface of a semiconductor body comprising the steps of

(a) masking said surface with a reflective material with said surface region exposed,

(b) immersing said semiconductor body in an atmosphere including a dopant, with said surface adsorbing dopant atoms, and

(c) irradiating said surface with a pulsed radiation beam of sufficient intensity to drive into said surface region atoms of said dopant without melting said semiconductor body, said dopant atoms being replenished on said surface between laser pulses.

5,316,970

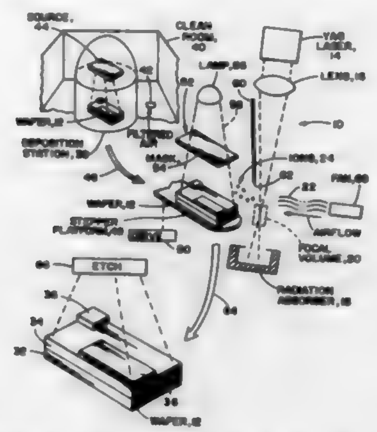
GENERATION OF IONIZED AIR FOR SEMICONDUCTOR CHIPS

John S. Batchelder, Tarrytown, N.Y.; Vaughn P. Gross, St. Albans; Robert A. Gruver, Essex Junction, both of Vt.; Philip C. D. Hobbs, Ossining, N.Y., and Kenneth D. Murray, Huntington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 571,805, Aug. 23, 1990, abandoned. This application Jun. 5, 1992, Ser. No. 895,181

Int. Cl.^{5} H05F *3/06*

U.S. Cl. 437—173 **16 Claims**



1. A method for generating contamination-free ionized air for discharging an object comprising:

illuminating a region of the air with radiation;

concentrating the radiation in a focal volume adjacent the object by directing rays of the radiation along converging paths which bypass the object, the concentrating providing sufficient intensity of radiation to ionize the air;

locating said focal volume at a side of the object to reduce illumination of a surface of the object by plasma in the focal volume, said step of locating including a locating of said focal volume adjacent an edge of the object to discharge the object by ions borne by the air; and

flowing the air past the object to bring ions of the ionized air in contact with charged regions on a surface of the object.

5,316,971

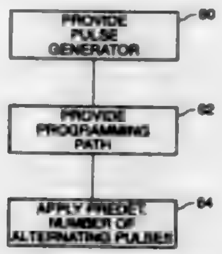
METHODS FOR PROGRAMMING ANTIFUSES HAVING AT LEAST ONE METAL ELECTRODE

Steve S. Chiang, Saratoga; Wenn-Jei Chen, Sunnyvale, and Esam Elashmawi, San Jose, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Filed Sep. 18, 1992, Ser. No. 947,103

Int. Cl.^{5} H01L *21/14, 21/306, 21/326, 21/465*

U.S. Cl. 437—170 **8 Claims**



1. A method for programming an antifuse including an antifuse material disposed between a lower electrode and an upper electrode, at least one of said lower and upper electrodes comprising a metal, said antifuse characterized by programming in response to a programming potential, comprising the steps of:

(1) providing an applied voltage equal to or greater than said programming potential and comprising a first applied voltage potential and a second applied voltage potential, said first applied voltage potential being more positive than said second applied voltage potential;

(2) applying, for a first time period, said applied voltage between said upper and lower antifuse electrodes, said first and second applied voltage potentials applied to said upper and lower electrodes with a first polarity orientation;

(3) applying, for a second time period, said applied voltage between said upper and lower antifuse electrodes, said first and second applied voltage potentials applied to said upper and lower electrodes with a second polarity orientation opposite to said first polarity orientation; and

(4) repeating steps (2) and (3) a number of times to form a read-disturb resistance filament between said upper and lower electrodes, between 1 and 1,000 times to form a read-disturb resistance filament between said upper and lower electrodes.

5,316,972

PROCESS FOR FORMING DEPOSITED FILM BY USE OF ALKYL ALUMINUM HYDRIDE AND PROCESS FOR PREPARING SEMICONDUCTOR DEVICE

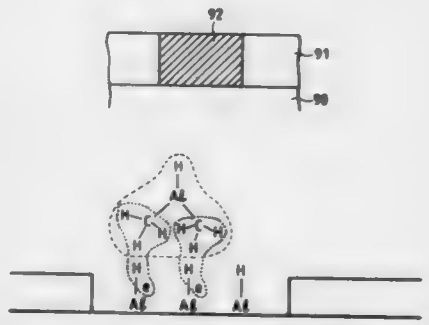
Nobuo Mikoshiba; Kazuo Tsubouchi, and Kazuya Masu, all of Sendai, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 588,548, Sep. 26, 1990, abandoned. This application Jun. 17, 1992, Ser. No. 899,940

Claims priority, application Japan, Sep. 26, 1989, 1-250022; Sep. 26, 1989, 1-250023; Jan. 16, 1990, 2-006559; Jan. 16, 1990, 2-006560

Int. Cl.^{5} H01L *21/285*

U.S. Cl. 437—187 **43 Claims**



1. A process for forming a deposited film comprising the steps of:

(a) providing a substrate having an electron donative surface in a space for formation of the deposited film,

(b) introducing a gas of an alkyl aluminum hydride into said space for formation of deposited film, and

(c) maintaining the temperature of said electron donative surface within the range of from the decomposition temperature of said alkyl aluminum hydride to 450° C. to form a metal deposit composed mainly of aluminum on said electron donative surface while varying the deposition speed of aluminum from a first deposition rate to a second deposition rate, wherein the first deposition rate is sufficiently lower than the second deposition rate to form an initial film having enhanced surface flatness with inhibited surface migration and wherein the second deposition rate is sufficiently higher than the first deposition rate to maximize layer formation and form a flat and high quality film at enhanced deposition speeds.

5,316,973

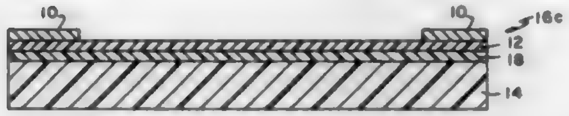
METHOD OF MAKING SEMICONDUCTING FERROELECTRIC PTCR DEVICES

Da Y. Wang, Lexington; Daniel T. Kennedy, Burlington; Thomas R. Middleton, Peabody, all of Mass., and Burton W. MacAllister, Hudson, N.H., assignors to GTE Control Devices Incorporated, Standish, Me.

Continuation of Ser. No. 782,856, Oct. 25, 1991, abandoned, which is a division of Ser. No. 693,494, Apr. 30, 1991, abandoned. This application Jan. 28, 1993, Ser. No. 10,503

Int. Cl.^{5} H01L *21/441*

U.S. Cl. 437—188 **14 Claims**



1. A method of making a PTCR device comprising the steps of:

providing a ferroelectric semiconductor having a Curie point and a bulk resistance;

providing a layer of electrically conducting material upon said ferroelectric semiconductor; and

heating said layer at a process temperature greater than said Curie point of the ferroelectric semiconductor for a period of time, and cooling said layer to ambient temperature at a cooling rate, said process temperature, time period, and cooling rate being selected to provide an ambient layer resistance greater than said bulk resistance of the ferroelectric semiconductor.

5,316,974

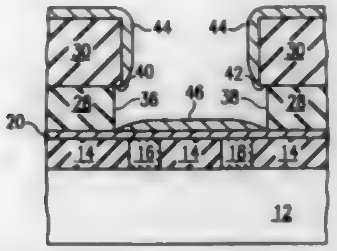
INTEGRATED CIRCUIT COPPER METALLIZATION PROCESS USING A LIFT-OFF SEED LAYER AND A THICK-PLATED CONDUCTOR LAYER

Sue E. Crank, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 286,549, Dec. 19, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 516,637

Int. Cl.^{5} H01L *21/00, 21/02, 21/44, 21/48*

U.S. Cl. 437—190 **12 Claims**



1. A method for forming a conductive structure in an integrated circuit, comprising the steps of:

forming a conductive barrier layer in conductive contact with components in a semiconductor substrate;

forming an insulating layer on said barrier layer;

forming a patterned layer on said insulating layer;

etching said insulating layer using said patterned layer as an etch mask, said etching exposing a portion of said barrier layer;

depositing a seed layer overall;

removing said patterned layer, thereby removing the portion of said seed layer deposited on said patterned layer; and

selectively forming a conductor on said seed layer.

5,316,975

METHOD OF FORMING MULTILEVEL INTERCONNECTIONS IN A SEMICONDUCTOR INTEGRATED CIRCUIT

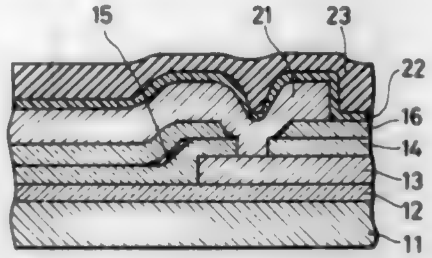
Akitoshi Maeda, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 21, 1992, Ser. No. 823,163

Claims priority, application Japan, Jan. 22, 1991, 3-005491

Int. Cl.^{5} H01L *21/441, 21/465*

U.S. Cl. 437—195 **12 Claims**



1. A method of forming multilevel interconnections in a semiconductor integrated circuit wherein electroconductive films are disposed adjacently with an insulating film sandwiched therebetween, said conductive films being connected to each other via a through-hole formed in said insulating film, said method comprising:

a first step of forming a first insulating film on a first electroconductive film;

a second step of forming a through-hole into said first insulating film, said through-hole reaching a surface of said first electroconductive film;

a third step of sputter etching to remove any extraneous material which may be existing on a surface of said first electroconductive film which is exposed into said through-hole;

a fourth step of forming a covering film on said first insulating film, said covering film being made of a material which is the same material that is used for forming a part of a second electroconductive film, that is closest to the covering film;

a fifth step of sputter etching to remove said covering film until extraneous material generated in said third step on said exposed surface of said first electroconductive film is fully removed and a surface of said first insulating film is fully exposed; and

a sixth step of forming said second electroconductive film on said surface of said first insulating film to electrically interconnect said second electroconductive film with said first electroconductive film via said through-hole.

5,316,976

CRATER PREVENTION TECHNIQUE FOR SEMICONDUCTOR PROCESSING

Haden J. Bourg, Jr., Roanoke; Jim A. McNelis, Arlington, both of Tex., and Peter Weiler, Palo Alto, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 8, 1992, Ser. No. 910,702

Int. Cl.^{5} H01L *21/31, 21/283*

U.S. Cl. 437—195 **10 Claims**

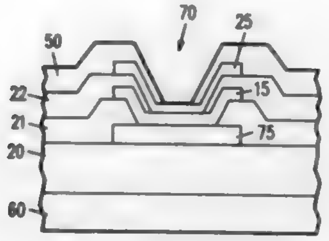
1. A process for forming a bond pad on an integrated circuit comprising the steps of:

forming a field oxide layer on a substrate at a bond pad site where said bond pad is to be formed;

forming an etch stop layer over said field oxide layer, said etch stop layer comprising nitride serving to inhibit erosion of said field oxide layer;

forming a first dielectric layer over said etch stop layer;

etching said first dielectric layer to remove said first dielectric over said bond pad site while not removing said etch stop layer; and



forming a first metal layer over said etch stop layer at said bond site.

5,316,977

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE COMPRISING METAL SILICIDE

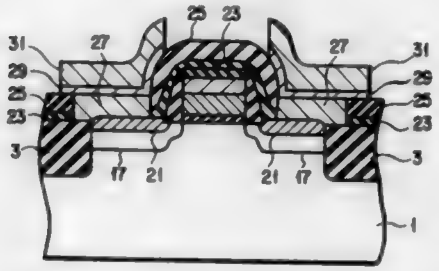
Iwao Kunishima, Kawasaki, and Kyoichi Suguro, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 16, 1992, Ser. No. 913,704

Claims priority, application Japan, Jul. 16, 1991, 3-175586; Jun. 29, 1992, 4-171094

Int. Cl.^{5} H01L *21/223, 21/225, 21/283*

U.S. Cl. 437—200 **13 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming an impurity diffusion layer of a second conductivity type on a semiconductor substrate of a first conductivity type,

forming a Ti compound layer containing a constituent element of said semiconductor substrate on said impurity diffusion layer, and

doping an impurity of the second conductivity type in said Ti compound layer by annealing in a reducing atmosphere containing a B_2H_6 gas and an H_2 gas;

further comprising a second annealing step in an oxidizing atmosphere containing a B_2H_6 gas performed after annealing in an atmosphere containing a B_2H_6 gas and an H_2 gas.

8. A method of manufacturing a semiconductor device, comprising the steps of forming an impurity diffusion layer of a second conductivity type on a semiconductor substrate of a first conductivity type, forming a thin film consisting of a transition metal on said impurity diffusion layer, and annealing said semiconductor substrate having said thin film thereon in an atmosphere containing an impurity element of the second conductivity type to cause the transition metal to react with a semiconductor constituent element of said semiconductor substrate and to dope the impurity element of the second conductivity type in a transition metal compound layer formed by the reaction between the transition metal and the semiconductor constituent element.

5,316,978

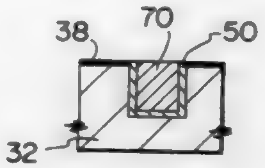
FORMING RESISTORS FOR INTERGRATED CIRCUITS

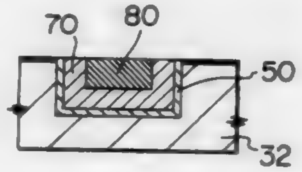
John M. Boyd, Woodlawn; Joseph P. Ellul, Nepean, and Sing P. Tay, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

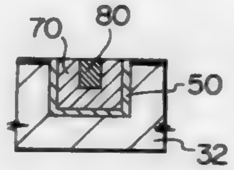
Filed Mar. 25, 1993, Ser. No. 37,048

Int. Cl.^{5} H01L *21/3205, 21/283*

U.S. Cl. 437—203 **10 Claims**







6. A method of forming a plurality of multi-valued resistors for an integrated circuit comprising:

forming a plurality of steep sided trenches in a surface of semiconductor substrate of an integrated circuit, each trench having first and second contact regions of a specific lateral dimension and a narrower portion extending therebetween, the narrower portion of each trench having a predetermined lateral dimension dependent on the required resistance value of the resistor to be formed therein;

providing a dielectric layer over sidewalls and a bottom of each trench, the dielectric layer lining each trench and leaving a cavity within;

providing a first conductive layer of a higher resistivity material over the dielectric layer of sufficient thickness to partially fill the contact regions and at least partially fill the narrower portion of each trench;

providing a second conductive layer of a lower resistivity material, filling the end contact regions and any unfilled part of the narrower portion of each trench, thereby filling the narrower portions of trenches of different predetermined lateral dimensions with different relative thicknesses of the first and second conductive layers;

planarizing the resulting structure by selectively removing the dielectric layer and first and second conductive layers extending above the surface of the substrate;

annealing for a sufficient time and at a sufficient temperature to cause interdiffusion of dopant impurities of the second conductive layer and the first conductive layer of high resistivity material, the first and second conductive layers combining to form a conductive layer of mixed composition within the trench having lower resistivity contact regions and a relatively high resistivity region extending therebetween within the narrower portion of the trench, the resistivity value of the region within the narrow portion of each trench being inversely proportional to the predetermined lateral dimension of said narrow portion of the trench.

5,316,979

RIE PROCESS FOR FABRICATING SUBMICRON, SILICON ELECTROMECHANICAL STRUCTURES

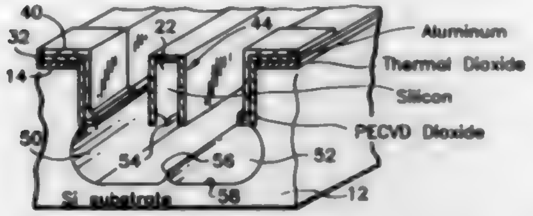
Noel C. MacDonald, and Zuoying L. Zhang, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 821,944, Jan. 16, 1992, Pat. No. 5,198,390. This application Mar. 29, 1993, Ser. No. 38,879

The portion of the term of this patent subsequent to Mar. 30, 2010, has been disclaimed.

Int. Cl.^{5} H01L *21/44, 21/48, 21/90*

U.S. Cl. 437—203 **7 Claims**



1. A reactive ion etching process for fabricating a high aspect ratio, submicron, released, single crystal silicon electromechanical structure independently of crystal orientation, comprising:

forming a patterned etch mask on a top surface of a single crystal silicon substrate, the etch mask defining a structure of arbitrary shape to be formed in said substrate, said shape being independent of crystal orientation in said substrate;

transferring the pattern of said etch mask to said substrate and forming by reactive ion etching trenches defining the structure to be fabricated in the substrate, said etching step forming trenches having bottom walls and vertical side walls;

forming an electrically insulating silicon dioxide layer on exposed surfaces of said silicon substrate, the exposed surfaces including said vertical side walls of said trenches;

forming metal electrodes on selected portions of said vertical side walls;

selectively removing said silicon dioxide insulating layer from said bottom walls of said trenches to expose said single crystal silicon substrate; and

reactive ion etching the exposed bottom wall substrate to undercut and to mechanically release said defined structure from said substrate to thereby produce a high aspect ratio, released, single crystal silicon structure having vertical side walls, said released structure being relatively movable with respect to said substrate.

5,316,980

METHOD OF MAKING A SEMICONDUCTOR DEVICE BY DRY ETCHING PROCESS

Shinichi Takeshiro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

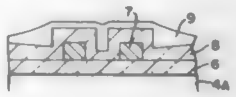
Filed Aug. 11, 1992, Ser. No. 929,161

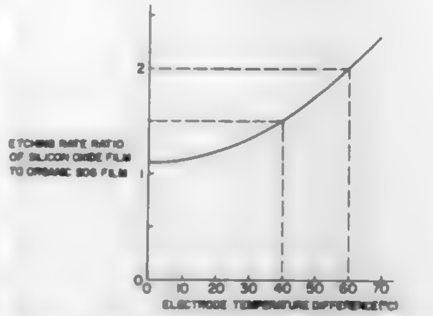
Claims priority, application Japan, Aug. 26, 1991, 3-212536

Int. Cl.^{5} H01L *21/465*

U.S. Cl. 437—228 **1 Claim**

1. A method for making a semiconductor device wherein an insulating film, which is composed of a silicon oxide film and an organic spin-on glass film, is formed on a semiconductor substrate having a step part, is thereafter etched back with a dry etching process, and is thereby planarized, wherein, during said dry etching process, the temperature of a lower electrode, on which said semiconductor substrate is supported, is maintained at a value 40° C. to 60° C. lower than the temperatures of an upper electrode, which stands facing said lower electrode, and of an etching chamber, wherein hexafluoroethane gas is used as a reaction gas, and wherein said etching process is carried out under the conditions of reaction gas flow rates and electrode temperatures such that the etching rate of said silicon oxide film is 1.5 to 2.0 times higher than the etching rate of said organic spin-on glass film.





5,316,981

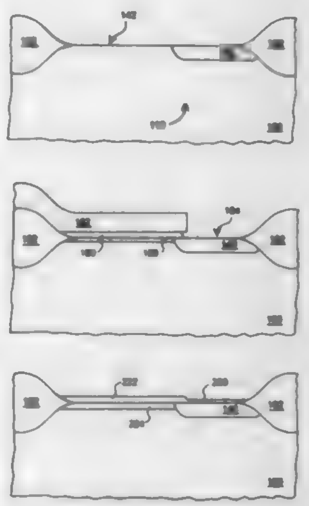
METHOD FOR ACHIEVING A HIGH QUALITY THIN OXIDE USING A SACRIFICIAL OXIDE ANNEAL

Mark I. Gardner, Red Rock, and Henry J. Fulford, Jr., Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 9, 1992, Ser. No. 959,230

Int. Cl.^{5} H01L *21/02*

U.S. Cl. 437—235 **13 Claims**



1. In an integrated circuit fabrication process, a method for growing a high quality oxide on a surface of a semiconductor body, comprising the steps of:

growing a first oxide upon a region of the semiconductor surface;

annealing the first oxide prior to any ion implantation therethrough;

removing the first oxide from the semiconductor surface region following the first oxide annealing step, to expose the surface region of the semiconductor body; and

growing a second oxide upon the exposed surface region of the semiconductor body following the first oxide removing step.

5,316,982

SEMICONDUCTOR DEVICE AND METHOD FOR PREPARING THE SAME

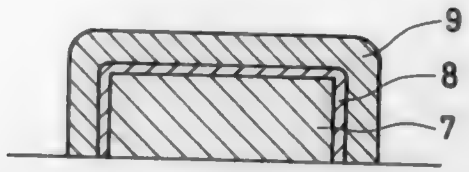
Kouji Taniguchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 28, 1992, Ser. No. 889,413

Claims priority, application Japan, Oct. 18, 1991, 3-271409

Int. Cl.^{5} H01L *21/02*

U.S. Cl. 437—236 **6 Claims**



1. A method for preparing a semiconductor device comprising:

(i)

(a) forming an aluminum or aluminum oxide film on a lower electrode of a Si-containing material,

(b) performing a first annealing in a non-oxidative atmosphere whereby oxide film occurring on a surface of the lower electrode is reduced with aluminum or aluminum oxide,

(ii) forming a dielectric film of Ta_2O_5 on the resulting aluminum oxide film, followed by second annealing in an oxidative atmosphere, and then

(iii) forming an upper electrode on the dielectric film.

5,316,983

APPARATUS FOR ANALYSIS OF PARTICULATE MATERIAL, ANALYTICAL METHOD FOR SAME, APPARATUS FOR PRODUCTION OF ULTRAPURE WATER, APPARATUS FOR MANUFACTURING OF SEMICONDUCTOR, AND APPARATUS FOR PRODUCTION OF PURE GAS

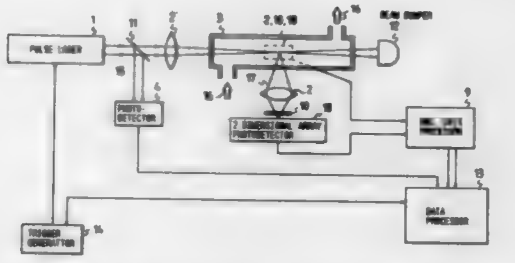
Haruo Fujimori; Tetsuya Matsui; Taiko Ajiro; Kenji Yokose, all of Hitachi, and Shigeru Izumi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1991, Ser. No. 740,493

Claims priority, application Japan, Aug. 3, 1990, 2-205036

Int. Cl.^{5} H01L *21/00*

U.S. Cl. 437—250 **29 Claims**



4. An apparatus for analyzing a particulate material by irradiation of a laser pulse having sufficient energy to cause laser breakdown plasma emission of the particulate material existing in liquid, comprising:

means for measuring a particle size of the particulate material in accordance with an intensity of the laser breakdown plasma emission of the particulate material in the liquid, and for calibrating said particle size with information other than the intensity of the laser breakdown plasma emission.

5,316,984

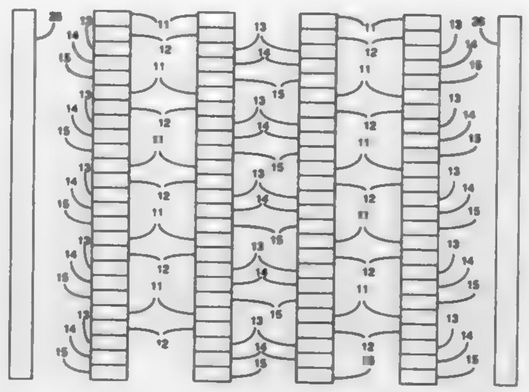
BRIGHT FIELD WAFER TARGET

Pierre Leourx, San Antonio, Tex., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Mar. 25, 1993, Ser. No. 36,786

Int. Cl.^{5} H01L *21/30;* **G03F** *9/00*

U.S. Cl. 437—250 **8 Claims**



1. A method for producing a target used in alignment of layers on a wafer, the method comprising the steps of:

(a) placing, within a target area, first alignment marks composed of material from a first layer placed on the wafer; and,

(b) placing, within the target area, subsequent alignment marks composed of material from layers placed on the wafer subsequent to the first layer, wherein the subsequent alignment marks are placed in locations within the target area which are different from locations within the target area in which the first alignment marks are placed;

wherein in order to align each of the layers placed on the wafer subsequent to the first layer, all visible alignment marks within the target area are used.

5,316,985

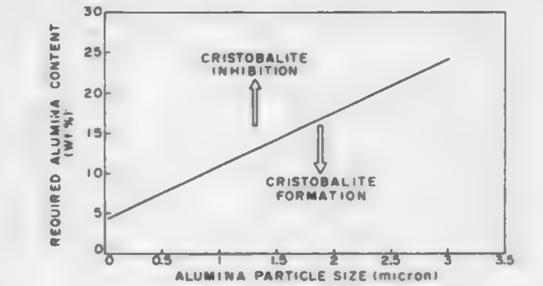
SUPPRESSION OF CRYSTAL GROWTH IN LOW DIELECTRIC INORGANIC COMPOSITION USING ULTRAFINE ALUMINA

Jau-Ho Jean, Export, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 9, 1991, Ser. No. 804,069

Int. Cl.^{5} C03C *8/22*

U.S. Cl. 501—16 **19 Claims**



1. A ceramic composition for forming a ceramic dielectric body having a sintered density greater than 97% and a dielectric constant of less than about 5.0, said composition comprising a mixture of:

(a) 25–49 weight percent of a low temperature glass selected from the group consisting of borosilicate glass, zinc borate glass and combinations thereof;

(b) 50–75 weight percent of a high temperature glass selected from the group consisting of high silica glass, titanium silicate glass and combinations thereof; and

(c) 1–8 weight percent of crystalline ceramic material having an average particle size of less than about 1 micron, said crystalline ceramic material selected from the group consisting of alumina, cordierite, mullite, magnesia, spinel, forsterite, steatite, aluminum phosphate ($AlPO_4$), aluminum nitride, aluminum titanate, barium oxide, titania, magnesium titanate, dolomite, anorthite, wollastonite, talc, sillmanite, silicon nitride, aluminum oxynitride, $CaZrO_3$, $MgO.Al_2O_3$, $ZnO.SiO_2$, ZrO_2, $ZrO_2.SiO_2$ and combinations thereof.

5,316,986

TRIETHYNYLBORAZINES AND PRODUCTION OF BN CERAMICS THEREFROM

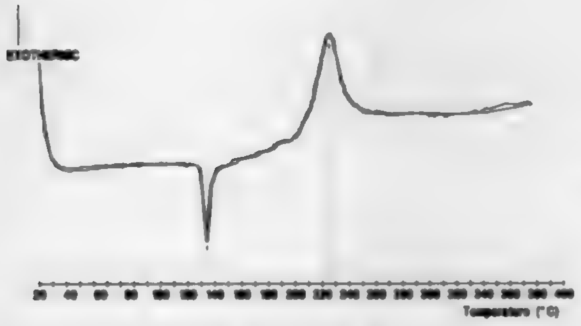
Christiane Blanchard, Le Breuil et Merleac; Evelyne Chassagneux, Millery; Gerard Mignani, Lyons, and Michel Vaultier, Chateaugiron, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed May 17, 1993, Ser. No. 61,246

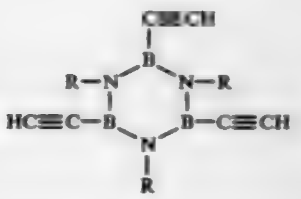
Claims priority, application France, May 15, 1992, 92 05915

Int. Cl.⁵ C04B *35/56*

U.S. Cl. 501—96 **20 Claims**



1. A compound having the formula (1):



(1)

wherein the radicals R, which may be identical or different, are each a hydrogen atom, an alkyl radical or a substituted alkyl radical.

5,316,987

CERAMIC COMPOSITE AND PROCESS FOR PRODUCTION THEREOF

Yoshiyuki Yasutomi, Katsuta; Kousuke Nakamura; Hideki Kita, both of Hitachi, and Masahisa Sobue, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

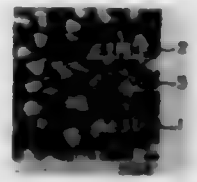
Continuation of Ser. No. 603,887, Oct. 26, 1990, abandoned, which is a division of Ser. No. 500,102, Mar. 26, 1990, Pat. No. 5,130,055, which is a continuation of Ser. No. 179,984, Apr. 11, 1988, abandoned. This application Mar. 30, 1992, Ser. No. 863,505

Claims priority, application Japan, Apr. 10, 1987, 62-86871; May 8, 1987, 62-110556; Aug. 20, 1987, 62-206698

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.⁵ C04B *35/58, 35/76*

U.S. Cl. 501—97 **4 Claims**



1. A composition for ceramics, comprising: 100 parts per weight of a raw material powder composition having 100 vol. % of a powder of metallic silicon or from 0–55 vol. % of a powder selected from the group consisting of SiC, TiN, TiC, TiB_2, ZrN, ZrC, ZrB_2, Cr_2N, Cr_3C_2, CrB, HfN, HfC, TaN, TaC, TaB_2, Mo_2N, Mo_2C, MoB, NbN, NbC, NbB_2, WC, TiB, VN, WSi_2, $TiSi_2$, $ZrSi_2$, $NbSi_2$, $TaSi_2$, $CrSi_2$, $MoSi_2$, VC, Fe_3C, ThC, CeC_2, Cr_7C_2, Al_2O_3, AlN, Si_3N_4, Si_2N_2O, TiO_2, BeO, and WN and from 45–100 vol. % of a powder of metallic silicon;

and from 4–16 parts by weight of a binder, said binder being a thermoplastic resin and present in such an amount as to yield an apparent viscosity at 150° C. of $(3-90)\times10^4$ $N\text{-}s/m^2$ for said composition for ceramics, wherein use of said composition in the production of a molded body results in a particle packing of at least 70 vol. % for the molded body.

5,316,988

SIALON CERAMIC COMPOSITIONS AND METHODS OF FABRICATION

Michael H. O'Brien, and Blair H. Park, both of Idaho Falls, Id., assignors to EG&G Idaho, Inc., Idaho Falls, Id.

Filed Aug. 2, 1993, Ser. No. 100,888

Int. Cl.⁵ C04B *35/58*

U.S. Cl. 501—98 **23 Claims**

1. A method of fabricating a SiAlON ceramic body comprising:

combining quantities of Si_3N_4, Al_2O_3 and CeO_2 to produce a mixture;

forming the mixture into a shape;

heating the body to a densification temperature of from about 1550° C. to about 1850° C.;

maintaining the body at the densification temperature for a period of time effective to densify the body;

cooling the densified body to a devitrification temperature of from about 1200° C. to about 1400° C.; and

maintaining the densified body at the devitrification temperature for a period of time effective to produce a β'-SiAlON crystalline phase in the body having elemental or compound form Ce incorporated in the β'-SiAlON crystalline phase.

5,316,989

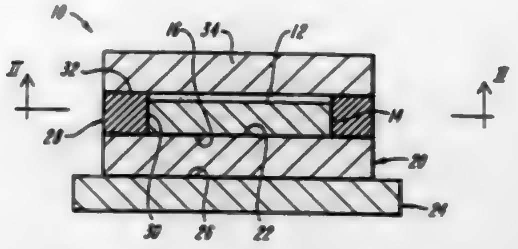
METHOD FOR MAKING A SMOOTH-SURFACE CERAMIC

Gilbert James, P.O. Box 1546, Wakefield, Mass. 01880

Filed May 8, 1991, Ser. No. 696,570

Int. Cl.⁵ C04B *35/10*

U.S. Cl. 501—153 **7 Claims**



1. A process for making a thin ceramic, comprising

preparing a wet mixture wherein about 40–60% wt. % of the mixture is a ceramic forming powder having a range of particle sizes and a surface area in the range of about 12 to 15 m^2g, the ceramic forming powder comprising at least about 99 wt. % of a metal oxide powder selected from the group consisting of alumina and beryllia, and a balance of approximately equal amounts of ball clay and talc, about 20–35 wt. % of a polymeric binder, about 15–25 wt. % of a liquid, organic carrier;

milling the wet mixture to form a milled slurry having substantially uniform consistency in which the ceramic forming powder has a surface area of at least about 15 m^2g;

forming the milled slurry into a desired shape maintained on a level release surface;

allowing the milled slurry to settle for a period of time sufficient to achieve uniform thickness of the slurry;

removing the organic carrier from the milled slurry to form a greenware article while maintaining the integrity of the milled slurry;

removing the greenware from the release surface;

supporting a major surface of the greenware on flat, smooth suitable kiln furniture above which is disposed a second flat, smooth body of suitable kiln furniture wherein the second kiln furniture body is in sufficiently close proximity to the greenware to minimize camber but not to prevent shrinkage during transition from the unfired to the fired state; and

firing the greenware at a temperature range of about 1425° C. to about 1560° C. for period of about 0.25 to 3 hours to yield a rigid ceramic having a CLA surface smoothness of 1 microinch or less, zero water absorption, and a flatness of less than 0.001 inch per inch camber.

5,316,990

CATALYST MATERIAL

Susan J. Cooper, Reading; Graham A. Hards, Wallingford, and David Thompsett, Reading, all of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, England

Filed Apr. 23, 1992, Ser. No. 872,301

Claims priority, application United Kingdom, May 4, 1991, 9109751

Int. Cl.⁵ B01J *37/34*

U.S. Cl. 502—5 **13 Claims**

1. A catalyst material comprising the product obtained by activating a precious metal-containing macrocyclic compound supported on a high surface area carbon so that the precious metal is in the zero oxidation state, said macrocyclic compound being an N4-chelate macrocycle.

5,316,991

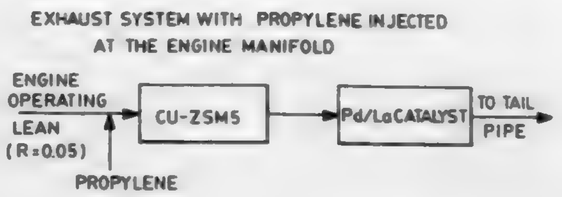
EXHAUST TREATING SYSTEM FOR LEAN-BURN CNG ENGINE

Somasundaram Subramanian, Melvindale; Robert J. Kudla, Warren, and Mohinder S. Chattha, Northville, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1991, Ser. No. 789,707

Int. Cl.⁵ B01J *29/06*

U.S. Cl. 502—65 **7 Claims**


EXHAUST SYSTEM WITH PROPYLENE INJECTED AT THE ENGINE MANIFOLD
ENGINE OPERATING LEAN (R=0.05)
CU-ZSM5
Pd/La CATALYST
TO TAIL PIPE
PROPYLENE

1. A three-way catalyst system for efficiently converting the exhaust gas from a CNG-fueled internal combustion engine when operated at lean conditions defined by a redox ratio of 0.02–0.9, the system comprising:

(a) a first stage catalyst comprising a transition metal-containing zeolite;

(b) means for injecting a fast-burning hydrocarbon into said exhaust prior to entry of said exhaust gas into said first stage catalyst, said hydrocarbon having a greater affinity than CH_4 in its ability to react with NO; and

(c) a second stage catalyst for treating the effluent from said first stage catalyst and comprising alumina impregnated with palladium.

2. The system as in claim 1, in which said second stage catalyst comprises also La_2O_3.

5,316,992

CATALYTIC REFORMING PROCESS WITH SULFUR ARREST

Michael B. Russ, Villa Park, and Paul A. Sechrist, Des Plaines, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 635,003, Dec. 27, 1990, abandoned. This application Nov. 13, 1992, Ser. No. 976,158

Int. Cl.⁵ B01J *29/32, 29/36*

U.S. Cl. 502—66 **11 Claims**

1. A catalyst system comprising a physical mixture of a sulfur-sensitive conversion catalyst having a Sulfur-Sensitivity Index of at least about 2.0 and a sulfur sorbent, the conversion catalyst comprising a nonacidic large-pore molecular sieve, at least one platinum-group metal component and a refractory inorganic-oxide support and the sulfur sorbent comprising one or more manganese oxides.

2. The catalyst system of claim 1 comprising a physical mixture of (i) first particles comprising the conversion catalyst and essentially free of the sulfur sorbent and (ii) second particles comprising the sulfur sorbent and essentially free of the conversion catalyst.

6. The catalyst system of claim 1 wherein the sulfur-sensitive catalyst further comprises an alkali metal component.

5,316,993

MOLDED BODIES CONTAINING DEALUMINATED ZEOLITE Y AND THE PROCESS FOR THEIR PRODUCTION

Elfriede Sextl, Geiselbach; Eckehart Roland; Peter Kleinschmit, both of Hanau, and Akos Kiss, Alzenau-Wasserlos, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 15, 1992, Ser. No. 883,877

Claims priority, application Fed. Rep. of Germany, May 27, 1991, 4117202; Jan. 31, 1992, 4202671

Int. Cl.^{5} B01J *29/08, 20/18, 35/10*

U.S. Cl. 502—68 **23 Claims**

1. A moulded body comprising dealuminated zeolite Y and at least one binder and having a hydrophobic factor of from 1.5 to 6.0; wherein a slurry of said binder in water does not exceed a pH of 10 and wherein said moulded body is calcined at 850° to 1100° C.

3. A process for the production of a moulded body according to claim 1, comprising mixing pulverulent dealuminated zeolite Y with at least one binder, optionally with the addition of a lubricant and/or a pore former, and optionally with water or an organic solvent, moulding the resulting mass to form a moulded body, and drying and calcining said moulded bodies; wherein a slurry of said binder in water does not exceed a pH of 10 and wherein said moulded body is calcined at 850° to 1100° C.

6. The process according to claim 3, wherein said binder is a clay mineral in quantities of from 5 to 40% and wherein a slurry of said binder in water does not exceed a pH of 10.

5,316,994

COPPER HYDRIDES AS CO-CATALYSTS FOR OLEFIN POLYMERIZATION

Donald R. Kelsey, Fulshear, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1992, Ser. No. 999,048

Int. Cl.^{5} C08F *4/60*

U.S. Cl. 502—117 **5 Claims**

1. A cyclicolefin metathesis polymerization catalyst system comprising:

a Group VB or VIB transition metal halide metathesis catalyst; and

an organo phosphine copper hydride catalyst.

5,316,995

HYDROCARBON CONVERSION CATALYST

Mark P. Kaminsky, Winfield; Mark S. Kleefisch, Naperville; George A. Huff, Jr., Naperville; Don M. Washecheck, Naperville, and Mark K. Barr, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 775,226, Oct. 11, 1991, Pat. No. 5,245,109. This application Mar. 17, 1993, Ser. No. 32,666

Int. Cl.^{5} B01J *27/06, 27/08, 27/125, 27/138*

U.S. Cl. 502—226 **12 Claims**

1. A composition consisting essentially of an intimately mixed halogen-containing mixed oxide of:

(a) at least one cationic species of a naturally occurring Group IIIB element selected from the group consisting of yttrium, lanthanum, neodymium, samarium and ytterbium;

(b) at least one cationic species of a Group IIA metal selected from the group consisting magnesium, calcium, strontium and barium; and

(c) at least one additional metal cationic species selected from the group consisting of germanium and gallium.

5,316,996

COMPOUND OXIDE CATALYST CARRIER, METHOD OF PRODUCING THE SAME AND METHOD OF TREATING HEAVY OIL WITH THE SAME

Toshio Itoh, Sodegaura, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed May 14, 1992, Ser. No. 883,259

Claims priority, application Japan, Jun. 3, 1991, 3-157360

Int. Cl.^{5} B01J *21/00, 32/00*

U.S. Cl. 502—238 **12 Claims**

1. A compound oxide catalyst carrier, comprising: a silica-alumina, the compound oxide catalyst carrier having a relative standard deviation of peak intensity of aluminum ranging from 0.100 to 0.170 as measured by scanning a cross section of a particle of the compound oxide catalyst carrier with an Electron Probe X-ray Microanalyzer in a scan-line direction along a diameter-line or an approximate diameter-line of the cross section.

2. The compound oxide catalyst carrier as claimed in claim 1, wherein the compound oxide catalyst carrier contains 30 to 70% by weight of alumina and 70 to 30% by weight of silica or titania, based on total weight of the compound oxide catalyst carrier.

4. A method of producing the compound oxide catalyst carrier of claim 2, comprising: mixing an alumina gel which contains, as measured as alumina, at least 70% by weight of particles of 4 to 20 μm in particle size based on total weight of alumina, with a silica sol or a titania sol to obtain a mixture, forming the mixture into particles, drying the particles and calcining the dried particles.

5,316,997

HEAT RESISTING STRUCTURE

Tetsuro Toyoda, and Katsunori Matsuoka, both of Tokyo, Japan, assignors to Showa Aircraft Industry Co., Ltd., Tokyo, Japan

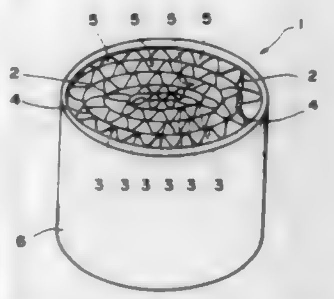
PCT No. PCT/JP90/00969, § 371 Date Mar. 26, 1991, § 102(e) Date Mar. 26, 1991, PCT Pub. No. WO91/01876, PCT Pub. Date Feb. 21, 1991

PCT Filed Jul. 30, 1990, Ser. No. 667,383

Claims priority, application Japan, Aug. 4, 1989, 1-202317; Aug. 29, 1989, 1-224273; Mar. 22, 1990, 2-72638

Int. Cl.^{5} B22B *3/12*

U.S. Cl. 502—314 **5 Claims**



1. A heat resisting structure used as a catalyst carrier in a catalytic converter for treating the exhaust gas of a gas engine comprising: a honeycomb-form structure, said honeycomb-form structure formed of at least one corrugated sheet having alternating ridges and grooves formed by folding the sheet continuously, and at least one flat sheet, said corrugated sheet and said flat sheet being alternately joined via an iron-based brazing filler metal, said corrugated sheet and said flat sheet comprising ferritic stainless steel and having a catalyst selected from the group consisting of platinum Pt, palladium Pd and rhodium Rh attached to the opposite surfaces of both said corrugated sheet and said flat sheet, said corrugated sheet and said flat sheet being alternately overlapped, rolled up, and joined to make a roll-form heat resisting structure.

5,316,998

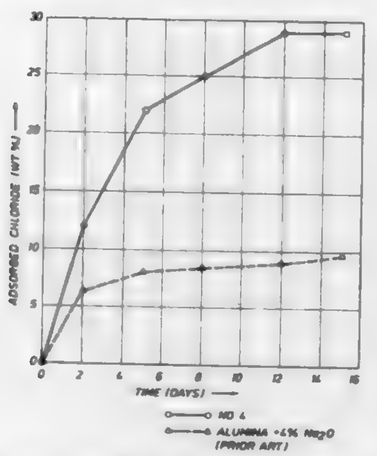
HCL ADSORBENT AND METHOD FOR MAKING AND USING SAME

John S. Lee, Baton Rouge, La., and Michael J. Pearson, Castro Valley, Calif., assignors to Discovery Chemicals, Inc., Port Allen, La.

Filed May 5, 1992, Ser. No. 878,857

Int. Cl.^{5} B01J *20/08, 20/04;* **B01D** *53/04;* **C01B** *7/00*

U.S. Cl. 502—415 **4 Claims**



1. A promoted adsorbent for removing HCl from fluid streams comprising:

activated alumina, and an alkali metal promoter, said alkali metal promoter being derived from a water soluble, alkali metal salt of a carboxylic acid containing from 1 to 6 carbon atoms heat treated with said alumina at a temperature of about 300° to about 555° C. for about 10–60 minutes and present in an amount such that, if calculated as alkali metal oxide, said adsorbent contains in excess of 5% by weight alkali metal oxide based on the weight of alumina present in said adsorbent, said adsorbent having a pore volume distribution of at least 0.10 cc/g at a pore diameter of 750 Angstroms and greater, of at least 0.35 cc/g at a pore diameter of 40 Angstroms and greater and at least 0.16 cc/g at pore diameters in the range of from about 10,000 Angstroms to about 100 Angstroms, said adsorbent having a crush strength of at least 15 lbs.

5,316,999

THERMAL TRANSFER DYE IMAGE-RECEIVING SHEET

Shigeo Hayashi, Kawasaki; Osamu Kohari, and Masaru Kato, both of Tokyo, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1991, Ser. No. 753,593

Claims priority, application Japan, Sep. 3, 1990, 2-230543; Oct. 18, 1990, 2-277909; Apr. 26, 1991, 3-096953

Int. Cl.^{5} B41M *5/035, 5/38*

U.S. Cl. 503—227 **10 Claims**

1. A thermal transfer dye image-receiving sheet comprising:

a substrate sheet; and

an image-receiving resinous layer formed on at least one surface of the substrate sheet and comprising a resinous material capable of receiving thermally transferred dye images,

said resinous material comprising, as an active principle, a vinyl chloride and vinyl propionate-based copolymer resin which comprises a copolymerization product of 60% to 98% by weight of vinyl chloride with 2% to 40% by weight of vinyl propionate, and having a glass transition temperature of 40° C. or more, and

said vinyl chloride and vinyl propionate-based copolymer resin satisfying the following relationships (I) and (II):

$$DP \geqq 250 \text{ and} \qquad (I)$$

-continued

$$\Delta YI \leqq 4 \qquad (II)$$

wherein DP represents a number average degree of polymerization of the vinyl chloride and vinyl propionate-based copolymer resin, and ΔYI represents a difference $(YI_1 - YI_0)$ between a yellowing factor YI_1 of the vinyl chloride and vinyl propionate-based copolymer resin heat treated at a temperature of 80° C. for 100 hours, and an original yellowing factor YI_0 of the non-heat treated copolymer, the yellow factors YI_1 and YI_0 being determined in accordance with Japanese Industrial Standard (JIS) K 7103.

5,317,000

ACCEPTOR ELEMENT FOR THERMOSUBLIMATION PRINTING

Robert Bloodworth; Wolfgang Podszun, both of Köln, Fed. Rep. of Germany; Geert Defieuw, Kessel; Herman Uytterhoeven, Bonheiden, both of Belgium, and Hans Schulze, Köln, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 2, 1992, Ser. No. 907,682

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1991, 4123919

Int. Cl.^{5} B41M *5/035, 5/38*

U.S. Cl. 503—227 **2 Claims**

1. A dye acceptor element for thermosublimation printing comprising a support and a dye acceptor layer, characterized in that the dye acceptor layer consists of a vinyl copolymer and of 2 to 20% by weight, based on the vinyl copolymer, of a plasticizer having a molecular weight MW of 150 to 1,000, wherein said vinyl copolymer has a glass transition temperature Tg in the range from 50 to 100° C. and a solubility parameter in the range from 8 to 12 $(cal/cm^3)^{1/2}$ and is selected from the group consisting of a vinyl copolymer consisting of

a) 10 to 80% by weight aromatic vinyl compound,
b) 5 to 40% by weight (meth)acrylonitrile,
c) 5 to 50% by weight (meth)acrylates,
d) 0 to 50% by weight other vinyl monomers, and a vinyl copolymer consisting of
e) 50 to 90% by weight vinyl halide,
f) 10 to 50% by weight vinyl ester,
g) 0 to 30% by weight other vinyl monomers.

5,317,001

THERMAL DYE TRANSFER RECEIVING ELEMENT WITH AQUEOUS DISPERSIBLE POLYESTER DYE IMAGE-RECEIVING LAYER

Robert C. Daly, and Kristine B. Lawrence, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1992, Ser. No. 996,345

Int. Cl.^{5} B41M *5/035, 5/38*

U.S. Cl. 503—227 **17 Claims**

14. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a dye image-receiving layer, wherein the dye image-receiving layer comprises a water dispersible polyester comprising recurring dibasic acid derived units and diol derived units, at least 50 mole % of the dibasic acid derived units comprising dicarboxylic acid derived units containing an alicyclic ring within two carbon atoms of each carboxyl group of said dicarboxylic acid, and at least 2.5 mole % of the dibasic acid derived units and diol derived units combined comprising ionic monomer derived units containing an ionic group, said ionic monomer derived units being derived from diester monomers which contain metal ion salts of sulfonic acids or iminodisulfonyl groups.

5,317,002
THERMAL TRANSFER SHEET AND THERMAL TRANSFER RECORDING METHOD

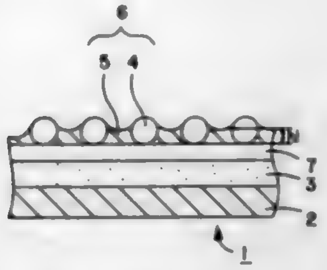
Hiroshi Onishi, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 15, 1993, Ser. No. 31,501

Claims priority, application Japan, Mar. 16, 1992, 4-057700

Int. Cl.^{5} B41M *5/035, 5/38*

U.S. Cl. 503—227 **8 Claims**



8. A thermal transfer recording method which employ;

a thermal transfer sheet comprises a heat resistant sheet-form substrate,

an ink layer containing a dye laminated on the substrate,

a dye-diffusion preventive layer comprising a material composed of at least water-soluble cellulose ether and/or polyvinyl alcohol, and laminated on the ink layer, and

a particle-transfer layer laminated on the dye-diffusion preventive layer, the particle-transfer layer comprising at least a softening transfer-material whose viscosity will be lowered by heating and dye acceptor particles of a dyeable thermoplastic resin dispersed in the softening transfer-material,

said method comprising holding the thermal transfer sheet between a thermal head and an image receiving medium and selectively heating said sheet through the thermal head according to an image signal, said heating being effected in such a way that at least a non-image-signal portion of the particle-transfer layer which is located adjacently to or spaced a plurality of picture elements apart from the image signal may be transferred onto the image receiving medium by modifying the image signal to heat the non-image-signal portions through the thermal head.

5,317,003
HERBICIDAL COMPOSITIONS COMPRISING GLYPHOSATE SALTS AND ALKOXYLATED QUATERNARY AMINE SURFACTANTS

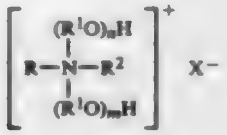
James W. Kassebaum, Ballwin, and Howard C. Berk, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 16, 1992, Ser. No. 914,089

Int. Cl.^{5} A01N *25/30, 57/04*

U.S. Cl. 504—116 **14 Claims**

1. A herbicidal composition which comprises a stable aqueous concentrate solution of: (a) one or more agriculturally acceptable salts of N-phosphonomethylglycine at an acid equivalent concentration of between about 5 and about 40 weight percent; and (b) a surfactant represented by the formula



$$\left[\begin{array}{c} (R^1O)_nH \\ | \\ R-N-R^2 \\ | \\ (R^1O)_mH \end{array}\right]^+ X^-$$

wherein R is an alkyl group having an average of from about 6 to about 14 carbon atoms, R^1 is ethyl, propyl or a mixture of ethyl and propyl, n and m are numbers independently selected from about 2 to about 40, and the sum of n and m is about 5 and about 50, R^2 is between an alkyl group having 1 to 4 carbon atoms, X^- is an agriculturally acceptable anion, and the weight ratio of surfactant to N-phosphonomethylglycine (expressed as the acid equivalent) is between about 1:5 and about 5:1.

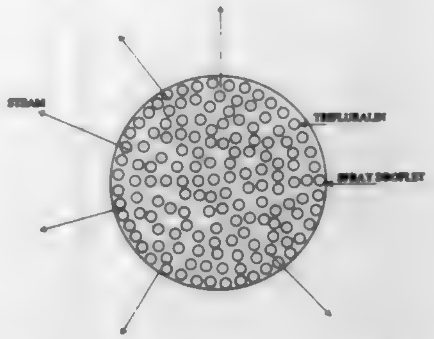
5,317,004
MICROENCAPSULATED YELLOW POLYMORPHIC FORM OF TRIFLURALIN

John Misselbrook, Lawrenceville, N.J.; Larry J. McKinney, Hahira, Ga.; James H. Lefiles, Valdosta, Ga.; Edwin F. Hoff, Jr., Valdosta, Ga., and Elliot Bergman, Valdosta, Ga., assignors to Griffin Corporation, Valdosta, Ga.

Continuation of Ser. No. 873,584, Apr. 21, 1992, abandoned, which is a continuation of Ser. No. 750,773, Aug. 22, 1991, abandoned, which is a continuation of Ser. No. 568,509, Dec. 10, 1990, abandoned, which is a division of Ser. No. 301,458, Jan. 24, 1989, Pat. No. 5,160,530. This application Nov. 12, 1992, Ser. No. 974,674

Int. Cl.^{5} A01N *25/28, 33/08*

U.S. Cl. 504—116 **7 Claims**



1. A method of controlling weeds comprising the steps of:

combining with water to form an aqueous suspension a dry herbicidal composition having improved wettability, dispersibility and suspensibility consisting essentially of trifluralin having a polymorphic form characterized by a yellow color and a melting point of approximately 41°–43° C., said herbicidal composition being microencapsulated in a water-soluble microcapsule, said composition being substantially free of a solvent for said trifluralin; and

applying an effective amount of said aqueous suspension to soil.

5,317,005
PYRIMIDINYL AND TRIAZINYL HERBICIDES

Graham P. Jones, Cambridge, England, assignor to Schering Agrochemicals Limited, England

PCT No. PCT/GB91/01152, § 371 Date Jan. 19, 1993, § 102(e) Date Jan. 19, 1993, PCT Pub. No. WO92/01677, PCT Pub. Date Feb. 6, 1992

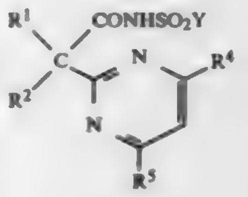
PCT Filed Jul. 12, 1991, Ser. No. 966,169

Claims priority, application United Kingdom, Jul. 19, 1990, 9015916

Int. Cl.^{5} C07D *239/26, 401/06;* **A01N** *43/54*

U.S. Cl. 504—239 **16 Claims**

1. A pyrimidine derivative of the formula:



and salts thereof, where:

Y is an alkyl group of 1 to 6 carbon atoms which is unsubstituted or is substituted by one or more halogen atoms, by cyano, by alkoxy of 1 to 4 carbon atoms, or by a group —COZ in which Z is a group —NR′R″ to —OR′ and R′ and R″ each represent hydrogen, alkyl of 1 to 6 carbon atoms, or phenyl; or is an amino group;

R^1 is substituted or unsubstituted alkyl group of 1 to 6 carbon atoms as defined above for Y; cycloalkyl group of 3 to 7 carbon atoms; phenyl which is unsubstituted or substituted by one ore more halogen atoms, nitro groups, amino groups, alkylamino, dialkylamino or acylamino groups where the alkyl moieties have from 1 to 4 carbon atoms, cyano groups, alkyl or alkoxy groups of 1 to 4 carbon atoms, alkoxycarbonyl groups in which the alkyl moiety is of 1 to 4 atoms, or phenoxy groups; or a hete ocyclyl group selected from furyl, pyridyl and thienyl which is unsubstituted or substituted by one or more alkyl groups of 1 to 4 carbon atoms;

R^2 is hydrogen, halogen, or alkyl of 1 to 6 carbon atoms; and

R^4 and R^5, which may be the same or different, are each hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino, alkylamino of 1 to 6 carbon atoms, dialkylamino in which each alkyl moiety is of 1 to 6 carbon atoms, or halogen.

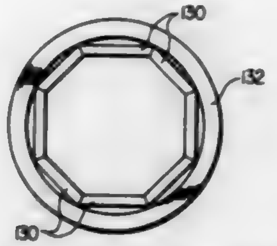
5,317,006
CYLINDRICAL MAGNETRON SPUTTERING SYSTEM

Nalin Kumar, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Continuation of Ser. No. 495,385, Mar. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 366,853, Jun. 15, 1989, abandoned. This application Oct. 4, 1991, Ser. No. 771,353

Int. Cl.^{5} H01L *39/00;* **C23C** *14/35, 14/56*

U.S. Cl. 204—298.12 **12 Claims**



1. A cathode for inclusion in a sputtering system, said cathode comprising:

a metallic outer cylinder and

lengthwise arrayed target material disposed within said metallic outer cylindrical in a closed polygonal cross-sectional shape within said metallic outer cylinder, said lengthwise arrayed target material able to be sputtered and to thereby form a film of high temperature superconducting material on a substrate positioned within said closed polygonal shape.

5,317,007
HIGH-TC OXIDE SUPERCONDUCTOR AND METHOD FOR PRODUCING THE SAME

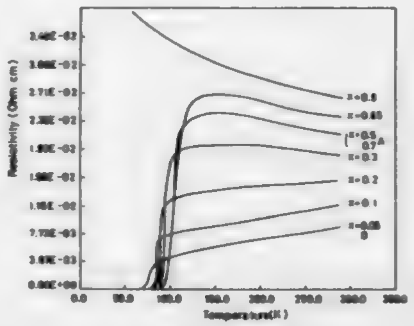
Yutaka Yamada, Kawasaki, and Satoru Murase, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 313,786, Feb. 23, 1989, Pat. No. 5,145,831. This application Jun. 29, 1992, Ser. No. 905,318

Claims priority, application Japan, Feb. 24, 1988, 63-39554

Int. Cl.^{5} C04B *35/00;* **H01B** *12/06;* **H01L** *39/12*

U.S. Cl. 505—121 **6 Claims**



1. The cuprate oxide superconductor having a nominal composition $(Bi_{1-x}X_x)_2Sr_2Ca_2Cu_cO_{10+\delta}$ wherein X is at least one of Al and Pb, in a stoichiometric ratio in which $x=0.05$ to 0.85, $c=1.5$ to 4.5 and δ is 0 to 1.

5,317,008
METHOD OF MANUFACTURING BISMUTH TYPE OXIDE SUPERCONDUCTOR

Kumiko Imai, Yokohama, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 381,134, Jul. 14, 1989, abandoned. This application Jan. 22, 1993, Ser. No. 8,081

Claims priority, application Japan, Jul. 20, 1988, 63-180781; Oct. 14, 1988, 63-259108

Int. Cl.^{5} H01L *39/24*

U.S. Cl. 505—100 **18 Claims**

1. A method of manufacturing a bismuth oxide superconductor comprising:

(i) applying a two-stage heat treatment to a molded body of a substance selected from the group consisting of (a) a bismuth oxide superconducting substance comprising bismuth, an alkaline earth metal, copper and oxygen and (b) a precursor thereof, to produce a superconducting phase, a first stage of the two-stage heat treatment being applied to heat and sinter said molded body at a temperature within a temperature range from a temperature of $T_M-20°$ C. inclusive, T_M being the melting start temperature of said substance which is heated and sintered, to a temperature $T_M+40°$ C. exclusively, and a second stage of the two-stage heat treatment being applied to heat the molded body in an atmosphere having an oxygen partial pressure of not less than 0.2 atm at a temperature from 700° C. to 890° C; and

(ii) cooling the heated body from 700° C. to 100° C. in an atmosphere having an oxygen partial pressure of not less than 0.2 atm at a cooling rate of not less than 12° C./minute, thereby suppressing the oxygen content of said bismuth oxide superconductor and providing a bismuth oxide superconductor having a high critical temperature and a high critical current density.

5,317,009

ANTI-HIV PROTEINS GAP 31, DAP 30 AND DAP 32 AND THERAPEUTIC USES THEREOF

Sylvia Lee-Huang, New York, N.Y.; Hsiang-fu Kung, Middletown, Md.; Paul L. Huang; Philip L. Huang, both of Boston, Mass.; Peter Huang; Henry I. Huang, both of New York, N.Y., and Hao-chia Chen, Potomac, Md., assignors to New York University, New York, N.Y.; American Biosciences, Inc., Boston, Mass. and National Institutes of Health, Bethesda, Md.

Filed Aug. 26, 1991, Ser. No. 749,541

Int. Cl.⁵ C07K *13/00, 15/10, 15/14*

U.S. Cl. 514—8 **3 Claims**

1. An isolated GAP 31 protein, comprising a 31KDa-protein, as determined on SDS-PAGE, wherein said GAP 31 protein is

(a) obtainable from the seeds of the plant *Gelonium multiflorum, Euphorbiaceae himalaya;*
(b) has anti-HIV activity in vitro at concentrations of about 0.3 nanomolar;
(c) lacks non-specific cytotoxicity in vitro at concentrations of about 300 nanomolar; and
(d) comprises the amino acid sequence of SEO ID NO:1.

5,317,010

PARATHYROID HORMONE ANALOGUES SUBSTITUTED AT AA 25, 26, 27, AND USE IN OSTEOPOROSIS TREATMENT

Peter K. T. Pang, University of Alberta, Dept. of Physiology, 7-55 Medical Science Bldg., Edmonton, Canada T6G 2H7 , and Jie Shan, Edmonton, Canada, assignors to Peter K. T. Pang, Edmonton, Canada

Filed Oct. 10, 1991, Ser. No. 773,098

Int. Cl.⁵ A61K *37/36;* **C07K** *7/10*

U.S. Cl. 514—12 **10 Claims**

1. A bovine parathyroid hormone analogue having amino acid substitutions at three positions, consisting essentially of the structure shown in SEQ ID NO:3, wherein Xaa^{25}, Xaa^{26} and Xaa^{27} are each selected from the group consisting of Alanine (Ala), Isoleucine (Ile), Leucine (Leu), Methionine (Met), Phenylalanine (Phe), and Valine (Val).

5,317,011

CLONING AND EXPRESSION OF A VARIANT GENE OF PLATELET FACTOR 4 AND COMPOSITIONS THEREOF TO MODULATE IMMUNE RESPONSES

Christopher J. Green, and Paul H. Johnson, both of Menlo Park, Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 302,425, Jan. 26, 1989, Pat. No. 5,187,075. This application Nov. 9, 1992, Ser. No. 973,656

Int. Cl.⁵ A61K *37/00;* **C07K** *13/00, 15/08;* **C12N** *15/12*

U.S. Cl. 514—12 **5 Claims**

1. A substantially pure, isolated protein encoded by the nucleic acid sequence of platelet factor 4 variant 1.

5,317,012

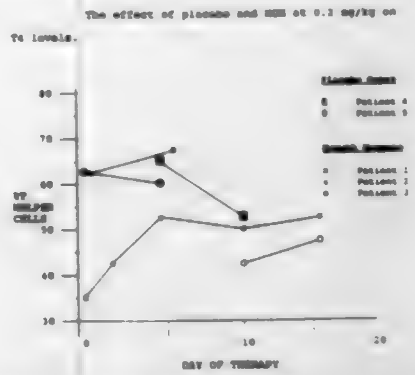
HUMAN GROWTH HORMONE INDUCED IMPROVEMENT IN DEPRESSED T4/T8 RATIO

Kenneth A. Kudsk, Memphis, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation of Ser. No. 770,919, Oct. 4, 1991, abandoned. This application Jan. 29, 1993, Ser. No. 12,783

Int. Cl.⁵ A61K *37/36*

U.S. Cl. 514—12 **27 Claims**



1. A method for increasing the T4/T8 ratio in a human with a depressed T4/T8 ratio comprising administering an amount of human growth hormone effective to increase the ratio to a level normal for said human.

5,317,013

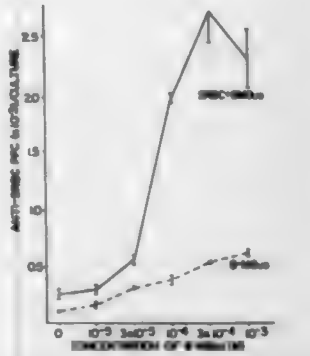
MODULATION OF ANIMAL CELLULAR RESPONSES WITH COMPOSITIONS CONTAINING 8-SUBSTITUTED GUANINE DERIVATIVES

Michael G. Goodman, Carlsbad, and William O. Weigle, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Division of Ser. No. 562,101, Aug. 2, 1990, Pat. No. 5,147,636, which is a division of Ser. No. 361,974, Jun. 6, 1989, Pat. No. 4,948,730, which is a division of Ser. No. 14,618, Feb. 13, 1987, Pat. No. 4,849,411, which is a continuation of Ser. No. 546,679, Nov. 1, 1983, Pat. No. 4,643,992, which is a continuation-in-part of Ser. No. 439,846, Nov. 9, 1982, Pat. No. 4,539,205. This application Sep. 15, 1992, Ser. No. 945,215

Int. Cl.⁵ A61K *31/70, 45/05;* **C07K** *13/00*

U.S. Cl. 514—45 **9 Claims**



1. A method of inducing interleukin-1-like activity in macrophages comprising contacting said macrophages with a composition including as an active ingredient an effective amount of 8-substituted guanine derivative bonded 9-1′ to an aldose having 5 or 6 carbon atoms in the aldose chain, said guanine derivative being free of electrically charged functionality, and said 8-substituent having an electron withdrawing effect greater than that of hydrogen and containing fewer than about 15 atoms, together with a diluent amount of a physiologically tolerable carrier.

5,317,014

PEPTIDES AND PSEUDOPEPTIDES DERIVED FROM TACHYKININ

Jean-Luc Fauchere, Saint-Cloud; Nathalie Kucharczyk, Paris; Angela D. Morris, Viroflay; Joseph Paladino, Conflans Sainte Honorine; Jacqueline Bonnet, Paris, and Christophe Thurieau, Boulogne sur Seine, all of France, assignors to Adir et Compagnie, Courbevoie, France

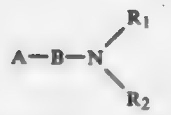
Filed Jun. 3, 1992, Ser. No. 893,930

Claims priority, application France, Apr. 6, 1991, 91 06721

Int. Cl.⁵ A61K *37/02;* **C07K** *5/06, 5/08, 5/10*

U.S. Cl. 514—17 **9 Claims**

1. A compound selected from those of formula (I):

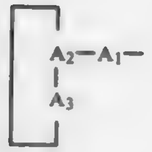


$$A-B-N\begin{matrix}R_1\\ \\R_2\end{matrix}$$

(I)

in which:

R_1 is methyl and R_2 is benzyl,
B represents a residue of an aromatic amino acid,
A represents
either a peptide residue of formula:



$$\begin{matrix}A_2-A_1-\\ |\\ A_3\end{matrix}$$

in which:

A_1 represents a bond, a residue 2-azabicyclo[2.2.2]octane-3-carbonyl (Abo), leucine (Leu), β-naphthylalanine (Nal), tryptophan (Trp) or tryptophan protected by Q (Trp(Q)), Q representing the radical

—X—(CH_2)n—R′

in which
X represents a bond, —CO— or —COO—,
n is an integer from 0 to 10,
R′ is hydrogen, linear or branched (C_1-C_{10}) alkyl, benzyl, 9-fluorenylmethyl, —NH_2, —COOH or —COOR″ (R″=linear or branched (C_1-C_8) alkyl),

A_2 represents an aspartic acid residue (Asp) or glutamic acid residue (Glu),

A_3 represents a residue 1,2,3,4-tetrahydroisoquinoline-3-carbonyl (Tic), 2-azabicyclo[2.2.2]octane-3-carbonyl (Abo), methylphenylalanine (MePhe), arginine (Arg), arginine protected by nitro (Arg (NO_2)), 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (Dht), spinacine (Spi), 4-hydroxyproline (Hyp), β-naphthylalanine (Nal) or proline (Pro),

it being understood that the peptide bond (—CO—NH—) between A_1 and A_2 or between A_2 and B in the case where A_1 is a bond, can be replaced by a pseudopeptide bond chosen from amongst —CH_2—NH— and —CH_2—S—, its and epimers as well as its pharmaceutically-acceptable acid or base addition salts, it being understood that each amino acid of the peptide sequence is optically pure and that the α carbon of each amino acid can be of D or L configuration.

5,317,015

AZACYCLIC BISPHOSPHONATES AS ANTICHOLESTEROLEMIC AGENTS

John W. Ullrich, Philadelphia, Pa.; Raymond D. Youssefyeh, Princeton Junction, N.J.; Daniel L. Cheney, Audubon, and Christopher J. Burns, Bryn Mawr, both of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

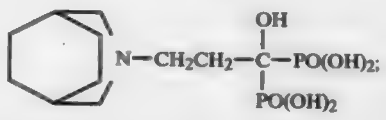
Filed May 1, 1992, Ser. No. 877,574

Int. Cl.⁵ A61K *31/675, 31/66*

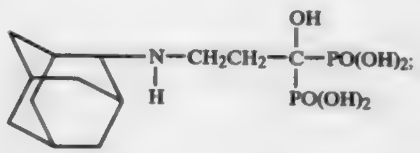
U.S. Cl. 514—79 **9 Claims**

1. A method of lowering serum cholesterol or maintaining lowered serum cholesterol in a patient requiring such treatment which comprises administering to such patient a squalene synthetase inhibitor effective amount of a compound selected from the group consisting of:

3-[3-azabicyclo[3.2.2]non-3-yl]-1-hydroxypropylidene-1,1-bisphosphonic acid, which is

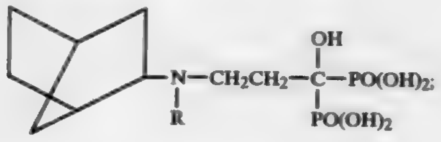


3-[adamant-2-ylamino]-1-hydroxypropylidene-1,1-bisphosphonic acid, which is



or

3-[norborn-2-ylamino]-1-hydroxypropylidene-1,1-bisphosphonic acid, which is



or a pharmaceutically acceptable salt thereof.

5,317,016

PYRROLIDYLTHIOCARBAPENEM DERIVATIVE

Yasuhiro Nishitani, and Tadashi Irie, both of Osaka, Japan, assignors to Shionogi Seiyaku Kabushiki Kaisha, Osaka, Japan

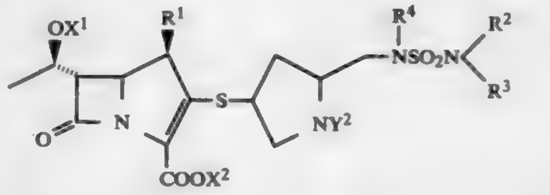
Filed Aug. 14, 1992, Ser. No. 929,961

Claims priority, application Japan, Aug. 20, 1991, 3-207972; Feb. 21, 1992, 4-35366

Int. Cl.⁵ C07D *487/04;* **A61K** *31/40*

U.S. Cl. 514—210 **16 Claims**

1. A pyrrolidylthiocarbapenem derivative represented by Formula I:



(I)

wherein R^1 is hydrogen or lower alkyl; R^2, R^3 and R^4 are hydrogen, lower alkyl which can be substituted, or an amino protecting group independently, or R^2 and R^3

together with a nitrogen atom to which R^2 and R^3 are bonded form a saturated or unsaturated cyclic group, or R^2 and R^4, or R^3 and R^4 together with two nitrogen atoms and one sulfur atom in the sufamide group form a saturated or unsaturated cyclic group; each cyclic group can further include at least one atom selected from the group consisting of oxygen, sulfur and nitrogen, and each cyclic group can be substituted; X^1 is hydrogen or a hydroxy protecting group; X^2 is hydrogen, a carboxy protecting group, an ammonio group, an alkali metal or an alkaline-earth metal; and Y^2 is hydrogen or an amino protecting group.

5,317,017

N-BIPHENYL-3-AMIDO SUBSTITUTED BENZOLACTAMS STIMULATE GROWTH HORMONE RELEASE

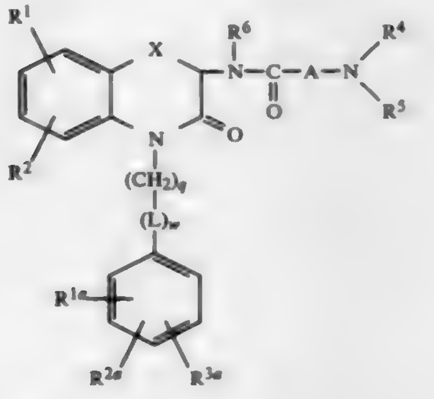
Hyun O. Ok; William R. Schoen, both of Edison, and Matthew Wyvratt, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 30, 1992, Ser. No. 954,220

Int. Cl.^{5} A61K *31/55;* **C07D** *243/10, 267/02, 281/02, 401/02, 413/02, 417/02*

U.S. Cl. 514—211 **13 Claims**

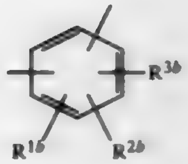
1. A compound having the formula:



I

where

L is



q is 0 to 4;

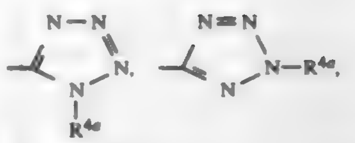
w is 0 or 1;

R^1, R^2, R^{1a}, R^{2a}, R^{1b}, and R^{2b} are independently hydrogen, halogen, C_1–C_7 alkyl, C_1–C_3 perfluoroalkyl, C_1–C_3 perfluoroalkoxy, $—S(O)_mR^{7a}$, cyano, nitro, $R^{7b}O(CH_2)_v—$, $R^{7b}COO(CH_2)_v—$, $R^{7b}OCO(CH_2)_v—$, $R^4R^5N(CH_2)_v—$, $R^{7b}CON(R^4)(CH_2)_v—$, $R^4R^5NCO(CH_2)_v—$, phenyl or substituted phenyl where the substituents are from 1 to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy; R^{7a} and R^{7b} are independently hydrogen, C_1–C_3 perfluoroalkyl, C_1–C_6 alkyl, substituted C_1–C_6 alkyl, where the substituents are phenyl or substituted phenyl; phenyl or substituted phenyl where the phenyl substituents are from 1 to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy and v is 0 to 3;

R^{3a} and R^{3b} are independently hydrogen, R^9, C_1–C_6 alkyl substituted with R^9, phenyl substituted with R^9, or phenoxy substituted with R^9;

m is 0 to 2;

R^9 is



$R^{7b}O(CH_2)_v—$, $R^{7b}COO(CH_2)_v—$, $R^{7b}OCO(CH_2)_v—$, $R^{7b}CO(CH_2)_v—$, $R^{7b}(CH_2)_vCO—$, $R^4R^5N(CH_2)_v—$, $R^{7b}CON(R^4)(CH_2)_v—$, $R^4R^5NCO(CH_2)_v—$, $R^4R^5NCS(CH_2)_v—$, $R^4R^5NN(R^5)CO(CH_2)_v—$, $R^4R^5NN(R^5)CS(CH_2)_v—$, $R^{7b}CON(R^4)N(R^5)CO(CH_2)_v—$, $R^{7b}CON(R^4)N(R^5)CS(CH_2)_v—$, $R^4N(OR^{7b})CO(CH_2)_v—$, $R^{7a}CON(OR^{7b})CO(CH_2)_v—$, $R^{4b}R^{12a}NCON(R^{12b})(CH_2)_v—$, $R^{4b}R^{12a}NCSN(R^{12b})(CH_2)_v—$, $R^{4b}R^{12a}NN(R^{12b})CSN(R^{12c})(CH_2)_v—$, $R^{4b}R^{12a}NN(R^{12b})CON(R^{12c})(CH_2)_v—$, $R^{4b}R^{12a}NN(R^{12b})COO(CH_2)_v—$, $R^{4b}R^{12a}NCOO(CH_2)_v—$ or $R^{13}OCON(R^{12b})(CH_2)_v—$,

where v is 0 to 3;

R^{12a}, R^{12b} and R^{12c} are independently R^{5a}, OR^{5a}, or COR^{5a}; R^{12a} and R^{12b}, or R^{12b} and R^{12c}, or R^{13} and R^{12b}, or R^{12a} and R^{4b} when taken together form $—(CH_2)_r—B—(CH_2)_s—$ where B is CHR^1, O, $S(O)_m$ or NR^{10}, m is 0, 1 or 2, r and s are independently 0 to 3 and R^1 and R^{10} are as defined;

R^{13} is C_1–C_3 perfluoroalkyl, C_1–C_6 alkyl, substituted C_1–C_6 alkyl, where the substitutents are hydroxy, $—NR^{10}R^{11}$, carboxy, phenyl or substituted phenyl; phenyl or substituted phenyl where the substituents on the phenyl are from 1 to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy or hydroxy; where R^{10} and R^{11} are independently hydrogen, C_1–C_6 alkyl, phenyl, phenyl C_1–C_6 alkyl, C_1–C_5-alkoxycarbonyl, or C_1–C_5-alkanoyl-C_1–C_6 alkyl;

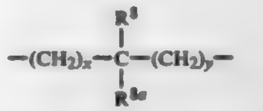
X is | $—CH_2CH(R^{20})—$, $—CH(R^{21})CH_2—$, $—CH(R^{21})CH(R^{20})—$, $—CH{=}C(R^{20})—$, $—C(R^{21}){=}CH—$, $—C(R^{21}){=}C(R^{20})—$, $—S(O)_mCH(R^{20})—$ or $—OCH(R^{20})—$;

R^{20} and R^{21} are independently hydrogen, R^1, R^2 independently disubstituted phenyl, R^1, R^2 independently disubstituted thiophenyl, C_1–C_{10} alkyl, substituted C_1–C_{10} alkyl, C_2–C_{10} alkenyl, substituted C_2–C_{10} alkenyl, C_2–C_{10} alkynyl, substituted C_2–C_{10} alkynyl where the substituents on the alkyl, alkenyl, alkynyl are from 1 to 3 of hydroxy, C_1–C_6 alkoxy, fluoro, R^1 substituted phenyl, $—NR^{10}R^{11}$, carboxy, C_1–C_5 alkoxycarbonyl, formyl or R^{20} and R^{21} when taken together form $—(CH_2)_rB(CH_2)_s—$ where B, r, s, R^1, R^2, R^{10} and R^{11} are as defined above, with the proviso that R^{20} and R^{21} cannot both be hydrogen;

R^4, R^{4a}, R^{4b}, R^5 and R^{5a} are independently hydrogen, phenyl, substituted phenyl, C_1–C_{10} alkyl, substituted C_1–C_{10} alkyl, C_3–C_{10} alkenyl, substituted C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, or substituted C_3–C_{10} alkynyl where the substituents on the phenyl, alkyl, alkenyl or alkynyl are from 1 to 5 of hydroxy, C_1–C_6 alkoxy, C_3–C_7 cycloalkyl, fluoro, R^1, R^2 independently disubstituted phenyl C_1–C_3 alkoxy, R^1, R^2 independently disubstituted phenyl, C_1–C_{20}-alkanoyloxy, C_1–C_5 alkoxycarbonyl, carboxy, formyl, or $—NR^{10}R^{11}$; or R^4 and R^5 when taken to form $—(CH_2)_rB(CH_2)_s—$ where B, r, s, R^1, R^2, R^{10} and R^{11} are as defined above;

R^6 is hydrogen, C_1–C_{10} alkyl, phenyl or phenyl C_1–C_{10} alkyl;

A is



$$—(CH_2)_x—\underset{R^{8a}}{\overset{R^8}{C}}—(CH_2)_y—$$

where x and y are independently 0–3;

R^8 and R^{8a} are independently hydrogen, C_1–C_{10} alkyl, trifluoromethyl, phenyl, substituted C_1–C_{10} alkyl where the substituents are from 1 to 3 of imidazolyl, indolyl, hydroxy, fluoro, $S(O)_mR^{7a}$, C_1–C_6 alkoxy, C_3–C_7 cycloalkyl, R^1, R^2 independently disubstituted phenyl C_1–C_3 alkoxy, R^1, R^2 independently disubstituted phenyl, C_1–C_5-alkanoyloxy, C_1–C_5 alkoxycarbonyl, carboxy, formyl, or $—NR^{10}R^{11}$ where R^{10} and R^{11} are as defined above; or R^8 and R^{8a} when taken together form $—(CH_2)_t—$ where t is 2 to 6; and R^8 and R^{8a} when independently joined to one or both of R^4 and R^5 form alkylene bridges between the terminal nitrogen and the alkyl portion of the A group wherein the bridge contains from 1 to 5 carbon atoms;

or pharmaceutically acceptable salts thereof.

7. A method for increasing levels of endogenous growth hormone in a human or an animal which comprises administering to such human or animal an effective amount of a compound of claim 1.

5,317,018

BENZODIAZEPINES AND COMPOSITIONS FOR TREATING ANXIETY AND PANIC DISORDERS, AND IDIOPATHIC AND PSYCHOMOTOR EPILEPSY

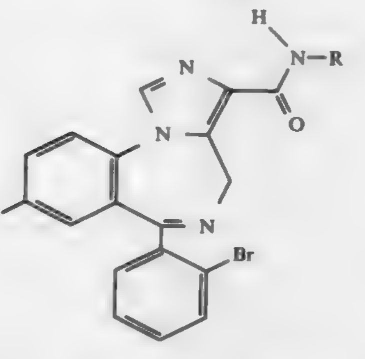
Armin Walser, 19 Crane Ave., West Caldwell, N.J. 07006; Alessandro Guidotti, 4434 Macomb St., NW., Washington, D.C. 20016, and Erminio Costa, 6001 Brookside Dr., Chevy Chase, Md. 20815

Filed Jun. 9, 1992, Ser. No. 895,851

Int. Cl.^{5} A61K *31/55;* **C07D** *487/04*

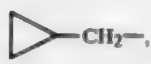
U.S. Cl. 514—220 **24 Claims**

1. A compound of the formula:



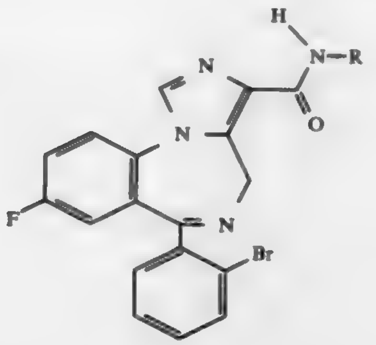
I

wherein R is hydrogen, $CH_3CH_2—$, $CH_2{=}CH—CH_2—$, $(CH_3)_2CH—$, $CH_3CH_2CH_2—$ or



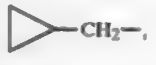
or a pharmaceutically acceptable salt thereof.

6. A method of treating panic disorders in a host comprising administering to the host in need of such treatment an effective antipanic amount of a compound of the formula:



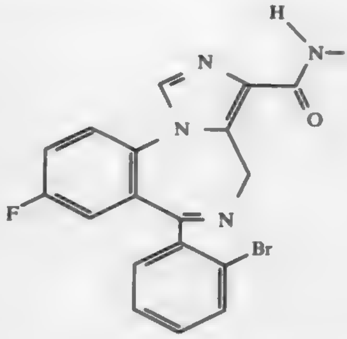
I

wherein R is hydrogen, $CH_3CH_2—$, $CH_2{=}CHCH_2—$, $(CH_3)_2CH—$, $CH_3CH_2CH_2—$, or



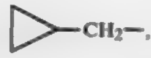
or a pharmaceutically acceptable salt thereof.

11. A method of treating epileptic disorders in a host comprising administering to a host in need of such treatment, an effective antiepileptic amount of a compound of the formula:



I

wherein R is hydrogen, $CH_3CH_2—$, $CH_2{=}CHCH_2—$, $(CH_3)_2CH—$, $CH_3CH_2CH_2—$, or



or a pharmaceutically acceptable salt thereof.

5,317,019

INHIBITION OF INTERLEUKIN-1 AND TUMOR NECROSIS FACTOR PRODUCTION BY MONOCYTES AND/OR MACROPHAGES

Paul E. Bender, Cherry Hill, N.J.; Don E. Griswold, North Wales, Pa.; Nabil Hanna, Solana Beach, Calif.; John C. Lee, Radnor; Bartholomew J. Votta, Pottstown, all of Pa.; Philip L. Simon, Randolph, N.J.; Alison M. Badger, Bryn Mawr, and Klaus M. Esser, Downingtown, both of Pa., assignors to SmithKline Beecham Corp., Phildelphia, Pa.

PCT No. PCT/US90/03367, § 371 Date Dec. 12, 1991, § 102(e) Date Dec. 12, 1991

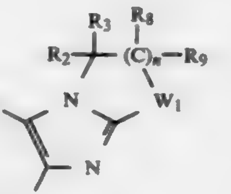
Continuation-in-part of Ser. No. 365,349, Jun. 13, 1989, abandoned. This PCT application Jun. 13, 1990, Ser. No. 809,484

Int. Cl.^{5} A01N *43/40;* **A61K** *31/54*

U.S. Cl. 514—224.2 **4 Claims**

1. A method of inhibiting the production of interleukin-1 (IL-1) by monocytes and/or macrophages in a human in need thereof which comprises administering to such human an effective, IL-1 production inhibiting amount of a compound of the formula

FORMULA (I)



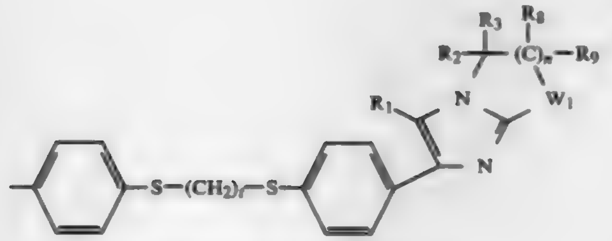
wherein:

W_1 is $—(CR_4R_5)—(CR_6R_7)—$, $—CR_5{=}CR_7—$, $—N{=}CR_7$, $—S(O)_m—$ or $—O—$;

n is 0 to 2;

one of R_1 and R_0 is 4-pyridyl or C_{1-4} alkyl-4-pyridyl, provided that when R_1 is C_{1-4} alkyl-4-pyridyl the alkyl substituent is located at the 2-position of the pyridine ring, and the other of R_1 and R_0 is

- (a) phenyl or monosubstituted phenyl wherein said substituent is C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, C_{2-5} 1-alkenyl-1-thio, C_{2-5} 1-alkenyl-1-sulfinyl, C_{3-5} 2-alkenyl-1-thio, C_{3-5} 2-alkenyl-1-sulfinyl, 1-acyloxy-1-alkylthio, C_{1-4} alkyl or Z wherein Z is —S—S—Z_1 and Z_1 is phenyl or C_{1-9} alkyl; or
- (b) disubstituted phenyl wherein said substituents are, independently, C_{1-3} alkylthio or C_{1-4} alkyl; or
- (c) disubstituted phenyl wherein one of said substituents is C_{1-3} alkylsulfinyl, C_{2-5} 1-alkenyl-1-thio, C_{2-5} 1-alkenyl-1-sulfinyl, C_{3-5} 2-alkenyl-1-thio, C_{3-5} 2-alkenyl-1-sulfinyl or 1-acyloxy-1-alkylthio and the other is C_{1-2} alkoxy, halo, or C_{1-4} alkyl;
- (d) disubstituted phenyl wherein the substituents are the same and are C_{1-3} alkylsulfinyl, C_{2-5} 1-alkenyl-1-thio, C_{2-5} 1-alkenyl-1-sulfinyl, C_{3-5} 2-alkenyl-1-thio, C_{3-5} 2-alkenyl-1-sulfinyl or 1-acyloxy-1-alkylthio; or
- (e) monosubstituted phenyl wherein the substituent is



t is 0 or 1; W_1 and R_1 are as defined above;

provided that:

(1.) when W_1 is —(CR_4R_5)—(CR_6R_7)— then
  n is 0 or 1; and
  R_2, R_3, R_4, R_5, R_6, R_7, R_8, and R_9 are, independently, —H or C_{1-2} alkyl; or
  when n is 0, R_4 and R_5 together form an oxo; R_4 and R_5 may both be fluoro, or one of R_4 and R_5 is H and the other is OH; or
(2.) when W_1 is —CR_5═CR_7— or —N═CR_7— then
  n is 1;
  R_3, R_5, R_7 and R_9 are, independently, —H or C_{1-2} alkyl; and
  R_2 and R_8 together represent a double bond in the B ring such that the B ring is an aromatic pyridine or pyrimidine ring;
(3.) when W_1 is $S(O)_m$ then
  m is 0, 1 or 2;
  n is 1 or 2; and
  R_3 and R_9 are, independently, —H or C_{1-2} alkyl;
  R_2 and R_8 are, independently, —H or C_{1-2} alkyl or R_2 and R_8 together represent a double bond in the B ring such that the B ring is an aromatic thiazole ring and
m is 0 and n is 1; and
(4) when W_1 is —O— then
  n is 1;
  R_3 and R_9 are, independently, —H or C_{1-2} alkyl; and
  R_2 and R_8 together represent a double bond in the B ring such that the B ring is an aromatic oxazole ring;

or a pharmaceutically acceptable salt thereof.

5,317,020

AROMATIC AMINE COMPOUNDS THEIR METHOD OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Xavier Emonds-Alt, Combaillaux; Pierre Goulaouic, Montpellier; Vincenzo Proietto, Saint Georges D'Orques, and Didier Van Broeck, Murviel Les Montpellier, all of France, assignors to Sanofi, Paris, France

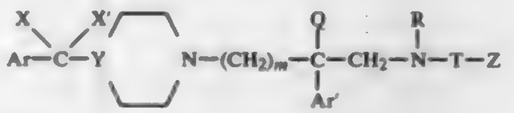
Filed Nov. 5, 1990, Ser. No. 610,093

Claims priority, application France, Nov. 6, 1989, 89 14517; Jun. 15, 1990, 90 07534

Int. Cl.^{5} H01N *43/60;* **C07D** *211/06, 405/00*

U.S. Cl. 514—255 **18 Claims**

1. A compound of the formula



(I)

in which:

m is 2 or 3;

Ar and Ar' independently are a thienyl group; a phenyl group which is unsubstituted or mono- or disubstituted by a halogen atom, by a C_1–C_3 alkyl, by a trifluoromethyl, by an alkoxy in which the alkyl is C_1–C_3 by a hydroxyl or by a methylenedioxy; or an imidazolyl group; it also being possible for Ar' to be a benzothienyl group which is unsubstituted or substituted by a halogen; a naphthyl group which is unsubstituted or substituted by a halogen; a biphenyl group; or an indolyl which is unsubstituted or substituted on the nitrogen by a benzyl group;

X is hydrogen;

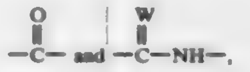
X' is hydrogen or a hydroxyl group or is joined to X" below to form a carbon-carbon bond,
  or X and X' together form an oxo group or a dialkylaminoalkoxyimino group of the formula ═N—O—$(CH_2)_p$—Am, in which p is 2 or 3 and Am is a dialkylamino group, it being possible for each alkyl to contain from 1 to 4 carbon atoms;

Y is a nitrogen atom or a group C(X"), in which X" is hydrogen or forms a carbon-carbon bond with X';

Q is hydrogen, a C_1–C_4 alkyl group or an aminoalkyl group of the formula —$(CH_2)_q$—Am', in which q is 2 or 3 and Am' is a piperidino, 4-benzylpiperidino or dialkylamino group, it being possible for each alkyl to contain from 1 to 4 carbon atoms;

R is hydrogen, a methyl group or a group $(CH_2)_n$—L, in which n is an integer from 2 to 6 and L is hydrogen or an amino group;

T is a group selected from



$$-\overset{\overset{\displaystyle O}{\|}}{C}- \text{ and } -\overset{\overset{\displaystyle W}{\|}}{C}-NH-,$$

W being an oxygen or sulfur atom; and

Z is either hydrogen, or M or OM when T is the group —C(═O)—, or M when T is the group —C(═W)—NH—, M being hydrogen; a linear or branched C_1–C_6 alkyl; a phenylalkyl in which the alkyl group contains from 1 to 3 carbon atoms and which is unsubstituted or mono- or poly-substituted on the aromatic ring by a halogen, a hydroxyl, an alkoxy having 1 to 4 carbon atoms or an alkyl having 1 to 4 carbon atoms; a pyridylalkyl in which the alkyl group contains from 1 to 3 carbon atoms; a naphthylalkyl in which the alkyl group contains from 1 to 3 carbon atoms; a pyridylthioalkyl in which the alkyl group contains from 1 to 3 carbon atoms; a styryl; a 1-methylimidazol-2-ylthioalkyl in which the alkyl group contains from 1 to 3 carbon atoms; a 1-oxophenyl-3-indan-2-yl; or an unsubstituted or mono- or poly-substituted aromatic or heteroaromatic group;

or one of its salts with mineral or organic acids.

5,317,021

3-MERCAPTO-GLUTAMIC ACID DERIVATIVES

Masanori Kawamura; Yoshinobu Arai, and Hideki Aishita, all of Osaka, Japan, assignors to ONO Pharmaceutical Co., Ltd., Osaka, Japan

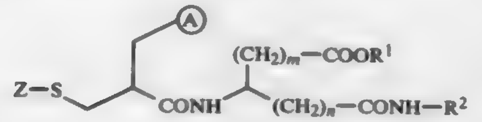
Division of Ser. No. 679,214, Apr. 2, 1991, Pat. No. 5,202,340, which is a division of Ser. No. 347,673, May 5, 1989, Pat. No. 5,017,589. This application Nov. 4, 1992, Ser. No. 971,229

Claims priority, application Japan, May 6, 1988, 63-109191; Oct. 3, 1988, 63-249433

Int. Cl.^{5} A61K *31/505, 31/445, 31/54;* **C07D** *213/56, 239/02, 277/82*

U.S. Cl. 514—275 **28 Claims**

1. An amino acid compound of the formula:



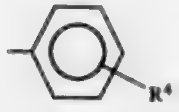
(I)

wherein

R^1 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,

R^2 represents mono-, bi- or tri-carbocyclic ring(s) containng not more than 15 carbon atoms which may be partially or fully saturated or aromatic or R^2 represents heterocyclie ring selected from the group consisting of furan, thiophene, pyrrole, oxazole, isoxazole, thiazole, isothiazole, imidazole, pyrazole, furazan, pyran, pyridine, pyridazine, pyrimidine, pyrazine, indole, isoindole, benzofuran, benzothiophene, indolizine, benzimidazole, benzthiazole, benzoxazole, chromene, quinoline, isoquinoline, quinolizine, purine, indazole, quinazoline, cinnoline, quinoxaline, phthalazine, pteridine, benzodiazepine, carbazole, acridine, phenanthridine, xanthene, phenazine and phenothiazine rings which may be may be partially or fully saturated or aromatic wherein the said cabocyclic ring or heterocyclic ring represented by R^2 is unsubstituted or substituted by 1 to 3 R^3s,

R^3 represents independently:
  (1) a halogen atom,
  (2) a trihalomethyl group,
  (3) a hydroxy group,
  (4) an alkyl group of 1 to 15 carbon atoms,
  (5) an alkoxy group of 1 to 4 carbon atoms,
  (6) an alkylthio, alkylsulfinyl or alkylsulfonyl group of 1 to 4 carbon atoms,
  (7) a group of the formula:



in which R^4 represents a hydrogen atom, a halogen atom, a trihalomethyl group, a hydroxy group, an alkyl group of 1 to 4 carbon atoms or an alkoxy group of 1 to 4 carbon atoms,

(8) a group of the formula

$-NR^5R^6$

in which R^5 and R^6 independently represent a hydrogen atom or an alkyl group of 1 ; to 4 carbon atoms,

(9) a group of the formula

$-CO-R^7$

in which R^7 represents an alkyl group of 1 to 4 carbon atoms or a phenyl group substituted by R^4 in which R^4 is as hereinbefore defined,

(10) a group of the formula:

$-COOR^8$

in which R^8 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,

(11) a group of the formula:

$-CONR^5R^6$

in which R^5 and R^6 are as hereinbefore defined,

(12) a group of the formula:

$-SO_2NR^5R^6$

in which R^5 and R^6 are as hereinbefore defined,

(13) a cyano group,
(14) a nitro group, or
(15) a group of the formula:

$-NHCO-R^7$,

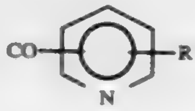
in which R^7 is as hereinbefore defined,

Z represents:
  (1) a hydrogen atom,
  (2) a group of the formula

$-COR^9$

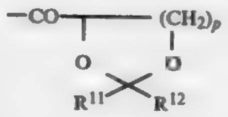
in which R^9 represents an alkyl group of 1 to 4 carbon atoms or a phenyl group substituted by R^{10}, in which R^{10} represents a hydrogen atom, a halogen atom, a trihalomethyl group, an alkyl group of 1 to 4 carbon atoms or an alkoxy group of 1 to 4 carbon atoms,

(3) a group of the formula:



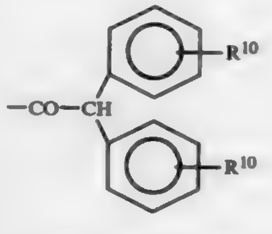
in which R^{10} is as hereinbefore defined,

(4) a group of the formula:



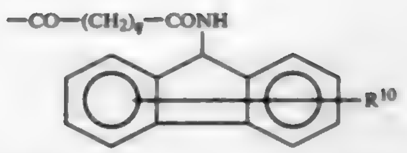
in which R^{11} and R^{12} independently represent a hydrogen atom, an alkyl group of 1 to 4 carbon atoms or a phenyl group substituted by R^{10}, in which R^{10} is as hereinbefore defined, or R^{11} and R^{12} together represent an alkylene group of 4 or 5 carbon atoms and p is an integer of 1 or 2,

(5) a group of the formula:



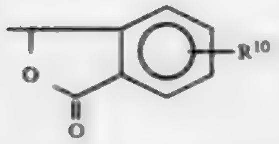
in which each of the two R^{10}s are independently as hereinbefore defined,

(6) a group of the formula:



in which R^{10} is as hereinbefore defined and q is an integer of 1 to 4,

(7) a group of the formula:



in which R^{10} is as hereinbefore defined,

Ⓐ represents a phenyl or cycloalkyl group of 4 to 7 carbon atoms, substituted by R^{13}, in which R^{13} represents a hydrogen atom, a halogen atom, a trihalomethyl group, an alkyl group of 1 to 4 carbon atoms or an alkoxyl group of 1 to 4 carbon atoms, and

m and n represent:

(1) when m is zero, n is an integer of 1 to 4, and

(2) when n is zero, m is an integer of 1 to 4, with the proviso that

(i) when R^1 represents a hydrogen atom, R^2 represents a pyridyl group, m represents an integer of 2 and when n represents zero, Z does not represent a hydrogen atom, and

(ii) when R^2 represents a heterocyclic ring selected from the group consisting of benzthiazole, thiazole, isothiazole, benzoxazole, oxazole and isoxazole wherein the said ring represented by R^2 is unsubstituted or substituted by 1 to 3 R^3s, where at least one of R^3 represents:

(1) a group of the formula:

$—NR^5R^6$

in which R^5 and R^6 independently represent a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,

(2) a group of the formula:

$—CONR^5R^6$

in which R^5 and R^6 are as hereinbefore defined,

(3) a group of the formula:

$—SO_2NR^5R^6$

in which R^5 and R^6 are as hereinbefore defined,

(4) a cyano group,

(5) a nitro group, or

(6) a group of the formula:

$—NHCO—R^7$,

in which R^7 represents an alkyl group of 1 to 4 carbon atoms or a phenyl group substituted by a hydrogen atom, a halogen atom, a trihalomethyl group, a hydroxy group, an alkyl group of 1 to 4 carbon atoms, an alkoxyl group of 1 to 4 carbon atoms,

Z does not represent a hydrogen atom,

or a non-toxic salt thereof.

5,317,022
PHARMACEUTICAL COMPOSITION AND USE

Anna Borsodi, Vitéz; Zsuzsa Fürst, Toldy; Sandor Hosztafi, Árpád; Schäfferné E. Varga, Főfasor; Beáta Buzá, Makkári; Tamás Friedmann, Budekeszi; Sandor Benyhe, and Mária Szücs, both of Sugárút, all of Hungary, assignors to Alkaloida Chemical Company Ltd., Finland

PCT No. PCT/HU92/00006, § 371 Date Oct. 2, 1992, § 102(e) Date Oct. 2, 1992, PCT Pub. No. WO92/13534, PCT Pub. Date Aug. 20, 1992

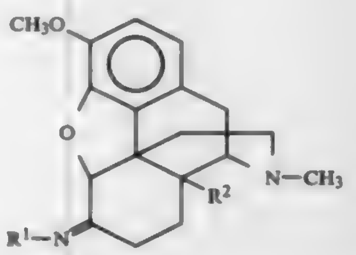
PCT Filed Feb. 3, 1992, Ser. No. 934,547

Claims priority, application Hungary, Feb. 4, 1991, 369

Int. Cl.^{5} A61K *31/114*

U.S. Cl. 514—282 **6 Claims**

1. A composition for achieving an opioid analgesic effect while inhibiting respiratory depression, said composition comprising an analgesic effective amount of a compound of the formula I:



I

wherein R^1 is -OH, and R^2 is H or OH, or a pharmaceutically acceptable salt thereof.

5,317,023
BENZOFURAN DERIVATIVES

Barry C. Ross; David Middlemiss; David I. C. Scopes; Torquil I. M. Jack; Kevin S. Cardwell; Michael D. Dowle; John G. Montana; Martin Pass, and Duncan B. Judd, all of Ware, Great Britain, assignors to Glaxo Group Limited, London, England

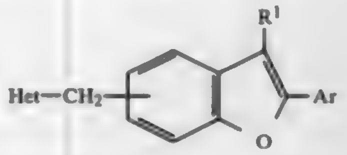
Filed May 15, 1992, Ser. No. 883,386

Claims priority, application United Kingdom, May 16, 1991, 9110633; Jan. 22, 1992, 9201358; Mar. 10, 1992, 9205174

Int. Cl.^{5} C07D *401/048;* A61K *31/44*

U.S. Cl. 514—303 **25 Claims**

1. A compound of formula (I):

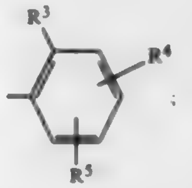


(I)

or a physiologically acceptable salt, solvate or metabolically labile ester thereof wherein

R^1 represents a hydrogen atom, a halogen atom, C_{1-6}alkyl, C_{2-6}alkenyl, fluoroC_{1-6}alkyl, C_{1-6}alkoxy, —CHO, $—CO_2H$ or $—COR^2$;

Ar represents the group

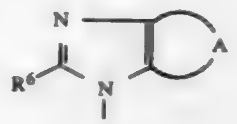


R^2 represents C_{1-6}alkyl, C_{2-6}alkenyl, C_{1-6}alkoxy or a group $—NR^{15}R^{16}$;

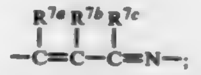
R^3 represents $—CO_2H$, $—NHSO_2CF_3$ or a C-linked tetrazolyl group;

R^4 and R^5 which may be the same or different each independently represent a hydrogen atom, a halogen atom or C_{1-6}alkyl;

Het represents the group



A, when read in a clockwise or anti-clockwise direction, represents



$$\overset{R^{7a}}{—C}=\overset{R^{7b}}{C}—\overset{R^{7c}}{C}=N—;$$

R^6 represents a hydrogen atom, C_{1-6}alkyl, C_{2-6}alkenyl, C_{1-6}alkylthio, C_{1-6}alkoxy, C_{3-7}cycloalkyl, or C_{3-7}cycloalkylC_{1-4}alkyl;

R^{7a}, R^{7b} and R^{7c}, which may be the same or different, each independently represents a hydrogen atom, a halogen atom, cyano, nitro, C_{1-6}alkyl, C_{2-6}alkenyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC_{1-4}alkyl, fluoroC_{1-6}alkyl, $—(C_mH_{2m})R^9$, $—(CH_2)_nCOR^{10}$ or $—(CH_2)_pNR^{11}COR^{12}$;

R^9 represents hydroxy or C_{1-6}alkoxy;

R^{10} represents a hydrogen atom, hydroxy, C_{1-6}alkyl, C_{1-6}alkoxy, phenyl, phenoxy or a group $—NR^{15}R^{16}$;

R^{11} represents a hydrogen atom or C_{1-6}alkyl;

R^{12} represents a hydrogen atom, C_{1-6}alkyl, C_{1-6}alkoxy, phenyl, phenoxy, or a group $—NR^{15}R^{16}$;

R^{15} and R^{16}, which may be the same or different, each independently represent a hydrogen atom or C_{1-4}alkyl;

m represents an integer from 1 to 6;

n represents zero or an integer from 1 to 4; and

p represents an integer from 1 to 4.

5,317,024
ETHER DERIVATIVES OF ALKYL PIPERIDINES AND PYRROLIDINES AS ANTIPSYCHOTIC AGENTS

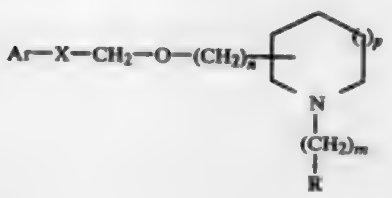
Gary A. Cain, New Castle, Del.; Thomas E. Christos, Oxford, Pa., and Sang W. Tam, Hockessin, Del., assignors to DuPont Merck Pharmaceutical Co., Wilmington, Del.

Division of Ser. No. 589,863, Sep. 28, 1990, Pat. No. 5,252,586. This application Aug. 3, 1993, Ser. No. 98,443

Int. Cl.^{5} C07D *211/06;* A01N *43/40*

U.S. Cl. 514—317 **13 Claims**

1. A method of inhibiting psychoses in a mammal which comprises administering to the mammal an effective amount of a compound of formula:



(I)

wherein:

n is 0, 1, or 2;

p is 0 or 1;

m i 1,2, or 3;

X is —C≡C— or $R^1C{=}CR^2$ (cis or trans);

R^1 and R^2 independently are H, alkyl of 1–4 carbon atoms, or phenyl;

Ar is naphthyl or phenyl, optionally substituted with 1–5 substituents individually selected form NO_2, halogen, CF_3, SH, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, hydroxy alkyl of 1–4 carbon atoms, $—C(=0)—R^3$, $—NR^3R^4$, $—C(=0)—NR^3R^4$, $—NR^3C(=0)R^4$ $S(O)qR^5$ where q is 0, 1, or 2;

R^3 and R^4 independently are H, alkyl of 1–4 carbon atoms, or phenyl;

R^5 is alkyl of 1–4 carbon atoms or phenyl;

R is H, alkyl of 1–5 carbon atoms, cycloalkyl of 3–6 carbon atoms, Arl where Arl is phenyl or naphthyl, or $—CH{=}CR^6R^7$; and

R^6 and R^7 independently are H or alkyl of 1–4 carbon atoms, provided that when n=0 the side chain is not located at the 2-position of the ring; or po1 a pharmaceutically acceptable salt thereof.

5,317,025
PIPERIDINYLTHIOINDOLE DERIVATIVES, THEIR METHODS OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT, USEFUL ESPECIALLY AS ANALGESICS

Nicole Bru-Magniez, Paris; Dominique Potin, Aubergenville, and Jean-Marie Teulon, La Celle Saint Cloud, all of France, assignors to Laboratoires USPA, Agen, France

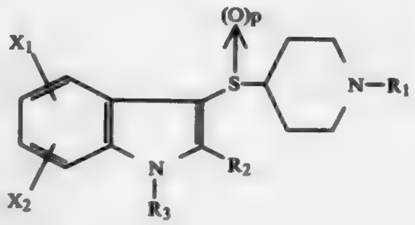
Filed Jun. 25, 1993, Ser. No. 81,704

Claims priority, application France, May 18, 1993, 9305966

Int. Cl.^{5} A61K *31/445;* C07D *401/12*

U.S. Cl. 514—323 **11 Claims**

1. A piperidinylthioindole compound of formula (I):



Formula (I)

in which:

X_1 and X_2 are independently:
- a hydrogen atom;
- a halogen atom;
- a lower alkyl radical having 1 to 6 carbon atoms;
- a trifluoromethyl group; or
- a lower O-alkyl radical having 1 to 6 carbon atoms; and can he located in the 4-, 5-, 6- or 7-position of the indole ring,

R_1 is:
- a hydrogen atom;
- a lower alkyl radical having 1 to 6 carbon atoms;
- a radical $—(CH_2)_n$-phenyl; or
- a radical $—(CH_2)_n$-pyrrole;

in which n is an integer from 0 to 4,

R_2 is:
- a hydrogen atom;
- a lower alkyl radical having 1 to 6 carbon atoms; or
- a phenyl radical which is unsubstituted or substituted by a halogen atom,

R_3 is:
- a hydrogen atom;
- a lower alkyl radical having 1 to 6 carbon atoms; or
- a radical $—(CH_2)_n$-phenyl in which the phenyl is unsubstituted or substituted by a halogen atom, n being an integer from 0 to 4, and

p is an integer from0 to 2, or a pharmaceutically acceptable addition salt thereof.

5,317,026
ACETAMIDE DERIVATIVE AND APPLICATION THEREOF

Masaki Otagiri, Teruko Imai; both of Kumamoto, Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Filed Mar. 2, 1993, Ser. No. 25,167

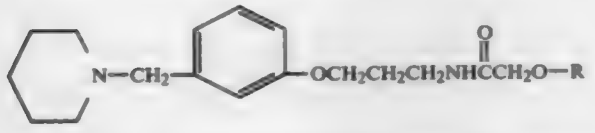
Claims priority, application Japan, Mar. 4, 1992, 4-082864

Int. Cl.^{5} A61K *31/445;* **C07D** *211/32*

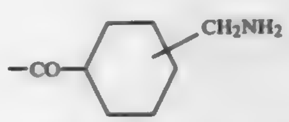
U.S. Cl. 514—331 **16 Claims**

1. A drug composition for inhibiting secretion of gastric acid or protecting gastric mucosa comprising

a. an effective amount of 2-substituted-N-{3-[3-(1-piperidinomethyl)phenoxy]propyl}acetamide, represented by the following formula,



wherein R is an aminomethylcyclohexane carbonyl group,



or a pharmaceutically acceptable salt thereof; and

b. a pharmaceutically acceptable carrier.

5,317,027
FUNGICIDAL COMPOSITIONS

Hubert Sauter, Mannheim; Klaus Schelberger, Goennheim; Reinhold Saur, Boehl-Iggelheim; Gisela Lorenz, Neustadt, and Eberhard Ammermann, Heppenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 943,677, Sep. 11, 1992, Pat. No. 5,260,327.

This application Jul. 8, 1993, Ser. No. 87,317

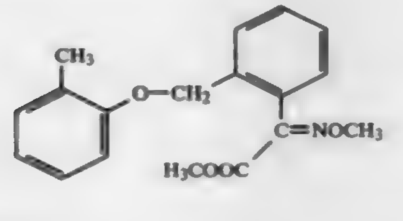
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1991, 4130298

Int. Cl.^{5} A01N *37/12, 37/44, 43/50*

U.S. Cl. 514—399 **2 Claims**

1. A fungicidal composition comprising a synergistically fungicidally effective amount of a mixture of

a) methyl α-methoximino-2-(2-methylphenoxy-methyl)-phenylacetate of the formula



and

b) prochloraz

wherein compounds a) and b) are present in a weight ratio range of 10:1 to 1:10.

5,317,028
7-((SUBSTITUTED)AMINO)-8((SUBSTITUTED)CARBONYL)-METHYLAMINO-1-OXASPIRO(4,5)DECANES USEFUL IN PARKINSON'S DISEASE, DYSTONIA, AND OTHER MOVEMENT DISORDERS

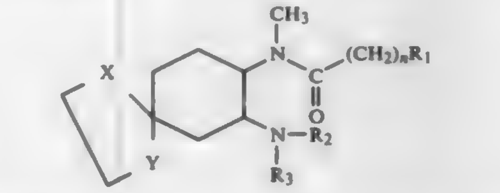
Alexander McKnight, Ely, and Geoffrey N. Wodruff, Dassels, Warner-Lambert Co., Morris Plains, NJ, both of United Kingdom

Filed Sep. 8, 1992, Ser. No. 941,576

Int. Cl.^{5} A61K *31/40*

U.S. Cl. 514—409 **6 Claims**

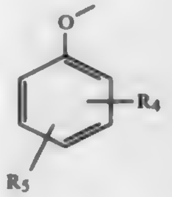
1. A method for treating Parkinson's disease which comprises administering to a patient in need of said treatment a therapeutically effective amount of a compound in unit dosage form of formula



I

or a pharmaceutically acceptable salt thereof wherein n is an integer of from one to six; either of X or Y is oxygen and the other is —CH_2—; R_1 is selected from

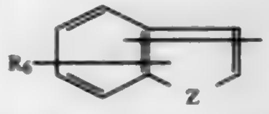
a)



wherein R_4 and R_5 are independently hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, or aryl;

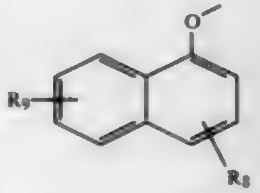
b) 3,4,5-trimethylphenoxy;

c)



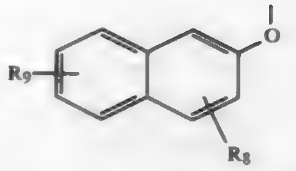
wherein R_6 is hydrogen, fluorine, chlorine, alkyl of from one to six carbon atoms, or aryl; Z is —CH_2—, —O—, —S—, or —NR_7—where R_7 is hydrogen, alkanoyl of from one to six carbon atoms, or alkyl of from one to six carbon atoms;

d)



wherein R_8 and R_9 are independently hydrogen, fluorine, bromine, alkyl of from one to six carbon atoms, or alkoxy of from one to four carbon atoms; or

e)



wherein R_8 and R_9 are as defined above; where R_2 and R_3 taken together with the nitrogen atom to which they are attached, form a pyrrolidinyl ring.

5,317,029
PHARMACEUTICAL COMPOSITION OF BENZOPYRANES FOR THE INHIBITION OF BONE RESORPTION

Mizuho Inazu; Ryoichi Satoh; Tsutomu Inoue, all of Saitama; Hiroshi Kitagawa, Kawajima; Masakazu Katoh, Saitama, all of Japan; Heinrich Englert, Hofheim am Taunus, Fed. Rep. of Germany; Denis Carniato, Clamart, France, and Hans-Jochen Lang, Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Japan Limited, Tokyo, Japan

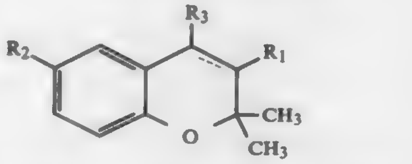
Filed Dec. 14, 1992, Ser. No. 990,617

Claims priority, application Japan, Dec. 16, 1991, 3-331767; Sep. 8, 1992, 4-239144

Int. Cl.^{5} A61K *31/44, 31/53, 31/35*

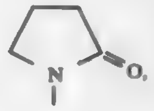
U.S. Cl. 514—422 **6 Claims**

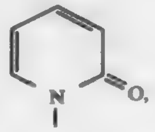
1. A method for treating bone resorption which comprises administering an effective amount for said treatment of a benzopyran derivative represented by formula (I)

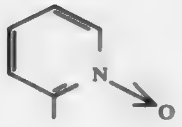


I

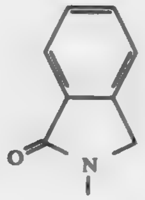
wherein the broken-lined bond denotes an optional double bond, R_1 denotes a hydrogen atom or a hydroxyl group, R_2 denotes a cyano group, a phenylsulfonyl group or a halogen-substituted methoxyl group, and R_3 denotes a group having the formula







or



together with a pharmaceutically acceptable carrier.

5,317,030
METHOD AND COMPOSITIONS FOR HELMINTIC, ARTHROPOD ECTOPARASITIC AND ACARIDAL INFECTIONS WITH NOVEL AGENTS

Irwin B. Wood, Yardley, Pa., and John A. Pankavich, Trenton, N.J., assignors to American Cyanamid Company, Wayne, N.J.

Continuation of Ser. No. 732,251, May 10, 1985, Pat. No. 5,198,464, which is a continuation-in-part of Ser. No. 617,649, Jun. 5, 1984, Pat. No. 4,869,901. This application Jun. 10, 1991, Ser. No. 712,777

The portion of the term of this patent subsequent to Mar. 30, 2010, has been disclaimed.

Int. Cl.^{5} A61K *35/00, 31/335*

U.S. Cl. 514—450 **15 Claims**

1. A method for the prevention, treatment or control of insecticidal infections in warm-blooded animals, said method comprising: orally, parenterally or topically administering to an animal an insecticaidally-effective amount of the fermentation broth or whole mash of microrganism *Streptomyces cyaneogriseus noncyanogenus,* having deposit accession number NRRL 15773, or a mutant thereof, containing agents designated LL-F28249α, LL-F28249β, LL-F28249γ, LL-F28249δ, LL-F28249ε, LL-F28249ζ, LL-F28249η, LL-F28249θ, LL-F28249ι, LL-F28249κ, LL-F28249λ, LL-F28249μ, LL-F28249ν, and LL-F28249ω; or the pharmaceutically and pharmacologically-acceptable salts thereof, wherein said agents have characteristic spectra as shown in FIGS. I-LVII of the attached drawings.

5,317,031
CHOLESTEROL LOWERING COMPOUNDS

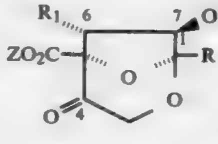
John G. MacConnell; Byron H. Arison, Watchung; George A. Doss, Westfield, and Richard L. Monaghan, Somerset, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 963,153, Oct. 19, 1992, abandoned. This application Nov. 24, 1992, Ser. No. 982,163

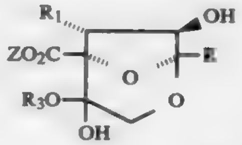
Int. Cl.^{5} A61K *31/335*

U.S. Cl. 514—452 **13 Claims**

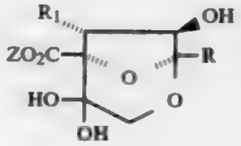
1. A composition comprising a compound of formula (I) and formula (II) and formula (III):



(II)



(I)

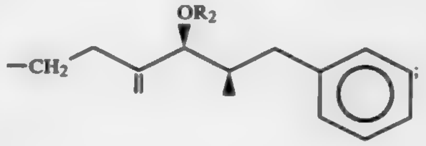


(III)

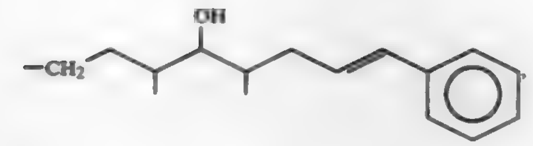
wherein

R is selected from

a)

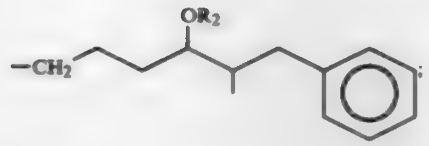


b)



or

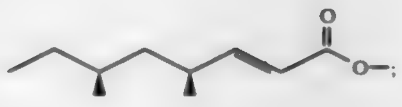
c)



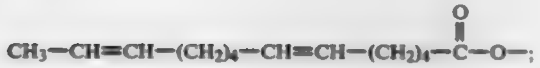
and

R_1 is selected from

a)



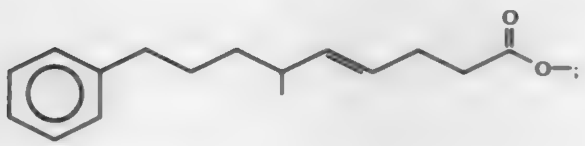
b)



$\mathrm{CH_3{-}CH{=}CH{-}(CH_2)_4{-}CH{=}CH{-}(CH_2)_4{-}\overset{O}{\overset{\|}{C}}{-}O{-}}$;

or

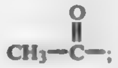
c)



R_2 is selected from

a) H and

b)

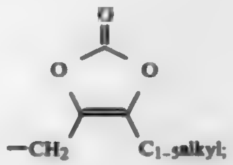


$\mathrm{CH_3{-}\overset{O}{\overset{\|}{C}}{-}}$;

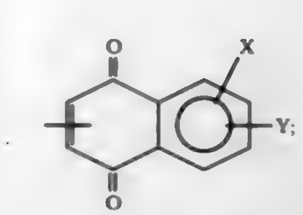
R_3 is $C_{1\text{-}5}$alkyl;

Z is selected from

- (i) H;
- (ii) $C_{1\text{-}5}$alkyl;
- (iii) $C_{1\text{-}5}$alkyl substituted with
  - a) $C_{1\text{-}5}$alkylcarbonyloxy;
  - b) arylcarbonyloxy;
  - c) $C_{1\text{-}5}$alkoxycarbonyloxy;
  - d) aryloxycarbonyloxy;
  - e)



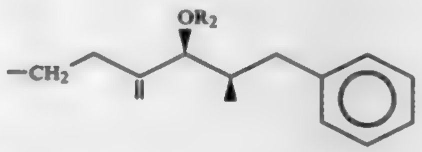
f)



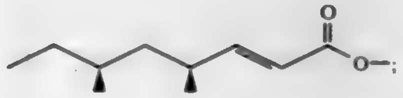
g) or the groups a) through d) form a 5 to 10 membered mono or bicyclic ring with $C_{1\text{-}5}$ alkyl;

(iv) $C_{3\text{-}6}$ cycloalkyl;

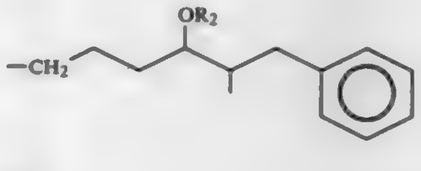
or a pharmaceutically acceptable salt thereof, provided that when R is



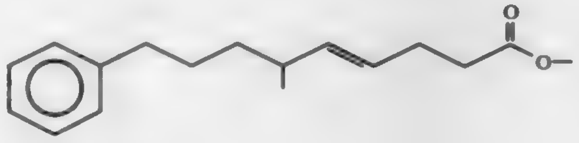
then R_1 is



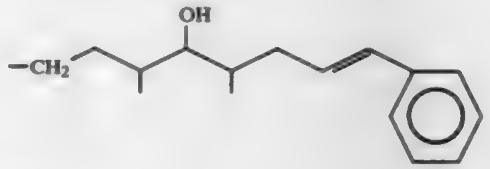
and when R is



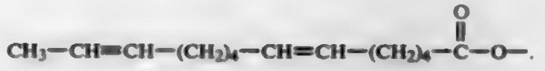
then R_1 is



and when R is



then R_1 is



$\mathrm{CH_3{-}CH{=}CH{-}(CH_2)_4{-}CH{=}CH{-}(CH_2)_4{-}\overset{O}{\overset{\|}{C}}{-}O{-}}$.

5,317,032
PROSTAGLANDIN CATHARTIC

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya; Sachiko Kuno, Takarazuka, and Tomio Oda, Itami, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

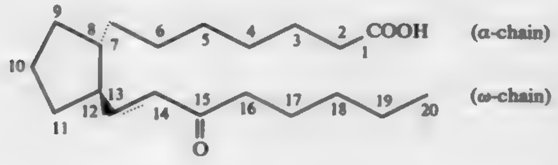
Continuation of Ser. No. 713,603, Jun. 11, 1991, abandoned, which is a continuation of Ser. No. 501,348, Mar. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 252,467, Oct. 3, 1988, abandoned. This application Dec. 30, 1992, Ser. No. 996,495

Claims priority, application Japan, Oct. 2, 1987, 62-250163

Int. Cl.^{5} A61K *31/557*

U.S. Cl. 514—530 **7 Claims**

1. A process for providing a cathartic effect to a patient in need thereof which comprises administering to cathartic-inducing effective amount of a 15-keto-16-halogen PGA, PGE or PGF having the following skeleton:



and wherein said skeleton is saturated or contains at least one unsaturated bond which is a 2,3-, 5-6- or 17,18- double bond or a 5,6- triple bond, and is not further substituted or is further substituted at at least one of C-3, C-6, C-17, C-19 and C-20 positions of the skeleton by a halogen atom, an alkyl group, an alkoxy group, a carbonyl group, a hydroxyl group, a phenyl group or a phenoxy group, or a pharmaceutically acceptable 1-ester or salt thereof, and a pharmaceutically acceptable carrier.

5,317,033
PROCESS FOR PRODUCING SYNTHETIC RESIN FOAM

Shigeru Motani, 1-1-501, 6-chome, Deguchi, Hirakata-shi Osaka, Japan; Tadayuki Saito, 22-37, 3-chome, Higashiimazato, Higashinari-ku, Osaka, Japan, and Takahiro Hayashi, 3-3-41-403, Idakano, Higashiyodogawa-ku, Osaka, Japan

Continuation of Ser. No. 602,509, Oct. 29, 1990, abandoned. This application Jan. 14, 1993, Ser. No. 4,472

Claims priority, application Japan, Feb. 1, 1990, 2-24331; Apr. 9, 1990, 2-94859; Jul. 20, 1990, 2-193481

Int. Cl.^{5} C08J *9/10*

U.S. Cl. 521—79 **36 Claims**

1. A process for producing a synthetic resin foam composed of cells having two sizes, one of the sizes being at most 0.3 mm and the other size being 0.4 to 1 mm, comprising the steps of:

forming a mixture of a water-absorbent high molecular weight organic compound having the capacity of absorbing at least 200 g of pure water per one gram of the compound, a cell controlling agent and a synthetic resin;

kneading and melting the mixture with heating;

incorporating water together with a volatile-type foaming agent into the mixture under pressure; and

extruding the mixture into a lower pressure space to form a foam.

5,317,034
METHOD FOR PRODUCING MODIFIED POLYISOCYANURATE FOAMS

Satoshi Nakamura, and Hirokatsu Shirahata, both of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Oct. 21, 1993, Ser. No. 138,970

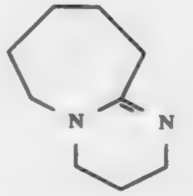
Int. Cl.^{5} C08G *18/00*

U.S. Cl. 521—108 **13 Claims**

1. A method for producing modified polyisocyanurate foam, comprising the step of:

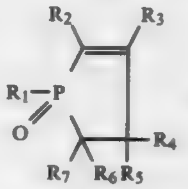
reacting an organic polyisocyanate, polyol and water is practiced in the presence of (a) a trimerization catalyst selected from salts of 1,8-diaza-bicyclo[5.4.0]-undecene-7 represented by formula (I)

(I)



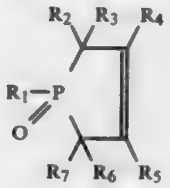
and (b) a carbodiimidation catalyst selected from phosphorene oxides represented by formula (II) or (III)

(II)



or

(III)



wherein R_1 represents substituted or unsubstituted alkyl, phenyl, naphthyl or benzyl group; R_2, R_3, R_4, R_5, R_6 and R_7 each represent independently H, Cl or a C_1–C_4 alkyl group.

5,317,035
ORIENTED POLYMERIC MICROPOROUS FILMS

Philip Jacoby, Naperville; Charles W. Bauer, Batavia; Scott R. Clingman, Glen Ellyn, all of Ill., and William T. Tapp, Marietta, Ga., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 749,213, Aug. 23, 1991, Pat. No. 5,176,953, which is a continuation-in-part of Ser. No. 633,087, Dec. 21, 1990, abandoned. This application Dec. 18, 1992, Ser. No. 993,300

Int. Cl.^{5} C08F *110/00*

U.S. Cl. 521—143 **7 Claims**

1. A polymeric composition comprising,

about 40 to about 90 parts by weight of a component A comprising an ethylene-propylene block copolymer having an ethylene content of about 10 to about 50 wt %,

about 5 to about 40 parts by weight of a component B comprising a propylene homopolymer or random copolymer having up to about 10 wt % of a comonomer of ethylene or an α-olefin of 4 to 8 carbon atoms,

about 1 to about 5 parts by weight, per 100 parts by weight of components A and B, of a component C comprising a low molecular weight polypropylene having a melt viscosity of about 50 to about 1,000 poise measured at a shear rate of 136 sec^{-1} and 190° C.,

about 5 to about 30 parts by weight, per 100 parts by weight of components A and B, of a component D comprising calcium carbonate, and

about 0.1 to about 10 ppm, per 100 parts by weight of components A and B, of a component E comprising a beta-spherulite nucleating agent.

5,317,036

GAS PHASE POLYMERIZATION REACTIONS UTILIZING SOLUBLE UNSUPPORTED CATALYSTS

Robert C. Brady, III, Morristown; Frederick J. Karol, Belle Mead; Timothy R. Lynn, Hackettstown; Robert J. Jorgensen; Sun-Chueh Kao, both of Belle Mead, and Eric P. Wasserman, Hopewell, all of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Oct. 16, 1992, Ser. No. 962,119

Int. Cl.^{5} C08F *4/642*

U.S. Cl. 523—223 **20 Claims**

1. A process for producing polymer in a gas phase polymerization reaction which comprises:

a) continuously introducing a gaseous stream comprising one or more monomers having from two to twelve carbon atoms into a reaction zone;

b) introducing an unsupported polymerization catalyst having a droplet size in the range of from about 1 to about 1,000 microns comprising (i) a transition metal compound selected from Groups IIIB to VIII and (ii) an organometallic compound wherein (i) and (ii) are in liquid form; and

c) withdrawing polymeric product from said reaction zone.

5,317,037

MOLDABLE COMPOSITION OF MATTER

Casey V. Golden, Evergreen; Ronald L. Turner, Golden; John A. Elverum, Elizabeth, and Ray L. Hauser, Boulder, all of Colo., assignors to Bio Dynamics, Ltd., Denver, Colo.

Continuation-in-part of Ser. No. 624,849, Dec. 10, 1990, Pat. No. 5,046,730. This application Sep. 9, 1991, Ser. No. 756,470

The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.

Int. Cl.^{5} C08K *5/00, 11/00*

U.S. Cl. 523—128 **16 Claims**

1. A moldable composition of matter comprising at least 2% by weight of a fibrous material and at least 30% by weight of a natural binding material selected from the group consisting of sugar, polydextrose, maltose, mannitol, gelatin, gluten, hydroxymethyl cellulose, gum arabic, and starch such that said composition can be melt-molded into an article having mechanical strength sufficient for the intended use thereof, said article being biodegradable.

5,317,038

Patent Not Issued For This Number

5,317,039

CYCLOPROPYL-ALANINE ARYL/ALKYLSULFIDE/SULFONYL-TERMINATED AMINO-DIOL COMPOUNDS FOR TREATMENT OF HYPERTENSION

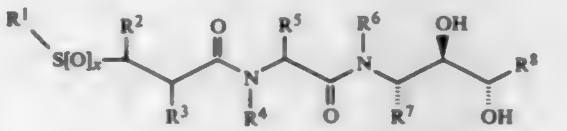
Barbara B. Chen, Glenview; Gunnar J. Hansson, Skokie, and John S. Baran, Winnetka, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 20, 1992, Ser. No. 916,458

Int. Cl.^{5} A61K *31/16*

U.S. Cl. 514—616 **25 Claims**

1. A compound of Formula I:



(I)

wherein R^1 is selected from the group consisting of alkyl, trifluoromethyl, cycloalkyl, cycloalkylalkyl, aryl, haloaryl, aralkyl and haloaralkyl; wherein x is a number selected from the group consisting of zero, one and two; wherein R^2 is selected from the group consisting of hydrido and alkyl; wherein R^3 is selected from the group consisting of hydrido, cycloalkylalkyl, aralkyl and haloaralkyl; wherein each of R^4 and R^6 is independently selected from the group consisting of hydrido and methyl; wherein R^5 is cyclopropylmethyl; wherein R^7 is selected from the group consisting of alkyl, cycloalkylalkyl and aralkyl; wherein R^8 is selected from the group consisting of hydrido, alkyl, hydroxyalkyl, cycloalkyl, cycloalkylalkyl, alkenyl and haloalkenyl; and wherein any one of said R^1 through R^8 groups having a substitutable position may be substituted with one or more groups selected from the group consisting of alkyl, hydroxy, alkoxy and alkenyl.

5,317,040

METHOD FOR THE TREATMENT OF PERTUSSIS WITH AMINOGUANIDINE

William E. Goldman, St. Louis, Mo., assignor to Washington University, St Louis, Mo.

Filed Jan. 26, 1993, Ser. No. 8,948

Int. Cl.^{5} A61K *31/155*

U.S. Cl. 514—634 **1 Claim**

1. A method for treatment of pertussis which comprises administering to a mammalian host an effective amount of aminoguanidine sufficient to inhibit the toxic effects of TCT released by *Bordetella pertussis.*

5,317,041

TICK RELEASE AID

Cynthia M. Chapman, P.O. Box 366, Coffeyville, Kans. 67337-0366, and Peter M. Lasater, Lenapah, Okla., assignors to Cynthia M. Chapman, Lenapah, Okla.

Continuation-in-part of Ser. No. 745,554, Aug. 15, 1991, abandoned. This application Oct. 8, 1992, Ser. No. 957,899

Int. Cl.^{5} A01N *27/00, 65/00*

U.S. Cl. 514—763 **6 Claims**

1. A method in aiding the removal of attached ticks from human and animals hosts comprising:

placing about one to two drops of a composition onto and immediately around a tick imbedded in a host, the composition comprising at least 25 volume percent of a citrus peel oil, at least 15 volume percent of a carrier fluid suitable for increasing the rate at which the citrus peel oil seeps into human skin or animal hide; and at least 10 volume percent an oil solubilizer suitable for increasing solubility of the composition in water; and

pulling on the tick with tweezers for removing the tick from the host.

5,317,042

WATER-BASED MICROEMULSION FORMULATIONS

Kolazi S. Narayanan, Palisades Park, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 654,250, Feb. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 546,014, Jun. 28, 1990, Pat. No. 5,156,666, which is a continuation-in-part of Ser. No. 505,030, Apr. 5, 1990, Pat. No. 5,160,528, which is a continuation-in-part of Ser. No. 448,707, Dec. 11, 1989, Pat. No. 5,071,463. This application Sep. 30, 1992, Ser. No. 953,331

The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.

Int. Cl.^{5} A01N *25/00, 65/00, 37/08*

U.S. Cl. 514—772 **11 Claims**

1. An inert matrix composition for forming a clear, efficacious aqueous microemulsion upon admixture with a predetermined amount of a pyrethroid insecticide and water, which is stable at or below room temperature for an extended period of time, consisting essentially of a predetermined mixture of nonionic surfactants:

(a) a C_6–C_{18} alkylpyrrolidone,

(b) an alkyl phenol ethoxylated alcohol with HLB$\geqq$6; and

(c) an ethylene oxide/propylene oxide/ethylene oxide block copolymer,

in a weight ratio of (a):(b):(c) of about 0.5–2:0.5–2:3–12.

5,317,043

PROCESS FOR THE RECOVERY OF POLYMERS DISSOLVABLE IN AQUEOUS ALKALINE OR ACID MEDIA

Michael Gass, Olten, Switzerland, assignor to Belland AG, Switzerland

Filed Jul. 26, 1991, Ser. No. 736,685

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 4023910

Int. Cl.^{5} C08J *11/26*

U.S. Cl. 521—43.5 **18 Claims**

1. A process for the recovery of polymers dissolvable in at least one of the group consisting of aqueous alkaline and acid media, comprising the steps of dissolving the polymers and precipitating with acid or alkaline precipitation reagents, the precipitation being carried out in a strong aqueous flow and the precipitated particles ripening substantially separate from one another.

5,317,044

ENDOTHERMIC BLOWING AGENTS FOR SURFACE MIGRATION OF COMPONENTS IN FOAMED PRODUCTS, COMPOSITIONS AND APPLICATIONS

Gerry Mooney, West Ajax, Canada; Rod A. Garcia, Orange, Tex.; Michael E. Tarquini, Havre de Grace, and John A. Kosin, Bel Air, both of Md., assignors to J. M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 467,585, Jan. 19, 1990, Pat. No. 5,045,570, Continuation-in-part of Ser. No. 352,307, May 16, 1989, Pat. No. 5,009,810. This application Jun. 11, 1991, Ser. No. 713,224

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.^{5} C08J *9/08*

U.S. Cl. 521—78 **8 Claims**

1. A method for producing a foamed product which comprises:

(a) selecting a polymer component to be foamed;

(b) adding an additive to said polymer component together with a blowing agent capable of causing said additives to migrate through said polymer component during a foaming process, said additive comprising both a polycarboxylic acid and a sodium aluminum hydroxy carbonate which have been surface treated with a component selected from the group consisting of mono- and di-glycerides, stearic acid, silane coupling agents, fatty acids, fatty acid salts, hydrotitinates and zirconates and mixtures thereof and;

(c) subjecting said mixture in step (b) to a foaming process to produce a foamed product, wherein said blowing agent causes said additive to migrate toward surfaces of the foamed product.

5,317,045

SYSTEM AND METHOD FOR REMOTELY HEATING A POLYMERIC MATERIAL TO A SELECTED TEMPERATURE

William G. Clark, Jr., Murrysville; Robert E. Shannon, Penn Township, Westmoreland County, and Warren R. Junker, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 635,987, Dec. 28, 1990, Pat. No. 5,272,216. This application Apr. 5, 1993, Ser. No. 42,588

Int. Cl.^{5} C08J *3/28;* **H05B** *6/64;* **B29C** *35/08;* **B32B** *31/28*

U.S. Cl. 523—300 **21 Claims**

1. A method for hearing a polymeric material to a selected temperature by the application of microwave energy thereto to form a structure that is remotely inspectable for internal discontinuities, comprising the steps of:

(a) selecting a spinel particulate ferromagnetic material from iron lignosulfonate whose Curie temperature corresponds to said selected temperature wherein the diameters of said particles are between about 50–150 angstroms;

(b) dispersing said spinel particulate ferromagnetic material throughout a matrix of said polymeric material to form a polymeric composite such that said particulate material forms between about 1% and 5% by weight of the composite, and

(c) remotely applying a beam of microwave energy having a frequency of between about 400–3,000 MHz to said polymeric composite to remotely heat at least a portion of said polymeric material throughout its volume to approximately the Curie temperature of the ferromagnetic structure to form said structure.

5,317,046

POLYAMIDE-EPOXY-SILICONE MODIFIED COATING COMPOSITIONS

Philip A. Fonkalsrud, 4229 E. 77th St., Tulsa, Okla. 74136

Filed Oct. 13, 1992, Ser. No. 959,620

Int. Cl.^{5} C08K *3/20;* **C08L** *63/00*

U.S. Cl. 523—425 **6 Claims**

1. A water base epoxy coating composition consisting essentially of:

(a) fifteen to thirty weight percent polyamide;

(b) an epoxy resin mixed with said polyamide in a weight ratio of polyamide to epoxy of about 0.6 to 1.8;

(c) a reactive siloxane mixed with said epoxy in a weight ratio of about 0.04 to 0.17 of said reactive siloxane to said epoxy;

(d) 14 to 24% by weight of a pigment to add color and opacity to said composition;

(e) 0.4 to 0.8 percent by weight of dispersant and solvent comprising 4 to 8 percent butyl cellusolve by weight 3½ to 6½ percent alcohol, and 0.2 to 0.4 percent by weight of TMPD Isobuty rate to facilitate mixing of said polyamide, said epoxy resin, said reactive siloxane and said pigment.

5,317,047

COMPOSITION ADAPTED TO BE USED FOR MANUFACTURING STOPPERS AND PROCESS OF MANUFACTURE

Bernard Sabate, Ceret; Joël Masse, Le Gue de Velluire, and Gérard Jeanty, Perpignan, all of France, assignors to Bouchons A Champagne Sabate, S.A., Ceret, France

PCT No. PCT/FR92/00022, § 371 Date Sep. 22, 1992, § 102(e) Date Sep. 22, 1992, PCT Pub. No. WO92/12848, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 14, 1992, Ser. No. 924,009

Claims priority, application France, Jan. 25, 1991, 9101127

Int. Cl.^{5} C08K *11/00;* **B65D** *39/00, 39/12*

U.S. Cl. 524—16 **15 Claims**

1. A composition useful for manufacture of products with an appearance of natural cork comprising;

a. 1%–85% of particles of ligneous plant matter;

b. 1%–60% of a plastics material of closed cellular structure having microspheres; said microspheres having a means dimension of less than 200 microns, said microspheres containing a hydrocarbon expansion agent; wherein said plastics material is selected from the group consisting of a polymer of vinyl chloride, a polymer of vinylidene chloride, a copolymer of vinyl chloride and acrylonitrile, a copolymer of vinylidene chloride, acrylonitrile, and methyl methacrylate, a copolymer of styrene and acrylonitrile, a polymer of ethylene, a polymer of vinyl acetate and a copolymer of methyl methacrylate and acrylonitrile; and

c. 5%–70% of a binding agent.

5,317,048

ULTRA WHITE N,N'-ETHYLENE-BIS(TETRABROMOPHTHALIMIDE) AND ITS PRODUCTION IN ACETIC ACID

Brian Tarbit, Ashington; Brian Adger, Hexham, and Paul Willett, Witton Le Wear, all of England, assignors to Great Lakes Chemical Corporation, W. Lafayette, Ind.

Filed Sep. 30, 1992, Ser. No. 954,281

Int. Cl.^{5} C08K *5/3417;* **C07D** *207/44*

U.S. Cl. 524—94 **28 Claims**

1. A process for preparing a highly white N,N'-ethylene-bis(tetrabromophthalimide) product, comprising:

reacting ethylene diamine and tetrabromophthalic anhydride in acetic acid to produce N,N'-ethylene-bis(tetrabromophthalimide);

recovering the N,N'-ethylene-bis(tetrabromophthalimide) in a white precipitate; and

drying the precipitate, so as to form a N,N'-ethylene-bis(tetrabromophthalimide) product with a yellowness index of about 4 or less.

5,317,049

POLYIMIDESILOXANE SOLUTION AND METHOD OF COATING SUBSTRATES

Sergio R. Rojstaczer, Amherst; David Y. Tang, E. Amherst, and John A. Tyrell, Williamsville, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jan. 21, 1993, Ser. No. 78,339

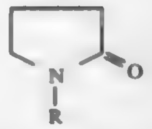
Int. Cl.^{5} C08K *5/3415*

U.S. Cl. 524—104 **20 Claims**

1. A solution of about 5 to about 50 wt % solids comprising

(A) a substantially fully imidized polyimidesiloxane; and

(B) a solvent which comprises at least 50 wt %, based on solvent weight, of a liquid substituted pyrrolidone having the formula



where R is aliphatic or cycloaliphatic from C_3 to C_{10}.

5,317,050

LATENT ACID CURABLE COMPOSITIONS

Arthur H. Gerber, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 988,247, Dec. 9, 1992, Pat. No. 5,296,520. This application Dec. 13, 1993, Ser. No. 166,096

Int. Cl.^{5} C08K *5/15*

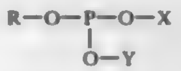
U.S. Cl. 524—107 **18 Claims**

1. A composition comprising:

A. an acid hardenable phenolic resin;

B. about 5% to 100% by weight of furfuryl alcohol based on the weight of the resin; and

C. an aryl phosphite having the formula



$$R{-}O{-}\underset{\displaystyle O{-}Y}{\underset{|}{P}}{-}O{-}X$$

wherein each of R and X is aryl of 6 to 12 carbon atoms, and Y is a member selected from the group consisting of hydrogen, aryl of 6 to 12 carbon atoms, and alkyl of 1 to 12 carbon atoms, said phosphite being in an amount sufficient on hydrolysis thereof to harden the resin.

5,317,051

SURFACE WHITENING PREVENTING FLAME-RETARDANT OLEFIN POLYMER COMPOSITION

Masahiro Harashige, Tokyo; Tsutomu Kawamura, Yokohama; Satoru Kaneko, Yokohama; Takashi Inoue, Yokohama; Atsuo Tokutake, Yokohama, and Toshitsune Yoshikawa, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00853, § 371 Date Apr. 9, 1990, § 102(e) Date Apr. 9, 1990, PCT Pub. No. WO90/02153, PCT Pub. Date Mar. 8, 1990

Continuation of Ser. No. 477,874, Apr. 9, 1990, abandoned. This PCT application Aug. 22, 1989, Ser. No. 890,360

Claims priority, application Japan, Aug. 22, 1988, 63-206337; Aug. 22, 1988, 63-320427

Int. Cl.^{5} C08K *5/10*

U.S. Cl. 524—310 **14 Claims**

1. A flame-retardant olefin polymer composition comprising:

100 parts by weight of a resin component consisting principally of:

a) 99–60% by weight of a polyolefin resin, and

b) 1–40% by weight of an olefin polymer modified with an unsaturated carboxylic acid or a derivative thereof;

c) 5–200 parts by weight of a flame retardant; and

d) at least one component selected from the group consisting of:

1 a mineral oil, a wax, a paraffin,

2 a higher fatty acid or an ester, amide or metallic salt thereof,

3 a silicone

4 a partial fatty acid ester of a polyhydric alcohol or aliphatic alcohol-, fatty acid-, aliphatic amino-, fatty acid amide-, alkylphenol- or alkylnaphthol-ethylene oxide adduct, and

5 a copolymer of vinylidene fluoride with one or more monomers selected from the group consisting of chlorotrifluoroethylene, hexafluoropropylene and tetrafluoroethylene,

wherein when d) is selected from one or more of components ① to ④ the total amount present is within the range of from 0.5 to 20 parts by weight, when d) is component ⑤ alone the total amount is within the range of from 0.01 to 5 parts by weight and when d) is selected from one or more of components ① to ④ together with components ⑤ the total amount of components ① to ④ is within the range of from 0.5 to 20 parts by weight and the total amount of component ⑤ is within the range of 0.01 to 5 parts by weight.

5,317,052

POLYVINYL ALCOHOL PRODUCT AND MULTI-LAYER PRODUCT CONTAINING THE SAME

Hiroyuki Ohba, Niihari; Kazuhiko Hirose, Abiko; Hideaki Tanaka, Niihari, and Nobuyuki Hisazumi, Tsuchiura, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1991, Ser. No. 792,856

Claims priority, application Japan, Nov. 30, 1990, 2-338796; Oct. 11, 1991, 3-263962; Oct. 11, 1991, 3-263963

Int. Cl.^{5} C08K *3/10*

U.S. Cl. 524—413 **12 Claims**

1. A polyvinyl alcohol product obtained by heat-treating a melt-molded polyvinyl alcohol product composed of a polyvinyl alcohol composition containing 0.01 to 3.0 mmol of a metal compound based on 1 g of polyvinyl alcohol, said metal compound being selected from the group consisting of metal halides and metal nitrates where the metal element is selected from alkali metals, alkaline earth metals, and divalent to quadrivalent heavy metals.

5,317,053

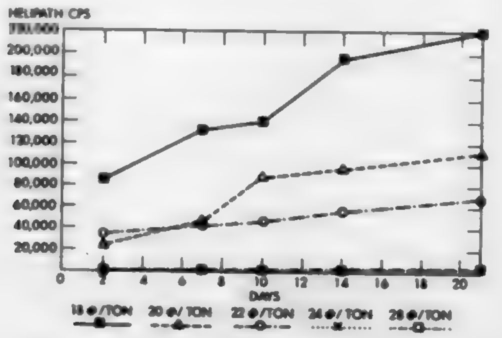
METHOD FOR PRODUCTION OF HIGH SOLID AQUEOUS CALCIUM CARBONATE SUSPENSIONS

Alan J. Brown; Michael S. Darsillo, both of Milledgeville, and O. Wayne Bentley, Jr., Gordon, all of Ga., assignors to ECC International Inc., Atlanta, Ga.

Continuation of Ser. No. 546,397, Jun. 29, 1990, abandoned. This application Jul. 31, 1992, Ser. No. 924,428

Int. Cl.^{5} C08K *3/26*

U.S. Cl. 524—425 **7 Claims**



1. A method for producing a high solids aqueous slurry of particulate calcium carbonate having highly stable aging characteristics, comprising:

dispersing in water at least 70% by weight solids of a finely divided particulate calcium carbonate in water, from 20 to 34 lbs (expressed on the basis of 40% actives) per ton of dry carbonate, of a salt form of a copolymer of acrylic acid and sulfonated vinyl monomer, having from about 30 to 50% of its carboxylic acid sites neutralized with a polyvalent cation, and substantially the balance of said carboxylic acid sites neutralized with a monovalent cation; wherein said copolymer is a polymerization product of from 1 to 75% by weight AMPS and 99 to 25% by weight of acrylic acid and having a molecular weight in the range of from about 1,000 to 20,000; and, wherein said polyvalent cation is selected from the group consisting of calcium, aluminum and magnesium.

5,317,054

REINFORCED POLYAMIDE COMPOSITES

Chih-Cheng Chiang; Mao-Song Lee; Jen-Lien Lin; Der-Tarng Su, and Shen-Nan Tong, all of Taiwan, Taiwan, assignors to Industrial Technology Research Institute, Taiwan, Taiwan

Continuation of Ser. No. 515,718, Apr. 27, 1990, abandoned. This application Aug. 7, 1992, Ser. No. 925,896

Int. Cl.^{5} C08K *3/34, 3/40*

U.S. Cl. 524—451 **8 Claims**

1. A reinforced polyamide composite consisting of:

(A) polyamide resin,

(B) 1 to 100 phr of at least one of fiber and filler reinforcing agent,

(C) 0.1 to 5 phr of an interfacial modifier, based on the polyamide, wherein the interfacing modifier is selected from the group consisting of $C_2H_2(CO_2H)_2$, $C_6H_6(CO)_2NH$, and $C_2H_2(CO)_2O$, and

(D) at least one processing aid, heat stabilizer, or antioxidant.

5,317,055

INTERNAL RESIN-TACKIFIED ACRYLIC POLYMERS

Henry W. Yang, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 631,612, Dec. 20, 1990, Pat. No. 5,164,441, which is a continuation-in-part of Ser. No. 360,507, Jun. 2, 1989, abandoned, and a continuation-in-part of Ser. No. 526,863, May 21, 1990, Pat. No. 5,095,065. This application Aug. 25, 1992, Ser. No. 935,482

Int. Cl.^{5} C09J *107/02*

U.S. Cl. 524—458 **8 Claims**

1. A method for preparing a tackified acrylic copolymer latex composition which comprises the steps of:

dissolving from about 10 to about 100 parts by weight of a hydrogenated hydrocarbon resin in 100 parts by weight of a liquid mixture of free-radical polymerizable monomers to form a polymerizable vinyl monomer reactant solution essentially free of chain transfer agent, the hydrocarbon resin having a weight average molecular weight of from about 500 to about 5000 and an aromatic content of at least about 10 percent by weight;

emulsifying the reactant solution in an aqueous medium;

polymerizing the emulsified monomers, in the absence of oxygen and chain transfer agent, in the presence of the resin and a free radical polymerization initiator, to form an acrylic copolymer latex; and

recovering the tackified acrylic copolymer latex internally tackified by the resin.

5,317,056

COMPOSITION FOR WETTING AND ENCAPSULATING ASBESTOS AND METHOD OF USING

Vern H. Batdorf, Minneapolis, Minn., assignor to H.B. Fuller Company, Vadnais Heights, Minn.

Continuation of Ser. No. 350,084, May 10, 1989, Pat. No. 5,034,247, which is a division of Ser. No. 213,355, Jun. 30, 1988, Pat. No. 4,866,105. This application Apr. 18, 1991, Ser. No. 687,102

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.^{5} C08L *9/00;* **C08K** *3/34;* **C08F** *20/10;* **B08B** *7/00*

U.S. Cl. 524—556 **12 Claims**

1. A penetrating composition for wetting and encapsulating an asbestos-containing material which, upon application, is capable of reducing the amount of airborne asbestos generated during and after debriding of the asbestos-containing material from a structural unit, which composition comprises:

(a) about 70 to 95 wt-% water;

(b) about 5 to 30 wt-% latex having a solids content of about 45 to 60 wt-% based upon the latex, a Brookfield viscosity of less than about 1500 cps and a particle size of less than about 0.4 microns; and

(c) an effective amount of a surfactant selected from the group consisting of a nonionic surfactant and a mixture of a nonionic and a cationic surfactant sufficient to provide a rate of penetration of the composition into a construction-type asbestos-containing material of at least about 2 mm/minute.

5,317,057
(HALOMETHYL VINYL ARENE)-MODIFIED ELASTOMERS AND COMPOSITIONS CONTAINING THEM HAVING REDUCED HYSTERESIS PROPERTIES

James E. Hall, Mogadore; William L. Hergenrother, Akron, and James Oziomek, Cuyahoga Falls, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 30, 1992, Ser. No. 998,204
Int. Cl.^{5} C08L *9/06, 9/00, 11/00*
U.S. Cl. 524—575 **18 Claims**

1. A (halomethyl arene)-modified elastomer having reduced hysteresis properties and made by reacting a lithium terminated elastomer intermediate with the halogen atom of a halomethyl vinyl arene compound of the formula

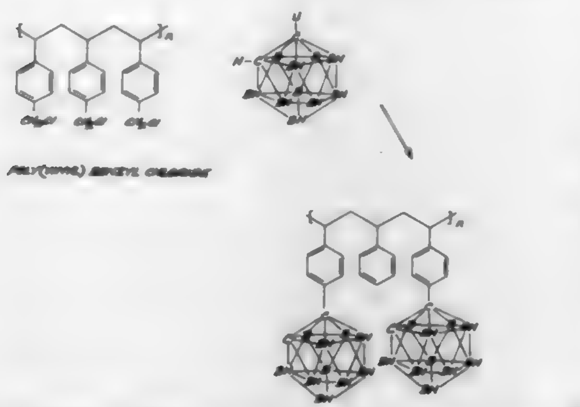
$XCH_2Ar\ CR{=}CH_2$

wherein R is a hydrogen, a lower alkyl group of one to about eight carbons or an aryl group of six to about ten carbons, Ar is a divalent aryl nucleus of six to 12 carbons and X is a chlorine, bromine or iodine atom.

5,317,058
MICROWAVE-ABSORBING MATERIALS CONTAINING POLAR ICOSAHEDRAL MOLECULAR UNITS AND METHODS OF MAKING THE SAME

Thomas K. Dougherty, Playa Del Rey; Norman H. Harris, Newhall; James R. Chow, Alhambra; Brian M. Pierce, Moreno Valley, and David A. Whelan, Chatworth, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 17, 1992, Ser. No. 870,023
Int. Cl.^{5} C08G *63/91, 79/08;* **C08F** *8/00, 4/52*
U.S. Cl. 525—64 **3 Claims**



1. A method for grafting o-carborane onto a polymer matrix, comprising a sequence of the following steps:

dissolving o-carborane in an oxygen free solvent to form a solution;

adding n-butylithium in hexane to said solution to form a solution of lithiated o-carborane;

adding said solution of lithiated o-carborane to a solution of poly(vinylbenzylchloride);

filtering said resulting solution to remove LiCl salts; and

isolating the grafted o-carborane onto the poly(vinylbenzylchloride) by evaporation of said solvent.

5,317,059
IMPACT-RESISTANT POLYMER BLENDS OF OLEFIN POLYMERS, POLYAMIDES, AND TERPOLYMER COMPATIBILIZERS

Deenadayalu Chundury, North Royalton, Ohio, and Bernard G. J. Bitsch, Chantilly, France, assignors to Ferro Corporation, Cleveland, Ohio

Filed Jul. 9, 1990, Ser. No. 550,733
Int. Cl.^{5} C08L *77/00*
U.S. Cl. 525—66 **27 Claims**

1. A blended polymer composition comprising:

(I) from about 30% to about 90% by weight of at least one polypropylene or copolymer of ethylene and propylene;

(II) from about 5% to about 25% by weight of at least one polyamide;

(III) from about 0.1% to about 25% of a compatibilizing agent which comprises at least one terpolymer of an alpha-olefin, an acrylic ester, and an alpha,beta-olefinically unsaturated dicarboxylic acid reagent, or a glycidyl acrylate; and

(IV) from 0.1% to about 10% by weight of at least one auxiliary compatibilizing agent selected from at least one selectively hydrogenated block copolymer of a vinyl aromatic hydrocarbon and a conjugated diene to which has been grafted, an alpha,beta-olefinically unsaturated carboxylic acid reagent, provided that the blended polymer is free of other polymers of vinyl aromatic hydrocarbons.

5,317,060
PROCESS FOR PRODUCING COMPOSITE RESIN FOR TONER

Yutaka Kukimoto; Hikoji Ueda; Kozo Suzuki, and Yoshihiko Koshiyama, all of Itabashi, Japan, assignors to Fujikura Kasei Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1992, Ser. No. 983,129
Claims priority, application Japan, Nov. 29, 1991, 3-339566
Int. Cl.^{5} C08L *33/08*
U.S. Cl. 525—197 **3 Claims**

1. A process for producing a composite resin for a toner, comprising the steps of:

mixing, in water, (a) low-molecular weight polymer powder comprising particles, not less than 80% by weight of said particles having a diameter of from 20 to 2000 microns, the weight average molecular weight of said low-molecular weight polymer being in the range of from 5,000 to 100,000, with (b) a high-molecular weight polymer emulsion, the weight average molecular weight of said high-molecular weight polymer being in the range of from 500,000 to 5,000,000;

subjecting the thus obtained mixture to a coagulation treatment; and

heating the resulting mixture to obtain a composite resin in which the low-molecular weight polymer particle and the high-molecular weight polymer are fixed and homogeneously mixed with each other.

5,317,061
FLUOROPOLYMER COMPOSITIONS

Edward F. Chu, Sunnyvale; Vijay Reddy, San Mateo, and Robert P. Saltman, Redwood City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 24, 1993, Ser. No. 21,827
Int. Cl.^{5} C08L *27/18, 27/20, 27/12*
U.S. Cl. 525—200 **13 Claims**

1. A polymer composition comprising a polymer component which contains three different polymers which comprises

(A) an amount x which is 35 to 85% by weight of the total polymer component of a first polymer which is a copolymer of tetrafluoroethylene and hexafluoropropylene (FEP) as primary monomers optionally with one or more other monomers,

(B) an amount y which is 10 to 60% by weight of the total polymer component of a second polymer which is a copolymer of tetrafluoroethylene and perfluoropropylvinyl ether (PFA) as primary monomers optionally with one or more other monomers, and

(C) an amount z which is 5 to 60% by weight of the total polymer component of a third polymer which is (i) a fluoropolymer which is polytetrafluoroethylene (PTFE) and (ii) melt-processable,

wherein the quantity $(y+z)/x$ is 0.3 to 2 and the composition

(1) has creep at 150° C. and 300 psi for 10 hours of less than 15%,

(2) has a modulus at 275° C. of at least 5×10^7 dynes/cm^2,

(3) has secondary crystalization of less than 20%, and

(4) has a tensile strength at ambient temperature of at least 3000 psi.

5,317,062
STYRENE-ISOPRENE-BUTADIENE RUBBER

Michael B. Rodgers, Akron; Stanley M. Mezynski, Mogadore; Adel F. Halasa, Bath; Wen-Liang Hsu, Copley; Barry A. Matrana, Akron, and Joel L. Cox, North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 944,669, Sep. 14, 1992, Pat. No. 5,272,220. This application Jul. 14, 1993, Ser. No. 91,868
Int. Cl.^{5} C08L *9/06;* **C08F** *236/10, 8/34*
U.S. Cl. 525—237 **12 Claims**

1. A styrene-isoprene-butadiene rubber which is particularly valuable for use in making truck tire treads, said rubber being comprised of repeat units which are derived from about 5 weight percent to about 20 weight percent styrene, from about 7 weight percent to about 35 weight percent isoprene, and from about 55 weight percent to about 88 weight percent 1,3-butadiene, wherein the repeat units derived from styrene, isoprene and 1,3-butadiene are in essentially random order, wherein from about 25% to about 40% of the repeat units derived from the 1,3-butadiene are of the cis-microstructure, wherein from about 40% to about 60% of the repeat units derived from the 1,3-butadiene are of the trans-microstructure, wherein from about 5% to about 25% of the repeat units derived from the 1,3-butadiene are of the vinyl-microstructure, wherein from about 75% to about 90% of the repeat units derived from the isoprene are of the 1,4-microstructure, wherein from about 10% to about 25% of the repeat units derived from the isoprene are of the 3,4-microstructure, wherein the rubber has a glass transition temperature which is within the range of about −90° C. to about −70° C., wherein the rubber has a number average molecular weight which is within the range of about 150,000 to about 400,000, wherein the rubber has a weight average molecular weight of about 300,000 to about 800,000, and wherein the rubber has an inhomogeneity which is within the range of about 0.5 to about 1.5.

5,317,063
WATER-SOLUBLE POLYMER SENSITIVE TO SALT

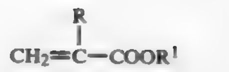
Masanori Komatsu, Narashino, and Yasuo Iida, Yokohama, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 656,755
Int. Cl.^{5} C08F *220/06, 220/12, 8/44*
U.S. Cl. 525—330.2 **6 Claims**

1. A water-soluble polymer which is soluble in tap water, but insoluble in an aqueous solution containing 0.5% or more of a neutral inorganic salt, which is a copolymer of:

(A) 10 to 90% by weight of acrylic acid and/or methacrylic acid; and

(B) 90 to 10% by weight of a vinyl monomer represented by the following general formula (I):



$$CH_2{=}\overset{\overset{\displaystyle R}{|}}{C}{-}COOR^1 \qquad (I)$$

(wherein R represents a hydrogen atom or a methyl group; and R^1 represents an aryl group or a cycloalkyl group), and in which 5 to 50 mole % of the repeating units derived from the acrylic acid and/or methacrylic acid is in the form of a salt.

5,317,064
MANUFACTURE OF POLYLACTIDE STEREOCOMPLEXES

Maria Spinu, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1992, Ser. No. 989,048
Int. Cl.^{5} C08L *67/04*
U.S. Cl. 525—411 **19 Claims**

1. A process for making polylactide stereocomplex, comprising, heating to a temperature of about 95° C. to about 200° C., at a pressure of about 1.4 MPa to about 700 MPa, a first mixture of preformed poly-D-lactide and L-lactide or preformed poly-L-lactide and D-lactide and a catalyst for lactide polymerization, wherein a weight ratio of said poly-D-lactide and L-lactide or poly-L-lactide and D-lactide is about 9:1 to about 1:9 to form a second mixture of poly-L-lactide and poly-D-lactide, and obtaining as a result thereof said stereocomplex in the form of a finished or semifinished part.

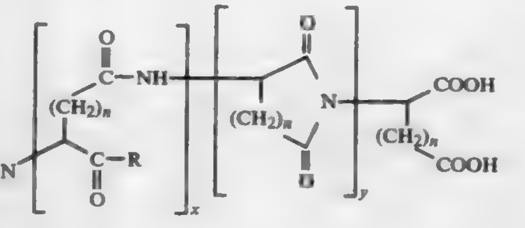
5,317,065
POLY AMINO DICARBOXYLIC ACID-CO-ANHYDRO AMINO DICARBOXYLIC ACID DERIVATIVE

Volker Krone, Flörsheim, and Axel Walch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 651,295, Jan. 29, 1991, Pat. No. 5,229,469. This application Mar. 25, 1993, Ser. No. 36,895
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1990, 4002736
Int. Cl.^{5} C08G *69/48*
U.S. Cl. 525—420 **3 Claims**

1. A polyaminodicarboxylic acid-co-anhydroaminodicarboxylic acid derivative of the Formula I

(I)



in which
- n is 1 or 2,
- x is 1 to 500,
- y is 1 to 500, where
- x+y is 2 to 1000 and
- R is NH—R^2, in which
  - R^2 is $(CH_2)_m$—OR^1, and
  - m is 2 to 6 and
  - R^1 is H, aryl, aralkyl, arylalkenyl, alkyl or C_3–C_8-cycloalkyl, where aryl is unsubstituted or substituted by C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkylcarbonyloxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy or hydroxyl, where
  - the alkyl radicals for R^1 have 1–22 carbon atoms and the alkenyl radicals have 2–22 carbon atoms, which are

uninterrupted or interrupted by a carbonyloxy or oxycarbonyl group, or

R^1 is the monovalent residue of a biologically inactive steroid alcohol or an amino acid,

where the repeating units in square brackets are distributed randomly or in blocks or both randomly and in blocks in the polymers and where both the repeating units indicated by x and y are identical or different and where the amino acids are α- or β-linked or both α- and β-linked.

5,317,066

POLYESTER-GRAFTED POLYAMIDE, PROCESS FOR PREPARING THE SAME, AND THERMOPLASTIC RESIN COMPOSITION CONTAINING THE SAME

Kazushi Watanabe, Ohtake, and Katsuhiko Sumida, Himeji, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 835,421, Feb. 19, 1992, abandoned. This application Mar. 23, 1993, Ser. No. 36,071

Int. Cl.^{5} C08L *77/06, 77/12*

U.S. Cl. 525—425 **4 Claims**

1. A polyester-grafted polyamide comprising a polyamide as the backbone and a thermoplastic polyester as the graft, said polyester-grafted polyamide having a number-average molecular weight of 50,000 to 500,000 as determined by gel permeation chromatography using polymethyl methacrylate as a standard and using 1,1,1,3,3,3-hexafluoro-2-propanol as an eluent.

5,317,067

MOLDING AND PUNCHING OUT MELT-MIXED EPOXY RESIN-THERMOPLASTIC RESIN COMPOSITION WITH HARDENER

Koji Yagi, and Seiichi Fukunaga, both of Ibaraki, Japan, assignors to Tokyo Tire & Rubber Company Limited, Tokyo, Japan

Continuation of Ser. No. 432,321, Nov. 6, 1989, abandoned, which is a division of Ser. No. 237,397, Aug. 29, 1988, abandoned. This application Feb. 3, 1992, Ser. No. 829,380

Claims priority, application Japan, Jan. 25, 1988, 63-15406; May 31, 1988, 63-134595

Int. Cl.^{5} C08L *63/02, 63/04*

U.S. Cl. 525—438 **2 Claims**

1. A process for producing an adhesive epoxy resin molded article which comprises molding into a 0.01 to 10 mm thick film or sheet in a substantially uncured state an epoxy resin composition which is obtained by melt-mixing 100 parts by weight of an epoxy resin with 25 to 33 parts by weight of polyester resin, alone or in combination with other components than a hardener in a first mixing step and then with a hardener alone or in combination with other components in a second mixing step, said epoxy resin having a number-average molecular weight of at least 200 and lower than 5000 and said polyester resin having a number-average molecular weight of at least 5000, and subsequently punching out the film or a sheet at temperatures higher than 15° C. and lower than 70° C. to obtain said molded article.

5,317,068

COMPOSITION OF TETRAGLYCIDYL, TRIGLYCIDYL AND DIGLYCIDYL EPOXY RESINS

Osamu Watanabe; Shinichi Murakami, both of Saitama; Sadahisa Wada, Kamifukuoka, and Hiroshi Inoue, Saitama, all of Japan, assignors to Tonen Corporation, Japan

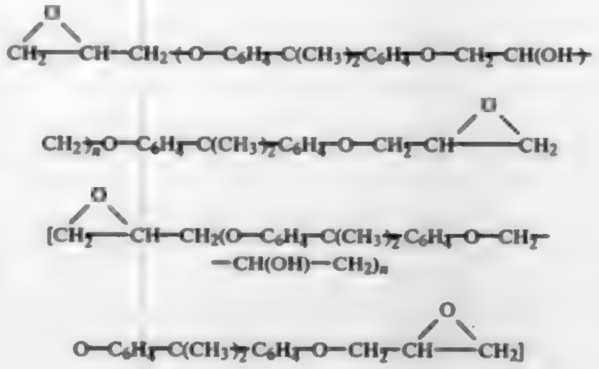
Continuation of Ser. No. 555,620, Jul. 23, 1990, abandoned. This application Mar. 3, 1993, Ser. No. 26,118

Claims priority, application Japan, Jul. 31, 1989, 1-200099

Int. Cl.^{5} C08L *63/02*

U.S. Cl. 525—526 **7 Claims**

1. An epoxy resin composition for forming fiber-reinforced composites having good tack and drape qualities, said composition consisting essentially of (A) 30–95% by weight of a tetrafunctional epoxy resin, (B) 3–40% by weight of a trifunctional epoxy resin, (C) 2–50% by weight of an admixture of epoxy resin oligomers, each of said oligomers being a polymer of a diglycidyl ether of bisphenol A having the following formula:



wherein n is a number providing a number average molecular weight of 380–5,500, said resin admixture (C) having a number average molecular weight of 450–1,300 and a weight average molecular weight providing a ratio of the weight average molecular weight to the number average molecular weight of 1.3–3.0 and (D) a curing agent.

5,317,069

MALEIMIDE-ALT-SILYLSTYRENE COPOLYMER

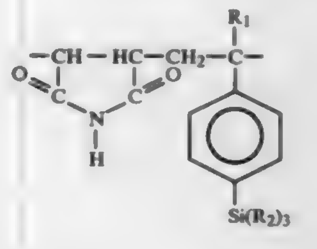
Wen-Yen Chiang, and Jin-Yuh Lu, both of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Jun. 7, 1993, Ser. No. 73,133

Int. Cl.^{5} C08F *22/40*

U.S. Cl. 526—262 **4 Claims**

1. A maleimide-alt-trialkylsilylstyrene copolymer having repeating units of:



I

wherein:

R_1 is H or methyl group;

R_2 is C_1–C_3 alkyl group; and

said copolymer has a weight average molecular weight of 25,000–120,000.

5,317,070

SYNDIOTACTIC HOT MELT ADHESIVE

Patrick Brant, Seabrook, Tex.; Kenneth O. McElrath, Jr., Chause de Waterloo, Belgium, and Martha H. Robertson, Zachary, La., assignors to Exxon Chemical Patents, Inc., Linden, N.J.

Continuation-in-part of Ser. No. 610,219, Nov. 9, 1990, abandoned. This application Aug. 25, 1992, Ser. No. 935,483

Int. Cl.^{5} C08L *23/10;* **C09J** *123/10*

U.S. Cl. 526—348.5 **21 Claims**

1. A hot melt adhesive comprising tackifier and syndiotactic propylene homopolymer or copolymer, said homopolymer or the propylene segment of the copolymer comprising at least about 80% racemic dyads and said homopolymer or copolymer having a melting point of from 100° C. to 180° C.

5,317,071

ALDEHYDE TREATMENT SYSTEM

Travis W. Honeycutt, Gainesville, Ga., assignor to Isolyser Company, Inc., Norcross, Ga.

Filed Jan. 31, 1991, Ser. No. 649,763

Int. Cl.^{5} B65D *85/24;* **C08G** *16/00*

U.S. Cl. 527—305 **8 Claims**

1. A method of converting a toxic composition containing an aldehyde to a composition which is substantially non-toxic, said method comprising reacting said aldehyde with one or more polymers having protic oxygen or nitrogen atoms and a polyimine to substantially swell or absorb to form a substantially solid reaction product by way of a substantially irreversible reaction, said polymers being a member selected from the group consisting of polyacrylamide, cellulose, ethyl hydroxyethyl cellulose, hydroxypropyl cellulose, ethyl cellulose, starch and sugar polymers.

5,317,072

CONDENSATION PROCESS FOR PREPARATION OF ORGANOFUNCTIONAL SILOXANES

Gary N. Bokerman, Midland, Mich.; David E. Puckett, Taylor Mill, and Larry H. Wood, Campbellsburg, both of Ky., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 31, 1992, Ser. No. 922,886

Int. Cl.^{5} C08G *77/06*

U.S. Cl. 528—12 **25 Claims**

1. A process for preparation of organofunctional terminated polydiorganosiloxane polymers, the process comprising:

(A) forming a mixture comprising a hydroxyl-terminated polydiorganosiloxane polymer described formula

$HO(R_2SiO)_nSiR_2OH$,

where each R is a radical independently selected from a group consisting of alkyls comprising one to 20 carbon atoms, cycloalkyls comprising 4 to 20 carbon atoms, and aryls, and n is an integer from one to 999; and an organofunctional chlorosilane end-blocker described by formula

$R^1_aR_bSiCl$,

where each R^1 is an organofunctional radical independently selected from a group consisting of alkenyls comprising two to 20 carbon atoms and haloalkyl radicals comprising one to 20 carbon atoms, R is as previously described, $a=1$, 2, or 3, $b=0$, 1, or 2, and $a+b=3$;

(B) contacting the mixture with a stoichiometric excess of water containing 5 to 36 weight percent hydrogen chloride; and

(C) isolating organofunctional-terminated polydiorganosiloxane polymers described by formula

$R^1_aR_bSiO(R_2SiO)_xSiR^1_aR_b$,

where R, R^1, a, and b are as previously described and x is an integer from $n+1$ to 1,000.

5,317,073

FLUOROSILICONE HYDRIDES

Edwin R. Evans, Clifton Park, and Edward M. Jeram, Burn Hills, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

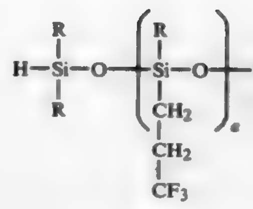
Filed Mar. 27, 1991, Ser. No. 676,906

Int. Cl.^{5} C08G *77/24*

U.S. Cl. 528—42 **11 Claims**

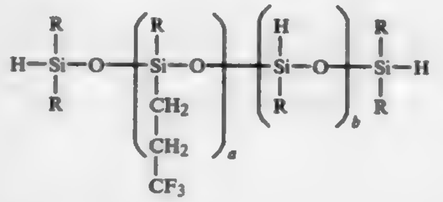
1. A hydride-functional fluorosilicone selected from the group consisting of:

(A) a hydride-functional fluorosilicone having the general formula



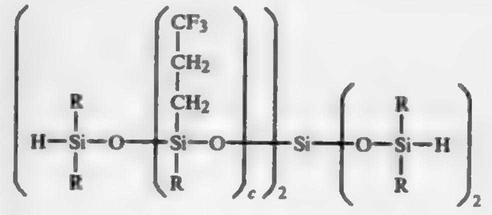
(I)

(B) a hydride functional fluorosilicone having the general formula



(II)

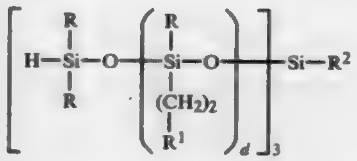
(C) a hydride-functional fluorosilicone having the general formula



(III)

and

(D) a hydride-functional fluorosilicone having the general formula



(IV)

wherein R represents a alkyl radical having from 1 to about 10 carbon atoms or a phenyl radical, R^2 represents a alkyl radical having from 1 to about 10 carbon atoms or phenyl radical, "a" represents a number from 1 to about 100, "b" represents a number from 10 to about 20 "c" represents a number from 1 to about 100, and "d" represents a number from 1 to about 100.

5,317,074

STAIN-RESISTANT ELASTOMERIC ORTHODONTIC FORCE MODULE

W. James Hammar, and Miriam D. Nave, both of St. Paul, Minn., assignors to Minneosta Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 7, 1991, Ser. No. 652,047

Int. Cl.^{5} C08G *18/42;* **A61C** *3/00*

U.S. Cl. 528—44 **42 Claims**

1. An elastomeric orthodontic force module that is sufficiently free of hydrocarbon-based polyether segments and hydrogen-based polyester segments to provide resistance to staining, said force module being made of a material having per 2 mm thickness a Hunter color difference when using a 2.5 cm illuminated opening of (a) less than 40 when compared to a Hunter white standard tile and (b) less than 33 after immersion in mustard solution for 30 minutes when compared to the

material before immersion in mustard solution, said material consisting essentially of polymers selected from the group consisting of polyurethane, polyurea, polyurethane/urea, fluoroelastomer and blends thereof, wherein said force module at room temperature can be repeatedly stretched to twice its original length and will forcibly return to approximately its original length after removal of a tensile stress.

5,317,075
HYDROXYL CONTAINING QUATERNARY AMMONIUM SALTS OF FATTY ACIDS AS INTERNAL MOLD RELEASE COMPOSITIONS

John E. Dewhurst; Ronald M. Pearlstein, both of Macungie, Pa.; Thomas W. Panunto, Yokahamo, Japan, and Reinaldo M. Machado, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 16, 1992, Ser. No. 992,517
Int. Cl.^{5} C08G *18/00*
U.S. Cl. 528—44 **20 Claims**

1. In a polyol containing B-side composition for reaction with a polyisocyanate-containing A-side composition to make a polyurethane or polyurethane/urea elastomer by reaction injected molding, the improvement which comprises a mold release composition which is the reaction product of a C_{12}–C_{36} fatty acid, a tertiary amine having at least one C_{12}–C_{18} alkyl substituent and a C_2–C_{21} reactive epoxide.

5,317,076
POLYUREA ELASTOMER WITH REDUCED MOISTURE VAPOR TRANSMISSION

Dudley J. Primeaux, II, Elgin, Tex., assignor to Texaco Chemical Co., White Plains, N.Y.

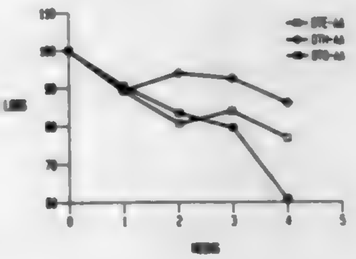
Filed Apr. 12, 1993, Ser. No. 45,150
Int. Cl.^{5} C08G *18/50, 18/65*
U.S. Cl. 528—61 **18 Claims**

1. A polyurea elastomer comprising the reaction product of an (A) component which includes an isocyanate and a (B) component which includes (1) an aminated 1,2-polyoxybutylene diol and (2) a chain extender.

5,317,077
POLYARYLATES CONTAINING DERIVATIVES OF THE NATURAL AMINO ACID L-TYROSINE

Joachim B. Kohn, Highland Park, N.J., and James J. Fiordeliso, Rochester, N.Y., assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.

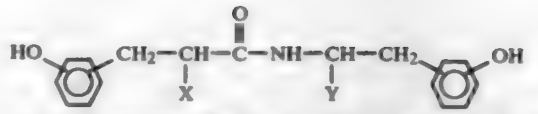
Division of Ser. No. 930,146, Aug. 13, 1992, Pat. No. 5,216,115, which is a continuation-in-part of Ser. No. 804,767, Dec. 9, 1991, Pat. No. 5,198,507, which is a division of Ser. No. 536,425, Jun. 12, 1990, Pat. No. 5,099,060. This application Mar. 29, 1993, Ser. No. 39,929
Int. Cl.^{5} C08G *63/00, 63/06*
U.S. Cl. 528—182 **13 Claims**



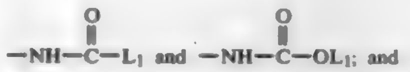
1. A method for the polymerization of polyarylates comprising:

mixing equimolar quantities of:

(a) a diphenol having a structure represented by the formula:

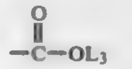


wherein X is selected from the group consisting of —H, —NHL_1, —NL_1L_2,:



$$-NH-\overset{O}{\overset{\|}{C}}-L_1 \text{ and } -NH-\overset{O}{\overset{\|}{C}}-OL_1\text{; and}$$

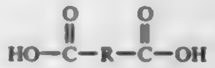
Y is selected from the group consisting of hydrogen and ester groups having the structure:



$$-\overset{O}{\overset{\|}{C}}-OL_3$$

wherein L_1, L_2 and L_3 are independently selected from the group consisting of straight or branched alkyl and alkylaryl groups containing up to 18 carbon atoms; and

(b) a dicarboxylic acid having a structure represented by the formula:

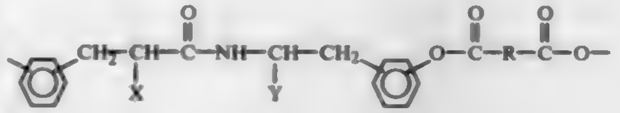


$$HO-\overset{O}{\overset{\|}{C}}-R-\overset{O}{\overset{\|}{C}}-OH$$

wherein R is selected from the group consisting of saturated and unsaturated, substituted and unsubstituted alkyl, aryl and alkylaryl groups containing up to 18 carbon atoms;

together with a catalytic amount of 4-(dimethylamino)-pyridinium-p-toluene sulfonate (DPTS) in a solvent for said polyarylate; and

adding at least one molar equivalent per mole of carboxylic acid groups present of a carbodiimide, so that a polyarylate is formed comprised of recurring structural units represented by the formula:

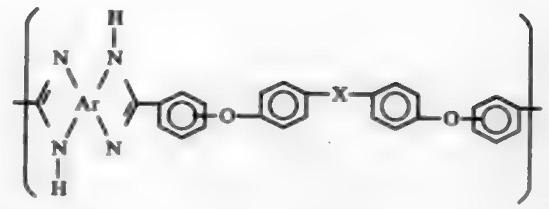


5,317,078
POLYBENZIMIDAZOLE VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

John W. Connell; Paul M. Hergenrother, both of Yorktown, and Joseph G. Smith, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 30, 1991, Ser. No. 790,730
Int. Cl.^{5} C08G *73/18*
U.S. Cl. 528—210 **9 Claims**

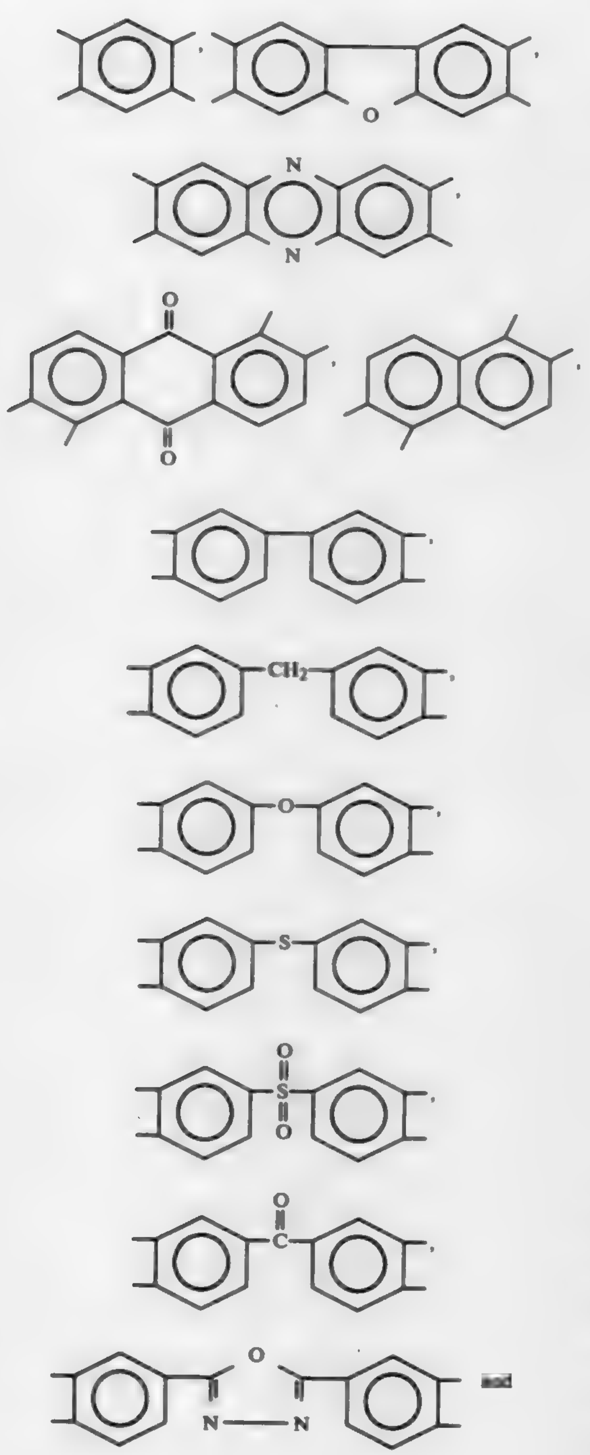
1. A soluble polybenzimidazole having the following structural repeat unit:



where:

the catenation of oxygen is selected from the group consisting of: meta-meta, para-para, and para-meta;

Ar is selected from the group consisting of:



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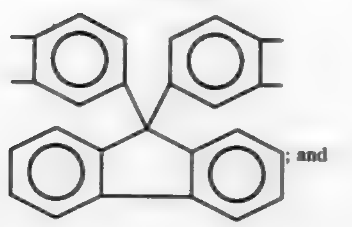
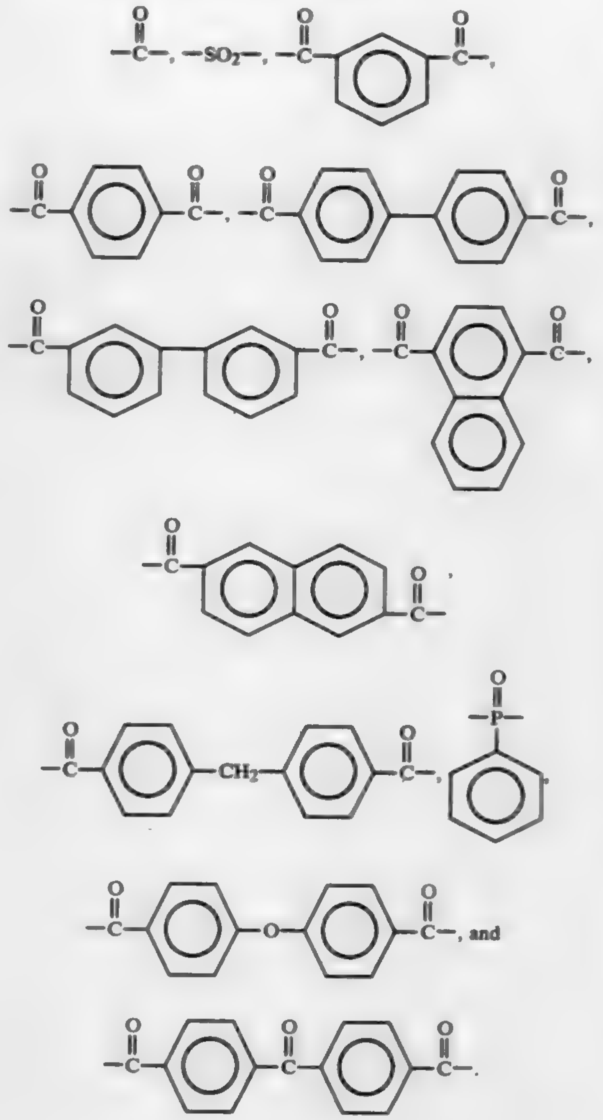


x is selected from the group consisting of:



5,317,079
FATTY ACID TERMINATED POLYANHYDRIDE

Abraham J. Domb, and Manoj Maniar, both of Baltimore, Md., assignors to Nova Pharmaceutical Corporation, Baltimore, Md.

Division of Ser. No. 756,483, Sep. 9, 1991, Pat. No. 5,179,189, which is a continuation-in-part of Ser. No. 467,635, Jan. 19, 1990, Pat. No. 5,171,812. This application Sep. 18, 1992, Ser. No. 947,048
Int. Cl.^{5} C08G *67/04*
U.S. Cl. 528—271 **11 Claims**

1. A method for synthesizing biodegradable fatty acid terminated polyanhydride polymers comprising:

a) synthesizing a fatty acid prepolymer from a fatty acid and a compound selected from the group consisting of an aliphatic carboxylic acid anhydride and an aliphatic carboxylic acid chloride,

b) synthesizing a dicarboxylic acid prepolymer from a dicarboxylic acid and a compound selected from the group consisting of an aliphatic carboxylic acid anhydride and an aliphatic carboxylic acid chloride, and

c) co-polymerizing the fatty acid prepolymer and the dicarboxylic acid prepolymer to form a fatty acid terminated polyanhydride polymer.

5,317,080

POLYETHER ACRYLAMIDE AND ACTIVE ENERGY RAY CURABLE RESIN COMPOSITION

Seiji Arimatsu, Hirakata; Chitoshi Kawaguchi, Souraku; Kazunori Kanda, Yao; Yasuhiro Kimura, Kawasaki; Masao Honma, Kawasaki; Syoichi Asada, Kawasaki; Atsushi Mashita, Kawasaki, and Koji Takeuchi, Kawasaki, all of Japan, assignors to Ajinomto Co., Inc., Tokyo and Nippon Paint Co., Ltd., Osaka, both of Japan

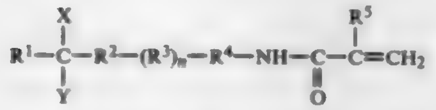
Continuation of Ser. No. 543,533, Jun. 26, 1990, abandoned. This application Nov. 23, 1992, Ser. No. 980,093

Claims priority, application Japan, Jun. 28, 1989, 1-166405; Jan. 16, 1990, 2-6698

Int. Cl.⁵ C08G *69/26;* **G03C** *1/73;* **C07C** *233/00, 235/00*

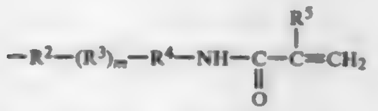
U.S. Cl. 528—332 **2 Claims**

1. A polyether acrylamide represented by the following general formula (I):



$$R^1-\underset{Y}{\overset{X}{C}}-R^2-(R^3)_n-R^4-NH-\underset{\overset{\|}{O}}{C}-\overset{R^5}{C}=CH_2 \qquad (I)$$

wherein R^1 represents —H; R^2 represents —CH_2—; R^3 represents —OCH_2CH_2—, n is an integer of 1–15; R^4 represents —$OCH_2CH_2CH_2$—; R^5 represents H; X represents H; and Y represents Formula II given below:



$$-R^2-(R^3)_m-R^4-NH-\underset{\overset{\|}{O}}{C}-\overset{R^5}{C}=CH_2 \qquad (II)$$

wherein R^2 represents a single bond, R^3, R^4 and R^5 have the same meaning as in formula (I), m being an integer of 1 to 15.

5,317,081

MICROWAVE PROCESSING

Jeffrey D. Gelorme, Plainville, Conn.; David A. Lewis, Carmel, N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 551,716, Jul. 11, 1990. This application Nov. 27, 1991, Ser. No. 799,378

Int. Cl.⁵ C08G *69/26, 73/10;* **B05D** *5/12*

U.S. Cl. 528—353 **28 Claims**

1. A method for manufacturing a polyimide comprising irradiating a polyimide precursor containing polyamic acid groups or polyamic acid ester groups or isoimide groups by a microwave apparatus means for applying microwave radiation to said precursor, said means having a variable power output, said precursor being combined with a solvent,

said precursor in combination with said microwave apparatus means comprising a system,

said radiation being applied to substantially completely remove said solvent and imidize said precursor to said polyimide,

and adjusting the power of said microwave radiation and maintaining resonance of said microwave radiation in said system during said imidization to control the degree and rate of said solvent removal and said imidization of said precursor to said polyimide to obtain a substantially defect free polyimide.

5,317,082

PHOTODEFINABLE OPTICAL WAVEGUIDES

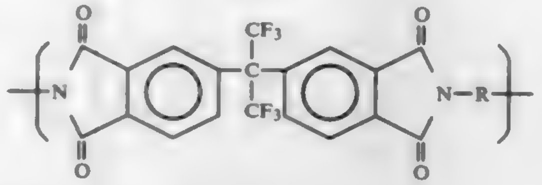
Allyson J. Beuhler, Downers Grove, and David A. Wargowski, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1992, Ser. No. 994,637

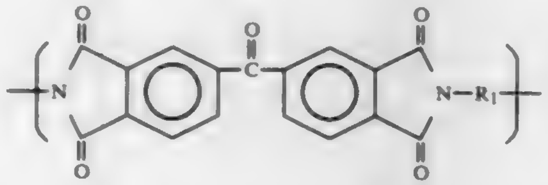
Int. Cl.⁵ C08G *73/10;* **G02B** *1/04, 6/16*

U.S. Cl. 528—353 **14 Claims**

1. A photodefinable optical waveguide comprising a core material within a cladding material wherein at least one of the core material and the cladding material comprises a copolyimide having the repeating units



and from about 0.1 mole % to about 30 mole %



wherein R and R_1 are selected from a group consisting of at least one of an aromatic diamine moiety having bulky methyl groups ortho to the amine, and a co-diamine moiety; or the polyamic acid, salts, or polyester precursors therefor; wherein the photosensitivity of the polyimide is less than about 1,000 mJ/cm², the birefringence is from about minus 0.25 to about plus 0.25, and wherein the refractive index of the core is greater than the cladding.

5,317,083

PROCESS FOR ISOLATING POLYCARBONATES FROM THEIR SOLUTIONS WITH TUBE HAVING CROSS SECTIONAL CONTRICTIONS

Dieter Freitag; Claus Wulff; Wolfgang Alewelt, and Hermann Kauth, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1993, Ser. No. 87,908

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1992, 4224025

Int. Cl.⁵ C08G *64/40*

U.S. Cl. 528—499 **6 Claims**

1. A process for isolating aromatic thermoplastic polycarbonates from solutions thereof in organic solvent, comprising dispersing the solution with steam to form a suspension of polycarbonate particles, condensed water and water/solvent vapor, drying the suspension in a tube with cross-sectional constrictions, and isolating the polycarbonate after drying.

5,317,084

PROCESS FOR LARGE-SCALE PRODUCTION OF ANTIMICROBAL PEPTIDE IN HIGH PURITY

Mamoru Tomita; Seiichi Shimamura, both of Kanagawa; Kozo Kawase, Saitama; Yasuo Fukuwatari, Kanagawa; Mitsunori Takase, Saitama; Wayne Bellamy, Kanagawa; Tomoyuki Hagiwara, Kanagawa, and Hiroyuki Matukuma, Kanagawa, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed May 29, 1992, Ser. No. 891,174

Claims priority, application Japan, Jun. 21, 1991, 3-150604

Int. Cl.⁵ C12N *9/08;* **C07K** *3/22, 13/00*

U.S. Cl. 530—324 **12 Claims**

1. A process for large-scale production of an antimicrobial peptide having the sequence Phe-Lys-Cys-Arg-Arg-Trp-Gln-Trp-Arg-Met-Lys-Lys-Leu-Gly-Ala-Pro-Ser-Ile-Thr-Cys-Val-Arg-Arg-Ala-Phe in high purity which comprises the steps of:

a) contacting a mixture of peptides containing the antimicrobial peptide which is prepared by enzymatically hydrolysing bovine lactoferrin or bovine milk protein containing lactoferrin with a carboxyl moiety-containing cation-exchange chromatographic medium to adsorb the antimicrobial peptide,

b) rinsing the chromatographic medium with a buffer to elute peptides other than the antimicrobial peptide,

c) desorbing the antimicrobial peptide in solution from the rinsed cation-exchange chromatographic medium with a solution containing a salt at a concentration of 1 to 4 moles per liter at pH 7–8, and

d) desalting the desorbed antimicrobial peptide solution, whereby the antimicrobial peptide of at least 90% by weight purity is obtained.

5,317,085

POLYNUCLEOTIDES THAT ENCODE THE HUMAN PROTEOGLYCAN PEPTIDE CORE OF THE EFFECTOR CELLS OF THE IMMUNE RESPONSE

Richard L. Stevens, Sudbury, Mass.; John H. Weis, Salt Lake City, Utah, and Christopher F. Nicodemus, Franconia, N.H., assignors to Brigham And Women's Hospital, Boston, Mass.

Division of Ser. No. 635,544, Jan. 18, 1991, Pat. No. 5,171,674, which is a continuation-in-part of Ser. No. 224,035, Jul. 13, 1988, abandoned. This application Jul. 7, 1992, Ser. No. 909,644

Int. Cl.⁵ C07K *7/08*

U.S. Cl. 530—326 **2 Claims**

1. A peptide of the formula SVQGYPTQRARYQWVR.

5,317,086

CYSTEINE PROTEINASE INHIBITORS AND INHIBITOR PRECURSORS

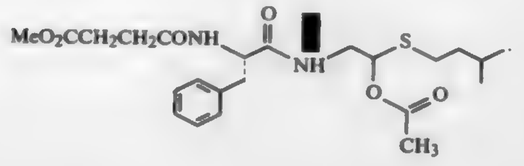
Paul A. Bartlett, Kensington, and Mary M. Mader, El Cerrito, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 9, 1992, Ser. No. 848,377

Int. Cl.⁵ C07K *5/00, 7/00;* **A61K** *37/00*

U.S. Cl. 530—327 **1 Claim**

1. The compound having the structure



5,317,087

PURIFICATION OF THE IL-2 RECEPTOR

Douglas P. Cerretti; David J. Cosman, both of Seattle; Steven K. Dower, Redmond; Carl J. March, Seattle; David L. Urdal, Seattle, and Alf D. Larsen, Seattle, all of Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation of Ser. No. 143,277, Jan. 5, 1988, abandoned, which is a continuation of Ser. No. 670,883, Nov. 13, 1984, abandoned. This application Oct. 22, 1990, Ser. No. 630,331

Int. Cl.⁵ C07K *13/00, 15/00*

U.S. Cl. 530—350 **3 Claims**

1. A homogeneous interleukin 2 receptor protein, precipitatable by monoclonal antibody 2A3-A1H, that has a molecular weight by SDS polyacrylamide gel electrophoresis of about 55,000 to 60,000 daltons and that has a specific activity from approximately 5,000 to approximately 21,000 femtomoles of interleukin 2 receptor per microgram of protein, wherein said protein comprises an N-terminal sequence Glu-Leu-Cys-Asp-Asp-Asp-Pro-Pro-Glu-Ile.

5,317,088

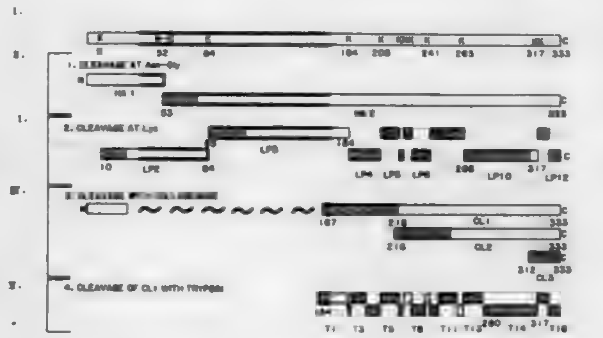
C-TERMINAL CONGLUTININ FRAGMENTS COUPLED TO SOLID SUPPORT

Young M. Lee, Carmichael; Kevin R. Leiby, and Thomas B. Okarma, Palo Alto, all of Calif., assignors to Applied Immune Sciences, Inc., Santa Clara, Calif.

Continuation of Ser. No. 433,546, Nov. 8, 1989, abandoned. This application Jul. 28, 1992, Ser. No. 921,296

Int. Cl.⁵ A61K *37/02;* **C07K** *3/00, 5/00, 17/00*

U.S. Cl. 530—350 **3 Claims**



1. A peptide coupled to solid support, wherein said peptide consists of a 25–153 amino acid sequence fragment from positions 181–333 of bovine conglutinin as shown in FIG. 2.

5,317,089

MONOCLONAL ANTIBODIES AGAINST IFN-OMEGA, PROCESSES FOR PREPARING THEM AND THEIR USE IN THE PURIFICATION AND DETECTION OF IFN-OMEGA

Günther Adolf, Vienna, Austria, assignor to Boehringer Ingelheim International GmbH, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 102,160

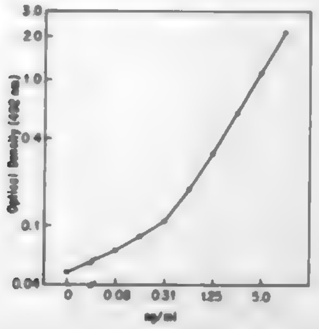
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633323

Int. Cl.⁵ C07K *15/14, 15/26*

U.S. Cl. 530—351 **1 Claim**

1. A method for the purification of omega interferon, comprising:

(a) contacting a sample suspected of containing said omega interferon with a monoclonal antibody which neutralizes the activity of an omega interferon but does not neutralize the activity of IFN-β, IFN-γ or α-interferons to form a complex;



(b) separating said complex formed in step (a); and
(c) recovering said omega interferon.

5,317,090
STEROID/THYROID HORMONE RECEPTOR-RELATED GENE, WHICH IS INAPPROPRIATELY EXPRESSED IN HUMAN HEPATOCELLULAR CARCINOMA, AND WHICH IS A RETINOIC ACID RECEPTOR

Hughes Blandin De The; Agnes Marchio; Pierre Tiollais; Anne Dejean, all of Paris; Nigel Brand, Strasbourg; Martin Petkovich, Strasbourg; Andree Krust, Strasbourg, and Pierre Chambon, Strasbourg, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 860,577, Mar. 30, 1992, abandoned, which is a continuation of Ser. No. 751,612, Aug. 21, 1991, abandoned, which is a continuation of Ser. No. 330,405, Mar. 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 278,136, Nov. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 209,009, Jun. 20, 1988, Pat. No. 5,149,781, which is a continuation-in-part of Ser. No. 134,130, Dec. 17, 1987, and Ser. No. 133,687, Dec. 16, 1987, abandoned. This application Dec. 11, 1992, Ser. No. 989,902

Int. Cl.^{5} A61K *35/14*

U.S. Cl. 530—387.1 11 Claims

1. A purified form of an antibody specific for a peptide of the retinoic acid receptor RAR-β having the amino acid sequence

MetPheAspCysMetAspValLeuSerValSerProGlyGlnIle
LeuAspPheTyrThrAla

SerProSerSerCysMetLeuGlnGluLysAlaLeuLysAlaCys
PheSerGlyLeuThrGln

ThrGluTrpGlnHisArgHisThrAlaGlnSerIleGluThrGln
SerThrSerSerGluGlu

LeuValProSerProProSerProLeuProProProArgValTyr
LysProCysPheValCys

GlnAspLysSerSerGlyTyrHisTyrGlyValSerAlaCysGlu
GlyCysLysGlyPhePhe

ArgArgSerIleGlnLysAsnMetIleTyrThrCysHisArgAsp
LysAsnCysValIleAsn

LysValThrArgAsnArgCysGlnTyrCysArgLeuGlnLysCys
PheGluValGlyMetSer

LysGluSerValArgAsnAspArgAsnLysLysLysLysGluThr
SerLysGlnGluCysThr

GluSerTyrGluMetThrAlaGluLeuAspAspLeuThrGluLys
IleArgLysAlaHisGln

GluThrPheProSerLeuCysGlnLeuGlyLysTyrThrThrAsn
SerSerAlaAspHisArg

-continued

ValArgLeuAspLeuGlyLeuTrpAspLysPheSerGluLeuAla
ThrLysCysIleIleLys

IleValGluPheAlaLysArgLeuProGlyPheThrGlyLeuThr
IleAlaAspGlnIleThr

LeuLeuLysAlaAlaCysLeuAspIleLeuIleLeuArgIleCys
ThrArgTyrThrProGlu

GlnAspThrMetThrPheSerAspGlyLeuThrLeuAsnArgThr
GlnMetHisAsnAlaGly

PheGlyProLeuThrAspLeuValPheThrPheAlaAsnGlnLeu
LeuProLeuGluMetAsp

AspThrGluThrGlyLeuLeuSerAlaIleCysLeuIleCysGly
AspArgGlnAspLeuGlu

GluProThrLysValAspLysLeuGlnGluProLeuLeuGluAla
LeuLysIleTyrIleArg

LysArgArgProSerLysProHisMetPheProLysIleLeuMet
LysIleThrAspLeuArg

SerIleSerAlaLysGlyAlaGluArgValIleThrLeuLysMet
GluIleProGlySerMet

ProProLeuIleGlnGluMetMetGluAsnSerGluGlyHisGlu
ProLeuThrProSerSer

SerGlyAsnThrAlaGluHisSerProSerIleSerProSerSer
ValGluAsnSerGlyVal

SerGlnSerProLeuValGln.

5,317,091
TECHNETIUM-99M LABELING OF PROTEINS

Ramaswamy Subramanian, Frederick, Md., assignor to Akzo N.V., Arnhem, Netherlands

Continuation-in-part of Ser. No. 661,293, Feb. 27, 1991, abandoned. This application Jun. 24, 1992, Ser. No. 903,427

Int. Cl.^{5} A61K *43/00, 49/02*

U.S. Cl. 424—1.53 6 Claims

1. A method for labeling a protein selected from the group consisting of an antibody or a F(ab')$_2$ antibody fragment with technetium-99m, comprising the following steps in the order presented:

first, contacting the protein with a reducing metal bound to a glucaric acid salt by a covalent or a coordinate bond in reaction mixture, whereby one to three sulfhydryl groups on the protein are reduced to disulfides, and,

second, adding pertechnetate to the reaction mixture and incubating to bind reduced technetium-99m to the protein, wherein the protein is selected from the group consisting of an antibody and a F(ab')$_2$ antibody fragment, and the labeling of the protein with the technetium-99m is at least 90%.

5,317,092
PROTEIN PURIFICATION METHOD

Jan Markussen, Herlev, Denmark, assignor to Novo Nordisk A/S, Novo Alle, Denmark

PCT No. PCT/DK90/00298, § 371 Date Jun. 5, 1992, § 102(e) Date Jun. 5, 1992, PCT Pub. No. WO91/07428, PCT Pub. Date May 30, 1991

PCT Filed Nov. 20, 1990, Ser. No. 721,582

Claims priority, application Denmark, Nov. 20, 1989, 5807/89

Int. Cl.^{5} C07K *3/20, 15/28*

U.S. Cl. 530—413 19 Claims

1. A method of recovering a protein or polypeptide of interest, the method comprising

(a) immobilizing, on a solid support, an antibody raised against a peptide which comprises at least a fragment

comprising an antigenic determinant of said protein or polypeptide,

(b) contacting a crude preparation of the protein or polypeptide of interest with the immobilized antibody under conditions resulting in a partial, reversible unfolding of the protein or polypeptide, so as to expose an amino acid sequence therein corresponding to the peptide used for raising the immobilized antibody and thereby obtain binding of the protein or polypeptide to the antibody, wherein the conditions resulting in a partial, reversible unfolding of the protein or polypeptide in step (b) are selected from a group consisting of an increase in temperature to between 37° and 60° C., a substantial increase or decrease in the pH of the protein or polypeptide preparation relative to the pH at which the protein or polypeptide is functional, the addition of a protein denaturing agent to the protein or polypeptide preparation, a concentration of a salt in the protein or polypeptide preparation higher than the physiological concentration of the salt, or a combination of two or more of these measures, and

(c) eluting the protein or polypeptide from the solid support under non-denaturing conditions to recover said protein or polypeptide in a form in which it is refolded into its native conformation.

5,317,093
BISAZO COMPOUNDS USEFUL AS ORGANIC PHOTOCONDUCTIVE MATERIALS

Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

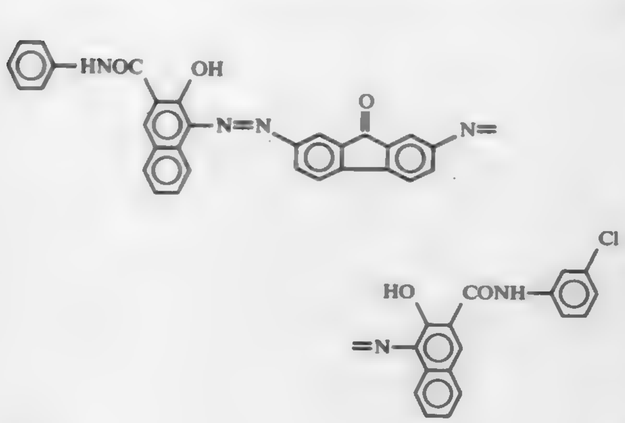
Filed Sep. 19, 1991, Ser. No. 762,462

Claims priority, application Japan, Sep. 20, 1990, 2-248708; Oct. 15, 1990, 2-273431; Nov. 29, 1990, 2-326046; Jul. 29, 1991, 3-188716

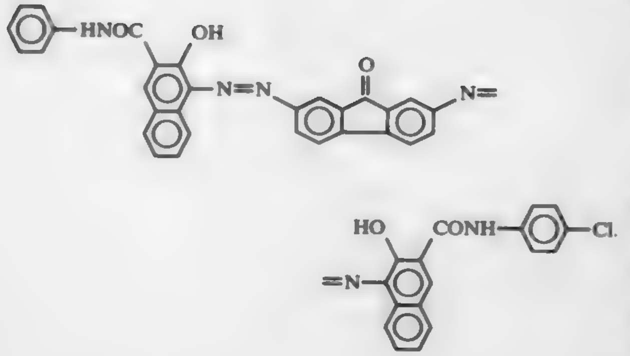
Int. Cl.^{5} C07C *245/10*

U.S. Cl. 534—658 3 Claims

1. A bisazo compound selected from the group consisting of



and



5,317,094
PROTEIN PP 15 PREPRARED BY GENETIC MANIPULATION

Ulrich Grundmann, Lahntal-Grossfelden; Karl-Josef Abel, and Eugen Amann, both of Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg-/Lahn, Fed. Rep. of Germany

Division of Ser. No. 709,790, Jun. 3, 1991, Pat. No. 5,188,933, which is a continuation of Ser. No. 324,068, Mar. 16, 1989, abandoned. This application Aug. 11, 1992, Ser. No. 928,039

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809119

The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.

Int. Cl.^{5} C07H *21/02, 21/04;* C12N *15/70, 15/74*

U.S. Cl. 536—23.5 3 Claims

1. An isolated DNA or RNA which (a) encodes the protein PP15 having the amino acid sequence shown in FIG. 2; and (b) hybridizes with the DNA having the sequence shown in FIG. 2, under stringent conditions.

5,317,095
ALPHA-D-GLYCOSYL KASUGAMYCIN, ITS PREPARATION, AND ANTIBACTERIAL AGENT CONTAINING THE SAME

Yukio Suzuki; Koutarou Muroyama, and Kei Suzuki, all of Kurashiki, Japan, assignors to Hayashibara Biochemical Laboratories, Inc., Okayama, Japan

Filed Mar. 3, 1993, Ser. No. 25,755

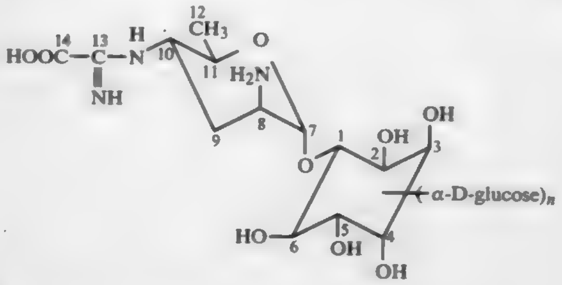
Claims priority, application Japan, Sep. 1, 1992, 4-233512

Int. Cl.^{5} C07H *17/04;* C12P *19/46*

U.S. Cl. 536—16.7 4 Claims

1. An α-D-glycosyl kasugamycin having the formula (III) which is hydrolyzed by α-glucosidase (EC 3.2.1.20) into one or more moles of D-glucose per 1 mole of kasugamycin:

(III)



wherein n is an integer of not less than 1.

5,317,096
TRANSFORMATION VECTORS ALLOWING EXPRESSION OF FOREIGN POLYPEPTIDE ENDOTOXINS FROM *BACILLUS THURINGIENSIS* IN PLANTS

Henri M. J. De Greve, Brussels, Belgium; Maria B. L. F. Salgado, Guerrero, Mexico; Marc C. E. Van Montagu, Brussels, Belgium; Mark A. Vaeck, Zemst, Belgium; Marcus F. O. Zabeau, Gent, Belgium; Jan J. A. Leemans, Heusden, Belgium, and Hermanus F. P. Hofte, Gent, Belgium, assignors to Plant Genetic Systems, N.V., Brussels, Belgium

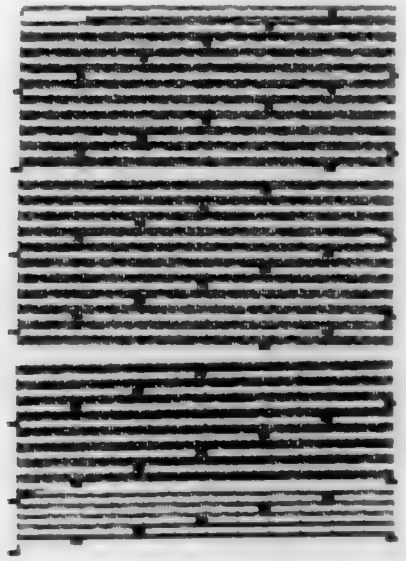
Division of Ser. No. 555,828, Jul. 23, 1990, which is a continuation of Ser. No. 821,582, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 692,759, Jan. 18, 1985, abandoned. This application Feb. 5, 1993, Ser. No. 14,148

Int. Cl.^{5} C07H *21/00*

U.S. Cl. 536—23.71 4 Claims

4. An isolated DNA molecule encoding: a) the protein of FIG. 13; b) a polypeptide toxin having an amino acid sequence of FIG. 13 between nucleotide position 141 and a nucleotide position between nucleotide positions 1938 and 1961 of FIG.

13; or c) a polypeptide toxin having an amino acid sequence of FIG. 13 between nucleotide position 141 and a nucleotide



position between nucleotide positions 1961 and 2308 of FIG. 13.

5,317,097

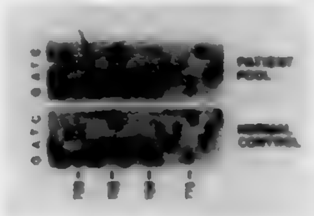
MUTATIONS IN THE GENE ENCODING THE α CHAIN ON PLATELET GLYCOPROTEIN IB

Jonathan L. Miller; David Cunningham; Vicki A. Lyle, all of Syracuse, and Clara N. Finch, Webster, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Oct. 7, 1991, Ser. No. 770,968

Int. Cl.⁵ C12N *15/11, 15/12;* **C12Q** *1/68;* **G01N** *33/50*

U.S. Cl. 536—24.31 **6 Claims**



1. A cDNA oligomer consisting essentially of a cDNA sequence complementary to DNA encoding naturally-occurring wild-type platelet glycoprotein Ib alpha having a mutation which renders said polypeptide encoded by said DNA more reactive with von Willebrand factor, wherein said mutation comprises an amino acid substitution for glycine at amine acid 233.

5,317,098

NON-RADIOISOTOPE TAGGING OF FRAGMENTS

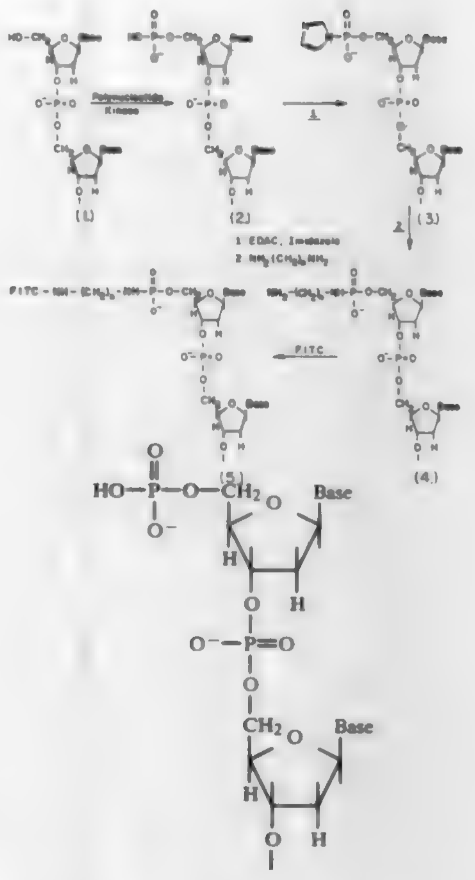
Hiroaki Shizuya, 1632 Indiana Ave., South Pasadena, Calif. 91030, and Sharon L. Millar, 1825 Lanai St., West Covina, Calif. 91792

Filed Mar. 17, 1986, Ser. No. 840,090

Int. Cl.⁵ C07H *21/02, 21/04*

U.S. Cl. 536—23.1 **18 Claims**

1. Labeled RNA and DNA fragment in which a segment portion thereof, having a 5′-phosphate end, has the formula



a linker portion thereof has the formula, $NH_2(CH_2)_nNH_2$, terminating in an amino at the first end and an amino at the second end, a plurality, n, of methylene units in a chain between said ends, and said first end bonded to said 5′-phosphate end of said segment, said plurality, n, of methylene units is preselected for the chemical characteristics of the fluorescent compound such that the summation of the chemical characteristics of said linker portion plus said chemical characteristics of said fluorescent compound may be adjusted by the selection of n to produce a preselected mobility of said arrangement in a polyacrylamide gel, whereby the spacing of adjacent bands in electrophoresis separation is controlled; and,

a fluorescent compound bonded to said second end.

5,317,099

PROCESS FOR THE PREPARATION OF CEPHEM DERIVATIVES

Kwang H. Lee, Kwacheon; Dong H. Ko, Kyonggi-do; Young J. Kim; Myung X. Xiang, both of Seoul, and Myeong S. Yoon, Kyonggi-do, all of Rep. of Korea, assignors to Cheil Foods & Chemicals, Inc., Seoul, Rep. of Korea

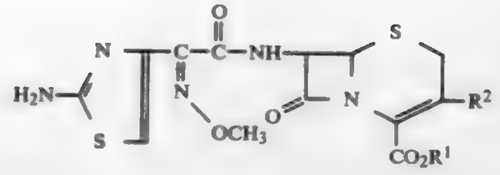
Filed Oct. 13, 1992, Ser. No. 959,359

Claims priority, application Rep. of Korea, Nov. 18, 1991, 91-20505

Int. Cl.⁵ C07D *501/06*

U.S. Cl. 540—222 **6 Claims**

1. A process for preparing a compound of the formula:



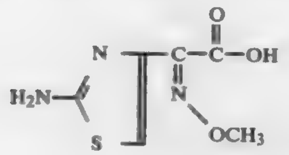
(I)

wherein R^1 represents hydrogen or a metal salt; and

R^2 represents hydrogen, acetoxymethyl, (1-methyl-1H-tetrazol-5-yl)thiomethyl or (2,5-dihydro-2-methyl-6-hydroxy-5-oxo-as-triazin-3-yl)thiomethyl,

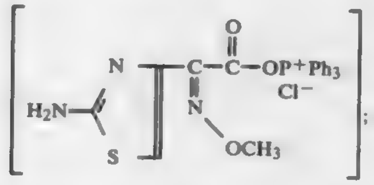
which process comprises the steps of:

(a) reacting a mixture of triphenylphosphine (Ph_3P) and hexachloroethane (C_2Cl_6) or carbon tetrachloride (CCl_4) with an organic acid of the formula:



(III)

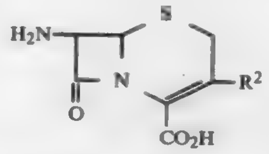
in an organic solvent to give an acyloxyphosphonium chloride derivative of the formula:



(IV)

; and

(b) acylating a silylated derivative of 7-ACA of the formula (V):



(V)

wherein R^2 is the same as defined above, wherein the acyloxyphosphonium chloride derivative is not isolated.

5,317,100

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE ACYLOXYAZETIDINONES

Jaroslav Kalvoda, Binningen, Switzerland; Martin Kessler, Hausgauen, France; René Lattmann, Binningen, and Gerardo Ramos, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corp., Ardsley, N.Y.

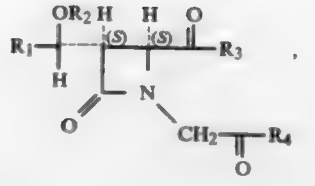
Continuation of Ser. No. 780,833, Oct. 23, 1991, abandoned, which is a continuation of Ser. No. 678,891, Mar. 28, 1991, abandoned, which is a continuation of Ser. No. 427,080, Oct. 25, 1989, abandoned. This application Oct. 22, 1992, Ser. No. 964,818

Claims priority, application Switzerland, Nov. 4, 1988, 4115/88-0

Int. Cl.⁵ C07D *205/08, 303/48;* **C07B** *41/12*

U.S. Cl. 540—357 **11 Claims**

1. A method of using a compound of the formula IIa



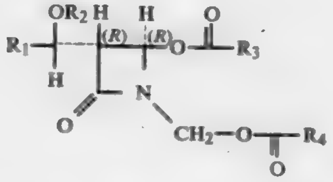
(IIa)

wherein

- R_1 is hydrogen or lower alkyl;
- R_2 is hydrogen or a hydroxy protecting group R_2'; and
- R_3 and R_4 are identical to each other and are selected from the group consisting of
  - (i) phenyl,
  - (ii) phenyl substituted by lower alkoxy, lower alkyl, and/or halogen,
  - (iii) 4-nitrophenyl, and
  - (iv) lower alkyl;

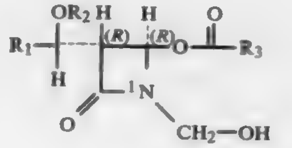
which comprises

(a) treating said compound of formula IIa with a peracid to result in a compound of formula III



(III)

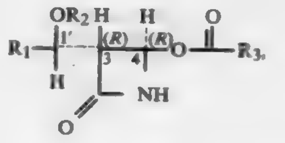
(b) replacing the radical of the formula $R_4—C(=O)—$ in formula III by hydrogen by enzymatic ester cleavage to obtain the compound of formula IV



(IV)

and

(c) removing from the compound of formula IV the hydroxymethyl group in the 1-position, if appropriate after conversion into a formyl group, to result in a compound of formula I



(I)

and, if desired, in a compound of formula I thus obtained in which R_2 is a protective group R_2', converting the protected hydroxyl group into the free hydroxyl group, and/or if desired in a compound of formula I thus obtained in which R_2 is a hydrogen, converting the free hydroxyl group into a protected hydroxyl group.

5,317,101

TRICYCLIC HETEROCYCLES

John Oldfield, Wilmslow, and Howard Tucker, Macclesfield, both of England, assignors to Imperial Chemical Industries PLC, London, England

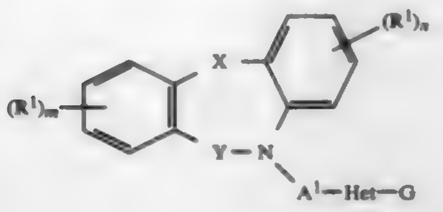
Filed Sep. 25, 1992, Ser. No. 950,706

Claims priority, application United Kingdom, Sep. 27, 1991, 9120640

Int. Cl.^{5} C07D *267/18;* **A61K** *31/55*

U.S. Cl. 540—488 **5 Claims**

1. A compound of the formula I



wherein

X is oxy, thio, sulphinyl, imino, (1-4C) alkylamino or methylene, the last named group optionally bearing one or two (1-4C) alkyl groups;

Y is carbonyl or methylene, the latter group optionally bearing one or two (1-4C)alkyl groups;

each R^1 which may be the same or different, is selected from hydrogen, halogeno, trifluoromethyl, nitro, cyano, hydroxy, amino, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkylthio, (1-4C)alkylsulphinyl, (1-4C)alkylsulphonyl, (1-4C)alkylamino and di-(1-4C)alkylamino;

m and n, which may be the same or different, is the integer 1 or 2;

A^1 is (1-4C)alkylene, (3-4C)alkenylene or (3-4C)alkynylene;

Het is a 5- or 6-membered heteroaryl moiety containing up to 1 heteroatom selected from nitrogen, oxygen and sulphur and optionally containing a further nitrogen heteroatom, or a 6-membered heteroaryl moiety containing 1 or 2 nitrogen heteroatoms, and which may optionally bear one substituent selected from halogeno, trifluoromethyl, nitro, cyano, hydroxy, amino, (1-4C)alkyl and (1-4C)alkoxy; and

G is carboxy, 1H-tetrazol-5-yl or a group of the formula:

$—CONH—SO_2R^2$

wherein R^2 is (1-4C)alkyl, benzyl or phenyl, the latter two of which may optionally bear one or two substituents selected from halogeno, trifluoromethyl, nitro, cyano, hydroxy, (1-4C)alkyl and (1-4C)alkoxy; or when G is carboxy an in-vivo hydrolysable ester thereof or an amide thereof;

or a pharmaceutically-acceptable salt thereof.

5,317,102

3,6-DIAMINO-2,5-PYRAZINEDICARBONITRILE

Seiji Tazaki; Tomio Yagihara, both of Kurashiki; Nobuo Matsui, Odawara; Atsushi Yanagisawa, Odawara, and Takakazu Kojima, Odawara, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

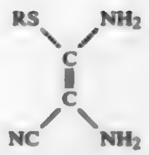
Division of Ser. No: 689,052, Apr. 29, 1991. This application Aug. 7, 1992, Ser. No. 927,258

Claims priority, application Japan, Aug. 31, 1989, 1-223215; Mar. 13, 1990, 2-59935

Int. Cl.^{5} C07D *241/26*

U.S. Cl. 544—336 **8 Claims**

1. A process for the production of 3,6-diamino-2,5-pyrazinedicarbonitrile, from compounds having the formula



where R is aryl, alkyl, aralkyl or alkenyl, as a starting material, and, reacting said compound in an acidic solution or a solution of the salt(s) of said acidic solution, by bubbling air through the solution for a period of between about 1 to about 12 hours at atmospheric pressure and room temperature with the pH of the solution being kept at from about 1 to about 5.

5,317,103

INDOLE-SUBSTITUTED FIVE-MEMBERED HETEROAROMATIC COMPOUNDS AS 5-HT$_1$ AGONISTS

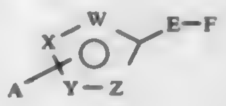
Raymond Baker, Much Hadham; Austin J. Reeve, Great Dunmow, and Leslie J. Street, Harlow, all of England, assignors to Merck Sharp & Dohme Limited, Hoddesdon, England

Continuation of Ser. No. 641,422, Jan. 15, 1991, abandoned. This application Jul. 16, 1992, Ser. No. 914,683

Int. Cl.^{5} C07D *417/04, 413/04, 451/00, 453/02*

U.S. Cl. 544—367 **7 Claims**

1. A compound of formula I, or a salt or prodrug thereof:



(I)

wherein the circle represents two non-adjacent double bonds in any position in the five-membered ring;

W, X, Y and Z independently represent oxygen, sulphur, nitrogen or carbon, provided that one of W, X, Y and Z represents oxygen or sulphur and at least one of W, X, Y and Z represents carbon;

A is selected from the group consisting of hydrogen, halogen, cyano, trifluoromethyl, nitro, $—OR^x$, $—OCOR^x$, $—ONR^xR^y$, $—SR^x$, $—NR^xR^y$, $—NR^xOR^y$, $—NR^zNR^xR^y$, $—NR^xCOR^y$, $—NR^xCO_2R^y$, $—NR^xSO_2R^y$, $—NR^zCVNR^xR^y$, $—COR^x$, $—CO_2R^x$, $—CONR^xR^y$, hydrocarbon selected from C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl (C_{1-6})alkyl, aryl, aryl (C_{1-6})alkyl;

heterocycloalkyl selected from azetidinyl, pyrrolidyl, piperidyl, piperazinyl and morpholinyl;

heteroaryl selected from pyridyl, quinolyl, isoquinolyl, pyridazinyl, pyrimidinyl, pyrazinyl, pyranyl, furyl, benzofuryl, dibenzofuryl, thienyl, benzthienyl, imidazolyl, oxadiazolyl and thiadiazolyl;

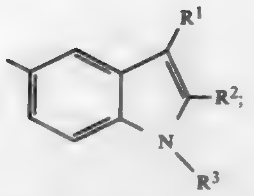
heteroaryl (C_{1-6})alkyl; and

heterocyclo (C_1–C_6)alkyl;

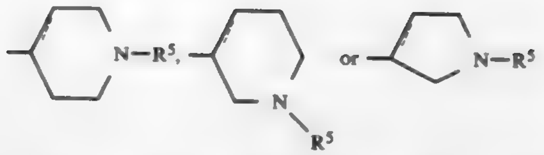
wherein said hydrocarbon, heterocyclo or heteroaryl group is unsubstituted or substituted by one or more groups selected from C_1–C_6 alkyl, adamantyl, phenyl, halogen, C_{1-6} haloalkyl, C_{1-6} aminoalkyl, trifluoromethyl, hydroxy, C_{1-6} alkoxy, aryloxy, keto, C_{1-3} alkylenedioxy, nitro, cyano, carboxy, C_{2-6} alkoxycarbonyl, C_{2-6} alkoxycarbonyl (C_{1-6})alkyl, C_{2-6} alkylcarbonyloxy, arylcarbonyloxy, C_{2-6} alkycarbonyl, arylcarbonyl, C_{1-6} alkylthio, C_{1-6} alkylsuphinyl, C_{1-6} alkylsulphonyl, arylsulphonyl, $—NR^vR^w$, $—NR^vCOR^w$, $—NR^vCO_2R^w$, $—NR^vSO_2R^w$, $—CH_2NR^vSO_2R^w$, $—NHCONR^vR^w$, $—CONR^vR^w$, $—SO_2NR^vR^w$ and $—CH_2SO_2NR^vR^w$, in which R^v and R^w independently represent hydrogen, C_{1-6} alkyl, aryl or aryl(C_{1-6})alkyl, and R^v and R^w when taken together represent a C_{2-6} alkylene group;

E represents a bond or a straight or branched alkylene chain containing from 1 to 4 carbon atoms;

F represents a group of formula:



R^1 represents $—CH_2—CHR^4—NR^xR^y$ or a group of formula:



in which the broken line represents no bond or a single bond;

R^2, R^3, R^4 and R^5 are independently selected from the group consisting of hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl and C_{2-6} alkynyl;

R^x and R^y independently represent hydrogen or hydrocarbon, as defined above, or R^x and R^y together represent a C_{2-6} alkylene group;

R^z represents hydrogen or hydrocarbon, as defined above;

V represents oxygen, sulphur or a group of formula $=N—G$;

wherein G represents hydrocarbon as defined above, or an electron-withdrawing group selected from cyano, nitro, $—COR^x$, $—CO_2R^x$ or $—CO_2R^x$, in which R^x is as defined above.

ELECTRICAL

5,317,104

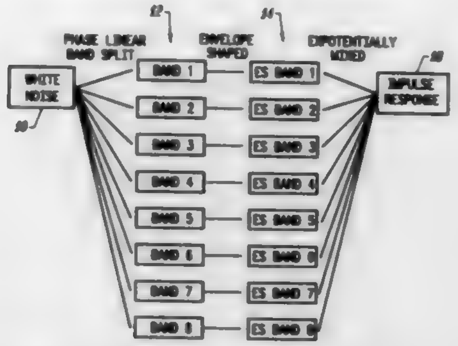
MULTI-TIMBRAL PERCUSSION INSTRUMENT HAVING SPATIAL CONVOLUTION

David R. Frost, Santa Cruz, Calif., assignor to E-muSystems, Inc., Scott Valley, Calif.

Continuation of Ser. No. 641,842, Nov. 16, 1991, abandoned. This application Dec. 28, 1992, Ser. No. 996,884

Int. Cl.^{5} G10H *1/02*

U.S. Cl. 84—625 **35 Claims**



1. A multi-timbral instrument comprising

means for creating a reverb impulse response, said means for creating a reverb impulse response comprising a noise signal generator for generating a noise signal, filter means for band-splitting the noise signal produced by said noise signal generator into a plurality of frequency bands each having a power amplitude, means for tapering the power amplitude of each of said bands to form tapered bands, said tapered bands having an initial decay section and a subsequent substantially constant power amplitude section, and means for combining said tapered bands to form said reverb impulse response, and

means for spatially convolving said reverb impulse response with a dry sound to create a pure reverb version of aid dry sound.

5,317,105

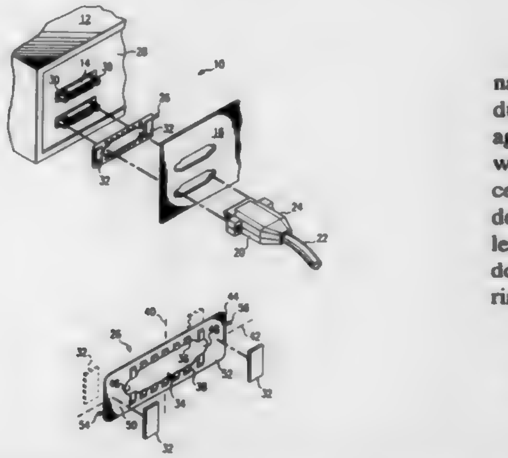
EMI/RFI GASKET APPARATUS

William F. Weber, Allen, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Dec. 18, 1992, Ser. No. 993,365

Int. Cl.^{5} H05K *9/00;* **H01R** *43/00, 4/66, 13/52*

U.S. Cl. 174—35 GC **6 Claims**



1. An EMI/RFI gasket for providing a barrier for EMI and RFI radiation transmission to and from an electronic system chassis, said chassis having a receptacle, said receptacle for receiving an electrical connector and having at least one of a variety of fastener points for fastening said electrical connector to said receptacle, said chassis further having an electrically-grounded cover plate for covering a predetermined portion of said chassis near said receptacle and connecting said chassis to an electrical ground, said EMI/RFI gasket comprising:

a gasket plate comprising a flat, flexible, electrically-conductive material having sufficient flexibility and surface area for adhering and electrically connecting to said cover plate while maintaining flexibility sufficient to move upon being placed over said receptacle and, thereby, promoting electrical contact among said receptacle, said connector, said cover plate, and said gasket plate;

a receiving slot within said gasket plate for receiving said receptacle and associating with said fastening point, said receiving slot being symmetrical about a longitudinal axis and a latitudinal axis of said gasket plate; and

a plurality of deflected teeth formed from said gasket plate and positioned around a predetermined portion of said receiving slot, said plurality of deflected teeth being deflected from said gasket plate for contacting said connector at points separated by not greater than a predetermined distance to maintain an electrical ground connection between said cover plate and said connector, said predetermined distance being determined partially by estimated wavelengths of said EMI radiation and said RFI radiation.

5,317,106

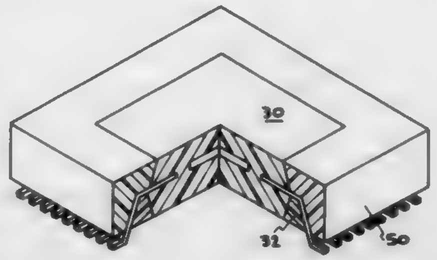
COPLANAR CORRECTOR RING

Young I. Kwon, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Oct. 13, 1991, Ser. No. 785,633

Int. Cl.^{5} H01L *23/02*

U.S. Cl. 174—52.4 **11 Claims**



1. A corrector ring arrangement for maintaining the coplanarity of the tips of the leads of a quad flat pack QFP package during shipping, handling, and installation, where a QFP package is a molded-plastic, flat-profiled, square-shaped package which has thin metal lead extending laterally from near the centerline of the four sides of a body with the leads being bent downwardly to provide a leg portion for the leads and with the leads terminating in a foot section which is inclined slightly downwardly toward the tip end of the leads, said corrector ring arrangement comprising:

a first ring member, having an inner peripheral surface adapted to engage the lower surface of the outer walls of the QFP package and having an outer peripheral surface adapted to engage the inner surfaces of the downwardly extending resilient leg portions of the leads of the QFP package;

means for holding the first corrector ring in position in place between the lower surface of the outer wall of the QFP package and the inner surface of the downwardly extending resilient leg portions of the leads of the QFP package, wherein said ring member protects and maintains the tips of the leads of the QFP package in proper coplanarity.

5,317,107

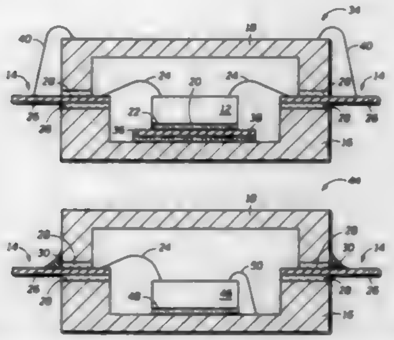
SHIELDED STRIPLINE CONFIGURATION SEMICONDUCTOR DEVICE AND METHOD FOR MAKING THE SAME

Rolando J. Osorio, Manchaca, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1992, Ser. No. 949,958

Int. Cl.^{5} H01L *23/02;* **H05K** *9/00*

U.S. Cl. 174—52.4 **22 Claims**



1. A shielded stripline configuration semiconductor device comprising:

a semiconductor die having a power supply terminal on an active surface;

a leadframe having a plurality of leads which are electrically connected to the semiconductor die, wherein the plurality of leads of the leadframe comprise a ground lead which is electrically connected to the power supply terminal of the semiconductor die;

a metal base upon which the semiconductor die is directly mounted with an adhesive;

a metal lid electrically connected to the power supply terminal of the semiconductor die by an external solder bridge from the metal lid to the ground lead;

means for electrically connecting the metal base to the power supply terminal; and

electrically insulating adhesive means for sealing the metal base and lid, wherein the semiconductor die and leadframe are disposed between the metal base and lid, such that the metal base and lid form a protective package body around the semiconductor die and a portion of the leadframe.

5,317,108

WEATHER-RESISTANT ELECTRICAL OUTLET COVER ASSEMBLY

Marshall J. Prairie, Jr., Pawtucket, R.I., assignor to L.E. Mason Company, Boston, Mass.

Filed Dec. 15, 1992, Ser. No. 991,368

Int. Cl.^{5} H02G *3/14*

U.S. Cl. 174—67 **16 Claims**

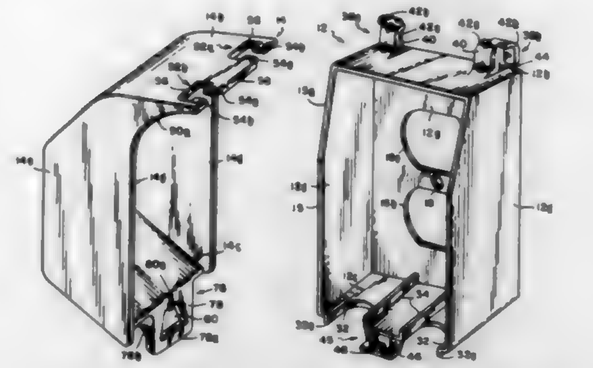
1. A weather-resistant electrical outlet cover assembly comprising

a cover plate having a top wall and at least one aperture for exposing an electrical device behind the cover plate;

a door having a top wall;

at least one first hinge means projecting up from the cover plate top wall, said first hinge means including laterally extending hook means defining a space between the hook means and the top wall of the cover plate and means defining a slot extending into said space, and

at least one second hinge means on the top wall of said door, said second hinge means including a laterally extending hinge pin for pivotal engagement in said space through said slot so that the door can swing between a closed position wherein the door overlies said aperture and an open position wherein the door is swung away from the cover plate to expose said aperture, and cam means on the top wall of said door and engaging the top wall of the cover plate, said cam means being shaped to shift said door relative to said cover plate when the door is moved by more than a selected amount from said open toward said closed position so that the hinge pin cannot escape from the hook means through said slot.



5,317,109

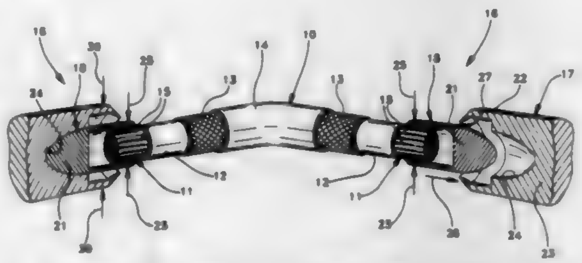
CONDUCTIVE POLYMER CABLE ASSEMBLY

Mahmoud Aldissi, Colchester, Vt., assignor to Champlain Cable Corporation, Colchester, Vt.

Filed Jun. 19, 1992, Ser. No. 901,634

Int. Cl.^{5} H01R *4/20*

U.S. Cl. 174—84 C **10 Claims**



1. A cable connection construction for a cable having a conductive polymeric element such as a conductive polymeric core or shield layer, comprising;

a first component comprising a first deformable portion for attachment to a conductive polymeric element of a cable such as a core or shield layer by means of crimping said first deformable portion about said conductive polymeric core or shield layer, said first component additionally having a male element contiguously joined to said first deformable portion for mating with a female recess disposed in an electrical connector; and

a second component comprising an electrical connector having a second deformable portion and a solid portion defining a female recess for receipt of, and mating with, said male element of said first component, said second deformable portion of said second component being securable about said first deformable portion of said first component by crimping said second deformable portion about said first deformable portion, whereby said electrical connector is attached to the conductive polymeric element by means of a double crimp that provides a connection of improved mechanical strength.

5,317,110

AUTOMATIC WEIGHING MACHINES FOR FOOD PRODUCTS

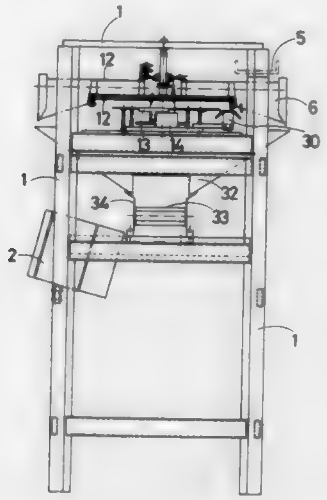
Agustin Dauder Guardiola, Badalona, Spain, assignor to Talleres Daumar S.A., Barcelona, Spain

Filed Sep. 25, 1992, Ser. No. 950,893

Claims priority, application Spain, Sep. 27, 1991, 9102129

Int. Cl.^{5} G01G *13/16, 19/00*

U.S. Cl. 177—25.18 **1 Claim**



1. Improvements in automatic weighing machines for food products, comprising:

a support frame for receiving buckets of the machine;

means for activating said receiving buckets of the machine;

means for feeding a product into an entrance of the machine, controlled by a programming processing unit, which includes a hopper, a channel and at least one endless belt, whose end empties out into an area under which said receiving buckets move in a line and are open on the top to receive the product that is unloaded from said end of the endless belt;

means for weighing the product contained in each receiving bucket and its tare;

a programming processing unit which continually records the tare of each receiving bucket and the real weight of the product that is collected by each receiving bucket as they continually move by, and when a total weight of the product contained in certain receiving buckets reaches a value with a preset tolerance, the programming processing unit orders the unloading of those receiving buckets whose batch of units of product adds up to said total preset weight, and wherein there are means for connecting the programming processing unit to the receiving bucket of the machine;

wherein the receiving buckets, arranged in a circle and in an overhanging manner, are joined radially by suitable means to a central revolving support in relation to a central vertical axis; in that each receiving bucket is joined to the central support by two horizontal, parallel and superimposed elastic bands which allow for the vertical swinging of the bucket; in that the receiving buckets continually pass in succession over a station with a single means for weighing the receiving bucket, connected with the programming processing unit; and in that the receiving buckets include at least one movable wall, and this wall is activated by the programming processing unit for the selective unloading of each batch of units of the product contained in the receiving buckets selected according to the total weight desired; the loading takes place onto means for conveying each one of the batches of product toward the exit of the machine.

5,317,111

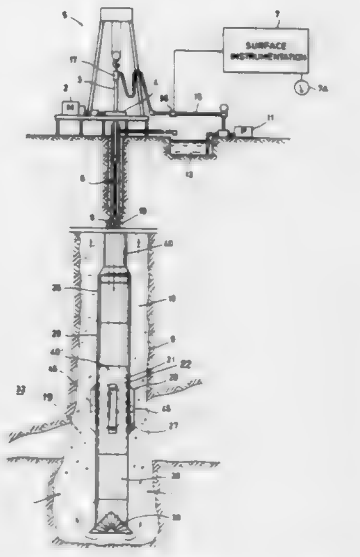
ULTRASONIC MEASUREMENT APPARATUS

Jacques Orban, and James C. Mayes, both of Sugar Land, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 788,431, Nov. 16, 1991, which is a division of Ser. No. 525,268, May 16, 1990, Pat. No. 5,130,950. This application Jan. 27, 1993, Ser. No. 9,842

Int. Cl.^{5} G01V *1/40*

U.S. Cl. 181—105 **8 Claims**



1. Borehole measurement apparatus comprising,

a tool adapted for connection in a drill string in a borehole, said tool having a generally cylindrical body defining a longitudinal axis, said cylindrical body having a substantially uniform outer diameter along its longitudinal axis, and a plurality of circumferentially spaced stabilizer blades placed about the periphery of and extending radially outwardly from said body, said blades extending longitudinally along a substantial portion of said body, and

ultra-sonic sensor means, including at least one ultra-sonic pulse-echo sensor mounted in one of said blades, said pulse-echo sensor placed substantially entirely within said stabilizer blade radially outwardly of said cylindrical body, for generating a signal indicative of a characteristic of said borehole.

5,317,112

INTAKE SILENCER OF THE VARIABLE TYPE FOR USE IN MOTOR VEHICLE

Keeho Lee, Seoul, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Oct. 17, 1991, Ser. No. 778,016

Int. Cl.^{5} F01N *1/02*

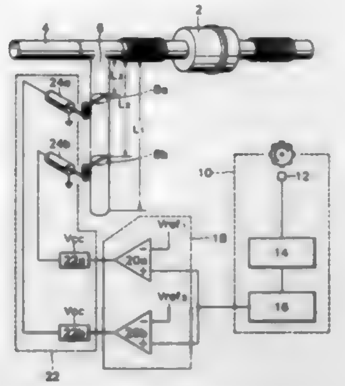
U.S. Cl. 181—250 **13 Claims**

1. A motor vehicle intake silencer having a variable-length resonance chamber, said length being rapidly changeable in response to engine speed by varying the effective length of said resonance chamber, said silencer comprising:

a side branch resonator tube communicable with a vehicle air intake tube to extend transversely of said air intake tube and constitute a variable length resonance chamber, said resonator tube having an end wall remote from said air intake tube and defining a first effective length of said resonator tube, said resonator tube also having a substantially constant inside cross-sectional profile along said first effective length from said air intake tube to said end wall;

at least one divider valve disposed in said resonator tube intermediately of said first effective length, said divider valve having a valve element adapted for movement transversely of said resonator tube into a tube-closing position in which said resonator tube has a further effective length shorter than said first effective length wherein an open position of each at least one said divider valve provides a straight-line resonance path between said intake tube and said end wall;

a valve actuator to operate each said divider valve selectively to close or open it in response to engine speed changes;



a valve controller coupled to each said valve actuator and including an engine speed detector, said valve controller being operative on each said valve actuator in response to a predetermined engine speed change;

whereby said first effective length of said resonator tube is selected to provide quarter-wave resonant noise reduction at a first engine speed range and each said further effective length is selected to provide enhanced noise reduction at a further engine speed range.

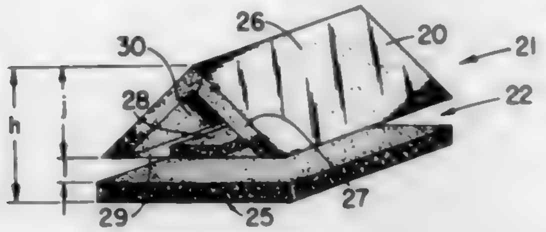
5,317,113
ANECHOIC STRUCTURAL ELEMENTS AND CHAMBER

John Duda, Dumont, N.J., assignor to Industrial Acoustics Company, Inc., Bronx, N.Y.

Filed Jul. 1, 1992, Ser. No. 907,187

Int. Cl.^{5} E04B *1/00*

U.S. Cl. 181—285 **23 Claims**



1. A substantially enclosed sound absorbing unit for an anechoic chamber which provides a maximum deviation from the inverse square law of about 3 dB comprising:

a substantially flat panel member having a layer of sound absorptive material;

an anechoic member disposed adjacent to said flat panel member said anechoic member having a base and a pair of generally spaced apart sound transparent wall members, said wall members including a layer of sound absorptive material, said wall members further including a substantially solid, sound reflective, protective cover sheet thereover having perforations formed therein, said perforations forming a free space and in which said free space of said perforated cover sheet is at least about 7% of the total area of the cover sheet.

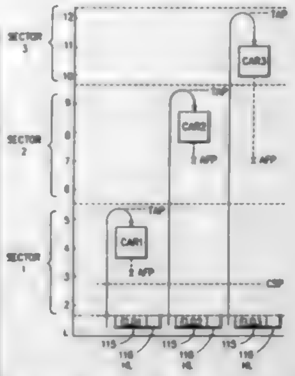
5,317,114
ELEVATOR SYSTEM HAVING DYNAMIC SECTOR ASSIGNMENTS

V. Sarma Pullela, North Granby, and Zuhair S. Bahjat, Farmington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 27, 1991, Ser. No. 799,572

Int. Cl.^{5} B66B *1/18, 1/20*

U.S. Cl. 187—128 **21 Claims**



1. A method of operating an elevator system that includes a group of elevator cars servicing a plurality of floor landings divided into sectors, comprising the steps of:

with control means associated with each elevator car of the group,

determining when the elevator car has reached a Turn Around Point (TAP) for reversing ascent and returning the elevator car to a lobby;

initiating descent of the elevator car to the lobby;

determining, during the descent of the elevator car, and before reaching a Control Stop Point (CSP) where the elevator car begins to decelerate, when the elevator car has reached a sector Assignment Fixation Point (AFP), after which assignment of a next sector to be serviced by the car in a next ascent is initiated;

responsive to a determination that the elevator car has reached the sector AFP, communicating sector-related information with other control means of other elevator cars of the group; and

based upon the communication, assigning to the elevator car the next sector to be serviced in the next ascent.

5,317,115
ELECTRONIC CONTROL FOR A MICROWAVE OVEN

Sven T. Forsberg, Norrköping, Sweden, assignor to Whirlpool Europe B.V., Veldhoven, Netherlands

Filed Dec. 18, 1992, Ser. No. 993,321

Claims priority, application Sweden, Dec. 23, 1991, 9103834

Int. Cl.^{5} H05B *6/68*

U.S. Cl. 219—716 **6 Claims**

1. A microwave oven comprising a microwave source and a power unit including a high voltage transformer for supplying a high voltage to the microwave source, said high voltage transformer being supplied with a mains voltage via a switch device and a control unit in order to connect the mains voltage, when starting the oven, at a moment substantially coinciding with a mains voltage maximum,

said switch device comprising a relay being supplied at switch-on with a control voltage from said control unit and the relay contacts of which are closed at switch-on with a delay corresponding to the switch-on time of the relay,

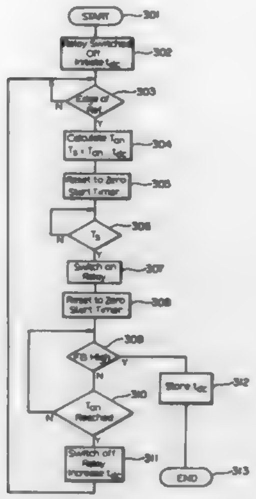
feedback means operatively connected to said switch device, said feedback means supplying a feed back signal to the control unit indicating changing states when the relay contacts change from an open to a closed position, a reference signal indicating the mains voltage phase also being supplied to the control unit,

said control unit operatively connected to said switch device and said feedback means and comprising a microprocessor device being programmed to perform the following steps during switch-on of the relay;

assume a value t_{dc} for the relay switch-on time

calculate the moment T_{on} of a mains voltage maximum from said reference signal

switch on the relay by supplying the control voltage at the moment $T_{on}-T_{dc}$



sense the feedback signal within a interval around T_{on}

when the relay contacts are closed within said interval, maintain the relay switched on alternatively, when the relay contacts are open within said interval, perform relay switch-off by interrupting the control voltage supply, assume a new value of t_{dc} and repeating the programmed steps until the relay contacts are closed within the interval.

5,317,116
PULSE WELDING APPARATUS

Yoichiro Tabata; Shigeo Ueguri; Yoshihiro Ueda, all of Hyogo; Masanori Mizuno, Aichi; Yoshiaki Katou, Aichi, and Osamu Nagano, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

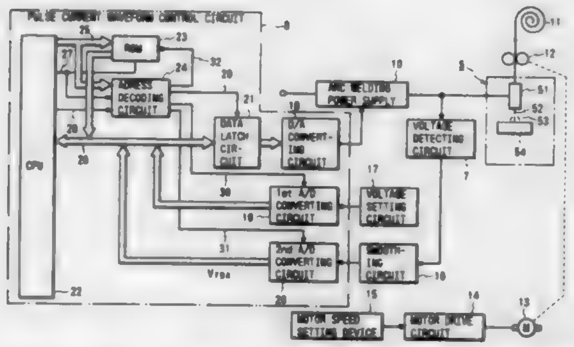
PCT No. PCT/JP90/00246, § 371 Date Mar. 27, 1991, § 102(e) Date Mar. 27, 1991, PCT Pub. No. WO91/01842, PCT Pub. Date Feb. 21, 1991

PCT Filed Feb. 27, 1990, Ser. No. 668,519

Claims priority, application Japan, Aug. 2, 1989, 1-200693; Aug. 2, 1989, 1-200694; Sep. 6, 1989, 1-231062

Int. Cl.^{5} B23K *9/09*

U.S. Cl. 219—130.51 **6 Claims**



1. A pulse welding apparatus in which pulse currents for melting a workpiece are supplied alternately with a base current or with a short-circuit current to a welding load so as to perform welding operation, the apparatus comprising:

an arc welding power supply unit for supplying said pulse currents to the welding load, in which one waveform of said pulse currents is further divided into a group of pulse currents which has at least one pulse width and at least one pulse interval, which is obtained to periodically repeat said group of pulse currents and to superpose with a continuous base current;

a voltage detecting circuit for detecting the output of said arc welding power supply unit;

a smoothing circuit for receiving the output signal of said voltage detecting circuit;

a voltage setting circuit for setting a desired output voltage; and

a microcomputerized digital circuit including a digital-/analog converter circuit for outputting a voltage signal corresponding to a desired output current to said arc welding power supply unit, a first analog/digital converter circuit for receiving the output signal of said voltage setting circuit, a second analog/digital converter circuit for receiving the output signal of said smoothing circuit, a data latch circuit having multiple bits output signal lines connected with multiple bits input signal lines of the digital/analog converter circuit, a CPU connected, via a common data bus, to each of said multiple bits input signal lines of the data latch circuit, said multiple bits output signal lines of the first analog digital converter circuit, and said multiple bits output signal lines of the second analog digital converter circuit; wherein

said CPU operates, when said arc welding power supply unit outputs the base current or the short-circuit current, such that a digital data V_{FBA} corresponding to an average output voltage of the arc welding power supply unit is compared with a digital data Vset corresponding to a desired output voltage at predetermined time intervals so as to maintain the base current or the short-circuit current or to output a melting current for the workpieces instead of the base current or the short-circuit current.

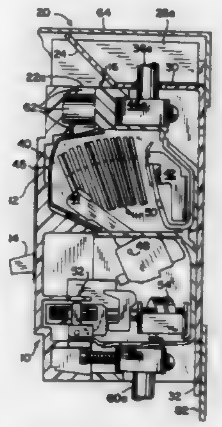
5,317,117
GAS DEFLECTION AND ISOLATION SYSTEM FOR USE WITH A HIGH POWER CIRCUIT BREAKER

Gary P. Bruski, Washington County, and Chester Malkowski, Jr., Milwaukee County, both of Wis., assignors to Allen-Bradley Co., Inc., Milwaukee, Wis.

Filed Nov. 30, 1992, Ser. No. 984,051

Int. Cl.^{5} H01H *33/00, 9/30*

U.S. Cl. 200—144 R **11 Claims**



5. A three-phase circuit breaker having a vertically inclined front on which a switching lever is mounted and a horizontally inclined top, said circuit breaker including:

three laterally adjacent contact assemblies, each assembly comprising:

a. a line terminal mounted on the top of said breaker,
b. an arc chamber located inside said breaker,
c. a stationary contact mounted in said arc chamber,
d. a movable contact mounted in said arc chamber, and
e. a passage connecting said arc chamber to a vent opening located on the top of said breaker forward of said line terminal; and

a gas deflector comprising a deflection plate which extends forward and upward from between the vent openings of said contact assemblies and the line terminals of said contact assemblies on the top of said circuit breaker over but spaced apart at an angle from said vent openings so as to deflect any gas escaping from said arc chambers of said contact assemblies through said passages of said contact assemblies forward of said circuit breaker and away from said line terminals.

5,317,118
PACKAGE WITH MICROWAVE INDUCED INSULATION CHAMBERS

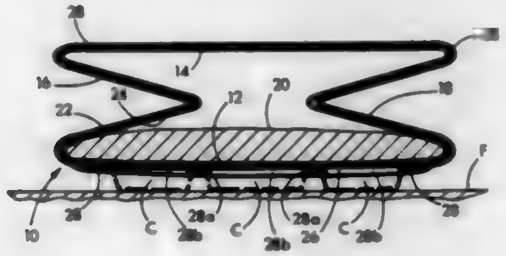
Lawrence C. Brandberg, Edina, and Jeffrey T. Watkins, Eden Prairie, both of Minn., assignors to Golden Valley Microwave Foods Inc., Edina, Minn.

Filed Feb. 5, 1992, Ser. No. 831,551

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.⁵ H05B *6/80;* B65B *25/22*

U.S. Cl. 219—727 **12 Claims**



1. An insulating microwave cooking package having a food compartment for containing food to be heated in a microwave oven, comprising:

inner and outer superimposed sheets of microwave transparent packaging material as a wall of the package;
said sheets of the package wall being sufficiently flexible to change shape during microwave heating;
seals connecting the inner and outer superimposed sheets together in selected sealed areas located between the sheets;
said seals defining a multiplicity of unsealed areas which provide multiple flattened inflatable chambers between the sheets and separate from said food compartment;
the inflatable chambers being adapted to expand when subjected to heat produced by the microwave oven without placing moisture or other expandable material therein prior to heating to provide a thermal barrier for reducing heat loss from the food compartment;
said package having parallel opposed upper and lower panels defining a top and a bottom surface of said package and gusset folds between said panels and a microwave heating susceptor connected to said lower panel;
said unsealed areas comprising a multiplicity of inflatable chambers within at least a portion of the package that includes said upper panel and said gusset folds to enhance cooking of the food by reducing heat loss therethrough.

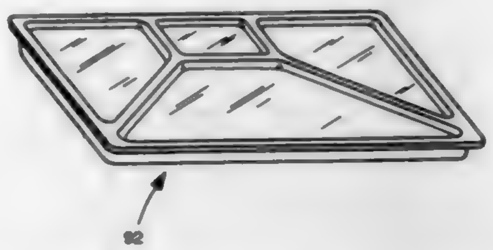
5,317,119
OVEN SAFE DISPOSABLE FOOD CONTAINER

John Ayres, Lapeer, Mich., assignor to Nu-Tech & Engineering, Inc., Lapeer, Mich.

Division of Ser. No. 517,204, May 1, 1990, Pat. No. 5,108,677, which is a continuation-in-part of Ser. No. 258,373, Oct. 17, 1988, Pat. No. 4,921,250. This application Apr. 16, 1992, Ser. No. 870,489

Int. Cl.⁵ H05B *6/80*

U.S. Cl. 219—734 **13 Claims**



1. A disposable container for holding, storing, and exposing food to heat, which is capable of use in microwave ovens, comprising:

a body comprised of sand granules having an average granule size of 0.08 to 0.5 millimeters, mixed with a decomposable binder, wherein the binder holds the granules of sand together to form a shape capable of receiving food: and
a coating covering at least a portion of the body wherein the coating prevents the passage of moisture therethrough, and makes the body capable of holding, storing and exposing food to heat.

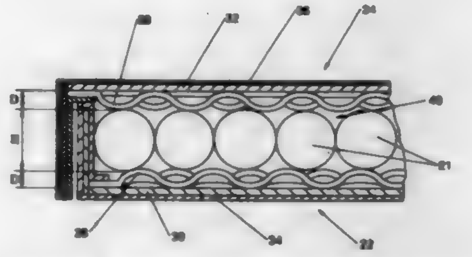
5,317,120
MICROWAVE SUSCEPTOR PACKAGE HAVING AN APERTURED SPACER BETWEEN THE SUSCEPTOR AND THE FOOD PRODUCT

Paul R. Bunke, and Robert L. Prosise, both of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 723,153, Jun. 28, 1991, abandoned. This application Jan. 13, 1993, Ser. No. 3,718

Int. Cl.⁵ H05B *6/64*

U.S. Cl. 219—730 **20 Claims**



7. A single-use, combined shipping, display and cooking microwave package for heating a plurality of food pieces in a microwave oven, the package comprising:

(a) a microwave transparent outer enclosure having a bottom panel and a top panel;
(b) a bottom panel microwave susceptor located adjacent the bottom panel;
(c) a bottom panel spacer adjacent the bottom panel microwave susceptor, between the bottom panel microwave susceptor and the food pieces, the bottom panel spacer being adapted to support the plurality of food pieces in a cavity located a first predetermined distance away from the bottom panel microwave susceptor and having a plurality of apertures for passing substantially all of the heat from the bottom panel microwave susceptor through the bottom panel spacer to the plurality of food pieces;

(d) a top panel microwave susceptor located adjacent the top panel; and
(e) a top panel spacer located adjacent the top panel microwave susceptor, between the top panel microwave susceptor and the food pieces, the top panel susceptor being adapted to support the plurality of food pieces in a cavity located a second predetermined distance away from the top panel susceptor and having apertures sized to pass substantially all of the heat from the top panel microwave susceptor directly through the top panel spacer to the plurality of food pieces.

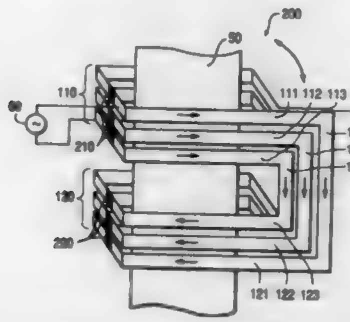
5,317,121
INDUCTION HEATING APPARATUS HAVING OPENABLE AND CLOSABLE COIL

Keiichi Katayama; Mitsuo Kato; Kazuya Tsurusaki; Mikio Hanamoto; Kazumasa Mihara, all of Hiroshima, and Takatoshi Eguchi, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1992, Ser. No. 947,836

Int. Cl.⁵ H05B *6/44*

U.S. Cl. 219—672 **3 Claims**



1. An induction heating apparatus comprising: a coil including a first coil section of at least one turn having a discontinuity at one location, a second coil section of at least one turn having a discontinuity at one location, a first electrical conductor electrically conductively connecting one end of each said turn of said first coil section defined at the discontinuity thereof to one end of each said turn of said second coil section defined at the discontinuity thereof, and a second electrical conductor electrically conductively connecting the other end of each said turn of said first coil section defined at the discontinuity thereof to the other end of each said turn of said second coil section defined at the discontinuity thereof, whereby one continuous electric current passageway is formed by the turns of said coil sections and said conductors, and each of said turns of the coil sections having a flexible portion between the ends thereof defined at the discontinuity; open/closing means connected to the coil for swinging respective portions of the coil relative to one another about said flexible portions of the turns of the coil sections of said coil so as to vary a distance between each said first conductor and each said second connector conductor; and a power supply connected to said coil.

5,317,122
DISCHARGE-PROCESSING ELECTRIC POWER-SOURCE ASSEMBLY

Akiyasu Ito; Munenori Kimura; Kazuo Tsurumoto, and Shouichi Nagasaka, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1993, Ser. No. 8,989

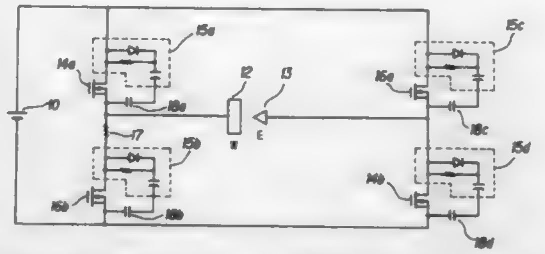
Claims priority, application Japan, Jan. 28, 1992, 4-012907

Int. Cl.⁵ B23H *1/02*

U.S. Cl. 219—69.18 **7 Claims**

1. A discharge-processing electric power-source assembly in which a gap is defined between a workpiece and an electrode, and processing is executed by discharge energy, said discharge-processing electric power-source assembly comprising:

a D.C. power source for supplying electric energy to said gap;



a switching element, controllably operable at a plurality of switching frequencies for converting a D.C. voltage of said D.C. power source to a pulse voltage;
a snubber circuit for protecting said switching element; and
cut-off means for cutting off said snubber in accordance with the switching frequency of said switching element.

5,317,123
CONTROLLER FOR A STUD WELDING MACHINE

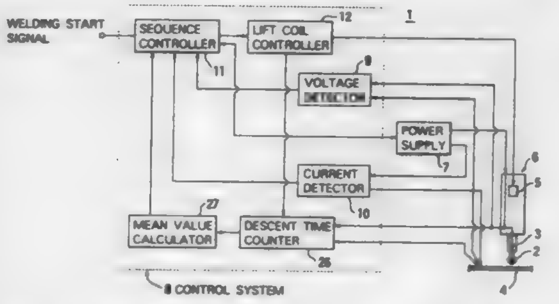
Hiroshi Ito, Aichi, Japan, assignor to Emhart Inc., Newark, Del.

Filed Jul. 13, 1993, Ser. No. 91,837

Claims priority, application Japan, Jul. 17, 1992, 4-50287[U]

Int. Cl.⁵ B23K *9/20*

U.S. Cl. 219—98 **1 Claim**



1. In a stud welding machine comprising a welding gun having a collet to hold a stud at the end thereof, lift means to lift the stud held by the collet from a base material, a power source connected to the welding gun to supply predetermined power across the stud and the base material, and a control device connected to the power source and the welding gun to control the power supplied from the power source to the welding gun to produce a pilot arc and subsequently a main arc across the stud and the base material, said control device comprising means to energize said lift means of the welding gun to lift the stud a predetermined distance from the base material to produce the pilot arc and then the main arc and to de-energize the lift means after a predetermined time to press the stud onto the base material to make the weld, said control device also including detection means to detect the voltage across the stud and the base material and to output a signal indicating that the stud is in press-contact with the base material, said control device including means to stop the supply of power from the power source to the welding gun after receiving said press-contact signal from the detection means, the improvement comprising means in said control device to measure descent time from de-energization of the lift means to contact of the stud with the base material, means to calculate an average value of such times measured N times, and means to adjust the timing of de-energizing of said lift means by using said average value.

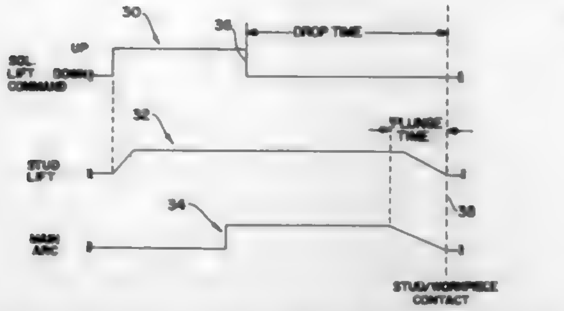
5,317,124
STUD WELDING

Carl W. Lesser, Swartz Creek, and Earl J. Schnur, Lake Orion, both of Mich., assignors to Emhart Inc., Newark, Del.

Filed Jul. 12, 1993, Ser. No. 89,822

Int. Cl.⁵ B23K *9/20*

U.S. Cl. 219—99 **2 Claims**



1. In a stud welding machine having lift means for moving a stud toward and away from a workpiece to which it is to be welded and means to create a main arc between said stud and said workpiece to melt the portions of said stud and said workpiece to be welded together, the improvement comprising a method of compensating for changes in drop time to hold plunge time substantially at an ideal constant value, comprising the steps of measuring the actual plunge time of each weld, continuously averaging a predetermined number of said actual plunge times on a rolling basis, and changing the time of the drop command to said lift means to the next cycle.

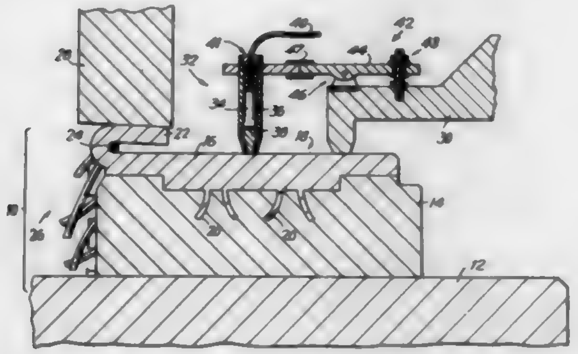
5,317,125
FUSING APPARATUS WITH TEMPERATURE CONTROL

Alessandro Rossi, Florence, Italy, assignor to Axis U.S.A., Inc., Marlborough, Mass.

Continuation of Ser. No. 596,876, Oct. 12, 1990. This application Feb. 22, 1993, Ser. No. 21,725

Int. Cl.⁵ B23K *11/25*

U.S. Cl. 219—110 **33 Claims**



1. Apparatus for fusing together two electrical conductors which collectively comprise a workpiece, said apparatus comprising:

a fusing member for performing heating and mechanical work on said workpiece;

a grounding member; and

a detecting means for detecting the temperature of a surface of said workpiece during fusing, said detecting means having conducting means which make contact with said surface for conducting heat from said surface of said workpiece and converting said heat into an electrical signal, said detecting means being distinct from said fusing member and said grounding member.

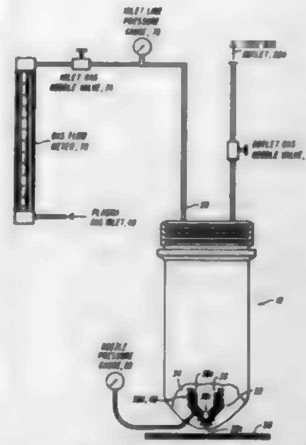
5,317,126
NOZZLE AND METHOD OF OPERATION FOR A PLASMA ARC TORCH

Richard W. Couch, Jr., Hanover; Nicholas A. Sanders, Norwich; Lifeng Luo, Lebanon; John Sobr, Enfield, and Patrik Bäckander, Lebanon, all of N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Filed Jan. 14, 1992, Ser. No. 820,278

Int. Cl.⁵ B23K *9/00*

U.S. Cl. 219—121.51 **26 Claims**



1. In a transferred arc plasma torch having a torch body mounting an electrode and a nozzle closely spaced from the electrode at a lower end of the torch to define a plasma chamber therebetween, said nozzle having a central orifice with an upstream entrance end adjacent the electrode and a downstream exit end adjacent and spaced from a workpiece with a high current density plasma jet exiting the torch from the central nozzle orifice and a plasma gas inlet passage formed in said torch body to direct plasma gas to the plasma chamber via a swirl ring, the improvement comprising

a plasma gas bypass channel formed in said nozzle with an inlet located downstream of the nozzle orifice entrance end and adjacent the exit end, said channel creating a bypass flow of plasma gas that increases the mass flow rate of the plasma gas through the plasma chamber and creating a highly uniform and very steady flow of the plasma gas through the plasma chamber.

5,317,127
APPARATUS INCLUDING AIR BLOWING AND INFRARED LIGHT MEANS FOR DRYING INK ON A SHEET

William H. Brewster, Jr., Fairfield; Lun Chan, New Fairfield, and Paul R. Sette, Branford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 28, 1992, Ser. No. 937,640

Int. Cl.⁵ F27B *9/06*

U.S. Cl. 219—388 **25 Claims**

1. Apparatus for drying ink on a sheet fed downstream therebeneath in a predetermined path of travel, the apparatus comprising:

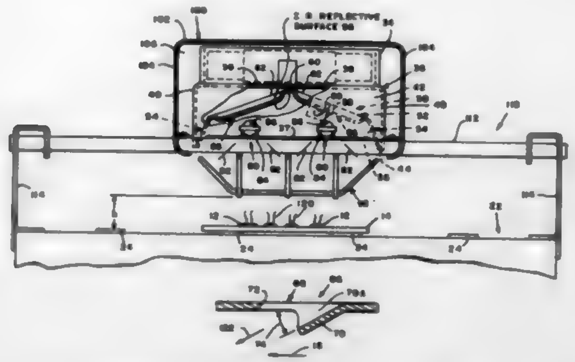
(a) framework;

(b) means for blowing air downwardly toward the path of travel of a sheet, the air blowing means including an electrically operable axial fan connected to the framework;

(c) an elongate member connected to the framework for location thereof beneath the fan, the member including an elongate upper wall and elongate oppositely disposed side walls depending from the upper wall, the upper wall having a light reflecting inner surface;

(d) means for providing infrared light, the light providing means including an elongate electrically-operable infrared lamp connected to the framework for location thereof within the member; and

(e) the upper wall of the member including a plurality of elongate parallel-spaced louvers formed therefrom and extending transversely of the longitudinal length thereof, each of the louvers including an aperture and vane associated with each other, each of the apertures having a generally rectangularly-shaped perimeter edge, each of the vanes being generally rectangularly-shaped and laterally-extending downwardly and downstream relative to the path of travel from the associated perimeter edge, whereby air from the fan is directed by each vane at an angle extending in the direction of the path of travel.



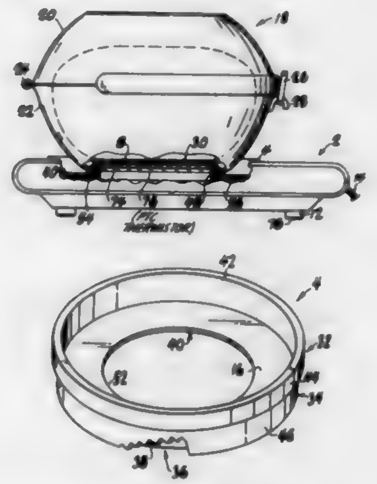
5,317,128
ELECTRIC HEATING UNIT FOR HEATING CONTAINER SPACE TO VARIABLE TEMPERATURE WITH CONSTANT ELECTRIC CURRENT

Kelvin K. W. Yao, Edison, N.J., assignor to Rototech Electrical Components, Inc., Edison, N.J.

Continuation of Ser. No. 565,468, Aug. 10, 1990, abandoned. This application Aug. 13, 1991, Ser. No. 747,471

Int. Cl.⁵ F27D *11/00*

U.S. Cl. 219—433 **19 Claims**



1. An apparatus for heating the contents of a container having a recess with a planar heat conducting surface formed in a bottom thereof, comprising:

a housing having an opening;

a plug-in electrical cord for receiving an electrical current, said cord having an end arranged in said opening in said housing;

means electrically coupled to sad cord for transforming said electrical current into heat radiation, said transforming means comprising a planar heat radiating surface supported by said housing;

means for supporting sad container in a stable position overlying said heat radiating surface, said container supporting means comprising an annular support surface which supports said container at a plurality of points of contact, said annular support surface having an aperture of diameter such that said planar heat radiating surface passes freely there through; and

first adjustment means located on a radially outer periphery of said container supporting means and second adjustment means located on said housing, said first and second adjustment means being coupled to adjustably support said container supporting means in any one of a plurality of positions, each of said plurality of positions being linearly displaced in a direction perpendicular to said planar heat radiating surface relative to the next preceding one of said plurality of positions and rotationally displaced about an axis perpendicular to said planar heat radiating surface relative to said next preceding one of said plurality of positions, at least one of said plurality of positions of said container supporting means being such that said annular support surface lies below said heat radiating surface and said hat radiating surface contacts said heat conducting surface when said container is supported by said annular support surface.

5,317,129
COOKING RANGE

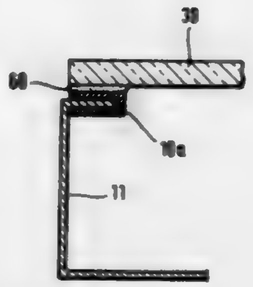
Martin Taplan, Ingelheim; Stefan Hubert, Wiesbaden, and Herwig Scheidler, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Aug. 5, 1992, Ser. No. 925,018

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1992, 4210010

Int. Cl.⁵ H05B *3/68;* **F24C** *3/00, 15/10*

U.S. Cl. 219—464 **19 Claims**



1. A cooking range comprising:

a plate of glass, glass ceramics or a similar material, said plate having a top surface, a bottom surface, and a peripheral edge;

a framing means for framing the plate including attachment means that are bonded to the bottom surface of the plate, and means for edge protection and lateral closing of the plate; and

a cooking range casing that surrounds the plate at its bottom and has lateral walls and a bottom part, said lateral walls having a bent flange at an upper end thereof;

wherein the attachment means of the framing means have an attachment frame (10) formed with a cross section profile in the shape of a lying "U", said cross section profile having an upper leg and a lower leg, said upper leg having an uppermost surface which is bonded with said bottom surface of the plate (30) such that said attachment frame is disposed completely beneath said plate, the attachment frame removably receiving said flange of the cooking range casing after the attachment frame is bonded to the bottom surface of the plate, and the means for edge protection and lateral closing of the plate (30) includes a visual frame (20) separate from the lateral walls (11) of the cooking range casing and a sealing mass sealingly disposed between said visual frame and said peripheral edge of said plate, said sealing mass being separate from said attachment frame.

5,317,130
PROGRAMMABLE LOAD COMPENSATION METHOD AND APPARATUS FOR USE IN A FOOD OVEN

Doug Burkett, and Gary Mercer, both of Eaton, Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

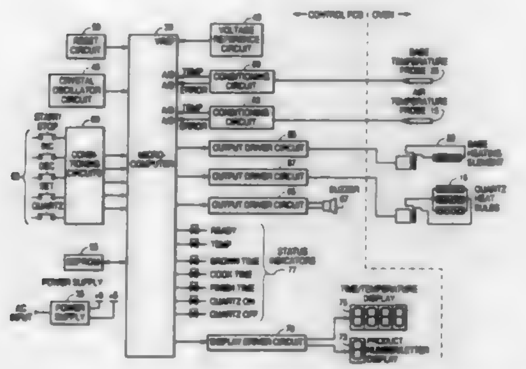
Filed Aug. 19, 1991, Ser. No. 746,910

Int. Cl.^{5} H05B *1/02*

U.S. Cl. 219—497 **27 Claims**

MICROFICHE APPENDIX INCLUDED

(4 Microfiche, 223 Pages)



14. A method for controlling a first means for heating food comprising the steps of:
- setting a first clock to a first predetermined clock value corresponding to a time for which the first means is switched to a first state;
- reading a compensation factor from a memory;
- continuously calculating a temperature error;
- calculating a compensated clock value dependent upon at least the compensation factor and the temperature error and setting a second clock to the compensated clock value;
- continuously decrementing the second clock;
- decrementing the first clock when the second clock falls below a second predetermined clock value; and
- switching the first means to a second state when the first clock falls below a third predetermined clock value.

5,317,131

Patent Not Issued For This Number

5,317,132
HEATING ELEMENTS CONTAINING ELECTRICALLY CONDUCTIVE TIN OXIDE CONTAINING COATINGS

Thomas J. Clough, Santa Monica; Victor L. Grosvenor, Topanga, and Naum Pinsky, Thousand Oaks, all of Calif., assignors to Ensci, Inc., Pismo Beach, Calif.

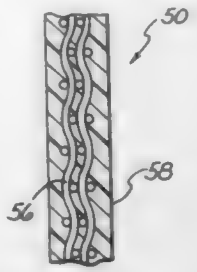
Continuation-in-part of Ser. No. 348,788, May 8, 1989, Pat. No. 5,039,845, which is a continuation-in-part of Ser. No. 272,517, Nov. 17, 1988, abandoned, and a continuation-in-part of Ser. No. 272,539, Nov. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 82,277, Aug. 6, 1987, Pat. No. 4,787,125, which is a division of Ser. No. 843,047, Mar. 24, 1986, Pat. No. 4,713,306. This application Jun. 12, 1991, Ser. No. 714,242

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.^{5} H05B *3/34*

U.S. Cl. 219—543 **28 Claims**

1. A resistance heating element comprising an inorganic three dimensional substrate having at least partially shielded surfaces associated with said substrate and having a dopant containing electrically conductive tin oxide coating on at least a portion of said at least partially shielded surfaces and all three dimensions thereof, said coated substrate being adapted and structured to provide heat in response to the presence of one or more electrical currents therein, said dopant being present in said coating in an amount effective to control the heating response of said coating in said element.



5,317,133
METHOD FOR CONTROLLING THE MICROWAVE ENERGY IN A MICROWAVE OVEN, AND MICROWAVE OVEN FOR IMPLEMENTING THE METHOD

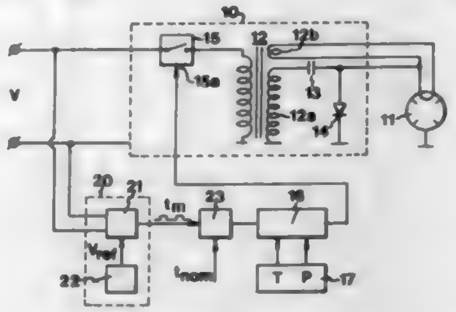
Tim Sundström, and David Wahlander, both of Norrköping, Sweden, assignors to Whirlpool Europe B.V., Veldhoven, Netherlands

Filed Mar. 30, 1993, Ser. No. 40,242

Claims priority, application Sweden, Apr. 3, 1992, 9201071A

Int. Cl.^{5} H05B *6/68*

U.S. Cl. 219—716 **13 Claims**



1. A method of controlling the microwave energy fed by a magnetron to an oven chamber of a microwave oven during a cooking procedure, wherein the magnetron is switched, by connecting and disconnecting a power-supply circuit, between zero output and full output which is determined by one of an nominal existing operation and apparatus parameter in the magnetron, a power-supply circuit for said magnetron and said oven chamber, the magnetron being, during a cooking procedure, either switched on with full output during the entire cooking time or pulsed with a given periodicity between full output and zero output in order to give a desired average output lower than full output, the cooking time and the output level being set at values giving a total switch-on time for the magnetron during the cooking procedure that is adapted to the food introduced into the oven chamber, said method comprising measuring at least one of said parameters and comparing it with a reference value which is related to the nominal value of the parameter; and using the result of the comparison to generate an effective switch-on time for the magnetron that is modified in relation to a set total switch-on time when there is a difference between the nominal parameter value and the measured value, thereby substantially eliminating the effect of this difference on the microwave energy supplied during the cooking procedure.

5,317,134
MICROWAVE OVEN HAVING PREPARATION OF MENU ASSISTING FUNCTION

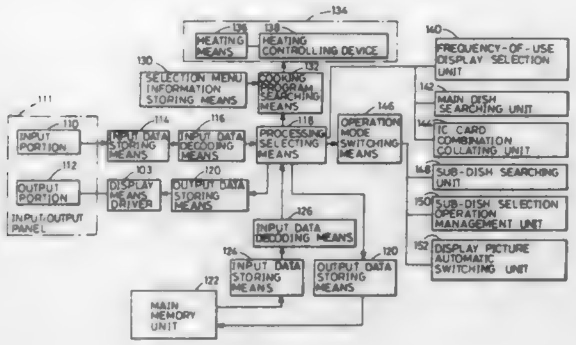
Kaoru Edamura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1992, Ser. No. 948,631

Claims priority, application Japan, Sep. 25, 1991, 3-245764

Int. Cl.^{5} H05B *6/68*

U.S. Cl. 219—720 **20 Claims**


134
136
HEATING MEANS
138
HEATING CONTROLLING DEVICE
140
FREQUENCY-OF-USE DISPLAY SELECTION UNIT
130
SELECTION MENU INFORMATION STORING MEANS
132
COOKING PROGRAM SEARCHING MEANS
142
MAIN DISH SEARCHING UNIT
111
110
INPUT PORTION
114
INPUT DATA STORING MEANS
116
INPUT DATA DECODING MEANS
118
PROCESSING SELECTING MEANS
146
OPERATION MODE SWITCHING MEANS
144
IC CARD COMBINATION COLLATING UNIT
112
OUTPUT PORTION
103
DISPLAY MEANS DRIVER
120
OUTPUT DATA STORING MEANS
148
SUB-DISH SEARCHING UNIT
150
SUB-DISH SELECTION OPERATION MANAGEMENT UNIT
INPUT-OUTPUT PANEL
126
INPUT DATA DECODING MEANS
152
DISPLAY PICTURE AUTOMATIC SWITCHING UNIT
124
INPUT DATA STORING MEANS
120
OUTPUT DATA STORING MEANS
122
MAIN MEMORY UNIT

1. Microwave oven comprising:
- cooking means, including a microwave generator, for cooking food according to a cooking program, specifying a cooking procedure;
- external memory attaching means for providing detachable attachment of both a first type and a second type external storing means, said first type external storing means for storing a plurality of kinds of main dish cooking information from cooking information relating to the cooking program and said second type external storing means for storing a plurality of kinds of sub-disk cooking information to be combined with the main cooking information in a menu, each of said plurality of kinds of main dish cooking information being related to at least one of said plurality of kinds of sub-dish cooking information;
- main dish cooking information selecting means, operatively connected to the first type external storing means, for accessing a user selected one of said plurality of kinds of main dish cooking information stored in the first external storing means attached to said external attaching means;
- sub-dish cooking information selecting means, operatively connected to the second type external storing means, for assisting a user, in preparation of a menu, in selecting sub-dish cooking information related to said accessed user selected main dish cooking information, said sub-dish cooking information being separately stored in said second type external storing means attached to said external attaching means;
- menu storing means, operatively connected to the main dish cooking information selecting means and the sub-dish cooking information selecting means, for storing a series of cooking programs corresponding to the main dish and sub-dish selected by the user as a menu;
- cooking controlling means, operatively connected to the cooking means and the menu storing means, for applying said cooking programs stored in said menu storing means to said cooking means in a predetermined order for execution of said cooking programs; and
- displaying means, operatively connected to the cooking controlling means, for displaying information to assist the user in preparing a menu by said main dish cooking information selecting means and said sub-dish cooking information selecting means and for displaying information relating to the cooking programs to be executed prior to execution of the cooking programs by said cooking controlling means.

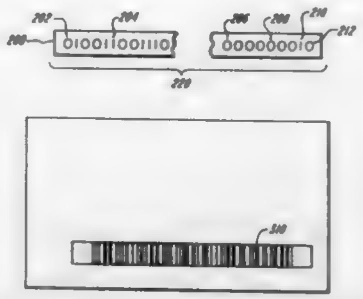
5,317,135
METHOD AND APPARATUS FOR VALIDATING INSTANT-WIN LOTTERY TICKETS

Richard Finocchio, 46 Dartmouth St., Everett, Mass. 02149

Filed May 24, 1991, Ser. No. 705,332

Int. Cl.^{5} G06F *15/44*

U.S. Cl. 235—375 **12 Claims**



1. A method for cashing instant-win lottery tickets, some of said tickets being winning tickets with a predetermined prize value and some of said tickets being non-winning tickets, by means of a computer system having a main memory and a disk memory, said method comprising the steps of:
- A. storing information for at least some of said winning tickets in said computer main memory at a predetermined location and storing information for others of said winning tickets in said computer disk memory at a predetermined location;
- B. printing a validation code on each of said tickets, said validation code comprising a flag indicating whether said each ticket is a winning ticket with sufficient information contained within said validation code to cash said each ticket, said sufficient information including the prize value of said each ticket and information identifying said predetermined computer main memory location;
- C. reading said validation code from a ticket presented for cashing at a validation location;
- D. partially decoding said validation code read from said presented ticket;
- E. reading said flag from said partially decoded validation code;
- F. decoding a predetermined portion of said validation code and accessing said predetermined computer main memory location using said identifying information to mark said presented ticket as cashed only when said flag indicates said presented ticket is a winning ticket with sufficient information contained within said validation code to cash said presented ticket;
- G. decoding a predetermined portion of said validation code to determine a disk address when said flag indicates that said presented ticket is a ticket with insufficient information contained within said validation code to cash said presented ticket; and
- H. accessing said computer disk memory using said disk address to locate said additional ticket status information to determine if said presented ticket is a winning ticket.

5,317,136
INFORMATION READING DEVICE WHICH CONTROLS COMMUNICATION INTERRUPT SIGNAL FROM A HOST SYSTEM

Makoto Hasegawa, Ichinomiya, and Koji Mori, Oobu, both of Japan, assignors to Nippodenso Co., Ltd., Kariya, Japan

Filed Dec. 20, 1991, Ser. No. 809,909

Claims priority, application Japan, Dec. 20, 1990, 2-404307; Sep. 20, 1991, 3-241592

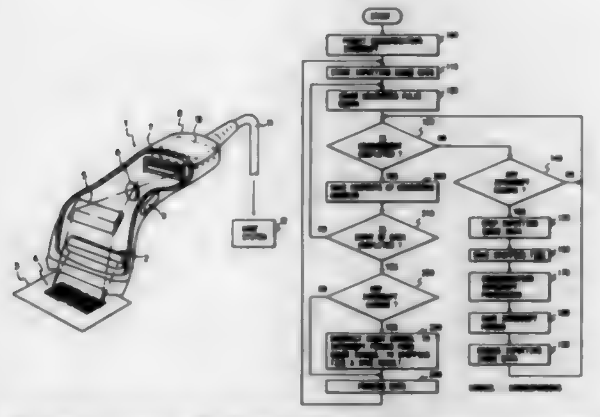
Int. Cl.^{5} G06K *7/10*

U.S. Cl. 235—375 **5 Claims**

1. An information reading device for use in a system in which a plurality of slave devices are connected to a master

unit through a common signal line, the information reading device being employed as the slave device, the information reading device comprising:

- irradiation means for irradiating electromagnetic waves on a recording medium, on which a plurality of codes are described;
- signal converting means for obtaining information signals representing the codes from electromagnetic waves reflected from the recording medium and storing the information signal;
- driving means for outputting a driving signal to the signal converting means and causing the signal converting means to serially output the information signals stored therein;
- code information output means for storing the information signals output from the signal converting means to form code information, converting the code information and outputting a signal representing a result of the conversion of the code information to the master unit;



- judgement means for determining whether or not an interrupt signal is input from the master unit to the information reading device;
- interrupt processing means for performing an interrupt processing in response to the interrupt signal if the judgement means determines that the interrupt signal is input from the host system to the information reading device;
- driving signal control means for making the driving means stop outputting the driving signal if the judgement means determines that the interrupt signal is input from the master unit to the information reading device, and for making the driving means resume outputting the driving signal when the interrupt processing means finishes the interrupt processing; and
- code control means for making the code information outputting means convert the code information by removing data represented by the signal output from the signal converting means when the interrupt processing means performs the interrupt processing.

5,317,137
MAGNETIC DEBIT CARD READER FRAUDULENT USE PREVENTION

John L. Wilkins, Manassas Park, Va., assignor to Comproducts Inc., Manassas Park, Va.

Filed Feb. 24, 1992, Ser. No. 839,567

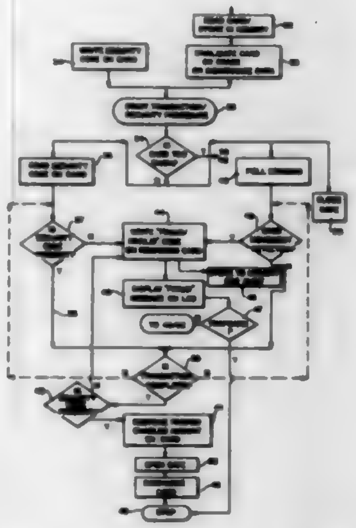
Int. Cl.^{5} G06K *7/08, 5/00*

U.S. Cl. 235—380 **14 Claims**

10. A method of preventing fraud in a transaction with a debit card having magnetic media on a face thereof, and utilizing a debit card reader having a magnetic read/write head, and a gate at the entrance to the reader, and wherein the debit card reader also has an LCD, comprising the steps of automatically:

- (a) with the magnetic head, reading a card inserted into a debit card reader to determine information from the magnetic media thereon;
- (b) generally simultaneously with step (a), closing the gate to positively prevent movement of the card out of the entrance to the reader until the transaction is completed;
- (c) writing a security code of the card;
- (d) after completion or termination of a transaction, opening the gate to provide for removal of the card from the reader, or trapping the card in the reader if it is determined to be an illegal card, without a security code, and
- (e) automatically, if in response to step (d) it is determined that the security code is not present, displaying a fraud indicating message on the LCD.

11. A method of preventing fraud in a transaction with a debit card having magnetic media on a face thereof, and utilizing a debit card reader having a magnetic read/write head, and a plurality of card position sensors, comprising the steps of automatically:



- (a) with the magnetic head, reading a card inserted into a debit card reader to determine information from the magnetic media thereon;
- (b) generally simultaneously with step (a), after the card has come to rest in a transaction position, enabling at least one of the sensors to sense the movement of the card from its rest position;
- (c) if in response to step (b) it is determined that the card has moved more than a predetermined amount from its rest position prior to completion of a transaction, invalidating the card in the reader with the read/write head, or precluding revalidation of the card; and
- (d) if in response to step (c) it is determined that the card has moved, also writing data, location, and/or other identifying data on the magnetic media of the card in the reader with the read/write head.

5,317,138
INFORMATION RECORDING AND OR REPRODUCING APPARATUS FOR USE IN HYBRID TYPE INFORMATION RECORDING MEDIUM

Tsuyoshi Togawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1992, Ser. No. 837,973

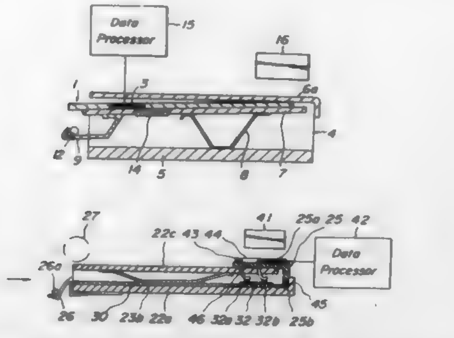
Claims priority, application Japan, Feb. 20, 1991, 3-045547; Mar. 29, 1991, 3-091033

Int. Cl.^{5} G06K *7/00, 19/08*

U.S. Cl. 235—440 **15 Claims**

1. An information recording and/or reproducing apparatus for use in a hybrid type card-like information recording medium on which an IC chip and optical information recording area and/or magnetic information recording area are provided, comprising:

- a shuttle for containing said hybrid type card-like information recording medium and transferring it in an extended direction of tracks formed on the medium in a reciprocal manner;
- an optical head for recording and/or reproducing information on and/or from said optical information recording area formed on the medium, and/or a magnetic head for recording and/or reproducing information on and/or from said magnetic information recording area formed on the medium;



- an information processing means for recording and/or reproducing information in and/or from said IC chip formed on the medium; and
- a contact means for making contact between said IC chip and said information processing means when said medium is inserted in the shuttle;
- said contact means being formed in said shuttle.

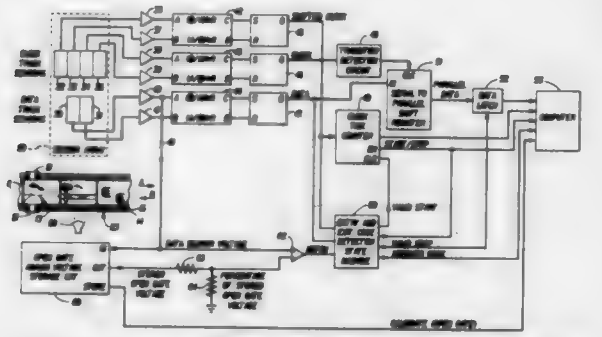
5,317,139
FILM OPTICAL CODE READER HAVING CLOCK AND DATA SENSORS

Stuart G. Evans; John E. Morse, both of Rochester, and Thomas C. Jessop, Webster, all of N.Y., assignors to Eastman Kodak Company, Rockester, N.Y.

Filed Oct. 20, 1992, Ser. No. 963,961

Int. Cl.^{5} G06K *7/10*

U.S. Cl. 235—462 **10 Claims**



1. A code reader comprising a first and a second data sensor and a first and a second clock sensor for reading the data track and clock track of a transmissive optical bar code formed on a portion of a surface that is moved past said code reader and illuminated by a light source, is characterized in that:

- said first and second data sensors are positioned adjacent to each other, in the same plane, in the direction of surface travel and the combined width of said first and second sensors is no larger than the minimum bar space width of the optical code;
- said first and second clock sensors are positioned adjacent to each other, in the same plane, in the direction of surface travel and the combined width of said first and second data sensors is no larger than the minimum bar space width of the optical code, wherein said first and second clock sensors are offset from said first and second data sensors in the downstream direction of surface travel;
- means coupled to said data sensors for detecting optical bar code transitions by determining the ratio of the signals sensed by said data sensors;
- means coupled to said clock sensors for detecting optical bar code transitions by determining the ratio of the signals sensed by said clock sensors; and
- means coupled to said data and clock transitions detecting means for processing the detected data and clock transition signals to determine the information contained in the data track and clock track of the optical code.

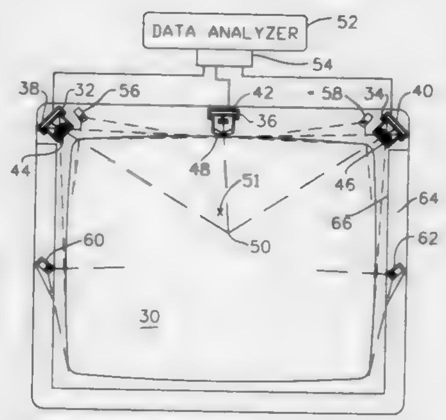
5,317,140
DIFFUSION-ASSISTED POSITION LOCATION PARTICULARLY FOR VISUAL PEN DETECTION

David I. Dunthorn, 908 W. Outer Dr., Oak Ridge, Tenn. 37830

Filed Nov. 24, 1992, Ser. No. 980,915

Int. Cl.^{5} G01V *9/04*

U.S. Cl. 250—221 **40 Claims**



1. A system for optically determining the direction of an object, said system comprising:

- a photodetector having a plurality of detector elements extending in at least one dimension;
- elements for projecting a diffuse image of the object onto said photodetector such that each of said detector elements produces an output signal corresponding to the intensity of that portion of the diffuse image which is projected onto the particular detector element, the diffuse image having a characteristic intensity distribution; and
- a data analyzer connected for receiving the output signals from said detector elements and operable to locate the position of the diffuse image on said photodetector by recognizing the characteristic intensity distribution of the diffuse image.

5,317,141
APPARATUS AND METHOD FOR HIGH-ACCURACY ALIGNMENT

Michael E. Thomas, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

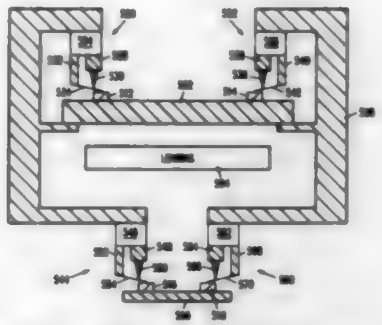
Filed Aug. 14, 1992, Ser. No. 929,826

Int. Cl.^{5} G21K *5/10*

U.S. Cl. 250—491.1 **28 Claims**

1. A method for alignment of a first object with a second object, comprising the steps of:

- (a) determining the location of a feature on a surface of said second object using a probe of a scanned probe microscope, said scanned probe microscope being distinct from said first object;



(b) positioning said first object in preselected spatial relationship with respect to said located feature.

5,317,142
AUTOMATIC FOCUSING APPARATUS WHICH REMOVES LIGHT REFLECTED BY A LOWER SURFACE OF A SAMPLE

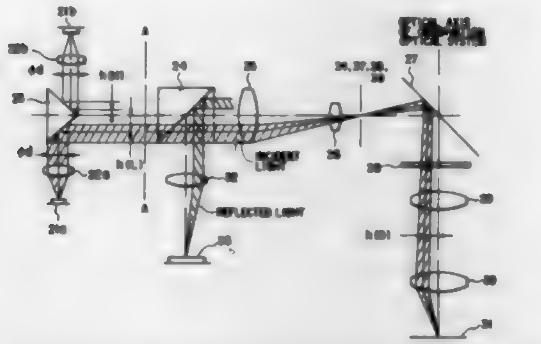
Hiroaki Noda, Tokyo; Shinichi Dosaka, Kanagawa, and Hiroshi Kurosawa, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1992, Ser. No. 975,699

Claims priority, application Japan, Nov. 18, 1991, 3-301795

Int. Cl.⁵ G02B *23/06*

U.S. Cl. 250—201.4 **12 Claims**



12. An automatic focusing apparatus for an optical system which forms an image of a transparent thin sample and in which an objective lens is disposed at a position to oppose the sample, comprising:

light source means for supplying light to measure a focusing state of said optical system;

converting means for converting the light supplied from said light source into a parallel beam parallel to an optical axis of said optical system, the parallel beam being incident on an eccentric portion of a pupil of said objective lens;

separating means for separating light reflected by an upper surface of the sample from said optical system, the light reflected by the upper surface of the sample being generated by reflecting the parallel beam, focused on the sample by said objective lens, by an upper surface of the sample;

beam adjusting means for setting a diameter of the parallel beam and a pupil passing position thereof so that light reflected by a lower surface of the sample will not be incident on said objective lens; and

focusing state discriminating means for discriminating a focusing state of said optical system according to the light reflected by the upper surface of the sample which does not include the light reflected by the lower surface of the sample.

5,317,143
OPTICAL DATA MEDIUM DRIVING APPARATUS AND A SERVO CIRCUIT WITH NORMALIZATION PROCESSING

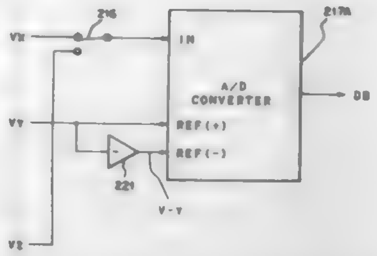
Kyosuke Yoshimoto, and Kyouji Shimoda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 212,566, Jun. 28, 1988, Pat. No. 5,204,901. This application Jan. 23, 1991, Ser. No. 645,182

Claims priority, application Japan, Jun. 4, 1987, 62-139044; Jun. 30, 1987, 62-160841

Int. Cl.⁵ G01J *1/20;* **H03M** *1/12*

U.S. Cl. 250—201.5 **4 Claims**



4. An apparatus for processing signals from a detector, the detector having at least first and second areas for generating electrical signals upon receiving a physical quantity, comprising:

first operation means for deriving out the sum of the electrical signals from at least the first and second areas of the detector to generate a first operation signal, the first operation signal having a predetermined amplitude;

second operation means for deriving out the difference between the electrical signals from at least the first and second areas of the detector to generate a second operation signal; and

converting means for converting the second operation signal generated by the second operation means into digital data in accordance with a conversion gain determined by the amplitude of the first operation signal generated by the first operation means.

5,317,144
WAVE FRONT ABERRATION MEASURING APPARATUS HAVING MEANS FOR ADJUSTING POSITION OF COLLIMATOR LENS

Masahiro Oono; Tsuyoshi Itoh; Katsuki Hayashi; Toshiyuki Kase; Masahiko Sasaki; Hiroshi Yamamoto, and Isao Okuda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 574,071, Aug. 29, 1990, Pat. No. 5,157,459. This application Jul. 28, 1992, Ser. No. 920,924

Claims priority, application Japan, Aug. 29, 1989, 1-225625; Aug. 29, 1989, 1-225626; Aug. 29, 1989, 1-225629; Aug. 29, 1989, 1-225630; Oct. 2, 1989, 1-258119

Int. Cl.⁵ G01J *1/20*

U.S. Cl. 250—201.5 **11 Claims**

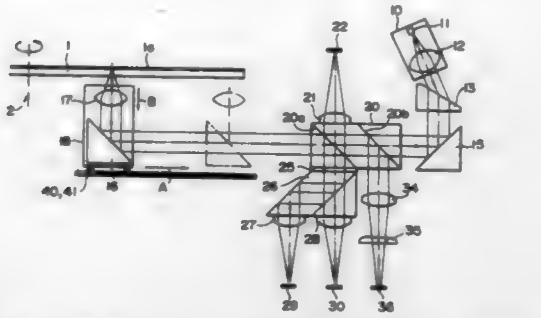
1. A system having a wave front aberration correcting means comprising:

a light source for emitting a divergent light beam having an astigmatism;

a collimator lens for making the light beam from said light source parallel;

an anamorphic optical system for modifying a cross-section shape of said light beam;

an objective lens for imaging the light beam onto a surface of an object; and



means for adjusting a distance between said light source and said collimator lens in order to correct said astigmatism of the light beam.

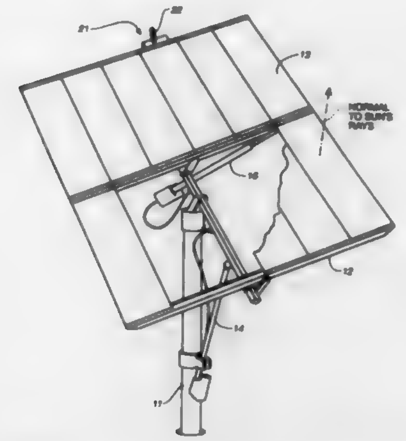
5,317,145
RADIATION SOURCE DETECTOR AND TRACKER CONTROL HAVING A SHADE POLE AND RADIATION RESPONSIVE SURFACE IN THE SHAPE OF NARROW BANDS

Ronald P. Corio, Albuquerque, N. Mex., assignor to Wattsun Corporation, Albuquerque, N. Mex.

Continuation of Ser. No. 815,385, Dec. 31, 1991, abandoned. This application Apr. 30, 1993, Ser. No. 56,822

Int. Cl.⁵ G01J *1/20*

U.S. Cl. 250—203.4 **7 Claims**



1. In a radiation source detector the combination comprising:

a shade pole casting a shadow of the radiation source; and

a first radiation responsive surface in the shape of a narrow band more than 0.00464 times the shade pole length and less than 0.75 inches wide disposed partially in and partially out of the shadow of said shade pole.

5,317,146
READ HEAD INCORPORATING AN IMAGE PICK-UP FUNCTION

Minoru Isobe, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1992, Ser. No. 975,492

Claims priority, application Japan, Nov. 18, 1991, 3-301847

Int. Cl.⁵ H01J *40/14*

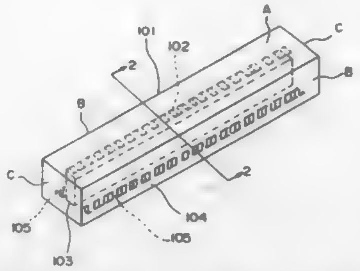
U.S. Cl. 250—208.1 **12 Claims**

1. A read head comprising:

a plurality of photoelectric conversion type light receiving element arrays arranged in a longitudinal direction on a substrate, for reading a medium;

a convergent rod lens array arranged adjacent to said plurality of light receiving element arrays, and having a script side end face; and

a solid light emitting element of a surface emission type



arranged adjacent to the script side end face of said convergent rod lens array, said solid light emitting element continuously covering the convergent rod lens array along the longitudinal direction.

5,317,147
METHOD AND APPARATUS FOR ABSOLUTE MEASUREMENT OF FORCE BY USE OF POLARIZED, NON-COHERENT LIGHT AND COMPENSATION OF STRAIN-INDUCED BIREFRINGENCE EFFECTS IN A SINGLE MODE-FIBER OPTIC WAVEGUIDE

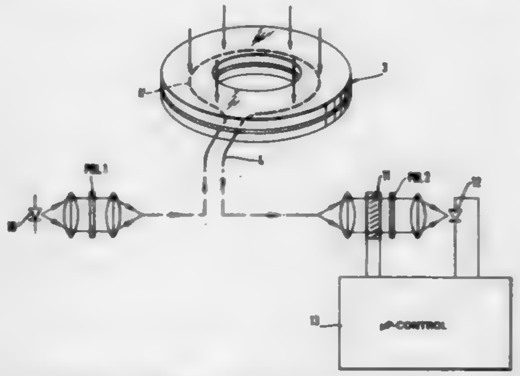
René Dändliker, Neuchâtel; Edwin Schweizer, Sevelen; Hanspeter Schad, Grabs, all of Switzerland, and Walter Odoni, Schaan, Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jan. 26, 1993, Ser. No. 8,927

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1992, 4202185

Int. Cl.⁵ H01J *5/16*

U.S. Cl. 250—227.17 **10 Claims**



1. A method for the fiber-optic measurement of force, which is based on a strain-induced birefringence of a single-mode light waveguide, which is embedded at least along a part of its length in a plane situated vertically relative to a pretensioning force between disks which distribute said pretensioning force along surfaces thereof, which comprises the steps of:

beaming polarized, non-coherent light into one end of a light waveguide wherein a phase difference, of two linear modes of said light waves which exit at an opposite end of said light waveguide, is caused by said force which acts on said light waveguide;

compensating for a consequent change in a birefringence in order to achieve measurements; and

evaluating a control signal which is required for compensation as a measurement of said force.

wherein a liquid crystal cell, the birefringence of which is constantly changed by said control signal, is utilized as a compensator element, and further wherein changes in intensity, shown on said liquid crystal cell as an image of an autocorrelation function, as a function of said control signal, are photoelectrically detected, and further wherein a reading signal is automatically checked at the maximum of the autocorrelation function.

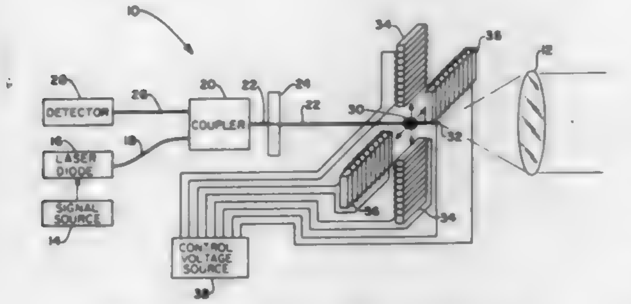
5,317,148
IR/LADAR SCANNER

Charles L. Gray, Akron; John T. Brooker, Mogadore, both of Ohio; Dale E. Bardin, San Diego, Calif., and E. Reeves Salby, II, Canton, Ohio, assignors to Loral Corporation, New York, N.Y.

Filed May 22, 1991, Ser. No. 704,255

Int. Cl.^{5} G02B *26/08;* G02F *1/295;* H01J *5/16*

U.S. Cl. 250—227.26 **10 Claims**



1. A scanner for an imaging system, comprising:

an optical detector;

an optic fiber communicating with said optical detector;

means operatively engaging said optic fiber for moving an end of said optic fiber;

a lens communicating with said optic fiber, said optic fiber being interposed between said optical detector and lens, said end of said optic fiber being moved through a focal point of said lens;

a light energy source interconnected with said optic fiber and in communication with said lens, said lens radiating light energy from said light energy source; and

an optic coupler interposed within said optic fiber, said optic coupler interconnecting said optical detector and said light energy source to said lens, said optic coupler duplexing said optic fiber to pass light energy from said light energy source to said lens and from said lens to said detector.

5,317,149
OPTICAL ENCODER WITH ENCAPSULATED ELECTROOPTICS

John J. Uebbing, Palo Alto; Thomas J. Lugaresi, Los Gatos, both of Calif., and David Pitou, Meridian, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 12, 1992, Ser. No. 975,609

Int. Cl.^{5} G01D *5/34*

U.S. Cl. 250—231.14 **20 Claims**

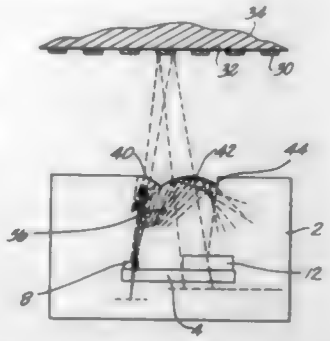
1. An optical encoder for sensing modulated light reflected from a movable member, the sensor comprising:

a light emitting device having a light output for illuminating the movable member;

at least one photodetector for detecting the modulated light reflected from the movable member;

a transparent medium encapsulating the light emitting device and the photodetector; and

a lens surface on the medium in an optical path defined between the light emitting device, the movable member, and the photodetector, and wherein the width of each cycle of photodetector area is twice the width of each cycle of reflective and nonreflective areas on the movable member divided by magnification of the detector lens.



5,317,150
POLARIMETER CALIBRATION METHOD AND APPARATUS

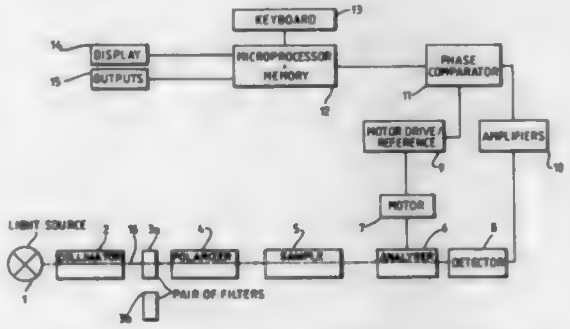
Harry Norris, and Jennifer L. Horn, both of Huntingdon, United Kingdom, assignors to Optical Activity Limited, Ramsey, United Kingdom

Filed Oct. 9, 1992, Ser. No. 959,138

Claims priority, application United Kingdom, Oct. 11, 1991, 9121658

Int. Cl.^{5} G01N *21/21*

U.S. Cl. 250—252.1 **7 Claims**



1. A method of calibrating a polarimeter to work at an unknown wavelength of comprising calibrating the polarimeter at a standard known wavelength, using the calibrated polarimeter to measure a sample, measuring the same sample at the unknown wavelength and setting the polarimeter to give the same measurement at the said unknown wavelength as at the known wavelength.

5,317,151
MINIATURIZED LIGHTWEIGHT MAGNETIC SECTOR FOR A FIELD-PORTABLE MASS SPECTROMETER

Mahadeva P. Sinha, 9725 Olive St., Temple City, Calif. 91780, and Albert D. Tomassian, 11444 Pala Mesa Dr., Northridge, Calif. 91326

Filed Oct. 30, 1992, Ser. No. 969,364

Int. Cl.^{5} H01J *49/30*

U.S. Cl. 250—298 **24 Claims**

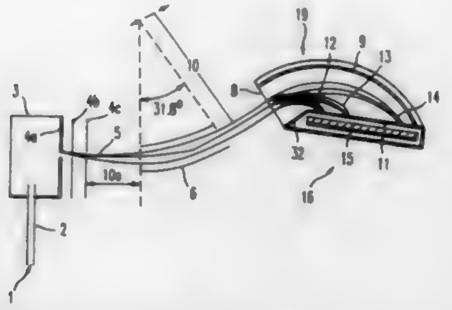
1. A magnetic sector for a double focusing non-scanning mass spectrometer, comprising:

a yoke of high magnetic permeability material for guiding magnetic flux therethrough, said yoke having a yoke upper surface and a yoke lower surface opposing the yoke upper surface;

an upper magnet comprising magnetic material which has an energy product density of greater than 1×10^7 GOe and having an upper magnet upper surface and an upper magnet lower surface, said upper magnet upper surface connected to and magnetically coupled with the yoke upper surface;

a lower magnet comprising magnetic material which has an energy product density of greater than 1×10^7 GOe and having a lower magnet lower surface and a lower magnet upper surface, said lower magnet lower surface attached to and magnetically coupled with the yoke lower surface;

an upper pole piece having an upper pole piece upper surface and an upper pole piece lower surface, said upper pole piece upper surface connected to said upper magnet lower surface, said upper pole piece upper surface having the same shape and size as the upper magnet lower surface and attached to and aligned therewith;



a lower pole piece having a lower pole piece lower surface and a lower pole piece upper surface, said lower pole piece lower surface connected to said lower magnet upper surface, said lower pole piece lower surface having the same size and shape as said lower magnet upper surface and attached to and aligned therewith;

wherein the upper pole piece lower surface and the lower pole piece upper surface both have the same shape, are both flat, in parallel, and aligned with one another; and

wherein the upper pole piece has a different shape than the lower pole piece.

5,317,152
CANTILEVER TYPE PROBE, AND SCANNING TUNNEL MICROSCOPE AND INFORMATION PROCESSING APPARATUS EMPLOYING THE SAME

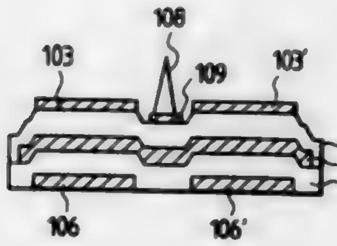
Osamu Takamatsu, Atsugi; Yutaka Hirai, Tokyo; Masaru Nakayama, Atsugi; Takayuki Yagi, Machida; Yuji Kasanuki, Isehara, and Yasuhiro Shimada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1992, Ser. No. 871,727

Claims priority, application Japan, Apr. 22, 1991, 3-116544

Int. Cl.^{5} H01J *37/26;* H01L *41/22*

U.S. Cl. 250—306 **11 Claims**



1. A cantilever type probe comprising:

a cantilever-shaped displacement element and a tip;

said displacement element including a first electrode layer, a first piezoelectric material film and a second piezoelectric material film which films are laminated on opposite sides of the first electrode layer, and a second electrode layer and a third electrode layer which second and third electrode layers are laminated on outer surfaces of the piezoelectric material films laminated on the opposite sides of the first electrode layer, and

said tip being connected with a leader electrode located at a free end of the displacement element,

wherein the first electrode layer protrudes outward in a width direction of the displacement element more than the second and third electrode layers.

5,317,153
SCANNING PROBE MICROSCOPE

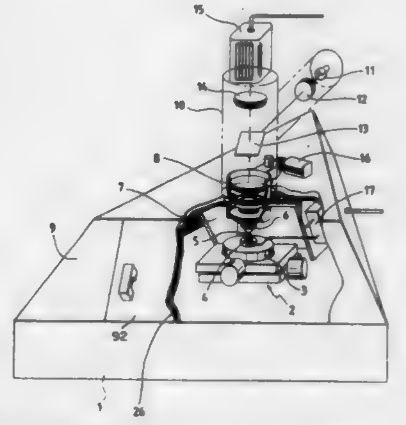
Hiroyuki Matsushiro, Machida; Tetsuji Onuki, Yokohama; Masaya Miyazaki, and Yasushi Fukutomi, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jul. 31, 1992, Ser. No. 922,505

Claims priority, application Japan, Aug. 8, 1991, 3-198155; Aug. 9, 1991, 3-200835

Int. Cl.^{5} H01J *37/26*

U.S. Cl. 250—306 **15 Claims**



1. A scanning probe microscope comprising:

a surface plate;

a probe microscope unit disposed on said surface plate for electrically processing information obtained by a relative scan of a probe to a sample to measure a fine constitution of a surface of said sample;

an optical microscope unit disposed on said surface plate spatially independently of said probe microscope unit for observing an optical image of said sample; and

a box having side faces arranged in a conic form, and encasing said probe microscope unit for shielding said probe microscope unit against external noises and electromagnetic waves.

5,317,154
ELECTRON MICROSCOPE EQUIPPED WITH X-RAY ANALYZER

Toshikazu Honda, Tokyo, Japan, assignor to Joel Ltd., Tokyo, Japan

Filed Mar. 5, 1993, Ser. No. 27,090

Int. Cl.^{5} H01J *37/244*

U.S. Cl. 250—310 **5 Claims**

1. An electron microscope comprising:

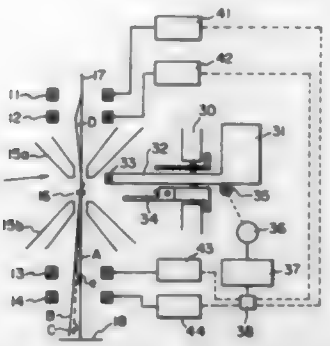
an electron gun for producing an electron beam;

a specimen to which said electron beam is irradiated;

an x-ray detector for detecting the x-rays emanating from said specimen, wherein said x-ray detector being moved between a first position remote from said specimen and a second position close to said specimen and an error of an irradiated position on said specimen caused by moving said X-ray detector at said second position;

a deflection means for deflecting said electron beam irradiated to said specimen;

a correcting signal generating means for generating a correcting signal, wherein said correcting signal is so set that the error of the position on said specimen irradiated by said electron beam caused by moving said X-ray detector to the second position is compensated; and



a switching means for supplying said correcting signal to said deflecting means.

5,317,155

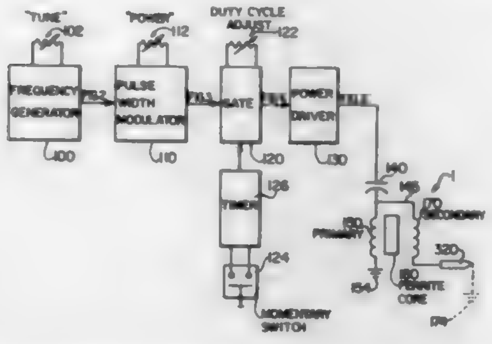
CORONA DISCHARGE APPARATUS

Ray J. King, Carolina Beach, N.C., assignor to The Electrogesic Corporation, New York, N.Y.

Filed Dec. 29, 1992, Ser. No. 997,907

Int. Cl.^{5} H01T ***19/04***

U.S. Cl. 250—324 **6 Claims**



1. An apparatus for producing a corona discharge, comprising:

means for producing a digital signal made up of low-frequency bursts of high-frequency width-modulated pulses;

means for transforming the signal into a high-voltage signal power magnitude varies directly with the pulse widths; and

means for producing the corona discharge in response to the high-voltage signal.

5,317,156

DIAGNOSTIC TESTS USING NEAR-INFRARED LASER ABSORPTION SPECTROSCOPY

David E. Cooper, Palo Alto; Clinton B. Carlisle, and Haris Riris, both of Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jan. 29, 1992, Ser. No. 827,209

Int. Cl.^{5} G01N ***21/35***

U.S. Cl. 250—345 **7 Claims**

1. Apparatus for determining information regarding the presence of first and second isotopic species in a molecular gas sample comprising:

a sample cell for holding the gas sample to be analyzed;

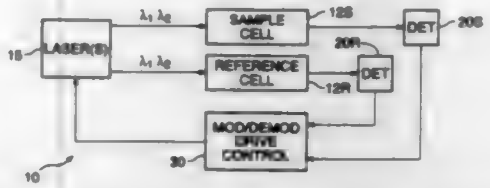
a reference cell for holding a volume of gas having a known ratio of the first and second isotopic species;

a laser diode illuminator for passing light of first and second wavelengths in the 1-μm to 3-μm range through both said sample cell and said reference cell;

said first wavelength being at an absorption line for molecules containing said first isotopic species;

said second wavelength being at an absorption line for molecules containing said second isotopic species;

means for modulating the light at each of said first and second wavelengths according to a particular regime;



means for demodulating the light at each of said first and second wavelengths according to said particular regime to provide respective signals corresponding to the absorption at each of said first and second wavelengths in each of said sample and reference cells; and

means for correlating said respective signals to provide a representation of the isotope ratio in said sample cell.

5,317,157

INFRARED RAY DETECTING SENSOR WITH GETTER PARTITION

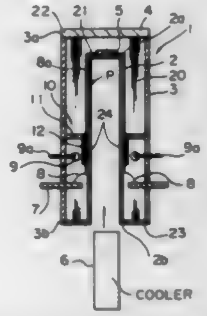
Yukihiro Yoshida; Satoshi Ueda; Makoto Itoh; Mitsuo Yoshikawa; Shigeki Hamashima; Hiroyuki Tsuchida, and Koji Hirota, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 20, 1992, Ser. No. 979,220

Claims priority, application Japan, Nov. 20, 1991, 3-304479; Jul. 22, 1992, 4-195225

Int. Cl.^{5} G01J ***5/06***

U.S. Cl. 250—352 **21 Claims**



1. An infrared ray detecting sensor comprising:

an axially extending inner cylindrical member and an axially extending outer cylindrical member enclosing the inner cylindrical member; the inner cylindrical member having opposite first and second ends; the outer cylindrical member having correspondingly opposite first and second ends with the first end of the outer cylindrical member extending beyond the first end of the inner cylindrical member;

first end wall means closing the first end of the inner cylindrical member; second end wall means closing the first end of the outer cylindrical member and including an infrared ray permeable window; third end wall means closing a gap between the second ends of the inner cylindrical member and the outer cylindrical member so as to form a chamber between the inner and outer cylindrical members and between the first and second end wall means; said chamber being evacuated to a vacuum level;

an infrared ray detecting element located in the chamber on the first end wall means of the inner cylindrical member for receiving an infrared ray incident through the infrared ray permeable window;

conductor means connecting the infrared ray detecting element to an outside electrical component;

at least one getter arranged in the chamber at a position between the first and second ends of the inner cylindrical member for ensuring the vacuum level of the chamber; and

at least one partition arranged in the chamber between the first end of the inner cylindrical member and the at least one getter for forming a restricted passage and allowing communication of a gas between the at least one getter and the infrared ray detecting element and obstructing a stray ray generated upon radiation of the at least one getter toward the infrared ray detecting element;

said restricted passage being formed such that a ray generated upon radiation of the at least one getter is reflected a plurality of times at the restricted passage and is dampened.

5,317,158

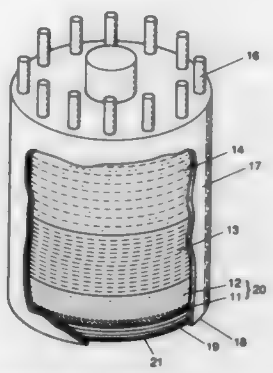
UNITARY SCINTILLATION DETECTOR AND SYSTEM

Stephanie A. McElhaney, Oak Ridge, and Marion M. Chiles, Knoxville, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Oct. 22, 1991, Ser. No. 781,550

Int. Cl.^{5} G01T ***1/20***

U.S. Cl. 250—367 **20 Claims**



1. A unitary scintillation detector for sensing the presence of alpha, beta, and gamma radiations comprising:

a housing having opposed ends, one of which is open and the second of which is closed by a light-tight aluminum entrance window, said entrance window capable of passing alpha, beta and gamma radiations into said housing without substantial attenuation;

three scintillators in series within said housing, said scintillators comprising a monolithic alpha/beta scintillator and a gamma scintillator, said monolithic alpha/beta scintillator comprising an alpha scintillator settled in a beta scintillator, said aluminum entrance window formed on the alpha scintillator end of said monolithic alpha/beta scintillator, said gamma scintillator located adjacent said open end of said housing, said alpha, beta and gamma scintillators successively responsive to said alpha, beta and gamma radiations passing through said entrance window, and each of said scintillators emitting light pulses having different decay constants for said alpha, beta and gamma radiations; and

single photosensitive means located at said open end of said housing, said photosensitive means responsive to said light pulses emitted from said scintillators and producing electrical signals therefrom.

5,317,159

METHOD OF USING AN ELECTRON CAPTURE TYPE DETECTOR

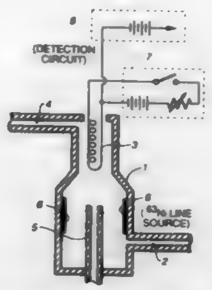
Toyoaki Fukushima, Kyoto, and Shozo Tanabe, Osaka, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Nov. 20, 1992, Ser. No. 979,828

Claims priority, application Japan, Jan. 31, 1992, 4-46145

Int. Cl.^{5} G01T ***1/185***

U.S. Cl. 250—381 **2 Claims**



1. A method of operating an electron capture type detector, said detector comprising an ionization vessel having therein line sources for a radioactive isotope serving as a negative electrode, a collector electrode, a purge gas route and a discharge gas route, and having an end of a column disposed at a lower section of said ionization vessel, said method comprising the steps of:

heating said collector electrode, for removing contaminants from said collector electrode, by causing an electric current to flow through a filament which is connected to a heating means and of which said collector electrode is comprised; and

simultaneously causing air or hydrogen gas to pass through said ionization vessel from said purge gas route to said discharge gas route over said collector electrode.

5,317,160

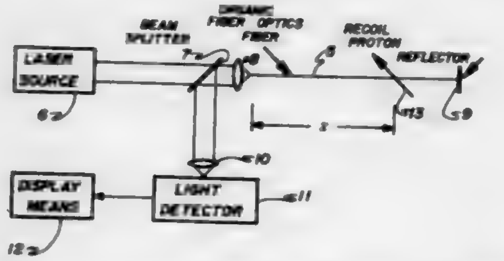
LASER PULSED FIBER OPTIC NEUTRON DETECTOR

Lee A. Hilbert, Athens; George R. Edlin; Leon H. Riley, both of Huntsville; Thomas G. Miller, Madison; Wilford W. Gebhart, Decatur, and Charles L. Johnson, Madison, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1993, Ser. No. 65,260

Int. Cl.^{5} G01T ***3/00, 5/00***

U.S. Cl. 250—390.12 **5 Claims**



1. A laser-pulsed fiber optic neutron detector comprising: means for generating laser pulses, a sensor having a plurality of vertically-stacked layers of organic fiber light pipes, each of said light pipes having a first end and a second end, and said sensor being suitably positioned to receive laser pulses at said first end of each of said light pipes, reflecting means located at said second end of each of said light pipes for reflecting laser pulses injected into said light pipes, detecting means suitably positioned to detect backscatter from laser pulses as said pulses travel within said light pipes and are reflected by the reflecting means at said second end, and display means coupled to said detecting means to receive backscatter and reflected laser

pulses from said detector means, for displaying the backscatter and the reflected laser pulse information.

5,317,161
ION SOURCE

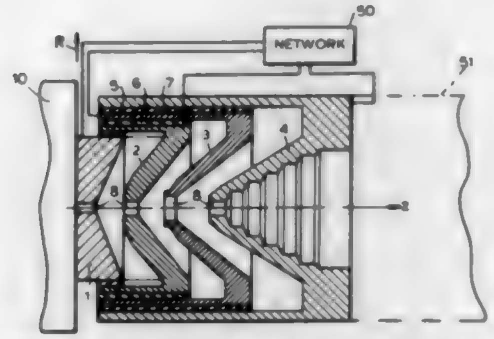
Alfred Chalupka; Gertraud Lammer, both of Vienna; Gerhard Stengl, Wernberg; Peter Wolf, and Johannes Fegerl, both of Vienna, all of Austria, assignors to IMS Ionen Mikrofabrikations Systeme Gesellschaft m.b.H., Vienna, Austria

Filed May 21, 1992, Ser. No. 888,661

Claims priority, application Austria, May 24, 1991, 1067/91

Int. Cl.^{5} H01J *37/08*

U.S. Cl. 250—423 R **16 Claims**



1. A duoplasmatron type ion source for use with an ion-optic imaging system, comprising:

a plasma chamber having an outlet from which ions generated in said plasma chamber emerge; and

an electrode assembly aligned with said outlet and traversed by ions supplied to said ion-optic imaging system, said electrode assembly comprising:

first, second, third and fourth axially spaced electrodes arrayed in succession along a path of said ions through said assembly, having axially aligned windows traversed by said ions and centered on a common axis,

means for applying approximately the same potentials to said second and fourth electrodes, and

means for applying to said first and third electrodes substantially the same potentials at a level higher than the potentials at said second and fourth electrodes so that the ions traversing said assembly are accelerated to a final energy by a potential difference between said first and fourth electrodes, at said potentials of said electrodes, the spacing between two neighboring electrodes being is selected to produce an electrical field strength therebetween in a region of said axis which exceeds 5 megavolt/meter.

5,317,162
APPARATUS AND METHOD FOR PHASE RESOLVED FLUORESCENCE LIFETIMES OF INDEPENDENT AND VARYING AMPLITUDE PULSES

Bertram G. Pinsky, Hayward, and Robert A. Hoffman, Livermore, both of Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 705,044, May 23, 1991, abandoned. This application Sep. 9, 1992, Ser. No. 941,780

Int. Cl.^{5} G01N *21/64*

U.S. Cl. 250—461.2 **21 Claims**

1. An instrument to measure phase fluorescence lifetimes of signals representative of characteristics of subpopulations of particles by determining phase shift between a reference signal and emissions from the particles, the instrument comprising:

delivery means for moving particles through an interrogation window of the instrument;

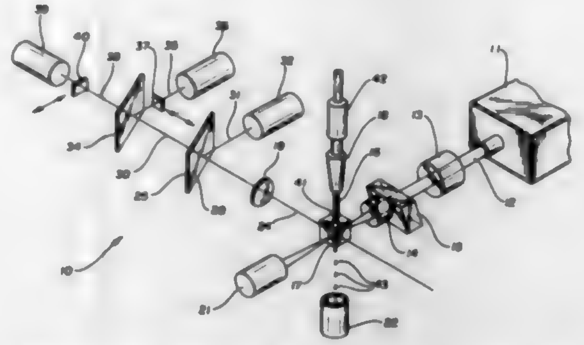
a source of modulated light at a predetermined frequency, the source positioned to direct and focus the modulated light onto individual particles in the window;

detection means responsive to emissions from the individual particles illuminated by the source of modulated light, the detection means for generating an output signal:

means for filtering the output signal and producing a filtered signal thereby passing a frequency band centered at the modulation frequency:

an amplifier for setting the signal level above a preset level thereby producing a filtered, amplified signal;

a limiting circuit to limit the filtered, amplified signal thereby producing a limited signal;



a filter to remove from the limited signal, harmonics above the modulation frequency and an envelope below a preset frequency thereby producing a filtered limited signal, and

a mixer to mix the filtered limited signal with a reference signal thereby relating the reference signal and the filtered limited signal to determine the relative phase shift of the fluorescence emissions.

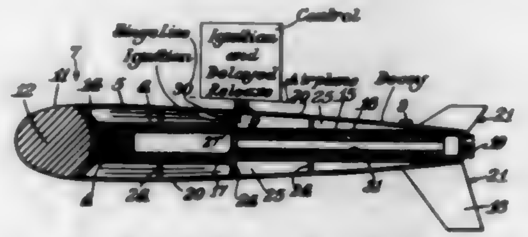
5,317,163
FLYING DECOY

Bernt Obkircher, Horgenzell, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 26, 1990, Ser. No. 489,930

Int. Cl.^{5} G01J *1/00;* **B64D** *1/04;* **F41F** *5/00;* **F42B** *10/00*

U.S. Cl. 250—495.1 **3 Claims**



1. In a flying decoy having a body equipped with a propulsion engine and having a magnified radar cross-section to decoy any missiles that seek radar echoes and/or heat, the improvement according to which the body is further equipped with means for combusting fuel not used for propulsion and lateral discharge openings for discharging the combustion products of the non-propulsion fuel to generate an exhaust plume larger or hotter or both larger and hotter than that of said propulsion engine.

5,317,164
RADIOTHERAPY DEVICE

Masaaki Kurokawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1992, Ser. No. 985,920

Claims priority, application Japan, Jun. 12, 1991, 3-323106

Int. Cl.^{5} G12G *5/00*

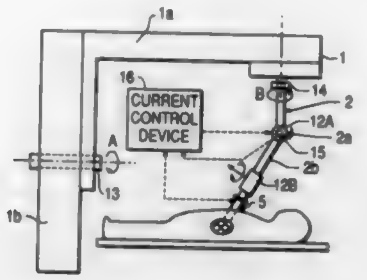
U.S. Cl. 250—492.3 **7 Claims**

1. A radiotherapy device comprising:

radiation generation means for generating an electron beam;

a guide tube of a small diameter attached at one end thereof to said radiation generation means, wherein said guide tube is adapted to be inserted at another end thereof into a body of a patient, said guide tube guiding said electron beam from said radiation generation means to said body of said patient;

electron beam convergence means disposed along said guide tube, for converting said electron beam into a thin beam directed to an affected part of said body of said patient;



deviation detector means for detecting a deviation of said electron beam from a center of said guide tube; and

feedback control means coupled to said deviation detector means, for controlling said electron beam convergence means to adjust an orbit of said electron beam along a central axis of said guide tube in response to an output of said deviation detector means.

5,317,165
APPARATUS FOR DETECTING THE PRESENCE AND THE QUALITY OF A FLAME BY DETECTING AND ANALYZING ELECTROMAGNETIC RADIATION OF DIFFERENT WAVELENGTHS

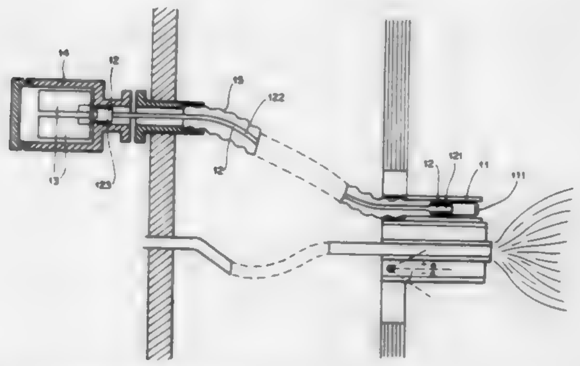
Giovanni Montagna, Milan, Italy, assignor to SIE Systems S.p.A., Pero, Italy

Filed Aug. 19, 1992, Ser. No. 932,086

Claims priority, application Italy, Aug. 27, 1991, 91-A-002292

Int. Cl.^{5} G01J *3/14*

U.S. Cl. 250—554 **7 Claims**



1. An apparatus for detecting the presence and the quality of a flame producing radiation and combustion gases in a combustion chamber, comprising:

an optical detecting and focusing element means which comprises a collecting lens having a geometric focal point for focusing the radiation serving for analysis of the combustion gases, said focusing being within a zone of the geometric focal point of the lens;

an optical transmitting element means for the radiation comprising an inlet head piece of a radiation-conductive fiber optics bundle which forms the transmitting element; said transmitting element being formed by radiation-conductive optical fibers in which each fiber has a radiation conductivity adapted to the radiation wavelength intended for the analysis;

wherein in the interior of the fiber optics bundle, a spreading member is inserted on the inlet head piece of said bundle, said spreading member for separating a part of the bundle at a given point into separate parts at the location of the spreading member;

an element means for separating the radiation and for sealing the combustion chamber; said element means having means for the mechanical fixation of the fibers, for guiding the fibers to the said optical radiation sensitive detecting and focusing element means, and for sealing off the gases originating from the interior of the combustion chamber; said separating element means separating the fibers from one another at an outlet side end thereof; and

means for measuring and analyzing the radiation.

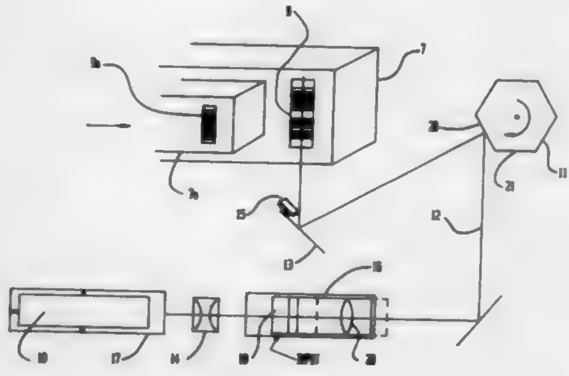
5,317,166
A SYSTEM FOR DECODING BAR CODED LABELS UPON DIFFERENT SIZE CONTAINERS

Benny R. Tafoya, Doylestown, Pa., assignor to PSC Inc., Webster, N.Y.

Filed Feb. 23, 1993, Ser. No. 21,055

Int. Cl.^{5} G06K *7/10*

U.S. Cl. 250—568 **28 Claims**



1. Apparatus for reading a coded label comprising,

a. a container wherein said label is mounted upon one of its surfaces, and said label containing information pertinent to said container;

b. means for scanning said coded label with a beam of light along an optical path to produce at least a first or, alternatively, a second reflected signal which is representative of information contained thereon;

c. said first reflected signal having a first magnitude, and said second reflective signal having a second magnitude which is less than said first magnitude,

d. means for determining whether said container falls within a first range of sizes, or alternatively whether it falls within a second range of sizes;

e. means for receiving said reflected signals from said scanned label;

f. means coupled to said receiving means for adjusting said receiving means based upon whether said determining means has detected said first or second range of container sizes;

g. whereby a threshold level is provided for said receiving means based upon whether said first magnitude or said second magnitude signal is obtained from said scanned label such that the information obtained may be successfully interpreted.

5,317,167
SEMICONDUCTOR LIGHT-EMITTING DEVICE WITH INGAALP

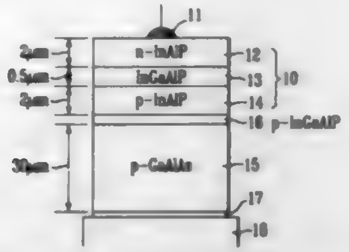
Toshihide Izumiya, Tokyo; Yasuo Ohba, Yokohama, and Ako Hatano, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 819,976, Jan. 13, 1992, Pat. No. 5,235,194, which is a division of Ser. No. 588,858, Sep. 27, 1990, Pat. No. 5,103,271. This application May 10, 1993, Ser. No. 59,221

Claims priority, application Japan, Sep. 28, 1989, 1-250450; Mar. 26, 1990, 2-73272

Int. Cl.^{5} H01L *33/00*

U.S. Cl. 257—13 **15 Claims**



1. A light emitting diode, comprising:

a light-emitting layer comprising p-type and n-type $In_xGa_yAl_{1-x-y}P$ $(0\leq x\leq 1, 0\leq y\leq 1)$ layers;

a first electrode provided on a light-outputting side of the light-emitting layer;

a first contact layer interposed between the light-emitting layer and the first electrode, the first contact layer being made of a group III-V compound semiconductor of the indirect transition type;

a second electrode provided on an opposite side to the light-outputting side of the light-emitting layer; and

a second contact layer interposed between the light-emitting layer and the second electrode, the second contact layer being made of a group III-V compound semiconductor.

5,317,168
SUPERCONDUCTING FIELD EFFECT TRANSISTOR

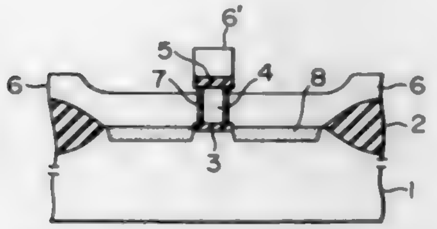
Toshikazu Nishino, Kawasaki; Ushio Kawabe; Fumio Murai, both of Tokyo; Tokuo Kure, Tokyo; Mutsuko Hatano, Kodaira, and Haruhiro Hasegawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 800,736, Dec. 3, 1991, abandoned, which is a continuation of Ser. No. 687,771, Apr. 19, 1991, abandoned, which is a continuation of Ser. No. 305,367, Feb. 1, 1989, abandoned. This application Nov. 19, 1992, Ser. No. 978,454

Claims priority, application Japan, Feb. 5, 1988, 63-23670; Jul. 1, 1988, 63-162511

Int. Cl.^{5} H01L *39/22*

U.S. Cl. 257—34 **14 Claims**



1. A superconducting field effect transistor comprising:

a semiconductor substrate;

first and second impurity-doped regions formed in the semiconductor substrate;

first and second superconducting electrodes formed on the semiconductor substrate, said first superconducting electrode being in contact with said first impurity-doped region and said second superconducting electrode being in contact with said second impurity-doped region; and

a gate electrode formed over a region of the semiconductor substrate between said first and second impurity-doped regions with an insulating film therebetween, said gate electrode interposed between said first and second superconducting electrodes, the gate electrode being formed of a first layer, and a second layer, different in material from the first layer formed on the top of the first layer, wherein side surfaces of said second layer which are opposite said first and second superconducting electrodes, extend further along a distance between said first and second superconducting electrodes, than side surfaces of the first layer which are opposite the first and second superconducting electrodes.

5,317,169
ORGANIC ELECTROLUMINESCENCE DEVICE

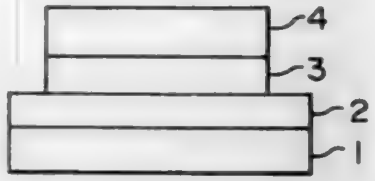
Tsuyoshi Nakano; Shuji Doi; Takanobu Noguchi; Toshihiro Ohnishi, and Yasushi Iyechika, all of Tsukuba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 658,639, Feb. 22, 1991. This application Apr. 1, 1992, Ser. No. 861,633

Claims priority, application Japan, Feb. 23, 1990, 2-043930; Mar. 22, 1990, 2-75225; Oct. 4, 1990, 2-267870

Int. Cl.^{5} H01L *29/28*

U.S. Cl. 257—40 **14 Claims**



1. An organic electroluminescence device having a light emitting layer and a charge transport layer disposed between a pair of electrodes at least one of which is transparent or semi-transparent, said charge transport layer comprising a conducting polymer having a repeating unit represented by the general formula (2):

$$—Ar_2—B— \qquad (2)$$

where Ar_2 represents an aromatic hydrocarbon group having 6 to 14 carbon atoms, a heterocyclic aromatic hydrocarbon group having 4 to 6 carbon atoms and containing nitrogen, sulfur or oxygen, or its nuclear-substituted groups in which the aromatic hydrocarbon group is substituted by one or two selected from the group consisting of hydrocarbon groups having 1 to 22 carbon atoms or alkoxy groups having 1 to 22 carbon atoms, and B represents a —CH=CH— group or an —NH— group, said conducting polymer having an electrical conductivity of 0.1 S/cm or less.

5,317,170
HIGH DENSITY, INDEPENDENTLY ADDRESSABLE, SURFACE EMITTING SEMICONDUCTOR LASER/LIGHT EMITTING DIODE ARRAYS WITHOUT A SUBSTRATE

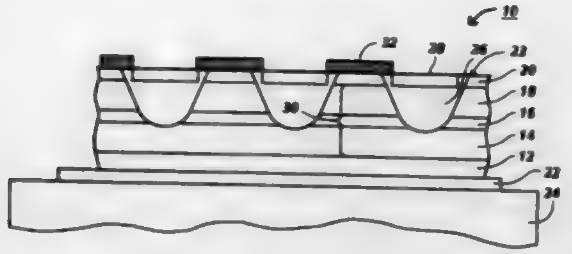
Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 620,229, Nov. 29, 1990, Pat. No. 5,216,263. This application Apr. 13, 1993, Ser. No. 45,400

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.^{5} H01L *33/00, 29/161, 27/02, 29/06*

U.S. Cl. 257—88 **38 Claims**



1. A high density, surface emitting, semiconductor light emitting diode (LED) array comprising:

a first semiconductor confinement layer deposited on a first semiconductor contact layer, said first confinement layer and said first contact layer having the same conductivity type,

an active semiconductor layer deposited on said first confinement layer, said active layer providing lightwave generation and propagation, said active layer having a smaller bandgap than said first confinement layer,

a second semiconductor confinement layer deposited on said active layer, said second confinement layer having a conductivity type opposite that of said first confinement layer,

a second semiconductor contact layer deposited on said second semiconductor confinement layer, said second contact layer and said second confinement layer having the same conductivity type,

disordered regions extending through said second contact layer, said second confinement layer, said active layer and at least partially through said first confinement layer, said disordered regions having a conductivity type opposite that of said contact layer and said second confinement layer,

at least one contact formed on said first contact layer, and light emitting areas formed between said disordered regions, contacts formed on said second contact layer, one of said contacts formed on said second contact layer aligned with each of said light emitting areas such that current injected between one of said contacts on said second contact layer and said at least one contact on said first contact layer will cause light emission from one of said light emitting areas through that portion of the surface of said first contact layer where said contact is not formed on said first contact layer.

5,317,171
MOS GATED THYRISTOR WITH REMOTE TURN-OFF ELECTRODE

Mallikarjunaswamy S. Shekar, and Bantval J. Baliga, both of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Apr. 29, 1992, Ser. No. 875,742

Int. Cl.^{5} H01L *29/100, 29/600, 29/740*

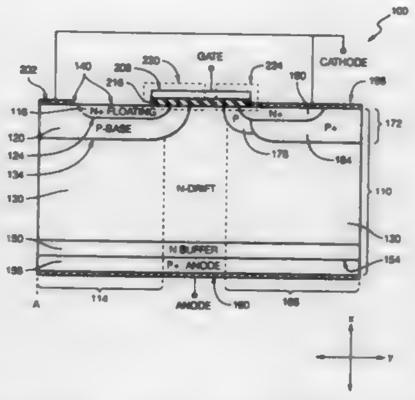
U.S. Cl. 257—138 **9 Claims**

6. A semiconductor thyristor device comprising:

anode and cathode electrodes;

a remote electrode connected to said cathode electrode;

a multi-layer body of semiconductor material having a first surface and including a regenerative portion and a non-regenerative portion each operatively coupled between said anode and cathode electrodes, said regenerative portion including adjacent first, second, third and fourth regions of alternating conductivity type arranged respectively in series wherein said first region of said regenerative portion is separated from said third region proximate said first surface by said second region, said remote electrode is in electrical contact with said second region and is separated from said first region thereby, and wherein said anode electrode is in electrical contact with said fourth region; and



an insulated gate electrode disposed adjacent said first surface for modulating electrical conductivity within said non-regenerative portion in order to turn said device on upon application of an enabling voltage to said gate electrode, and for modulating electrical conductivity within said second region of said regenerative portion and within said non-regenerative portion in order to turn said device off upon application of a non-enabling voltage to said gate electrode;

wherein any charges remaining in said second region of said regenerative portion are collected by said remote electrode subsequent to said application of said non-enabling voltage to said gate electrode.

5,317,172
PNPN SEMICONDUCTOR DEVICE CAPABLE OF SUPPORTING A HIGH RATE OF CURRENT CHANGE WITH TIME

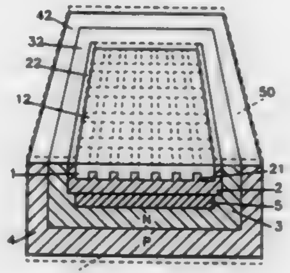
Stephen W. Byatt, Bromham, United Kingdom, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 11, 1992, Ser. No. 896,932

Claims priority, application United Kingdom, Nov. 27, 1991, 9125260

Int. Cl.^{5} H01L *29/080, 29/740*

U.S. Cl. 257—164 **19 Claims**



1. A PNPN semiconductor device comprising an outer

P-type region having an outer surface boundary for the PNPN semiconductor device, an inner N-type region, an inner P-type region and an outer N-type region having an outer surface boundary for the PNPN semiconductor device with a first junction between the outer N-type region and the inner P-type region, a second junction between the inner P-type region and the inner N-type region and a third junction between the inner N-type region and the outer P-type region; said inner P-type region including an outer formation around the periphery of the inner P-type region surrounding the inner P-type region on all sides extending from the inner P-type region to be substantially level with the outer surface boundary of the outer N-type region and within said outer formation at least a portion of higher conductivity than the remainder of the inner P-type region extending from the remainder of the inner P-type region and terminating short of the outer surface boundary of the outer N-type region whereby said portion of the inner P-type region forms part of said first junction; and a first terminal on the outer surface boundary of the outer N-type region contacting the formation of the inner P-type region and a second terminal on the outer surface boundary of the outer P-type region.

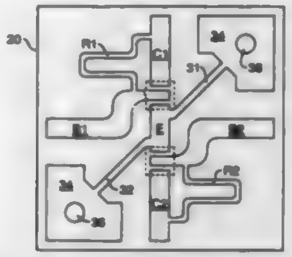
5,317,173
HBT DIFFERENTIAL PAIR CHIP FOR QUASI-OPTIC AMPLIFIERS

Emilio A. Sovero, Thousand Oaks, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed May 13, 1993, Ser. No. 62,361

Int. Cl.^{5} H01L *29/72, 29/161*

U.S. Cl. 257—197 **13 Claims**



1. A monolithic heterojunction bipolar transistor (HBT) differential pair chip, comprising: first and second HBTs fabricated on said chip, said HBTs having a common emitter;

said first HBT further comprising a first collector, a first base, and a first bias resistor connecting said first collector and said first base;

said second HBT further comprising a second collector, a second base, and a second bias resistor connecting said second collector and said second base; and

an emitter bias resistor connected to said common emitter.

5,317,174
BULK CHARGE MODULATED DEVICE PHOTOCELL

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1993, Ser. No. 19,516

Int. Cl.^{5} H01L *27/14*

U.S. Cl. 257—222 **18 Claims**

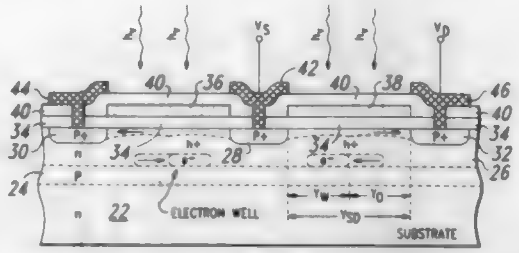
1. A bulk charge modulated MOSFET for sensing light comprising:

a semiconductor layer of a first conductivity type;

a transistor channel of a second conductivity type formed in the semiconductor layer, the transistor channel including a potential well for carriers of the first conductivity type, the well formed at a substantial depth from the surface of the transistor, the carriers formed responsive to incident light, collecting in the potential well;

a source region of the second conductivity type formed in the semiconductor layer laterally adjacent the transistor channel, the source region operable to sense a change in threshold voltage of the MOSFET channel responsive to the collection of carriers by the potential well;

a drain region of the second conductivity type formed in the semiconductor layer adjacent the transistor channel and spaced from the source region, the drain region is connected to a voltage source, the voltage source is pulsed to create a wide potential well that extends across the transistor channel from the source region to the drain region during a charge integration period and a narrow potential well during a readout period.



5,317,175
CMOS DEVICE WITH PERPENDICULAR CHANNEL CURRENT DIRECTIONS

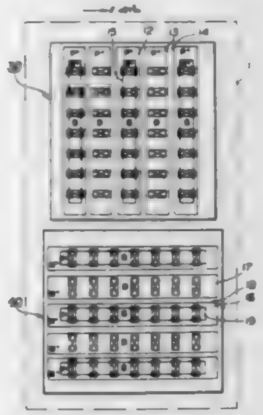
Kraisorn Throngnumchai, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 29, 1992, Ser. No. 827,319

Claims priority, application Japan, Feb. 8, 1991, 3-017916

Int. Cl.^{5} H01L *27/02, 27/10*

U.S. Cl. 257—255 **15 Claims**



1. A semiconductor device comprising:

a first pair of source and drain regions which form a P channel MOSFET, and which are formed in a (011) oriented semiconductor substrate comprising a first surface of a (011) crystal plane; and

a second pair of source and drain regions which form an N channel MOSFET and which are formed in said (011) oriented semiconductor substrate;

wherein said source and drain regions of said P channel and N channel MOSFETs are arranged so that a first direction of a main current component flowing in said P channel MOSFET is substantially perpendicular to a second direction of a main current component flowing in said N channel MOSFET;

wherein at least one of said source regions and said drain regions of at least one of said P channel and N channel MOSFETs comprises first and second portions which are separated from each other, and which are different in lateral geometry from each other.

5,317,176
POWER TRANSISTOR HAVING MULTIFINGER CONTACTS

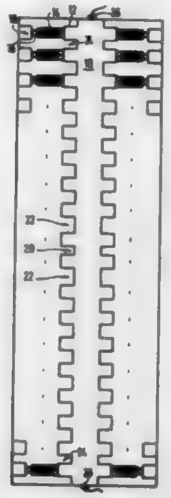
Ulrich Schaper, and Birgit Holzapfl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 3, 1993, Ser. No. 25,667

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1992, 4207909

Int. Cl.^{5} H01L *27/02, 23/48*

U.S. Cl. 257—287 **17 Claims**



1. A power transistor comprising: a plurality of monolithically integrated, contacted individual transistors arranged in a single plane; the transistors having finger-shaped contacts, said finger-shaped contacts being arranged along a stripshaped contact surface to which a power feed is provided at only a first end of the strip-shaped contact surface; and spacings of successive contacts from said first end of said contact surface decreasing strictly monotonously to a second end of the contact surface.

5,317,177
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

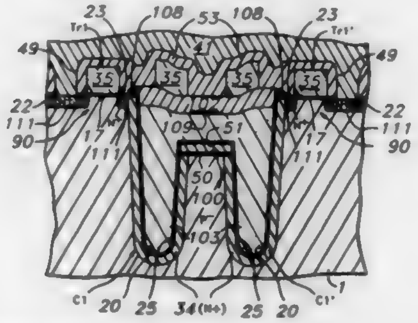
Toshiyuki Nagata, Tsukuba; Hiroyuki Yoshida, Ryugasaki; Takayuki Niuya, Tsukuba; Yoshihiro Ogata; Katsushi Boku, both of Tsuchiura, and Yoichi Miyai, Toride, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 27, 1992, Ser. No. 889,323

Claims priority, application Japan, Jun. 7, 1991, 3-163912

Int. Cl.^{5} H01L *29/68, 29/78, 29/92*

U.S. Cl. 257—301 **20 Claims**



1. A semiconductor device comprising:

a first depression, which is formed within the surface of a semiconductor substrate;

a second depression, which is formed to be linked with the first depression and to be deeper than the first depression;

a conductor, which is buried in the first and second depressions;

and an insulating film, which is formed on top of the conductor thereby creating an interface;

wherein the interface between the insulating film and the conductor is formed inside the first depression.

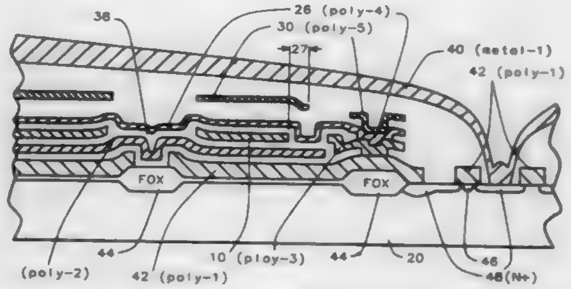
5,317,178
OFFSET DUAL GATE THIN FILM FIELD EFFECT TRANSISTOR

Neng-Wei Wu, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Division of Ser. No. 884,773, May 18, 1992, Pat. No. 5,266,507. This application Jul. 22, 1993, Ser. No. 94,978

Int. Cl.^{5} H01L *29/76, 29/788, 29/04*

U.S. Cl. 257—314 **8 Claims**



1. An offset dual gate thin film field effect transistor comprising:

an insulating substrate;

a narrow stripe of conductive material on said substrate to serve as a lower gate electrode;

a first thin gate dielectric layer over said lower gate electrode;

a layer of polycrystalline silicon over said lower gate electrode and extending beyond the edges thereof;

a second gate dielectric layer over said layer of polycrystalline silicon;

a upper offset gate electrode located over said lower gate electrode with a portion thereof providing an offset in the range of 0.2 to 0.6 micrometers extending beyond one edge of said lower gate electrode;

source and drain regions in said layer of polycrystalline silicon layer located beyond opposite edges of said upper offset gate electrode.

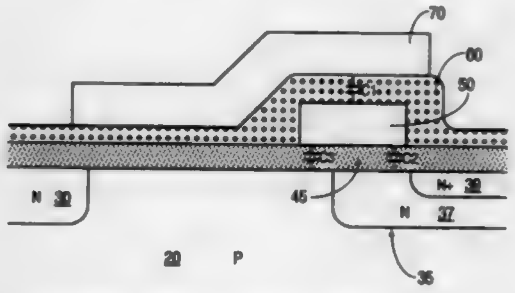
5,317,179
NON-VOLATILE SEMICONDUCTOR MEMORY CELL

Ling Chen, Sunnyvale; Tien-ler Lin, Cupertino, and Albert Wu, San Jose, all of Calif., assignors to Integrated Silicon Solution, Inc., Sunnyvale, Calif.

Filed Sep. 23, 1991, Ser. No. 764,019

Int. Cl.^{5} H01L *29/68, 29/78, 29/34*

U.S. Cl. 257—321 **9 Claims**



1. A nonvolatile memory cell comprising:

a substrate;

a doped region disposed in a first portion of said substrate;

- a charge storing body having a first end adjacent said doped region and a second end disposed adjacent a second portion of said substrate;
- a first dielectric layer having a first region disposed between said doped region and said charge storing body and having a second region disposed between said second portion of said substrate and said charge storing body;
- a conductive body disposed adjacent said charge storing body; and
- a second dielectric layer disposed between said conductive body and said charge storing body;

wherein said second dielectric layer exhibits a smaller dielectric permittivity than said first dielectric layer.

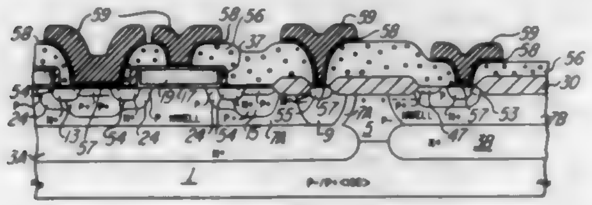
5,317,180
VERTICAL DMOS TRANSISTOR BUILT IN AN N-WELL MOS-BASED BICMOS PROCESS

Louis N. Hutter, Richardson, and John P. Erdeljac, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 755,406, Sep. 5, 1991, abandoned, which is a division of Ser. No. 592,108, Oct. 3, 1990, Pat. No. 5,171,699. This application Apr. 28, 1992, Ser. No. 876,689

Int. Cl.^{5} H01L *29/10, 29/78, 27/02*

U.S. Cl. 257—337 **17 Claims**



1. An integrated circuit having plural active components including a DMOS transistor and a bipolar transistor, comprising:
- (a) a first P-type layer;
- (b) plural spaced apart N+ regions at a common surface of said first P-type layer, each said N+ region corresponding with one of said plural active components; and
- (c) plural spaced apart N-well regions, each of said N-well regions being contiguous to one of said N+ regions, each of said N-well regions containing the current path of one of said active components;
- (d) wherein said N-well has a surface and wherein said DMOS transistor includes an N-type source and drain and a P-type backgate region in said N-well having a backgate opening with an edge at the surface of said N-well and a gate insulatingly spaced from said N-well defining said edge of said backgate opening at the surface of said N-well, said gate having a sidewall oxide defining an edge of an opening for said source at the surface of said N-well.

5,317,181
ALTERNATIVE BODY CONTACT FOR FULLY-DEPLETED SILICON-ON-INSULATOR TRANSISTORS

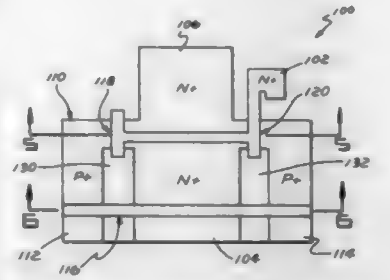
Scott M. Tyson, Colorado Springs, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1992, Ser. No. 942,996

Int. Cl.^{5} H01L *27/01*

U.S. Cl. 257—347 **15 Claims**

1. A transistor formed on an island of silicon over an insulator film over a silicon substrate comprising:
- a. a channel region in the silicon island;
- b. a source region comprising a mesa formed in the silicon island;
- c. a drain region formed in the silicon island and being spaced from the source region and defining the channel region therebetween;
- d. a gate extending over the channel region for controlling surface potential in the channel region;
- e. an insulator region lying between the gate and the channel and separating the gate from the channel region;
- f. at least one body tie region disposed adjacent to and in abutting relation with the channel region and disposed along a predetermined length of the source and being separated from the source by an aperture; and



- g. a layer of metal routing overlying the body tie region and the mesa of the source region for electrically connecting the two regions, wherein electrical connection between the channel region and the body tie region is severed when the channel region achieves full depletion.

5,317,182
TERMINATION OF THE POWER STAGE OF A MONOLITHIC SEMICONDUCTOR DEVICE

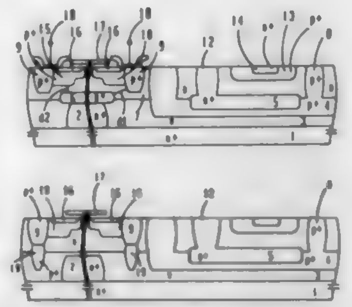
Raffaele Zambrano, La Punta CT, and Antonio Grimaldi, Scicli RG, both of Italy, assignors to Consorzio Per la Ricerca Sulla Microelectronica, Catania, Italy

Filed May 29, 1991, Ser. No. 706,751

Claims priority, application Italy, May 31, 1990, 6610A/90

Int. Cl.^{5} H01L *29/70, 29/78*

U.S. Cl. 257—378 **32 Claims**



1. An integrated circuit device comprising:

at least one monolithic body of semiconductor material, including a heavily doped N-type substrate and one or more epitaxial layers thereon, an outermost one of said epitaxial layers extending to a first surface of said monolithic body;

a power stage and an integrated control circuit, said power stage containing one or more vertical-current-flow MOS transistors;

said power stage including at least:
- a first patterned diffusion, which is P-type and in proximity to said first surface of said monolithic body;
- a second patterned diffusion, which is P-type, and in proximity to said first surface, and extends deeper into said monolithic body than said first diffusion does;
- a third patterned diffusion, which is heavily doped, and N-type, and extends from said substrate toward said first surface of said monolithic body;

wherein each said vertical-current-flow MOS transistor comprises
- a respective portion of said first diffusion, which is laterally shaped to define a body portion of said transistor; and
- a source terminal surrounded by said body portion; and
- an n-type drift region to which said body portion forms a p/n junction; and
- an insulated gate which is capacitively coupled to at least a portion of said body portion; and
- a respective portion of said third diffusion, which is laterally shaped to provide a drain portion of said transistor, said drain portion being separated from said body portion by said n-type drift region;

and wherein at least one said vertical-current-flow MOS transistor further comprises a respective portion of said second diffusion adjoining said body portion thereof;

and wherein the minimum separation between said second and third diffusions, in any one said MOS transistor, is greater than the minimum separation between said first and third diffusions.

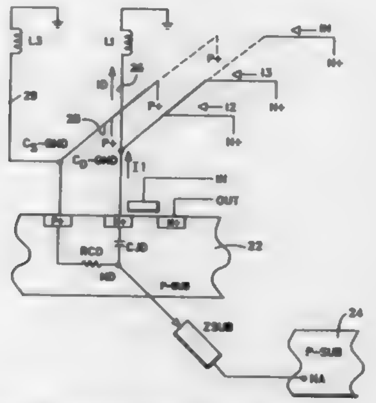
5,317,183
SUBSTRATE NOISE COUPLING REDUCTION FOR VLSI APPLICATIONS WITH MIXED ANALOG AND DIGITAL CIRCUITRY

Charles R. Hoffman, Raleigh, and John M. Mullen, Wake Forest, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 3, 1991, Ser. No. 754,478

Int. Cl.^{5} H01C *29/76, 29/94, 29/00;* **G06F** *7/38*

U.S. Cl. 257—369 **9 Claims**



1. An improved VLSI chip comprising:

a substrate;

a plurality of interconnected digital devices which generate digital functions fabricated on said substrate;

circuit means for generating analog functions fabricated on said substrate;

at least one device contact are for coupling to at least one digital device fabricated in said substrate;

a device ground pin (C_D-GND) coupled to the chip;

a first conductive means for forming a device ground return path interconnecting the device ground pin (C_D-GND) and the at least one device contact area;

a substrate contact region fabricated on the substrate;

a substrate ground pin (C_S-GND) coupled to the chip; and

a second conductive means for forming a substrate ground return path interconnecting the substrate ground pin (C_S-GND) and the substrate contact region.

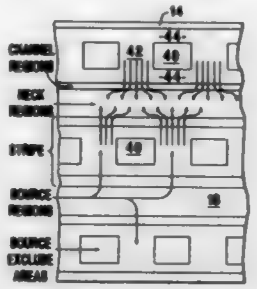
5,317,184
DEVICE AND METHOD FOR IMPROVING CURRENT CARRYING CAPABILITY IN A SEMICONDUCTOR DEVICE

Christopher L. Rexer, Mountaintop, Pa., assignor to Harris Corporation, Melbourne, Fla.

Filed Nov. 9, 1992, Ser. No. 973,709

Int. Cl.^{5} H01L *27/01, 21/44*

U.S. Cl. 257—401 **22 Claims**



1. A semiconductor device comprising:

a wafer of a first conductivity type with a plurality of elongated well regions of a second conductivity type therein spaced apart by neck regions of said first conductivity type,

each of said well regions having an elongated source region of said first conductivity type along the length thereof, said source region excluding a plurality of uniformly sized, centrally located source exclude areas spaced longitudinally along the length thereof,

said source exclude areas of adjacent ones of said well regions being offset longitudinally with respect to each other to thereby increase the uniformity of current density in said neck regions.

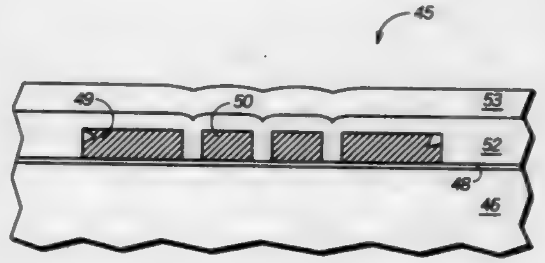
5,317,185
SEMICONDUCTOR DEVICE HAVING STRUCTURES TO REDUCE STRESS NOTCHING EFFECTS IN CONDUCTIVE LINES AND METHOD FOR MAKING THE SAME

Mark G. Fernandes, and Hisao Kawasaki, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 609,681, Nov. 6, 1990, abandoned. This application Feb. 18, 1992, Ser. No. 836,169

Int. Cl.^{5} H01L *21/88*

U.S. Cl. 257—629 **8 Claims**



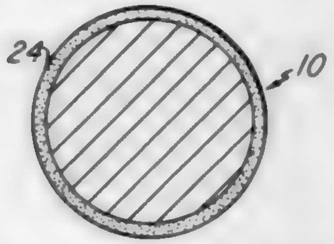
1. A semiconductor device having structures to reduce stress notching effects in conductive lines comprising:

a semiconductor die having a plurality of active conductive lines thereon which are each used to transmit signals, are substantially parallel in at least a portion of the semiconductor die, are substantially equidistant from one another being separated by a first distance, and are substantially in a common plane of the semiconductor die, the plurality of active conductive lines having a first and a second outermost active conductive line, and wherein each of the first and the second outermost active conductive lines are substantially wider than the remaining active conductive lines.

5,317,186
RING CRYSTALLIZATION OF WAFERS TO PREVENT THERMAL SHOCK

Kendall S. Wills, Houston; Paul A. Rodriguez, Lewisville, and Melvin L. Brewer, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 636,314, Dec. 31, 1990, Pat. No. 5,149,675.
This application Jun. 15, 1992, Ser. No. 898,268
Int. Cl.⁵ H01L *29/34, 29/04*
U.S. Cl. 257—629 **18 Claims**



1. A semiconductor wafer resistant to thermal shock, comprising:

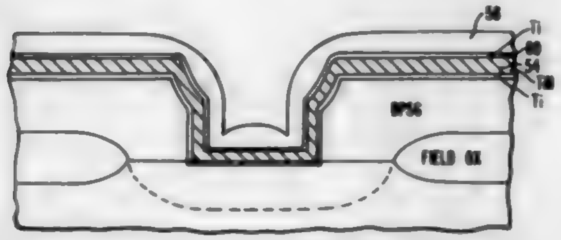
a non-polycrystalline wafer; and

a ring, loop or closed figure of polycrystalline material formed around an edge of said wafer.

5,317,187
TI/TIN/TI CONTACT METALLIZATION

Gregory Hindman; Jack Berg, and Peter N. Manos, II, all of Boise, Id., assignors to Zilog, Inc., Campbell, Calif.

Division of Ser. No. 878,626, May 5, 1992, Pat. No. 5,240,880.
This application Feb. 16, 1993, Ser. No. 17,838
Int. Cl.⁵ H01L *49/00, 23/48, 29/46, 29/54*
U.S. Cl. 257—659 **3 Claims**



1. A semiconductor circuit including a metallic contact to a doped silicon region comprising:

a silicon substrate with doped regions;

an interlevel dielectric layer defining therein a contact hole over one of said doped regions, the interlevel dielectric layer being on top of and contacting the silicon substrate;

a silicide layer on the doped region of the silicon substrate in the contact hole wherein said interlevel dielectric layer is not on top of the silicide layer;

a titanium nitride layer over said silicide layer;

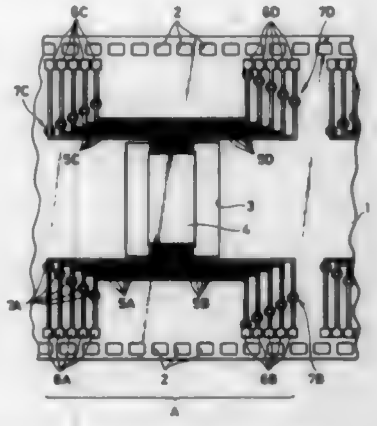
a titanium layer on top and of contacting the titanium nitride layer; and

a metal layer including aluminum on top and contacting said titanium layer where said metal layer is in electrical contact with the one of said doped regions.

5,317,188
MEANS FOR AND METHODS OF TESTING AUTOMATED TAPE BONDED SEMICONDUCTOR DEVICES

Kenji Kondou, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 27, 1992, Ser. No. 874,628
Claims priority, application Japan, Apr. 30, 1990, 3-128570
Int. Cl.⁵ H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 257—668 **14 Claims**



1. A semiconductor device, comprising:

an elongated carrier tape having device-holes arranged at predetermined intervals along the length of said carrier tape;

sets of first wiring lines formed on a first surface of said carrier tape, each set of said first wiring lines being individually associated with a corresponding one of said device-holes;

a plurality of semiconductor chips, each of said chips being retained in an individually associated one of said device-holes, said semiconductor chips being electrically connected to said respective sets of said first wiring lines; and

second wiring lines formed on a second surface of said carrier tape with said second wiring lines extending along said length of said carrier tape, said second surface being opposite to said first surface, and a number of said second wiring lines being at least the same as or larger than a number of said first wiring lines belonging to each set of said first wiring lines; and

means for connecting each of said first wiring lines belonging to each set of said first wiring lines to be electrically connected to each of said second wiring lines via a connecting means so that an electrical testing signal can be simultaneously applied to all of said semiconductor chips.

5,317,189
AXIAL LEAD FRAME

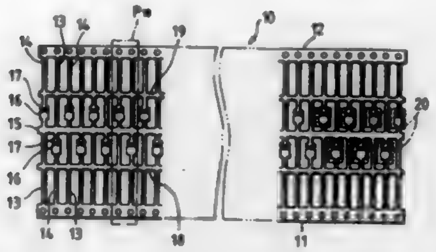
Kazuyoshi Tsuji, and Eiji Shimazaki, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Mar. 9, 1993, Ser. No. 27,371
Claims priority, application Japan, Jun. 29, 1992, 4-196316
Int. Cl.⁵ H01L *23/48, 29/40, 23/02, 23/12*
U.S. Cl. 257—694 **3 Claims**

1. An axial lead frame for producing an electronic component having two poles located opposite to each other, comprising;

two side rails arranged opposite to each other;

plural pairs of lead terminals, each pair extending in aligned relation from the opposite side rails, respectively, the lead terminals of each aligned pair consisting of a longer lead terminal having a longer length and a shorter lead terminal having a shorter length with the locations of the longer and shorter lead terminals being reversed in adjacent pairs and the pairs being arranged to extend in parallel with each other with equally spaced relationship in the direction of the side rails and located in a space defined between said side rails; and

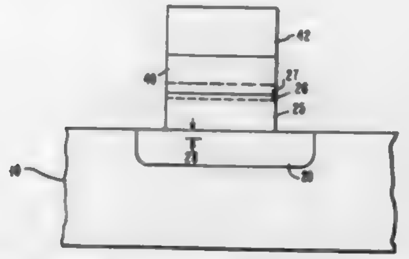


a buffer member formed at a substantially central location between said side rails so as to allow each of said longer lead terminals to be joined to each other along said buffer member.

5,317,190
OXYGEN ASSISTED OHMIC CONTACT FORMATION TO N-TYPE GALLIUM ARSENIDE

Aaron J. Fleischman, Teaneck, N.J.; Naftali E. Lustig, Croton-on-Hudson, and Robert G. Schad, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1991, Ser. No. 782,683
Int. Cl.⁵ H01L *29/400*
U.S. Cl. 257—743 **10 Claims**



6. A contact to gallium arsenide comprising:

a first layer consisting essentially of a gallium oxide compound;

a second layer consisting essentially of a metal element and oxygen;

a third layer comprising nickel, germanium, and gold;

said first layer interposed between said second and third layers; and

said third layer contacting said gallium arsenide.

5,317,191
LOW-MELTING-POINT JUNCTION MATERIAL HAVING HIGH-MELTING-POINT PARTICLES UNIFORMLY DISPERSED THEREIN

Shunichi Abe, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

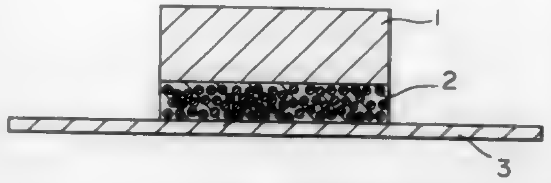
Filed Aug. 14, 1992, Ser. No. 929,443
Claims priority, application Japan, Aug. 19, 1991, 3-206776
Int. Cl.⁵ H01L *23/48, 29/46, 29/62, 29/64*
U.S. Cl. 257—746 **3 Claims**

1. A semiconductor device comprising

a semiconductor element;

a support member; and

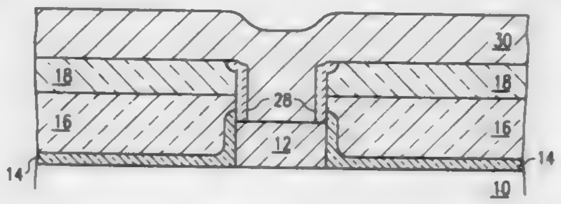
a junction material disposed between said semiconductor element and said support member for attaching said semiconductor element to said support member wherein said junction material includes a parent phase of Pb-60Sn having a relatively low melting point and fine particles of Pb having a relatively high melting point uniformly dispersed in the parent phase.



5,317,192
SEMICONDUCTOR CONTACT VIA STRUCTURE HAVING AMORPHOUS SILICON SIDE WALLS

Fusen E. Chen; Girish A. Dixit, both of Dallas, and Che-Chia Wei, Plano County, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed May 6, 1992, Ser. No. 879,190
Int. Cl.⁵ H01L *29/400*
U.S. Cl. 257—750 **8 Claims**



1. A contact structure for an integrated circuit, comprising:

an underlying conductive structure;

a first conformal oxide layer overlying the underlying conductive structure, such first conformal oxide layer being undoped or lightly doped;

a planarizing oxide layer overlying the first conformal oxide layer, such planarizing oxide layer having a large amount of impurities;

a second conformal oxide layer, such second conformal oxide layer being undoped;

an opening through the second conformal oxide layer, the planarizing oxide layer, and the first conformal oxide layer to expose a portion of the underlying conductive structure;

thin sidewalls of amorphous silicon alongside sides of the opening, separating the opening from the first and second conformal oxide layers and the planarizing oxide layer; and

a conductive interconnect layer lying on the second conformal oxide layer and extending into the opening, and separated from the planarizing oxide layer and the first and second conformal oxide layers in the opening by the thin amorphous silicon sidewalls.

5,317,193
CONTACT VIA FOR SEMICONDUCTOR DEVICE

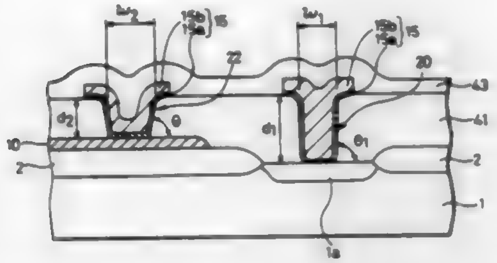
Shinya Watanabe, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1993, Ser. No. 29,509
Claims priority, application Japan, May 7, 1992, 4-114945
Int. Cl.⁵ H01L *23/48, 29/40*
U.S. Cl. 257—774 **9 Claims**

1. A semiconductor device comprising:

an interlayer insulating film formed between conductive layers,

a first contact hole formed penetrating said interlayer insulating film for electrically connecting the conductive layers, and a second contact hole of a depth greater than that of said first contact hole, formed penetrating said interlayer insulating film for electrically connecting the conductive layers,



wherein said second contact hole is formed to have a diameter smaller than that of said first contact hole and an inclining angle of an inner circumferential wall of said first contact hole is greater than that of said second contact hole.

5,317,194

RESIN-SEALED SEMICONDUCTOR DEVICE HAVING INTERMEDIATE SILICON THERMAL DISSIPATION MEANS AND EMBEDDED HEAT SINK

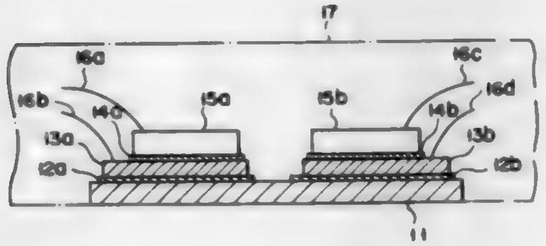
Shigeki Sako, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 688,619, Jun. 14, 1991, abandoned. This application Feb. 25, 1993, Ser. No. 23,862

Claims priority, application Japan, Oct. 17, 1989, 1-269663

Int. Cl.^{5} H01L *23/02, 25/04, 23/28, 23/12*

U.S. Cl. 257—777 **15 Claims**



1. A semiconductor device comprising:

a heat sink;

a plurality of heat-radiating silicon chips arranged on said heat sink; and

a plurality of semiconductor elements arranged on the heat-radiating silicon chips, respectively;

the heat-radiating silicon chips each including a silicon layer having a surface, an electrically insulating layer, and an electrically conductive layer, the electrically insulating layer being formed on the surface of the silicon layer, and the electrically conductive layer being formed on the electrically insulating layer.

5,317,195

SEMICONDUCTOR DEVICE IMPROVED IN LIGHT SHIELDING PROPERTY AND LIGHT SHIELDING PACKAGE

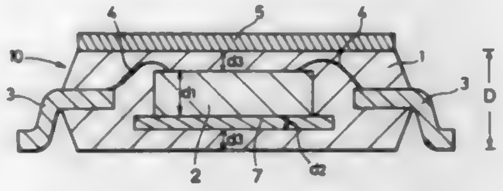
Masahiko Ishikawa; Kohji Hayano; Shinichi Mori; Masayuki Yamashita; Osamu Ueda, and Namiki Moriga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1991, Ser. No. 792,872

Claims priority, application Japan, Nov. 28, 1990, 2-127935[U]; Nov. 28, 1990, 2-335398; Oct. 31, 1991, 3-286350

Int. Cl.^{5} H01L *23/28*

U.S. Cl. 257—787 **19 Claims**



1. A semiconductor device comprising:

a semiconductor chip; and

a resin mold having a light shielding property in which said semiconductor chip is housed, said resin mold having a light shielding seal bonded onto a surface thereof, said seal having an outerlayer of metal for reflecting light, and an inner layer which is colored black for absorbing light, wherein said resin mold is made essentially of an epoxy resin containing carbon black and a filler.

5,317,196

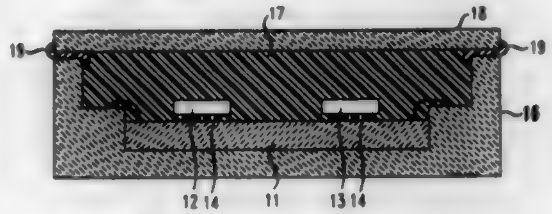
ENCAPSULANT METHOD AND APPARATUS

Ching-Ping Wong, Lawrenceville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 28, 1992, Ser. No. 936,445

Int. Cl.^{5} H01L *23/28*

U.S. Cl. 257—791 **7 Claims**



1. An article of manufacture comprising:

an electronic device;

said electronic device being substantially enclosed by a fluid encapsulant;

means comprising a container for containing the fluid encapsulant;

said fluid encapsulant consisting essentially of a silicone resin and a catalyst selected from the group consisting of platinum and tin;

the silicone resin selected from the group consisting of polydimethylsiloxane, polymethylphenylsiloxane, polydimethyldiphenylsiloxane, and mixtures thereof;

said silicone resin comprising molecules terminated in vinyl components and hydride components, the ratio of the vinyl components to the hydride components being in the range of 5:1 to 20:1.

5,317,197

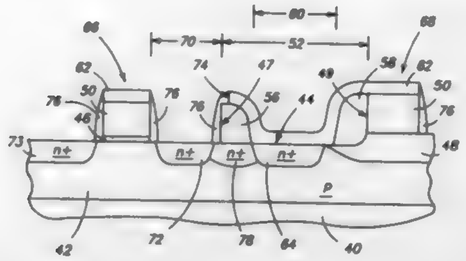
SEMICONDUCTOR DEVICE

Martin C. Roberts, Boise, Id., assignor to Micron Semiconductor, Inc., Boise, Id.

Division of Ser. No. 963,836, Oct. 20, 1992, Pat. No. 5,232,863. This application Apr. 29, 1993, Ser. No. 54,901

Int. Cl.^{5} H01L *27/02, 23/48*

U.S. Cl. 257—401 **7 Claims**



1. A product produced by the process of:

providing a gate insulative layer on a semiconductor wafer substrate;

providing a first layer of a first material over the gate insulative layer, the first material being electrically conductive or capable of being rendered electrically conductive;

etching the first layer and gate layer to expose a contact area;

providing a second layer of second material over the contact area and first layer, the second material being selectively etchable relative to the first material and the substrate;

etching the second layer selectively relative to the first material and the substrate to provide a pair of buried contact spacers over respective opposing edges of the first layer in the contact area, and to reexpose a portion of the contact area and the first layer;

providing a third layer of a third material over the first layer, the buried contact spacers and the exposed portion of the contact area, the third material being electrically conductive or capable of being rendered electrically conductive;

etching the first and third layers to define a transistor gate of one device and a transistor gate of another device, and to interconnect the transistor gate of the another device to the portion of the contact area with the third layer material, and to define an exposed region adjacent both the one gate and one of the buried contact spacers;

providing insulative spacers about edges of the transistor gates;

providing a conductivity enhancing impurity implant into the substrate through the exposed region;

rendering the portion of the contact area within the substrate electrically conductive; and

rendering substrate beneath the one buried contact spacer electrically conductive to electrically interconnect the portion of the contact area within the substrate to the conductivity enhancing impurity implanted region of the substrate.

5,317,198

OPTICALLY CONTROLLED REMOTE BY-PASS SWITCH

Charles R. Husbands, Acton, Mass., assignor to The MITRE Corporation, Bedford, Mass.

Continuation of Ser. No. 543,465, Jun. 26, 1990, abandoned. This application Sep. 30, 1992, Ser. No. 954,432

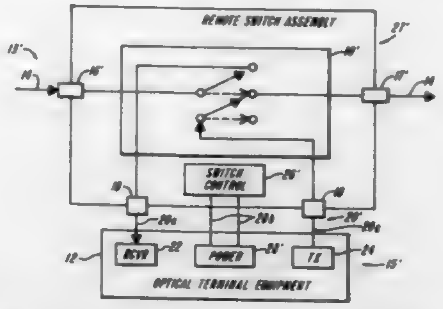
Int. Cl.^{5} H04B *10/08;* **H04J** *14/00;* **G02F** *1/00*

U.S. Cl. 307—116 **14 Claims**

1. A bypass switch that increases the survivability and performance of a local area optical communications network having a ring carrying periodic optical signals, a plurality of nodes optically coupled into the ring through the bypass switch, each node connecting the ring via the bypass switch and a stub cable to a terminal having an optical receiver and an optical transmitter that regenerates the received signals, the stub cable alone optically connecting the ring and the terminals through the bypass switch, comprising

means associated with each node for passively monitoring and detecting the average optical power output from the associated one of said terminals and generating a first control signal if there is a diminution of said optical power output as compared to a threshold value,

logic means responsive to said first control signal that generates a second control signal,



a plurality of optical switches each optically coupled to said ring and to the associated terminal through the associated stub cable, said switches each being bistable and latching between bypass and non-bypass states, and

means for generating a signal to switch the state of said optical switch in response to said second control signal,

said passive monitoring means, logic means, optical switch and switch signal generating means being located remotely from the associated terminal at a node of the ring, and said stub cable being purely dielectric.

5,317,199

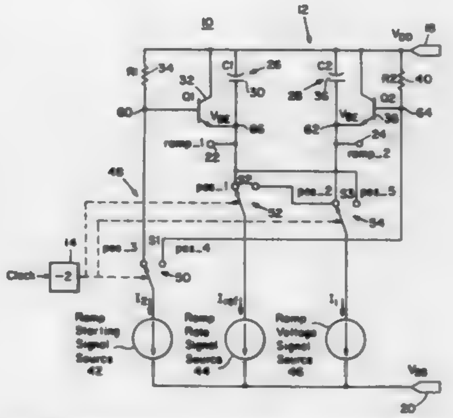
RAMP GENERATOR SYSTEM

Edward P. Jordan, Greensboro, N.C., assignor to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 877,082, May 1, 1992, abandoned. This application Mar. 25, 1993, Ser. No. 37,701

Int. Cl.^{5} H03K *4/08, 5/12, 4/10*

U.S. Cl. 307—228 **14 Claims**



1. An improved ramp generator system, comprising:

a plurality of ramp generator circuits for producing a series of identical ramps;

a ramp rate signal source for controlling the ramp slope;

a ramp voltage signal source for establishing a starting voltage of the ramp;

a ramp starting signal source for starting the ramp;

means for defining a plurality of ramp periods; and

switching means, responsive to said means for defining, for alternately, sequentially connecting said ramp rate signal source and said ramp starting signal source to one of said ramp generator circuits, and said ramp voltage signal source to another of said ramp generator circuits for producing said series of identical ramps.

5,317,200
PHASE SHIFT CIRCUIT APPARATUS

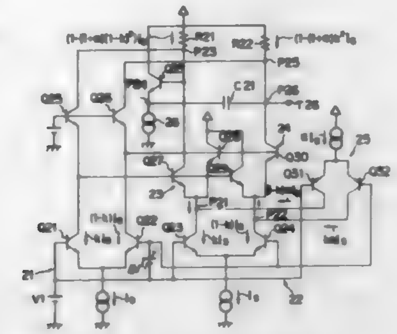
Seiichi Nishiyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 28, 1992, Ser. No. 952,656

Claims priority, application Japan, Sep. 30, 1991, 3-278787; Sep. 30, 1991, 3-278788

Int. Cl.^{5} H03K *5/00;* **H03L** *7/00, 7/06*

U.S. Cl. 307—262 **5 Claims**



1. A Phase shift circuit apparatus comprising:

first differential amplification means including first and second transistors having common emitters for receiving an input signal;

second differential amplification means including third and fourth transistors having common emitters for receiving the input signal;

third differential amplification means including fifth and sixth transistors having common emitters connected to a collector of the third transistor of the second differential amplification means;

fourth differential amplification means including seventh and eighth transistors having common emitters connected to a collector of the fourth transistor of the second differential amplification means;

a first load resistance connected to the fifth transistor;

a second load resistor connected to the eighth transistor, the first and second load resistances being connected to a reference voltage source;

fifth differential amplification means including ninth and tenth transistors having common emitters to be draw a current at predetermined times as large as the input signal, the ninth and tenth transistors having collectors connected to respective connection nodes between the third differential amplification means and the third transistor and between the fourth differential amplification means and the fourth transistor for producing a negative signal voltage;

an eleventh transistor cascode connected to-a collector of the first transistor, and connected to a third connection node between the first load resistance and the fifth transistor;

a twelfth transistor cascode connected to a collector of the second transistor, and connected to a fourth connection node between the second load resistance and the eighth transistor;

a buffer transistor having a base connected to a fifth connection node between the third connection node and the fifth transistor, the buffer transistor having an emitter connected to a current source; and

a phase element having one terminal connected to a sixth connection node between the buffer transistor and the current source, the other terminal thereof connected to a seventh connection node between the sixth connection node and the eighth transistor; and wherein:

the first, the third and the ninth transistors are driven by a predetermined bias voltage;

the second, the fourth and the tenth transistors are driven by a variable bias voltage;

the fifth and the seventh transistors are driven by a voltage at a connection node between the first and the eleventh transistors;

the sixth and the eighth transistors are driven by a voltage at a connection node between the second and the twelfth transistors; and

the input signal provided to the first and the second differential amplification means is outputted from the seventh connection node with its phase shifted.

5,317,201
LOGICAL CIRCUIT FOR DETECTING A POTENTIAL

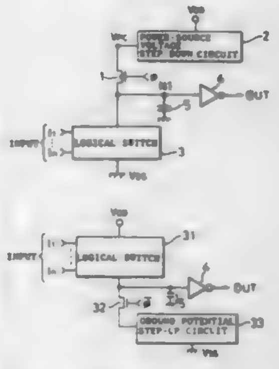
Toshinari Takayanagi, Iwakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 24, 1992, Ser. No. 873,112

Claims priority, application Japan, Apr. 26, 1991, 3-097552

Int. Cl.^{5} H03K *3/01*

U.S. Cl. 307—296.1 **14 Claims**


Vdd
POWER SOURCE VOLTAGE STEP DOWN CIRCUIT
2
1
OUT
INPUT
LOGICAL SWITCH
3
Vss
31
32
GROUND POTENTIAL STEP-UP CIRCUIT
33

1. A logic circuit for detecting a potential change at a potential detecting point, the logic circuit comprising:

output means, connected between a first power source potential and a second power source potential lower than said first power source potential, for comparing a potential at said potential detecting point and a potential at a switching point thereof with each other to judge fluctuations of the potential at said potential detecting point;

voltage supply means for supplying a third potential between the potential at said switching point of said output means and said first power source potential, from an output end thereof;

a first FET (field effect transistor) of a first conductivity type for controlling an electrical conductivity between the output end of said voltage supply means and said potential detecting point; and

switch means for controlling an electrical conductivity between said potential detecting point and said second power source potential in accordance with an input signal.

5,317,202
DELAY LINE LOOP FOR 1X ON-CHIP CLOCK GENERATION WITH ZERO SKEW AND 50% DUTY CYCLE

Alexander Waizman, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.

Filed May 28, 1992, Ser. No. 890,038

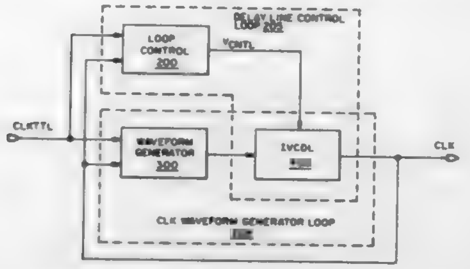
Int. Cl.^{5} H03K *5/13, 5/04*

U.S. Cl. 307—269 **7 Claims**

1. Synchronous clock generator for synchronizing a delayed and inverted synthesized 50% duty cycle clock signal with a reference clock signal, each clock signal having a first and second state transition during each clock period, comprising:

an inverting controllable delay line with a nominal delay of one half of a period of the reference clock having the synthesized clock signal at its input and a delayed inverted replica at its output;

a delay line control loop comprising a delay line controller coupled to the inverting controllable delay line for producing at the delay line output an inverted synthesized clock waveform with its first transition synchronous with a corresponding first transition of the reference clock signal, the delay of the delay line controlled by the delay line controller by comparing the reference clock first transition with the inverted synthesized clock signal at the output of the delay line; and



clock waveform generator comprising a clock waveform generator coupled to the inverting controllable delay line for synthesizing a 50% duty cycle clock waveform by using the inverting delay line to produce a half period delayed in an inverted replica of the reference clock first transition to synthesize the second transition of the synthesized waveform.

5,317,203
SAMPLE-AND-HOLD CIRCUIT

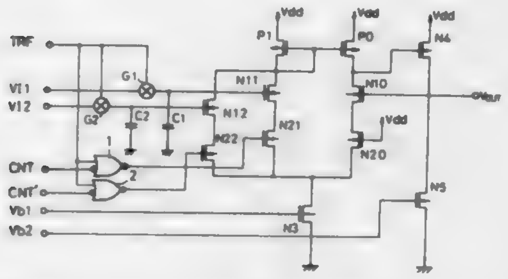
Junji Tanaka, Sakurai; Toshio Watanabe, Kita-Katsuragi, and Yukihisa Orisaka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1992, Ser. No. 872,160

Claims priority, application Japan, Apr. 25, 1991, 3-095604

Int. Cl.^{5} G11C *27/02*

U.S. Cl. 307—353 **11 Claims**



1. A sample-and-hold circuit, comprising:

a plurality of inputs for receiving input signals with instantaneous voltages;

a plurality of capacitors;

a plurality of analog switches connected respectively between the inputs for receiving input signals and the capacitors to charge the capacitors to the instantaneous voltages of input signals when the corresponding analog switches are conducting by a sampling signal;

an output circuit comprising a differential amplifier and a buffer amplifier connected in cascade;

the differential amplifier comprising a plurality of input circuit legs connected in parallel, each input circuit leg including an input transistor and a switching transistor connected in series;

an input of the input transistor in each input circuit leg being a non-inverting input of the differential amplifier;

a feedback connection provided between an inverting input of the differential amplifier and an output of the buffer amplifier constituting an output of the sample-and-hold circuit;

a plurality of inputs of the switching transistors respectively connected to a plurality of logic circuits to turn on the switching transistors in a systematic chosen sequence in the hold mode of the analog switches, wherein each of the logic circuits is supplied with an input switching signal and the sampling signal; and

the inputs of the input transistors connected to the capacitors to put the voltage across one of the capacitors to the output of the sample-and-hold circuit when the corresponding switching transistor is turned on.

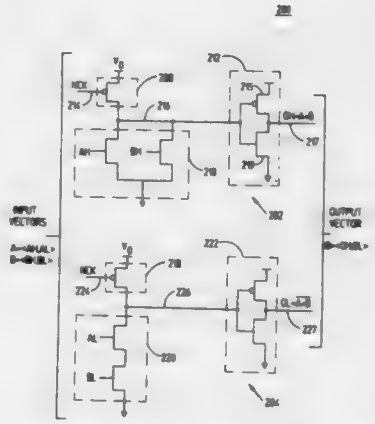
5,317,204
MITIGATING THE ADVERSE EFFECTS OF CHARGE SHARING IN DYNAMIC LOGIC CIRCUITS

Jeffry D. Yetter, Ft. Collins, and Robert H. Miller, Jr., Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 684,720, Apr. 12, 1991, Pat. No. 5,208,490. This application May 19, 1992, Ser. No. 885,797

Int. Cl.^{5} H03K *19/017*

U.S. Cl. 307—443 **34 Claims**



1. A system for mitigating the adverse effects of charge sharing in dynamic logic gates by manipulating the physical layout of transistors, the system comprising:

an inverting buffer means for providing a gate output;

an arming means for precharging the inverting buffer input of said inverting buffer means;

logic means for receiving a gate input and for discharging said inverting buffer input to ground, said logic means having a plurality of transistors connected in ladder-like manner and having at least three converging transistors which converge at a node, said converging transistors configured on a substrate with a common interstitial space so that a region of each transistor gate is adjacent a region of two of the other remaining transistor gates.

5,317,205
SEMICONDUCTOR INTEGRATED CIRCUIT AND ASSOCIATED TEST METHOD

Fumihiko Sato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 2, 1992, Ser. No. 892,196

Claims priority, application Japan, Jun. 26, 1991, 3-153660

Int. Cl.^{5} H03K *3/289*

U.S. Cl. 307—443 **4 Claims**

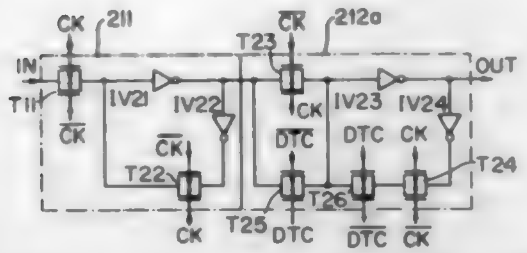
1. A semiconductor integrated circuit comprising:

a sequential circuit consisting of a plurality of flip-flops which latch and keep data supplied to an input terminal at a prescribed timing and which perform prescribed sequential treatments of the input data;

a combinational circuit which is implemented at the input terminals of said sequential circuit and which performs a prescribed combinational treatment or treatments of the input data to said sequential circuit;

data-through means operated by an external control signal designed to transfer the data supplied to the input terminal direct to an output terminal of a prescribed flip-flop of said plurality of flip-flops of said sequential circuit,

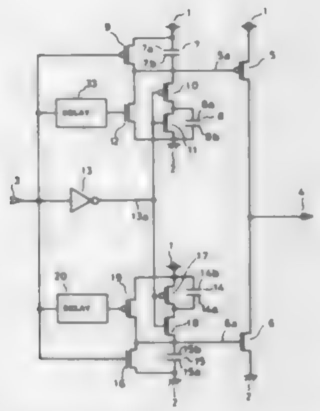
wherein said flip-flops comprise a first transfer gate designed to transfer and control on and off input data in accordance with a clock signal supplied thereto, a first inverter designed to reverse the polarity of the input data signal received as the output of the first transfer gate to be transferred to the output terminal, a second inverter designed to reverse the polarity of the input data signal received as the output of the first inverter, a second transfer gate designed to transfer and control the output data of said second inverter turned on and off by the clock signal of opposite polarity to said first transfer gate, and wherein data-through means comprises a third transfer gate connected in parallel to said first transfer gate and turned on and off by said external control signal, and a fourth transfer gate connected in series to said second transfer gate and turned on and off in opposite polarity of said third transfer gate by said external control signal.



5,317,206
BUFFER CIRCUIT USING CAPACITORS TO CONTROL THE SLOW RATE OF A DRIVER TRANSISTOR

Toshiaki Hanibuchi, and Masahiro Ueda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1992, Ser. No. 980,877
Claims priority, application Japan, May 14, 1992, 4-122020
Int. Cl.⁵ H03K *19/07, 5/12*
U.S. Cl. 307—443 13 Claims



1. A buffer circuit comprising:

a first potential source for supplying a potential of a first level,

a second potential source for supplying a potential of a second level,

an output element coupled to said first potential source and an output node, said output element having a control electrode and said output element being responsive to a signal applied to said control electrode for driving said output node to said first level,

a first capacitive element having one electrode coupled to said first potential source and the other electrode coupled to said control electrode,

a second capacitive element having one electrode and another electrode, said one electrode of said second capacitive element being coupled to said second potential source,

shorting means activated in response to a signal of said second level provided to an input node for shorting said one electrode and said other electrode of said first capacitive element and shorting said first electrode and said other electrode of said second capacitive elements,

connecting means activated in response to a signal of said first level provided to said input node for connecting said other electrode of said second capacitive element to said control electrode of said output element,

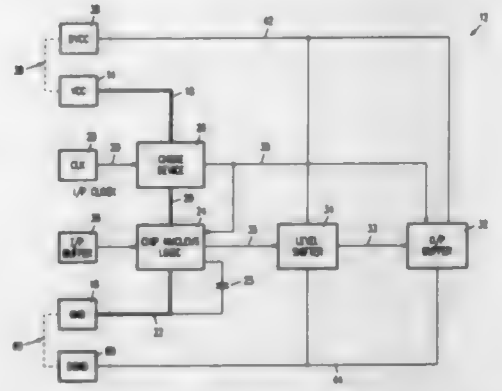
delay means for delaying a signal applied to said input node for a predetermined time, and

coupling means activated in response to a signal of said first level from said delay means for coupling said control electrode to said second potential source, said coupling means being activated after inactivation of said shorting means and activation of said connecting means.

5,317,207
INTEGRATED CIRCUIT HAVING REDUCED ELECTROMAGNETIC EMISSIONS AN INTEGRATED CIRCUIT INCLUDING A VARIABLE IMPEDANCE FOR REDUCED ELECTROMAGNETIC EMISSION

Gordon L. Mortensen, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 765,847, Sep. 26, 1991, abandoned. This application May 3, 1993, Ser. No. 56,807
Int. Cl.⁵ H03K *17/16*
U.S. Cl. 307—443 23 Claims



1. In an integrated circuit having a power supply coupled to said integrated circuit by a power and a ground buss for supplying voltage and current to the nucleus logic elements of the integrated circuit, a circuit for reducing electromagnetic emission from said integrated circuit comprising:

a choke circuit having a first input connected to said power supply by said voltage buss, and an output corresponding to a voltage supply buss connected to said nucleus logic and a control input wherein a supply current for the integrated circuit flows from said first input to said output;

a clock delay circuit for receiving an input clock signal, said clock signals having rising and falling transitions;

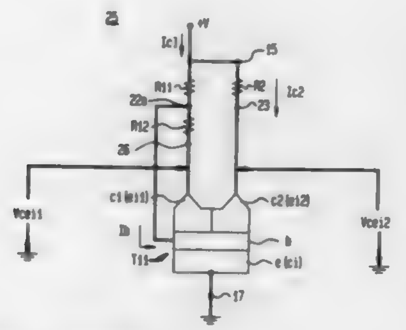
means for generating a first and a second control signal and for providing said control signals to the control terminal of said choke circuit, said first control signal adapted to increase the resistance between the input and output of the choke circuit in response to a transition of said clock signal and said second control signal adapted to decrease the resistance between the input and output of said choke circuit a period of time after the transition of said clock signal;

said clock delay circuit adapted for providing a delayed clock signal to the nucleus logic where said delay clock has a transition occurring after the first control signal and before the second control signal.

5,317,208
INTEGRATED CIRCUIT EMPLOYING INVERSE TRANSISTORS

Dennis C. Banker, Newburgh; Tore A. Carlson, Brewster; Jack A. Dorler, Holmes, all of N.Y.; Paul D. Hendricks, Whitehall, Pa.; Walter S. Klara, Hopewell Junction, N.Y.; Frank M. Masci, Wappingers Falls, N.Y., and James R. Struk, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1992, Ser. No. 881,595
Int. Cl.⁵ H03K *19/013*
U.S. Cl. 307—454 20 Claims



1. Circuitry comprising:

first and second separated and spaced apart semiconductor regions of one conductivity type formed within a third semiconductor region of a second conductivity type which is opposite the first conductivity type;

the third region being formed within a fourth semiconductor region of the one conductivity type;

the first and second regions being separated from the fourth region by the third region;

first means for coupling the first region to the third region;

second means for supplying a reference current to the first region so as to cause a positive current to flow into the first region and through the third region and into the fourth region; and

third means coupled to the second region for enabling positive current flow which is proportional to the reference current to flow through the second region into the third region and then into the fourth region.

5,317,209
DYNAMIC THREE-STATE BUSSING CAPABILITY IN A CONFIGURABLE LOGIC ARRAY

Tim Garverick, Cupertino, and Rafael C. Camarota, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 752,282, Aug. 29, 1991, abandoned. This application Feb. 5, 1993, Ser. No. 14,464
Int. Cl.⁵ H03K *19/177*
U.S. Cl. 307—465 1 Claim

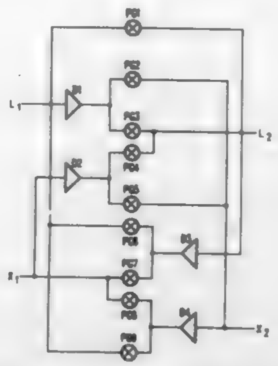
1. A configurable logic array comprising:

a plurality of individually configurable logic cells arranged in a matrix that includes a plurality of rows of configurable logic cells and a plurality of columns of configurable logic cells;

at least one row local bus running between adjacent rows of configurable logic cells, said configurable logic cells in said adjacent rows being selectively connectable thereto;

p1 at least one column local bus running between adjacent columns of configurable logic cells, said configurable logic cells in said adjacent columns being selectively connectable thereto;

configurable repeater means responsive to preselected repeater configuration signals for selectively connecting row local busses and column local busses to define a bussing network;

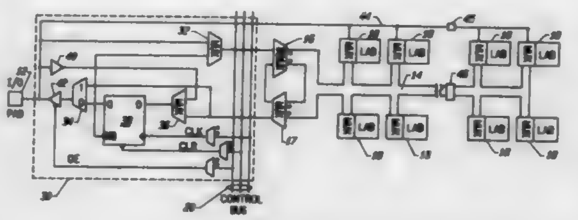


configuration means for providing the preselected repeater configuration signals and for also provided logic cell configuration signals to first and second configurable logic cells to selectively connect the first and second configurable logic cells to the bussing network such that the first configurable logic cell can write data to the bussing network to be read by the second configurable logic cell and, corresponding, the second configurable logic cell can write data to the bussing network to be read by the first configurable logic cell.

5,317,210
I/O CELL FOR PROGRAMMABLE LOGIC DEVICE PROVIDING LATCHED, UNLATCHED, AND FAST INPUTS

Rakesh H. Patel, Santa Clara, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Feb. 23, 1993, Ser. No. 21,414
Int. Cl.⁵ H03K *19/177*
U.S. Cl. 307—465 9 Claims



1. An input/output (I/O) cell for interconnecting an I/O pad with an array of logic blocks in a programmable logic device in both a clocked and unclocked mode comprising

a first multiplexing means having an input and a plurality of outputs, said first multiplexing means selectively connecting said input through one of said outputs to an array of logic array blocks through an internal bus of said PLD,

latch means driven by a clock and coupled to said I/O pad and to said first multiplexing means for providing a clocked output to said I/O pad and clocked inputs to said first multiplexing means, and

interconnecting means for directly connecting said I/O pad to at least one logic block without passing through said latch means and said first multiplexing means for fast input of selected signals from an external source with said external source directly driving said at least one of logic block.

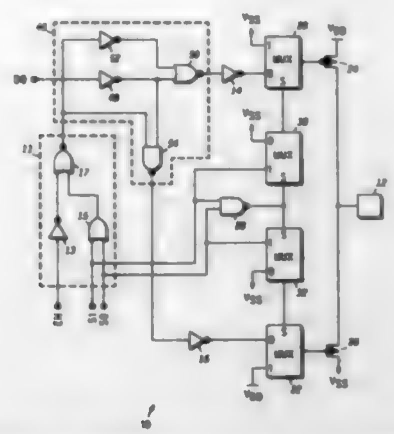
5,317,211
PROGRAMMABLE PIN FOR USE IN PROGRAMMABLE LOGIC DEVICES

Dandas K. Tang, Tempe, and Timothy W. Sutton, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 5, 1993, Ser. No. 26,665

Int. Cl.⁵ H03K *19/173*

U.S. Cl. 307—465 **14 Claims**



1. A circuit for programming an I/O site in a programmable logic device, comprising:

circuit means coupled to receive a driving signal, an enable signal and first and second control signals for providing first and second signals at first and second outputs;

first multiplexor means being responsive to a first select signal for alternately providing said first signal or a first voltage at an output thereof, said first multiplexor means having an input coupled to said first output of said circuit means;

second multiplexor means being responsive to a second select signal for alternately providing said second signal or a second voltage at an output thereof, said second multiplexor means having an input coupled to said second output of said circuit means;

an output transistor circuit being coupled between said first and second voltages and to the I/O site, said output transistor circuit having first and second inputs being respectively coupled to said outputs of said first and second multiplexor means; and

control means for providing said first and second select signals to said first and second multiplexor means, said control means having inputs being responsive to said first and second control signals.

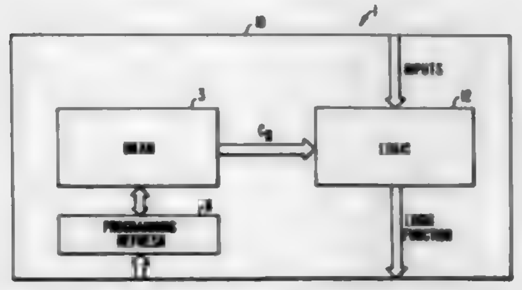
5,317,212
DYNAMIC CONTROL OF CONFIGURABLE LOGIC

Sven E. Wahlstrom, 570 Jackson Dr., Palo Alto, Calif. 94303

Filed Mar. 19, 1993, Ser. No. 34,451

Int. Cl.⁵ H03K *19/173, 19/094*

U.S. Cl. 307—465 **17 Claims**



1. Programmable logic in an integrated circuit comprising:

logic means for outputting signals representative of logical functions of inputs to said integrated circuit;

means for inputting data to an array of capacitance means for storage of selected voltage levels thereon, said data representative of a desired logic function;

means for refreshing selected voltages in said array of capacitance means, each of said capacitance means comprising a control voltage node coupled to said logic means; and

means for reading out data from said control node while refreshing said selected voltages in said array of capacitance means, whereby logic functions may be performed with said logic means when said capacitance means are being refreshed.

5,317,213
LEVEL CONVERTER WITH DELAY CIRCUITRY USED TO INCREASE SWITCHING SPEED

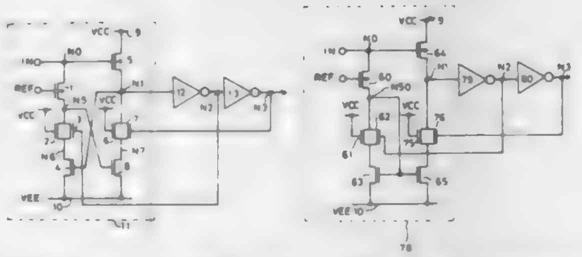
Hirotoshi Sato; Atsushi Ohba, and Akira Hosogane, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1992, Ser. No. 961,979

Claims priority, application Japan, Nov. 21, 1991, 3-306214

Int. Cl.⁵ H03K *19/0185, 19/0948*

U.S. Cl. 307—475 **25 Claims**



1. A level converter for converting an input signal of a first logic type level received at an input node into an output signal of a second logic type level, comprising:

an output node for supplying the output signal;

first means responsive to said input signal for setting said output node at a level of a first potential;

second means responsive to said input signal for setting said output node at a level of a second potential;

delay means for delaying a signal at said output node; and

control means responsive to a delay signal received from said delay means, for controlling the magnitude of a resistance between said output node and said second potential,

wherein said second means includes latch means for latching a signal potential at said output node, and wherein said control means includes means responsive to said delay signal, for changing the magnitude of a resistance between said latch means and said second potential.

5,317,214
INTERFACE CIRCUIT HAVING DIFFERENTIAL SIGNAL COMMON MODE SHIFTING MEANS

Edward T. Lewis, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 9, 1993, Ser. No. 28,511

Int. Cl.⁵ H03K *19/003*

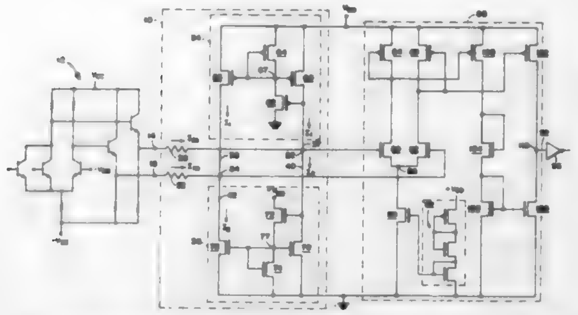
U.S. Cl. 307—475 **6 Claims**

1. An interface circuit for converting a differential input voltage having a common-mode level into an output voltage having a different, common-mode level, the interface circuit comprising:

a voltage level shifting means;

a current source; and

means for feeding current between the current source and an input terminal adapted to receive the differential input voltage, such current passing through the voltage level shifting means an amount related to the level of the differential input voltage.



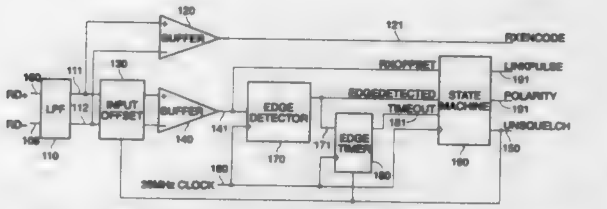
5,317,215
METHOD AND APPARATUS FOR FREQUENCY DISCRIMINATING COMPUTER NETWORK SIGNALS

David A. Kranzler, Belmont, Calif., assignor to 3COM Corporation, Santa Clara, Calif.

Filed Dec. 1, 1992, Ser. No. 984,128

Int. Cl.⁵ G01R *23/02*

U.S. Cl. 307—517 **8 Claims**



1. In a receiver for a Local Area Network (LAN) environment, a frequency discrimination circuit accepting as input a clock signal and a transmission signal, the frequency discrimination circuit comprising:

a) an edge detector coupled to receive the clock signal and the transmission signal as inputs for producing an edge detected signal;

b) an edge timer coupled to receive the clock signal and the edge detected signal as inputs for producing a timeout signal; and

c) a state machine circuit coupled to receive the clock signal, the edge detected signal, and the timeout signal for producing an unsquelch signal indicating whether the transmission signal meets frequency discrimination requirements;

wherein the edge detected signal is synchronous with the clock signal;

wherein the edge timer comprises a shift register clocked by the clock signal and having the edge detected signal as a data input; and

wherein the edge timer further comprises a timeout determining means having edge detection inputs, with a plurality of bits of the shift register coupled as edge detection inputs, for determining and providing a timeout signal indicating that none of the edge detection inputs represents an edge detection.

5,317,216
ACTIVE FILTER CIRCUIT

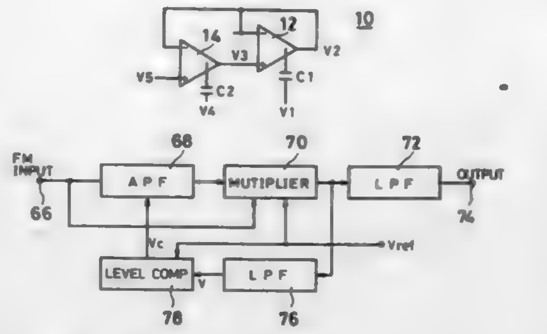
Nobukazu Hosoya, Nara; Katsunori Miura, Shijonawate, and Toru Sasaki, Matsubara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 19, 1990, Ser. No. 515,021

Claims priority, application Japan, Apr. 20, 1989, 1-100767; Sep. 28, 1989, 1-252578; Sep. 28, 1989, 1-252579

Int. Cl.⁵ H03B *1/00;* **H03K** *5/00*

U.S. Cl. 307—521 **21 Claims**



1. An active filter circuit, comprising:

a first differential pair constructed to include first and second transistors;

a first capacitive load connected to a collector of said second transistor of said first differential pair;

a first negative feed-back transistor for feeding-back an output at said collector of said second transistor to a base of said second transistor;

a second differential pair constructed to include third and fourth transistors;

a second capacitive load connected to a collector of said fourth transistor of said second differential pair;

a second negative feed-back transistor for feeding-back an output at said collector of said fourth transistor to a base of said first transistor constituting said first differential pair;

fifth and sixth transistors for forming a first current mirror circuit which is connected to said collector of said second transistor;

seventh and eighth transistors for forming a second current mirror circuit which is connected to said collector of said fourth transistor; and

biasing means formed in association with at least one of said first and second differential pairs for applying bias voltage to bases of two transistors constituting said at least one of the differential pairs, said biasing means including resistor voltage-dividing means for applying a divided voltage to respective bases of said two transistors as said bias voltages.

5,317,217
UNIVERSAL ACTIVE FILTER

Martin Rieger, Rottweil, and Sabine Roth, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed May 27, 1993, Ser. No. 67,832

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1990, 4038111

Int. Cl.⁵ H03B *1/00;* **H03K** *5/00*

U.S. Cl. 307—521 **16 Claims**

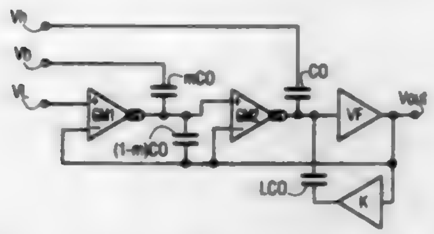
1. A universal active filter, comprising:

first, second and third inputs (V1, Vb, Vh) and an output (Vout);

said first input (V1) being connected with the non-inverting input of a first trans-conductance amplifier (GM1) having an amplification gm1;

said second input (Vb) being connected, via a first capacitor (mCO), with the output of said first trans-conductance amplifier (GM1), with the non-inverting input of a second trans-conductance amplifier (GM2) having an amplification gm2, as well as with a second capacitor ((1−m)CO);

said third input (Vh) being connected, via a third capacitor (CO), with the output of said second trans-conductance amplifier (GM2), with the input of a voltage follower (VF) having a high-resistance input, and with a feedback capacitor (LCO); and



said filter output (Vout) being connected to the output of said voltage follower (VF), to the inverting inputs of the two transconductance amplifiers (GM1 and GM2), to the second capacitor ((1−m)CO), as well as to the input of an amplifier (K) having an amplification k and having an output connected to said feedback capacitor (LCO).

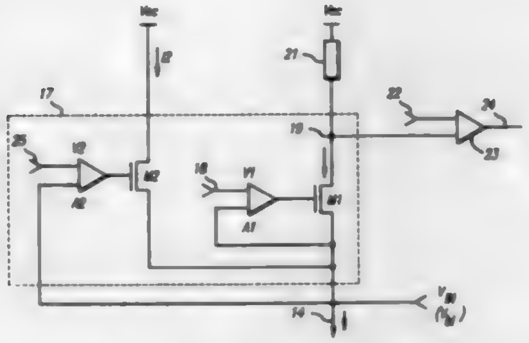
5,317,218
CURRENT SENSE CIRCUIT WITH FAST RESPONSE

Ding-Jen Liu, Hsinchu, Taiwan, assignor to United Microelectronics Corp., Taiwan, Taiwan

Continuation-in-part of Ser. No. 869,234, Apr. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 637,475, Jan. 4, 1991, abandoned. This application Apr. 12, 1993, Ser. No. 46,665

Int. Cl.⁵ G01R *19/00*

U.S. Cl. 307—530 9 Claims



1. A current sense amplifier comprising:

An impedance transfer circuit including an input terminal, a first transistor, a first amplifier, a second transistor and a second amplifier, wherein a source of said first transistor, an input of said first amplifier, a source of said second transistor and an input of said second amplifier are connected to said input terminal respectively, an output of said first amplifier is connected to a gate of said first transistor, an output of said second amplifier is connected to a gate of said second transistor and a drain of said second transistor is connected to a positive supply terminal; said first and second amplifiers respectively receiving a first and second reference voltage with the first reference voltage of said first amplifiers being larger than the second reference voltage of said second amplifier; and

a current comparator circuit, comprising a load which is connected to a drain of said first transistor and a comparator providing an output logic level of said current comparator circuit, according to a current passing through said first transistor.

5,317,219
COMPENSATED DIGITAL DELAY CIRCUIT

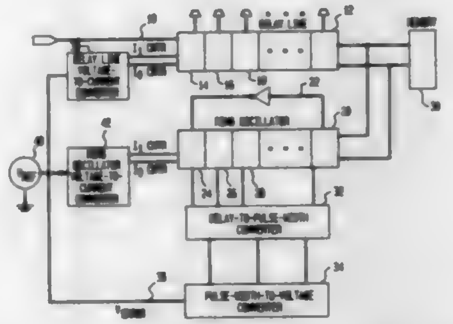
Annibale M. Lupi, and Massimo G. Lupi, both of Clifton, N.J., assignors to Data Delay Devices, Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 767,416, Sep. 30, 1991, Pat. No. 5,175,452. This application Oct. 8, 1992, Ser. No. 958,179

The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.

Int. Cl.⁵ H03K *5/159, 3/01*

U.S. Cl. 307—603 19 Claims


DELAY LINE
RING OSCILLATOR
DELAY-TO-PULSE-WIDTH CONVERTER
PULSE-WIDTH-TO-VOLTAGE CONVERTER

1. A compensated digital delay circuit having a design format suited for integrated circuitry utilizing complementary MOS technology comprising:

an input for signals-to-be-delayed;

a delay line with a plurality of time delay cells connected to said input, each of said time delay cells selectively interconnectable for forming one or more delay configurations, said delay line having a first output therefrom;

first circuit means for generating a variable current from a control voltage, said first circuit means connected to said time delay cells;

internal compensation means for compensating temperature and power supply variations, said internal compensation means connected to said first circuit means to adjust the time delay of the delay cells, said internal compensation means, in turn, comprising:

ring oscillator means for temperature and power supply compensation, said oscillator means having time delay cells selected for interchangeability with those of said delay line, said first output of said delay line connected to the ring oscillator, said ring oscillator having a second output therefrom;

second circuit means for generating a variable current from a reference voltage, said second circuit means connected to said ring oscillator; and,

control circuit means for generating a variable voltage signals for connection to said first circuit means to adjust the current to the time delay cells, said control circuit means connected to said second output of said ring oscillator;

whereby a precision delay line is formed from complementary MOS technology employing an oscillator means to compensate for temperature and power supply variations and without using a reference frequency for timing.

5,317,220
LINEAR DC MOTOR

Mikhail Godkin, 4414 Exbury Ct., San Diego, Calif. 92130

Filed Jun. 24, 1992, Ser. No. 903,493

Int. Cl.⁵ H02K *41/00*

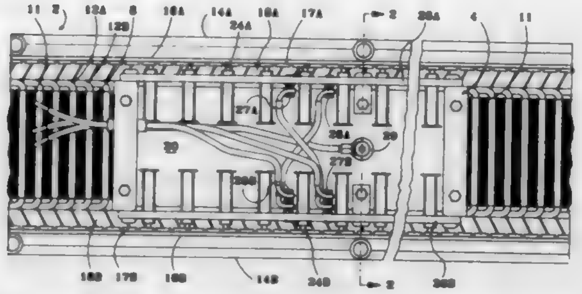
U.S. Cl. 310—12 16 Claims

1. A linear DC motor comprising:

a linear core defining a plurality of slots distributed over its length,

dual sets of coils disposed in said slots and interlaced in the core slots to balance impedances and heat dissipation thereof,

corresponding dual commutation means each for progressively energizing its corresponding set of coils, respective magnetic forces produced by energization of corresponding members of the sets of coils being mutually augmentative, and field means relatively moveable rectilinearly along and parallel to the core proximate thereto for presenting a magnetic field to the sets of coils,



the interaction of the magnetic field from the field means and magnetic forces produced by progressive energization of at least one of the sets of coils causing movement of the field means relative to the core.

5,317,221
LINEAR DRIVING DEVICE

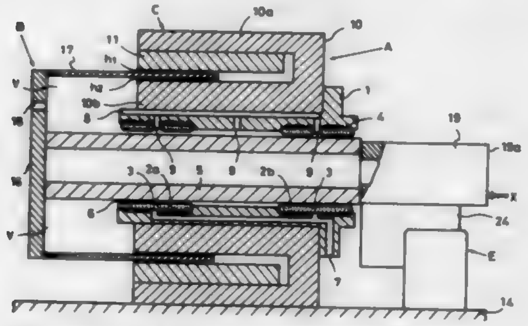
Tadayuki Kubo, Tsuchiura; Kazuo Watanabe, Ushiku, and Michio Horikoshi, Moriyamachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1992, Ser. No. 936,840

Claims priority, application Japan, Sep. 4, 1991, 3-250318; Sep. 4, 1991, 3-250321; Jan. 31, 1992, 4-040613

Int. Cl.⁵ H02K *41/00*

U.S. Cl. 310—12 13 Claims



1. A linear driving device comprising:

a hydrostatic gas bearing;

a shaft supported by said bearing, wherein said bearing and said shaft are both disposed within a voice-coil motor, wherein said shaft moves in a direction of movement in response to actuation of the voice-coil motor; and

a locking mechanism for constraining the movement of said shaft in its direction of movement, wherein said locking mechanism comprises an air cylinder, and

wherein a member is fixed to the side of said shaft, and wherein said air cylinder is fixed to said shaft and clamps the member fixed to the side of said shaft when the supply of a pressurized gas to said hydrostatic gas bearing is stopped.

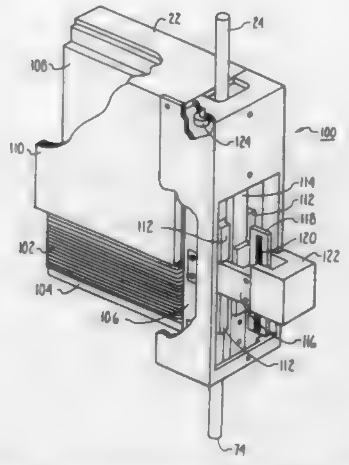
5,317,222
WORKPIECE TRANSPORTER DEVICE WITH REPLACEABLE GRIP

Edward A. Neff, Rancho Santa Fe; Hans Portegies, Temecula, and Stan Kim, Cerritos, all of Calif., assignors to Systems, Machines, Automation Components Corp., Murrieta, Calif.

Continuation-in-part of Ser. No. 765,130, Sep. 25, 1991, Pat. No. 5,175,456. This application Dec. 28, 1992, Ser. No. 996,893

Int. Cl.⁵ H02K *41/00*

U.S. Cl. 310—13 20 Claims



1. A device for moving and positioning an assembly component in an automated assembly operation which comprises:

means for creating a magnetic field;

an electrical coil for carrying a current, said coil being disposed around a coil piston for movement within the magnetic field in response to current flow through the coil;

a grip connected with the coil and engageable with the component;

means electrically connected with the coil for providing the electrical current to generate very light and very precise forces on the component during positioning of the component; and

means for absorbing forces applied to the grip during movement by the coil.

5,317,223
METHOD AND DEVICE IN MAGNETOSTRICTIVE MOTION SYSTEMS

Lothar E. Kiesewetter, Berlin, Fed. Rep. of Germany; Fredy Olsson, Malmö, Sweden, and Carl H. Tyrén, Antibes, France, assignors to Dynamotive Corporation, Newport, R.I.

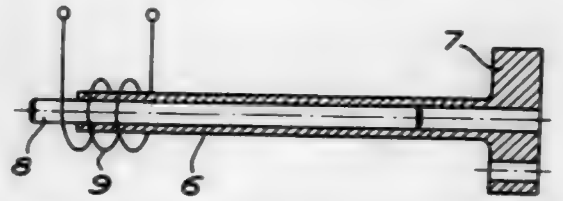
Continuation of Ser. No. 411,464, Sep. 21, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 628,923

Claims priority, application Sweden, Jan. 21, 1987, 8700219

The portion of the term of this patent subsequent to Apr. 30, 2009, has been disclaimed.

Int. Cl.⁵ H02N *2/00;* **H01L** *41/12*

U.S. Cl. 310—26 16 Claims



1. Method of making a first body (1, 8) having magnetostrictive properties and a second body (2, 6), against which said first body is in bearing contact with a certain grip between the

contact surfaces, to move with respect to each other while substantially maintaining said grip, characterized in that a magnetic field is made to influence sequentially only one of adjacent partial sections (**1***a*–**1***e*) of said first body (**1**, **8**), starting with the front end of the body as seen in the intended direction of movement, said magnetic field being adjusted so that under the influence of the magnetic field the respective partial section undergoes an increase in length and simultaneously a contraction in the transverse direction, the magnitude of which being great enough in order to decrease, preferably eliminate the grip between said bodies.

5,317,224

ELECTRIC MACHINE WITH MEANS FOR GUIDING COOLING AIR SUPPLIED FROM OUTSIDE OF THE MACHINE

Istvan Ragaly, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

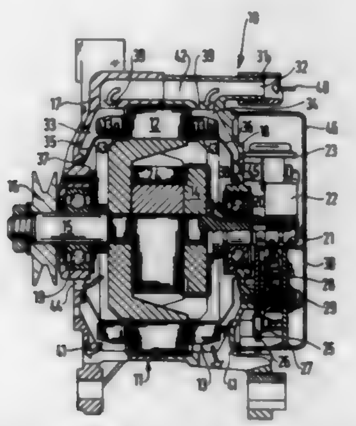
PCT No. PCT/DE91/00003, § 371 Date May 12, 1992, § 102(e) Date May 12, 1992, PCT Pub. No. WO91/11845, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 8, 1991, Ser. No. 849,431

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003155

Int. Cl.^{5} H02K *9/02*

U.S. Cl. 310—58 **10 Claims**



1. Electric machine having an exterior and an interior and provided with means for guiding cooling air from the exterior, said electric machine comprising a machine housing including two housing halves (**17,18**), each of said housing halves acting as an end shield, a lamination bundle (**12**) provided with a stator winding (**13**) having winding heads (**13***a*, **13***b*), said lamination bundle (**12**) and said stator winding (**13**) being clamped in the machine housing between the housing halves, and a rotor (**14**) mounted in the machine housing to cooperate magnetically with the lamination bundle (**12**), wherein the machine housing is provided with at least one air guiding duct (**33,34**) circumferentially disposed about at least one of the winding heads (**13***a*, **13***b*) of the stator winding (**13**) on one side of the lamination bundle and the at least one air guiding duct (**33,34**) is provided with at least one inlet opening (**30**) for admission of cooling air from the exterior and at least one outlet opening (**40**) for expulsion of the cooling air to carry away heat dissipated during operation, and each of the at least one air guiding ducts (**33,34**) is bounded exteriorly by one of the housing halves of the machine housing and interiorly by one of two annular walls (**35,36**) inserted between the lamination bundle (**12**) and the housing half bounding the at least one air guiding duct (**33,34**) exteriorly, and

wherein an annular groove (**37,38**) is provided in an inside surface of each of the housing halves (**17,18**) to receive one of the annular walls (**35,36**) and said at least one winding head (**13***a*, **13***b*) extends in said at least one air guiding duct so as to be exposed to the cooling air in said at least one air guiding duct.

5,317,225

SPINDLE MOTOR AND DISK CLAMP MECHANISM USED THEREIN

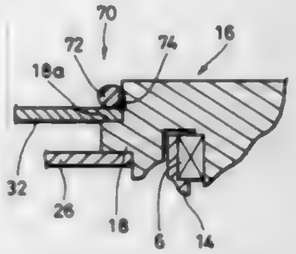
Itsuo Miyaji, Yokaichi, and Hiroyuki Yonei, Hikone, both of Japan, assignors to Nippon Densan Corporation, Kyoto, Japan

Filed Dec. 13, 1991, Ser. No. 808,103

Claims priority, application Japan, Dec. 29, 1990, 2-416183; Dec. 29, 1990, 2-416184; Dec. 31, 1990, 2-418826

Int. Cl.^{5} H02K *7/14;* **G11B** *17/08, 5/016*

U.S. Cl. 310—67 R **4 Claims**



1. A disk clamp mechanism, comprising:

a disk placement surface defined by a hub on which a recording disk is mounted; and clamp means for clamping the recording disk place on the disk placement surface, wherein the disk placement surface of the hub is substantially flat, a ring shaped recess, the cross section of which is substantially in the shape of semi-circle, is provided above the disk placement surface of the hub, the distance from the placement surface to the lower edge of the recess is set slightly smaller than the thickness of the recording disk, the clamp means is formed from an elastic ring, the cross section of the elastic ring is circular, and one recording disk is elastically held between the disk placement surface and the elastic ring by mounting the elastic ring in the recess.

5,317,226

ROTOR AND STATOR COMPONENTS FOR A MAGNETIC BEARING

Nigel H. New, Harrow, United Kingdom, assignor to The Glacier Metal Company Limited, Middlesex, England

PCT No. PCT/GB91/01282, § 371 Date Jan. 15, 1993, § 102(e) Date Jan. 15, 1993, PCT Pub. No. WO92/02737, PCT Pub. Date Feb. 20, 1992

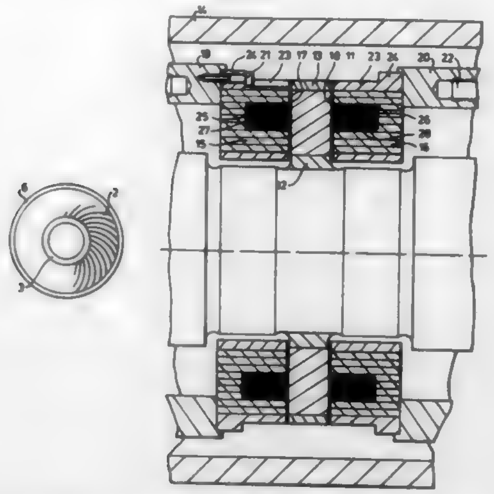
PCT Filed Jul. 29, 1991, Ser. No. 960,401

Claims priority, application United Kingdom, Jul. 28, 1990, 9016625

Int. Cl.^{5} H02K *7/09*

U.S. Cl. 310—90.5 **5 Claims**

1. Laminated stator and rotor components of a magnetic thrust bearing, each comprising a plurality of generally radially disposed and radially adjacent laminations, said rotor component laminations fixed at their inner ends to a cylindrical hub having an axis of rotation, the laminations all being curved in the same direction so that their outer tips lie in a common cylindrical plane which is concentric with said hub.



5,317,227

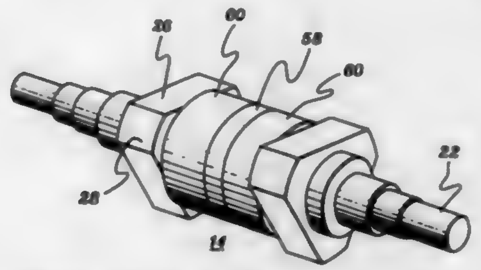
ROTOR WITH HOLLOW CYLINDRICAL PERMANENT MAGNET

Rodolfo Palma, Troy, and William H. Miller, Loudonville, both of N.Y., assignors to REM Technologies, Inc., Schenectady, N.Y.

Filed Dec. 8, 1992, Ser. No. 986,675

Int. Cl.^{5} H02K *21/12*

U.S. Cl. 310—156 **16 Claims**



1. A winding-less rotor for a dynamoelectric machine rotatable about a central longitudinal axis comprising:

an axially extending elongate rotatable body containing a first set of circumferentially spaced axially extending salient poles with circumferentially spaced recesses therebetween at one axial location and a second set of circumferentially spaced axially extending salient poles with recesses therebetween at an opposite axial location; and

a single toroidal magnet coaxially mounted on said body wherein the toroidal magnet is coaxially oriented on the body between the first and second set of circumferentially spaced axially extending salient poles.

5,317,228

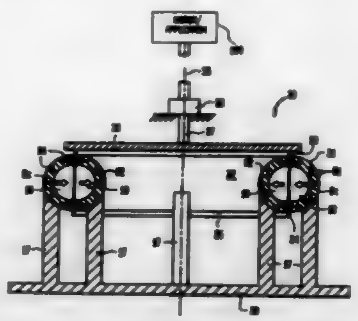
HIGH-POWER ELECTRICAL MACHINERY WITH TOROIDAL PERMANENT MAGNETS

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 650,845, Feb. 5, 1991, abandoned. This application Feb. 22, 1993, Ser. No. 21,293

Int. Cl.^{5} H02K *31/00*

U.S. Cl. 310—178 **4 Claims**



1. A homopolar motor comprising:

a permanent magnet structure having two magnet shells, the permanent magnet structure having a hollow central cavity such that when the magnet shells are placed together the permanent magnet structure is a hollow toroid having a circular gap between the two magnet shells, said magnet shells being magnetized such that an orientation of their magnetization α varies over the cross section of said shells by the equation: $\alpha=2\theta$, where θ is an axial angle, such that a radial transverse magnetic field is generated in said hollow central cavity;

an electrically conductive cylinder rotatably and coaxially mounted with respect to said magnet shells within said circular gap and lying in said transverse magnetic field;

an electrical source; and

conductive brushes connecting the electrical source to the conductive cylinder.

5,317,229

PRESSURE PULSE SOURCE OPERABLE ACCORDING TO THE TRAVELING WAVE PRINCIPLE

Georg Koehler, Geisfeld; Ulrich Schaetzle, Erlangen; Arnim Rohwedder, Fuerth, and Martin Scheidt, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 12, 1992, Ser. No. 974,517

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1991, 4139024

Int. Cl.^{5} H01L *41/08*

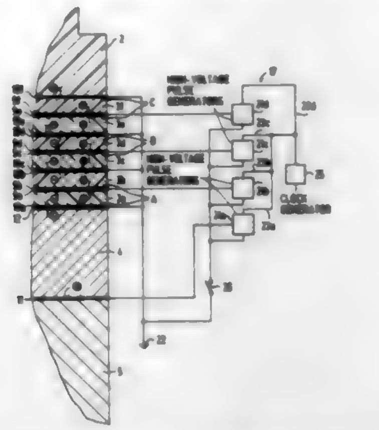
U.S. Cl. 310—334 **23 Claims**

1. A pressure pulse source for generating acoustic pressure pulses in an acoustic propagation medium comprising:

a foil arrangement of a plurality of electrically contacted, piezoelectric foils stacked directly on top of one another with no interstices therebetween;

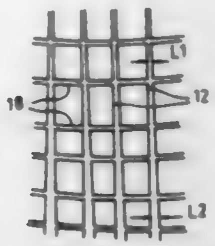
said foil arrangement having a first end face from which said pressure pulses emerge, and an opposite end face, and a backing, consisting of a piezoceramic transducer having electrical contacts, disposed against said opposite end face of said foil arrangement; and

means for driving said piezoelectric foils and said piezoceramic transducer according to the traveling wave principle for causing each of said piezoelectric foils and said piezoceramic transducer to produce acoustic waves for generating pressure pulses.



5,317,230
AMPLIFIER VALVE WITH GRID HAVING RODS OF VARIABLE WIDTH

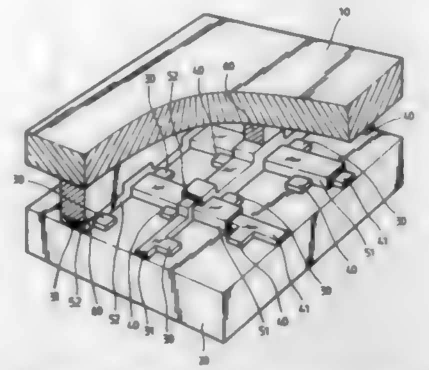
Michel-Pierre Tardy, and Jean-Pierre Buge, both of Thonon, France, assignors to Thomson Tubes Electroniques, Boulogne Billancourt, France
PCT No. PCT/FR91/00334, § 371 Date Dec. 30, 1991, § 102(e) Date Dec. 30, 1991, PCT Pub. No. WO91/17559, PCT Pub. Date Nov. 14, 1991
PCT Filed Apr. 23, 1991, Ser. No. 778,966
Claims priority, application France, May 4, 1990, 90 05640
Int. Cl.^{5} H01J *1/46*
U.S. Cl. 313—293 **6 Claims**



1. A high-frequency electronic amplifier valve, comprising:
an anode and a cathode arrangement having a grid structure between said anode and said cathode wherein said cathode functions with said grid structure to establish a fixed potential distribution in the vicinity of said cathode while providing for electron flow emitted by said cathode toward said anode;
wherein said high-frequency valve has high-frequency currents circulating between one end of said valve and a second end of said valve wherein said second end is an output end of said valve and wherein said grid is positioned in a resonant output circuit of said valve formed by said anode and said cathode and wherein current antinodes are produced in the vicinity of said second end of said valve with said current antinodes providing maximum high-frequency currents;
said grid structure including a plurality of rods whose width is variable along the length of the grid and wherein the rods with greatest width are near said second end of said valve where said high-frequency current is at its highest value.

5,317,231
PLASMA DISPLAY DEVICE

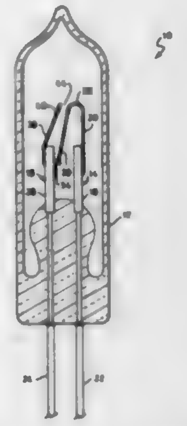
Sang-rok Lee, Seoul, Rep. of Korea, assignor to Samsung Electron Devices, Co., Ltd., Kyunggi-do, Rep. of Korea
Filed Oct. 30, 1991, Ser. No. 785,107
Claims priority, application Rep. of Korea, Nov. 2, 1990, 90-17768
Int. Cl.^{5} H01J *17/49*
U.S. Cl. 313—493 **4 Claims**



1. A plasma display device of a matrix driving type comprising:
a transparent front plate and a rear plate;
a plurality of both anode signal lines and cathode signal lines arranged in the form of an X-Y matrix on said rear plate and insulated so that the plurality of both signal lines are protected from exposure to a discharge space;
anodes and cathodes protruding from the corresponding signal lines near the intersections of said anode signal lines and said cathode signal lines and exposed to the discharge space, the protrusion of said anodes and said cathodes being in a plane parallel to a plane of said transparent front and rear plates; and
barrier ribs provided between said anode signal lines and said front plate.

5,317,232
AC/DC-OPERABLE GLOW DISCHARGE STARTER HAVING TWO BIMETALS

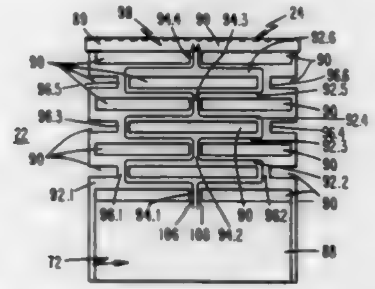
Nikolaos Barakitis, 10B May St., Salem, Mass. 01970; Marvin S. Corrales, San Jose, Desamparados, and Jovge C. Rodriquez, Roma Jardines, Heredia, both of Costa Rica
Filed Jul. 17, 1992, Ser. No. 916,044
Int. Cl.^{5} H01J *17/30, 61/64*
U.S. Cl. 313—619 **5 Claims**



1. A glow discharge starter comprising an hermetically sealed envelope containing an ionizable medium, a bimetallic electrode and a counter electrode located within said envelope, said bimetallic electrode including a first bimetallic element having a curved portion and a free end, a first discharge gap having a predetermined spacing is formed between said free end of said first bimetallic element and said counter electrode, a second bimetallic element having an end secured to said counter electrode and having a portion thereof positioned adjacent said curved portion of said first bimetallic element such that a second discharge gap having a predetermined spacing is formed therebetween, the predetermined spacing of said second discharge gap being greater than said predetermined spacing of said first discharge gap at 25 degrees Celsius.

5,317,233
VACUUM TUBE INCLUDING GRID-CATHODE ASSEMBLY WITH RESONANT SLOW-WAVE STRUCTURE

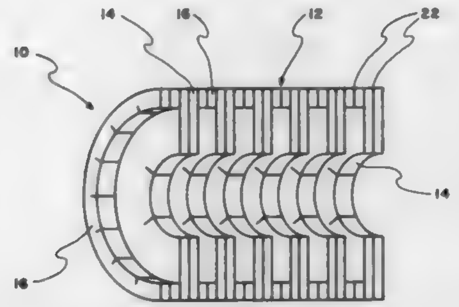
Erling Lien, Los Altos, and Arthur Karp, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.
Filed Apr. 13, 1990, Ser. No. 508,442
The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.
Int. Cl.^{5} H01J *25/02, 23/36*
U.S. Cl. 315—5.370 **103 Claims**



33. A grid for a vacuum tube for amplifying an r.f. signal having a predetermined frequency, the grid comprising an electrically conductive structure, the structure including means for current modulating in response to the signal an electron beam of the tube passing therethrough so that the current modulated beam has a current variation that is a replica of the signal to be amplified, the structure including a slow-wave circuit having a length that is approximately an odd integral multiple of a quarter wavelength at the predetermined frequency of the signal so the slow-wave structure is approximately resonant at the predetermined frequency.

5,317,234
MODE TRAP FOR ABSORBING TRANSVERSE MODES OF AN ACCELERATED ELECTRON BEAM

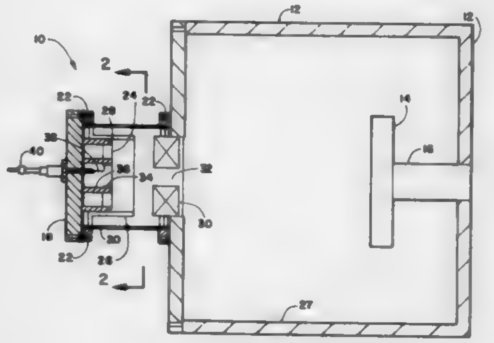
Eric P. Chojnacki, Woodridge, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 5, 1992, Ser. No. 924,991
Int. Cl.^{5} H01P *1/162;* **H05H** *9/00*
U.S. Cl. 315—5.41 **6 Claims**



1. In a linear accelerator comprising a waveguide that accelerates an electron beam passing therethrough, the electron beam having a transverse mode and an accelerator mode associated therewith, a mode trap to trap and absorb the transverse modes passing through the waveguide while allowing the accelerator mode to pass through the waveguide, the mode trap comprising:
a multiplicity of electrically conductive irises and rings, each iris and ring including a respective aperture, and the irises and rings stacked in a side-by-side, alternating fashion such that the apertures of the irises and rings define the waveguide;
an absorbing material layer embedded in each iris and ring, the absorbing material layer encircling, but spaced from the respective aperture;
each iris and ring further including a plurality of slots spaced around the respective aperture and extending out toward the respective absorbing material layer;
whereby the transverse mode of the accelerator beam is channeled through the slots in the rings and irises and is absorbed by the absorbing layer, without limiting the accelerator mode of the accelerator beam.

5,317,235
MAGNETICALLY-FILTERED CATHODIC ARC PLASMA APPARATUS

James R. Treglio, San Diego, Calif., assignor to ISM Technolog, San Diego, Calif.
Filed Mar. 22, 1993, Ser. No. 35,309
Int. Cl.^{5} H01J *7/24*
U.S. Cl. 315—111.41 **25 Claims**



1. A magnetically filtered cathodic arc deposition apparatus which comprises:
generally annular cathode means;
anode means spaced from said cathode means;
cathode arc initiating means adjacent to said cathode means;
a target area spaced from said cathode means adapted to contain a target to receive ions generated at said cathode means;
an annular solenoidal magnet spaced from said cathode means, between said cathode means and said target;
the opening in said annular magnet being aligned with said cathode means such that no straight line exists between any location on said cathode means and any location on said target area.

5,317,236

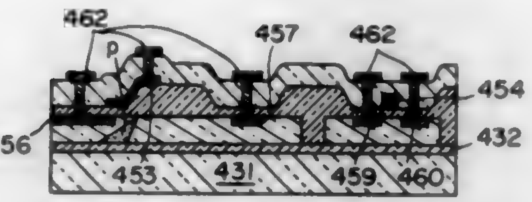
SINGLE CRYSTAL SILICON ARRAYED DEVICES FOR DISPLAY PANELS

Paul M. Zavracky, Norwood; John C. C. Fan, Chestnut Hill; Robert McClelland, Norwell, all of Mass.; Jeffrey Jacobsen, Hollister, Calif.; Brenda Dingle, Norton, and Mark B. Spitzer, Sharon, both of Mass., assignors to Kopin Corporation, Taunton, Mass.

Continuation-in-part of Ser. No. 636,602, Dec. 31, 1990, Pat. No. 5,206,749. This application Dec. 31, 1991, Ser. No. 815,684

Int. Cl.^{5} H01J *9/00*

U.S. Cl. 315—169.3 **28 Claims**



1. A method of fabricating a panel display comprising:

a) forming a silicon-on-insulator structure including a single thin film layer of essentially single crystal silicon material on an insulating layer, the insulating layer being positioned over a semiconductor substrate;

b) forming an array of transistors in or on the single layer of essentially single crystal silicon material to form a circuit panel, the circuit panel including an array of display pixel electrodes such that each display pixel electrode is actuatable by at least one transistor; and

c) positioning an electroluminescent material over each display pixel electrode such that an electric field generated at each display pixel electrode causes light to be emitted by the electroluminescent material.

5,317,237

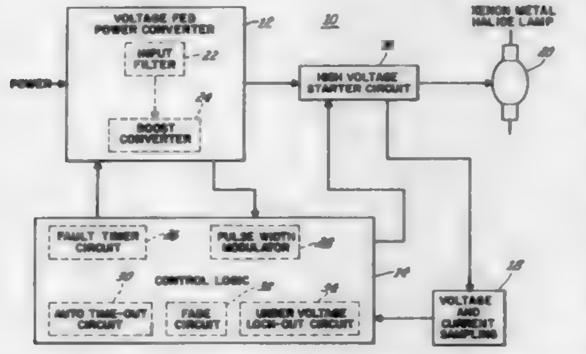
LOW VOLTAGE BALLAST CIRCUIT FOR A HIGH BRIGHTNESS DISCHARGE LIGHT SOURCE

Joseph M. Allison, Euclid; Raymond A. Buchina, Mentor; James D. Mieskowski, Seven Hills; Edward J. Thomas, Streetboro, and John M. Davenport, Lyndhurst, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 858,927, Mar. 27, 1992, abandoned. This application Nov. 24, 1992, Ser. No. 981,023

Int. Cl.^{5} H05B *41/36*

U.S. Cl. 315—307 **13 Claims**



1. A low voltage DC input ballast circuit for a discharge lamp comprising:

input filter means for receiving and filtering said low voltage DC input such that a conditioned signal is produced thereby;

first boost converter circuit receptive of said conditioned DC signal, said first boost converter circuit having a first power switching device which is effective upon introduction of a control signal thereto, such that a run signal having a predetermined amplitude and frequency is produced from said conditioned DC signal;

control circuit means coupled to said discharge lamp for receiving a sample of at least one of a voltage and a current operating characteristic of said discharge lamp and developing said control signal as a function thereof;

output coupling circuit having said run signal connected as an input thereto, said output coupling circuit being connected to said discharge lamp so that said run signal is fed to said discharge lamp as a voltage during steady state operating conditions; and

starting circuit arrangement connected to said output coupling circuit and effective during initial on conditions of said discharge lamp so as to develop a high voltage pulse across said output coupling circuit, said high voltage output pulse being effective to cause ionization of the ingredients of said discharge lamp and thus the starting thereof, said starting circuit arrangement being effective so as to repeat said high voltage pulse in less than 10 milliseconds in the event that said discharge lamp fails to start as a result of the preceding high voltage pulse.

5,317,238

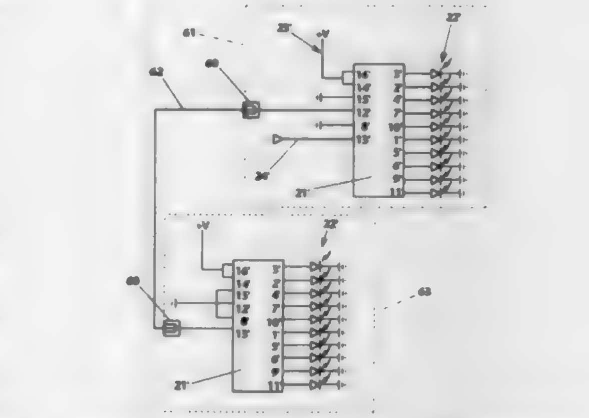
ELECTROMAGNETIC FIELD SENSITIVE ANIMATED ORNAMENTAL DISPLAY

Richard Schaedel, 872 Lovell Ave., Mill Valley, Calif. 94941

Filed Oct. 7, 1991, Ser. No. 772,170

Int. Cl.^{5} H05B *37/00*

U.S. Cl. 315—323 **8 Claims**



2. An electronic display for amusement and ornamentation, including first and second pluralities of LEDs, first and second integrated circuit counter devices, each including a trigger input having a high signal sensitivity, a DC power supply connected to each integrated circuit counter device, each integrated circuit counter device having a plurality of sequentially activated outputs, each of said sequentially activated outputs of said first integrated circuit connected directly to one of said first plurality of LEDs, each of said sequentially activated outputs of said second integrated circuit connected directly to one of said second plurality of LEDs, antenna conductor means connected directly to said trigger input of said first integrated circuit counter device and disposed to receive ambient electromagnetic fields in the vicinity of said display and to generate a corresponding AC signal to actuate said trigger input of said first integrated circuit counter device, said first integrated circuit counting device including a cascade output, and said second integrated circuit device including a trigger input connected to said cascade output of said first integrated circuit device, whereby said second integrated circuit counter device counts at a rate that is an integral divisor of the counting rate of said first integrated circuit counter device.

5,317,239

DEFLECTION YOKE FOR CATHODE RAY TUBE

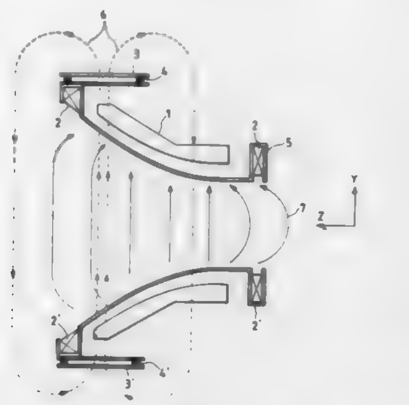
Hiroki Ohguro, Kanagawa; Yoshio Yoshiwara, Chiba; Minoru Furuya, Iwate; Nobutaka Okuyama, Kanagawa; Soichi Sakurai, Kanagawa, and Michitaka Ohsawa, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Mizusawa Electronics Co., Ltd., Mizusawa, both of Japan

Filed Jan. 15, 1993, Ser. No. 5,147

Claims priority, application Japan, Jan. 17, 1992, 4-006195

Int. Cl.^{5} H01J *29/56*

U.S. Cl. 315—370 **4 Claims**



1. A deflection yoke for a cathode ray tube, comprising:

a deflection yoke body including horizontal deflection coil means for generating a horizontal deflection magnetic field, vertical deflection coil means for generating a vertical deflection magnetic field and a ferrite core; and

an upper cancelling coil and a lower cancelling coil for cancelling an undesired magnetic field generated by said deflection yoke body,

said upper and lower cancelling coils being arranged above and below said deflection yoke body, for generating a cancelling magnetic field for substantially cancelling undesired portions of the horizontal deflection magnetic field, said upper and lower cancelling coils being arranged between a front end of said horizontal deflection coil means and a center of said ferrite core and in parallel to an axis direction of said deflection yoke body, the undesired portions of the horizontal deflection magnetic field in a front region and a rear region of said deflection yoke body being under-corrected and over-corrected, respectively.

5,317,240

KINESCOPE DRIVER APPARATUS WITH CONTRAST ENHANCEMENT

Anton W. Keller, Zurich, Switzerland, assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Jun. 29, 1992, Ser. No. 906,313

Int. Cl.^{5} H01J *29/52*

U.S. Cl. 315—383 **9 Claims**

1. Amplifier apparatus, comprising:

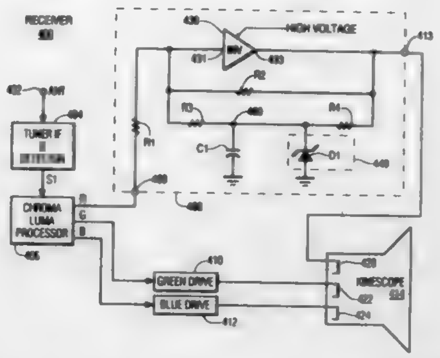
an inverting amplifier having an input terminal for receiving a video input signal to be amplified, having an output terminal for providing an amplified video output signal and having linear and non-linear feedback paths; said two feedback paths together determining a nominal closed loop gain for the amplifier;

said non-linear path including both amplitude and frequency dependent elements and comprising a circuit node coupled via first and second resistors to respective ones of said input and output terminals of said amplifier and including a voltage dependent impedance, a frequency dependent impedance and a source of reference potential coupled in circuit with said node for modifying said closed loop gain of said amplifier;

characterized in that;

for driving a kinescope, said output terminal of said amplifier is coupled to a cathode electrode of a kinescope;

said frequency dependent impedance and said voltage dependent impedance are coupled in parallel between said circuit node and said source of reference potential;



the values of said frequency dependent impedance, said voltage dependent impedance, said first and second resistors and said source of reference potential being selected for increasing the closed loop gain of said amplifier in low brightness picture areas and for increasing the closed loop gain of said amplifier for high frequency video detail signal components in high brightness picture areas to provide images on said kinescope having expanded low-light contrast and enhanced high-light picture detail.

5,317,241

ROTARY DRIVE FOR A DATA CARRIER

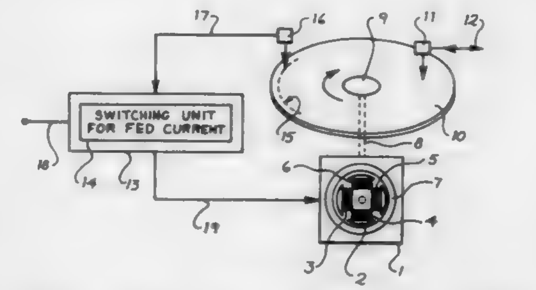
Helmut Hans, St. Georgen, Fed. Rep. of Germany, assignor to Papst Licensing GmbH, Spaichingen, Fed. Rep. of Germany

Continuation of Ser. No. 126,600, Nov. 30, 1987, abandoned. This application Mar. 19, 1991, Ser. No. 671,454

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640907

Int. Cl.^{5} H02P *7/00*

U.S. Cl. 318—254 **9 Claims**



1. A rotary drive for rotating a data carrier, comprising a brushless direct current motor with a permanent magnet rotor; a wound stator having at least one winding coil; a circuit arrangement for activating the coil to generate a magnetic field for producing rotary movement in the rotor; sensing means for reading signals recorded on the data carrier, the output of the sensing means being connected to the circuit arrangement for activating the winding, and the data carrier having control signals which identify at least those angular positions of the rotor relative to the stator at which commutation of current fed to the winding coil is to be initiated.

5,317,242
MOTOR-DRIVING CIRCUIT AND WIRE-BONDING APPARATUS

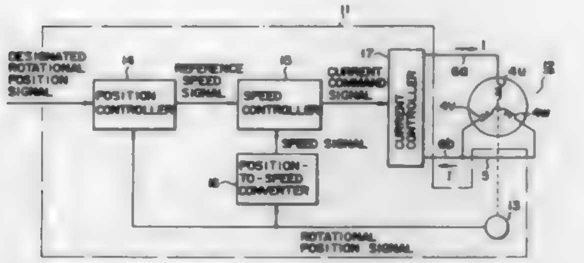
Noriyasu Kashima; Mutsumi Suematsu, both of Yokohama; Kazumi Ohtani, Fujisawa, and Koichiro Atsumi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 499,680, Mar. 27, 1990, Pat. No. 5,080,276. This application Nov. 15, 1991, Ser. No. 793,007

Claims priority, application Japan, Mar. 27, 1989, 1-74521

Int. Cl.^{5} H02K *7/02*

U.S. Cl. 318—254 **13 Claims**



1. A motor-driving circuit for driving a motor including;

a rotor having a rotatable shaft with a permanent magnet attached thereto for generating magnetic flux; and

a stator including an iron core, three-phase windings wound around their on core to form Y-connection windings, and three leads connected to and extending from the windings;

said motor-driving circuit comprising:

short-circuiting means for short-circuiting two of the three leads to each other;

rotational position-detecting means for detecting a rotational position of the motor and outputting current position information; and

control means for supplying an exciting current to the short-circuit leads and the remaining lead to control the shaft of the rotor to move to a designated rotational position within a narrow angular range, said exciting current having a value corresponding to a difference between the current position information from the rotational position-detecting means and externally input positional information which represents the designated rotational position within the narrow angular range.

5,317,243
METHOD AND APPARATUS FOR DETECTING VELOCITY PROFILES OF A SPINNING ROTOR OF A POLYPHASE DC MOTOR

Scott W. Cameron, Milpitas, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 876,871, Apr. 30, 1992, which is a continuation-in-part of Ser. No. 770,576, Oct. 3, 1991. This application Jul. 31, 1992, Ser. No. 923,237

Int. Cl.^{5} H02P *5/06*

U.S. Cl. 318—254 **15 Claims**

1. A circuit for operating a polyphase dc motor having a plurality of driving coils that are commutatively energized in a predetermined sequence to rotate a rotor, comprising:

a zero crossing detector connected to determine when a back emf of a floating driving coil crosses zero;

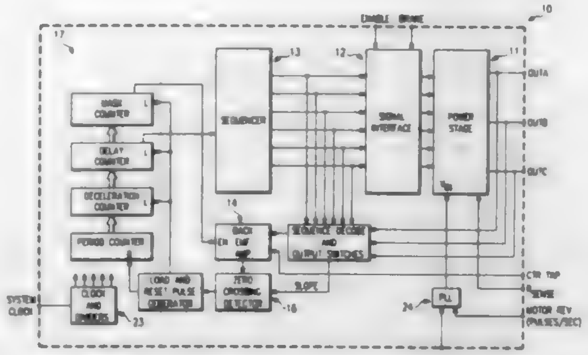
a generator for generating commutation sequence signals for controlling which of said driving coils are energized a delayed time after said zero crossing detector detects that a back emf of a floating driving coil has crossed zero;

and mask circuit for inhibiting said zero crossing detector for a delayed time after a commutation change, in dependence upon an acceleration of the rotor, comprising:

a period counter, an acceleration counter, and a mask counter, said period counter being an up counter, and said acceleration and mask counters being down counters;

a source of clock pulses connected to clock said period and acceleration counters;

a programmable clock pulse divider connected to receive and programmably divide said clock pulses to provide clock pulses at a selectively divided frequency to said mask counter;



means operative when said zero crossing is detected to load a count from said period counter into said mask and acceleration counters and then to reset said period counter; and

an output from said acceleration counter being connected to determine the selectively divided frequency of clock pulses provided by said programmable clock pulse divider to said mask counter.

5,317,244
MOTOR CONTROL UNIT PROVIDED WITH ANTI-BURNING DEVICE

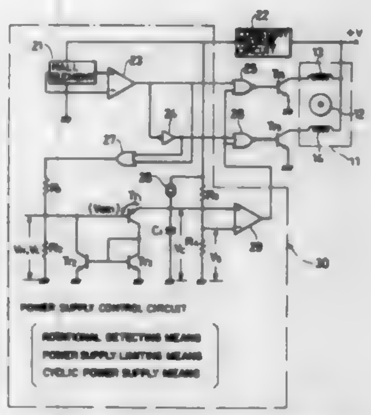
Takuro Ishikura, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 685,988, Apr. 15, 1991, abandoned, which is a continuation of Ser. No. 330,467, Mar. 30, 1989, abandoned. This application Aug. 6, 1992, Ser. No. 924,618

Claims priority, application Japan, Mar. 31, 1988, 63-80615

Int. Cl.^{5} H02P *6/02*

U.S. Cl. 318—254 **14 Claims**


+V
11
12
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22
23
30
POWER SUPPLY CONTROL CIRCUIT
ROTATIONAL DETECTING MEANS
POWER SUPPLY LIMITING MEANS
CYCLIC POWER SUPPLY MEANS

1. A motor control apparatus for preventing burning, comprising:

power supply control means including,

rotational detection means for detecting whether the rotational speed of a motor is below a predetermined value, for outputting a pulse signal having a pulse width which varies depending on a comparison of the detected rotational speed of said motor to said predetermined value, and for detecting when said motor fails to rotate,

power supply limiting means for limiting current supplied to said motor in response to said pulse signal from said rotational detection means,

current supply means for charging a capacitor,

discharging means for discharging said capacitor when the difference between the rotational speed detected by said rotational detection means and a capacitance load of said capacitor is greater than said predetermined value,

cyclic power supply means for supplying current to said motor for a predetermined cycle before the rotation of said motor is re-initiated for automatically providing a cyclic power supply until said capacitance load exceeds said predetermined value responsive to said rotational detection means detecting that said motor has failed to rotate, and

power supply discontinuing means for discontinuing the current supplied from said cyclic power supply to said motor when said capacitance load of said capacitor exceeds said predetermined value,

wherein said cyclic power supply means is arranged for supplying current to said motor at said predetermined cycle responsive to said rotational detection means detecting that said motor has failed to rotate and said power supply limiting means is arranged to limit the current to said motor in response to the rotational speed detected to be below said predetermined value.

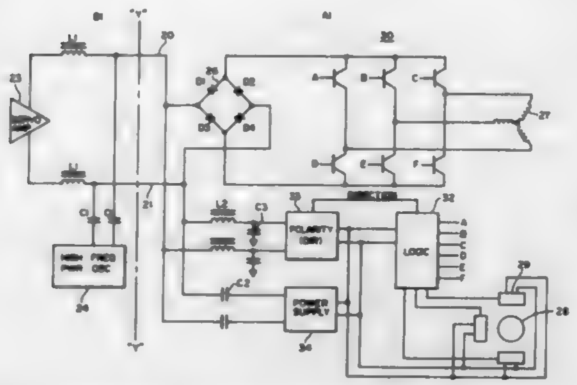
5,317,245
BRUSHLESS DC MOTOR CONTROL NETWORK

Frederick G. Moritz, Hauppauge, and Roger Mosciatti, Coram, both of N.Y., assignors to MFM Technology, Inc., Ronkonkoma, N.Y.

Filed Oct. 29, 1992, Ser. No. 968,339

Int. Cl.^{5} H02P *6/02*

U.S. Cl. 318—254 **14 Claims**



1. A brushless DC motor network comprising a polyphase motor including stator coils and a rotor, a motor energizing main voltage supply, a commutation signal responsive switching circuit connecting predetermined stator coils to said main voltage supply, means for sensing the angular position of said rotor, a commutation circuit responsive to said sensing means for applying commutation signals to said switching circuit, said motor network being characterized by said rotor position sensing means and said switching circuit being located in a first section and said main voltage supply being located in a second section remotely spaced from said first section and having a motor control variable voltage output including a periodically varying component, said motor network further comprising a pair of power conductors connected to said voltage output and extending said second section to said first section and an auxiliary power supply having an energizing input coupled to said conductors and a DC output energizing said commutation circuit.

5,317,246
DEVICE FOR CONTROLLING THE TORQUE OF AN ASYNCHRONOUS ELECTRIC MOTOR BY CONTROLLING THE PHASE OF THE MOTOR STATOR VOLTAGE

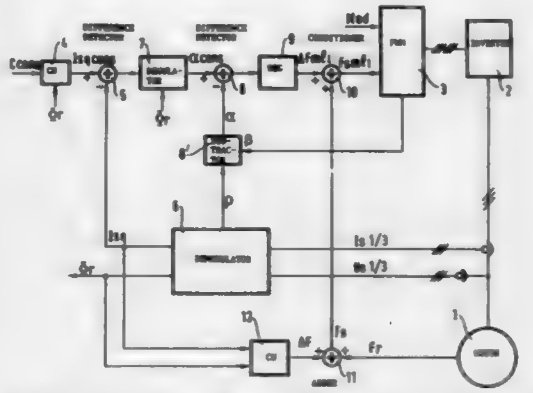
Liming Wei, Villeurbanne, France, assignor to GEC Alsthom SA, Paris, France

Filed Nov. 24, 1992, Ser. No. 980,707

Claims priority, application France, Nov. 29, 1991, 91 14806

Int. Cl.^{5} H02P *7/00*

U.S. Cl. 318—432 **4 Claims**



1. Device for controlling the torque of an asynchronous electric motor by controlling only the phase of the motor stator voltage relative to a flux in said motor on the basis of a set point for only the quadrature component of a stator current in a frame of reference related to said flux in turn derived from a motor torque set point, the device comprising:

first difference detecting means for detecting any difference between only said stator current set point and a current value of said quadrature component, and

first regulator means operating on the basis of said difference to provide a phase value to be applied to said motor to reduce said difference.

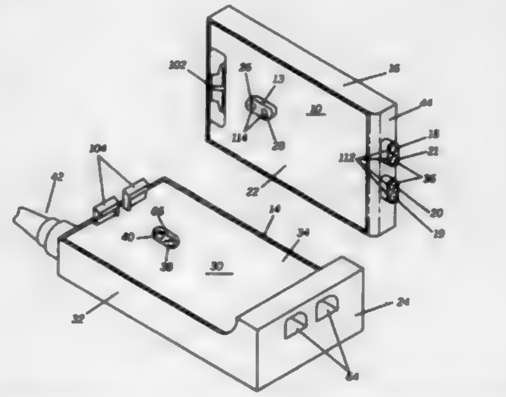
5,317,247
INTEGRATED BATTERY CONTACT AND RETENTIVE PROTRUSION

Kok H. Chong, Tamarac; Steven J. Finch, Sunrise, and Robert Leon, Miami Lakes, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 19, 1993, Ser. No. 49,060

Int. Cl.^{5} A02J *7/00*

U.S. Cl. 320—2 **5 Claims**



1. A battery for attachment to and powering of a radio, the battery comprising:

at least one cell;

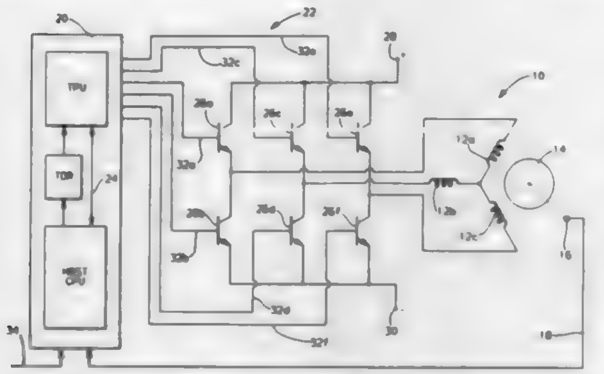
a housing containing said at least one cell;

mating means, located on the housing, for selectively attaching the battery and the radio, the mating means including a pair of protrusions selectively receivable by the radio; and

charging contacts located on at least one of the protrusions.

5,317,248
MICRO-CONTROLLER BASED PWM WAVEFORM GENERATION FOR A MULTIPLE PHASE AC MACHINE
Daniel E. Utley, Anderson; Kevin M. Deasy, Noblesville, and Gordon D. Cheever, Jr., Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich. and Delco Electronics Corp., Kokomo, Ind.

Filed Nov. 12, 1992, Ser. No. 975,295
Int. Cl.⁵ H02P *5/28*
U.S. Cl. 318—811 **6 Claims**



1. In a control system for a multiple phase AC machine including an array of switching devices defining an inverter, a timer data register for storing PWM on-time data for respective switching devices of said inverter, a host processor interruptable to update said PWM on-time data based on a machine position encoder signal and a requested machine current, and a timer processor for generating conduction control signals for the switching devices of said inverter based on the PWM on-time data stored in said timer data register, a method of operation for said timer processor comprising the steps of:

generating a sync signal having leading edges occurring once per PWM cycle;

interrupting said host CPU at successive leading edges to initiate periodic updating of the PWM on-time data stored in said timer data register;

setting off-to-on and on-to-off transitions of said conduction control signals in accordance with the updated PWM on-time data such that said transitions are centered about a succeeding leading edge of said sync signal; and

controlling the switching devices of said inverter in accordance with respective conduction control signals.

5,317,249
TRANSMIT MODE DETECTOR IN A BATTERY CHARGER
Robert B. Ford, Tamarac, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

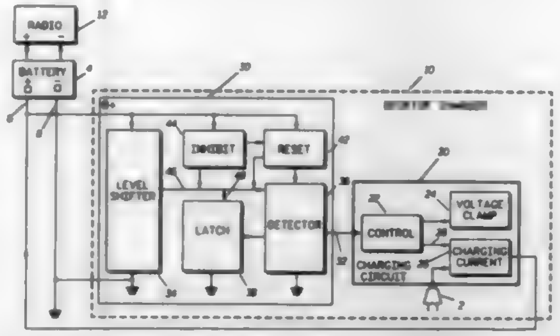
Filed Jul. 15, 1991, Ser. No. 729,667
Int. Cl.⁵ H02J *7/00*
U.S. Cl. 320—2 **12 Claims**

1. A battery charger having two terminals for charging a battery for a radio, the battery charger comprising:

charging means having a controllable parameter for charging the battery;

operational mode detector means coupled to the two terminals for detecting an operational mode of the radio in response only to the voltage detected across the two terminals; and

control means coupled to the operational mode detector means and to the charging means for controlling the controllable parameter in response to the operational mode detected.

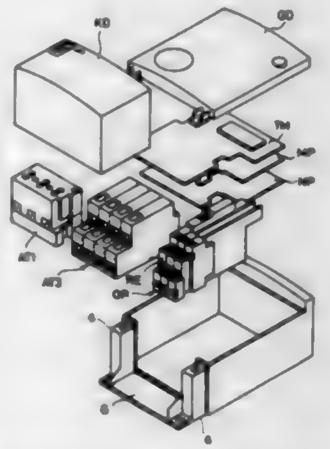


5,317,250
MODULAR ELECTRONIC METER HAVING REDUCED WIDTH
Petrus Warmerdam, Wetzikon, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed Jan. 9, 1992, Ser. No. 818,676

Claims priority, application Switzerland, Jan. 9, 1991, 00036/91

Int. Cl.⁵ G01R *1/04, 19/00, 15/00;* **H02B** *1/00*
U.S. Cl. 324—156 **17 Claims**



1. Electronic electricity meter of modular structure comprising:

a box-like housing having a plurality of modules, each of said modules performing different functions and being interconnected to form a module stack, at least one of the modules being a measuring circuit for measuring a load current;

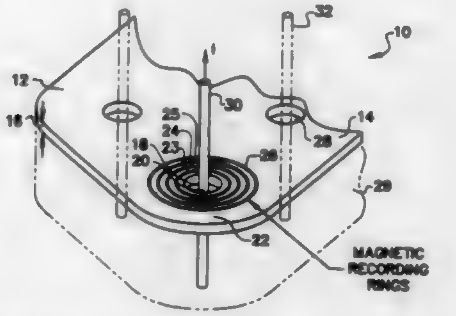
means attached to said box-like housing for holding said module stack within the box-shaped housing, the measuring circuit being a three-dimensional box-shaped module having first, second and third dimensions representing a length, a height and a width, respectively of said measuring circuit, said length being defined by a first separation distance between first and second opposing end faces of said measuring circuit and said width being defined by a second separation distance between third and fourth opposing end faces located perpendicular to said first and second end faces, said height being greater than said width, said measuring circuit further including:

two connecting terminals for detecting a single-phase load current, said two connecting terminals being arranged one above the other along an axis parallel to said height of said measuring circuit and being exposed on said first end face of said measuring circuit; and

a current sensor which is connected to said connecting terminals.

5,317,251
PEAK MAGNETIC FIELD DETECTOR WITH NON-VOLATILE STORAGE
Jeffrey S. Haviland, Plymouth; Donald R. Krahn, Eagan, and Robert W. Schneider, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 23, 1992, Ser. No. 979,950
Int. Cl.⁵ G01R *19/00;* **G11B** *5/127*
U.S. Cl. 324—102 **20 Claims**



1. Device for detecting a magnetic field and storing the value of said magnetic field, said device comprising:

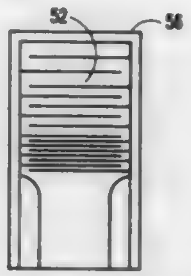
a substrate;

individual magnetic field detecting elements spatially distributed at fixed locations on said substrate, said individual magnetic field detecting elements being in a predetermined first state of magnetization prior to exposure to said magnetic field;

means for exposing said individual elements to said magnetic field, said magnetic field altering said predetermined first state of magnetization in at least one of said individual magnetic field detecting elements to a second state of magnetization, said second state of magnetization being representative of said value of said magnetic field.

5,317,252
DOSIMETER FOR MONITORING THE CONDITION OF POLYMERIC MATERIALS AND CHEMICAL FLUIDS
David E. Kranbuehl, 201 Harrison Ave., Williamsburg, Va. 23185

Filed Sep. 15, 1992, Ser. No. 944,928
Int. Cl.⁵ G01N *27/00*
U.S. Cl. 324—71.7 **11 Claims**



1. A dosimeter which through reproducible changes in its complex permittivity, ϵ^*, provides an indication of the properties of at least one of a polymeric material and a chemical fluid of interest, comprising:

a substrate;

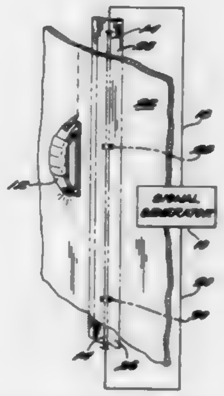
an electrode pattern in the form of an interdigitated capacitor positioned on said substrate, at least one of said substrate and said electrode pattern being selected to yield reproducible changes in at least one of a real component, ϵ', and an imaginary component, ϵ'', of a complex permittivity, ϵ^*, or equivalent circuit representation thereof, for particular degradative conditions of interest, said reproducible changes being matched with a property of interest of said polymeric material or said chemical fluid to be monitored, wherein changes in at least one of ϵ' and ϵ'', or equivalent circuit representations thereof, correspond with a degree of deterioration of said property of interest of said polymeric material or said chemical fluid to be monitored;

an impedance analyzer means connectable to said electrode pattern for detecting changes in at least one of ϵ' and ϵ'', or equivalent circuit representation thereof, for said substrate at one or more frequencies; and

a means for correlating detected changes in at least one of ϵ' and ϵ'', or equivalent circuit representations thereof, with said degree of deterioration of said property of interest of said polymeric material or chemical fluid.

5,317,253
CONCEALED WIRE TRACING APPARATUS
James W. Kronberg, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 27, 1991, Ser. No. 798,785
Int. Cl.⁵ G01R *19/00*
U.S. Cl. 324—67 **6 Claims**



1. An apparatus for detecting the presence of an electrical conductor, said conductor partially or completely concealed by a surface, said apparatus comprising:

a housing having a planar surface and a handle;

a coil of wire, said coil having a long axis and a short axis, said coil held by said housing so that said long axis is parallel to said planar surface, said coil being perpendicular to said planar surface;

means for generating an electrical signal in said electrical conductor;

a piezoelectric transducer in electrical connection with said coil so that, when said housing is moved toward said electrical conductor and said signal generating means is generating a signal in said electrical conductor, said piezoelectric transducer emits a signal having an intensity related to the distance and orientation of said coil with respect to said electrical conductor, said signal of said piezoelectric transducer indicating by a highest relative intensity when said planar surface engages said concealing surface, said coil is closest to said electrical conductor and said long axis is parallel thereto; and

means for marking said concealing surface, said marking means carried by said housing so that said marking means marks said concealing surface when said housing is tilted.

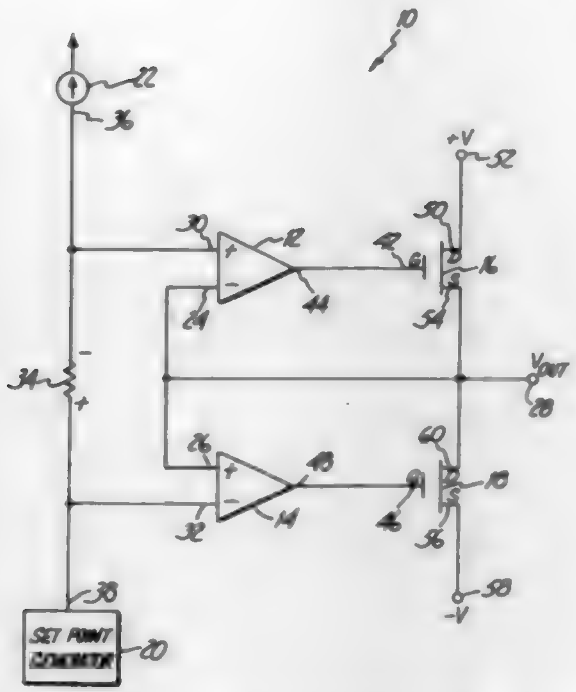
5,317,254
BIPOLAR POWER SUPPLY

Donald R. Olson, Shoreview, Minn., assignor to Micro Control Company, Minneapolis, Minn.

Filed Sep. 17, 1992, Ser. No. 946,545

Int. Cl.⁵ G05F *3/24*

U.S. Cl. 323—316 **6 Claims**



1. A bipolar power supply for selectably providing a voltage from one of a positive voltage source and a negative voltage source at an output terminal, the power supply comprising:

first operational amplifier means having a first input offset voltage, a first input, a second input electrically connecting to the output terminal, and an output providing a first control signal;

second operational amplifier means having a second input offset voltage, a first input electrically connected to the output terminal and the second input of the first operational amplifier means, a second input, and an output providing a second control signal;

voltage offset means electrically connected to both the first input of the first operational amplifier means and the second input of the second operational amplifier means for setting the first input of the first operational amplifier means apart from the second input of the second operational amplifier means by a voltage potential which is designed to prevent simultaneous presence of the first and second control signals, and which exceeds a sum of the first and second input offset voltages;

a first metal oxide semiconductor field effect transistor (MOSFET) electrically connected to the first operational amplifier means and turned on with presence of the first control signal, the positive voltage source and the output terminal;

a second metal oxide semiconductor field effect transistor (MOSFET) electrically connected to the second operational amplifier means and turned on with presence of the second control signal, the negative voltage source and the output terminal;

selector means having an output, for providing a signal to the first and second operational amplifier means to determine the voltage to be provided at the output terminal.

5,317,255
ELECTRIC INSPECTION UNIT USING ANISOTROPICALLY ELECTROCONDUCTIVE SHEET

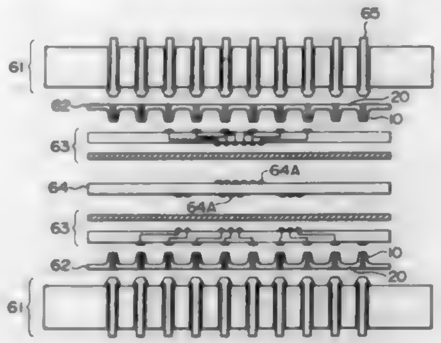
Shinichi Suyama, Iruma, and Yuiti Haruta, Hirakata, both of Japan, assignors to Soken International Consultants Co., Ltd., Tokyo, Japan

Division of Ser. No. 588,944, Sep. 27, 1990, Pat. No. 5,132,058. This application Feb. 11, 1992, Ser. No. 833,729

Claims priority, application Japan, Sep. 29, 1989, 1-252214

Int. Cl.⁵ G01R *31/02*

U.S. Cl. 324—158 P **7 Claims**



1. An electric inspection unit, comprising:

a plurality of electrodes; and

an anisotropically electroconductive first sheet having a first major surface and a second major surface opposing the first major surface, said first sheet being placed so as to be present between some of the electrodes and a base board to be inserted into the unit when the base board is electrically inspected,

wherein the first sheet has a plurality of electroconductive first regions extending in the direction of thickness of the sheet, wherein each of the first regions extends from the second major surface to the first major surface, said first regions are arranged so as to be insulated from one another by second regions, said second regions comprising insulating, elastic, high-molecular-weight substance, each of the electroconductive first regions comprising a bump region forming a bump in the first major surface of the sheet, each of said first regions comprising said insulating, elastic, high-molecular-weight substance and electroconductive particles, said electroconductive particles densely fill the insulating, elastic, high-molecular-weight substance in the first regions.

5,317,256
HIGH-SPEED, HIGH-IMPEDANCE EXTERNAL PHOTOCONDUCTIVE-TYPE SAMPLING PROBE/PULSER

Steven L. Williamson, Ann Arbor, Mich., assignor to University of Michigan, Ann Arbor, Mich.

Filed May 12, 1992, Ser. No. 882,053

Int. Cl.⁵ G01R *1/073*

U.S. Cl. 324—158 P **31 Claims**

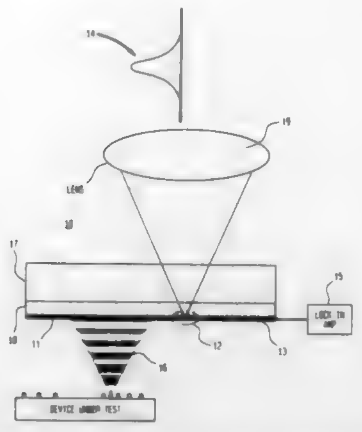
1. A probe for achieving high-impedance electrical communication with a device under test which is to be subjected to measurement of high-speed electrical signals, the probe comprising:

contact electrode means for contacting electrically the device under test;

input/output electrode means for selectably receiving and producing the high-speed electrical signals; and

photoconductive gate means coupled between said input-/output electrode means and said contact electrode means for controlling electrical communication between said input/output electrode means and said contact electrode means in response to an optical signal, said photoconductive gate means being formed as a metal-semiconductor-metal interdigitated electrode on a gate layer of a high-

resistivity semiconductor material having a carrier lifetime of less than approximately 10 ps and a bandgap sufficiently narrow to effect absorption from an optical gate pulse having a duration of less than approximately 10 ps thereby resulting in photoconductivity, said interdigitated electrodes having spacings and widths on the order of 1 μm.



5,317,257
BURN-IN APPARATUS AND BURN-IN BOARD REMOVING METHOD USING MOVABLE COOLING ENCLOSURE

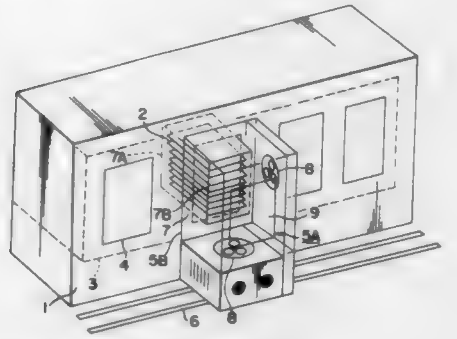
Iwao Sakai, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 715,926, Jun. 14, 1991, abandoned. This application Dec. 29, 1992, Ser. No. 998,775

Claims priority, application Japan, Nov. 28, 1990, 2-322290

Int. Cl.⁵ G01R *1/02*

U.S. Cl. 324—158 F **11 Claims**



1. A burn-in apparatus comprising:

a burn-in apparatus body having a burn-in chamber in which burn-in boards are heated and subjected to a burn-in test; and

a robot for supplying a burn-in boards into and removing the burn-in boards from the burn-in chamber, the robot comprising:

a movable enclosure movable between a position outside of the burn-in chamber and a position inside the burn-in chamber in which the movable enclosure surrounds a burn-in board disposed inside the burn-in chamber; and

a cooling means for cooling the inside of the movable enclosure while the movable enclosure is disposed inside the burn-in chamber.

5,317,258
DEVICE FOR EVALUATING PERIODIC SIGNALS FROM INDUCTIVE PICK-UPS HAVING A PULSE FORMER STAGE INFLUENCED AS A FUNCTION OF THE PICK-UP SIGNAL AMPLITUDE

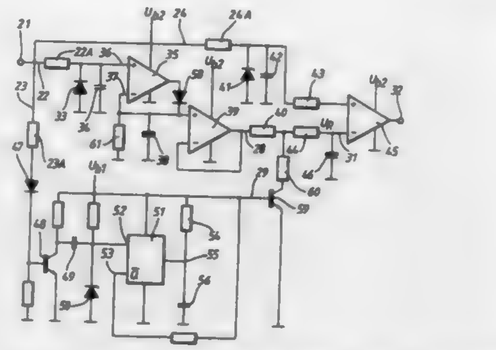
Jürgen Setzer, Illingen; Hans Braun, Stuttgart, and Hermann Stein, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Sep. 21, 1992, Ser. No. 948,087

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1991, 4131128

Int. Cl.⁵ G01N *27/72;* **G01B** *7/14;* **G01P** *3/48, 3/54*

U.S. Cl. 324—225 **12 Claims**



1. Device for evaluating periodic signals from inductive pick-ups, comprising:

a peak detector having an output, and an input to which a pick-up signal can be applied from an output of the inductive pick-up in order to influence, as a function of the pick-up signal amplitude, a transition from a first to a second logic state at an output of a downstream pulse former stage having first and second inputs, where the first input is provideable with variable reference signals and the second input with the pick-up signal;

a pulse generator stage which receives the pick-up signal as an input and generates at an output pulses at a repetition frequency which corresponds to the frequency of the pick-up signal; and

a weighting stage having an output coupled to the pulse former stage, a first input coupled to the output of the peak detector, and a second input coupled to the output of the pulse generator stage, the weighting stage combining the signals from the output of the peak detector and from the output of the pulse generator stage to form said variable reference signal in a predetermined fashion.

5,317,259
DC-BASED MAGNETIC FIELD CONTROLLER

Dale K. Kotter, Shelley; Richard A. Rankin, Ammon, and John P,. Morgan, Idaho Falls, all of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 14, 1990, Ser. No. 522,877

Int. Cl.⁵ G01N *27/72;* **G01R** *33/12, 33/06*

U.S. Cl. 324—251 **7 Claims**

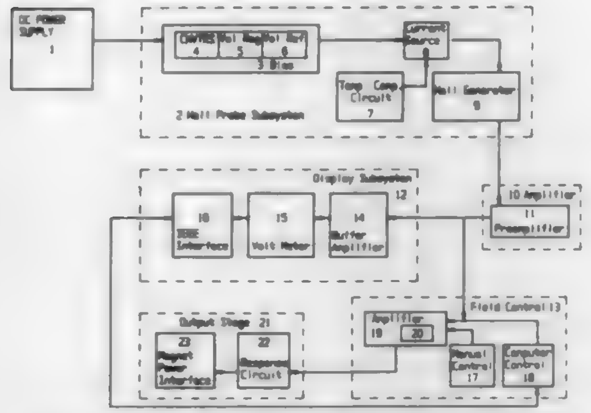
1. An apparatus for the control of a magnetic field comprising:

a dc power supply;

a hall probe subsystem receiving a dc current from said dc power supply and including means for generating a hall effect signal, means for biasing said dc current having a voltage regulator, a precision voltage reference, and a dc-to-dc converter, a temperature compensation circuit, and means for providing a constant current to said means for generating said hall effect signal;

means for amplifying said hall effect signal, having a preamplifier which includes a chopper stabilized preamplifier, said preamplifier adapted to receive said hall effect signal from said hall effect generator and wherein said chopper stabilized preamplifier receiving said hall effect signal and having the ability to further transmit an amplified hall effect signal;

a field control subsystem including means for field control adapted to receive said amplified hall effect signal from said chopper stabilized preamplifier and having the ability to generate a control signal, and said means for field control having a manual field control mode and computer field control mode and wherein while in said computer field control mode of operation said means for field control has the ability to adjust said control signal to compensate for real time monitoring of said magnetic field;



a display subsystem adapted to receive and display said amplified hall effect signal from said chopper stabilized preamplifier, and including an interface means having the ability to receive said amplified hall effect signal, said interface mans including an IEEE interface circuitry having the ability to digitize a magnetic field reading, which allows real time monitoring by said field control subsystem; and

an output controller adapted to receive said control signal from said means for field control, ad said output controller including means for stabilizing said control signal, and means for magnetic field interface, said means for magnetic field interface having the ability to adjust said magnetic field in response to said control signal.

5,317,260

PROCESS FOR GENERATING A PULSE SEQUENCE

Arne Kasten, Karlsruhe, and Günter Laukien, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten, Fed. Rep. of Germany

PCT No. PCT/DE90/00457, § 371 Date Dec. 26, 1991, § 102(e) Date Dec. 26, 1991, PCT Pub. No. WO91/00530, PCT Pub. Date Jan. 10, 1991

PCT Filed Jun. 15, 1990, Ser. No. 781,243

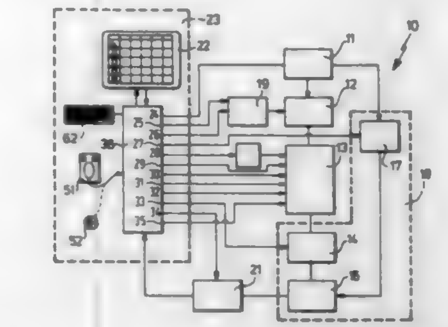
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3920997

Int. Cl.^{5} G01R *33/20*

U.S. Cl. 324—309 **15 Claims**

1. An improved method for generating a magnetic resonance pulse sequence for the investigation of a sample by a magnetic resonance experiment, said method including the steps of triggering a control signal from electronic control means of a magnetic resonance apparatus at a predetermined time to generate a physical quantity having individual properties and a location in time with respect to a common starting point in time; setting in a programmable computer of the magnetic resonance apparatus a parameter set, having parameters, allocated to the physical quantity and to the control signal, the parameter set being processed and stored in the computer, and, during a magnetic resonance pulse sequence, a chronologically controlled retrieval of the parameter set generates the control signal; allocating an image symbol to the parameter set, the image symbol being displayed on a screen of a computer monitor, and attaching a time mark to the image symbol, the time mark also being displayed on the screen, the improvement comprising:

allocating a window to the image symbol; setting the time mark to define a point in time at which the parameter set allocated to the control signal and to the physical quantity is to be retrieved; opening the window to input a particular parameter set, the window being on the screen; and entering data into a window field of the window for setting the parameters of a particular parameter set.



5,317,261

VOLUME-SELECTIVE MAGNETIC RESONANCE IMAGING METHOD AND DEVICE

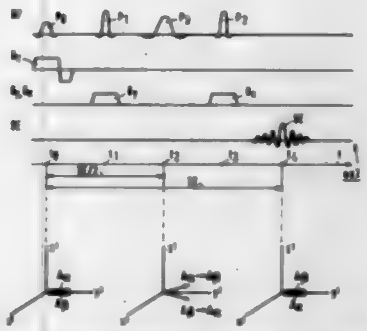
Jan A. Den Hollander; Peter R. Luyten, and Reurt P. Van Stapele, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 12, 1992, Ser. No. 881,906

Claims priority, application European Pat. Off., May 27, 1991, 91201254.9

Int. Cl.^{5} G01V *3/00*

U.S. Cl. 324—309 **8 Claims**



1. A volume-selective magnetic resonance method for determining one of a spectrum and a spectroscopic image of a region of an object which is arranged in a steady, uniform magnetic field, said method comprising applying a volume-selective pulse and gradient sequence to the region of the object to generate magnetic resonance signals, which sequence comprises a 90° excitation pulse followed by first and second 180° pulses, a magnetic field gradient superposed on the steady magnetic field during at least one of the pulses in order to obtain volume-selective resonance signals and one of a chemically selective amplitude and frequency modulated pulse and a broadband 90° pulse between the first and second 180° pulses for refocusing a J-coupling between nuclei in a molecule of the object.

5,317,262

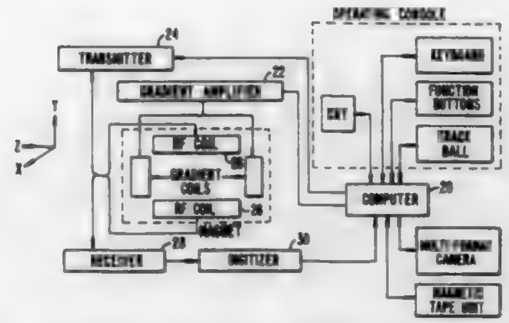
SINGLE SHOT MAGNETIC RESONANCE METHOD TO MEASURE DIFFUSION, FLOW AND/OR MOTION

Chrit T. W. Moonen, Silver Spring, Md., and Peter van Gelderen, Delft, Netherlands, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 5, 1992, Ser. No. 926,010

Int. Cl.^{5} G01V *3/00*

U.S. Cl. 324—309 **10 Claims**



1. A single-shot method for obtaining magnetic resonance signals from a body, the method comprising the steps of:

(a) applying a first radio-frequency (RF) excitation pulse to the body to tip nuclear spins;
(b) applying, after said application of said first RF excitation pulse, a first gradient pulse to the body;
(c) applying a second RF excitation pulse to the body;
(d) applying, after said application of said second RF excitation pulse, a series of consecutive alternating-phase gradient pulses, each gradient pulse having an amplitude and a pulse width;
(e) detecting a series of gradient-recalled echoes created by said series of consecutive alternating-phase gradient pulses, said series of gradient recalled echoes including a particular spin echo; and
(f) ratioing a pair of corresponding ones of said gradient recalled echoes, with said corresponding ones of said pair of gradient recalled echoes symmetric in time with respect to said particular spin echo.

5,317,263

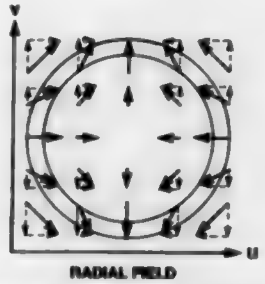
METHOD FOR CREATING A Z-ROTATION USING RADIAL PULSES IN NMR EXPERIMENTS INVOLVING COHERENCE TRANSFORMATIONS

David G. Cory, Boston, and Werner E. Maas, Billerica, both of Mass., assignors to Bruker Instruments, Inc., Billerica, Mass.

Filed Mar. 17, 1993, Ser. No. 32,612

Int. Cl.^{5} G01V *3/00*

U.S. Cl. 324—309 **7 Claims**



1. A composite RF pulse sequence for use in NMR experiments, which sequence causes a spatially-varying spin rotation about the z-axis when applied to a nuclear spin system in a sample and the resulting NMR signal is observed by means of a detection coil having a receiver phase, the pulse sequence comprising in combination:

a first RF pulse that has a uniform RF field strength throughout the sample and a phase relative to the detection coil receiver phase with a spatial dependence such that all possible phase differences are equally represented throughout the sample; and

a homogeneous RF π_x pulse applied subsequent to the first RF pulse.

5,317,264

METHOD FOR PERFORMING MAGNETIC RESONANCE SPECTROSCOPY OR TOMOGRAPHY IN A PRESELECTABLE REGION OF A MATERIAL

Eberhard Rommel, Ulm-Gögglingen, and Rainer Kimmich, Ulm, both of Fed. Rep. of Germany, assignors to Kohler Schmid & Partner, Fed. Rep. of Germany

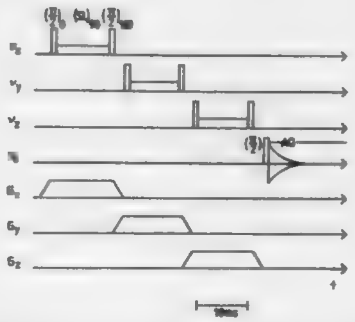
PCT No. PCT/DE90/00190, § 371 Date Sep. 13, 1991, § 102(e) Date Sep. 13, 1991, PCT Pub. No. WO90/10878, PCT Pub. Date Sep. 20, 1990

Continuation of Ser. No. 762,024, Sep. 13, 1991, abandoned. This PCT application Mar. 14, 1990, Ser. No. 64,738

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1989, 3908392

Int. Cl.^{5} G01N *33/20*

U.S. Cl. 324—309 **9 Claims**



1. A method of performing magnetic resonance spectroscopy or tomography in a preselected sample region having a net nuclear magnetization direction and being positioned in a homogeneous external magnetic field having a field direction, said method comprising the steps of:

A. applying a first RF pulse to at least the preselected region, the RF pulse having a direction and magnitude selected to create a first nuclear magnetization component in a direction transverse to the field direction;
B. applying, to refocus the first nuclear magnetization at a time t, a first constant magnetic field gradient having a direction to at least the preselected region for a predetermined time interval following the application of the RF pulse in step A;
C. applying, beginning at time t, a second RF pulse during the predetermined time interval in step B wherein said second rf pulse is a spin lock pulse;
D. applying a third RF pulse to at least the preselected region, the third RF pulse having a direction and magnitude selected to transfer the first nuclear magnetization component into the field direction;
E. removing the first constant magnetic field gradient;
F. applying a fourth RF pulse to at least the preselected region, the fourth RF pulse having a direction and magnitude selected to create a second nuclear magnetization component in a direction transverse to the field direction; and
G. detecting an induction signal produced by the second nuclear magnetization component.

5,317,265

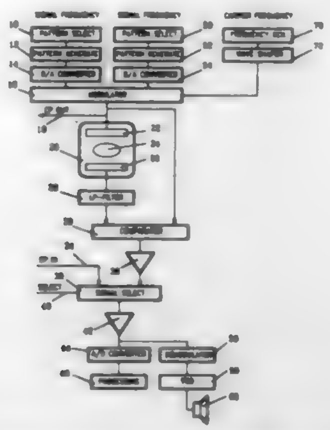
COMPUTERIZED MAGNETIC RESONANCE ANALYZER

Ronald J. Weinstock, Sigrid Lipsett, 2083 Lindengrove St., Westlake Village, Ventura County, Calif. 91361

Filed Sep. 16, 1992, Ser. No. 945,529

Int. Cl.⁵ G01R *33/20*

U.S. Cl. 324—312 **6 Claims**



1. An apparatus for providing a magnetic resonance signal for a matter under test comprising first means for generating a first electrical signal; second means for generating a second electrical signal; modulating means for modulating said second signal with said first signal and providing a third electrical signal;

said third signal having a frequency spectrum between 3 Hz and 14 kHz, first inductor means for generating an electromagnetic field controlled by said third electrical pattern signal, said first inductor means being adapted to subject said matter under test to said electro magnetic field; second inductor means for sensing an electromagnetic field in close proximity to said matter under test and providing a fourth electrical signal, said fourth electrical signal being indicative for the electromagnetic field generated by said first inductor means and said magnetic resonance signal of said matter under test; means for comparing said third electrical signal with said fourth electrical signal and providing a first difference signal, said first difference signal being indicative of the magnetic resonance characteristic of said matter under test; means for analyzing said difference signal.

5,317,266

LOCAL ANTENNA WITH HOMOGENEOUS SENSITIVITY FOR A NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Ralph Meissner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 10, 1992, Ser. No. 974,120

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1991, 4138459; Sep. 21, 1992, 4231584

Int. Cl.⁵ G01R *33/20*

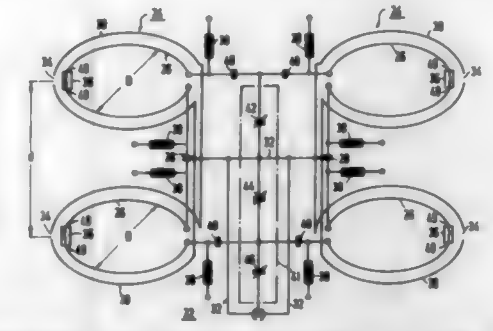
U.S. Cl. 324—318 **10 Claims**

1. A local antenna for transmitting and receiving radio frequency signals in a nuclear magnetic resonance imaging apparatus, said local antenna comprising:

first and second axially spaced sub-antennas each consisting of at least one turn of a conductor and each having the same winding direction;

capacitive means connected in series with and between said first and second sub-antennas for shortening the path length effective for radio frequency signals between said first and second sub-antennas; and

a parallel capacitance connected in parallel with the series-connected first and second sub-antennas and capacitive means, said parallel capacitance and said capacitive means each having a capacitance and the capacitance of said capacitive means and the capacitance of said parallel capacitance being substantially the same.



5,317,267

SPARK PLUG VOLTAGE PROBE FOR USE WITH AN INTERNAL COMBUSTION ENGINE

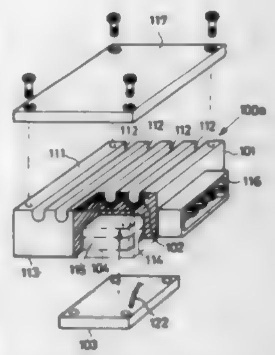
Shigeru Miyata; Hideji Yoshida; Yoshihiro Matsubara; Yasuo Ito, and Takashi Suzuki, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Apr. 9, 1992, Ser. No. 866,812

Claims priority, application Japan, Apr. 12, 1991, 3-080107; Jun. 14, 1991, 3-143531; Jun. 14, 1991, 3-143532; Jul. 8, 1991, 3-167127

Int. Cl.⁵ F02P *17/00;* **G01R** *19/165, 1/06, 15/00*

U.S. Cl. 324—402 **1 Claim**



1. A spark plug voltage probe which detects a voltage applied to a spark plug installed in an internal combustion engine so as to analyze a burning condition in the internal combustion engine on the basis of the voltage applied to the spark plug, the spark plug voltage probe comprising:

an insulator base (**101**) secured to the top of the internal combustion engine, an upper surface (**111**) of the insulator base (**101**) having a groove (**112**) in which a spark plug cable (**105**) is located and a lower surface (**113**) of the insulator base (**101**) having a cavity (**114**) as an accommodation space (**115**) in which electrical circuits are placed in a package substrate (**103**) by means of a resin filler (**104**); and

an electrode plate (**102**) embedded in the insulator base (**101**) along the groove (**112**) and electrically connected to the electrical circuits by way of a lead wire (**122**).

5,317,268

SPARKING VOLTAGE DETECTING DEVICE FOR INTERNAL COMBUSTION ENGINES

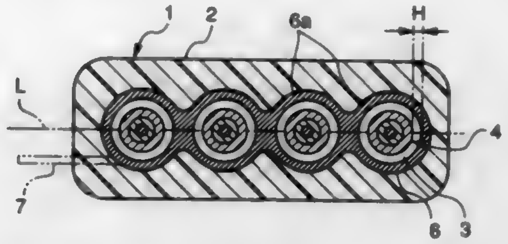
Shigeru Maruyama; Yuichi Shimasaki; Takashi Hisaki; Masaki Kanehiro; Shigeki Baba, and Takuji Ishioka, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1992, Ser. No. 979,687

Claims priority, application Japan, Nov. 28, 1991, 3-339722; Nov. 28, 1991, 3-339724; Nov. 28, 1991, 3-339726

Int. Cl.⁵ G01R *13/42*

U.S. Cl. 324—402 **22 Claims**



1. A sparking voltage detecting device for an internal combustion engine having an ignition system having at least one secondary side high-tension cord, said sparking voltage detecting device being mounted on said secondary side high-tension cord, for detecting sparking voltage generated in said engine, comprising:

a main body formed of an insulating material and having at least one through hole formed therein, said high-tension cord being fitted through said through hole in a liquidtight manner; and

at least one conductive member embedded in said main body at a location radially outward of said through hole and spaced from said high-tension cord by a predetermined distance.

5,317,269

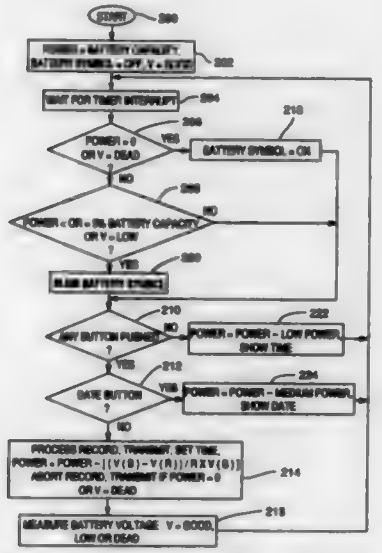
WRIST-WORN ECG MONITOR WITH BATTERY END OF LIFE PREDICTION

Gary N. Mills, Gladstone, and Habib Homayoun, Aloha, both of Oreg., assignors to Instromedix, Inc., Hillsboro, Oreg.

Division of Ser. No. 816,389, Dec. 26, 1991, Pat. No. 5,289,824. This application Jan. 8, 1993, Ser. No. 1,779

Int. Cl.⁵ G01N *27/416*

U.S. Cl. 324—427 **4 Claims**


START
BATTERY SYMBOL = ON
WAIT FOR TIMER INTERRUPT
POWER = 0 OR V = DEAD ?
YES
NO
210
OR V = LOW ?
BLINK BATTERY SYMBOL
ANY BUTTON PUSHED ?
POWER = POWER – LOW POWER, SHOW TIME
DATE BUTTON ?
POWER = POWER – MEDIUM POWER, SHOW DATE
PROCESS RECORD, TRANSMIT, SET TIME,
ABORT RECORD, TRANSMIT IF POWER = 0 OR V = DEAD
MEASURE BATTERY VOLTAGE V = GOOD, LOW OR DEAD
210
212
214
222
224

1. For use with a wrist-worn ECG data monitor capable of monitoring, recording and transmitting ECG data, the monitor having different operational modes controlled by one or more switches, a battery end of life prediction method comprising the following steps:

predetermining a power capacity value for the battery; and repeatedly thereafter:

first measuring the current drain on such battery while the monitor is being supplied with power therefrom, and second measuring the voltage of such battery, said first and said second measuring steps being performed near in time to one another;

first calculating the instantaneous power consumed by the monitor based upon said first and said second measuring steps, and second calculating the cumulative power consumed by such monitor based upon successive ones of said first calculating steps, said second calculating step being performed in such manner that different operational modes of the monitor are accorded different power consumption rating criteria; and

comparing the result of said second calculating with said power capacity value; then

based upon said comparing, determining whether said consumed power is approximately equal to said power capacity value; and if so then

annunciating on the monitor the impending end of life of the battery.

5,317,270

COLD CATHODE IONIZATION VACUUM GAUGE WITH GUARD RING

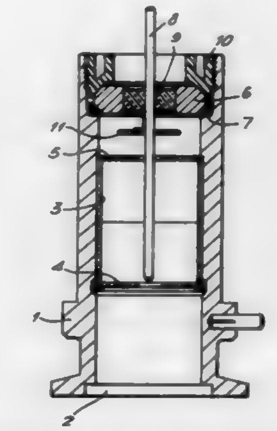
Paul G. Lethbridge, Lewes E. Sussex, England, assignor to The BOC Group plc, Surrey, England

Filed May 28, 1992, Ser. No. 890,058

Claims priority, application United Kingdom, May 31, 1991, 9111747

Int. Cl.⁵ G01L *21/34;* **H01J** *1/88*

U.S. Cl. 324—460 **7 Claims**



1. A gauge head for a vacuum gauge of the ionization type comprising:

an outer cathode sleeve having an inlet at one end for communication with the vacuum;

an anode of rod-like configuration coaxially extending into the cathode sleeve at the other end thereof;

an electrically conductive guard ring interposed between the cathode sleeve and the anode to collect electrical current that would otherwise flow within the gauge head directly from the anode to the outer cathode sleeve;

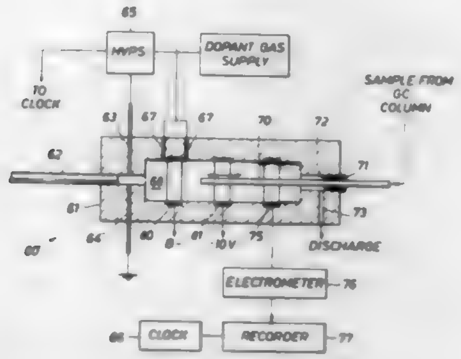
the guard ring located at the other end of said outer cathode sleeve and positioned such that said anode extends therethrough;

anode mounting means for mounting the anode within the guard ring in electrical isolation from one another; and

guard ring connection means for connecting said guard ring to said outer cathode sleeve in electrical isolation from one another.

5,317,271
HIGH VOLTAGE SPARK EXCITATION AND IONIZATION DETECTOR SYSTEM WITH ADJUSTABLE SAMPLE INPUT FOR SENSITIVITY CONTROL

Wayne E. Wentworth, and Stanley D. Stearns, both of Houston, Tex., assignors to Valco Instruments, Co., Houston, Tex.
Continuation-in-part of Ser. No. 662,149, Mar. 28, 1991, Pat. No. 5,153,519. This application Oct. 5, 1992, Ser. No. 956,632
Int. Cl.^{5} G01N *27/62, 27/68*
U.S. Cl. 324—464 **25 Claims**

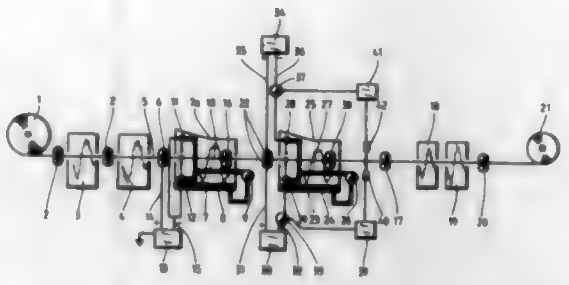


1. A charged particle detector comprising:
(a) a closed chamber having a carrier gas flow inlet at a first end and spaced outlet at a second end to enable gas flow therethrough;
(b) spaced electrodes forming a spark responsive to DC current flow sufficient to enable an electrical spark to be formed between said electrodes locating the spark thereacross, said electrodes being positioned to form a spark in carrier gas flow into said chamber and create charged particles;
(c) a spaced detector electrode in said chamber for collection of charged particles downstream of the spark across the gap wherein the charged particles move toward said detector electrode to enable a current to be formed indicative of charged particle concentration in said chamber; and
(d) an inlet into said chamber for controllably introducing a sample gas flow from a GC source downstream from said spark forming electrodes so that said sample gas flow and said carrier gas flow provide charged particles for said detector electrode.

5,317,272
PROCESS AND APPARATUS EMPLOYING A STREAM OF ELECTROLYTIC LIQUID FOR EXAMINING THE POROSITY OF COATED OBJECTS

Klaus Jorgens, Am Flothen 98, D-5600 Wuppertal 1, Fed. Rep. of Germany
Filed Aug. 13, 1992, Ser. No. 929,788
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1991, 4127740
Int. Cl.^{5} G01N *27/00, 15/08;* **C25D** *5/00;* **G01R** *31/00*
U.S. Cl. 324—558 **19 Claims**

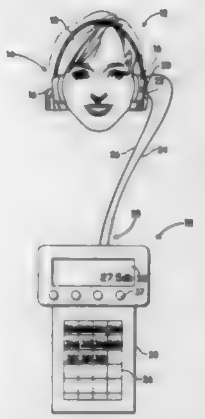
1. A process for testing the porosity of an electrically conductive object having a first coated surface which has been coated by being subject to electrocoating with a water-based enamel, which process comprises:
making electrical contact with the object to form a first pole for a test voltage;
applying an uninterrupted stream of an electrolytic liquid composed of the water-based enamel or its permeate derived through ultrafiltration to the first coated surface of the object to form a second pole for the test voltage;
applying the test voltage to the first and second poles; and



measuring the current flowing from the first pole through the stream of liquid and the coating to the second pole to test the porosity of the coating.

5,317,273
HEARING PROTECTION DEVICE EVALUATION APPARATUS

William J. Hanson, Bolton, and Peter R. Teare, Westborough, both of Mass., assignors to Liberty Mutual, Boston, Mass.
Filed Oct. 22, 1992, Ser. No. 964,778
Int. Cl.^{5} H04R *29/00*
U.S. Cl. 324—616 **18 Claims**



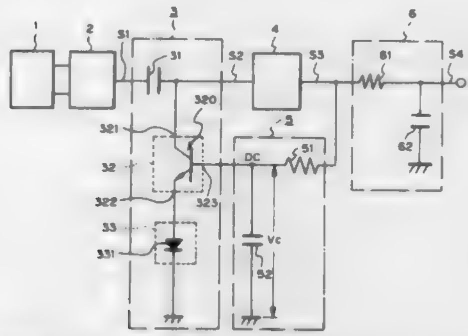
1. A portable hearing protection device measuring apparatus for determining the noise attenuation of a muff type hearing protection device worn by a person in a noisy environment, said apparatus comprising:
two microphones, one for detecting noise outside a muff, the other for detecting noise inside the muff, said microphones detecting noise received by each microphone simultaneously and providing input signals;
circuitry for receiving the input signals and for providing an output including a single number output representing a difference between the noise detected by the two microphones; and
a display for displaying the single number output.

5,317,274
HUMIDITY METER

Shiro Nakagawa, Chiba, and Atsuko Tsuchida, Saitama, both of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Dec. 8, 1992, Ser. No. 986,688
Claims priority, application Japan, Dec. 13, 1991, 3-110095[U]
Int. Cl.^{5} G01W *1/00*
U.S. Cl. 324—678 **8 Claims**

1. A humidity meter comprising;

a humidity sensor (1) which provides impedance depending upon humidity to be measured,
a humidity-frequency converter (2) for providing an alternating signal of frequency which depends upon the impedance of said humidity sensor (1),
a differentiation circuit (3) coupled with output of said humidity-frequency converter (2) for providing a differentiated signal by differentiating of output of said humidity-frequency converter (2).
a wave-form shaping circuit (4) coupled with output of said differentiation circuit (3) for providing an output pulse when an output of said differentiation circuit exceeds a predetermined threshold level,
said differentiation circuit (3) and said wave-form shaping circuit (4) comprising a pulse width modulator for controlling pulse width of said alternating signal,
a feed back means (5) for providing a control potential at an output of said wave-form shaping circuit (4) to said differentiation circuit (3) to adjust the time constant of said differentiation circuit (3),

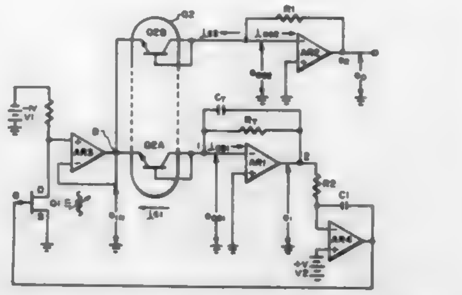


an integrator (6) coupled with the output of said wave-form shaping circuit (4) for providing a potential proportional to frequency and pulse width of the output of said wave-form shaping circuit (4),
an output terminal coupled with the output of said integrator (6) providing measured humidity,
said differentiation circuit (3) comprising an capacitor (31) with one end coupled with the output of said humidity-frequency converter (2), and a series circuit of a variable impedance element (32) having a control input (323) coupled with said fee back means (5), and a non-linear impedance element (33) having larger impedance when the potential applied thereto is low as compared to when the potential applied thereto is high, said series circuit being connected between the other end of said capacitor (31) and ground.

5,317,275
CONDUCTANCE MEASUREMENT CIRCUIT WITH WIDE DYNAMIC RANGE

Bruce E. Mount, Diamond Bar, and Myron Von Esch, Chino, both of Calif., assignors to Orbital Sciences Corporation, Dulles, Va.
Filed Jan. 13, 1992, Ser. No. 820,457
Int. Cl.^{5} G01R *27/26*
U.S. Cl. 324—692 **19 Claims**

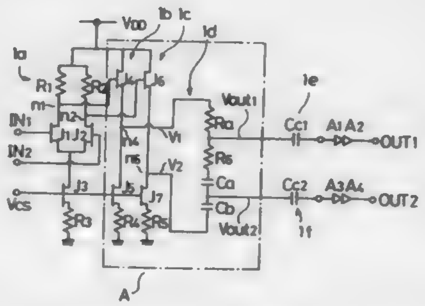
1. A circuit for measuring the conductance of a solution under test which contains biological growth media where an increase in the conductance of the solution indicates growth, or multiplication, of bacteriological colonies and in which a pair of spaced-apart electrodes are placed for applying current to said solution, comprising,
first means connected to said electrodes for applying current to said electrodes and for maintaining a voltage drop at a predetermined value regardless of any change in conductance of said solution,
second means connected to said first means for adjusting the current necessary to maintain said voltage drop at said predetermined value,
third means connected to said second means responsive to said second means to provide a current output responsive to the change in voltage drop so that the output of said second means remains constant,



said second and third means including means which responds to a small change in voltage drop provides a large current output to produce a wide range of conductance measurement, and
fourth means connected to said third means for producing an output proportional to conductance of said solution.

5,317,276
PHASE SHIFTER

Kazuya Yamamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 5, 1993, Ser. No. 102,428
Claims priority, application Japan, Aug. 11, 1992, 4-236557
Int. Cl.^{5} H03K *5/00, 5/13*
U.S. Cl. 328—155 **10 Claims**



1. A phase shifter receiving an input signal and producing two output signals having a 90° phase difference from each other comprising:
first and second input nodes for respectively receiving first and second input signals having opposite phases;
a first serial connection of a first resistor and a second resistor, connected at a resistor node, said first and second resistors having the same resistance values, a first end of said first serial connection being connected to said first input node;
a second serial connection of a first capacitor and a second capacitor, said first and second capacitors having the same capacitance values and being connected at a capacitor node, said second serial connection being connected to the second end of said first serial connection and said second input node; and
first and second output nodes respectively connected to the resistor node and the capacitor node, producing output signals having a 90° phase difference from each other.

5,317,277

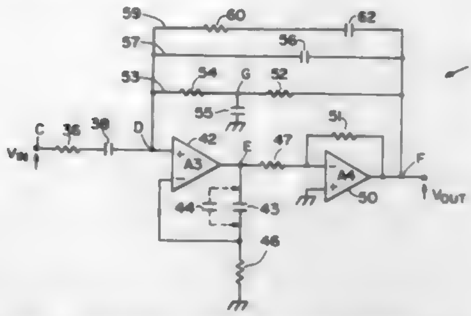
POWER AMPLIFYING APPARATUS FOR SUPPLYING A.C. SIGNALS HAVING A MAXIMUM LOOP GAIN AT A DESIRED FREQUENCY

George A. Cavigelli, Lexington, Mass., assignor to Doble Engineering Company, Watertown, Mass.

Filed Dec. 8, 1992, Ser. No. 986,762

Int. Cl.⁵ H03F *1/34*

U.S. Cl. 330—109 **15 Claims**



1. Power amplifying apparatus for supplying A.C. signals having a maximum loop gain at a desired frequency, said apparatus comprising:

band pass network including first and second cascaded amplifiers,

said amplifiers including multiple feedback loops with multiple resistors and capacitors,

said feedback loops being constructed and arranged to stabilize the output A.C. signals and to establish predetermined bandwidth of said network,

a capacitor-resistor feedback loop including a capacitor and a resistor connected in series,

said capacitor-resistor feedback loop arranged to connect the output of the second amplifier and the input of the first amplifier, and

the capacitor and the resistor of said capacitor-resistor feedback loop selected to maximize the loop gain of said amplifying apparatus at said desired frequency in said bandwidth.

5,317,278

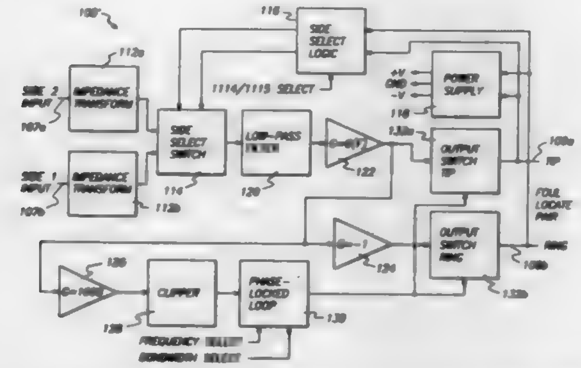
SWITCHED ACTIVE FAULT LOCATE FILTER

Albert H. Miller, Carmichael, and Maynard A. Wright, Citrus Heights, both of Calif., assignors to RC Concepts, Inc., Foresthill, Calif.

Continuation of Ser. No. 557,603, Jul. 23, 1990, abandoned. This application Apr. 21, 1992, Ser. No. 873,599

Int. Cl.⁵ H04B *17/02;* H03K *11/00*

U.S. Cl. 328—167 **13 Claims**



1. In a telephone network having a plurality of regenerators, a fault locate filter, comprising:

a constant gain amplifier providing a constant gain amplified signal matched to a plurality of test frequencies wherein an input signal comprises a selected one of the test frequencies;

a phase-locked loop detecting the selected test frequency in the amplified signal; and

a switch controlled by the phase-locked loop wherein only detection of the selected frequency causes the switch to be activated so as to gate the amplified signal onto a test line, wherein the input signal is received from a T-carrier line.

5,317,279

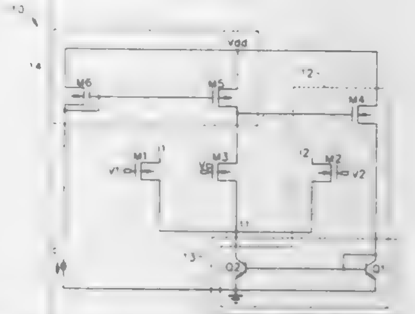
LINEAR VOLTAGE TO CURRENT CONVERTER INCLUDING FEEDBACK NETWORK

Seyed R. Zarabadi, Kokomo, Ind., and Mohammed Ismail, Columbus, Ohio, assignors to Ohio State University, Columbus, Ohio

Filed Dec. 31, 1992, Ser. No. 999,316

Int. Cl.⁵ H03F *3/45*

U.S. Cl. 330—253 **32 Claims**



1. A voltage to current converter comprising:

first, second, and third field effect transistors (FETs), the sources of which are electrically connected to define a common source node;

first and second voltage inputs electrically connected to the gate of said first FET and the gate of said second FET, respectively;

first and second current outputs electrically connected to the drain of said first FET and the drain of said second FET, respectively; and

a feedback network, electrically connected between the drain of said third FET and the common source node for maintaining constant current through said third FET.

5,317,280

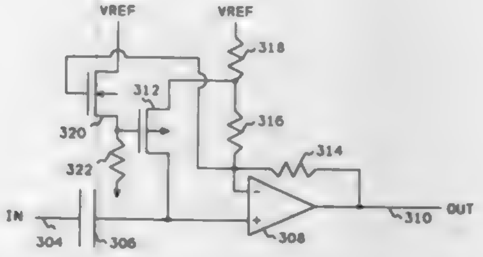
HIGH IMPEDANCE CIRCUIT USING PFET

Robert A. Zimmer, and Charles E. Moore, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 21, 1993, Ser. No. 125,045

Int. Cl.⁵ H03F *3/45*

U.S. Cl. 330—261 **11 Claims**



1. A high impedance circuit for biasing a non-inverted input to an operational amplifier, said circuit comprising:

a p-channel field effect transistor having a source connection thereof connected to said non-inverted input to said operational amplifier, and a drain connection thereof connected to a supply voltage; and

a source follower circuit having an input connected to an inverting input of said operation al amplifier, and having an output connected to a gate of said p-channel field effect transistor.

5,317,281

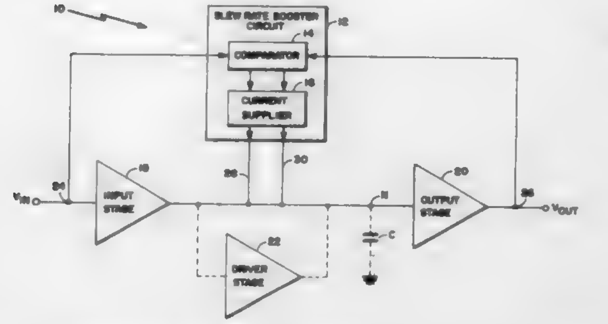
SLEW RATE BOOSTER CIRCUIT

Charles L. Vinn, Mipitas, and Yihe Huang, Palo Alto, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 12, 1993, Ser. No. 3,361

Int. Cl.⁵ H03F *3/26*

U.S. Cl. 330—265 **9 Claims**



1. A circuit for increasing the slew rate on an amplifier circuit comprising:

means for comparing an input signal of said amplifier circuit and an output signal of said amplifier circuit and selectively providing a control signal when the difference in the voltage levels of said signals exceeds a predetermined threshold; and

means for supplying a current into the amplifier circuit in response to said control signal wherein, when said difference in levels of said signals is less than said threshold, said supply means is off and does not provide current to said amplifier and, when the difference in the voltage levels of said signals exceeds said predetermined threshold, said supplying means is activated and supplies current to said amplifier in accordance with said control signal to increase the slew rate of said amplifier.

5,317,282

TETRODE BIASING CIRCUIT

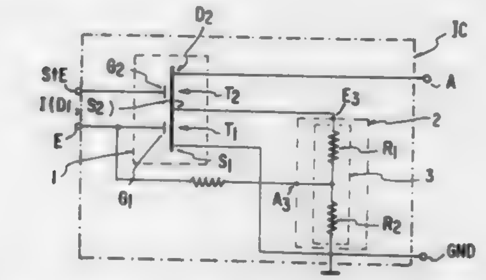
Wilfried Quast, Ederstadt, Fed. Rep. of Germany, assignor to Temic Telefunken microelectronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Sep. 30, 1992, Ser. No. 953,718

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1991, 4134176

Int. Cl.⁵ A03F *3/16*

U.S. Cl. 330—277 **13 Claims**



1. A semiconductor array having a tetrode integrated in a semiconductor element, said tetrode comprising a first and a second field-effect transistor having a common semiconductor area that forms the drain electrode of said first field-effect transistor and the source electrode of said second field-effect transistor, wherein said semiconductor array has as a feedback element a three-pole array integrated in said semiconductor element, wherein the input of said three-pole array is connected to said common semiconductor area of said tetrode, and wherein the output of said three-pole array is connected to the semiconductor area forming the gate electrode of said first field-effect transistor of said tetrode.

5,317,283

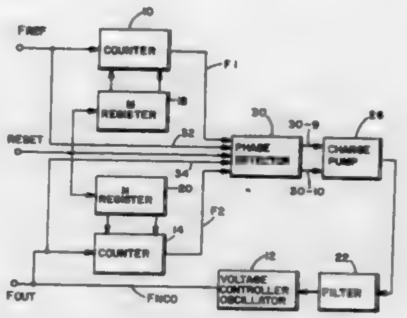
METHOD TO REDUCE NOISE IN PLL FREQUENCY SYNTHESIS

Veijo S. Korhonen, Oulu, Finland, assignor to Nokia Mobile Phones, Ltd., Salo, Finland

Filed Jun. 8, 1993, Ser. No. 73,314

Int. Cl.⁵ H03L *7/089*

U.S. Cl. 331—1 A **10 Claims**



1. A phase locked loop circuit comprising:

storing means for storing first and second predetermined numbers,

counting means connected to said storing means for providing a first signal in response to counting substantially said first predetermined number of cycles of a reference signal and for further providing a second signal in response to counting substantially said second predetermined number of cycles of an output signal,

phase detection means connected to said first and second signals of said counting means, to said reference signal and to said output signal wherein said reference signal is controlled by said first counting means signal and said output signal is controlled by said second counting means signal for providing a phase difference signal in logic state between said reference signal and said output signal,

and loop means connecting said phase detection means and said counting means for providing said output signal having a frequency proportional to said phase difference signal logic state.

5,317,284

WIDE BAND, LOW NOISE, FINE STEP TUNING, PHASE LOCKED LOOP FREQUENCY SYNTHESIZER

Steve S. Yang, Chatsworth, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 8, 1993, Ser. No. 15,957

Int. Cl.⁵ H03L *7/00*

U.S. Cl. 331—2 **20 Claims**

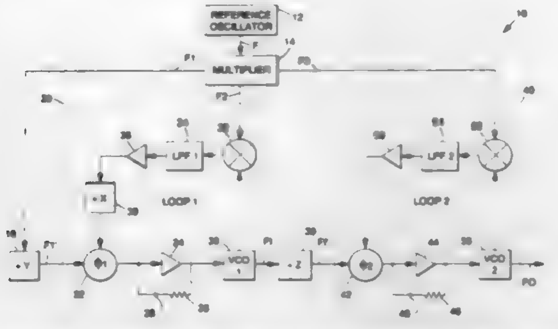
1. Apparatus comprising:

reference frequency means for providing a plurality of reference frequency signals having predetermined reference frequencies F1, F2, F3;

first frequency shifting means coupled to the reference frequency means for shifting the frequency of the first frequency signal at frequency F1 to provide a frequency shifted reference frequency signal at frequency F1';

first phase locked loop means coupled to the reference frequency means for receiving the frequency shifted reference frequency signal at frequency F1' and the second reference frequency signal at frequency F2, and for providing an intermediate output signal at frequency FI in response thereto;

second frequency shifting means coupled to the first phase locked loop means for shifting the frequency of the intermediate frequency signal at frequency FI to provide a frequency shifted intermediate frequency signal at frequency FI′; and

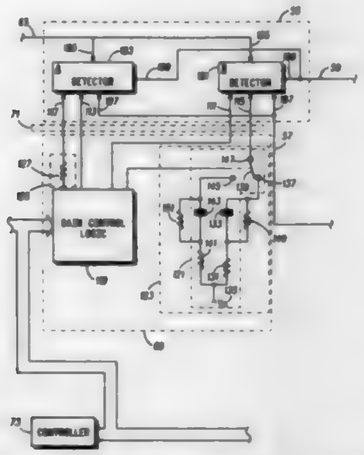


second phase locked loop means coupled to the reference frequency means and to the second frequency shifting means for receiving the third reference frequency signal at frequency F3 and the frequency shifted intermediate signal at frequency FI′ and for providing an output signal of the frequency synthesizer at frequency FO in response thereto.

5,317,285
FREQUENCY SYNTHESIZER EMPLOYING A CONTINUOUSLY ADAPTIVE PHASE DETECTOR AND METHOD

Yin-Kwong Chan, Surrey, Canada, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1993, Ser. No. 23,839
Int. Cl.⁵ H04B *3/10*
U.S. Cl. 331—16 **20 Claims**



1. A frequency synthesizer arranged in a phase locked loop fashion to provide an output signal with a preselected frequency within a controlled lock time from a voltage controlled oscillator, comprising:

phase detector means having a controllable gain, for providing an error signal that is proportional to said controllable gain and that corresponds to a phase difference between a reference signal and a feedback signal, said error signal as processed determining the preselected frequency of the voltage controlled oscillator, said feedback signal corresponding to the preselected frequency;

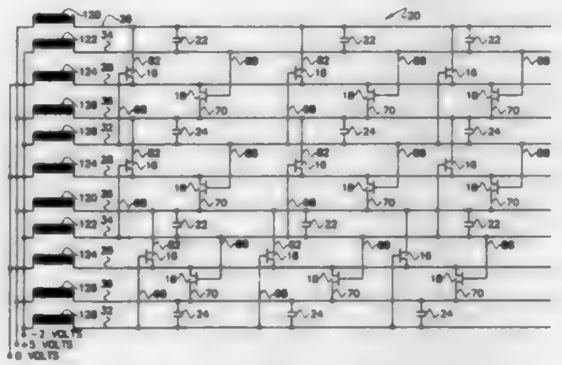
adapt means, coupled to said phase detector means, for setting said controllable gain to an adapt value; and

tracking means, coupled to said phase detector means, for setting said controllable gain to a tracking value by adjusting said controllable gain in a substantially continuous and monotonic fashion from said adapt value to said tracking value.

5,317,286
POWER COMBINING OSCILLATOR

John J. Geddes, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 9, 1992, Ser. No. 973,350
Int. Cl.⁵ H03B *27/00, 5/00*
U.S. Cl. 331—56 **13 Claims**



13. A power combining oscillator comprising:

antenna means for radiating electromagnetic energy, wherein said antenna means comprises a plurality of first conducting means for conducting current;

a plurality of oscillating means, connected to the plurality of first conducting means, for generating oscillation signals to be emanated by said antenna means;

a plurality of second conducting means, connected to said plurality of oscillating means and capacitively connected to the first plurality of conducting means, for feeding back oscillation signals from the first conducting means to said plurality of oscillating means;

a plurality of third conducting means, connected to said plurality of oscillating means, for sustaining operation ability of said oscillating means; and

a mirror means, proximate to said antenna means, for forming a resonant cavity with said antenna means; and

wherein:

said power combining oscillator is formed on an integrated circuit;

the dimensions of and the distances among first, second and third pluralities of conducting means determine a resonant frequency and an amount of feedback for sustaining oscillations of said plurality of oscillating means;

said power combining oscillator is capable of emanating electromagnetic radiation at frequencies greater than 30 gigahertz; and

said plurality of oscillating means is an array of unit oscillators, each unit oscillator comprising a plurality of transistors having a feedback loop sufficient to sustain oscillation of the unit oscillation.

5,317,287
LOW-GAIN, RANGE PROGRAMMABLE, TEMPERATURE COMPENSATED VOLTAGE CONTROLLED RING OSCILLATOR

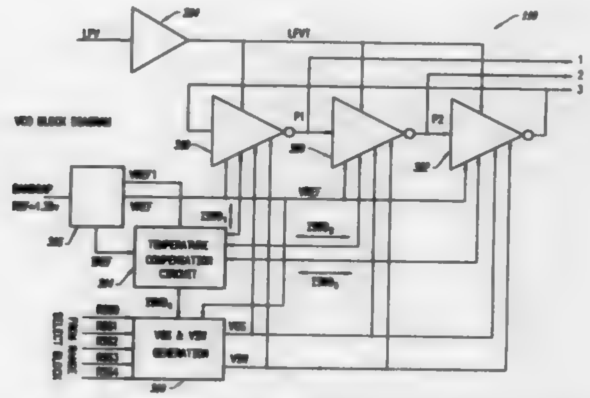
Michael A. Brown, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara City, Calif.

Filed Jul. 16, 1992, Ser. No. 914,977
Int. Cl.⁵ H03B *5/04;* **H03L** *1/02, 7/099*
U.S. Cl. 331—57 **6 Claims**

1. A voltage controlled oscillator for generating an oscillator

output signal which is independent of changes in surrounding temperature, the voltage controlled oscillator comprising:

a plurality of inverter elements connected in series in a ring configuration such that each inverter element generates an oscillator signal in response to an oscillator signal provided by the previous inverter element in the series, each inverter element also being responsive to a first reference voltage, a delta temperature current provided from a plurality of delta temperature currents, a first bias voltage, and a second bias voltage, the frequency of the oscillator signal provided by each inverter element varying in response to a loop filter voltage provided to the inverter element;



voltage translator means for generating the first reference voltage and a second reference voltage in response to a temperature independent bandgap voltage;

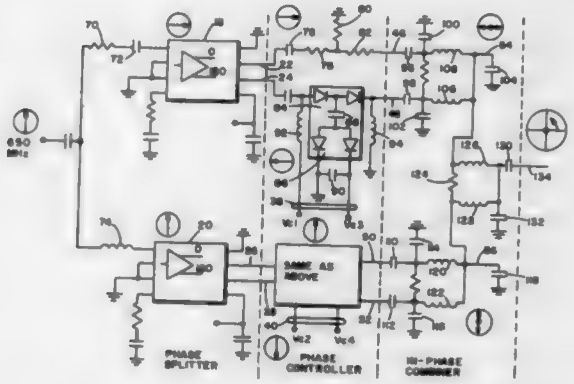
voltage generation means for generating the first bias voltage and the second bias voltage in response to one of a plurality of range select signals, the first reference voltage, and one of the plurality of delta temperature currents; and

temperature compensation means for sourcing and sinking the plurality of delta temperature currents in response to the second reference voltage.

5,317,288
CONTINUOUSLY VARIABLE ELECTRONICALLY CONTROLLED PHASE SHIFT CIRCUIT

Ming L. Yung, Los Altos; Bernard M. Albrecht, Jr., Sunnyvale; Nicholas L. Muhlhauser, Los Gatos, and Stephen T. Herbusky, Santa Clara, all of Calif., assignors to Space Systems/-Loral, Inc., Palo Alto, Calif.

Filed Dec. 15, 1992, Ser. No. 990,903
Int. Cl.⁵ H03C *3/00, 3/40;* **H03H** *7/20*
U.S. Cl. 332—144 **8 Claims**



1. A phase shift circuit for providing an output signal in response to an input signal to provide an adjustable shift of the phase of said input signal over a 360 degree range comprising:

means responsive to an input signal for splitting the phase of said input signal into four separate signals that are equal in amplitude and 90 degrees out of phase with each other,

an attenuation means responsive to said four separate signals for selectively attenuating at least one of said four separate signals in response to at least one applied control signal, said attenuation means including a first attenuating circuit means responsive to a first pair of said four separate signals from said splitting means, said first pair of said signals being 180 degrees out of phase with each other, for selectively attenuating one of said first pair of signals in response to a first control signal applied to said first attenuation circuit means, and a second attenuation circuit means responsive to a second pair of said four separate signals from said splitting means, said second pair of signals being 180 degrees of out phase with each other, for selectively attenuating one of said second pair of signals in response to a second control signal applied to said second attenuation circuit means,

a combining means for combining said signals from said attenuation means into a single output signal having a phase shift determined by the amount of attenuation of said at least one of said separate signals with respect to the other ones of said four separate signals, said single output signal having a resultant phase that is phase shifted with respect to said input signal by a selected amount of phase within a 360 degree range as determined by said amount of attenuation,

wherein said combining means includes a first combining circuit means for combining said first pair of signals from said first attenuation circuit means into one signal having a phase shift determined by the amount of attenuation of said attenuated one of said first pair of signals with respect to the unattenuated one of said pairs of signal,

a second combining circuit means for combining said second pair of signals from said second attenuation circuit means into one signal having a phase shift determined by the amount of attenuation of said attenuated one of said second pair of signals with respect to the unattenuated one of said pair of signals,

and a third combining circuit means responsive to said output signals from said first and second combining means for combining said signals therefrom into said single output signal having a resultant phase that is phase shifted with respect to said input signal by a selected amount of phase within a 360 degree range as determined by said amounts of attenuation,

wherein said phase splitting means includes a capacitance element responsive to said input signal to said phase shift circuit for providing an output signal on a first output lead, and an inductance element responsive to said input signal to said phase shift circuit for providing an output signal on a second output lead, said output signals on said first and second output leads being 90 degrees apart in phase.

5,317,289
FREQUENCY-FLUCTUATING INTERFERENCE REMOVED RECEIVER

Yoshihiro Konishi, Sagamihara; Masahito Asa, and Hideki Fujiwara, both of Ichikawa, all of Japan, assignors to Uniden Corporation, Ichikawa City, Japan

Continuation-in-part of Ser. No. 835,558, Feb. 14, 1992, Pat. No. 5,223,807. This application Mar. 9, 1993, Ser. No. 29,943
Int. Cl.⁵ H03H *7/07*
U.S. Cl. 333—17.1 **11 Claims**

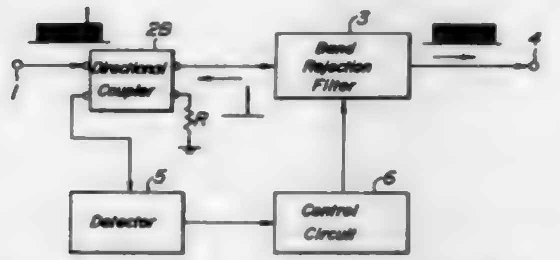
1. A frequency-fluctuating interference removed receiver for communication, wherein a frequency fluctuating interference wave intermixed into a predetermined frequency range of an input wave for communication is frequency-selectively removed, said receiver comprising:

a variable narrow band rejection filter means having a variable rejection band and a control terminal for receiving a control signal that controls a central frequency of said rejection band,

a detector means,

a directional delivering means for receiving said input wave, said delivering device being connected to said filter means and said detector means and providing said input wave to said filter means, said delivering means being a directional coupler,

said filter means frequency-selectively absorbing a narrow band component of said input wave in accordance with said rejection band, so as to present zero-impedance with respect to said narrow band component, and passing through other components of said input wave, said narrow band component corresponding to said frequency-fluctuating interference wave,



said delivering means receiving and delivering said narrow band component, reflected by impedance mismatch caused by zero-impedance present by said filter means, to said detector means,

said detector means providing an output having a variable level that is determined by said control signal applied to said control terminal of said filter means that controls said central frequency of said rejection band, and

a control circuit means connected between said detector means and said control terminal of said filter means, for providing, in response to said output of said detector means, said control signal to said control terminal of said filter means to shift said rejection band of said filter means in a direction which causes said output of said detector means to increase.

5,317,290

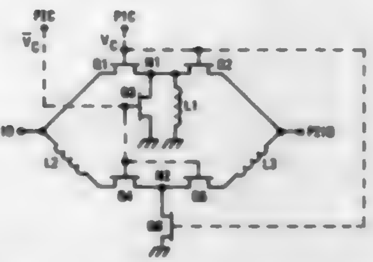
MMIC (MONOLITHIC MICROWAVE INTEGRATED CIRCUIT) SWITCHABLE BIDIRECTIONAL PHASE SHIFT NETWORK

Anthony W. Jacomb-Hood, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 19, 1987, Ser. No. 110,015

Int. Cl.^{5} H03H *11/20*

U.S. Cl. 333—164 **5 Claims**



1. A monolithic microwave integrated circuit (MMIC) switchable bidirectional LC phase shift network, exhibiting a desired differential insertion phase between states over a range of operating frequencies comprising:

A. a substrate of Gallium Arsenide having a ground plane on the underside thereof,

B. a first input-output port,

C. a second input-output port,

D. six field effect transistors (Q1–Q6) each having a pair of principal electrodes and a gate for application of a control potential, each transistor, when the gate is in a "high" state exhibiting principally a bidirectional low resistance between principal electrodes, and when the gate is in a "low" state exhibiting principally a bidirectional capacitive reactance between principal electrodes,

E. one principal electrode of each transistor of the set Q1 Q2 and Q3 being coupled to a first node N1, the other principal electrode of transistor Q1 being connected to said first port, the other principal electrode of transistor Q2 being connected to said second port, and the other principal electrode of transistor Q3 being connected to substrate ground,

F. three inductors L1, L2 and L3; a first inductor L1 being connected between node N1 and substrate ground,

G. the second and third inductors L2, L3 having equal values, the inductor L2 having one terminal connected to said first port, and the inductor L3 having one terminal connected to said second port,

H. one principal electrode of each transistor of the set Q4 Q5 and Q6 being connected to a second node N2, the other principal electrode of transistor Q4 being connected to the other terminal of said second inductor L2, the other principal electrode of transistor Q5 being connected to the other terminal of said third inductor L3, and the other principal electrode of transistor Q6 being connected to substrate ground,

I. control means for achieving a differential phase shift, comprising a first control terminal (P1C) connected to the gates of transistors Q1, Q2 and Q6 for application to a first control signal, and a second control terminal (P2C) connected to the gates of transistors Q3, Q4 and Q5 for application to a second control signal, complimentary to the first control signal,

the application of a "high" from said first control terminal (P1C) simultaneously with the application of a "low" from said second control terminal P2C causing a first, band pass in which each of the transistors Q1, Q2 and Q6 becomes conductive and equivalent to a resistor of low value and each of the transistors Q3, Q4, and Q5 becomes non-conductive and equivalent to a capacitor, the relatively low equivalent resistances of the transistors being small in relation to the reactive impedances to form an equivalent network consisting of three shunt branches, the first a series LC branch, the second a parallel LC branch, and the third a series LC branch, said equivalent network being approximating a single shunt LC branch exhibiting a small phase delay or phase advance varying linearly over a given operating range of frequencies,

the application of a "low" from said first control terminal (P1C) simultaneously with the application of a "high" from said second control terminal (P2C) causing a second, low pass state in which each of the transistors Q1, Q2 and Q6 becomes non-conductive and equivalent to a capacitor, and each of the transistors Q3, Q4 and Q5 becomes conductive and equivalent to a resistor of low value, the relatively low equivalent resistances of the transistors being small in relation to the reactive impedances to form an equivalent network approximating a second order pi phase delay network exhibiting a larger phase delay than in the first state, and varying linearly over said given operating range of frequencies,

the slopes of the insertion phase versus frequency in said two states being substantially equal to maintain a constant insertion phase difference over said given operating range.

5,317,291

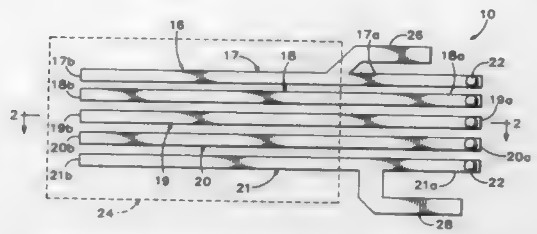
MICROSTRIP FILTER WITH REDUCED GROUND PLANE

Allen F. Podell, Palo Alto, Calif., assignor to Pacific Monolithics, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 882,447, May 12, 1992, abandoned. This application Feb. 19, 1993, Ser. No. 20,044

Int. Cl.^{5} H01P *1/203, 1/205*

U.S. Cl. 333—203 **4 Claims**



1. A microstrip comb-line filter for microwave signals comprising:

a planar dielectric substrate;

a planar ground member positioned on one side of the dielectric substrate and extending along a first portion of the substrate, there being a second portion of the substrate along which the ground member does not extend, and forming thereby a nonconductive cavity;

a plurality of parallel, electromagnetically coupled and spaced-apart, elongate microstrip conductors positioned on the other side of the dielectric substrate, one common end of each of the conductors being positioned adjacent to the first portion of the substrate and connected to the ground member, and the other end of each of the conductors being electrically spaced from the ground member and positioned adjacent to the second portion of the substrate, the nonconductive cavity associated with the second portion of the substrate extending at least half the length of each of the conductors and being sufficiently long to produce a high-pass characteristic above the band-pass zero in the filter;

an input port connected to a first conductor adjacent to the one end of said first conductor for receiving the microwave signals; and

an output port connected to a second conductor adjacent to the one end of said second conductor for transmitting the filtered microwave signals.

5,317,292

DEVICE WITH FLEXIBLE, STRIPLINE CONDUCTORS AND A METHOD OF MANUFACTURING SUCH A DEVICE

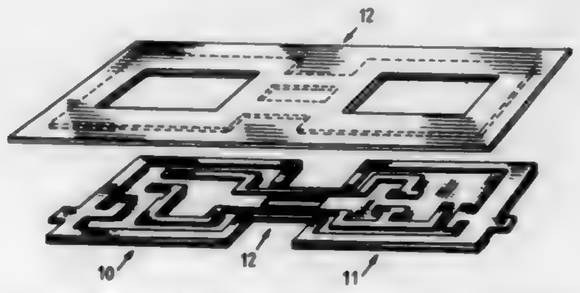
Karl-Erik Leeb, Djurhamn, Sweden, assignor to Telefonaktibolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 12, 1992, Ser. No. 897,813

Claims priority, application Sweden, Jun. 14, 1991, 91018341

Int. Cl.^{5} H01P *3/08*

U.S. Cl. 333—238 **14 Claims**



1. A device with flexible stripline conductors enclosed by dielectric and ground planes, wherein

a conductor laminate is arranged comprising

a first dielectric isolating substrate,

said flexible stripline conductors being located on one of said laminate's surfaces and etched from said conductor laminate's conductive layer, and

a window opening, being cut between said conductor laminate's conductors, and

a ground plane laminate is arranged comprising

a second dielectric isolating substrate, being cut similarly to said conductor laminate's conductive layer only with a slightly larger dimension and

a conductive layer such as a copper foil being applied to a first side of said second dielectric isolating substrate,

wherein said conductive layers and all laminates are attached to each other for instance by means of adhesive bonding, with the stripline conductors of said conductor laminate being applied to said dielectric isolating substrate layer of said ground plane laminate, and

wherein a metallization is applied to a side of said device, which is opposite to the conductive surface of said ground plane laminate and is electrically connected to said conductive surface in a manner which completely encloses said conductors and said substrates by an electrically conductive layer.

5,317,293

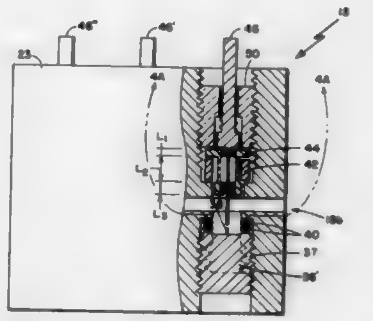
WAVEGUIDE SWITCH CIRCUIT WITH IMPROVED SWITCHING AND TUNING CAPABILITY

Donald F. Bacon, Chelmsford, and Howard M. Richards, Dracut, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 20, 1991, Ser. No. 812,198

Int. Cl.^{5} H01P *1/15*

U.S. Cl. 333—258 **15 Claims**



1. A circuit comprising:

a waveguide transmission line having an input port, an output port, a first wall surface having an aperture communicating with a first cavity disposed therein and a second wall surface having a second cavity disposed therein said first and second cavities being disposed along the waveguide transmission line;

an electrically conductive member disposed in a first region of said second cavity;

a diode having a conducting state and a nonconducting state and a first and a second electrode, the first electrode disposed on a first surface of said electrically conductive member;

an electrically conductive post having a first end disposed in said first cavity and having a second end disposed in said second cavity with said second end electrically contacting the second electrode of said diode;

means for providing a short circuit impedance characteristic when said diode is in a conducting state and alternatively an open circuit impedance characteristic when said diode is in a nonconducting state between the electrically conductive post and the second wall surface of the waveguide transmission line; and

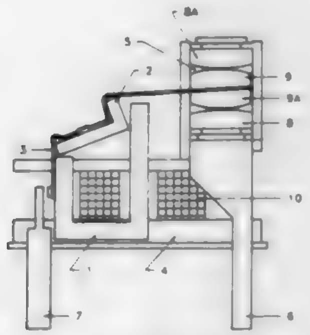
means for providing a low impedance characteristic between said electrically conductive post and said first wall

surface of the waveguide transmission line to RF signals propagating along said waveguide transmission line, said providing means comprising:
an RF choke means, having a portion of the electrically conductive post disposed therethrough, for providing a first region having a high impedance characteristic and for providing a second region having a low impedance characteristic; and
means for disposing the RF choke means for providing the low impedance characteristic precisely at the aperture of the first wall surface.

5,317,294
ELECTROMAGNETIC RELAY

Jacques Vielot, Southfield, Mich., assignor to Magnetic Technology, Inc., Southfield, Mich.

Filed Aug. 16, 1991, Ser. No. 745,595
Int. Cl.^{5} H01H *51/22*
U.S. Cl. 335—80 **2 Claims**



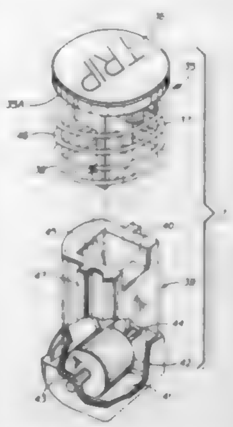
1. An electromagnetic relay comprising:
an electromagnetic coil wound about a bobbin;
a stamped J-shaped magnetic pole piece integrally forming the core and yoke portions;
said core portion having a first section entirely within the bobbin and a second section extending beyond the top of the bobbin;
said second section extending substantially a quarter of the length of the said first section or as determined by the mechanical requirement derived from the tangential force;
said yoke portion, extending parallel to the core portion being substantially the same length as said first core section;
an L-shaped armature carrying a contact spring;
said L-shaped armature having first and second legs;
said first leg pivotally mounted about the end of the yoke;
said second leg being in close proximity and parallel to the said second core portion.

5,317,295
MOLDED CASE CIRCUIT BREAKER TRIP-TO-TEST BUTTON

David A. Ferullo, Bristol; Roger J. Morgan, Simsbury, and James L. Rosen, West Hartford, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 8, 1993, Ser. No. 28,202
Int. Cl.^{5} H01H *9/00*
U.S. Cl. 335—172 **9 Claims**

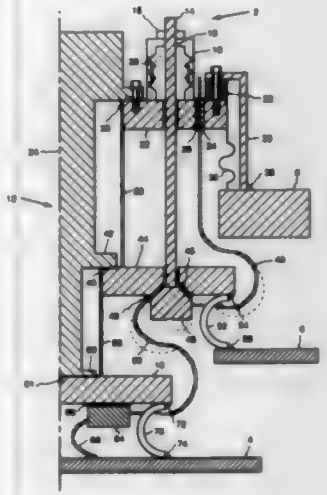
1. A circuit breaker comprising:
a plastic circuit breaker case and a plastic circuit breaker cover;
a pair of contacts within said circuit breaker case arranged for automatic separation by means of an operating mechanism;
an operating handle extending through said circuit breaker cover for manually turning said contacts between open and closed conditions;
a trip unit within said circuit breaker cover determining overcurrent conditions through a protected circuit and activating said operating mechanism to separate said contacts and interrupt circuit current; and
a trip button arranged within said circuit breaker cover and extending within said circuit breaker case, said trip button including a top piece formed of an electrically-insulative material and having one end externally accessible from said circuit breaker cover and an opposite end extending within said circuit breaker cover, said trip bottom also including a bottom piece open at a top end and at a bottom end thereof, said top end receiving said opposite end of said of said top piece and said bottom end supporting a roller member to contact a trip bar associated with said operating mechanism and thereby articulate said operating mechanism for test purposes.



5,317,296
DEMOUNTABLE CONDUCTION COOLED CURRENT LEADS FOR REFRIGERATED SUPERCONDUCTING MAGNETS

Mark E. Vermilyea, Schenectady, and Bizhan Dorri, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1991, Ser. No. 759,336
Int. Cl.^{5} H01F *1/00*
U.S. Cl. 335—216 **21 Claims**

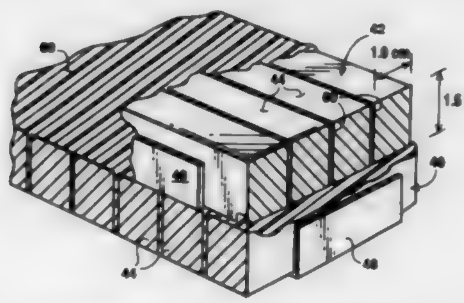


1. A refrigerated superconducting magnet, said magnet comprising:
a magnet cartridge means;
a thermal shield means located adjacent said magnet cartridge means;
at least two refrigerator stage station means located adjacent said magnet cartridge means and said thermal shield means;
a movable actuator means having first and second ends and located adjacent said stage station means;
a connector means operatively connected to said second end of said actuator means and capable of contacting one of said stage station means; and
a current lead means which thermally and electrically connects said connector means and thermally and electrically connects one of said connector means with said magnet cartridge means.

5,317,297
MRI MAGNET WITH ROBUST LAMINATED MAGNETIC CIRCUIT MEMBER AND METHOD OF MAKING SAME

Leon Kaufman, San Francisco; Joseph W. Carlson, Kensington, both of Calif.; Shigemasu Okada, Osaka, and Shigeo Hashimoto, Hyogo, both of Japan, assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 546,112, Jul. 2, 1990, abandoned. This application Oct. 26, 1993, Ser. No. 141,701
Int. Cl.^{5} H01F *3/00*
U.S. Cl. 335—297 **60 Claims**



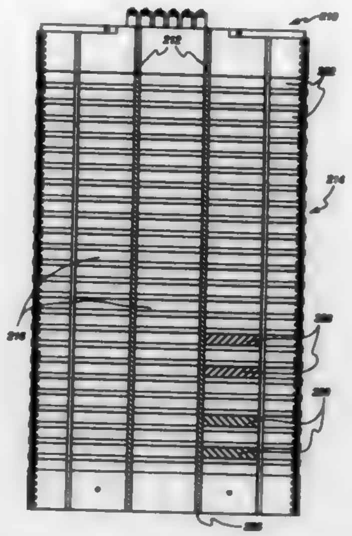
1. An MRI magnet providing an NMR polarizing field B_o within a patient image volume in an air gap between a pair of pole pieces, each pole piece having a laminated magnetic circuit member comprising:
a layer of magnetically permeable bar-shaped laminations bonded together into a unitary structure having a major surface disposed perpendicular to the polarizing field B_o and electrically insulated from each other;
individual ones of said bar-shaped laminations being dimensioned with a length that is perpendicular to said polarizing field B_o and a width in the lamination direction that is greater than 2 millimeters and being spaced sufficiently close to each other as to provide a fill factor of magnetically permeable material substantially in excess of fifty per cent.

5,317,298
APPARATUS AND METHOD FOR PASSIVE SHIMMING OF A SUPERCONDUCTING MAGNET WHICH IMAGES HUMAN LIMBS

Bizhan Dorri, Clifton Park; Evangelos T. Laskaris; Kenneth G. Herd, both of Schenectady, and Raymond E. Gabis, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1993, Ser. No. 346
Int. Cl.^{5} G01V *3/00*
U.S. Cl. 335—301 **4 Claims**

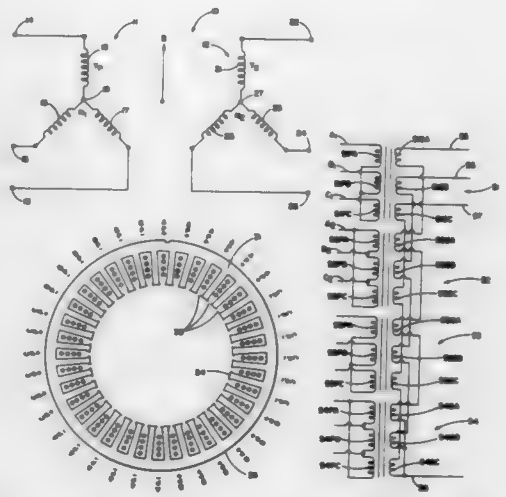
1. An integral passive shim/gradient coil assembly, wherein said assembly is comprised of:
a gradient coil means;
a passive shim support means integrally attached to said gradient coil means;
shim locations located substantially adjacent to said shim support means;
a passive shim means placed within a predetermined number of shim locations;
a shim cover means operatively connected to said passive shim means wherein said shim cover means is further comprised of: rectangular covers which measure approximately 2.281 inches long by 0.375 inch wide by 0.005 inch thick; and
a holding means for holding said shim cover means in place over said passive shim means wherein said holding means is further comprised of: an adhesive tape.



5,317,299
ELECTROMAGNETIC TRANSFORMER

P. John Dhyanchand; Jayant Vaidya; Rajhunath Mokadam, and Richard Arbanella, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 3, 1991, Ser. No. 725,487
Int. Cl.^{5} H01F *33/00;* H02J *3/00*
U.S. Cl. 336—5 **21 Claims**



1. A rotating field summing transformer comprising:
first and second core means for providing a path for electromagnetic flux;
first primary winding means and first secondary winding means wound with respect to said first core means such that said first primary winding means and said first secondary winding means form a transformer for producing a rotating electromagnetic field when said first primary winding means is energized which induces a first second-

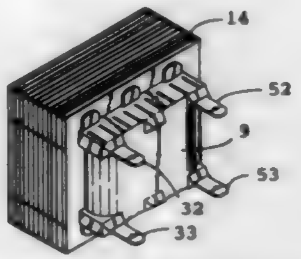
ary output in said first secondary winding means, said first primary winding means and said first secondary winding means being stationary with respect to one another;

second primary winding means and second secondary winding means wound with respect to said second core means such that said second primary winding means and said second secondary winding means form a transformer for producing a rotating electromagnetic field when said second primary winding means is energized which induces a second secondary output in said second secondary winding means, said second primary winding means and said second secondary winding means being stationary with respect to one another; and,

connecting means for connecting said first and second secondary winding means together so that said first and second secondary outputs add.

5,317,300
ENCAPSULATED HIGH EFFICIENCY TRANSFORMER AND POWER SUPPLY

Robert P. Boesel, 1695 Valentine Ave., St. Paul, Minn. 55112
Continuation-in-part of Ser. No. 492,821, Mar. 13, 1990, Pat. No. 5,088,186. This application Jul. 2, 1991, Ser. No. 724,926
Int. Cl.^{5} H01F *27/02, 27/30*
U.S. Cl. 336—96 **18 Claims**



1. A high efficiency fully encapsulated power transformer apparatus comprising:

(a) a magnetic core member having a plurality of generally planar E and I core pieces, said core pieces being stacked such that planar surfaces of opposing core pieces generally abut one another;

(b) a unitary bobbin having a plurality of terminal receiving slot means, said bobbin having a first flange, a second flange, and a third flange, wherein said first and second flanges form a first winding form, and second and third flanges form a second winding form, said bobbin including walls forming a tapered central aperture for accepting and retaining said core pieces, said aperture being tapered on at least one wall that is generally parallel to said planar surfaces of said core pieces, whereby said core pieces are compressed in a direction generally perpendicular to the planar surfaces thereof, said bobbin having a plurality of extended tabs protruding from said first and third flanges;

(c) a first winding on said first winding form;

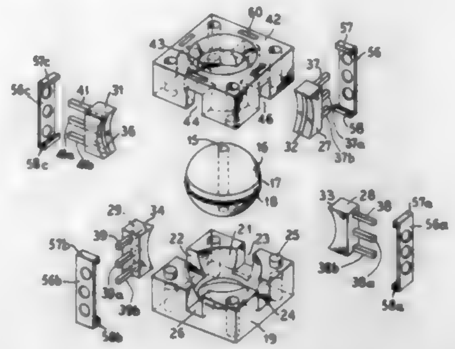
(d) a second winding on said second winding form;

(e) a terminal means inserted into said terminal slot means for electrical connection to said first and second windings; and

(f) a bobbin and core member encapsulation formed of an encapsulant substantially covering and substantially conforming to said bobbin and said core member, said encapsulant being formed of a material selected from the group consisting of a thermoplastic material, a thermosetting material, or mixtures thereof.

5,317,301
JOY STICK

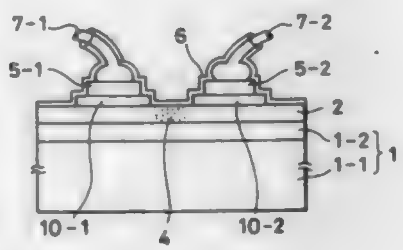
Dean DeVolpi, 603 Columbine, Lisle, Ill. 60532
Filed Jul. 15, 1992, Ser. No. 913,200
Int. Cl.^{5} H01C *10/16*
U.S. Cl. 338—128 **6 Claims**



1. A joy stick comprising, lower and upper ball receiving members, a ball mounted between said lower and upper ball receiving members, a conductive path attached about the periphery of the ball, a slot formed in said lower and upper ball receiving members, and a contact member receivable in said slot, said contact member formed with an arcuate resistor which is engageable with said conductive path attached to said ball, including spring biasing means connected to said lower and upper ball receiving members and to said contact member to bias it toward said conductive path, including a plurality of slots in said lower and upper members, a plurality of contact members receivable in said plurality of slots and each formed with arcuate resistors engageable with said conductive path on said ball, and said spring biasing means biasing said plurality of contact members toward said conductive path, and wherein said ball is formed with an annular groove, and said conductive path comprises a coil of electrical conductive material mounted in said groove.

5,317,302
DIAMOND THERMISTOR

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Division of Ser. No. 579,536, Sep. 10, 1990, Pat. No. 5,183,530. This application Sep. 16, 1992, Ser. No. 945,365
Claims priority, application Japan, Sep. 11, 1989, 1-235139
The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.
Int. Cl.^{5} H01C *7/10*
U.S. Cl. 338—225 D **13 Claims**



1. A diamond thermistor comprising:

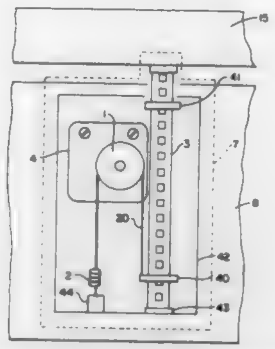
a diamond layer;

a pair of impurity doped diamond layers formed on said diamond layer and spaced apart from one another; and

a pair of electrodes respectively formed on said impurity doped diamond layers.

5,317,303
BATTERYLESS SENSOR USED IN SECURITY APPLICATIONS

Gerald F. Ross, Longboat Key, Fla.; Richard M. Mara, Tewksbury; Kenneth W. Robbins, North Reading, both of Mass., and Robert J. Fontana, Rockville, Md., assignors to Anro Engineering, Inc., Lexington, Mass. and Multispectral Solutions, Inc., Gaithersburg, Md.
Filed Sep. 11, 1992, Ser. No. 943,715
Int. Cl.^{5} G08B *1/08, 13/08*
U.S. Cl. 340—539 **10 Claims**



1. A system including a number of batteryless sensors and a single receiver for detecting an intrusion at any one of said sensors, each of said sensors comprises:

a sensor enclosure having an opening at atop end and a spring anchor at a bottom end;

a rod positioned parallel to an intersection of two sides of said enclosure and having a top end protruding through said opening;

a spring connected to said spring anchor;

a pulley;

a toothed belt having one end connected to said spring and another end connected to said rod at a bottom end in such a manner as to be wrapped around said pulley for a predetermined angle, said rod protruding through said opening a first predetermined distance under tension from said spring when said rod is in a first position, and said rod protruding through said opening a second predetermined distance under tension from said spring when said rod is being held in second position by a protected body,

generator means having said pulley positioned so that rotation of said pulley by said belt when said rod moves between said first position and said second position, and between said second position and said first position, generates a predetermined voltage;

electronic means coupled to said generator means and responsive to said predetermined voltage for generating a coded rf signal identifying said sensor;

said single receiver responsive to said coded rf signal from said any one of said sensors for signaling that said intrusion occurred and identifying a site of said intrusion.

5,317,304
PROGRAMMABLE MICROPROCESSOR BASED MOTION-SENSITIVE ALARM

Alexander K. Choi, Cupertino, Calif., assignor to Sonicpro International, Inc., Santa Clara, Calif.
Continuation-in-part of Ser. No. 642,478, Jan. 17, 1991, abandoned. This application Oct. 23, 1991, Ser. No. 781,599
Int. Cl.^{5} G08B *13/14*
U.S. Cl. 340—571 **35 Claims**

1. An apparatus for detecting tampering and theft in and of equipment, said apparatus operating in combination with a power supply for supplying power to said apparatus, said apparatus comprising:

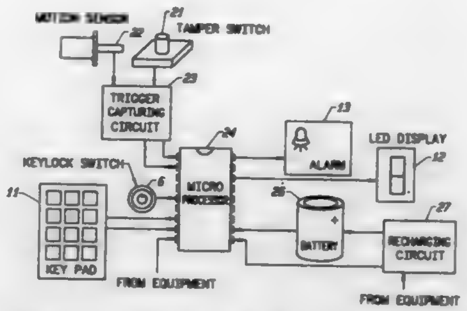
power source means for obtaining power from said power supply;

user interface means for user changeable program setting of a predetermined motion value in said apparatus;

means for maintaining memory of said predetermined motion value after said value has been set;

motion sensor means for detecting motion of said equipment; and

logic means for determining whether a motion detected by said motion sensor means is equivalent to said predetermined motion value when said motion sensor means detects that said detected motion has occurred,

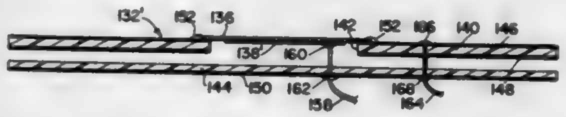


said logic means being operatively coupled to said motion sensor means for detecting motion and to said power source means for supplying power,

said motion sensor means, said logic means, said user interface means, and said means for maintaining memory of said predetermined motion value drawing substantially no power from said power source means until said motion sensor means detects that said detected motion has occurred.

5,317,305
PERSONAL ALARM DEVICE WITH VIBRATING ACCELEROMETER MOTION DETECTOR AND PLANAR PIEZOELECTRIC HI-LEVEL SOUND GENERATOR

James P. Campman, P.O. Box 167, Transfer, Pa. 16154
Filed Jan. 30, 1992, Ser. No. 828,170
Int. Cl.^{5} G08B *23/00;* H01L *41/04*
U.S. Cl. 340—573 **21 Claims**



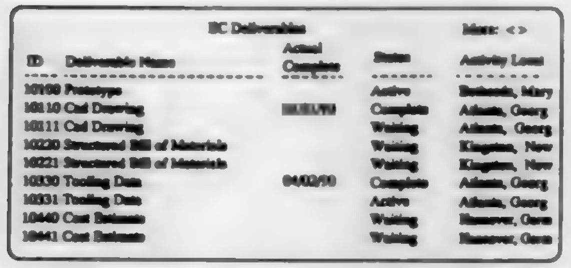
1. A personal alert safety system having condition responsive sensor means and alarm means indicative of personal safety conditions comprising: a small size portable casing, said casing comprising an internal divided two part chamber, the first part being a watertight sealed cavity and the second part being a sound resonating cavity with surrounding walls including at least one sound port providing a passage from the interior to the exterior of said resonating cavity; a sealed flat wall means comprising a dividing wall between said two chamber parts; electric and electronic control and operating circuitry means disposed in said first part of said chamber including a source of electric power, two series connected, single pole, push button control switches each having "on" and "off" positions and being spring biased to the "off" position, and flip-flop electronic switching means controlled by said control switches to enable said circuitry means to be turned "on" and "off" respectively by a sequence of simultaneous operations of said two control switches; said sealed flat wall means comprising a thin flat sound generating piezoelectric transducer device electrically connected to said circuitry means; a motion detector, and means rigidly mounting said motion detector within said first part of said two part chamber, said motion detector generating a sine wave voltage output a characteristic of

which changes responsive to motion of said casing; and said circuitry means further including a tone oscillator, a rate oscillator and an amplifier, connected between said motion detector and said piezoelectric sound generating transducer and responsive to the output of said motion detector to cause a specific high intensity sweeping alarm signal to be emitted when the circuitry means is turned on and in the event that the casing is motionless.

5,317,306
SYSTEM AND METHOD FOR DYNAMIC CONTROL OF HORIZONTAL SCROLLING

Robert L. Abraham, Marietta, and Vincent J. Osisek, Acworth, both of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1991, Ser. No. 741,294
Int. Cl.^{5} G09G *1/16*
U.S. Cl. 345—118 **29 Claims**



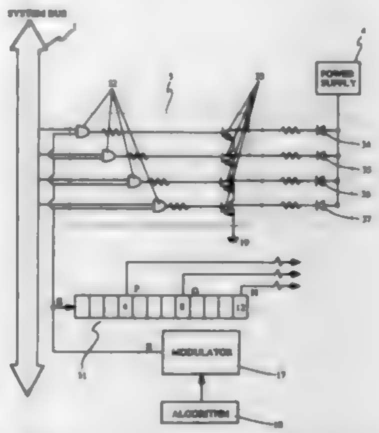
27. A computer program for the dynamic control of horizontal scrolling of data from a stored list in a window on a display screen, said program method comprising:
- means for adjusting the size of the window available for the display of data in the stored list in response to a first user command;
- means for receiving a second user command to scroll through the data in the stored list in a specified direction;
- means for determining if the stored list can be scrolled in the direction specified by the second user command;
- means for determining the dynamic width of the window available for the display of data;
- means for determining a must display column in said stored list and reducing the space available in the window by the width of the must display column;
- means for scanning through the columns in the stored list to determine the columns that are designated as sticky and placing said sticky columns in the window; and
- means for placing said must display column and additional columns from said stored list in the available space remaining in the window until the window is full.

5,317,307
METHOD FOR PULSE WIDTH MODULATION OF LEDS WITH POWER DEMAND LOAD LEVELING

Laurence C. Thomas, Jr., Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 22, 1992, Ser. No. 887,777
Int. Cl.^{5} G08B *5/22*
U.S. Cl. 340—815.45 **8 Claims**

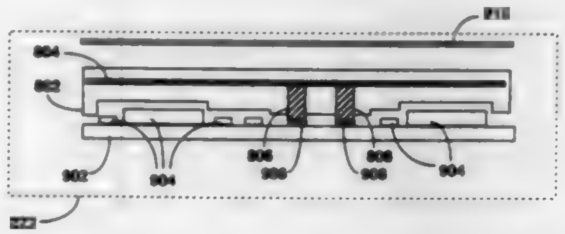
8. A method for pulse width modulation switching of groups of LED's in an LED array of a computer to produce power demand load leveling of a power source for said LED's, said LED array comprising first, second, third and fourth groups of LED's, said method comprising the steps of:
- supplying control signals via control lines from processing sections of said computer to first, second, third and fourth gating control logic elements corresponding to said groups of LED's, each of said gating control logic elements comprising a plurality of AND gates each having as a first input said control signal of a respective control line and an output coupled in series to an individual LED via a transistor, said transistor having a base terminal coupled to said AND gate, a collector terminal coupled in series to a power supply via a respective LED and an emitter terminal coupled to ground;
- providing a first modulating signal having a preset period as output from a pulse width modulator, said modulator being driven by a waveform algorithm capable of varying said period of said first modulating signal;
- supplying said first signal as input to a shift register comprising twelve cells;
- selecting as output from a fourth, eighth and twelfth cell of said shift register second, third and fourth signals delayed from said first signal by once, twice and three times a predetermined time, respectively, said predetermined time corresponding to twenty five percent of said period of said first modulating signal;
- modulating control signals of said first, second, third and fourth groups of LED's by applying said first, second, third and fourth signals as a second input to said AND gates of said first, second, third and fourth gating control logic elements, respectively, to activate no more than one of said groups of LED's at any one time, said period of said first modulating signal being selected such that said predetermined time is sufficiently long to permit an output current of said power supply to stabilize between consecutive activations.



5,317,308
CIRCUIT SUPPORTING MECHANICAL SHOCK ISOLATOR FOR RADIO RECEIVER

David A. Tribbey, Boynton Beach; Allen D. Hertz, Boca Raton, and Mario A. Rivas, W. Palm Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 4, 1992, Ser. No. 878,126
Int. Cl.^{5} H04Q *7/00*
U.S. Cl. 340—825.44 **20 Claims**

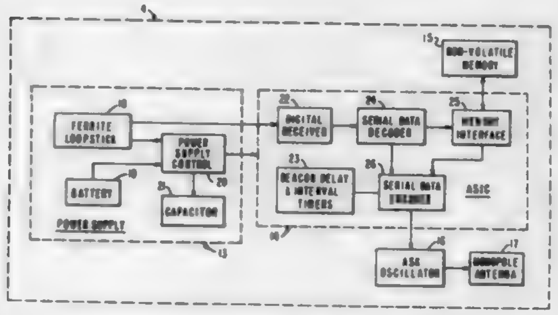


11. A communication receiver for receiving transmitted messages, comprising:
- a housing;
- a circuit supporting substrate within the housing and mechanically coupled thereto;
- electronic circuitry, at least a portion of which being mechanically coupled to the circuit supporting substrate, including receiving means for receiving a message; and
- mechanical shock isolation means within the housing and mechanically coupled to the circuit supporting substrate for substantially increasing the natural frequency of vibration of the circuit supporting substrate, the mechanical shock isolation means including an electrically conductive layer being electrically coupled to the electronic circuitry,
- wherein the electronic circuitry includes control means capable of being electrically coupled to the electrically conductive layer of the mechanical shock isolation means to form an electrical loop circuit for sensing electrical integrity of the electrical loop circuit to determine when the mechanical shock isolation means is misplaced or missing in the housing.

5,317,309
DUAL MODE ELECTRONIC IDENTIFICATION SYSTEM

Leonard C. Vercellotti, Oakmont; Alan F. Mandel, Mt. Lebanon; Richard J. Ravas, Penn Twp., Westmoreland County; John C. Schlotterer, Murrysville, and James A. Neuner, Richland Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 609,983, Nov. 6, 1990, abandoned. This application Sep. 21, 1992, Ser. No. 948,345
Int. Cl.^{5} G08C *19/00;* **G01S** *1/00*
U.S. Cl. 340—825.54 **20 Claims**

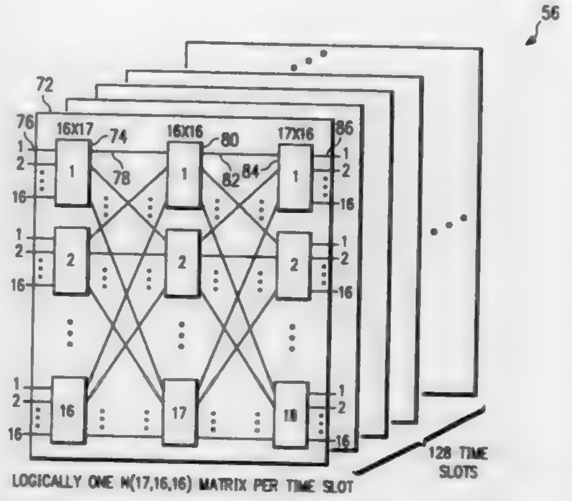


1. A dual mode electronic identification system comprising:
- an access transmitter means for providing an RF interrogation signal;
- an access receiver means for responding to an identity signal having identifying data encoded therein;
- an electronic identification tag having supply means for providing electrical power to said tag, memory means for storing identifying data associated with said tag, RF receiver means cooperable with said supply means for receiving and processing said RF interrogation signal, transmitter means for transmitting the identity signal containing said identifying data associated with said tag in response to a receipt by said receiver means of said RF interrogation signal and for periodically transmitting a beacon signal containing said identifying data associated with said tag in response to a lack of a receipt by said receiver means of said RF interrogation signal, and timer means for allowing transmission of said beacon signal to be initiated only after the elapse of a predetermined time period during which said RF interrogation signal is not perceived by said receiver means;
- beacon signal processing means for detecting said beacon signal and determining therefrom the physical position of said tag and for decoding said identifying data associated with said tag; and wherein
- said predetermined time period is greater than the time intervals between said periodic transmissions of said beacon signal.

5,317,310
METHOD AND SYSTEM FOR SELECTING AN OPTIMAL REARRANGEMENT SEQUENCE FOR A CROSS-CONNECT COMMUNICATION MATRIX

Edward K. Bowdon, Plano, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed May 14, 1992, Ser. No. 882,912
Int. Cl.^{5} H04Q *11/04*
U.S. Cl. 340—826 **8 Claims**



5. A method for determining the minimum number of rearrangements for connecting an input gate to an output gate through a rearrangeably blocked communications matrix, comprising the steps of:
- representing the communications matrix by an array having a first dimension and a second dimension, said first dimension representing a plurality of input stage switches of the communications matrix, said second dimension representing a plurality of output stage switches of the communications matrix, said array having a plurality of cells, each of said cells representing an intersection of said first dimension with said second dimension and representing a possible center stage switch connection through the communications matrix;
- identifying a rearrangeably blocked center stage switch of the communications matrix in terms of said first dimension and said second dimension;
- identifying in a plurality of center stage switches a plurality of pairs of center stage switches, each pair comprising a first center stage switch and a second center stage switch, said first center stage switch not being associated with the same output stage switch as said blocked center stage switch, said second center stage switch not being associated with the same input stage switch as said blocked center stage switch;
- determining, in parallel, for each of said pairs, the number of rearrangement steps necessary for first and second rearrangement sequences through the communications matrix, said first rearrangement sequence being from said input switch to said output switch by using said first center stage switch first and said second rearrangement sequence through the communications matrix being from said input switch to said output switch by using said second center stage switch first; and
- terminating said determining first and second rearrangement sequence steps upon determining the shorter of said first rearrangement sequence and said second rearrangement sequence.

5,317,311
TRAFFIC CONGESTION MONITORING SYSTEM
David K. Martell, Green End, Bedfordshire, and Ian R. Williams, 25 Pemberley Avenue, Bedford, both of United Kingdom

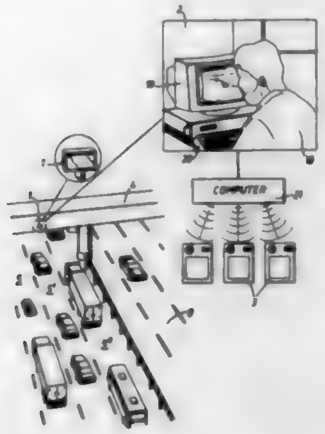
PCT No. PCT/GB89/01348, § 371 Date Sep. 13, 1990, § 102(e) Date Sep. 13, 1990, PCT Pub. No. WO90/05969, PCT Pub. Date May 31, 1990

PCT Filed Nov. 14, 1989, Ser. No. 555,458

Claims priority, application United Kingdom, Nov. 14, 1988, 8826624

Int. Cl.⁵ G08G *1/09*

U.S. Cl. 340—905 **18 Claims**



1. A vehicle carrying receiving means arranged to receive information as to traffic congestion at a location as represented by traffic units average speed at said location and to receive messages, unrelated to traffic congestion, for a person at said vehicle, and visual display means connected to said receiving means and serving to display that information indicative of traffic units average speed at said location and said messages, said visual display means serving to display a vehicular route diagram and said information indicative of said average speed being displayed in the region of a position on said diagram corresponding to said location.

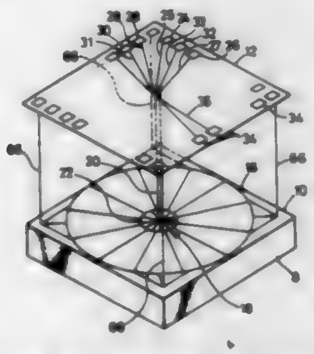
5,317,312
ANALOG-TO-DIGITAL CONVERTER OF AN ANNULAR CONFIGURATION
Hiroyuki Kouno; Minobu Yazawa, and Toshio Kumamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1992, Ser. No. 990,488

Claims priority, application Japan, Dec. 16, 1991, 3-331968

Int. Cl.⁵ H03M *1/34*

U.S. Cl. 341—158 **19 Claims**



1. An analog-to-digital converter for converting an analog signal into a digital signal by sampling the analog signal at a timing defined by an externally applied clock signal, said converter comprising:

a) a semiconductor layer having a main surface;

b) a voltage dividing network having first and second end portions and formed in the form of a circular arc with a predetermined point on said main surface set as a center, for dividing a reference voltage applied to said first and second end portions to produce a plurality of divided voltage values on said circular arc;

c) means for transmitting an analog signal to a plurality of places on said main surface which are approximately the same distance from said predetermined point;

d) a plurality of comparison means, each formed on said main surface approximately the same distance from said predetermined point and connected to said means for transmitting said analog signal and said voltage dividing network, for comparing a voltage value of said analog signal of said plurality of divided voltage values at a timing defined by a predetermined clock signal and outputting a result of the comparison;

e) means for encoding outputs of said comparison means to output a signal representing the voltage value of said analog signal; and

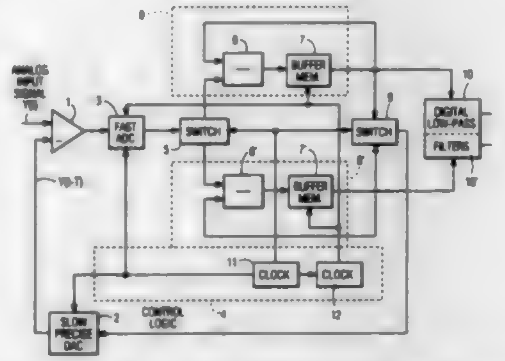
f) means for applying said clock signal over approximately the same distance via said predetermined point to each of said plurality of said comparison means.

5,317,313
METHOD AND APPARATUS FOR ANALOG/DIGITAL CONVERSION
Jürgen Kässer, Diekholzen, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jun. 9, 1993, Ser. No. 74,333

Int. Cl.⁵ H03M *1/40*

U.S. Cl. 341—163 **4 Claims**



1. A method of A/D conversion of a carrier-modulated input signal, comprising the steps of

adding an instantaneous value of the input signal to a stored value representing an analog previous instantaneous value, retarded by a predetermined phase angle of a carrier;

converting a resulting analog sum value, in a fast A/D converter having a limited word length, into a digital difference value;

subtracting, from said difference value, a digital previous instantaneous value;

storing the result as a new digital instantaneous value;

feeding the new digital instantaneous value to a downstream circuit (10); and

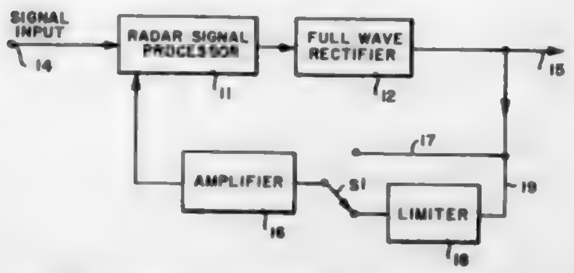
feeding the new digital instantaneous value to a precise D/A converter (2) which generates said analog previous instantaneous value.

5,317,314
ELECTRONIC COUNTER COUNTERMEASURE CIRCUIT FOR AUTOMATIC GAIN CONTROL BY ELECTRONIC COUNTERMEASURE DECEPTION
George S. Mead, Maynard, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1972, Ser. No. 223,796

Int. Cl.⁵ G01S *7/36*

U.S. Cl. 342—16 **3 Claims**



1. In a radar receiver circuit having an automatic gain control feedback comprising:

a radar signal processor and a demodulator coupled in series from an input of received radar signals to a rectified output;

an automatic gain control amplifier in a feedback circuit form said rectified output to said radar signal processor, said feedback circuit having first and second branch conductors connectable between said rectified output and an input to said automatic gain control amplifier;

a limiter in said first branch conductor; and

a switch in said feedback circuit for selectively connecting said first and second branch conductors with said automatic gain control amplifier whereby feedback signals can either be applied directly to said automatic gain control amplifier or applied through a limiter of changes in dynamic range.

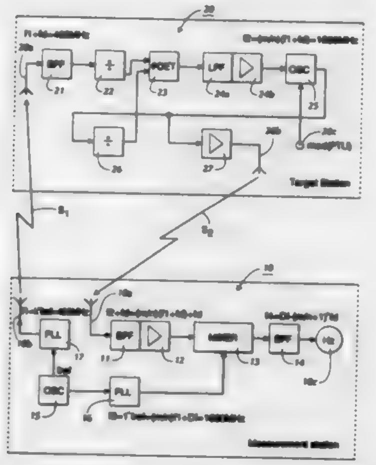
5,317,315
METHOD AND DEVICE FOR MEASUREMENT OF THE VELOCITY OF A MOVING TARGET BY MAKING USE OF THE DOPPLER SHIFT OF ELECTROMAGNETIC RADIATION
Pentti Karhunen, Vantaa, and Henry Andersson, Espoo, both of Finland, assignors to Vaisala Oy, Finland

Filed Feb. 17, 1993, Ser. No. 18,789

Claims priority, application Finland, Feb. 24, 1992, 920804

Int. Cl.⁵ G01S *13/536, 13/95*

U.S. Cl. 342—26 **10 Claims**



1. Method for measurement of the velocity of a moving target (20) by making use of electromagnetic radiation, which is preferably in the range of radio frequency, and in which method a radio transmitter-receiver arrangement is employed both at the measurement station (10) and at the target (20) to be measured, by means of which arrangement radio signals are transmitted to and received from the opposite station (10), and in which method the Doppler shift (fd) included in the frequency of the signal (S_1, S_2) transmitted from and received at the measurement station (10) is detected at the measurement station (10), and on the basis of the Doppler shift (fd) the velocity (v) of escape and/or approach of the target (20) to be measured in relation to the measurement station (10) is determined, characterized in that the medium comprises a combination of the following steps:

(a) from the measurement station (10) and from the target station (20), radio signals (S_1, S_2) are transmitted that are in different frequency ranges, as compared with each other, so that the receivers at the measurement station (10) and at the target station (20) are not subjected to interference,

(b) receiving said radio signals (S_1, S_2) at stations (20, 10) opposite to their transmission stations (10, 20),

(c) locking the oscillator of the target station (20) with the frequency transmitted by the measurement station (10) plus or minus the Doppler shift by means of a phase-locked loop (PLL), and passing the frequency of said oscillator to the transmitter part of the target station (20),

(d) receiving the signal (S_2) transmitted by the target station (20) at the measurement station (10), and

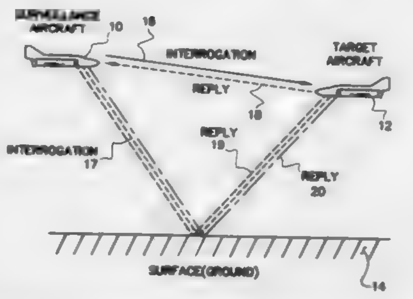
(e) measuring the Doppler shift (fd) of the frequency of the signal (S_1) transmitted from the measurement station (10) and of the signal received at the measurement station, and determining the velocity (v) of the moving target on the basis of the Doppler shift.

5,317,316
METHOD OF ALTITUDE TRACK INITIALIZATION IN AN AIRCRAFT TRACKING SYSTEM
Patricia K. Sturm; Kathryn W. Ybarra, both of Phoenix, and Lewis R. Motisher, Peoria, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 22, 1992, Ser. No. 995,274

Int. Cl.⁵ G01S *13/00*

U.S. Cl. 342—30 **7 Claims**



1. A method of processing a plurality of replies of target aircraft provided in response to interrogation signals from a surveillance aircraft during surveillance periods to determine whether an altitude track may be initialized for use in a traffic alert and collision avoidance system, said method comprising the steps of:

selecting three replies, one from each of three consecutive surveillance periods, said replies having binary or coded altitude data of high or low confidence;

comparing the binary or coded altitude data of non-adjacent and adjacent replies of the selected replies and generating an altitude difference value for each of the comparisons;

discarding further efforts to initialize a track if any of the altitude difference values are greater than first predetermined separated altitudes if and only if such non-adjacent and adjacent replies have binary or coded altitude data of high confidence; and

further comparing the binary or coded altitude data of the non-adjacent and the adjacent replies whether or not the replies have binary data of low or high confidence to determine whether an altitude track may be initialized.

5,317,317

METHOD AND DEVICE TO DETECT THE GARBLING OF PULSES RECEIVED BY A SECONDARY RADAR BY PHASE ANALYSIS

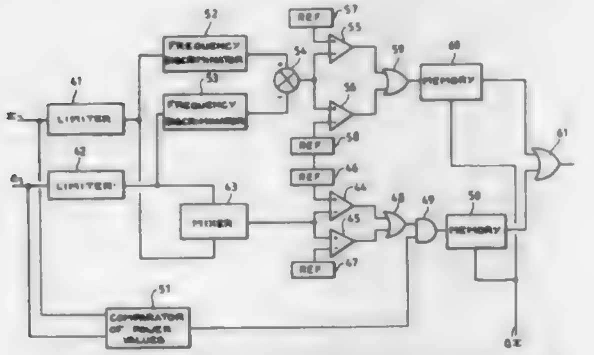
Philippe Billaud, Fontenay Aux Roses, and Claude de Volder, Auffargis, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Mar. 10, 1993, Ser. No. 29,169

Claims priority, application France, Mar. 10, 1992, 92 02844

Int. Cl.^{5} G01S *13/76, 13/44*

U.S. Cl. 342—40 **9 Claims**



1. A method to detect the garbling of pulses received by a secondary radar with monopulse reception antenna delivering a sum signal given by its sum channel and a difference signal given by its difference channel, wherein said method consists in analyzing the phase difference between the sum signal and the difference signal, the garbling of at least two received pulses being detected by means of a phase difference, the value of which is substantially different from 0° or 180°.

5,317,318

IDENTIFICATION SYSTEM USING TRANSPONDER BADGES, COMPONENT PARTS THEREFOR AND APPLICATIONS THEREOF

Gérard Thomas, Eragny S/Oise, and Alain Oliveros, Montauban, both of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 733,316, Jul. 22, 1991, abandoned. This application Apr. 7, 1993, Ser. No. 44,567

Claims priority, application France, Jul. 23, 1990, 9009380

Int. Cl.^{5} G01S *13/80*

U.S. Cl. 342—44 **7 Claims**

1. A server-based system comprising

a telephone installation having a switching system to which is connected a plurality of telephones and/or telephone terminals,

a radio identification server subsystem further comprising

at least one interrogator including a microwave transmitter for producing interrogation signals modulated by a BARKER code,

a plurality of transponder type identifying badges using the power of a BARKER code modulated signal received from one of said interrogators to transmit a respective microwave response code transposed from the received modulated signal,

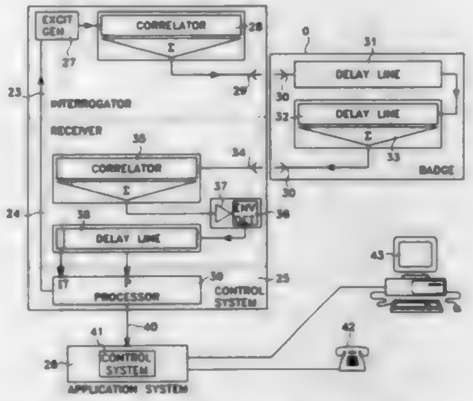
at least one identification receiver for using a correlative method to decode the microwave response codes received from the badges,

an identification control system responsive to decoded microwave response codes for deriving identification information, and

means for determining in real time the location of at least some telephone subscribers wearing badges served by the installation,

a transmission link, and

an application subsystem associated with said switching system and connected by said transmission link to said radio identification server subsystem, for using the location information obtained by the radio identification server in an on-line data processing application, said application subsystem further comprising



contact means for causing said switching system to page each of the subscribers at, and/or for transferring calls addressed to each of the subscribers to, an available telephone or telephone terminal near which each said subscriber is temporarily located, and

transfer means for causing said switching system to transfer specific facilities associated with the category of telephone installation subscriber assigned to a usual telephone or telephone terminal of said subscriber, to said available telephone or telephone terminal.

5,317,319

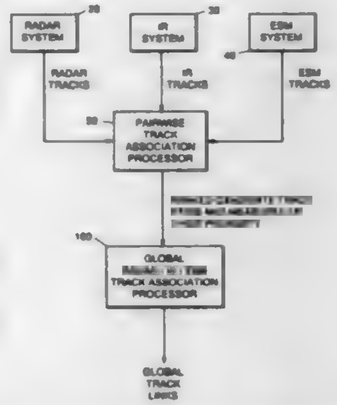
AUTOMATIC GLOBAL RADAR/IR/ESM TRACK ASSOCIATION BASED ON RANKED CANDIDATE PAIRINGS AND MEASURES OF THEIR PROXIMITY

John T. Fagarasan, Brea; Stephen W. Alland, Pomona, and Ronald J. Jakaub, Hacienda Heights, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 17, 1992, Ser. No. 916,772

Int. Cl.^{5} G01S *17/66, 17/87, 7/50*

U.S. Cl. 342—53 **8 Claims**



1. A method for performing global association processing of the respective radar, infrared (IR) and electronic support measures (ESM) tracks from a tri-sensor system providing such radar, IR and ESM tracks, and wherein the sensor system provides (i) for each IR track, a radar/IR (R/I) positional association (PA) list and an association candidate list (ACL) subset of the PA list, the PA list consisting of radar tracks each having an R/I bearing history figure of merit measuring the radar track's historical angular proximity to the IR track, the ACL ranked by an R/I discrepancy figure of merit, with the smallest discrepancy yielding the highest rank, wherein each IR track is linked to the highest ranked radar track in its R/I ACL, (ii) for each ESM track, a radar/ESM (R/E) positional association (PA) list and an association candidate list (ACL) subset of the PA list, the PA list consisting of radar tracks each having an R/E bearing history figure of merit measuring the radar track's historical angular proximity to the ESM track, the ACL ranked by an R/E discrepancy figure of merit, with the smallest discrepancy yielding the highest rank, wherein each ESM track is linked to the highest ranked radar track in its R/E ACL, and (iii) for each ESM track, an IR/ESM (I/E) positional association (PA) list and an association candidate list (ACL) subset of the PA list, the PA list consisting of radar tracks each having an I/E bearing history figure of merit measuring the IR track's historical angular proximity to the ESM track, the ACL ranked by an R/I discrepancy figure of merit, with the smallest discrepancy yielding the highest rank, wherein each ESM track is linked to the highest ranked IR track in its I/E ACL, the method including the steps of:

(a) for each radar track R having IR track links, forming a strong global track germ (GTG) consisting of the radar track R and all IR tracks linked to it;

(b) for each radar track with no IR tracks linked to it, forming a weak radar GTG consisting of that radar track;

(c) for each IR track with no radar track linked to it, forming a weak IR GTG consisting of that IR track;

(d) for each ESM track defining a list of strong GTG's eligible for association with that ESM track;

(e) for each ESM track defining a list of weak GTG's eligible for association with that ESM track;

(f) globally associating each ESM track with the eligible strong GTG of smallest bearing displacement from the ESM track, if any;

(g) if no strong GTG is eligible of association with a particular ESM track, globally associating that ESM track with the best choice weak GTG, if any; and

(h) for each ESM track which does not associate with any GTG, declaring that ESM track not globally associated with any other tracks.

5,317,320

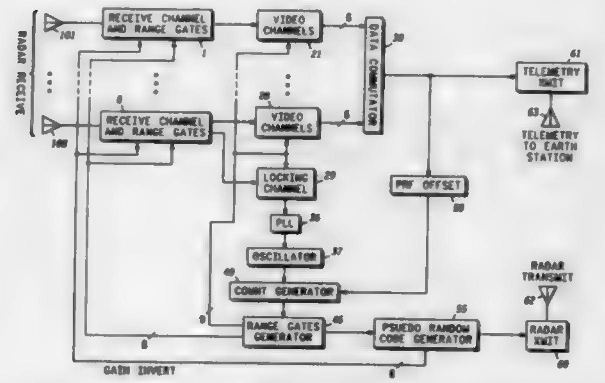
MULTIPLE RADAR INTERFERENCE SUPPRESSOR

Richard K. Grover, Scottsdale, and Keith M. Kingsbury, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 27, 1992, Ser. No. 982,528

Int. Cl.^{5} G01S *13/50, 13/42*

U.S. Cl. 342—159 **20 Claims**



1. A multiple radar interference suppressor comprising:

a plurality of sources of radar transmit signals, said radar transmit signals having approximately the same frequency;

means for receiving said radar transmit signals, said means for receiving coupled to said plurality of sources of radar transmit signals;

means for phase locking a pulse repetition frequency of said received radar transmit signals of a first of said plurality of sources to a second of said plurality of said sources, said means for phase locking coupled to said means for receiving; and

means for phase offsetting the pulse repetition frequency of said locked, received radar transmit signals of said first and second sources, said means for phase offsetting coupled between said means for receiving and said means for phase locking.

5,317,321

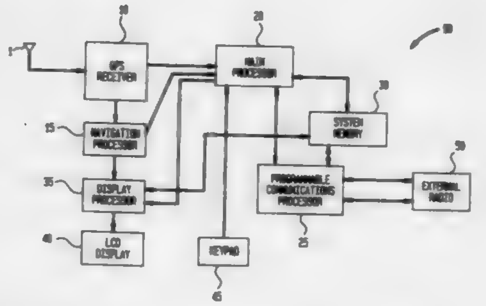
SITUATION AWARENESS DISPLAY DEVICE

Paul F. Sass, Freehold, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 25, 1993, Ser. No. 85,268

Int. Cl.^{5} G01S *13/00*

U.S. Cl. 342—176 **11 Claims**



1. A situation awareness display device, comprising:

tracking means for determining instantaneous position information of a local unit utilizing said display device, said position information repeatedly updated at preprogrammed time intervals;

navigation means for deriving direction and velocity of said device from said local unit position information of said tracking means, said navigation means computing progress toward a series of programmed waypoints;

programmable communication means for transmitting said local unit position information over an external radio to remote units having their own local situation awareness display device, said programmable communication means receiving the position information of said remote units over said external radio;

processing means for controlling the flow of information within said device, said processing means deriving the relative position of said remote units with respect to said local unit from said position information, and said processing means storing said relative position information for retrieval;

display means for retrieving and graphically displaying said stored relative position information, said graphical display showing the relative position of remote units in relation to and from the perspective of said local unit; and

control means for providing operator control over said display device.

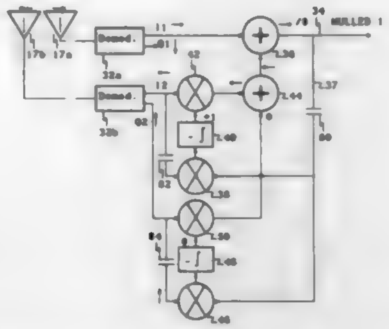
5,317,322
NULL PROCESSING AND BEAM STEERING RECEIVER APPARATUS AND METHOD

Paul H. Grobert, Granada Hills, Calif., assignor to Magnavox Electronic Systems Company, Fort Wayne, Ind.

Continuation of Ser. No. 817,169, Jan. 6, 1992, abandoned. This application Jun. 28, 1993, Ser. No. 83,396

Int. Cl.^{5} G01S *3/16*

U.S. Cl. 342—378 **11 Claims**



1. Signal processing receiver apparatus, comprising:
- demodulator means for demodulating a plurality of modulated signals received at a corresponding plurality of antenna array elements, to produce a primary information signal and one or more related auxiliary information signals, all of the information signals containing an interference signal;
- weighting means for operating on the one or more auxiliary information signals to produce a corresponding number of intermediate signals; and
- summing means for combining the primary information signal and the intermediate signals to produce a sum signal in which the interference signal is substantially nulled out;
- wherein the weighting means includes means for adjusting weighting factors applied to the auxiliary information signals, to steer a composite beam formed by the antenna array elements to a direction that enhances reception of the modulated signals, without detracting significantly from nulling of the interference signal;
- and wherein the weighting means and the summing means function together to produce simultaneous nulling of the interference signal and steering of the composite beam;
- and wherein the means for adjusting the weighting factors to enhance reception of the modulated signals includes adjustable gain means, to ensure that beam steering correction signals do not have an adverse effect on nulling out the interference signal;
- and wherein the weighting means includes
    - means for correlating the sum signal with each of the auxiliary information signals, to produce a corresponding number of product signals,
    - means for integrating the product signals to product a corresponding number of weighting factors, and
    - means for multiplying the weighting factors by the corresponding auxiliary information signals to produce the intermediate signals for summing with the primary information signal;
- and further comprising:
- means for removing any time-varying data components from the demodulated primary information signal, to leave only an essentially non-varying primary information signal;
- low-pass filter means, for removing from the demodulated primary information signal any components due to the interference signal; and
- additional summing means, for combining the primary signal, free of the interference signal, with the intermediate signals, to produce a beam steering error signal;
- and wherein the means for adjusting the weighting factors includes additional correlation means, for correlating the beam steering error signal with each of the auxiliary information signals to produce a second set of product signals, and means for combining the two sets of product signals to product a signal set of weighting factors.

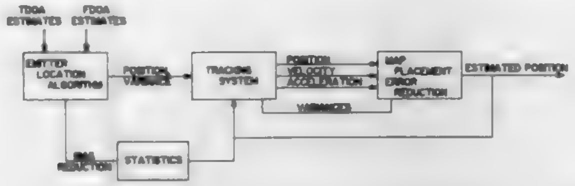
5,317,323
PASSIVE HIGH ACCURACY GEOLOCATION SYSTEM AND METHOD

Joseph P. Kennedy, Fairfax; Christopher D. Roller, Burke, and Robert W. Hooper, Arlington, all of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Mar. 5, 1993, Ser. No. 26,782

Int. Cl.^{5} G01S *3/02*

U.S. Cl. 342—457 **31 Claims**



1. A system for accurately locating a mobile cellular radio comprising:
- a grid of at least three radio receivers for receiving a radio signal from the mobile cellular radio, the position of said radio receivers being known to within about four meters;
- resolution means for removing multipath radio signals from the radio signal received by said radio receivers using angle-of-arrival differentiation;
- a satellite-based time source for providing the actual time of arrival of the radio signal from the mobile cellular radio at said radio receivers to an accuracy of less than about one hundred nanoseconds; and
- calculating means for determining the location of the mobile cellular radio based on the time difference of arrival of the radio signal received therefrom at said radio receivers, said calculating means being operatively connected to said radio receivers so as to receive therefrom the actual time of arrival of the radio signal from the mobile cellular radio.

5,317,324
PRINTED ANTENNA

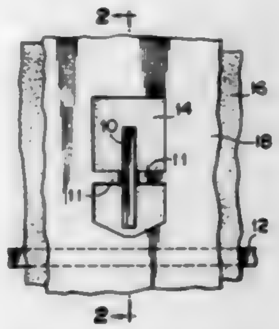
Motoyuki Naito, and Koichi Ito, both of Chiba, Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1992, Ser. No. 898,507

Claims priority, application Japan, Jun. 20, 1991, 3-176212; Feb. 14, 1992, 4-059675; May 21, 1992, 4-154506

Int. Cl.^{5} H01Q *13/08*

U.S. Cl. 343—700 MS **16 Claims**



1. A printed antenna which comprises a window opening formed in a grounded conductor layer provided on a front side of an insulator substrate, and a strip conductor arranged in the window opening of the grounded conductor layer as a strip antenna element which has a width in a horizontal direction and a length in a vertical direction of said grounded conductor layer, said grounded conductor layer being further formed with convex portions in the form of short segments having leading ends thereof projecting into said window opening closely spaced a short distance apart from a central portion of the length of said strip conductor from respective sides of said window opening formed in said grounded conductor layer and aligned in the horizontal direction of said grounded conductor layer relative to said strip conductor.

5,317,325
RADIO ANTENNAS

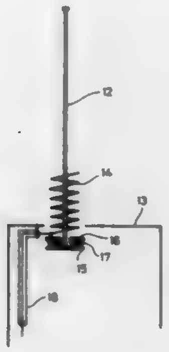
Howard Bottomley, Aylesbury, England, assignor to Antenna Products Limited, Great Britain

Filed Mar. 12, 1992, Ser. No. 850,050

Claims priority, application United Kingdom, Mar. 16, 1991, 9105586

Int. Cl.^{5} H01Q *1/24*

U.S. Cl. 343—702 **7 Claims**



1. A radio antenna comprising a main antenna element, a housing with respect to which the main antenna element is slidably movable between an extended position of the element and a retracted position of the element, a first electrically conducting member attached to the housing and forming a stationary capacitor plate for connection to radio transmitting or receiving apparatus, a second electrically conducting member attached to an inner end of the main antenna element and forming a movable capacitor plate, and a further antenna element carried by the housing for connecting to the radio transmitting or receiving apparatus, in the extended position of the main antenna element the stationary and movable capacitor plates forming a capacitor which constitutes an electrical signal link between the main antenna element and the radio transmitting or receiving apparatus, in the retracted position of the main antenna element the movable capacitor plate being spaced from the stationary capacitor plate so as effectively to disconnect the electrical signal link, the further antenna element comprising a receiving/transmitting antenna element when the main antenna element is in the retracted position thereof, the main antenna element being an elongated rod which passes through a central aperture in the stationary capacitor plate, and including a dielectric washer attached to the stationary capacitor plate, the washer being disposed between the movable and stationary capacitor plates in the extended position of the main antenna element.

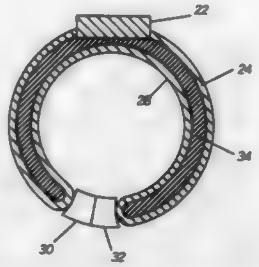
5,317,326
FOLDED DIPOLE ANTENNA

Yew S. Tay, Plantation; Oscar Garay, Coral Springs, and Jose A. Llorente, North Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 709,247, Jun. 3, 1991, abandoned. This application Jan. 15, 1993, Ser. No. 5,203

Int. Cl.^{5} H01Q *1/12*

U.S. Cl. 343—718 **2 Claims**



1. A radio suitable to be worn around a human wrist, comprising:
- a radio housing;
- a strap attached to the housing;
- a modified folded dipole antenna for receiving and transmitting radio signals in orthogonal orientations, the modified folded dipole antenna being disposed along an outer portion and an inner portion of the strap and comprising:
- central feeder means in said radio housing;
- a first portion coupled to the central feeder means, the first portion having a first folded end;
- a second portion coupled to the central feeder means, the second portion having a second folded end; and
- the first and second folded ends being in close proximity to each other, and being capacitively coupled to each other by a buckle.

5,317,327
COMPOSITE ANTENNA FOR RECEIVING SIGNALS TRANSMITTED SIMULTANEOUSLY VIA SATELLITE AND BY TERRESTRIAL STATIONS, IN PARTICULAR FOR RECEIVING DIGITAL AUDIO BROADCASTING RADIO SIGNALS

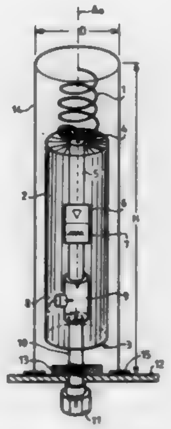
Philippe Piole, Rennes, France, assignor to France Telecom, Issy-Les-Moulineaux and Telediffusion de France, Montrouge, both of France

Filed Jun. 26, 1992, Ser. No. 903,937

Claims priority, application France, Jun. 28, 1991, 91 08089

Int. Cl.^{5} H01Q *1/36*

U.S. Cl. 343—725 **6 Claims**



1. A composite antenna comprising, in combination:
- a skirt-helix assembly having first and second radiating ele-

ments operating independently to separately receive respective first and second signals of like frequency;

said first radiating element comprising a quarter-wavelength skirt antenna adapted to be disposed over an artificial ground and comprising a vertically disposed cylindrical tube having a closure surface closing an upper end of said tube, and a feed point means on a wall of said tube for sampling said first signal received by said skirt antenna, said skirt antenna having a radiation pattern which is essentially omnidirectional with a low elevation angle suitable for receiving signals from terrestrially situated transmitting antennas;

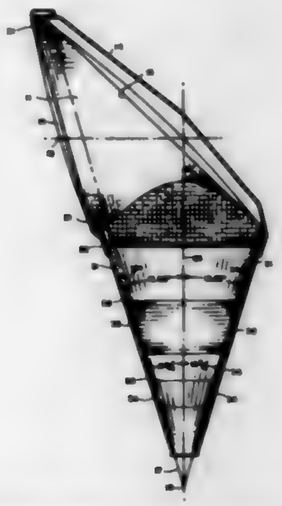
said second radiating element comprising a helical antenna disposed vertically and coaxially above said skirt antenna and insulated therefrom with said closure surface constituting a reflective plane means for modifying a typical radiation pattern of said helical antenna, by lowering a receive lobe of said radiation pattern to an elevation angle suitable for receiving signals from a satellite, so as to provide a hybrid radiation pattern which is partially axial and partially radial, said helical antenna also having a feed line means for sampling said second signal received by said helical antenna, said feed line means having an outer conductor being in electrical contact with said closure surface of said skirt antenna and an inner conductor being insulated from said outer conductor, passing through said closure surface to an inside of said skirt antenna, and electrically attached to said helical antenna; and

coupling means for receiving said first and second signals of like frequency from said feed point means and said feed line means, respectively, and for combining and feeding said like frequency signals from an output of said coupling means on a common line.

5,317,328
HORN REFLECTOR ANTENNA WITH ABSORBER LINED CONICAL FEED

Daniel C. Allen, Saco, Me., assignor to Gabriel Electronics Incorporated, Scarborough, Me.

Filed Apr. 2, 1984, Ser. No. 596,100
Int. Cl.⁵ H01Q *13/00*
U.S. Cl. 343—786 8 Claims

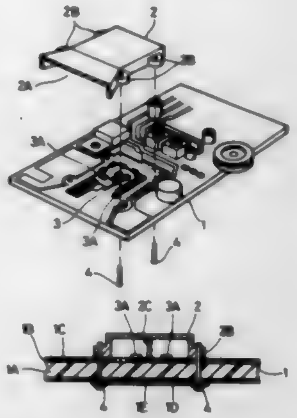


1. In a horn reflector antenna which has a housing formed by a cone and a shroud the axes of which intersect at approximately 90°, the axis of said shroud being the radiation pattern beam axis of the antenna and the axis of said cone being the feed axis, and a reflector positioned within said housing at an angle to the beam axis and the feed axis to reflect microwave energy between an aperture on the beam axis and an off-set feed horn at the apex of said cone wherein said aperture is the open end of said shroud and approximately the size of the full area of said reflector projected on said beam axis, said cone extending from the mouth of said feed horn to intersect said shroud to form a conductive housing closed except for said aperture, the improvement which comprises making the inner diameter of said cone larger through out its axial length than the projected full area of said reflector to the mouth of said feed horn; and microwave absorber material lining the inner wall of said cone over substantially its entire length from said feed horn to said shroud, said material having thickness at any point in the cone no greater than the spacing between said inner diameter and the periphery of the projected full area of said reflector to said mouth to avoid blocking microwave energy, passing between said feed horn and the full area of said reflector, said absorber improving the radiation pattern by its effect on the microwave energy passing through the cone without significant gain loss due to absence of absorber in the path of said energy.

5,317,329
MICROWAVE DETECTOR AND HORN ANTENNA STRUCTURE THEREFOR

Takeshi Hatasa, Toyota, Japan, assignor to Yupiteru Industries Co., Ltd., Japan

Continuation of Ser. No. 587,797, Sep. 25, 1990, abandoned. This application Jul. 16, 1992, Ser. No. 914,641
Claims priority, application Japan, Sep. 26, 1989, 1-250043
Int. Cl.⁵ H01Q *13/02*
U.S. Cl. 343—786 1 Claim



1. A microwave detector, comprising:

a microstrip plate comprising a dielectric substrate having a first side and an opposite second side, a high frequency circuit disposed on said dielectric substrate on said first side, and a ground plate mounted to said dielectric substrate on said second side; and

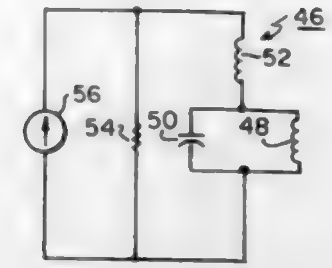
a horn antenna element comprising an electroconductive material, said horn antenna element having a top wall, a side wall extending from said top wall, and an open bottom, and being mounted to said first side of said dielectric substrate and over said high frequency circuit;

wherein said ground plate and said horn antenna element are mounted opposite each other such that a horn antenna is formed therebetween, said horn element having a cross-sectional shape, the area of which is gradually reduced from an inlet portion toward the inside of said horn antenna element and which is constant thereafter, said horn element being fastened to said microstrip plate by a screw which establishes an electrical connection between said horn antenna element and said ground plate, the top wall of said horn antenna element being provided with a ridge on an interior surface thereof, said ridge gradually increasing in height from said inlet portion toward the inside of said element.

5,317,330
DUAL RESONANT ANTENNA CIRCUIT FOR RF TAGS

David F. Everett, Gambrills, and Daniel C. Buck, Hanover, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1992, Ser. No. 957,119
Int. Cl.⁵ H01Q *21/00;* G08B *13/24*
U.S. Cl. 343—867 21 Claims



1. In a two-way communication system having a stationary member and a portable passive member, said portable passive member having circuitry for storing and transmitting coded information, said stationary member transmitting a signal at a first frequency via a magnetic field and said portable passive member transmitting coded information stored by said circuitry in said portable passive member at a second frequency via a magnetic field, the improvement comprising an antenna circuit provided in said portable passive member, said antenna circuit comprising:

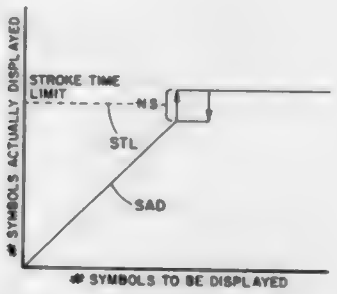
(a) a parallel resonant circuit having a receive antenna for deriving operating power from said signal at a first frequency for use in said circuitry provided in said portable passive member; and

(b) a series resonant circuit having a transmit antenna for transmitting at a second frequency said coded information stored by said circuitry in said portable passive member, said second frequency differing from said first frequency.

5,317,331
SYMBOLOGY DISPLAY METHOD

Evelyn J. Patty, Albuquerque, N. Mex., and Jose A. Q. Garza, Tempe, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 500,076, Mar. 28, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 782,914
Int. Cl.⁵ G09G *1/10*
U.S. Cl. 345—16 6 Claims



1. A method for truncating excess data in a digital display system having a fixed refresh rate by employing a null symbol as a gauge, the method comprising the steps of:

(a) stroke scanning a set of symbology comprising visual symbols while marking actual stroke time of the set of symbology;

(b) comparing the actual stroke time of the set of symbology with a predetermined stroke time limit;

(c) if the actual stroke time does not exceed the predetermined stroke time limit and a null symbol is not present in the set of symbology, adding a null symbol to the set of symbology;

(d) if the actual stroke time exceeds the predetermined stroke time limit and a null symbol is present in the set of symbology, removing the null symbol from the set of symbology;

(e) if the actual stroke time exceeds the predetermined stroke time limit and a null symbol is not present in the set of symbology, removing at least one of the visual symbols from the set of symbology and adding a null symbol to the set of symbology;

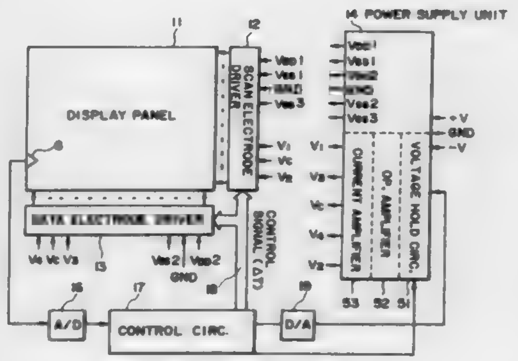
(f) if the actual stroke time does not exceed the predetermined stroke time limit and a null symbol is present in the set of symbology, adding a visual symbol to the set of symbology; and

(g) repeating steps (a) through (f).

5,317,332
DRIVING APPARATUS FOR AN ELECTRODE MATRIX SUITABLE FOR A LIQUID CRYSTAL PANEL

Hideo Kanno, Kawasaki; Hiroshi Inoue, Yokohama, and Atsushi Mizutome, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 262,576, Oct. 25, 1988, Pat. No. 5,066,945. This application Sep. 9, 1991, Ser. No. 757,009
Claims priority, application Japan, Oct. 26, 1987, 62-271120; Nov. 12, 1987, 62-284158
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.⁵ G09G *3/36*
U.S. Cl. 345—101 4 Claims



1. A display apparatus, comprising:

a) a driving unit comprising a scanning electrode driver and a data electrode driver for driving an electrode matrix having scanning electrodes and data electrodes;

b) a drive voltage generating unit comprising first means for generating a fixed voltage, second means for generating a source voltage for providing drive voltages for driving the electrode matrix, and third means for generating a first voltage equal to a difference of the fixed voltage from the source voltage and a second voltage equal to a difference of the source voltage from the fixed voltage,

wherein the first voltage and the second voltage are of mutually opposite polarities with respect to the fixed voltage, and the fixed voltage comprises a voltage set to an intermediate value between a maximum output voltage and a minimum output voltage of said drive voltage generating unit;

c) a liquid crystal panel comprising a first substrate having said scanning electrodes thereon, a second substrate having said data electrodes thereon, and a liquid crystal disposed between said first and second substrates; and

d) control means for controlling said scanning electrode driver and said data electrode driver so as to sequentially apply a scanning selection signal to said scanning electrodes and apply data signals corresponding to given data to said data electrodes in synchronism with the scanning selection signal.

5,317,333

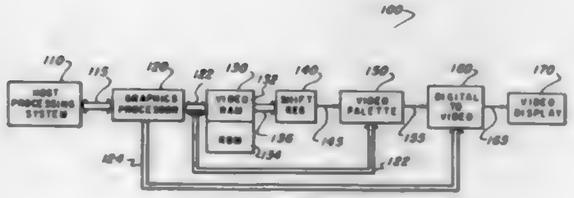
GRAPHICS DATA PROCESSING APPARATUS WITH DRAW AND ADVANCE OPERATION

Karl M. Guttag, Houston; Michael D. Asal; Jerry R. Van Aken, both of Sugarland, all of Tex.; Neil Tebbutt, Golfe Juan, France, and Mark F. Novak, Ypsilanti, Mich., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 522,409, May 10, 1990, Pat. No. 5,162,784, which is a continuation of Ser. No. 449,225, Dec. 6, 1989, abandoned, which is a continuation of Ser. No. 366,308, Jun. 13, 1989, abandoned, which is a continuation of Ser. No. 245,980, Sep. 16, 1988, abandoned, which is a continuation of Ser. No. 804,203, Dec. 3, 1985, abandoned. This application Jul. 17, 1992, Ser. No. 916,302

Int. Cl.⁵ G09G *1/06*

U.S. Cl. 345—133 **30 Claims**



1. A graphics data processing apparatus comprising:

a display memory for storing a displayable image arranged in an array of pixels, the pixels addressable by X and Y coordinates, each pixel represented by a digital code;

a first register for storing a first data word representing X and Y coordinates;

a second register memory for storing a second data word representing X and Y coordinates; and

a processing unit connected to the display memory and the first and second registers, the processing unit including writing means for writing a digital code in the pixel location of the display memory designated by the X and Y coordinates of the first data word, and storing means for storing in the first register a data word representing an X coordinate calculated from the X coordinate of the first data word and the X coordinate of the second data word and having a Y coordinate calculated from the Y coordinate of the first data word and the Y coordinate of the second data word.

5,317,334

METHOD FOR DRIVING A PLASMA DISLAY PANEL

Yoshio Sano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 800,575

Claims priority, application Japan, Nov. 28, 1990, 2-327066

Int. Cl.⁵ G09G *3/22*

U.S. Cl. 345—148 **3 Claims**

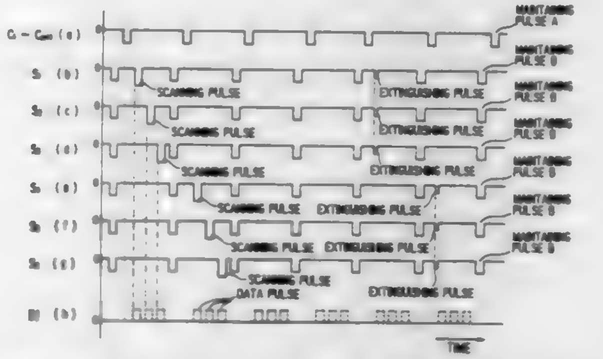
1. A method for driving a plasma display panel, comprising the steps of:

dividing a field time to a plurality of sub-field times each having a different light emitting time from others, at least one of said sub-field times being longer than others to have a light emitting time longer than that of others;

selecting a condition from light emitting and non-light emitting conditions at each light emitting time of each sub-field to provide a predetermined gradation to an image to be displayed;

supplying maintaining pulses to a plurality of scanning electrodes with a predetermined time interval;

scanning one field by supplying scanning pulses to said plurality of scanning electrodes in accordance with said condition selected by said predetermined gradation wherein at least two scanning pulses are supplied to each of at least two electrodes of said scanning electrodes in turn within one and the same interval of maintaining pulses so as to suppress a frequency of maintaining pulses low; and



supplying at least two extinguishing pulses to said at least two of said scanning electrodes, respectively, at the same timing in one interval of said maintaining pulses to cease light emission.

5,317,335

Patent Not Issued For This Number

5,317,336

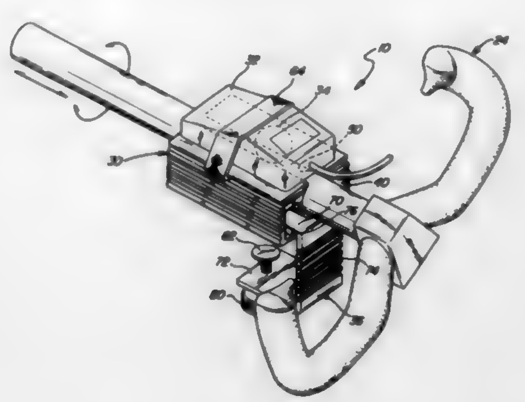
MOUSE YOKE ASSEMBLY FOR INTERFACING WITH A COMPUTER

Kenneth J. Hall, 7554 Weld County Rd. 74, Windsor, Colo. 80550

Filed Jun. 23, 1992, Ser. No. 902,966

Int. Cl.⁵ G09G *5/08*

U.S. Cl. 345—164 **8 Claims**



1. A mouse yoke assembly for interfacing with a computer through the sensing means of a mouse, said assembly comprising;

a housing and a control member movably supported by said housing, said housing including an integral body defining a central channel extending therethrough, and a cradle portion supporting a shaft of the control member along a single continuous length of the shaft, said housing adapted to support a mouse thereon and relative to said control member such that movement of said control member is sensed by the sensing means of the mouse;

said assembly including a clamping means for removably mounting said housing to a support structure and to immobilize said housing as said control member is moved relative to said housing;

said clamping means including a U shaped member having a pair of legs and a connecting portion extending therebetween with one of said legs extending into said channel of said housing and the other disposed adjacent a support structure such that the support structure is disposed therebetween and a fastening means for fixing the U shaped member relative to the support structure to immobilize said housing relative to the support structure.

5,317,337

PRINTING METHOD FOR DISC-SHAPED INFORMATION CARRIERS

Helmut Ewaldt, Uetze-Hänigsen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 214,703, Jul. 1, 1988, abandoned. This application Mar. 22, 1990, Ser. No. 497,831

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721651

Int. Cl.⁵ H04N *1/21;* B41J *2/435*

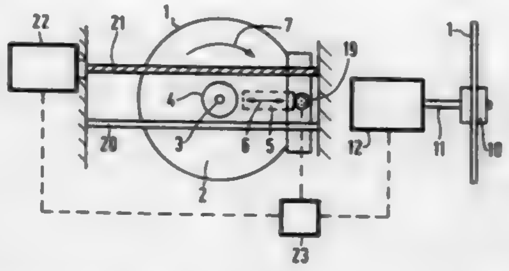
U.S. Cl. 346—1.1 **16 Claims**

1. A method for providing a disc-shaped information carrier with label information in the form of graphics and/or characters, said information carrier having at least a first layer for receiving the label information and a second layer in which optically readable information is included, the method comprising:

preparing the label information by means of a data processing system;

transferring the label information from said data processing system to a printer for processing, said printer having a printing head for printing; and

printing the label information directly on at least a part of said first layer;



wherein during printing, said printing head is moved radially relative to said information carrier and said information carrier is rotated.

5,317,338

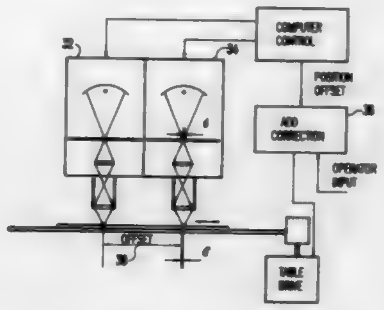
VISUAL MEASUREMENT TECHNIQUE AND TEST PATTERN FOR APERTURE OFFSETS IN PHOTOPLOTTERS

William I. Doxsey, Poughkeepsie; John J. Masten, Jr., deceased, late of Poughkeepsie by Barbara C. Masten, administratrix ; Richard M. Schroedl, Wappingers Falls, and Donald G. Will, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1991, Ser. No. 787,305

Int. Cl.⁵ G01D *9/00*

U.S. Cl. 346—1.1 **6 Claims**



1. A method of operating a photoplotter having a line side and an aperture side for respectively forming line images and aperture images, said method including the steps of

forming an aperture image having a centerline,

forming a test pattern image overlapping said aperture image, said test pattern image including a measurement graticule having a centerline,

determining the distance from said centerline of said measurement graticule to said centerline of said aperture image from said measurement graticule, and

controlling said photoplotter to superimpose said centerline of said aperture image on a centerline of an image produced by said line side of said photoplotter which corresponds to said centerline of said test pattern image.

5,317,339

PRINTING MODULE FOR AN INK-PRINTING SYSTEM HAVING AN INK STORAGE CONTAINER WITH AN INTEGRATED INK-PRINTING HEAD

Hilarion Braun, Xenia, Ohio; Wolfgang Schullerus, Evenhausen, and Harald Schulz, Berlin, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany and Eastman Kodak Company, Rochester, N.Y.

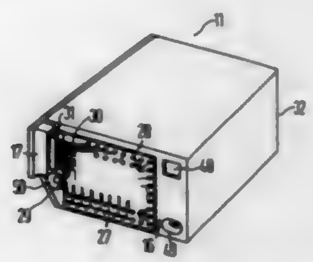
PCT No. PCT/EP90/01640, § 371 Date Jun. 3, 1992, § 102(e) Date Jun. 3, 1992, PCT Pub. No. WO91/04861, PCT Pub. Date Apr. 18, 1991

PCT Filed Sep. 28, 1990, Ser. No. 847,056

Claims priority, application European Pat. Off., Oct. 3, 1989, 89118348.5

Int. Cl.^{5} B41J *2/175*

U.S. Cl. 346—1.1 **22 Claims**



1. A printing module for an ink-printing system, comprising:
a) an ink storage container having an integrated ink-printing head;
b) a housing for holding said integrated ink-printing head, said housing having an ink supply opening and having an inner wall;
c) an ink collection region being disposed in said housing, and being in fluidic communication with said ink supply opening, wherein said ink collection region is formed exclusively by a depression in said inner wall of said housing, said depression being in a vicinity of a limit area of the ink collection region having longitudinal and lateral dimensions that are a multiple of a depth of said depression;
d) a filter element covering said limit area of said ink collection region and preventing penetration of air into said ink collection region;
e) a storage element being in direct contact with said filter element, being disposed essentially compression-free in said housing, and being made of a microchanneled, ink absorbing and releasing material; and
f) a plurality of spacers being disposed in said depression, whereby said plurality of spacers maintain a predetermined distance between said filter element and a bottom surface of said ink collection region.

5,317,340

METHOD AND DEVICE FOR ERASING AND WRITING ON MAGNETIC RECORDING MEDIA SUITABLE FOR DIRECT VIEWING

Hemant K. Mody, 200 White Rabbit Trail, Rochester, N.Y. 14612

Filed Aug. 23, 1990, Ser. No. 571,939

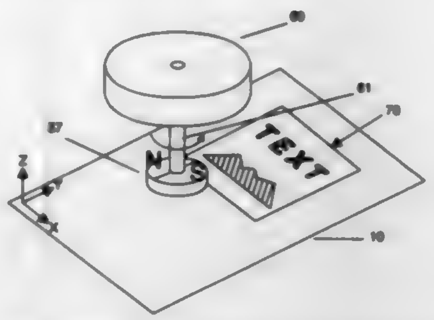
Int. Cl.^{5} G11B *9/00*

U.S. Cl. 346—74.3 **16 Claims**

1. Apparatus for recording a visible image in a magnetic recording element comprising a plurality of magnetic flakes encapsulated and dispersed on a substrate, such recording being effected by selectively orienting such flakes, in accordance with visible image information to be recorded, either in a plane substantially parallel to said substrate, or in a plane substantially normal to said substrate, said apparatus comprising:

a stencil comprising a first region and a second region of differing magnetic permeability, said first region having a permeability substantially higher than the permeability of said second region, said first region and second region being imagewise configured to define image information to be recorded, said stencil being adapted to be positioned in close proximity to and opposite such magnetic recording element during a recording operation;

means for producing a magnetic field having a surface defining at least one pair of magnetic poles of opposite polarity, said surface being adapted to be disposed in a plane substantially parallel to and opposite said stencil during a recording operation; and



means for producing relative movement between said magnetic field-producing means and said stencil to cause the magnetic flakes of that portion of a magnetic recording element located opposite said first region of said stencil to become oriented substantially normal to such substrate, and to cause the magnetic flakes of that portion of a recording element located opposite said second region of said stencil to become oriented substantially parallel to such substrate.

5,317,341

THERMAL HEAD AND METHOD OF MAKING THE SAME

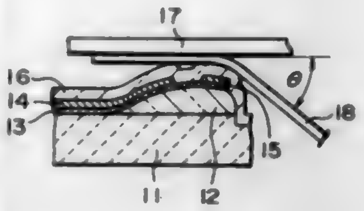
Yutaka Tatsumi, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jan. 9, 1992, Ser. No. 818,381

Claims priority, application Japan, Jan. 24, 1991, 3-7257; Jan. 24, 1991, 3-7258

Int. Cl.^{5} B41J *2/335*

U.S. Cl. 346—76 PH **10 Claims**



9. A printer comprising:
an original image supply section for supplying an original image to be reproduced;
a recording sheet supply section for supplying a recording sheet on which said original image is reproduced;
a thermal transfer printing section for reproducing said original image on said recording sheet, the thermal transfer printing section having a thermal print head, wherein the thermal print head comprises:
a glaze layer formed, as a heat accumulating layer, on a substrate, an edge of said glaze layer being cut and rounded;
a resistance layer formed on portions of said glaze layer;
electrode layers formed on said resistance layer at a given location;
a printing portion sandwiched between said electrode layers on other portions of said glaze layer uncovered by said resistance layer;
a protective film formed on said resistance and electrode layers to cover said glaze, resistance and electrode layers and said printing portion; and
anti-separation means for preventing separation of said protective film from a surface of said thermal print head, said anti-separation means including: a portion of said substrate externally exposed by cutting said glaze layer; and said protective film covering said exposed substrate portion.

5,317,342

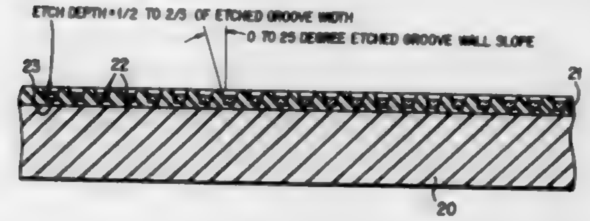
HIGH-DENSITY PRINT HEAD

Donald C. Sedberry, Gwynedd, Pa., assignor to Max Levy Autograph, Inc., Philadelphia, Pa.

Division of Ser. No. 408,529, Sep. 18, 1989, which is a division of Ser. No. 141,113, Jan. 5, 1988, Pat. No. 4,897,676. This application Aug. 12, 1992, Ser. No. 928,352

Int. Cl.^{5} B41J *2/325*

U.S. Cl. 346—76 PH **15 Claims**


ETCH DEPTH = 1/2 TO 2/3 OF ETCHED GROOVE WIDTH
0 TO 25 DEGREE ETCHED GROOVE WALL SLOPE
23
22
21
20

1. A print head comprising at least one high-density electronic circuit, the circuit comprising a plurality of conductors, the conductors being formed in grooves in an electrically insulating substrate, each of said grooves having a width and a depth, the depth of each of said grooves being of the same order of magnitude as the width, the conductors being formed of a conductive cermet material, each of the conductors having a width which is less than about 0.005 inches, wherein there are spaces between adjacent conductors, the spaces having a width less than about 0.005 inches, the circuit extending over a total area exceeding about one square inch, the conductors having ends disposed near an image recording medium, wherein activation of selected conductors causes production of a picture element on said medium.

5,317,343

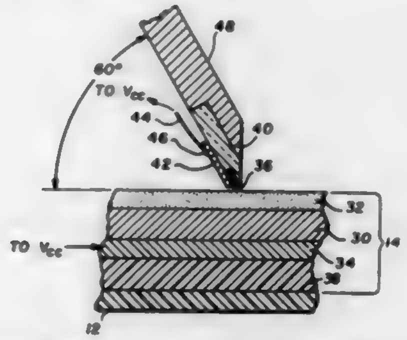
ELECTRODES FOR RESISTIVE RIBBON THERMAL PRINT HEAD

George W. Brock, La Jolla, Calif., and Michael E. Long, Penfield, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1992, Ser. No. 947,588

Int. Cl.^{5} B41J *2/385*

U.S. Cl. 346—76 PH **22 Claims**



1. A resistive ribbon pringt head for delivering electrical current to a dye carrier resistive ribbon, the resistive ribbon print head comprising:
(a) a non-electrically but thermally conductive ceramic substrate; and
(b) a plurality of spaced electrically conductive non-oxide ceramic electrodes secured to the substrate, each of said electrodes (i) being formed throughout from material WC, W_2C, TaC, or ZrC, and (ii) having a free surface of said material adapted to contact a dye carrier resistive ribbon.

5,317,344

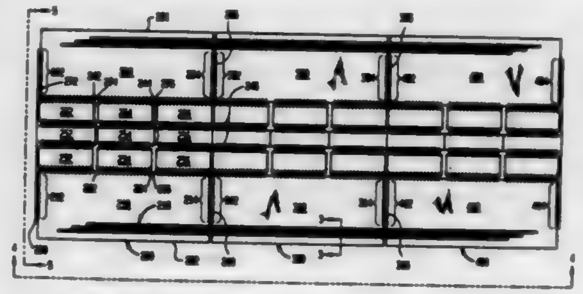
LIGHT EMITTING DIODE PRINTHEAD HAVING IMPROVED SIGNAL DISTRIBUTION APPARATUS

Bryan A. Beaman, Churchville; Jeffrey G. LaPointe, Spencerport, and David A. Newman, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1989, Ser. No. 455,125

Int. Cl.^{5} B41J *2/45*

U.S. Cl. 346—107 R **22 Claims**



1. A printhead comprising:
a support member;
a plurality of modules situated on said support member in a side-to-side relationship in a row;
each of said modules including a tile having mounted thereon a plurality of print element arrays, a corresponding first plurality of drive circuits connected to said print element arrays and a first spreader board, connected to said drive circuits wherein said spreader board has a predefined wiring pattern for providing data and clock signals to said drive circuits;
a bus bar affixed to said first spreader board and wherein said first spreader board overhangs an edge of the tile so that a pin extending from the bus bar extends through a through-hole on said first spreader board and does not contact said tile; and
plural wire interconnection means existing between each pre-defined area on the wiring pattern on the first spreader board in each first one of said modules and a corresponding pre-defined area in the wiring pattern in the spreader board in each second one of said modules situated adjacent to said first module such that the modules are interconnected in a daisy-chained fashion so that data and clock signals for said drive circuits are passed from one spreader board to another through said daisy-chain connection.

5,317,345

IMAGE FORMATION APPARATUS HAVING ERASING MEANS RESPONSIVE TO OPERATION STATUS

Yoshiharu Ueki, Nara, and Fumio Shimazu, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1991, Ser. No. 799,169

Claims priority, application Japan, Nov. 29, 1990, 2-333726; Nov. 29, 1990, 2-333728

Int. Cl.^{5} G02F *1/13;* **B41J** *2/445*

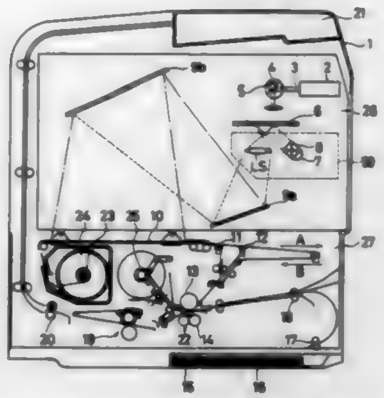
U.S. Cl. 346—107 R **1 Claim**

1. An image formation apparatus for selectively storing image data received from image data outputting means in an

optical image memory by beam light and printing it out on a recording medium, said image formation apparatus comprising:

clocking means for clocking a predetermined time period after every completion of printing;

said image data outputting means outputting command data prior to the image data,



detecting means for detecting whether the command data contains an erase command; and

erasing means for erasing the contents stored in the optical image memory when the predetermined time period has passed or the erase command is detected.

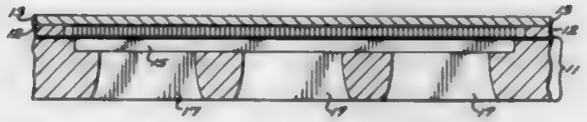
5,317,346
COMPOUND INK FEED SLOT

Andre Garcia, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1992, Ser. No. 845,882

Int. Cl.^{5} B41J *2/14*

U.S. Cl. 346—140 R **4 Claims**



1. A thin film thermal ink jet printhead, comprising:

a silicon substrate having a top surface and a bottom surface; an elongated trench formed in the top surface of said silicon substrate;

a plurality of slots extending through said silicon substrate from the bottom surface thereof to said elongated trench;

a plurality of patterned thin film layers disposed on areas of the top surface of said silicon substrate apart from the trench; and

an ink barrier layer disposed over said plurality of patterned layers and forming a plurality of ink containing chambers adjacent to said trench, said ink barrier layer having an opening generally in alignment with said elongated trench and in communication with said ink containing chambers;

whereby ink is conveyed from outside the printhead through said slots and trench, and into said ink containing chamber.

5,317,347
IMAGE FORMING APPARATUS

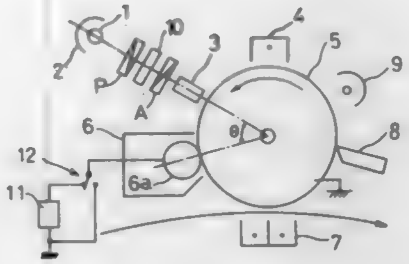
Tomohiko Masuda; Ken Matsubara, both of Takatsuki; Tsukasa Yagi, Toyonaka; Koji Wakamiya, and Hirohisa Kitano, both of Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 688,172, Apr. 19, 1991, abandoned. This application Jan. 19, 1993, Ser. No. 6,159

Claims priority, application Japan, Apr. 20, 1990, 2-105671; Apr. 20, 1990, 2-105672

Int. Cl.^{5} G01D *15/14*

U.S. Cl. 346—160 **12 Claims**



1. An image forming apparatus which comprises a light shutter disposed between a source of light and an image carrier, which is electrostatically charged to a predetermined polarity, and capable of exhibiting a light transmissivity which varies according to a voltage applied to said light shutter, an electrostatic latent image being formed on the image carrier by radiating rays of light having passed through the light shutter, said apparatus comprising:

a voltage applying means for applying a first voltage of a predetermined direction to the light shutter according to image information during a first period in which a first area on a surface of the image carrier passes across the light shutter and also for applying a second voltage of a direction counter to said predetermined direction to the light shutter during a second period in which a second area on the surface of the image carrier passes across the light shutter;

a developing means to which a predetermined bias voltage is applied, said developing means being operable to supply a developing material onto a portion of said first area having a potential lower than the developing bias voltage as a result of operation of the light shutter; and

a development inhibiting means operable during the second period to inhibit a supply of the developing material onto said second area, including a charger disposed between the light shutter and the developing means, said charger being operable to apply a charge of the same polarity as said predetermined polarity to the second area.

5,317,348
FULL COLOR SOLID STATE LASER PROJECTOR SYSTEM

Randall J. Knize, 25 19th Ave., Apt. A., Venice, Calif. 90291

Filed Dec. 1, 1992, Ser. No. 983,873

Int. Cl.^{5} G03B *21/28;* H04N *9/31*

U.S. Cl. 353—31 **20 Claims**

1. A full color solid-state laser projector system comprising:

a red solid-state laser means based upon semiconductor lasers operating to produce a light beam at a proximate 610–640 nm wavelength;

a red light modulator means; said red light modulator means receiving the laser light produced by said red solid-state laser means and operating to produce a red laser beam;

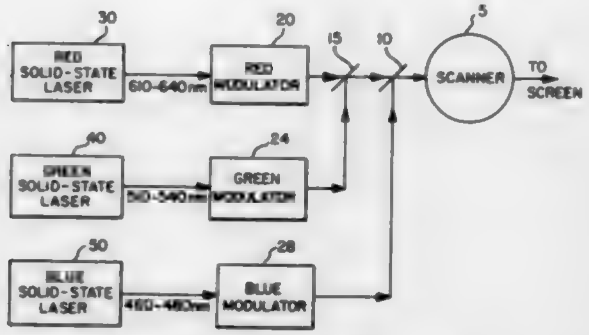
a green solid-state laser means based upon semiconductor lasers operating to produce a light beam at a proximate 510–540 wavelength;

a green light modulator means; said green light modulator means receiving the laser light produced by said green solid-state laser means and operating to produce a green laser beam;

a blue solid-state laser means based upon semiconductor lasers operating to produce a light beam at a proximate 460–480 nm wavelength;

a blue light modulator means; said blue light modulator means receiving the laser light produced by said blue solid-state laser means and operating to produce a blue laser beam;

a first combiner means and a second combiner means, and a scanner means;



said second combiner means receiving said red and green laser beams produced by said red and green modulator means, and combining said beams to produce a red/green laser beam directed at said first combiner means;

said first combiner means receiving said blue laser beam produced by said blue modulator means, and combining said blue laser beam with said red/green laser beam to produce a combination of red, green and blue laser light which is directed at said scanner means;

said scanner means receiving said combination laser light and operating to produce a laser beam output for a screen or other equipment.

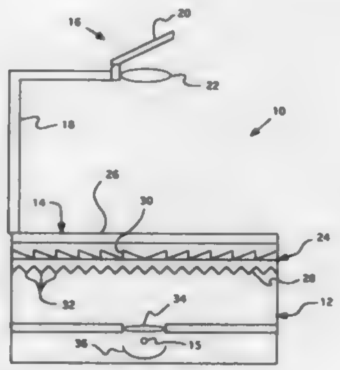
5,317,349
OVERHEAD PROJECTOR WITH ACHROMATIC FRESNEL LENS

Dennis F. Vanderwerf, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1993, Ser. No. 84,513

Int. Cl.^{5} G03B *21/14*

U.S. Cl. 353—38 **8 Claims**



8. An overhead projector comprising:

a base having a stage area;

a projector head mounted to said base, proximate said stage area;

a light source in said base;

a condenser lens located adjacent said light source, between said light source and said stage area;

a back reflector located adjacent said light source, opposite said condenser lens; and

a condensing lens system located at said stage area, said condensing lens system including:

a convergent, catadioptric Fresnel lens having an upper plano surface and a lower surface, said lower surface having a plurality of generally circular, prismatic ridges and grooves defining an effective center, said catadioptric lens having negative dispersion, and

a convergent, dioptric Fresnel lens generally parallel with said catadioptric lens, having an upper plano surface and a lower surface, said lower surface having a plurality of prismatic ridges and grooves defining an effective center and being located adjacent said upper plano surface of said catadioptric lens whereby said effective center of said dioptric lens overlies said effective center of said catadioptric lens, said dioptric lens having positive dispersion,

said catadioptric and dioptric lenses being constructed of a polymeric thermoplastic having an index of refraction of at least about 1.4, and conforming to the conditions:

$$F_1<(\phi_1-\phi_2)$$

and

$$\phi_2<\phi_3,$$

where F_1 is a refracting groove angle of said catadioptric lens, ϕ_1 is an entrance angle of a light ray entering said lower surface of said catadioptric lens, ϕ_2 is an internal angle of a light ray between said upper plano surface of said catadioptric lens and said lower surface of said dioptric lens, and ϕ_3 is an exit angle of a light ray exiting said upper plano surface of said dioptric lens.

5,317,350
OVERHEAD PROJECTOR

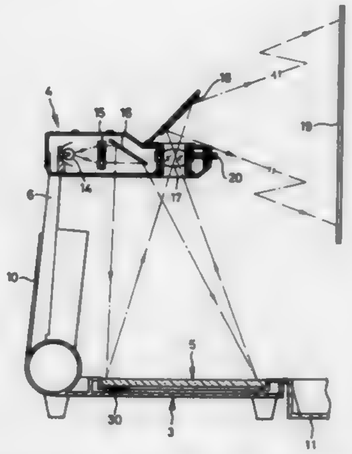
Masaaki Nomura; Ko Aosaki; Takashi Kubo; Kenta Namioka, all of Saitama, and Koji Takanose, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 19, 1993, Ser. No. 34,463

Claims priority, application Japan, Mar. 19, 1992, 4-14935[U]; Mar. 19, 1992, 4-63937; May 18, 1992, 4-124630; Jun. 11, 1992, 4-152449; Jun. 11, 1992, 4-152450; Mar. 10, 1993, 5-49664

Int. Cl.^{5} G03B *21/08*

U.S. Cl. 353—63 **40 Claims**



1. An overhead projector having a light source for illuminating an original material comprising a transparency and a projector head positioned above said original material and adapted to project an image of said original material onto a screen, said overhead projector comprising:

a stage on which said original material is supported, said stage having a Fresnel plate of which one surface is formed to be a Fresnel surface, and an electrostatic attracting structure on the upper side of said Fresnel plate and integral with said Fresnel plate, for attracting said original material electrostatically;

said electrostatic attracting structure including a conductive membrane constituting a pair of electrodes which are arranged in coplanar fashion and adjacent each other, a dielectric/protective layer covering said conductive membrane so as to protect said conductive membrane; and

power supply means for applying a high voltage of direct current of opposite polarities to respective ones of said pair of electrodes.

5,317,351
POSITION DETECTING DEVICE

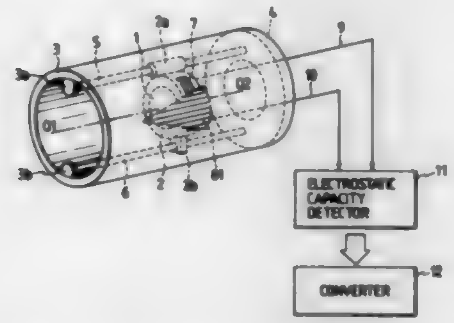
Hiroyuki Takahara, Yokohama; Shigeru Ogino, and Masayoshi Sekine, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,057

Claims priority, application Japan, Dec. 21, 1990, 2-412617; Nov. 28, 1991, 3-314559

Int. Cl.^{5} G03B *1/18*; H01G *5/14*

U.S. Cl. 354—195.1 **21 Claims**



1. A position detecting device comprising:

(a) a movable member;

(b) a first electrode movable with movement of said movable member; and

(c) a second electrode disposed at a location opposed to said first electrode, an edge of at least one of said first and second electrodes being inclined with respect to a direction of movement of said first electrode, the inclination of the edge varying in accordance with a position of said first electrode relative to said second electrode so that an area over which said first electrode and said second electrode overlap varies in response to relative movement of said first and second electrodes, to indicate an absolute position of said movable member with respect to said second electrode and to change a position detection accuracy in accordance with a position of said first electrode.

5,317,352
ELECTRONICALLY CONTROLLED CAMERA

Takeo Kobayashi, Tokyo; Yasushi Tabata, Ichikawa; Norio Numako, Nogi, and Katsutoshi Nagai, Kawaguchi, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 655,105, Feb. 14, 1991, Pat. No. 5,210,558. This application Jul. 23, 1992, Ser. No. 917,498

Claims priority, application Japan, Feb. 14, 1990, 2-32903

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

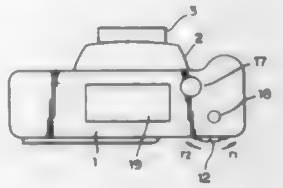
Int. Cl.^{5} G03B *1/18*

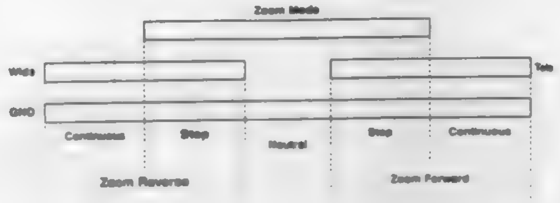
U.S. Cl. 354—195.1 **7 Claims**

1. An electronically controlled camera comprising a zoom lens which is capable of being driven to move in the direction of an optical axis of said zoom lens between a tele extremity and a wide extremity, said camera further comprising:

a single operation member for selecting whether said zoom lens should move towards said tele extremity or said wide extremity and also whether said zoom lens should stepwisely or continuously move in said selected direction; and

control means for driving said zoom lens to move either stepwisely or continuously between said tele and wide extremities in accordance with said operation of said single operation member.





5,317,353
SHUTTER RELEASE DEVICE

Takumi Kobayashi, and Etsuro Nishio, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

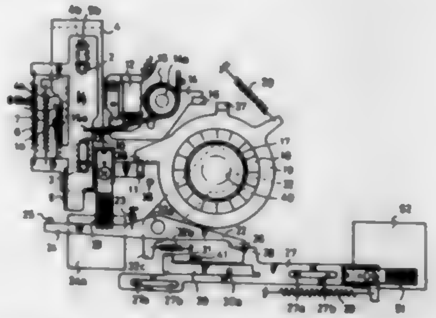
The portion of the term of this patent subsequent to May 10, 2010, has been disclaimed.

Continuation of Ser. No. 412,492, Sep. 26, 1989, abandoned. This application Jan. 27, 1992, Ser. No. 825,312

Claims priority, application Japan, Oct. 4, 1988, 63-130185; Oct. 21, 1988, 63-137650

Int. Cl.^{5} G03B *17/38*

U.S. Cl. 354—266 **23 Claims**



1. A shutter release device for a camera, said shutter release device comprising:

a release member mounted for movement from an initial position to operate a shutter of said camera;

a delay member mounted for movement relative to said release member;

means for releasing a shutter of said camera, said releasing means being controlled by movement of said delay member;

biasing means connected to said delay member and said release member for urging said delay member in a direction in which said delay member operates said shutter releasing means, said biasing means comprising means whereby movement of said member from said initial position by a stroke shorter than a predetermined value stores energy in said biasing means;

means for preventing movement of said delay member as long as said release member is moved from said initial position by a stroke shorter than said predetermined value; and

means for releasing said movement preventing means when said release member is moved from said initial position by a stroke longer than predetermined value to enable movement of said delay member to operate said shutter releasing means.

5,317,354
REMOTE CONTROL FOR A CAMERA HAVING AN OPTICAL FIBER

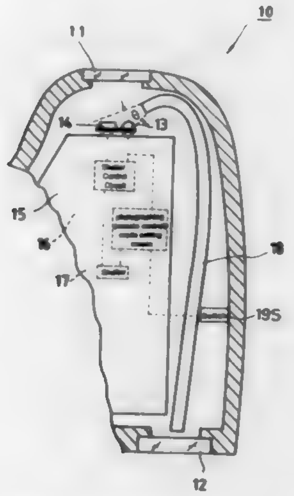
Kosei Kosako, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1993, Ser. No. 15,834

Claims priority, application Japan, Feb. 17, 1992, 4-006151[U]

Int. Cl.^{5} G03B *17/38*

U.S. Cl. 354—266 **6 Claims**



1. A remote control apparatus for a camera including a remote control transmitter which emits a remote control signal light, and a light receiver provided in a camera body which receives the remote control signal light emitted from said remote control transmitter, wherein a shutter of said camera body can be released in response to the remote control signal light received by said light receiver, comprising:

a light emitter which is provided adjacent to said light receiver to emit light to indicate activation of a remote control mode in which a picture can be taken by said remote control apparatus;

a first transparent portion provided on a side of said camera body through which light can be transmitted;

a second transparent portion provided on another side of said camera body through which light can be transmitted; and

an optical fiber having a first end and a second end, the first end facing said light emitter and said light receiver, the second end facing one of said first or said second transparent portion.

5,317,355
FILM CASSETTE WITH SPOOL LOCK AND LIGHT-SHIELDING DOOR

Dennis R. Zander, Penfield, N.Y., and Hideaki Kataoka, Odawara, Japan, assignors to Eastman Kodak Company, Rochester, N.Y. and Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1993, Ser. No. 34,978

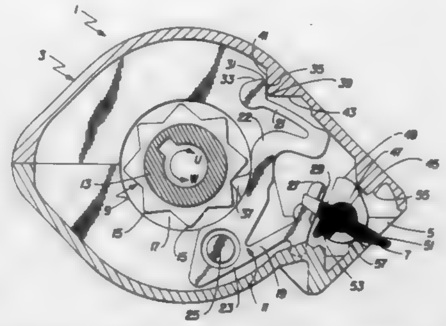
Int. Cl.^{5} G03B *17/26*

U.S. Cl. 354—277 **6 Claims**

1. A film cassette comprising light-shielding means for preventing ambient light from entering the cassette interior, a film spool supported for rotation in film unwinding and film winding directions, and locking means supported for pivotal movement into engagement with said spool to secure the spool and out of engagement with the spool to release the spool, is characterized in that:

said light-shielding means is supported for closing movement to prevent ambient light from entering the cassette interior and for opening movement, and includes cam means for pivotally moving said locking means into engagement with said spool responsive to closing movement of the light-shielding means and for holding the locking means engaged with the spool; and

said locking means includes first resilient means for being temporarily deformed should the locking means be blocked from being pivotally moved by said cam means to engage said spool and said light-shielding means is forcibly closed or should the locking means be held engaged with the spool and the spool is forcibly rotated in the film unwinding and winding directions, and second resilient means for being temporarily deformed independent of said first resilient means should the locking means be held engaged with the spool and the spool is forcibly rotated in the film unwinding and winding directions, whereby the light-shielding means is permitted to be closed even though the locking means is obstructed and the spool is permitted to be rotated even though the locking means is engaging the spool.



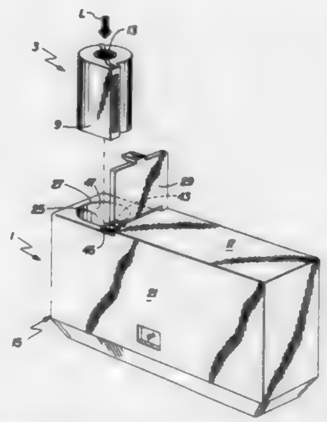
5,317,356
PHOTOGRAPHIC CAMERA WITH INTERIOR DUST SEAL

William F. Dassero, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 24, 1993, Ser. No. 21,444

Int. Cl.^{5} G03B *17/02*

U.S. Cl. 354—288 **5 Claims**



1. A photographic camera comprising a chamber for receiving a cartridge containing a filmstrip, a film exposing gate, and movable blocking means for sealing a film passage to said exposing gate which must be moved out of the way to permit

a filmstrip from a cartridge in said chamber to be advanced to the exposing gate, is characterized in that:

said blocking means is positioned inside said chamber over a film egress opening to said film passage to be moved to uncover said film egress opening by a cartridge during insertion of the cartridge into the chamber, whereby a filmstrip from the cartridge can be advanced through said film egress opening to said film passage.

5,317,357

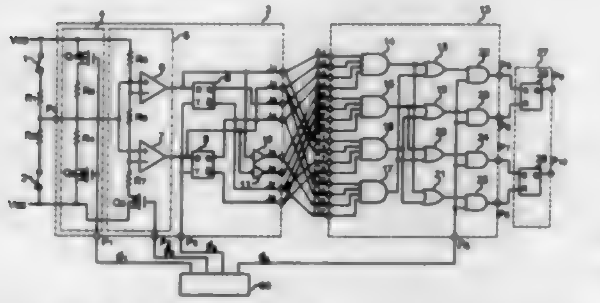
CAMERA DUAL SWITCH SINGLE DATA INPUT-MULTIPLE DATA OUTPUT DEVICE

Yoichi Seki; Teruyo Hayakawa; Hiroyuki Saito, and Shinichi Endo, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Nov. 29, 1991, Ser. No. 801,762

Int. Cl.^{5} G03B *17/00*

U.S. Cl. 354—289.12 **18 Claims**



1. A data input-output device for a camera, comprising: first and second switches individually switchable to open and closed states to generate input data; means for determining the open and closed states of each of the first and second switches; first and second flip-flops for latching input data generated by opening and closing the first and second switches and outputting corresponding output data; data converting means for converting the input data generated by opening and closing the first and second switches to digital data by a combination of the input data generated by opening and closing the first and second switches and of the output data of the first and second flip-flops; a plurality of AND circuits connected to receive the digital data converted by the data converting means and perform AND logic operations thereon; and data output means for outputting a plurality of digital data from the AND logic operations obtained by the plurality of AND circuits.

5,317,358

PHOTOGRAPHIC FILM TRANSPORTING MEMBER, PHOTOGRAPHIC FILM TRANSPORTING APPARATUS AND PHOTOGRAPHIC PROCESSING SYSTEM

Ken Kawada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 2, 1992, Ser. No. 970,146

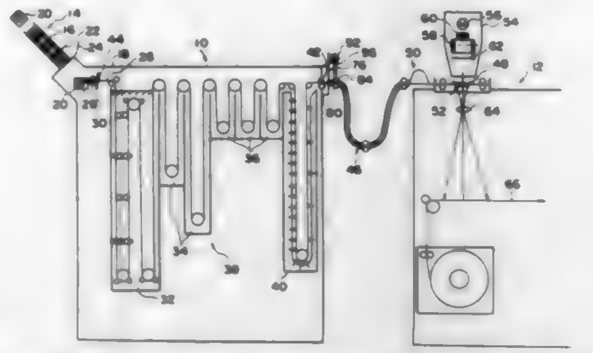
Claims priority, application Japan, Nov. 6, 1991, 3-290127

Int. Cl.^{5} G03D *3/08*

U.S. Cl. 354—319 **20 Claims**

1. A photographic film transporting apparatus comprising:

transport passage means formed of an elongated flexible member and having a pair of mutually opposed grooves for guiding transversely opposite ends of a photographic film and extending in a longitudinal direction of said transport passage means; and



two coupling portions for respectively coupling opposite ends of said transport passage means to two photographic film processing apparatuses.

5,317,359

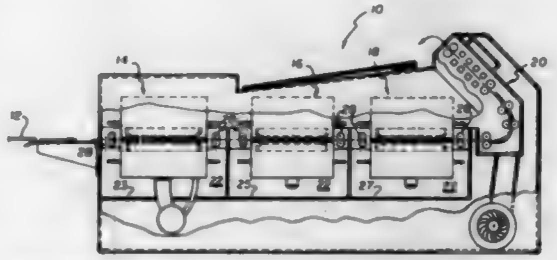
APPARATUS FOR PROCESSING PHOTOSENSITIVE MATERIAL

David G. Sherburne, Ontario, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1992, Ser. No. 956,135

Int. Cl.^{5} G03D *3/02*

U.S. Cl. 354—324 **24 Claims**



1. In an apparatus for processing photosensitive material, the apparatus having an upper tank for retaining a processing fluid and a lower tank for retaining the processing fluid, a processing chamber between the upper tank and lower tanks through which the material can be advanced for processing the photosensitive material, said processing chamber having an entrance at one end and an exit at the other end to allow the photosensitive material to travel through the chamber, first supply means at the entrance and exit for supplying processing fluid from the upper tank to the processing chamber to create a first fluid layer on one side of the photosensitive material, a first drain located between the entrance and exit for removing processing fluid from the second fluid layer, second supply means at the entrance and exit for supplying processing fluid from the lower tank to the processing chamber to create a second fluid layer on the opposite side of the photosensitive material, a second drain located between the entrance and exit for removing processing fluid from the second fluid layer; the improvement comprising:

means for substantially equalizing the back pressure of the processing fluid at the first and second drains.

5,317,360

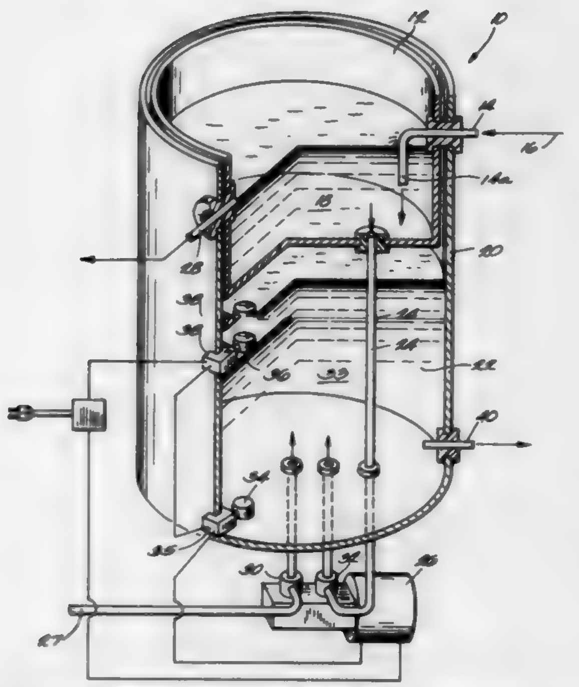
CHEMICAL RECYCLER FOR PHOTO PROCESSING MACHINE

Gunter Woog, 5435 Bauers Dr., West Bend, Wis. 53095

Continuation-in-part of Ser. No. 775,917, Oct. 15, 1991, and a continuation-in-part of Ser. No. 617,522, Nov. 23, 1990, Pat. No. 5,057,858. This application May 8, 1992, Ser. No. 879,939

Int. Cl.^{5} G03D *3/02*

U.S. Cl. 354—324 **8 Claims**



1. A device for recycling a liquid chemical selected from the group consisting of fixer solution and developer solution into a photo processing machine, said photo processing machine having a fixer tank with and inlet and an overflow outlet and a developer tank with an inlet and an overflow outlet, and a metering replenishment pump for inputting chemicals into each of said tanks, said device comprising:

at least one first container for receiving and containing a chemical liquid flowing from the overflow outlet of one of said tanks;

an inlet into said first container, connected to the overflow outlet, for permitting liquid to flow from the overflow outlet into said first container;

a source of fresh chemical liquid,

at least one second container for receiving and containing a mixture of used chemical liquid from said first container and fresh unused chemical from said source thereof,

a pump for pumping a fixed ratio of the liquid from said first container and said fresh unused chemical into the inlet of said second container,

an outlet in said second container connected to the one of said replenishment pumps connected to said one of said tanks.

5,317,361

CONTROL DEVICE FOR PREVENTING RED-EYE EFFECT ON CAMERA

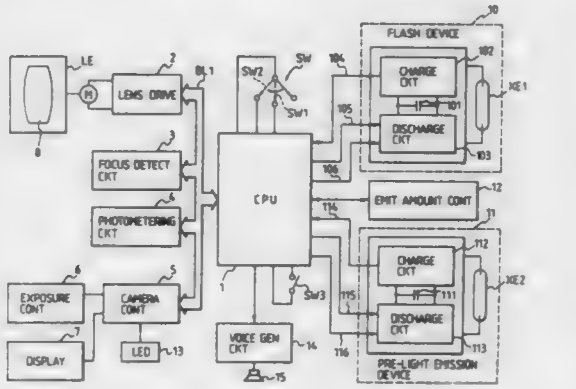
Toru Fukuhara, Isehara; Toshio Sosa, Narashino; Masaharu Hara; Hachiro Kanai, both of Kawasaki, and Norikazu Yokonuma, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 930,466, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 785,210, Oct. 25, 1991, abandoned, which is a continuation of Ser. No. 632,648, Dec. 26, 1990, abandoned, which is a continuation of Ser. No. 445,996, Dec. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 323,386, Mar. 14, 1989, abandoned. This application Nov. 12, 1992, Ser. No. 974,781

Claims priority, application Japan, Mar. 16, 1988, 63-64031; Mar. 16, 1988, 63-64032; Mar. 25, 1988, 63-72236; Mar. 25, 1988, 63-72237; Mar. 25, 1988, 63-72238; Apr. 11, 1988, 63-88757; Apr. 12, 1988, 63-49820[U]; Apr. 15, 1988, 63-50771[U]; Dec. 6, 1988, 63-309258

Int. Cl.^{5} G03B *15/05*

U.S. Cl. 354—415 **51 Claims**



1. A camera comprising:

main flash means provided to emit illuminating light toward an object;

pre-light-emitting means provided to emit pre-irradiating light toward the object for reducing the size of a human eye pupil;

driving control means for causing said pre-light-emitting means to emit light prior to the light emission of said main flash means; and

means for indicating acoustically prior to the emission by said pre-light-emitting means, that said pre-irradiating light and said illuminating light will be emitted one after another.

5,317,362

CONTROL CIRCUIT FOR CAMERA HAVING AUXILIARY LIGHT SOURCE

Minoru Takahashi, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Jun. 11, 1992, Ser. No. 897,287

Claims priority, application Japan, Jun. 13, 1991, 3-168835; Jun. 13, 1991, 3-168836; Jun. 13, 1991, 3-168837

Int. Cl.^{5} G03B *15/05, 7/26*

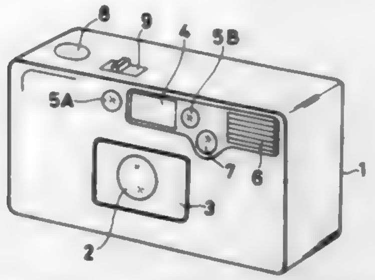
U.S. Cl. 354—418 **2 Claims**

1. A control circuit for a camera having an auxiliary light source comprising:

an auxiliary light source, provided separately from an electronic light source, which emits light so as to prevent red-eye phenomenon;

a CPU for controlling the entire operation of said camera for controlling driver circuits for braking a predetermined motor of said camera during the battery voltage check in the ordinary mode, and for controlling driver circuits for braking another motor in addition to said motors during the battery voltage check in the red-eye preventing mode as a result of applying a dummy current to said driver circuits;

a transistor for starting a battery check by said CPU; and



a comparator for judging the battery capacity by using the battery voltage during braking said predetermined motor in ordinary mode and by using the battery voltage at the state of braking another motor in addition to said predetermined motors in the red-eye prevent mode.

5,317,363

IMAGE FORMING APPARATUS USING DRY SILVER SALT MATERIAL

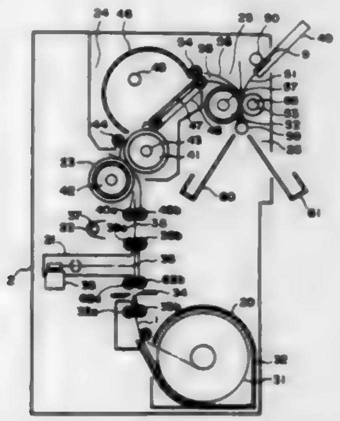
Kazuo Isaka, Tokyo; Akihiro Mouri, Kokubunji; Masato Katayama, Yokohama; Tetsuro Fukui, Kawasaki, and Yoshinobu Shiraiwa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 558,705, Jul. 27, 1990, abandoned. This application Aug. 6, 1991, Ser. No. 742,727

Claims priority, application Japan, Jul. 28, 1989, 1-195628

Int. Cl.^{5} G03B *27/32, 27/52*

U.S. Cl. 355—27 **20 Claims**



1. An image forming apparatus using dry silver salt material, comprising:

a photosensitive member having a base material and reducing material, photosensitive silver halide and organic silver salt which are on the base material;

means for projecting digital information light onto said photosensitive member;

means for uniformly heating said photosensitive member; and

auxiliary exposure means disposed upstream of said uniform heating means with respect to movement direction of said photosensitive member for uniformly exposing an entire surface of said photosensitive member.

5,317,364

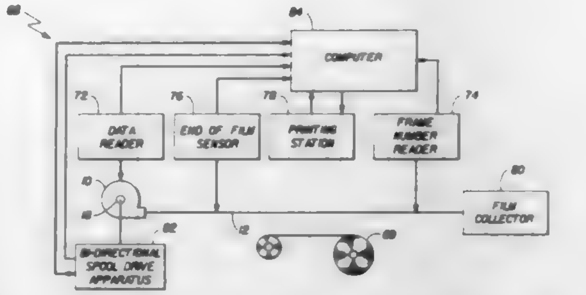
METHOD AND APPARATUS FOR REPRODUCING AN IMAGE RECORDED ON A PHOTOGRAPHIC FILMSTRIP

Roger A. Fields, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 4, 1993, Ser. No. 34

Int. Cl.^{5} G03B *27/52*

U.S. Cl. 355—40 **9 Claims**



1. An apparatus for reproducing images recorded on a photographic filmstrip wound on a film spool contained in a cartridge, said photographic filmstrip having machine-readable frame numbers associated with said images recorded thereon and said photographic filmstrip being associated with means for storing film related data including frame numbers identifying selected images to be reproduced; said apparatus comprising first means for reading said stored data, second means for reading said frame numbers, means for printing said images onto a photographic paper and means for controlling said first and second reading means, and said printing means; said apparatus characterized in that:

said control means includes means for determining whether a frame number, read by said second reading means, of a first available frame on a photographic filmstrip removed from a film cartridge is equal to one or is greater than one; means for searching first for a highest of the respective frame reading means, on a photographic filmstrip removed from the cartridge and then in succession the next lowest frame number of the selected images until all of the frame numbers of the selected images have been found if the frame number of the first available frame of a photographic filmstrip is equal to one, or for searching first for a lowest of the respective frame reading means, on a photographic film strip removed from the cartridge and then in succession the next highest frame number of the selected images until all of the frame numbers of the selected images have been found if the frame number of the first available frame of a photographic filmstrip is greater than one, and means for activating said printing means to print each one of the selected images in response to its frame number being found.

5,317,365

SUPPLY HOPPER FOR FANFOLD PAPER STACKS

Paul E. Tschiderer, Geneseo, and Gary P. Lawniczak, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 2, 1992, Ser. No. 984,654

Int. Cl.^{5} G03B *27/62*

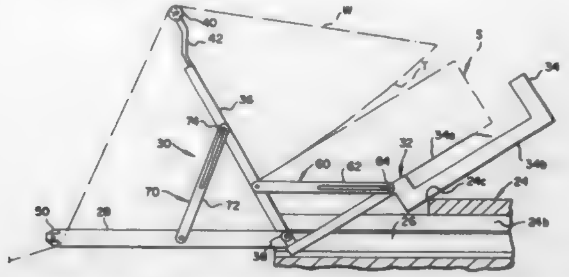
U.S. Cl. 355—75 **21 Claims**

1. A supply hopper for holding a stack of fanfold paper and guiding such fanfold paper for reliable feeding as it is withdrawn from said supply hopper, said supply hopper comprising:

a tray, in an operative erected position, for supporting a stack of fanfold paper, said tray including a base member oriented at an angle in the range of between 25°–45° from the horizontal, and a stop member connected to said base member along the lower marginal edge thereof, said stop

member and said base member forming an included angle of substantially 90°;

a guide member supported by said tray, in an operative erected position, substantially above a fanfold paper stack supported on said tray at a height sufficient to lift the topmost individual panel of said stack at least partially off said stack when the fanfold paper is threaded over said guide member; and



a bail assembly, in an operative erected position, connected to said tray extending away from said base member of said tray on the opposite side of said stop member from said base member, said bail assembly acting as a damper on fanfold paper being withdrawn from the stack of fanfold paper passing from such stack supported on said tray over said guide member and below said bail assembly.

5,317,366

PROCESSING UNIT AND SYSTEM INCLUDING PLURALITY OF THE PROCESSING UNITS

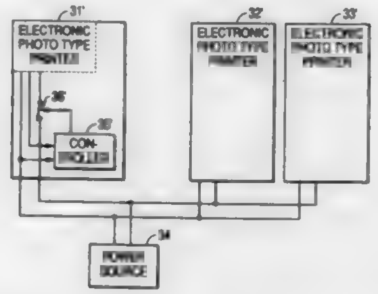
Makoto Koshi, and Yoshihiko Kaiju, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 794,258, Nov. 19, 1991, abandoned. This application May 19, 1993, Ser. No. 63,049

Claims priority, application Japan, Nov. 20, 1990, 2-312782

Int. Cl.^{5} G03G *21/00*

U.S. Cl. 355—202 **11 Claims**


31'
32'
33'
ELECTRONIC PHOTO TYPE PRINTER
ELECTRONIC PHOTO TYPE PRINTER
ELECTRONIC PHOTO TYPE PRINTER
CONTROLLER
POWER SOURCE
34

1. A system having a plurality of processing units and a common power source connected thereto for supplying power to the plurality of processing units, comprising:

a plurality of switching means, respectively corresponding to and incorporated in the plurality of processing units and interconnecting the respective plurality of processing units with the common power source, for receiving respective control inputs thereto and selectively being switched thereby to ON and OFF conditions for respectively and selectively supplying power therethrough, or discontinuing the supply of power therethrough, to the respective processing units from the common power source;

a plurality of request means, respectively associated with and incorporated in said plurality of processing units, each operable for determining the requirement for, and correspondingly generating a request for, the selective supply of power from the common power source to the respective processing unit; and

a plurality of individual controllers respectively associated with and incorporated in the plurality of processing units, each thereof detecting the power supply condition of the common power source, comparing the detected condition with a predetermined power supply condition and determining, based on the comparison result, an allowable condition permitting the supply of further power from the common power source and a non-allowable such condition, each individual controller further being responsive to a request received from the associated request means of the respective processing unit and in accordance with determining the allowable condition of the common power source, selectively generating and supplying a corresponding control input to the associated switching means for selectively switching said associated switching means to the ON condition thereby to supply power through the associated, selectively switched switching means to the respective processing unit.

5,317,367

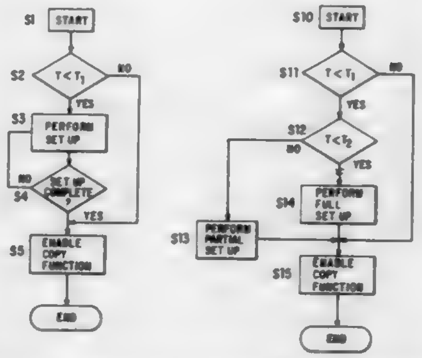
THERMAL REALTIME CLOCK

Daniel J. Pierce, Rochester, and William P. Reese, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1993, Ser. No. 3,055

Int. Cl.^{5} G03G *21/00*

U.S. Cl. 355—203 **8 Claims**



1. A reprographic apparatus having a plurality of monitored subsystems comprising:

a power switch actuatable between a power on position and a power off position;

a setup system for determining the existence of operable conditions of each of said plurality of monitored subsystems when said power switch switches to said power on position, said setup system including enabling means for enabling operation of the reprographic apparatus when the setup systems determines that said plurality of monitored subsystems are operable, said setup system preventing operation of said apparatus until operability is determined;

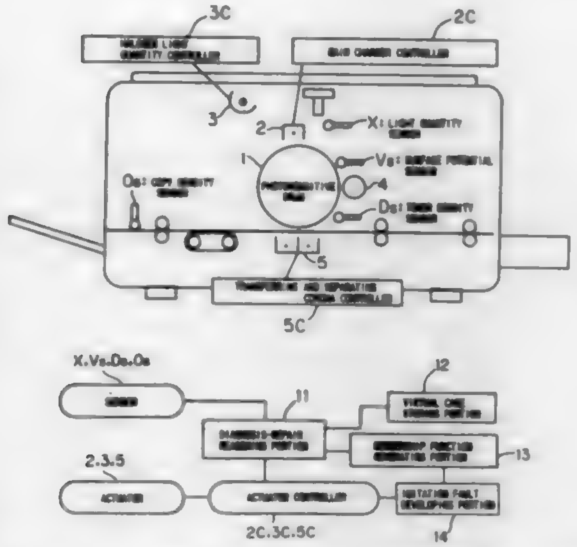
a timer for determining a time period that said power switch is in the off position; and

bypass means for bypassing the setup system to enable operation of the reprographic apparatus in the absence of a determination of operable conditions at said monitored subsystem by said setup system when the time period that said power switch has been in the off position is determined to be less than a predetermined time interval.

5,317,368
IMAGE FORMING APPARATUS CAPABLE OF MAKING SELF-DIAGNOSIS

Yoshiki Shimomura; Sadao Tanigawa, both of Osaka; Yasushi Umeda, Tokyo; Tetsuo Tomiyama, Chiba, and Hiroyuki Yoshikawa, Chiyoda, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Mar. 19, 1993, Ser. No. 34,398
Claims priority, application Japan, Mar. 24, 1992, 4-66439
Int. Cl.^{5} G03G *15/00*
U.S. Cl. 355—207 **40 Claims**



1. An image forming apparatus capable of making self-diagnosis of a fault developed by the image forming apparatus, comprising:

virtual case storing means having stored therein a plurality of faults which can be developed by the image forming apparatus and sets of qualitative values of parameters representing the state of each of the faults out of the results obtained by qualitatively expressing said image forming apparatus by a casual relation network of parameters representing the property of the image forming apparatus and qualitative simulating all states which can exist on the image forming apparatus using said casual relation network of parameters when it is assumed that a fault symptom appears on the image forming apparatus;

a plurality of sensors for detecting the states of a predetermined plurality of portions in the image forming apparatus;

landmark storing means having stored therein landmarks in a qualitative quantity space which are respectively defined using fuzzy membership functions and required for converting detected values of the sensors into qualitative values;

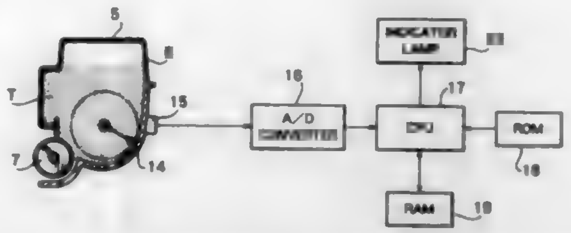
converting means for reading the detected values of said respective sensors when the fault symptom actually appears on the image forming apparatus, to convert the detected values of the sensors into fuzzy qualitative values respectively using the membership functions stored in said landmark storing means; and

fault specifying means for comparing a set of fuzzy qualitative values obtained by the conversion using said converting means with the sets of qualitative values of parameters representing the state of each of the faults which are stored in said virtual case storing means, to specify the fault represented by the set of qualitative values which is in a predetermined relationship to the set of fuzzy qualitative values as a fault causing the fault symptom actually appearing.

5,317,369
APPARATUS FOR DETECTING TONER IN IMAGE FORMING APPARATUS

Keiichi Nakanishi, Nagaokakyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 17, 1992, Ser. No. 946,959
Claims priority, application Japan, Sep. 26, 1991, 3-247965
Int. Cl.^{5} G03G *15/08*
U.S. Cl. 355—208 **15 Claims**



1. An apparatus for detecting an amount of toner in a developing device casing, the apparatus used for an image forming apparatus having a rotatable toner agitator which stirs the toner inside the developing device casing, the apparatus comprising

a sensor for detecting the change of magnetic flux density, the magnetic flux density varying with the amount of toner;

means for sampling signals output from the sensor a plurality of times at substantially constant predetermined intervals while the agitator rotates approximately 360°;

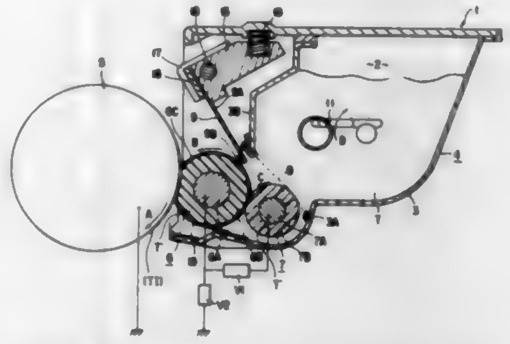
means for setting up a threshold value using the plurality of sampled signals, the means for setting up a threshold value comprising means for selecting the data sample having the lowest value among the plurality of sampled signals and adding a predetermined value to the data sample having the lowest value; and

means for counting the number of sampled signals which are not equal to the threshold value amount of toner in the casing.

5,317,370
DEVELOPING APPARATUS INCLUDING MEANS FOR COLLECTING USED DEVELOPING AGENT

Mitsuaki Kohyama, Tokyo; Kazuhiko Kikuchi; Naruhito Yoshida, both of Yokohama; Minoru Yoshida, Tokyo, and Kouji Hirano, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1992, Ser. No. 989,520
Claims priority, application Japan, Dec. 13, 1991, 3-329306
Int. Cl.^{5} G03G *15/06*
U.S. Cl. 355—245 **2 Claims**



1. A developing apparatus for developing a latent image on an image carrier using a one-component developing agent, comprising:

first supplying means in contact with the image carrier, for supplying the developing agent to the latent image on the image carrier and simultaneously removing the developing agent remaining on the image carrier;

storing means for storing the developing agent;

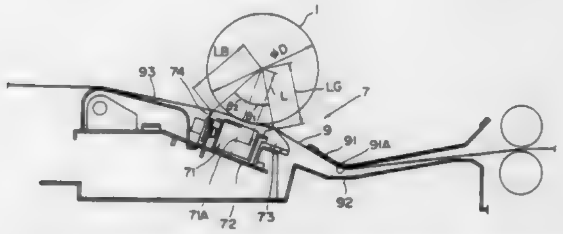
second supplying means formed of a roller having a metal shaft and a flexible expanded foam member around the metal shaft, the flexible expanded foam member being formed of a flexible expanded polyurethane foam layer having a conductivity of below 10^9 Ω.cm, a density of 0.45 g/cm^2 and 50 to 60 cells/mm, the second supplying means in contact with the first supplying means, for supplying the developing agent from the storing means to the first supplying means and removing the developing agent remaining on the first supplying means; and

removing means, in contact with the second supplying means, for removing the developing agent back into the storing means.

5,317,371
SKEW PREVENTION STRUCTURE FOR ELECTROPHOTOGRAPHIC PRINTER

Yoshio Monma, Ooi, and Hiroyuki Yamaguchi, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 683,550, Apr. 10, 1991, abandoned. This application Sep. 23, 1992, Ser. No. 949,369
Claims priority, application Japan, Apr. 13, 1990, 2-97882
Int. Cl.^{5} G03G *15/14*
U.S. Cl. 355—274 **13 Claims**



1. An electrophotographic printer comprising a photoconductive drum, and a transfer charger, a feed path of a recording medium being defined between said photoconductive drum and said transfer charger, a latent image being formed on the circumferential surface of said photoconductive drum by exposing said surface to light carrying image data, a toner image being formed by applying toner to said latent image, said recording medium being charged by said transfer charger so that said toner image is transferred from said photoconductive drum to said recording medium, said printer further comprising:

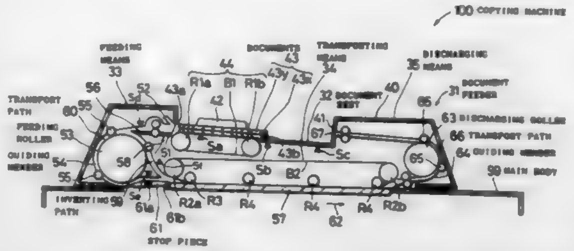
first shifting means arranged at the upstream side of said feed path with respect to said transfer charger for shifting said recording medium to said photoconductive drum by a predetermined amount; and

second shifting means arranged at the downstream side of said feed path with respect to said transfer charger for shifting said recording medium to said photoconductive drum by another predetermined amount, wherein said first shifting means and said second shifting means press said recording medium along a predetermined width of said photoconductive drum, such that a straight line formed by interconnecting said first and second shifting means intersects said circumferential surface of said photoconductive drum at more than one point, said second shifting means being remote from said photoconductive drum so as not to apply pressure directly to said photoconductive drum.

5,317,372
COPYING METHOD AND APPARATUS

Masayoshi Nakabayashi, Wakayama, and Manabu Matsumoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 24, 1992, Ser. No. 996,645
Claims priority, application Japan, Dec. 26, 1991, 3-345180
Int. Cl.^{5} G03G *15/00*
U.S. Cl. 355—311 **8 Claims**



1. A copying method using a document feeder comprising the steps of:

containing documents in a container in a stacked state in a predetermined order;

supplying documents stacked in the container from one of an uppermost layer or a bottommost layer sequentially one by one and transporting the documents to an exposure region;

discharging documents after exposure from the exposure region to the other of the uppermost layer or the bottommost layer and stacking the documents in the predetermined order; and

controlling the steps of supplying and discharging interlocked with copying operation;

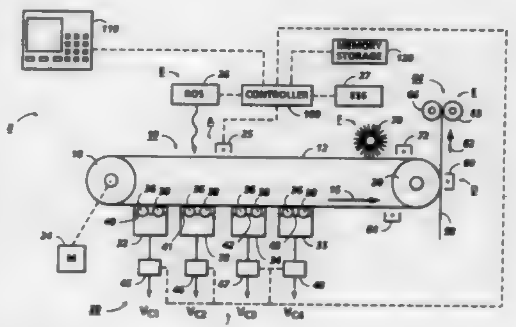
wherein the documents are taken out, exposed, and discharged in a circulating manner to enable copying of a plurality of documents in the predetermined order,

the method further comprises the step of detecting the length of the documents at least in transport direction, wherein during the step of controlling, in response to a detection result during the step of detecting, when the sum of length of documents to be copied in the transport direction is below a predetermined length, the documents are moved back and forth in a transport path for repeating copying without discharging the documents to be copied.

5,317,373
METHOD AND APPARATUS FOR USER CUSTOMIZED COLORANTS IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1992, Ser. No. 996,416
Int. Cl.^{5} G03G *15/01*
U.S. Cl. 355—326 R **5 Claims**



1. An electrophotographic printing machine of the type

having a photoconductive surface on which a developed image is formed for producing a plural color image on a sheet substrate, comprising:

means for charging the photoconductive surface;

image generating means for exposing the charged portion of the photoconductive surface to record a latent image on the charged photoconductive surface;

image developing means for developing the latent image recorded on the photoconductive surface, said image developing means includes a plurality of developer units with each of said developer units having different color developer materials and each of said developer units being electrically biased to various levels;

adjusting means for adjusting in combination said charging means, said image generating means, and said image developing means so as to attract developer materials to the photoconductive surface in varying relative quantities from each of said plurality of developer units which produce the developed image thereby forming a developed image having a desired color; and

means, responsive to said adjusting means, for storing electronic signals corresponding to selected adjustments of said adjusting means.

5,317,374

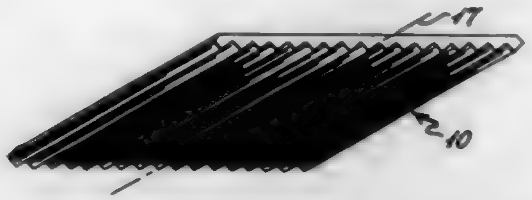
METHOD AND APPARATUS FOR MEASURING A DISTANCE TO AN OBJECT FROM DUAL TWO DIMENSIONAL IMAGES THEREOF

Peter M. Lister, Johnson City, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Sep. 25, 1992, Ser. No. 951,009

Int. Cl.⁵ G01C *3/00*

U.S. Cl. 356—3 2 Claims



1. A method for determining coplanarity deviation of any lead tip of a multilead component from a seating plane, and comprising the steps of:

providing a prismatic plate and vision camera;

establishing a reference plane;

situating said prismatic plate generally parallel to said reference plane and spaced from said multilead component and generally perpendicularly intersecting a focal axis between said component and said vision camera;

acquiring dual images of each said lead tip via said prismatic plate;

determining a tip distance from said reference plane to each said lead tip according to a corresponding separation distance between said dual images corresponding to each said lead tip; and

comparing each said tip distance and defining said seating plane by tips of at least three leads which are farthest from said reference plane; and

determining a distance of projection of each remaining lead tip relative to said seating plane.

5,317,375

OPTICAL DISTANCE MEASURING APPARATUS

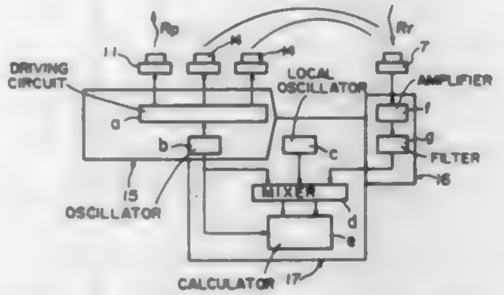
Yukio Omamyuda, Sagamihara; Shigeru Kimura, Yokohama; Toru Tanabe, Machida; Kazuhisa Iwasaki, Yokohama; Takao Seto, Yokohama; Hideki Kitamura, Yokohama; Kazuhiko Sugimura, Yokohama, and Yasushi Senoo, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1992, Ser. No. 841,049

Claims priority, application Japan, Feb. 28, 1991, 3-017073; Feb. 28, 1991, 3-017074; Mar. 29, 1991, 3-028246

Int. Cl.⁵ G01C *3/08*

U.S. Cl. 356—5 11 Claims



1. An optical distance measuring apparatus operable, comprising:

a light emitting means for emitting a distance measuring light beam,

an optical lens system including means for orienting said distance measuring light beam toward an object to be measured, said distance measuring light beam being reflected from said object in the form of a reflected light beam,

light receiving means for receiving a reflected light beam reflected from said object to be measured through said optical lens system,

a plurality of reference light source means, each arranged in optical association with said light receiving means for generating a reference light beam, and

processing means for correcting a phase delay between said distance measuring light beam and said received reflected light beam using said reference light beams so as to determine a distance, said processing means including a display portion having a screen, and

control means for performing a controlling operation such that a certain item representing a distance is visually recognized on the screen of said display portion only when said object to be measured is present within a range where said distance can be measured with said apparatus.

5,317,376

SOLID STATE PULSED COHERENT LASER RADAR FOR SHORT RANGE VELOCIMETRY APPLICATIONS

Farzin Amzajerdian, Thousand Oaks, and Eli Margalit, Calabasas, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 3, 1992, Ser. No. 984,794

Int. Cl.⁵ G01C *3/08*

U.S. Cl. 356—28.5 38 Claims

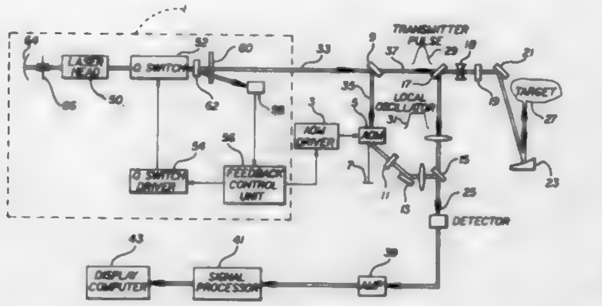
1. A single frequency laser system, wherein a high energy pulse signal is generated as an analysis beam and a lower energy flat top pulse is generated as a reference beam, both being generated from a laser source single frequency pulse signal, said laser system capable of providing interferometric type analysis of the two beams when heterodyned, which comprises:

a laser source which generates a single frequency, high energy pulse signal beam plane polarized in a preselected plane;

means for splitting said pulse signal beam simultaneously into an analysis beam and a reference beam;

means for directing said analysis beam to an external target whereby part of said analysis beam energy will become a reflected beam returning back upon itself;

means for reforming said reference beam into a lower energy, flat top signal of a preset time period set to extend for a minimum time period which covers the transit time of said analysis beam to a target medium and back to said laser system;



means for receiving said reflected beam and adjusting its polarization to match the polarization of said reference beam;

means for combining said reference beam and said reflected beam to allow them to be heterodyned together interferometrically;

means for detecting; and

means for measuring preselected properties of said heterodyned beam.

5,317,377

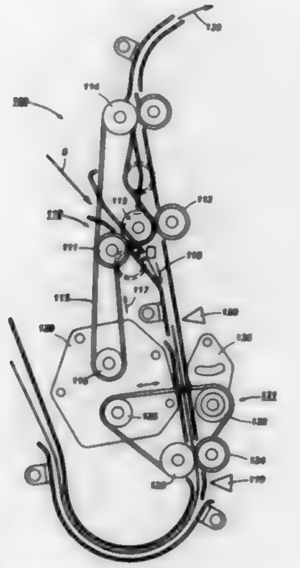
INVERTER APPARATUS CAPABLE OF INVERTING A3 OR 11×17" SHEETS

Robert F. Rubscha; Robert H. Alexander, Jr., both of Fairport; Glenn M. Keenan, Rochester, and Paul R. Lagonegro, Henrietta, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1991, Ser. No. 767,001

Int. Cl.⁵ G03G *21/00*

U.S. Cl. 355—319 16 Claims



2. A substrate inverter, comprising:

(a) an inversion chute having a curved portion;

(b) input drive means for driving a substrate into said chute in an initial direction and subsequently into said curved portion of said inversion chute;

(c) flexible, passive deflector gate means serving as the sole gate means for directing sheets into and out of said inversion chute for opening and closing access to said inversion chute by a substrate fed from said input drive means, and wherein said passive deflector gate means is opened only by movement of a sheet therepast and closes automatically after the sheet passes said passive gate means due to its flexibility; and

(d) output drive means positioned directly adjacent said input drive means for driving a substrate out of said chute in an output direction generally opposite but in substantially the same plane as said initial incoming substrate direction and past said passive deflector gate means.

5,317,378

ENHANCING EMISSION OF EXCITED RADIATION IN AN ANALYTICAL SAMPLE SUBJECTED TO EXCITING RADIATION

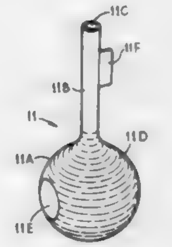
Henry M. Mould, and Robert Bennett, both of Buckinghamshire, England, assignors to Perkin-Elmer Ltd., Beaconsfield, England

Filed Feb. 15, 1991, Ser. No. 656,266

Claims priority, application United Kingdom, Feb. 19, 1990, 9003690

Int. Cl.⁵ G01N *21/64, 21/65*

U.S. Cl. 356—301 39 Claims



1. An analytical optical sample-cell within which a fluid sample will in operation be subjected to exciting radiation at the sample station of an analytical instrument for the purpose of enabling the excited radiation emitted by the sample to be analysed, the fluid sample being pervious to both radiations, comprising:

a) a hollow imaging mirror having an inner imaging surface which in operation surrounds the sample and acts as a specular optical integrator by virtue of the fact that the said mirror enables both radiations to be multiply reflected within the sample;

b) a hollow bulbous fluid-sample retaining part defined by a wall having a small filling orifice, an outer surface to which the inner imaging surface of the hollow imaging mirror adheres and a substantially co-extensive inner surface adapted to enclose the sample completely except for the small filling orifice, via which the bulbous part may be filled with fluid sample by means of a syringe, the wall of the bulbous part being pervious to both radiations; and

c) a single optical aperture in said mirror through which the exciting radiation will be admitted and the excited radiation will exit, the area of the actual imaging surface of the said mirror being between 51 and 98 percent of the total area represented by the sum of the area covered by the imaging surface and the area of the optical aperture, said sum being substantially equal to the area of said outer surface of the bulbous part, excluding the filling orifice area.

5,317,379

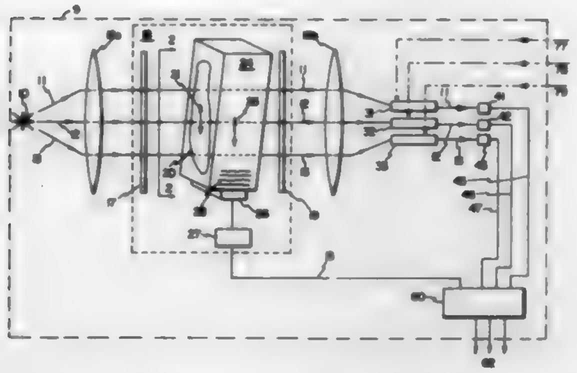
CHEMICAL SPECIES OPTICAL ANALYZER WITH MULTIPLE FIBER CHANNELS

Frederick M. Ryan, New Alexandria, and James W. Thomson, Murrysville, both of Pa., assignors to Rosemount Analytical Inc., Eden Prairie, Minn.

Filed Feb. 11, 1992, Ser. No. 833,530

Int. Cl.⁵ G01J *3/06;* **G01N** *21/31, 21/35*

U.S. Cl. 356—308 **23 Claims**



1. An analyzer for measuring properties of multiple chemical samples, comprising:

a source simultaneously projecting multiple polychromatic light beams corresponding to the chemical samples;

an AOTF system transmitting a time sequence of selected spectral portions of the light beams, the AOTF system including an AOTF crystal positioned at a location where a cross-section of the light beams forms a light spot elongated along a first axis, the AOTF crystal being sized so as to define a long axis substantially aligned with the first axis;

sample cell means for exposing each chemical sample to its corresponding light beam to modify the corresponding light beam as a function of a property of the chemical sample; and

detector means for detecting the light beams after modification by the chemical samples and after transmission by the AOTF system, the detector means providing detector outputs as a function to the properties being measured.

5,317,380

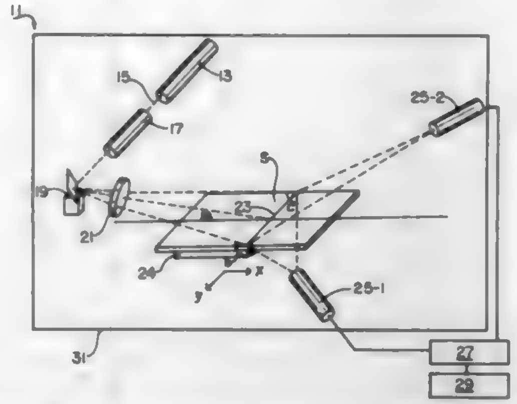
PARTICLE DETECTION METHOD AND APPARATUS

Charly D. Allemand, Nantucket, Mass., assignor to Inspex, Inc., Billerica, Mass.

Continuation-in-part of Ser. No. 657,207, Feb. 19, 1991, abandoned. This application Dec. 31, 1991, Ser. No. 815,145

Int. Cl.⁵ G01N *21/88*

U.S. Cl. 356—338 **26 Claims**



1. A method for detecting particles on a surface of an object comprising the steps of:

a) providing a scanning beam of light;

b) bringing said scanning beam of light to focus as a scan line on the surface of the object at a grazing angle of incidence; and

c) measuring forward scattered light from the surface of the object, said measuring comprising observing forward scattered light at a meridional angle of between about 5 degrees and about 60 degrees, said meridional angle being constant over said scan line.

5,317,381

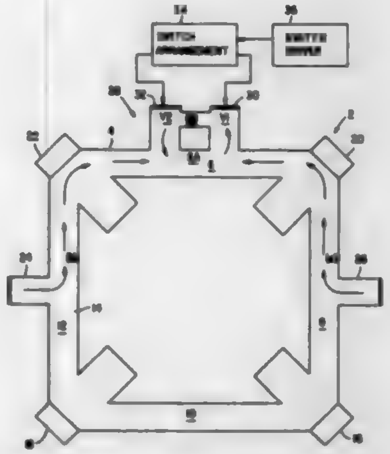
PNEUMATICALLY DITHERED RING LASER GYROSCOPE

Thomas J. Lavin, Nutley, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 18, 1989, Ser. No. 408,826

Int. Cl.⁵ G01C *19/68*

U.S. Cl. 356—350 **8 Claims**



7. A ring laser gyro, comprising:

a base having a resonant cavity therein, with said cavity filled with an active gas medium;

electrically energizable electrode means for establishing an electrical discharge in said active gas medium for exciting a pair of light beams counterpropagating in said optical resonant cavity, wherein said light beams tend to exhibit mode locking effects and wherein said electrode means defines a gain section of the optical cavity;

means for generating an output signal for said gyro by measuring a difference in the frequencies of said light beams;

pneumatic means for synchronously inducing an oscillatory flow of the active gas medium along said gain section of the optical cavity whereby the mode locking effects are reduced; and

said pneumatic means including the electrically energizable electrode means arranged with a first cavity having a first pneumatic volume and with a second cavity having a second pneumatic volume, and the first and second pneumatic volumes being mutually coupled by first and second portions of the gain section of the optical cavity, and in which first and second portions pneumatic energy is exchanged to provide a pneumatically resonant circuit.

5,317,382

OPTICAL PHASE DETECTION METHOD WITH ORTHOGONAL POLARIZATION AND PHASE COMPENSATION ARRANGEMENT

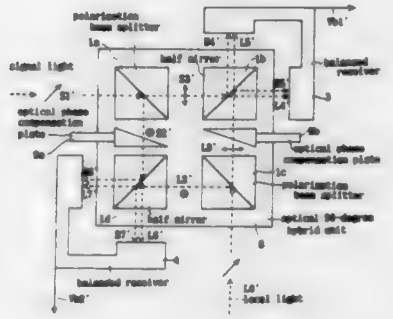
Tetsuya Miyazaki, Fujimi, and Shiro Ryu, Niiza, both of Japan, assignors to Kokusai Denshi Denwa Company, Ltd., Tokyo, Japan

Filed Nov. 25, 1991, Ser. No. 797,742

Claims priority, application Japan, Nov. 29, 1990, 2-325545

Int. Cl.⁵ G01B *9/02*

U.S. Cl. 356—351 **11 Claims**


polarization beam splitter
signal light
half mirror
balanced receiver
optical phase compensation plate
polarization beam splitter
half mirror
optical 90-degree hybrid unit
balanced receiver
local light

1. A method of optical phase detection, comprising the steps of:

separating a linearly polarized signal light and a local light emitted from a local light laser light source into mutually-perpendicular P-polarized and S-polarized components by first and second polarization beam splitters;

regulating the phases of at least one of said P-polarized and S-polarized components by first and second optical phase compensation plates so that the polarized components of said signal light are maintained in phase with each other, while the polarized components of said local light have a phase difference of 90° therebetween;

combining the polarized components of said signal light and the polarized components of said local light with each other by first and second combiners to produce an in-phase component and a quadrature component 90° out phase with said in-phase component;

demodulating said in-phase component to produce an output signal; and

synchronizing the phases of said signal light and the phase of said local light with each other through the use of said in-phase component and said quadrature component.

5,317,383

ARRAY RETROREFLECTOR APPARATUS FOR REMOTE SEISMIC SENSING

Albert J. Berni, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 18, 1992, Ser. No. 946,729

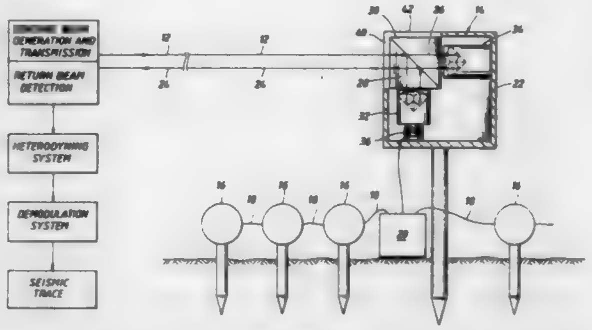
Int. Cl.⁵ G01B *9/02*

U.S. Cl. 356—351 **85 Claims**

1. A remote detector apparatus adapted to provide a single return beam having two transversely polarized overlapping sensing signals, the signals having between them a difference signal which represents an electrical signal produced at a selected location, said signals enabling a bipolarized, differential mode, laser differential interferometry, remote sensing system to detect the electrical signal , to cancel common mode signals on the return sensing signals and to reduce turbulent noise on the difference signal, the turbulent noise being caused by atmospheric effects between a receiver of the system and said remote detector apparatus, the remote detector apparatus comprising:

a casing, the casing being functional to couple,, motions at the selected location, the motions having directions of movements in any of three orthogonal directions at the selected location; and

a first means mounted on the casing which is functional for converting a single sensing beam into a single return beam (a) by splitting and (b) polarizing the sensing beam to form two polarized sensing signals, (c) by frequency modulating both of the polarized sensing signals to contain Doppler shifted frequency components that represent common motions coupled to the casing, (d) by frequency modulating one of the sensing signals with the electrical signal, the electrical signal being coupled to said first means by a second means for coupling the electrical signal to said first means, whereby, the two polarized sensing signals contain a difference signal between them which represents the electrical signal , (e) by combining the two polarized sensing signals to form the return beam, and (f) by directing the return beam to a return propagation path which takes the return beam to the receiver, the return beam having two transversely polarized return sensing signals which overlap each other on the return propagation path such that the two return sensing signals occupy substantially the same air space, whereby the atmospheric effects on the sensing beam and the overlapping return sensing signals result in turbulent noise on the single sensing beam and the single return beam which are common mode signals to both said return sensing signals thus reducing the effects of turbulent noise on the difference signal.



5,317,384

POLARISATION STATE INSENSITIVE OPTICAL DISCRIMINATOR

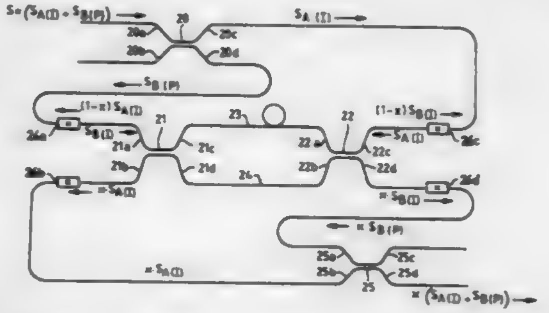
Jonathan P. King, Epping, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 17, 1992, Ser. No. 916,011

Claims priority, application United Kingdom, Jul. 18, 1991, 9115549

Int. Cl.⁵ G01B *9/02;* **H01J** *5/16*

U.S. Cl. 356—351 **9 Claims**



1. A polarisation state insensitive optical discriminator com-

prising a Mach Zehnder interferometer with two birefringent limbs which interferometer is optically interconnected with first and second polarisation beam splitters, wherein the Mach Zehnder interferometer has first and second ports at one end of its birefringent limbs and third and fourth ports at the other, wherein each of the first and second polarisation beam splitters has first and second ports and third and fourth ports, wherein the first, third, second and fourth ports of the Mach Zehnder interferometer are respectively optically interconnected with the fourth and third ports of the first polarisation beam splitter and the second and first ports of the second polarisation beam splitter with relative alignments such that an optical signal of arbitrary state of polarisation (SOP) launched into one port of one of the polarisation beam splitters selected from the group consisting of the first and second ports of the first polarisation beam splitter and the third and fourth ports of the second polarisation beam splitter is separated into two orthogonally polarised components and launched into the Mach Zehnder interferometer to propagate with substantially the same SOP in opposite directions through said two limbs, which SOP is substantially matched with one of the birefringence eigenstate SOP's of said limbs of the Mach Zehnder interferometer.

5,317,385

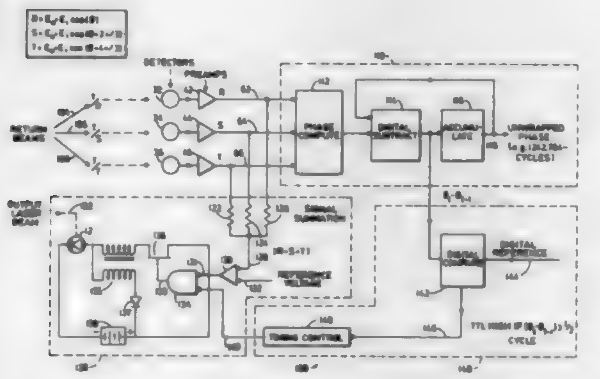
PORTABLE EXTENDED LIFE METROLOGY SYSTEM FOR MEASURING SCALE DISPLACEMENT WITH THREE OUTPUT SIGNALS USING A PULSED SOURCE

John R. Silva, Rehoboth, and Geert J. Wyntjes, Chelsea, both of Mass., assignors to Federal Products Corporation, Providence, R.I.

Filed Dec. 16, 1992, Ser. No. 991,441

Int. Cl.^{5} G01B *9/02*

U.S. Cl. 356—356 **12 Claims**



1. In a metrology system of the kind comprising:

(a) a radiation source for directing a beam of radiation on a component whose parameter is to be measured, structure for producing two separate beams of radiation from portions of radiation modified by said component, optical structure for causing said two beams to interact and form an interference fringe pattern as a function of said parameter to be measured;

(b) transducer apparatus responsive to said interference fringe pattern for simultaneously generating three intensity-modulated optical signals, I_R, I_S and I_T, that are related to said interference fringe pattern, signal processing apparatus for accurately determining an aspect of said interference fringe pattern from said three signals;

(c) means for accumulating phase information proportional to said aspect of said interference fringe pattern; and

(d) means for converting said accumulated phase and aspect information to desired outputs indicative of said parameter to be measured;

the improvement comprising:

(e) a pulsed drive circuit designed to minimize power drain on said metrology system without affecting its measurement accuracy, said pulse drive circuit comprising:

(f) a variable frequency pulse generator circuit coupled between the output of said signal processing apparatus and said radiation source to drive said source in a pulsed mode;

(g) a comparator circuit coupled between said means for accumulating phase information and said variable frequency pulse generator circuit to control the energy per pulse and the pulse rate of said source in said pulsed mode; and

(h) an energy source connected to said source to power said radiation source in said pulsed mode, including means to return residual energy to said system.

5,317,386

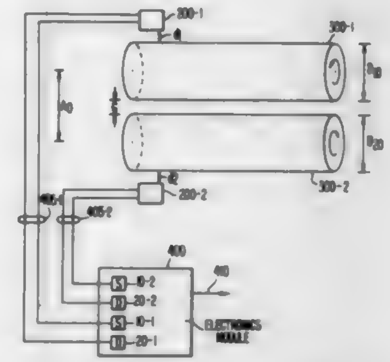
OPTICAL MONITOR FOR MEASURING A GAP BETWEEN TWO ROLLERS

Michael A. Marcus, Honeoye Falls; Kenneth R. Schafer, Avon, and Diane E. Kestner, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1991, Ser. No. 755,787

Int. Cl.^{5} G01B *11/00*

U.S. Cl. 356—372 **12 Claims**



1. A gap measurement device, comprising:

a first roller and a second roller, said first roller and said second roller defining a gap therebetween;

a first optical probe, housed in an isothermal environment, to measure a first distance to said first roller and to generate a first-distance signal indicative of said first distance;

a second optical probe, housed in an isothermal environment, to measure a second distance to said second roller and to generate a second-distance signal indicative of said second distance; and

an electronics module, coupled to said first optical probe and to said second optical probe, to generate a gap-width signal indicative of said gap based on said first-distance signal and said second-distance signal.

5,317,387

METHOD OF AND APPARATUS FOR NON-DESTRUCTIVE COMPOSITE LAMINATE CHARACTERIZATION

Cornelis G. Van Hengel, Roland Holstlaan 1078, 2624 JR Delft, and Hendrik A. Vuil, Bickerlaan 10, 2071 DC Santpoort, both of Netherlands

Filed Dec. 16, 1991, Ser. No. 807,939

Claims priority, application United Kingdom, Apr. 14, 1989, 8908507

Int. Cl.^{5} G01B *11/00*

U.S. Cl. 356—372 **15 Claims**

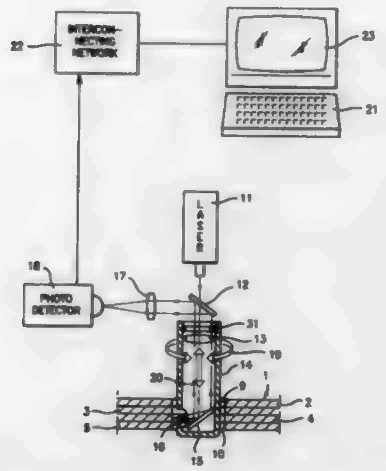
11. An apparatus for non-destructive determination of the stacking order and the fiber orientation of a fiber reinforced composite laminate (1), comprising:

light source means (11), for illuminating optically a series of spots of a cross-sectional surface (6,7,8;10) of a composite laminate (1) under examination;

detector means (18), for generating an electrical output signal relative to the amount of light received from an illuminated spot;

probe means (14), optically coupled with said light source means (11) and detector means (18), for providing a light beam to be directed to said cross-sectional surface (6,7,8;10);

drive means (24,25;26,27), for moving relative to each other said probe means (14) and said cross-sectional surface (6,7,8;10) of the composite laminate (1) under examination;



support means (29;23), supporting said light source means (11), detector means (18), probe means (14) and drive means (24,25;26,27), said support means (29) having adjustment means for adjusting said cross-sectional surface (6,7,8;10) of the composite laminate (1) under examination and said probe means (14); and

processor means (21), equipped for controlling said drive means (24,25;26,27) in a programmable manner, and for processing the electrical output signal of said detector means (18) to generate a characterization of the composite laminate (1) under examination indicative of the stacking order and the fiber orientation thereof.

5,317,388

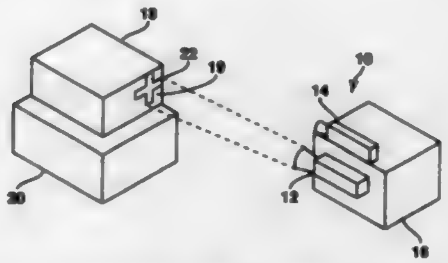
METHOD AND APPARATUS FOR DETERMINING THE DISPLACEMENT OF A RECTANGULAR OBJECT WITH RESPECT TO A REFERENCE POSITION

Stefan Surka, Sandy Hook; Joe Zheng, Brookfield, and Laura Kelmar, Danbury, all of Conn., assignors to United Parcel Service of America, Inc., Atlanta, Ga.

Filed Jun. 29, 1992, Ser. No. 905,563

Int. Cl.^{5} G01B *11/00*

U.S. Cl. 356—373 **24 Claims**



1. A method for determining the displacement in six degrees of freedom of a rectangular planar surface with respect to a reference position, comprising the steps of:

(a) obtaining a reference image comprising a projection of a defined lighting pattern comprising at least six points on a reference rectangular planar surface in the reference position, the six points comprising first, second and third points on the reference surface, fourth and fifth points at the intersections of a first edge of the reference surface and, respectively, first and second parallel lines in the plane of the reference surface and perpendicular to said first edge, and a sixth point at the intersection of a second edge of the reference surface and a third line in the plane of the reference surface and perpendicular to said second edge, the first edge being perpendicular to the second edge, said first and second points being in known positional relationship with said first, second and third lines;

(b) obtaining a real image comprising the projection of said lighting pattern on the surface; and

(c) determining the displacement of the surface with respect to the reference position from the positions of said six points in said reference image and said real image.

5,317,389

METHOD AND APPARATUS FOR WHITE-LIGHT DISPERSED-FRINGE INTERFEROMETRIC MEASUREMENT OF CORNEAL TOPOGRAPHY

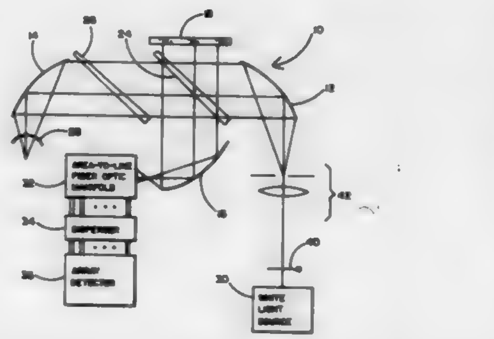
Eric B. Hochberg, Altadena, and Edmund C. Baroth, Granada Hills, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 364,165, Jun. 12, 1989, Pat. No. 5,071,251. This application May 30, 1990, Ser. No. 530,798

The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.

Int. Cl.^{5} G01B *11/06*

U.S. Cl. 356—382 **20 Claims**



1. An apparatus for mapping the topography of an aspheric surface; the apparatus comprising:

a white-light interferometer for generating a polychromatic interferometric fringe pattern, said fringe pattern corresponding to the optical path differences between said aspheric surface and a reference surface of known topography; and

means for determining monochromatic fringe pattern components of said polychromatic fringe pattern for unambiguously measuring said optical path differences from a single interferometric image.

5,317,390

METHOD FOR JUDGING PRINTING SHEETS

Claus A. Bolza-Schunemann; Hans-Bernhard Bolza-Schunemann, and Albrecht J. Germann, all of Wurzburg, Fed. Rep. of Germany, assignors to Koenig & Bauer, Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Aug. 6, 1992, Ser. No. 925,273

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1991, 4126582

Int. Cl.^{5} G01B *11/00*

U.S. Cl. 356—394 **10 Claims**

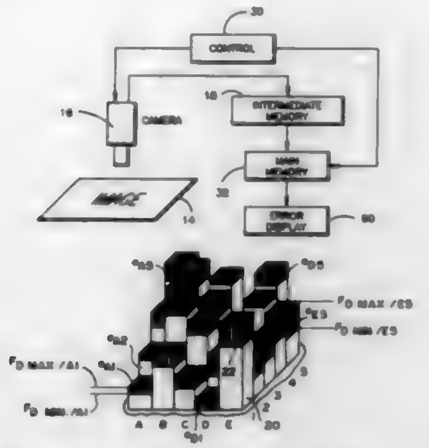
1. A procedure for judging the quality of a printed image printed on a printing carrier comprising:

dividing a printed image to be judged into a multiplicity of image pixel elements of a preselected size;

determining a nominal ink density value for each of said image pixel elements and storing such nominal ink density values in a reference image storing device;

determining from a multiplicity of printed proof images judged to be acceptable the actual proof ink density values for each of said image pixel elements:

obtaining from said actual values a maximal acceptable ink density value ($F_{D\ MAX}$) and a minimal acceptable ink density value ($F_{D\ MIN}$) for each of said image pixel elements to provide an ink density tolerance range for each said image pixel elements;



allocating to said stored nominal ink density value for each of said image pixel elements an error tolerance range corresponding to the maximal and minimal acceptable ink density values $F_{D\ MAX}$ and $F_{D\ MIN}$;

measuring the actual ink density value for each image pixel element for a printed image to be judged; and

comparing said measured ink density values for each image pixel element to said stored nominal ink density value and error tolerance range to determine the quality of the printed image to be judged.

5,317,391

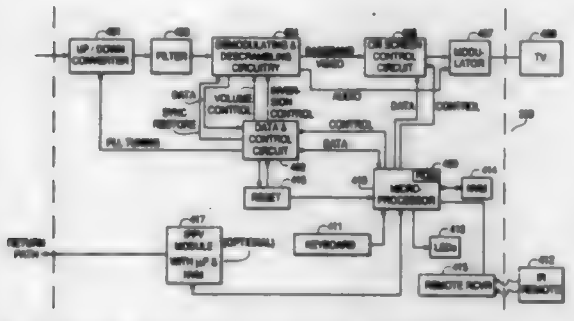
METHOD AND APPARATUS FOR PROVIDING MESSAGE INFORMATION TO SUBSCRIBERS IN A CABLE TELEVISION SYSTEM

Robert O. Banker, Cumming; Kinney C. Bacon, Lawrenceville, and Julius B. Bagley, Marietta, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Nov. 29, 1991, Ser. No. 799,987

Int. Cl.⁵ H04N *7/08;* **H04H** *1/02*

U.S. Cl. 348—6 **20 Claims**



15. A subscriber terminal apparatus comprising:

a receiver for tuning to and receiving a plurality of channels, at least some of said channels containing in-band data;

first data extraction means for extracting, from a first channel to which said receiver is tuned, a message definition addressed to said subscriber terminal apparatus, said message definition comprising a message alert and tuning information indicating a second channel in which a message transaction containing characters for generating a screen display is located;

second data extraction means, responsive to said tuning information, for tuning said receiver to said second channel and extracting said message transaction corresponding to said message definition;

a memory for storing said message definition;

a message indicator; and

processing means, responsive to said message alert, for directing said message indicator to indicate to a user of said subscriber terminal apparatus that said message definition has been extracted.

5,317,392

NOISE REDUCING DEVICE FOR UP-GOING SIGNALS IN BIDIRECTIONAL CATV SYSTEM

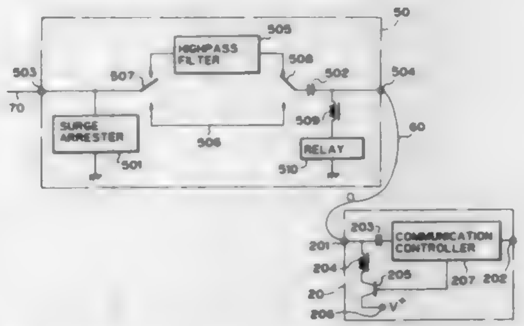
Ryouji Ishibashi, and Naomasa Nishimoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1991, Ser. No. 812,687

Claims priority, application Japan, Dec. 26, 1990, 2-414016

Int. Cl.⁵ H04B *3/32;* **H04H** *1/02*

U.S. Cl. 348—6 **4 Claims**



1. In a CATV system of the type having a central unit interconnected with a terminal unit, a noise reducing device for an up-going signal from the terminal unit to the central unit comprising:

controller means at the terminal unit for superposing a DC current on an up-going signal only when said terminal unit sends an up-going signal to the central unit;

high-pass filter means connected between the central unit and the terminal unit and passing only a down-going signal from the central unit to the terminal unit;

bidirectional circuit means paralleling the high-pass filter means and passing both of an up-going signal and a down-going signal; and

switching means responsive to the DC current from the controller means for selecting said high-pass filter means when said controller means does not output a DC current or selecting said bidirectional circuit means when said controller means outputs said DC current.

5,317,393

STEREOSCOPIC IMAGE DISPLAYING APPARATUS

Chun Gyoo Lee, Kyonggi, Rep. of Korea, assignor to Samsung Electron Devices Company, Ltd., Kyonggi, Rep. of Korea

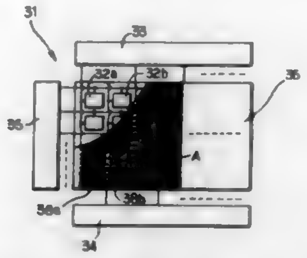
Filed Jul. 21, 1992, Ser. No. 918,215

Claims priority, application Rep. of Korea, Aug. 28, 1991, 91-14942

Int. Cl.⁵ H04N *13/04*

U.S. Cl. 348—58 **26 Claims**

1. In a stereoscopic image displaying apparatus in which an object is photographed from left and right and the photographed image signals are sent to first and second image signal driving integrated circuits for driving a panel array consisting of pairs of odd column pixels and even column pixels for horizontal scanning, said first integrated circuit generating the left photographed image and said second integrated circuit generating the right photographed image separately, said apparatus further comprising:



optical polarizing means installed in front of said array of said odd column pixels and said even column pixels, for respectively passing only components of a perpendicular direction among the light rays respectively.

5,317,394

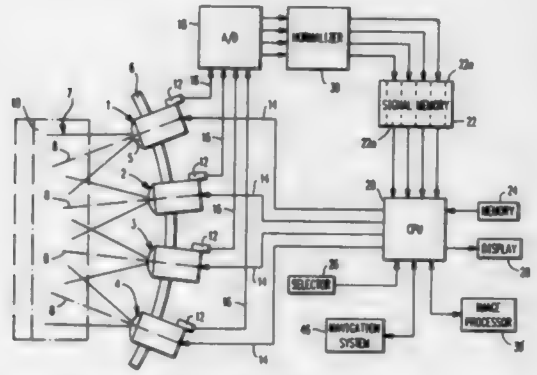
DISTRIBUTED APERTURE IMAGING AND TRACKING SYSTEM

Robert A. Hale, Ellicott City, Md.; Harvey C. Nathanson, Pittsburgh, Pa., and Joel F. Hazlett, Linthicum, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1992, Ser. No. 876,619

Int. Cl.⁵ H04N *7/18*

U.S. Cl. 348—208 **15 Claims**



1. An imaging system comprising:

a plurality of sensors capable of sensing objects within a field of view about a sight line, at least two sensors positioned to have different sight lines and the sight lines having known relative positions, each sensor producing signals corresponding to positions of objects within a field of view at a given time at least one sensor being subjected to at least one of motion, flexure and vibration;

means for sensing and measuring at least one of motion, flexure and vibration of each at least one sensor;

an internal navigational system which establishes a reference plane which reference plane remains in a selected position;

adjustment means attached to at least one sensor and to the internal navigation system so that the adjustment means will adjust the sight lines of the sensors in response to movement of the sensors caused by at least one of motion, flexure and vibration and to maintain a desired spatial relationship between the reference plane and the sight lines of the sensors;

at least one sensor signal memory connected to the sensors which receives and stores the signals produced by the sensors in a manner permitting concurrent access to and display of signals received from any selected combinations of at least two sensors; and

a processing unit and associated memory containing at least one program for selecting sensor signals from the sensor signal memory in a manner to create a composite image from signals from at least two sensors and doing at lease one of outputting selected sensor signals, processing selected sensor signals to create at least one processed signal and outputting selected processed signals, the processing unit being connected to at least one sensor signal memory.

5,317,395

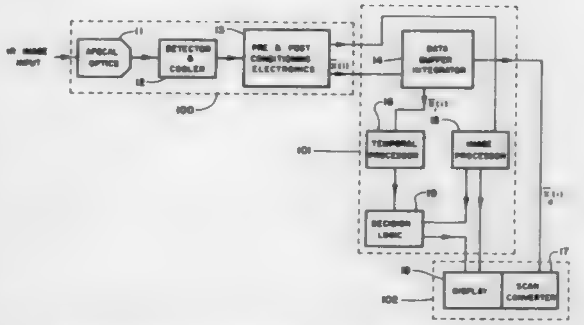
FOCAL PLANE ARRAY DUAL PROCESSING SYSTEM AND TECHNIQUE

Todd R. Carr, Alexandria, and Brian J. Kowalewski, Fredericksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1993, Ser. No. 40,193

Int. Cl.⁵ H04N *5/33*

U.S. Cl. 348—164 **2 Claims**



1. A focal plane array dual processing system in a staring FLIR device wherein infrared energy is collected by afocal optics and focused onto a cryogenically cooled detector array wherein said focal plane array dual processing system is comprised of:

a focal plane array with row by column detector elements for which resultant sampled data is utilized for imaging and image processing and a smaller row by column subset of said larger row by column detector element which resultant spatial subset is utilized for temporal processing;

conditioning electronics which accepts said resultant sampled data to multiplex, amplify, digitize and lexicographically order in a raster format an output raster-formatted raw data vector;

a data buffer integrator which double buffers said raw data vector for processing in an output means, and addresses the spatial subset of the raw data vector for temporal processing;

a temporal processor which processes the spatial subset of the raw data vector to provide a power spectrum estimation of a time series of pixels represented by the spatial subset;

an image processor which processes the doubled buffered raw data vector at a predetermined frame rate;

output means which processes the output of the temporal and image processor for simultaneously generating imagery of the overall scene as well as the power spectrum estimation of a sub-region of interest of the scene.

5,317,396

HIGHLY EFFICIENT ENCODING APPARATUS

Yasushi Fujinami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 30, 1992, Ser. No. 828,294

Claims priority, application Japan, Feb. 8, 1991, 3-039349

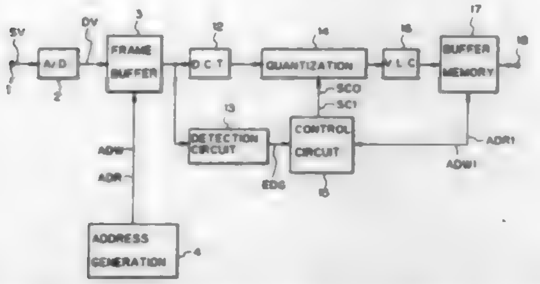
Int. Cl.⁵ H04N *7/12*

U.S. Cl. 343—390 **3 Claims**

1. A highly efficient encoding apparatus for encoding each frame of an input video signal including blocks of a predetermined size and each having a respective pattern, comprising:

means for determining a complexity of said pattern in each of said blocks and for generating a control signal based on

the determination of said complexity of said pattern in each of said blocks,
an orthogonal transform circuit for producing conversion coefficients representing each of said blocks,
means for setting said conversion coefficients to zero in accordance with said control signal,



means for quantizing said conversion coefficients, as selectively set to zero by said means for setting said conversion coefficients to zero, using a quantizing step width to produce encoded data, and
means for varying said quantizing step width in accordance with said determination of said complexity of said pattern in each of said blocks.

5,317,397

PREDICTIVE CODING USING SPATIAL-TEMPORAL FILTERING AND PLURAL MOTION VECTORS

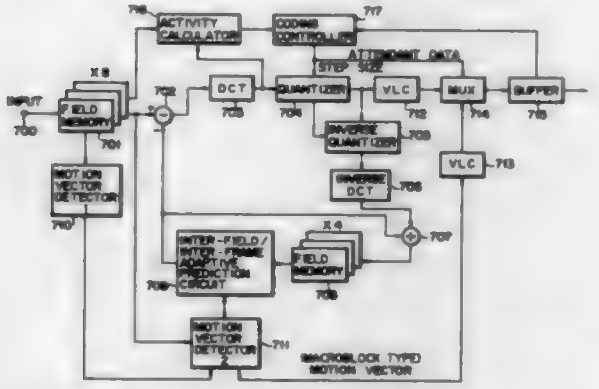
Toshinori Odaka, Yokohama; Yoshiharu Uetani, Kawasaki; Tadaaki Masuda, Tokyo; Tomoo Yamakage, Kawasaki; Hideyuki Ueno, Tokyo; Noboru Yamaguchi, Yashio; Yoshihiro Kikuchi, Yokohama, and Tadahiro Oku, Urayasu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1992, Ser. No. 890,705

Claims priority, application Japan, May 31, 1991, 3-130012; Oct. 17, 1991, 3-298316; Oct. 17, 1991, 3-298317; Oct. 31, 1991, 3-286855; Feb. 18, 1992, 4-030923

Int. Cl.^{5} H04N *7/137*

U.S. Cl. 348—416 **16 Claims**



1. A video coding apparatus, comprising:
memory means for storing at least one of plural field picture signals and plural frame picture signals used for prediction as plural reference picture signals;
prediction signal producing means including first filtering means for spatial filtering each of said plural reference picture signals designated by each of one set of motion vectors obtained as one set of candidates, to produce first prediction signal candidates, each of said one set of motion vectors designating each of said plural reference picture signals, and second filtering means for spatial-temporal filtering the plural reference picture signals, each of which is designated by each of said corresponding motion vectors, to produce a second prediction signal candidate;
motion vector detecting means for detecting an optimum set of motion vectors corresponding to said one set of motion vectors, which produce a prediction signal candidate with a smallest prediction error as a prediction signal, from among the prediction signal candidates obtained from at least one of said first filtering means and said second filtering means, within plural possible sets of motion vector candidates;
selecting means provided in said prediction signal producing means, for selecting and outputting the prediction signal candidate determined by said motion vector detecting means as the prediction signal; and
coding means for coding the to-be-coded picture signal using the prediction signal.

5,317,398

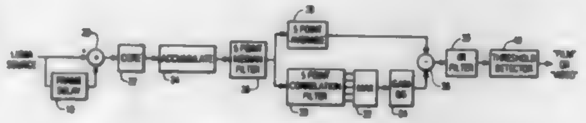
VIDEO/FILM-MODE (3:2 PULLDOWN) DETECTOR USING PATTERNS OF TWO-FIELD DIFFERENCES

Scott D. Casavant, East Windsor; Robert N. Hurst, Jr., Hopewell; Stuart S. Perlman, Princeton; Michael A. Isnardi, Plainsboro, all of N.J., and Felix Aschwanden, Thalwil, Switzerland, assignors to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Aug. 17, 1992, Ser. No. 930,257

Int. Cl.^{5} H04N *5/14*

U.S. Cl. 348—570 **16 Claims**



14. A film/video detector comprising:
a source of a video signal;
signal delay apparatus coupled to said source for providing said video signal delayed by two field periods;
signal differencing apparatus coupled to said source and said signal delay apparatus for generating differences between corresponding image points of said video signal and said delayed video signal;
an accumulator for accumulating said differences over respective field periods to generate accumulated values;
detection apparatus, including a correlator, coupled to said accumulator, for evaluating accumulated values in successive five field groupings and generating a detection signal indicative of film source material when an accumulated value is significantly different than an average of a plurality of accumulated values.

5,317,399

IMAGE REPRODUCING APPARATUS CAPABLE OF FREEZING A DISPLAYED IMAGE

Yoshifumi Satake, Yokohama; Ikuo Watanabe, Kawasaki; Motokazu Kashida, Musashino, and Akihiro Shikakura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

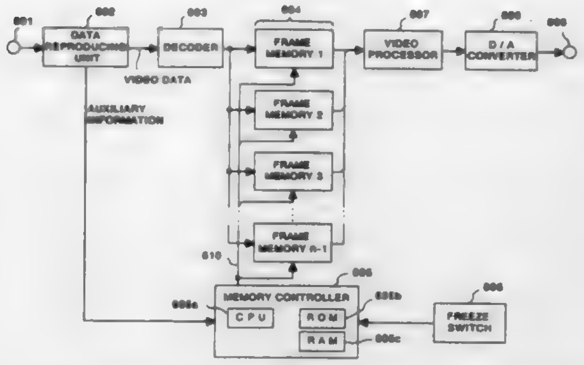
Continuation of Ser. No. 696,007, May 6, 1991, abandoned. This application Aug. 30, 1993, Ser. No. 113,530

Claims priority, application Japan, May 9, 1990, 2-117560; Feb. 19, 1991, 3-024329; Mar. 5, 1991, 3-038290

Int. Cl.^{5} H04N *5/14, 5/262, 5/272*

U.S. Cl. 348—571 **7 Claims**

1. An image reproducing apparatus for inputting a coded image as well as information comprising input control information and output control information relevant to this image, decoding this coded image, storing this decoded image in any one of a plurality of frame memories in accordance with the input control information, and displaying the stored image in accordance with the output control information relevant thereto, comprising:
freezing means for freezing the displayed image regardless of the output control information;
memory means for storing information which specifies a frame memory storing the image displayed as a frozen picture frozen by said freezing means; and
control means for, when a freeze mode established by said freezing means has been cancelled, and until the frame memory specified by the information stored by said memory means has been updated by a newly inputted image, excluding the image stored in this frame memory from output designated by the output control information, wherein
the image includes a still picture, the input control information includes information designating a frame memory which is to be a destination for writing in the still picture, and the output control information includes information designating a frame memory which stores an image to be combined with the still picture.



5,317,400

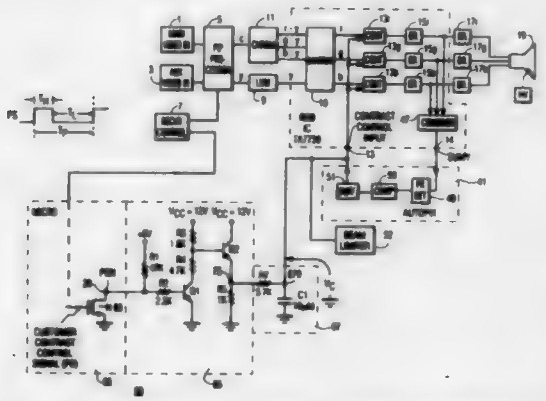
NON-LINEAR CUSTOMER CONTRAST CONTROL FOR A COLOR TELEVISION WITH AUTOPIX

Thomas D. Gurley, and William A. Lagoni, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 22, 1992, Ser. No. 887,737

Int. Cl.^{5} H04N *5/57*

U.S. Cl. 348—679 **14 Claims**



1. In a TV system which includes a contrast control section coupled to a brightness control section and wherein the contrast control and brightness control sections are responsive to red (r), green (g) and blue (b) color signal and wherein the TV system also includes means for combining outputs of the brightness control section to produce a "combined signal" representative of the luminance component of the image to be displayed, and wherein the "combined signal" is coupled via a control loop to the contrast control section for controlling its response to the r, g and b color signals, the improvement comprising:
non-linear contrast control means, coupled to the contrast control section, responsive to externally generated user control signals for controlling the gain of the contrast control section, said non-linear contrast control means for producing control signals which are a non-linear function of the user generated control signals.

5,317,401

APPARATUS FOR PROVIDING CONTRAST AND/OR BRIGHTNESS CONTROL OF A VIDEO SIGNAL

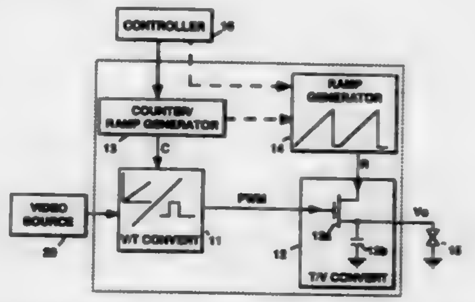
Antoine Dupont, Strasbourg; Bernard Hepp, Sevres, and Eric Benoit, Eybens, all of France, assignors to Thomson Consumer Electronics S.A., Courbevoie, France

Filed Jun. 15, 1993, Ser. No. 77,843

Claims priority, application European Pat. Off., Jun. 19, 1992, 92401737

Int. Cl.^{5} H04N *5/57*

U.S. Cl. 368—678 **9 Claims**



1. Apparatus for translating a video signal for reproduction of a video image on a display device comprising:
a source of video signal;
digital ramp generator for generating a ramp signal which increases at a controlled rate responsive to a control signal;
an amplitude to pulse width converter having first and second input terminals coupled respectively to receive said video signal and said ramp signal, said pulse width converter providing pulses exhibiting a first state for the duration the amplitude of the video signal is greater than the ramp signal and exhibiting a second state when the ramp signal exceeds the video signal;
control means for generating said control signal, said control signal conditioning said digital ramp generating means to increase or decrease said controlled rate and thereby control the contrast of the displayed image; and
a pulse width to amplitude converter, responsive to said pulses for generating a sampled signal to drive the display device.

5,317,402

DAISY CHAIN VIDEO SWITCHES

Hung Y. Wong, Solon, and Mark W. Magalotti, Broadview Heights, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

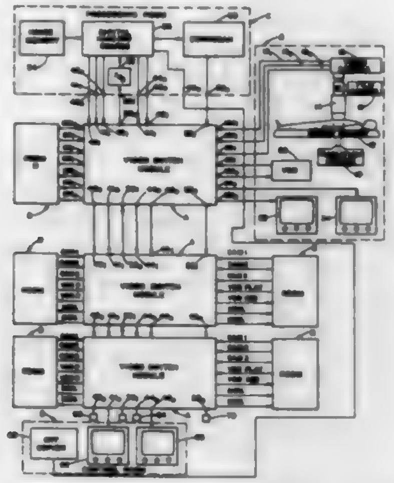
Continuation-in-part of Ser. No. 940,180, Sep. 3, 1992, Pat. No. 5,301,220. This application Dec. 31, 1992, Ser. No. 999,312

Int. Cl.^{5} H04N *5/268*

U.S. Cl. 348—705 **18 Claims**

16. A switch module for interconnection with like switch modules for connecting a plurality of video input and display means with a central digital image processor, the switch module comprising:
a video source input for receiving unprocessed video image signals from a video source;
a first video display output for providing first processed video signals to a first video display means;

a second video display output for supplying second processed video signals to a second video display means;
a first processed video signal input for receiving the first processed video signals;
a first processed video signal output for supplying the first processed video signals to a first processed video signal input of another module;
a second processed video signal input for receiving the second processed video signals;
a second processed video signal output for supplying the second processed video signals to a second processed video signal input of another module;
an unprocessed video signal input for receiving unprocessed video signals from an unprocessed video signal output of another module;



an unprocessed video signal output for supplying unprocessed video signals to an unprocessed video signal input of another module;
switching means for;
(i) in a flowthrough mode, connecting the first processed video signal input to the first processed video signal output, connecting the second processed video signal input to the second processed video signal output, and connecting the unprocessed video signal input to the unprocessed video signal output; and
(ii) in another mode, connecting the video input means input to the unprocessed video signal output, connecting the first processed video signal input to the first display output, and connecting the second processed video signal input with the second display output.

5,317,403

FAVORITE CHANNEL SELECTION USING EXTENDED KEYPRESS

Douglas M. Keenan, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

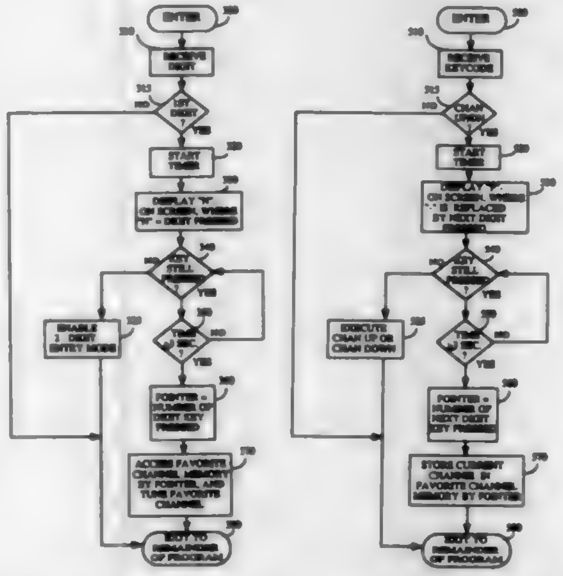
Filed Jun. 26, 1992, Ser. No. 907,917

Int. Cl.^{5} H04N *5/44*

U.S. Cl. 348—731 **11 Claims**

5. Television channel selection apparatus for a television receiver, comprising:
memory means for storing tuning data relating to preferred ones of said television channels;
keyboard means including a plurality of numeric keys for generating keycodes corresponding to digits of channel numbers when said keys are activated by a user;
control means coupled to said keyboard means for receiving said keycodes and for generating a tuning control signal in response thereto;
said control means operating in a first mode to generate said tuning control signal upon receiving the second digit of a two digit channel number, and operating in a second mode to generate said tuning control signal upon receiving an instruction to tune one of said preferred television channels;
said control means timing an interval during which data corresponding to the first digit of said two digit channel numbers is received, said control means operating in said second mode when said interval exceeds a predetermined time period, and operating in said first mode when said interval does not exceed said predetermined time period.

8. Television channel selection apparatus for a television receiver, comprising:
memory means for storing tuning data relating to preferred ones of said television channels;
keyboard means including a plurality of numeric keys for generating keycodes corresponding to digits of channel numbers when said keys are activated by a user;
control means for receiving said keycodes and for generating a tuning control signal in response thereto; and
timing means for timing a predetermined time interval;


ENTER
RECEIVE DIGIT
NO
YES
START TIMER
KEY STILL PRESSED ?
ENABLE 2 DIGIT ENTRY MODE
POINTER = NUMBER OF DIGIT KEY PRESSED
ACCESS FAVORITE CHANNEL MEMORY BY POINTER, AND TUNE FAVORITE CHANNEL
EXIT TO REMAINDER OF PROGRAM
RECEIVE KEYCODE
EXECUTE CHAN UP OR CHAN DOWN
STORE CURRENT CHANNEL IN FAVORITE CHANNEL MEMORY BY POINTER

said control means examining a received keycode and starting said timing means if said keycode corresponds to one of a first-received digit of one of said numeric keys, or a predetermined keycode;
said control means measuring the duration of time in which said keycode is received, and if said duration of time reaches a predetermined value said control means performs one of storing current channel data in said memory means in accordance with a next entered numeric keycode if said received keycode is said predetermined keycode, and reading said memory means and tuning one of said preferred channels according to stored channel data if said received keycode is said first-received digit of one of said numeric keys;
if said duration of time does not reach said predetermined value said control means performs one of entering said digit as a first digit of a two digit channel number and processing said predetermined keycode according to its content.

5,317,404

APPARATUS FOR RECORDING AN IMAGE ON A PHOTOGRAPH IN A STILL-VIDEO CAMERA

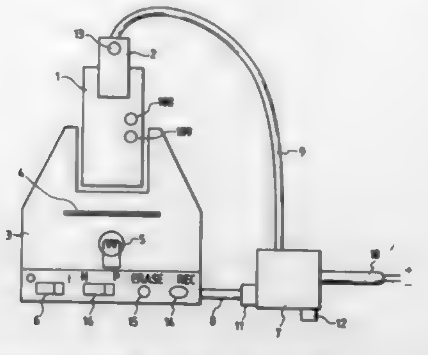
Nobuo Fukushima; Osamu Takeda, both of Yokohama, and Ryoji Kubo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1991, Ser. No. 767,397

Claims priority, application Japan, Oct. 2, 1990, 2-265355; Oct. 2, 1990, 2-265356; Oct. 2, 1990, 2-265357; Oct. 2, 1990, 2-265362

Int. Cl.^{5} H04N *5/30, 5/253*

U.S. Cl. 358—335 **22 Claims**



1. An image recording system comprising:
an auxiliary adaptor for recording an image and having a manipulation section for generating an instruction signal;
a recording and reproducing apparatus to be used together with said auxiliary adaptor, wherein said recording and reproducing apparatus includes means for receiving said instruction signal corresponding to the manipulation of said manipulation section of said auxiliary adaptor, and means for controlling a state of said recording and reproducing apparatus according to said instruction signal received by said means for receiving; and
means for disregarding said instruction signal corresponding to the manipulation of said manipulation section when said recording and reproducing apparatus is in a reproducing mode.

5,317,405

DISPLAY AND IMAGE CAPTURE APPARATUS WHICH ENABLES EYE CONTACT

Makoto Kuriki, Tokyo; Hitoshi Arai, Niiza; Shigenobu Sakai, Tama; Masato Nakamura, Hachioji; Hideki Nakajima; Shirou Suyama, both of Tokyo; Kazutake Uehira, and Noboru Hagiwara, both of Tokorozawa, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Feb. 25, 1992, Ser. No. 840,559

Claims priority, application Japan, Mar. 8, 1991, 3-67588; Apr. 15, 1991, 3-108161; Jul. 22, 1991, 3-204530; Jul. 22, 1991, 3-204531; Aug. 26, 1991, 3-236825

Int. Cl.^{5} H04N *5/30, 7/14*

U.S. Cl. 348—20 **13 Claims**

1. A display and image capture apparatus comprising:
display means provided with a display surface for displaying an image;
half-transparent mirror means disposed in front of said display surface substantially in parallel thereto, for reflecting a portion of light from a subject standing in front of said display surface and for transmitting therethrough a portion of light from said image on said display surface, said half-transparent mirror means including a plurality of micro half-transparent mirrors (micro HMs) having substantially identical shapes and arranged on a common plane, said micro HMs having reflecting faces at predetermined inclination angles θ relative to said common plane, respectively, for reflecting at least a portion of light from said subject; and

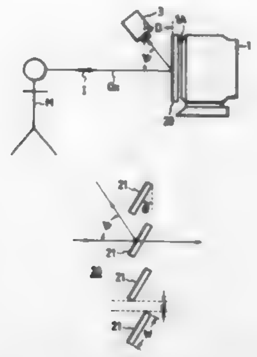


image capturing means disposed near said display means, for receiving light reflected from said half-transparent mirror means and for capturing the image of said subject.

5,317,406

IMAGE READING DEVICE AND IMAGE INFORMATION PROCESSING APPARATUS UTILIZING THE SAME

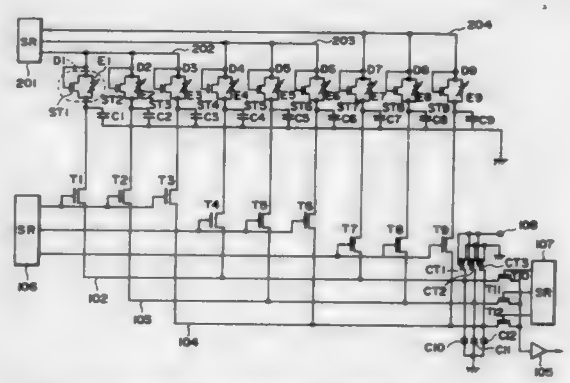
Isao Kobayashi, Sagamihara; Noriyuki Kaifu, Yokohama; Toshihiro Saika, Zama, and Tadao Endo, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 786,771, Nov. 1, 1991, abandoned. This application Jun. 8, 1993, Ser. No. 73,980

Claims priority, application Japan, Nov. 7, 1990, 2-299919

Int. Cl.^{5} H04N *3/14, 5/335*

U.S. Cl. 348—307 **31 Claims**



1. An image reading device comprising:
a plurality of first accumulating means;
a plurality of phototransistors each having a first main electrode, a second main electrode, and a control electrode, first main electrodes of said plurality of phototransistors being connected in common and being selectively connectable to a reference voltage source, second main electrodes of said plurality of phototransistors being connected to said plurality of first accumulating means;
switch means;
a plurality of second accumulating means connected respectively to said plurality of first accumulating means through said switch means;
readout means for reading, in serial, signals accumulated in said plurality of second accumulating means; and
reset means connected to the control electrodes of said phototransistors to drive said phototransistors thereby resetting the signals accumulated in said first accumulating means through said phototransistors.

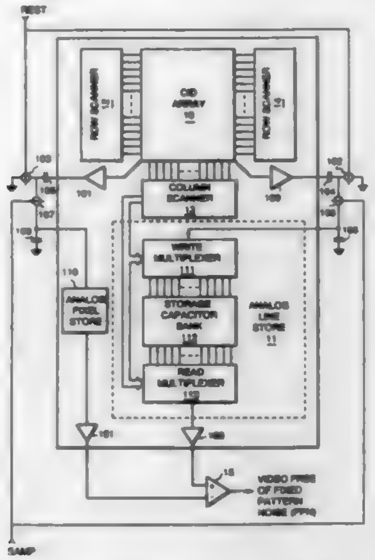
5,317,407
FIXED-PATTERN NOISE CORRECTION CIRCUITRY FOR SOLID-STATE IMAGER

Gerald J. Michon, Waterford, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 667,113, Mar. 11, 1991. This application Jun. 17, 1992, Ser. No. 900,504

Int. Cl.⁵ H04N *3/14, 5/335*

U.S. Cl. 348—306 **15 Claims**



1. A solid state imager including means for generating successive sequences of n analog samples supplied at a prescribed clocking rate, and a radiation tolerant analog delay line for delaying by n sample times those successive sequences of n analog samples supplied at a prescribed clocking rate, n being an integer at least fifty, said analog delay line comprising:

- an input terminal for receiving said successive sequences of analog samples supplied at a prescribed clocking rate;
- an output terminal for supplying said successive sequences of analog samples supplied at a prescribed clocking rate and delayed by n sample times;
- a bank of linear storage capacitors, n in number, having similar capacitances that are substantially invariant with change in stored charge;
- a 1:n write multiplexer for sampling successive regularly clocked analog samples sequentially to said n storage capacitors for temporary storage therein, as latter parts of sequential read-then-write operations;
- an n:1 read multiplexer for sequentially sampling with substantially equal delays said temporarily stored analog samples from said n storage capacitors, as earlier parts of sequential read-then-write operations; and
- a scanner for generating control signals for said write multiplexer and said read multiplexer at said prescribed clocking rate, for implementing said sequential read-then-write operations.

5,317,408
HORIZONTALLY ALIGNED IMAGE PICKUP FOR CCD IMAGE SENSOR

Isao Hirota, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 27, 1992, Ser. No. 842,609

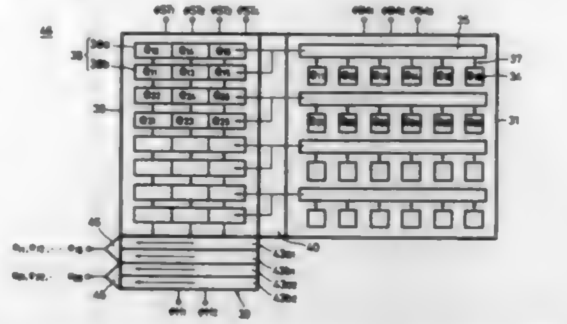
Claims priority, application Japan, Feb. 27, 1991, 3-032989

Int. Cl.⁵ H04N *3/14, 5/335*

U.S. Cl. 348—315 **5 Claims**

1. A charge coupled device image sensor, comprising:

(a) an imaging section including a plurality of photoelectric converting sections arrayed in a matrix configuration for generating signal charges and a plurality of horizontal shift registers arranged between horizontal rows of the photoelectric converting sections for transferring the signal charges via a readout section in the horizontal direction;



(b) a storage section having a plurality of horizontal shift registers for each of said horizontal shift registers in said image section for transferring the signal chargers in the horizontal direction and in zigzag fashion in the vertical direction line by line;

(c) readout means coupled to said storage section and including first and second sets of horizontal shift registers for reading out signal charges from said storage section, said first set of horizontal shift registers storing signal charges of odd lines of said photoelectric converting sections, said second set of horizontal shift registers storing signal charges of even lines of said photoelectric converting sections; and

(d) serial-to-parallel converting means provided between said imaging section and said storage section for converting one line of signal charges from said imaging section into a plurality of lines of signal charges, said serial-to-parallel converting means including:

- a pair of transfer sections coupled to each output of the plurality of said horizontal shift registers of said image section and a channel provided between the pair of said transfer sections and a first gate controlling said channel; and
- a second gate provided between each input side of the plurality of horizontal shift registers of said storage section and said pair of said transfer sections.

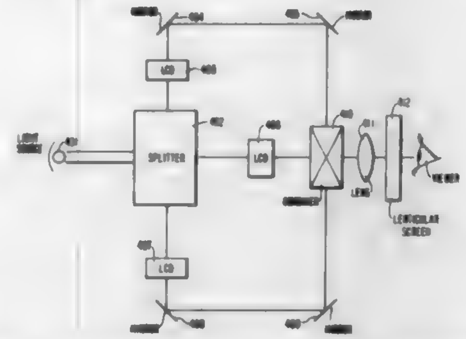
5,317,409
PROJECTION TELEVISION WITH LCD PANEL ADAPTATION TO REDUCE MOIRE FRINGES

Stephen Macocs, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 3, 1991, Ser. No. 801,239

Int. Cl.⁵ H04N *5/74, 9/31*

U.S. Cl. 348—751 **8 Claims**



1. A rear screen LCD projection television comprising

- a lenticular screen having a plurality of lenticulars;
- an LCD panel including a plurality of addressable pixels, which pixels are addressed according to a plurality of scan lines; and
- an optical path connecting the LCD panel to the lenticular screen, the path being such that the scan lines, when incident on the lenticular screen, are perpendicular to the lenticulars; characterised in that
- the pixels of the LCD panel are shaped so that no interpixel region produces a light pattern which, when incident on the lenticular screen, is parallel to the lenticulars, whereby moiré fringes on the lenticular screen are reduced.

5,317,410
I-AXIS DETECTING CIRCUIT PROVIDED IN COLOR DEMODULATING CIRCUIT OF TV RECEIVER

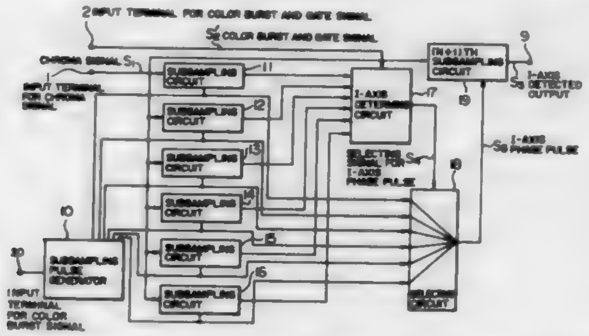
Hiroki Monta; Toshiaki Tsuji, both of Ibaraki, and Kiyoshi Imai, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 19, 1992, Ser. No. 836,752

Claims priority, application Japan, Feb. 25, 1991, 3-030115

Int. Cl.⁵ H04N *9/65, 9/66*

U.S. Cl. 348—638 **3 Claims**


2 INPUT TERMINAL FOR COLOR BURST AND GATE SIGNAL
S2 COLOR BURST AND GATE SIGNAL
CHROMA SIGNAL S1
INPUT TERMINAL FOR CHROMA SIGNAL
SUBSAMPLING CIRCUIT
(N+1)TH SUBSAMPLING CIRCUIT
9
S3 I-AXIS DETECTED OUTPUT
I-AXIS DETERMINING CIRCUIT
17
SELECTING SIGNAL FOR I-AXIS PHASE PULSE
S4 I-AXIS PHASE PULSE
11
12
13
14
15
16
10
SUBSAMPLING PULSE GENERATOR
INPUT TERMINAL FOR COLOR BURST SIGNAL
SELECTING CIRCUIT

1. An I-axis detecting circuit provided in a color demodulating circuit of a TV receiver comprising:

- first phase to N-th phase subsampling circuits for subsampling a chrominance signal (sampling frequency f_1) by a frequency f_2 (f_1/N) and by N subsampling pulses for the N phases, adjacent ones of said subsampling pulses being shifted with respect to each other by one clock ($1/f_1$);
- an I-axis determining circuit for providing a signal for selecting an I-axis phase pulse from said N subsampling pulses responsive to a color burst gate signal;
- a circuit for selecting and outputting a proper one of said N subsampling pulses as said I-axis phase pulse, based on a selecting signal for said I-axis determining circuit; and
- an (N+1)th subsampling circuit for subsampling said chrominance signal by the I-axis phase pulse output from said selecting circuit and supplying an I-axis detected output.

5,317,411
IMAGE ENCODING

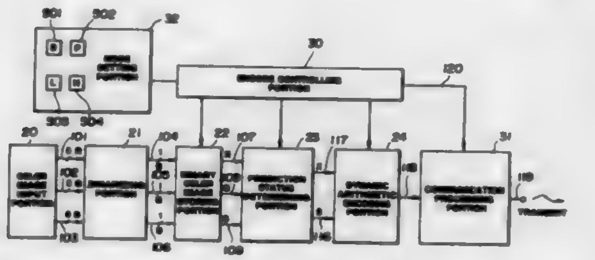
Tadashi Yoshida, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1992, Ser. No. 913,040

Claims priority, application Japan, Jul. 15, 1991, 3-173956; Nov. 22, 1991, 3-307804

Int. Cl.⁵ H04N *1/41*

U.S. Cl. 358—261.2 **30 Claims**



1. Image encoding apparatus comprising:

- first encoding means for encoding an image plane sequentially;
- second encoding means for encoding the image dot sequentially; and
- selection means for selecting one of said first and second encoding means to provide encoded data.

9. Image encoding apparatus comprising:

- first encoding means for encoding an image having a plurality of planes by a method in which data of one plane is encoded with reference to other planes;
- second encoding means for encoding the image by a method in which data of one plane is encoded without reference to other planes; and
- selection means for selecting one of said first and second encoding means to provide encoded data.

5,317,412
VIDEO TAPE RECORDER FOR RECORDING AND REPRODUCING HIGH-DEFINITION VIDEO SIGNAL AND AUDIO SIGNAL

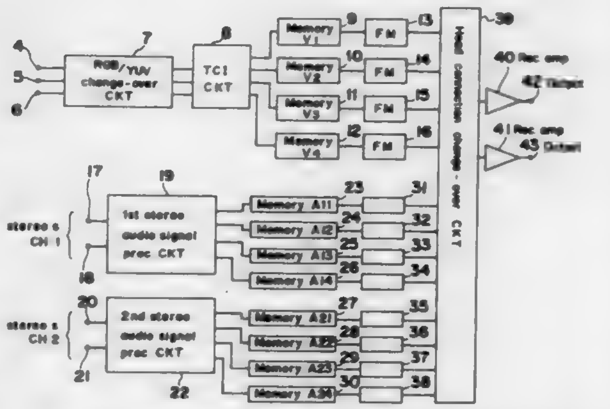
Yoshihiro Morioka, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1992, Ser. No. 922,147

Claims priority, application Japan, Jul. 31, 1991, 3-191605

Int. Cl.⁵ H04N *5/782, 9/79*

U.S. Cl. 358—310 **10 Claims**

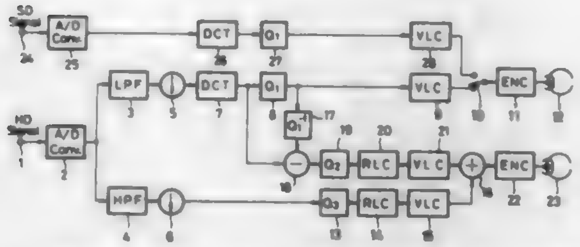


1. A high definition color video signal and audio signal magnetic recording/reproducing apparatus for recording/reproducing a high-definition color video signal and an audio signal on a magnetic tape, said recording/reproducing apparatus comprising:

- processing means for receiving and processing said high-definition color video signal and said audio signal and for generating four outputs for each of said processed high-definition color video signal and said processed audio signal,
- memory means for storing and outputting said four outputs for each of said high-definition color video signal and said audio signal,
- a rotary cylinder having only two magnetic heads mounted in a symmetrical relation with respect to a rotational center, said rotary cylinder being wound with the magnetic tape through approximately 350°,
- a rotary cylinder drive circuit for rotating the rotary cylinder through two rotations during each one field period of said high-definition color video signal, and
- switcher means for supplying the outputs of the memory means to said two magnetic heads on said rotary cylinder respectively through a change-over switch circuit,
- whereby said processed high definition color video signal and said processed audio signal are arranged to be recorded and reproduced on said magnetic tape by using four tracks during a one field period.

5,317,413
DIGITAL HIGH-DEFINITION VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

Naofumi Yanagihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 3, 1992, Ser. No. 971,061
Claims priority, application Japan, Nov. 12, 1991, 3-295842
Int. Cl.^{5} H04N *5/76, 5/782*
U.S. Cl. 358—335 **10 Claims**



1. An apparatus for recording a digital video signal comprising:

band-separating means for separating a digital high-definition video signal formed at a predetermined bit rate to provide a high band signal and a low band signal;

signal compressing means for compressing a bit rate of said low band signal so that said low band signal becomes equivalent to a standard digital video signal;

restoring means coupled to said signal compressing means for restoring the compressed low band signal to provide a restored signal;

difference signal generating means for generating a difference signal comprised of a difference between said low band signal and said restored signal;

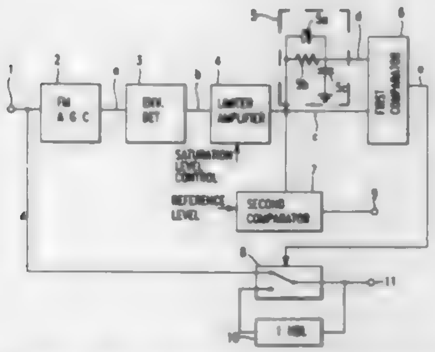
synthesizing means for producing a synthesized signal by combining said difference signal and said high band signal;

coding means for coding said low band signal and said synthesized signal so that a bit rate of said synthesized signal becomes a bit rate of said standard digital video signal; and

recording means for recording said coded low band signal and said coded synthesized signal on separate tracks on a magnetic tape.

5,317,414
DROP OUT COMPENSATION CIRCUIT

Yoshitaka Shindo, Daito, and Fukuji Anzai, Chiyoda, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Continuation of Ser. No. 523,745, May 15, 1990, abandoned.
This application Jan. 4, 1993, Ser. No. 569
Claims priority, application Japan, May 19, 1989, 1-127328; Jul. 17, 1989, 1-183980
Int. Cl.^{5} H04N *5/94*
U.S. Cl. 358—336 **15 Claims**



1. In a video signal reproducing apparatus for reproducing video signals previously recorded in a recording medium wherein said apparatus has a video head, a drop out compensation circuit for compensating for portions of decreased amplitude in a reproduced output video signal produced from the video head, said circuit comprising:

means for envelope-detecting said reproduced output video signal from the video head and for producing a detected output signal having a level corresponding to an amplitude of said reproduced output video signal,

means for producing a drop out detection signal by comparing the level of said detected output signal with a predetermined level, said drop out detection signal having a pulse width substantially equivalent to a duration of a level change of said detected output signal,

first means for delaying the drop out detection signal by a prescribed time period and producing a pulse signal, said pulse signal having a pulse width commencing with a leading edge of said drop out detection signal and terminating after said prescribed time period,

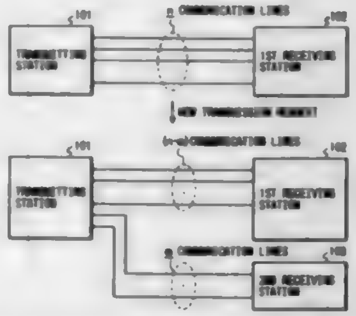
means, responsive to said drop out detection signal and said pulse signal, for producing a drop out compensation period signal by comparing the pulse width of said drop out detection signal with the pulse width of said pulse signal, said drop out compensation period signal having first and second states and a duration equivalent to the shorter of either the pulse width of the drop out detection signal or the pulse width of the pulse signal,

second means for delaying the reproduced output video signal from the video head by one horizontal period so as to form a one-horizontal period delayed output video signal, and

means, connected to said reproduced output video signal and the one-horizontal period delayed output video signal and operative in response to said drop out compensation period signal, for generating, in response to the first and second states of the drop out compensation period signal, a drop out compensated video signal as being either said reproduced output video signal or said one-horizontal period delayed output video signal, respectively.

5,317,415
DATA COMMUNICATION METHOD USING A PLURALITY OF LINES

Hideo Kinami; Yoshihiro Maei; Masahiro Mochizuki; Yoshiaki Tezuka; Takashi Sakayama; Shinichiro Nagoya; Hiroaki Sakaki, and Yosuhiro Kamiyama, all of Saitama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Jan. 26, 1993, Ser. No. 9,035
Claims priority, application Japan, Jan. 28, 1992, 4-035825
Int. Cl.^{5} H04N *1/00;* **H04J** *3/12*
U.S. Cl. 358—425 **4 Claims**



1. A data communication method in which a transmitting station divides data into a plurality of data blocks and transmits the data blocks in parallel through a plurality of communication lines, and a receiving station receives the data blocks transmitted from the transmitting station through the plurality of communication lines and composes the data blocks into original data, said data communication method comprising the steps of:

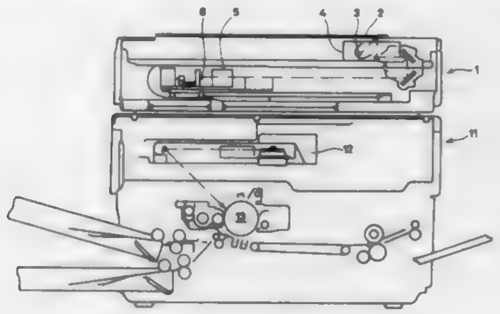
detecting that a new transmission request is present during a parallel data transmission through a plurality of communication lines;

releasing at least one of the communication lines to continuously use the remaining communication lines for the parallel data transmission in response to the detected new transmission request; and

performing a new data transmission through the released communication line.

5,317,416
FACSIMILE APPARATUS WITH A PAGE PRINTER HAVING REDUCED MEMORY CAPACITY REQUIREMENTS

Toshio Tsuboi, Osaka; Munehiro Nakatani, Toyokawa, and Shigenobu Fukushima, Yao, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jun. 24, 1991, Ser. No. 719,832
Claims priority, application Japan, Jun. 27, 1990, 2-168864; Jun. 27, 1990, 2-168865; Jun. 27, 1990, 2-168866; Jun. 27, 1990, 2-168867; Jun. 27, 1990, 2-168868; Jun. 27, 1990, 2-168869; Jun. 27, 1990, 2-168870
Int. Cl.^{5} H04M *1/40*
U.S. Cl. 358—444 **12 Claims**



1. A facsimile apparatus comprising:

printing means for printing an image of one page at a constant speed, wherein the image of one page comprises a plurality of lines and each line is printed at a predetermined interval,

receiving means for receiving compressed image data,

expanding means for expanding said received image data to convert the same into print data,

storing means for storing the print data corresponding to one line among the plurality of lines,

writing means for writing said print data converted by said expanding means into said storing means,

transfer means to read out said print data from said storing means for transferring the same to said printing means at said predetermined interval with a predetermined transfer speed, and

control means for controlling said writing means and said transfer means so that said writing means writes said print data into said storing means, when said transfer means is not transferring said print data into said printing means.

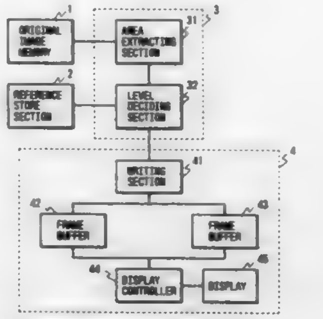
5,317,417
IMAGE PROCESSING APPARATUS WITH IMPROVED IMAGE REDUCTION

Katsumi Yamamura, Yokohama, and Hideyuki Hanaoka, Kawasaki, both of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan
Filed Oct. 25, 1991, Ser. No. 783,031
Claims priority, application Japan, Nov. 21, 1990, 2-319073; Mar. 4, 1991, 3-37255; May 28, 1991, 3-123483
Int. Cl.^{5} H04N *7/12*
U.S. Cl. 358—451 **10 Claims**

1. An image reducing apparatus comprising:

black-pixel counting means for counting a number of black pixels in an N×M-pixel area in an original image represented by white and black levels, where N and M denote predetermined integers equal to or greater than 2;

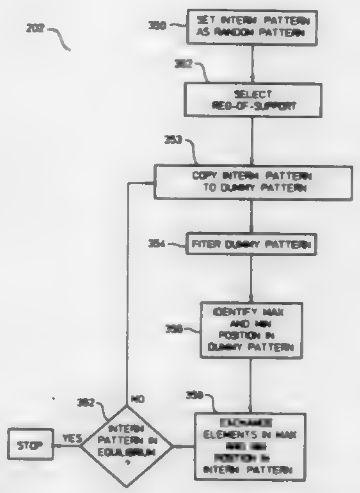
pattern comparing means for comparing a pixel pattern in the N×M-pixel area and an area surrounding the N×M-pixel area with predetermined reference patterns; and



level determining means for determining a level of a pixel in a reduction-resultant image in accordance with the black-pixel number counted by the black-pixel counting means and with a result of the pattern comparison by the pattern comparing means, the reduction-resultant image pixel corresponding to the N×M-pixel area in the original image.

5,317,418
HALFTONE IMAGES USING SPECIAL FILTERS

Qian Lin, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 11, 1993, Ser. No. 60,285
Int. Cl.^{5} G03F *3/08*
U.S. Cl. 358—456 **19 Claims**


202
350
SET INTERIM PATTERN AS RANDOM PATTERN
352
SELECT REG-OF-SUPPORT
353
COPY INTERIM PATTERN TO DUMMY PATTERN
354
FITER DUMMY PATTERN
356
IDENTIFY MAX AND MIN POSITION IN DUMMY PATTERN
358
EXCHANGE ELEMENTS IN MAX AND MIN POSITION IN INTERIM PATTERN
362
INTERIM PATTERN IN EQUILIBRIUM ?
NO
YES
STOP

1. A method of generating a halftone image from a grey scale image by means of a dither matrix,

the halftone image, the grey scale image and the dither matrix each occupying an area, the three areas being substantially equal to each other,

the halftone image and the grey scale image each having a plurality of pixels, each pixel having a value, and

the dither matrix having a plurality of elements that are generated by a plurality of patterns, each pattern also having a plurality of elements, each element in each pattern occupying a position in the pattern, each element having a value,

the method comprising the steps of comparing the value of each pixel of the grey scale image with the value of an element in the dither matrix and, based on the result of the

comparison, determining the value of a corresponding pixel of the halftone image, and
the value of each element in each pattern of the dither matrix being determined by a single-peaked and positive filter with a region-of-support, the peak being approximately at the center of the region-of-support, and
for a given pattern, the region-of-support being dependent on the average separation of a pre-selected value in that pattern, such that all elements with the preselected values are substantially uniformly distributed across the pattern.

5,317,419
IMAGE RECOGNITION APPARATUS

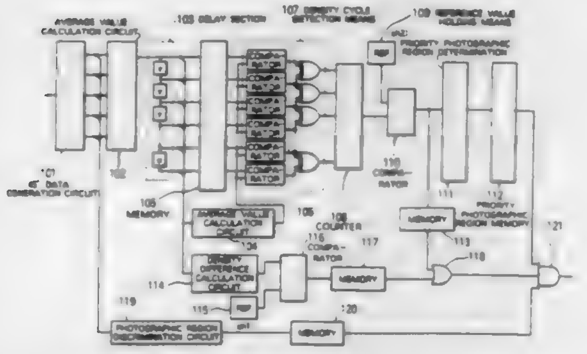
Noboru Koizumi, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jul. 7, 1992, Ser. No. 909,631

Claims priority, application Japan, Aug. 7, 1991, 3-197787; Aug. 23, 1991, 3-212164; Aug. 30, 1991, 3-220243

Int. Cl.^{5} H04N *1/40*

U.S. Cl. 358—462 **7 Claims**


AVERAGE VALUE CALCULATION CIRCUIT
103 DELAY SECTION
107 DENSITY CYCLE DETECTION MEANS
109 REFERENCE VALUE HOLDING MEANS
PRIORITY PHOTOGRAPHIC REGION DETERMINATION
COMPARATOR
101 DATA GENERATION CIRCUIT
105 MEMORY
AVERAGE VALUE CALCULATION CIRCUIT
106 COUNTER
110 COMPARATOR
MEMORY
PRIORITY PHOTOGRAPHIC REGION MEMORY
DENSITY DIFFERENCE CALCULATION CIRCUIT
COMPARATOR
MEMORY
PHOTOGRAPHIC REGION DISCRIMINATION CIRCUIT
MEMORY
114
117
118
119
120
121

1. An image processing apparatus for processing image signals corresponding to an image including a character image region, a halftone image region, and a continuous tone image region, the apparatus comprising:
means for generating first image signals corresponding to said character image region, and second image signals corresponding to said halftone image region and said continuous tone image region, from said image signals;
means for processing said first image signals; and
means for processing said second image signals;
wherein said generating means includes:
means for converting said image signals into binarized image signals, expressing said image with a black pixel and a white pixel, according to the density level of respective pixels of said image;
means for recognizing partial image regions, each of which has a predetermined number of pixels in said image, said recognizing means recognizing whether said partial image regions are black regions in each of which said black pixel exists in more than a predetermined number, or said partial image regions are non-black regions in each of which none of said black pixels exists, so that said image comprises at least one of the group of said black regions and the group of said non-black regions; and
means for estimating a continuous length of said black regions.

5,317,420
NOISE ELIMINATION APPARATUS FOR ELIMINATING NOISE COMPONENTS HAVING A HIGH DENSITY AND A LOW DENSITY

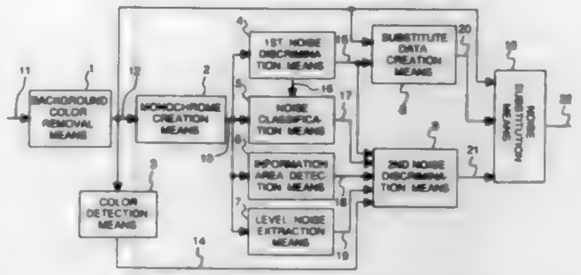
Yasuhiro Kuwahara, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1992, Ser. No. 961,538

Claims priority, application Japan, Mar. 5, 1992, 4-047411

Int. Cl.^{5} H04N *1/38, 1/46, 5/213*

U.S. Cl. 358—463 **17 Claims**


11
1
BACKGROUND COLOR REMOVAL MEANS
12
2
MONOCHROME CREATION MEANS
3
COLOR DETECTION MEANS
4
1ST NOISE DISCRIMINATION MEANS
5
NOISE CLASSIFICATION MEANS
6
INFORMATION AREA DETECTION MEANS
7
LEVEL NOISE EXTRACTION MEANS
SUBSTITUTE DATA CREATION MEANS
2ND NOISE DISCRIMINATION MEANS
NOISE SUBSTITUTION MEANS
10
14
15
16
17
18
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21
22

1. A noise elimination apparatus comprising:
first noise discrimination means for discriminating first noise components in image data;
information area detection means for detecting an area of necessary information in the image data;
second noise discrimination means for discriminating second noise components according to first noise discrimination data output from said first noise discrimination means and information area data output from said information area detection means;
substitute data creation means for creating substitute data to be substituted for second noise discrimination data output from said second noise discrimination means using the image data and the first noise discrimination data output from said first noise discrimination means; and
noise substitution means for substituting substitute data output from said substitute data creation means for the second noise discrimination data output from said second noise discrimination means.

5,317,421
WHITE REFERENCE DATA GENERATING UNIT APPLIED TO SHADING CORRECTION SYSTEM

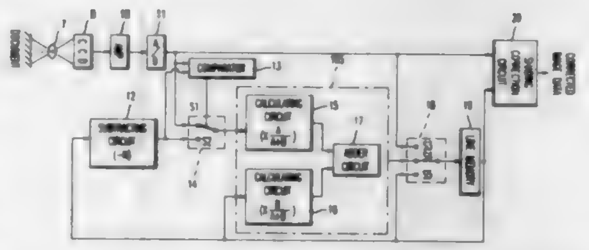
Masaaki Ito, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 3, 1992, Ser. No. 816,671

Claims priority, application Japan, Jan. 8, 1991, 3-011522; Jan. 8, 1991, 3-011551; Sep. 30, 1991, 3-276291

Int. Cl.^{5} H04N *1/04*

U.S. Cl. 358—464 **19 Claims**



1. A white reference data generating unit for generating white reference data based on image data which is obtained while an image sensor means is scanning on a white reference plate in a predetermined number of lines, said white reference data being used in a shading correction process, said white reference data generating unit comprising:
storage means for storing the white reference data;
determination means, coupled to said image sensor means, for determining whether or not the image data supplied from said image sensor means is equal to or less than a threshold level based on data stored as the white reference data in said storage means;
updating means, coupled to said storage means, for updating the white reference data stored in said storage means to new white reference data calculated based on the white reference data stored in said storage means and input data while said image sensor means is scanning each line on said white reference plate; and
supply means, coupled to said storage means, said determination means and said updating means, for supplying the image data, as the input data, to said updating means when said determination means determines that the image data is greater than the threshold level, and for supplying difference data, as the input data, to said updating means when said determination means determines that the image data is equal to or less than the threshold level, said difference data being obtained by subtracting a first value form the white reference data stored in said storage means.

5,317,422
INFORMATION COMMUNICATION APPARATUS

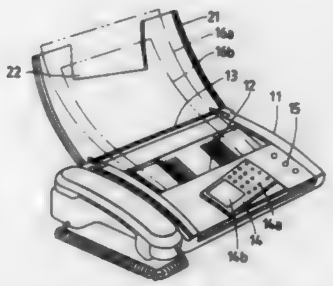
Munenori Fujimoto, Tokyo, Japan, assignor to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed May 27, 1992, Ser. No. 888,717

Claims priority, application Japan, May 28, 1991, 3-123486; May 28, 1991, 3-123488

Int. Cl.^{5} H04N *1/40*

U.S. Cl. 358—476 **11 Claims**



1. An information communication apparatus such as a facsimile machine comprising:
an apparatus main body;
an operation panel portion provided at a front end of an upper surface of the apparatus main body;
a manuscript inlet opening provided at substantially the center of the upper surface of said apparatus main body;
a recording paper outlet opening provided behind the manuscript inlet opening on said apparatus main body; and
a tray serving as a manuscript holder as well as a recording paper tray which is hingedly supported at a rear end of the apparatus main body so as to be opened or closed between an opened position where the tray extends rearward and obliquely upward and a closed position where the tray covers the upper surface of the apparatus main body.

5,317,423
IMAGE SENSING APPARATUS USING CALIBRATION SEQUENCES STORED IN EXTENDED PORTIONS OF SHIFT REGISTERS

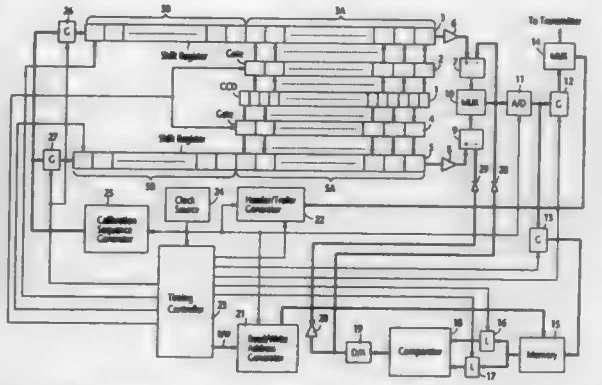
Hisashi Harada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 30, 1992, Ser. No. 998,384

Claims priority, application Japan, Dec. 30, 1991, 3-360351

Int. Cl.^{5} H04N *1/04*

U.S. Cl. 358—482 **6 Claims**



1. An image sensing apparatus comprising:
an array of image sensing elements;
a first shift register having a plurality of stages divided into first and second sections, the stages of the first section corresponding respectively to odd-numbered elements of said array;
a second shift register having a plurality of stages divided into first and second sections, the stages of the first section corresponding respectively to even-numbered elements of said array;
gate means responsive to a transfer command pulse for transferring image signals developed in the odd-numbered elements of said array to the corresponding stages of said first shift register and transferring image signals developed in the even-numbered elements of said array to the corresponding stages of said second shift register;
means for generating a calibration sequence of equal pulse amplitude;
control means for generating said transfer command pulse during a line scan interval, causing said calibration sequence to be stored into the second section of each of said first and second shift registers when said gate means is in a turn-off state, and alternately driving said first and second shift registers for delivering the image signals and the calibration sequences therefrom;
means for combining the image signals delivered from the first and second shift registers;
means for detecting a difference in amplitude between the calibration sequences delivered from the first and second shift registers; and
compensation means responsive to the detected difference for controlling the amplitude of the image signals delivered from said shift registers.

5,317,424
DRUM TYPE IMAGE SCANNER

Toshiaki Aotani, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 4, 1991, Ser. No. 802,094

Claims priority, application Japan, Dec. 25, 1990, 2-414464

Int. Cl.^{5} H04N *1/04*

U.S. Cl. 358—491 **13 Claims**

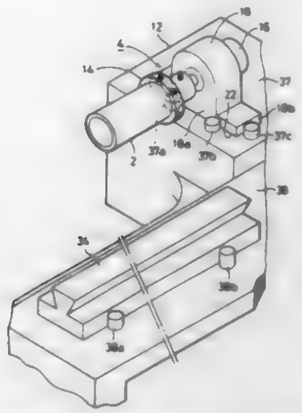
1. A drum type image scanner, comprising:
a cylinder on which an original to be scanned is mounted;
a cylinder drive motor for rotating said cylinder;

cylinder holding means for steadily holding said cylinder and said cylinder drive motor;

optical means for optically reading the original on said cylinder;

a base on which said optical means and said cylinder holding means are mounted, comprising guide means for guiding said optical means along a straight track and reference means for positioning said cylinder holding means to make the rotational axis of said cylinder parallel to said straight track of said guide means; and

a driving motor for driving said optical means along said straight track,



wherein said cylinder holding means comprises a bracket which has a bottom face formed parallel to the axis of said cylinder and a cylinder-key way, formed on the bottom face, parallel to the axis of said cylinder,

said base further comprises a mount on which said bracket of said cylinder holding means is fixed, said mount being parallel to the straight track of said guide means and having a base-key way formed parallel to the straight track of said guide means, said base-key way being formed opposite to said cylinder key way, and

said reference means comprises a key to be fitted into said base-key way and said cylinder-key way to thereby steadily position said cylinder holding means on said base.

5,317,425

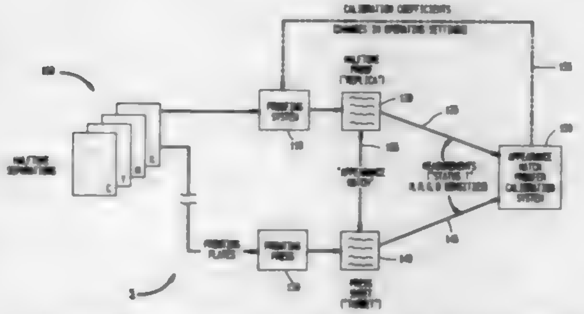
TECHNIQUE FOR USE IN CONJUNCTION WITH AN IMAGING SYSTEM FOR PROVIDING AN APPEARANCE MATCH BETWEEN TWO IMAGES AND FOR CALIBRATING THE SYSTEM THERETO

John P. Spence, Webster, N.Y.; Edward M. Granger, Sausalito, Calif., and Charles E. Rinehart, Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1992, Ser. No. 834,076

Int. Cl.^{5} H04N *1/46*

U.S. Cl. 358—504 **24 Claims**



1. In imaging apparatus having first and second different imaging systems, wherein said first and second imaging systems generate respective first and second image depictions of a common original image, and said second imaging system has a variable response, a method for obtaining an appearance match between said first and second image depictions and for generating operational settings for varying the response of said second imaging system so as to calibrate a response of the second imaging system to a response of the first imaging system, the method comprising the steps of:

obtaining data values for corresponding portions of said first and second image depictions in a pre-determined manner that substantially parallels interpretative color preferences of a viewer; and

determining, in response to said data values and through a pre-defined model of said second imaging system and pre-determined matching principles, operational settings for setting the response of said second imaging system to produce an image depiction, through said second imaging system, that is an appearance match to said first image depiction, wherein said matching principles comprise a plurality of pre-defined rules that collectively define an appearance match between corresponding image depictions produced by said first and second imaging systems in response to a common source image applied as a common input to both said first and second imaging systems.

5,317,426

COLOR ESTIMATION METHOD FOR EXPANDING A COLOR IMAGE FOR REPRODUCTION IN A DIFFERENT COLOR GAMUT

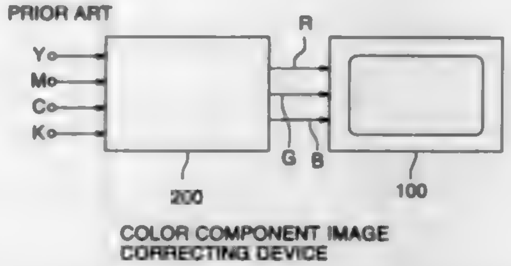
Toru Hoshino, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,251

Claims priority, application Japan, Nov. 26, 1990, 2-321687; Nov. 26, 1990, 2-321688

Int. Cl.^{5} H04N *1/46;* **G03F** *3/08*

U.S. Cl. 358—515 **6 Claims**



1. A method for expanding color image data of a first media to be reproduced on a second media having a color reproducing capability larger than that of the first media, said method comprising:

obtaining a first color gamut on a colorimetric system on the basis of a plurality of color image data of the first media the colorimetric system being one of the CIE standard $L^*u^*v^*$ and $L^*a^*b^*$ color systems;

obtaining a second color gamut on the colorimetric system on the basis of a plurality of color image data of the second media;

calculating a first lightness difference between maximum and minimum values of the lightness on a lightness axis of the first color gamut, a second lightness difference between maximum and minimum values of lightness on a lightness axis of the second color gamut, and a lightness difference ratio of the first light difference to the second lightness difference;

inputting color image data "T" of the first media;

converting the L^* value of the color image "T" of the first media on the basis of the lightness difference ratio;

selecting a line passing a lightness "LT" and chroma "rT" of the color image data "T"while keeping a hue "θT" of the color image data "T";

obtaining a maximum chroma "rlmax" on the selected line in the first color gamut and a maximum chroma "r2max" on the selected line in the second color gamut;

comparing the chroma "rT" of the color image data "T"with a threshold value which is "a" $(a<1.0)$ times of the maximum chroma "rlmax" of the first color gamut; and

in the case that the chroma "rT" is not larger than the threshold value,

using the u^* and v^* values or a^* and b^* values of the color image data "T" without any change, or

in the case that the chroma "rT" is larger than the threshold value,

calculating a first chroma difference between the maximum chroma "rlmax" int he first color gamut and the threshold value, a second chroma difference between the maximum chroma "r2max" in the second color gamut and the threshold value, and the chroma difference ratio between the first chroma difference and the second chroma difference,

converting the chroma "rT" on the basis of the chroma deference ratio,

converting the u^* and v^* values or the a^* and b^* values of the color image data "T" so as to obtain a converted chroma without changing the hue "θT", and

converting further the L^* value of the color image data "T" in accordance with the conversion amount of the chroma so as to increase the lightness in accordance with the increases of the chroma at least in a high lightness region.

5,317,427

IMAGE PROCESSING APPARATUS AND METHOD FOR ALLOWING THE DYNAMIC RANGE OF DIGITAL IMAGE DATA HAVING A WIDE DYNAMIC RANGE TO BE COMPRESSED WHILE PRESERVING INFORMATION OF THE DIGITAL IMAGE DATA

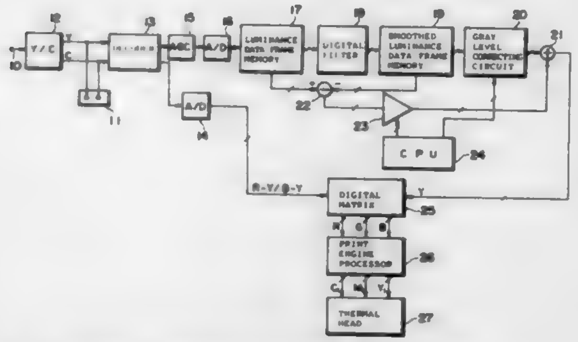
Kouji Ichikawa, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 28, 1992, Ser. No. 936,667

Claims priority, application Japan, Aug. 30, 1991, 3-244088

Int. Cl.^{5} H04N *1/46, 1/40;* **G03F** *3/08*

U.S. Cl. 358—520 **6 Claims**



3. An image processing apparatus comprising:

dividing means for dividing digital luminance image data applied into high luminance image data and low luminance image data using a predetermined threshold value;

luminance level conversion processing means for separately subjecting said high luminance image data and said low luminance image data obtained by the division by said dividing means to luminance level conversion processing such that the lowest luminance level of said high luminance image data is less than or equal to the highest luminance level of said low luminance image data; and

digital luminance image data generating means for synthesizing said high luminance image data and said low luminance image data subjected to the luminance level conversion processing by said luminance level conversion processing means to generate digital luminance image data corresponding to one frame image.

5,317,428

IMAGE ENCODING METHOD AND APPARATUS PROVIDING VARIABLE LENGTH BIT STREAM SIGNALS

Hidefumi Osawa, Kawaguchi; Yasuhiko Yasuda, Musashino, and Shigeo Kato, Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

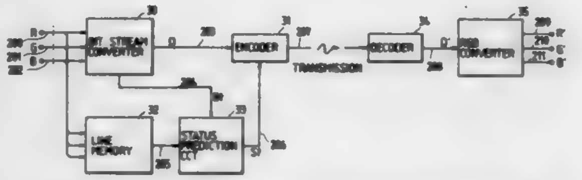
Continuatior of Ser. No. 514,766, Apr. 26, 1990, abandoned.

This application Nov. 25, 1992, Ser. No. 982,115

Claims priority, application Japan, Apr. 26, 1989, 1-106608; Apr. 26, 1989, 1-106609

Int. Cl.^{5} H04N *11/02*

U.S. Cl. 358—539 **11 Claims**



1. An image encoding method comprising the steps of:

for each pixel, inputting a plurality of color component signals representing one of N colors and the plurality of color component signals together representing a color of the pixel;

for each pixel, sequentially converting the color component signals into a bit stream signal, the bit stream signal having a length dependent on the color of the pixel and comprising bits of logic "0" and/or logic "1", wherein a number of bits of logic "0" in the bit stream signal is different for each of the N colors; and

sequentially encoding the bit stream signals using a binary encoding method.

5,317,429

TRILAYER NEMATIC LIQUID CRYSTAL OPTICAL SWITCHING DEVICE

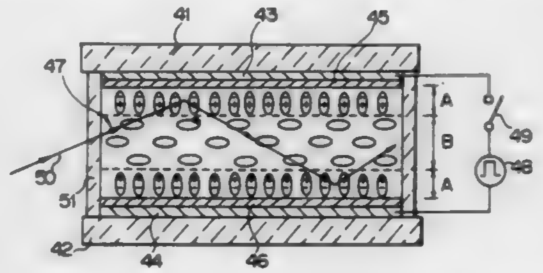
Akihiro Mochizuki, and Katsusada Motoyoshi, both of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1991, Ser. No. 798,968

Claims priority, application Japan, Nov. 28, 1990, 2-327518

Int. Cl.^{5} G02F *1/13, 1/1335, 1/133, 1/137*

U.S. Cl. 359—42 **10 Claims**



9. An optical switching system comprising: first and second optical switching devices, each device comprising:

first and second transparent substrates having corresponding main surfaces with respective first and second transparent electrodes and first and second alignment films formed thereon, the first and second transparent substrates being disposed with the main surfaces in a facing, spaced relationship and defining a gap therebetween,

first and second transparent end walls disposed in spaced and opposed relationship and extending between the respective main surfaces of the first and second transparent substrates,

a nematic liquid crystal material, capable of forming a dimer, disposed in and filing the gap and defining a central layer separating first and second layers, the first and second layers being contiguous with and extending from the respective first and second alignment films to the central layer and defining corresponding first and second interfaces with the central layer, the first and second layers each exhibiting a ferroelectric characteristic and the central layer exhibiting a normal dielectric characteristic, and

each of the first and second liquid crystal layers, in the absence of a voltage being applied to the respective first and second transparent electrodes, having a first index of refraction relative to the index of refraction of the central liquid crystal layer which results in total reflection of a coherent light beam, which is transmitted through the first transparent end wall and propagated in the central layer, at the respective interfaces of the first and second layers with the central layer, and each of the first and second layers having a second, different index of refraction relative to the index of refraction of the central layer in response to the application of an electrical voltage to the first and second transparent electrodes, such that at least a part of the coherent light beam, which is propagated through the central liquid crystal layer, is transmitted through a corresponding one of the first and second liquid crystal layers and through the respective, contiguous alignment film, transparent electrode and transparent substrate and thereby to the exterior of the respective transparent substrate; and the second optical switching device being positioned relatively to the first optical switching device for receiving, through the first end wall and within the central layer of the second optical switching device the coherent light beam transmitted through the first transparent substrate of the first optical switching device.

5,317,430

LIQUID CRYSTAL DISPLAY DEVICE HAVING TRANSPARENT OPTICAL CONDUCTOR INTEGRAL WITH OPAQUE SUPPORT ON END SURFACES WITH NO LIGHT SOURCE

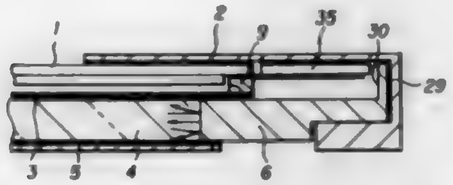
Shinichi Uratani, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1992, Ser. No. 987,621

Claims priority, application Japan, Dec. 11, 1991, 3-102132

Int. Cl.^{5} G02F *1/1335*

U.S. Cl. 359—49 **3 Claims**



1. A liquid crystal display device comprising a liquid crystal device panel and a lighting unit for backlighting of said liquid crystal device panel, said lighting unit including a transparent optical conductor disposed in parallel with said liquid crystal device panel rearwardly thereof, an opaque support for supporting said transparent optical conductor in relation to said liquid crystal device panel, a tubular light source disposed at one end of said transparent optical conductor, and a light source cover and reflector disposed near said tubular light source and adapted to reflect light, emitted from said tubular light source and heading for the outside, toward said transparent optical conductor,

wherein said opaque support is formed integrally with said transparent optical conductor so as to merge into the remaining end surfaces of said transparent optical conductor where no tubular light source is disposed, and said light source cover and reflector is formed integrally with said opaque support.

5,317,431

LIQUID CRYSTAL DISPLAY DEVICE WITH SCATTERING WHITE LAYER AND COLOR FILTER

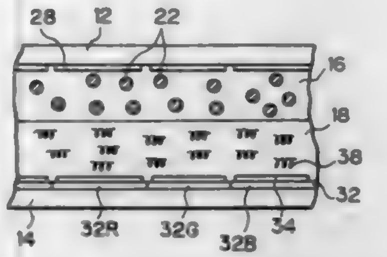
Hidefumi Yoshida, and Kazutaka Hanaoka, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 20, 1992, Ser. No. 979,635

Claims priority, application Japan, Nov. 21, 1991, 3-306283

Int. Cl.^{5} G02F *1/13, 1/133, 1/335*

U.S. Cl. 359—51 **13 Claims**



1. A liquid crystal display device comprising first and second opposite plates, a first liquid crystal layer having a threshold voltage and a dichroic dye contained therein, a second liquid crystal layer having a threshold voltage different from that of the first liquid crystal layer and light scattering properties, and a color filter provided on one of the plates; the first and second liquid crystal layers being stratified separately from each other and superposed one above the other between the plates.

5,317,432

LIQUID CRYSTAL DISPLAY DEVICE WITH A CAPACITOR AND A THIN FILM TRANSISTOR IN A TRENCH FOR EACH PIXEL

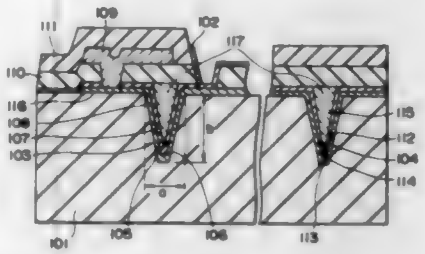
Masumitsu Ino, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 1, 1992, Ser. No. 937,727

Claims priority, application Japan, Sep. 4, 1991, 3-224352; Dec. 19, 1991, 3-354801; Dec. 19, 1991, 3-354805

Int. Cl.^{5} G02F *1/1343;* **H01L** *29/68, 23/48*

U.S. Cl. 359—59 **16 Claims**



1. A liquid crystal display device comprising:

a substrate having a first trench;

a plurality of display elements arranged in a matrix form, each of said display elements comprising a picture element electrode, a thin film transistor formed in said first trench and associated with said picture element electrode, and a capacitor element associated with said picture element electrode; and wherein said first trench has a structure satisfying the relation of:

$$0<\tan\theta\leq a/2b$$

wherein a represents a width of said first trench; b represents a depth of said first trench; and θ represents a tapered angle of said first trench.

5,317,433

IMAGE DISPLAY DEVICE WITH A TRANSISTOR ON ONE SIDE OF INSULATING LAYER AND LIQUID CRYSTAL ON THE OTHER SIDE

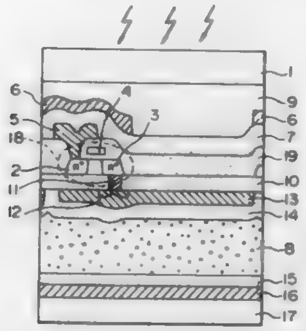
Mamoru Miyawaki, Isehara; Shigeki Kondo, Hiratsuka; Yoshio Nakamura, Atsugi, and Tetsunobu Kouchi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1992, Ser. No. 984,099

Claims priority, application Japan, Dec. 2, 1991, 3-341761; Nov. 13, 1992, 4-327570

Int. Cl.^{5} G02F *1/1343, 1/1335, 1/1333*

U.S. Cl. 359—59 **12 Claims**



1. A liquid crystal image display device, comprising: an insulating layer or base having two surface sides;

liquid crystal material;

a transistor and an interconnection layer for said transistor on one surface side of said insulating layer or base;

a liquid crystal voltage applying electrode for applying a voltage to said liquid crystal material on the other surface side of said insulating layer or base,

wherein one of major electrode portions of said transistor and said liquid crystal voltage applying electrode are connected to each other with an electrode on the other surface side of said insulating layer that it shields the transistor from light through an opening in said insulating layer.

5,317,434

COLOR FILTER STRUCTURE FOR LIQUID CRYSTAL DISPLAYS WITH SEAL END ON OR SURROUNDED BY ORIENTATION FILM

Hiroshi Ohara, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 12, 1991, Ser. No. 730,180

Claims priority, application Japan, Jul. 12, 1990, 184810

Int. Cl.^{5} G02F *1/1335, 1/1333, 1/1337, 1/1339*

U.S. Cl. 359—68 **21 Claims**

1. A liquid crystal display apparatus comprising:

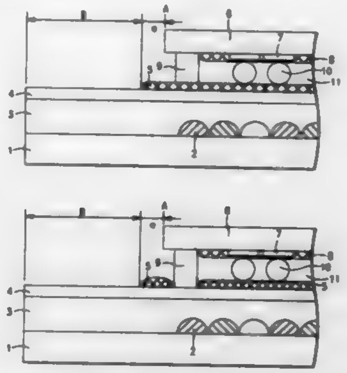
a) a first substrate;
b) a color filter;
c) a protective layer;
d) a transparent electrode;
e) a first orientation film;
f) at least one seal; and
g) a second substrate;

wherein said color filter is disposed upon a surface of said first substrate, said protective layer is formed on said first substrate over said color filter, said transparent electrode is formed on top of said protective layer, said first orientation film is formed on top of said transparent electrode such that a portion of said transparent electrode remains exposed, said seal is mounted on said first orientation film offset laterally inward from an edge of said first orientation film and said second substrate extends beyond the position of said seal.

12. A liquid crystal display apparatus comprising:

a) a first substrate;
b) a color filter;
c) a protective layer;
d) a transparent electrode;
e) a first orientation film;
f) at least one seal; and
g) a second substrate;

wherein said color filter is disposed upon a surface of said first substrate, said protective layer is formed on said first substrate over said color filter, said transparent electrode is formed on top of said protective layer, said first orientation film is formed on top of said transparent electrode such that a portion of said transparent electrode remains exposed, said seal is mounted on said transparent electrode such that said first orientation layer abuts one end of said seal, said second substrate is mounted on top of said seal such that a portion of said second substrate extends beyond the position of said seal, and wherein said first orientation film extends beyond said second substrate by an amount in the range of approximately 0.5 mm to 1.0 mm.



5,317,435

HOLOGRAPHIC RECORDING APPARATUS HAVING A LIQUID CRYSTAL MODULATOR INCLUDING A DIFFUSER WITH PLURAL PHASE SHIFT REGIONS

Kenishi Kasazumi, Takatsuki; Makoto Kato, Nishinomiya, and Ikunori Kobayashi, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 680,484, Apr. 4, 1991, Pat. No. 5,225,920. This application Feb. 10, 1993, Ser. No. 15,936

Claims priority, application Japan, Apr. 6, 1990, 2-92429

The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.

Int. Cl.^{5} G02F *1/1335*

U.S. Cl. 359—69 **8 Claims**

1. A holographic image information recording apparatus comprising:

a coherent light source;

a beam splitter that splits the light from the coherent light source into an object beam and a reference beam;

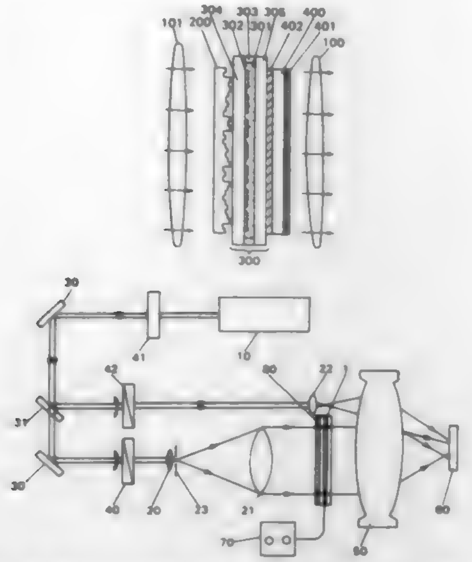
a polarizing device capable of fine-adjusting the polarizing direction of the object beam;

a collimating optical system into which the object beam with its polarizing direction adjusted by the polarizing device is introduced;

a liquid crystal device into which the object beam passing through the collimating optical system is introduced for transmission therethrough and which modulates the intensity of the transmitting beam in accordance with image data;

a diffuser which has a plurality of phase shift regions arranged at a prescribed pitch and is disposed on an incident light side of the liquid crystal device, at least two of the plurality of phase shift regions of the diffuser being arranged in a manner to correspond to one pixel of the liquid crystal device;

an interference optical system which causes the light emitted from the liquid crystal device to interfere with the reference beam separated splitter; and



a means for recording the light produced as a result of the interference by the interference optical system.

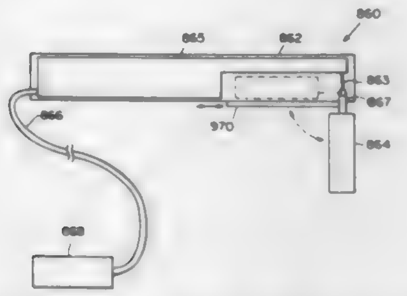
5,317,436
A SLIDE ASSEMBLY FOR PROJECTOR WITH ACTIVE MATRIX MOVEABLY MOUNTED TO HOUSING

Mark B. Spitzer, Sharon; Jack P. Salerno, Waban, and Paul M. Zavracky, Norwood, all of Mass., assignors to Kopin Corporation, Taunton, Mass.

Continuation-in-part of Ser. No. 839,241, Feb. 20, 1992, which is a continuation-in-part of Ser. No. 636,602, Dec. 31, 1990. This application Apr. 22, 1992, Ser. No. 872,297

Int. Cl.^{5} G02F *1/1333, 1/13, 1/1335*

U.S. Cl. 359—83 **28 Claims**



1. A slide assembly for a display adapted for use with a slide projector having a projector body, a light source, an optical system and a chamber in which an image forming element can be placed for projection onto an external viewing surface, the slide assembly comprising:

a housing adapted to be positioned over a slide projector body;

an active matrix display slide movably mounted to the housing and having a storage position within the housing and an operating position outside of the housing, the display slide being movable from the storage position into the operating position such that the display slide can be positioned in a slide projector chamber when the display slide is in the operating position for selectively transmitting light from the light source to the optical system for projection of an image formed on the active matrix display slide onto the external viewing surface.

5,317,437
DISPLAY APPARATUS WITH PIXELS HAVING SUBPIXEL REGIONS

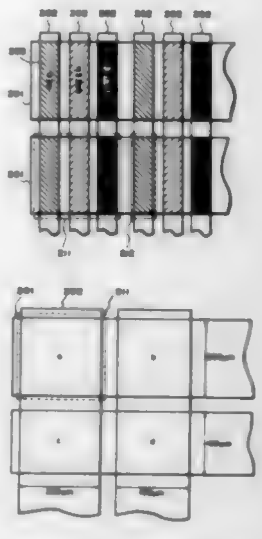
Kazunori Katakura, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1992, Ser. No. 916,611

Claims priority, application Japan, Jul. 25, 1991, 3-207273

Int. Cl.^{5} G02F *1/1343*

U.S. Cl. 359—87 **14 Claims**



1. A display apparatus comprising pixels arranged along plural rows and columns, each pixel comprising a pair of opposed electrodes, wherein:

said pixels further comprise an arrangement of plural subpixels with color filters of different colors wherein integral light quantities of the same color sub-pixels of adjacent pixels are different;

said display apparatus further comprises means for selecting a first display operation in which a single pixel is displayed as one display unit, or a second display operation in which at least two adjacent pixels are combined to form one display unit.

5,317,438
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD OF PRODUCING THE SAME HAVING AN IMPROVED CONNECTION BETWEEN A FLEXIBLE FILM SUBSTRATE AND A DRIVE CIRCUIT SUBSTRATE

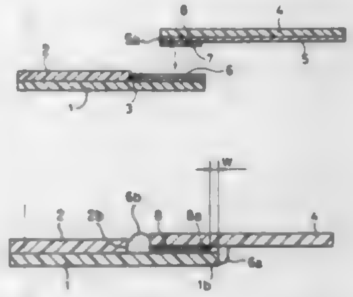
Takumi Suzuki, Atsugi; Yuichi Ota, Hadano; Yuji Narumi, Kanagawa, and Youichiro Miyaguchi, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 26, 1992, Ser. No. 935,297

Claims priority, application Japan, Aug. 29, 1991, 3-218734

Int. Cl.^{5} G02F *1/1343, 1/1333*

U.S. Cl. 359—88 **14 Claims**



1. A liquid crystal display device in which a flexible film is used as a panel substrate and in which a transparent electrode terminal formed on said panel substrate in connected to a wiring terminal formed on a drive circuit substrate wherein:

a radiation-setting adhesive is coated on a surface of a connection portion forming the transparent electrode terminal of the panel substrate;

a conductive member is projectively provided on a surface of a connection portion forming the wiring terminal of the drive circuit substrate;

a hotmelt adhesive covers a surface of the drive circuit substrate including the conductive member; and

said hotmelt adhesive softens at a temperature below a glass transition point of a polymer film for said panel substrate.

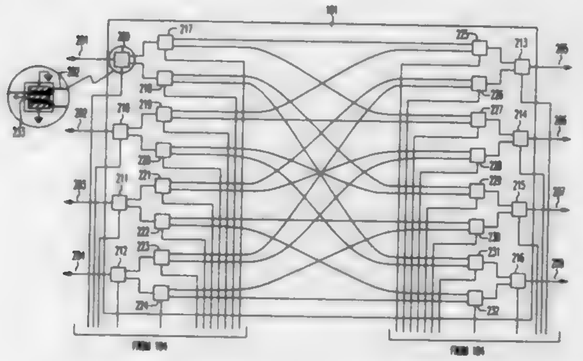
5,317,439
AUTOMATIC ON-LINE MONITORING AND OPTIMIZATION OF OPTICAL NETWORK SWITCHING NODES

Mohammad T. Fatehi, Middletown, and Fred L. Heismann, Freehold, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 17, 1992, Ser. No. 914,302

Int. Cl.^{5} H04B *10/08*

U.S. Cl. 359—110 **30 Claims**



1. A method for monitoring the performance of an optical switching node exhibiting an analog switching characteristic responsive to control parameters, wherein an optical signal is transmitted through said switching node via an optical path, comprising the steps of:

modulating at said switching node, in response to an electrical signal generated at a signal source, the amplitude of said optical signal;

monitoring said optical path at a fixed position to detect the amplitude, frequency and phase characteristics of said modulated optical signal; and

evaluating the performance of said switching node as a function of said detected amplitude, frequency and phase characteristics.

5,317,440
SINGLE WAVELENGTH BIDIRECTIONAL OPTICAL FIBER COMMUNICATION LINK

Huy-Pin Hsu, Northridge, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 21, 1990, Ser. No. 526,427

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.^{5} H04B *10/24*

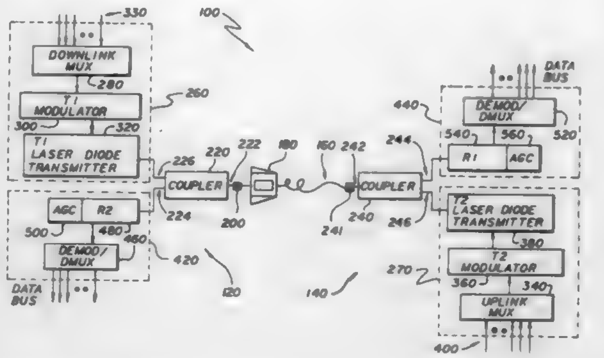
U.S. Cl. 359—113 **11 Claims**

1. A bidirectional communication link comprising:

an optical fiber having a first and a second end;

first means for launching a first optical carrier of a first wavelength onto said fiber at said first end thereof, said first launching means including means for impressing a first modulating signal confined to a first frequency spectrum upon said first carrier;

second means for launching a second optical carrier of said first wavelength onto said fiber at said second end thereof, said second launching means including means for impressing upon said second carrier a second modulating signal confined to a second frequency spectrum not overlapping said first spectrum;



first receiver means, coupled to said second end of said fiber, for extracting said first modulating signal from said first optical carrier; and

second receiver means, coupled to said first end of said fiber, for extracting said second modulating signal from said second optical carrier.

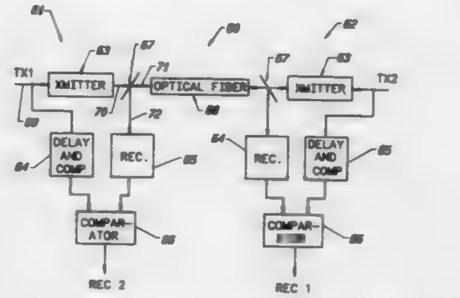
5,317,441
TRANSCEIVER FOR FULL DUPLEX SIGNALLING ON A FIBER OPTIC CABLE

Steven B. Sidman, Vancouver, Wash., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 21, 1991, Ser. No. 779,829

Int. Cl.^{5} H04B *10/24, 10/00*

U.S. Cl. 319—113 **14 Claims**



13. For use in an optical signal transmission system having a local transceiver and a remote transceiver for full duplex signalling between the two transceivers, a transceiver comprising:

means for transmitting in response to an input signal an optical signal corresponding to the input signal over a fiber optic cable to a remote transceiver;

means for receiving simultaneously an optical signal which corresponds to said input signal and an optical signal from a remote transceiver for providing a first output signal having a first component which corresponds to said input signal and a second component which corresponds to the optical signal received from the remote transceiver; and

means for providing in response to said input signal and said first output signal having said first and said second components a second output signal comprising said second component with said first component remoted therefrom, said means for providing said second output signal comprising:

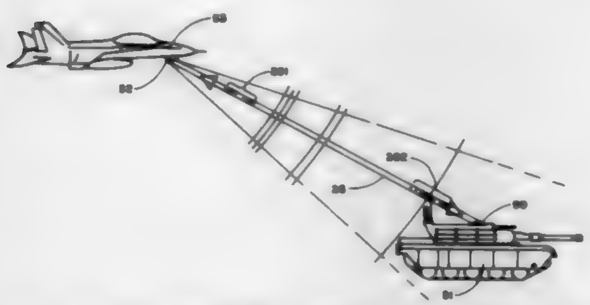
means responsive to said input signal for generating a compensating signal which is equal in magnitude and opposite in phase to the magnitude and phase of said first component in said first output signal; and

a differential amplifying means responsive to said first output signal and said compensating signal for providing said second output signal.

5,317,442
MUTUALLY PUMPED PHASE CONJUGATOR FOR REMOTE IDENTIFICATION

Edward J. Sharp, Fredericksburg; Gary L. Wood, Centreville; William W. Clark, III, Lorton, all of Va., and Gregory J. Salamo, Fayetteville, Ark., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 29, 1993, Ser. No. 98,999
Int. Cl.^{5} H04B *10/00*
U.S. Cl. 359—170 **8 Claims**



7. A universal identification of friend or foe (IFF) system utilizing a real-time communications link between two distinct positions to establish positive identification comprising:

a pumped laser for generating and transmitting a first signal from a first position;

modulation means for modulating said first signal;

a remote laser beacon at a second position for generating and transmitting a second signal at the same wavelength as said first signal;

first detecting means at said first position for detecting incoming signals from said second position;

second detecting means at said position for detecting incoming signals from said first position;

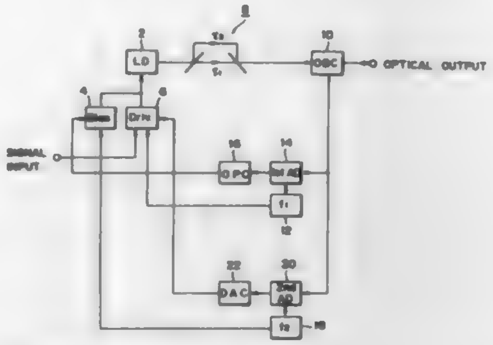
a mutually pumped phase conjugator mirror (MPPCM) which receives said first modulated signal as a first input signal to establish a beam fan field of view;

means to allow the MPPCM to scan a predetermined field of view, upon which, when said second signal is detected by the first detecting means, said second signal is received by the MPPCM as a second input signal to the MPPCM such that said first and second signals are united within the MPPCM and generates simultaneously a temporally modulated phase conjugated return of the other of said first and second signals in the MPPCM thereby effecting lock-on and establishing a two-way modulated phase conjugation signal which is detected at said first and second positions, so that a real-time optical communications link is established between both distinct parties allowing for the approximate immediate transferral of digital information with positive direction and identification of both distinct parties is achieved.

5,317,443
OPTICAL TRANSMITTER

Hiroshi Nishimoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1991, Ser. No. 799,158
Claims priority, application Japan, Nov. 27, 1990, 2-320771
Int. Cl.^{5} H04B *10/04*
U.S. Cl. 359—187 **21 Claims**



1. An optical transmitter comprising:

a laser diode;

a bias circuit for supplying a bias current to said laser diode;

a driving circuit for supplying said laser diode with a modulation current in accordance with an input signal, said modulation current being supplied in such a manner that the integral value of the oscillation frequency of said laser diode, varied in one time slot by said modulation current, reaches a phase amount of one of k_π and $-k_\pi$, k being at least 1;

a Mach-Zehnder optical interferometer for converting angle-modulated light coming from said laser diode into intensity-modulated light, the interferometer having a delay time difference corresponding to 1/k of one time slot;

an optical branching circuit for branching the signal light from said Mach-Zehnder interferometer;

a first oscillator for slightly amplitude-modulating said modulation current using a first low frequency signal;

a first amplitude detector for detecting the amplitude and polarity of the frequency component of said first low frequency signal contained in the signal light branched by said optical branching circuit; and

an operating point control circuit for increasing or decreasing, depending on the polarity detected by said first amplitude detector, the phase difference given upon interference by multiplying said oscillation frequency by said delay time difference, whereby control of said bias current is effected so that the amplitude detected by said first amplitude detector reaches zero.

5,317,444
LIGHT SCANNING APPARATUS

Takeo Iwasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 30, 1992, Ser. No. 982,900
Claims priority, application Japan, Dec. 2, 1991, 3-317962
Int. Cl.^{5} G02B *26/08*
U.S. Cl. 359—214 **24 Claims**

1. An optical scanning apparatus for optically scanning a medium, comprising:

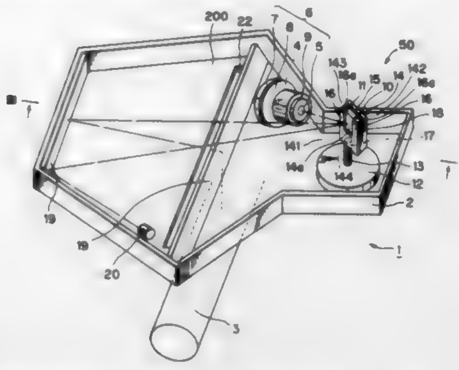
a light source for receiving image information and for emitting a light beam modulated in accordance with the image information;

reflecting means including a first part defining a single reflective surface for reflecting the light beam emitted from said light source to direct the light beam to the medium, the reflecting means further including a second part;

rotating means for rotating the single reflective surface of said reflecting means to allow the single reflective surface to scan the light beam on the medium in a scanning sweep;

imaging means for receiving the light beam emitted from said light source and for converting the light beam into a focused light beam to be focused on the medium, the single reflective surface of said reflecting means receiving the focused light beam from said imaging means and directing the focused light beam to the medium; and

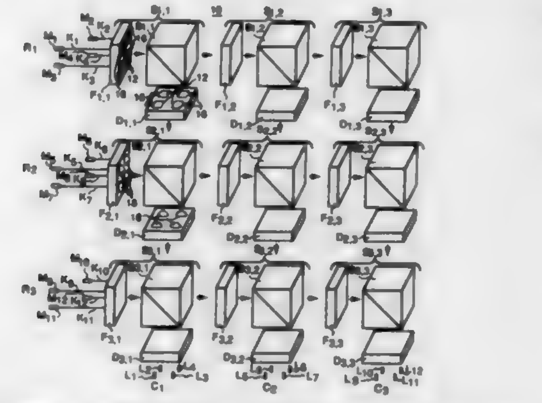
preventing means for preventing the second part of said reflecting means for directing the light beam to be focused on the medium.



5,317,445
OPTICAL DEVICE WITH SPATIAL LIGHT MODULATORS FOR SWITCHING POLARIZED LIGHT

Michael C. DeJule, Clifton Park, N.Y., and Thomas L. Credelle, Los Gatos, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1992, Ser. No. 991,607
Int. Cl.^{5} G02F *1/03, 1/1335, 1/29*
U.S. Cl. 359—250 **16 Claims**



1. An optical switching device for simultaneously and individually directing a plurality of externally derived linearly polarized optical signal beams to a selected plurality of output ports of said device, said device comprising:

a first switching matrix comprising a plurality M×N of switching cells arranged in M columns and N rows of said cells;

each of said switching cells comprising first and second spatial light modulators positioned at an angle to each other for operating on optical beams passed by said cell;

each of said spatial light modulators including an array of individually controllable pixels patterned such that corresponding pixels in a row of cells are aligned with each other along said row and corresponding pixels in a column of cells are aligned with each other along said column;

each first spatial light modulator of a cell in the first column of said matrix being positioned to receive a portion of said plurality of externally derived optical beams such that each pixel thereof receives a respective one of said optical beams;

each first spatial light modulator in cell columns of said matrix subsequent to said first column being positioned to directly receive optical beams from a cell located in a preceding column of the same row;

means for individually receiving and applying control signals to the pixels of each of said first and second spatial light modulators capable of rotating the polarization orientation of the received optical beam through and up to at least 90°; and

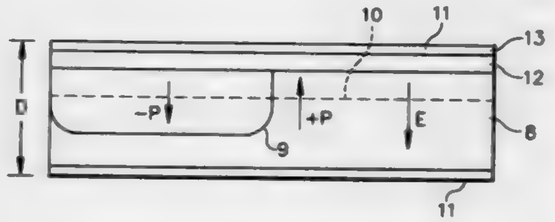
each of said cells further comprising a polarizing beamsplitter optically coupled to receive optical beams from the first spatial light modulator thereof and from the second spatial light modulator of a cell located in a preceding row of the same column, said beamsplitter permitting optical beams received with a first selected linear polarization orientation to pass therethrough undeflected, but causing signal beams received with a second selected linear polarization orientation to be deflected at an angle;

whereby externally derived optical signal beams applied simultaneously to said first cell column can propagate through said matrix under the direction of said control signals so as to reach said selected output ports without mutual interference.

5,317,446
ELECTROOPTIC DEVICE FOR SCANNING USING DOMAIN REVERSED REGIONS

Jose M. Mir, Webster, N.Y.; Daniel Stancil, Mars, and Taviah E. Schlesinger, Mt. Lebanon, both of Pa., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1992, Ser. No. 953,460
Int. Cl.^{5} G02B *1/32*
U.S. Cl. 359—296 **16 Claims**



1. An improved scanning device for deflecting an incident light beam through an electronically controlled angle in response to the application of an electric field to the device comprising:

a monolithic body including a light transmissive portion formed from electrooptic material;

at least first and second antiparallel poled ferroelectric regions in the light transmissive portion; and

electrode means on the body, said electrode means arranged on the body overlying the first and second antiparallel poled ferroelectric regions, so that upon the application of an electrical signal to the electrode means, an electric field is created at least partially within the light transmissive portion of the body, at least a part of each ferroelectric region being intersected by the electric field.

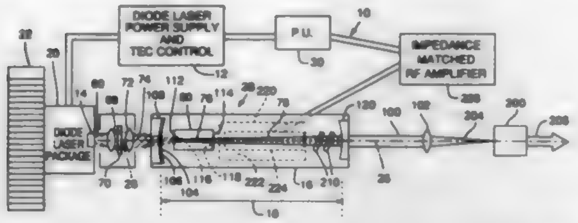
5,317,447
HIGH-POWER, COMPACT, DIODE-PUMPED, TUNABLE LASER

Brian Baird, Lake Oswego, and Richard DeFreez, Hillsboro, both of Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Apr. 24, 1992, Ser. No. 873,408

Int. Cl.⁵ G02F *1/37;* **H01S** *3/094*

U.S. Cl. 359—328 **31 Claims**


DIODE LASER POWER SUPPLY AND TEC CONTROL
P.U.
IMPEDANCE MATCHED RF AMPLIFIER
DIODE LASER PACKAGE
10
12
30
208
200
206
204
102
100
120
16
18
26
210
222
224

1. A method for generating usable laser optical output substantially in a 360–460 nm range, comprising:

generating with a high-power diode laser an optical pumping output at a pumping emission wavelength;

coupling said optical pumping output into a solid-state lasant positioned within a solid-state resonator cavity, said solid-state lasant having an absorption bandwidth well-matched to said pumping emission wavelength and a solid-state laser optical output in a 720–920 nm wavelength range; and

coupling said solid-state laser optical output into a nonlinear waveguide for converting said solid-state laser optical output from said 720–920 nm wavelength range to usable laser optical output in said 360–460 nm wavelength range.

5,317,448
METHOD FOR DRIVING A LASER AMPLIFIER WITH MINIMIZED DISTORTION

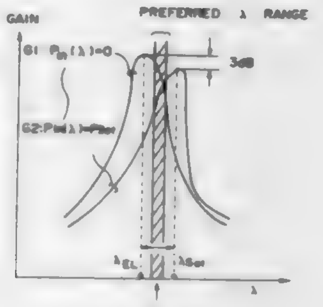
Hiroyuki Nobuhara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 13, 1992, Ser. No. 850,822

Claims priority, application Japan, Mar. 20, 1991, 3-57427

Int. Cl.⁵ G02F *1/00*

U.S. Cl. 359—333 **9 Claims**



1. A method for controlling an optical amplifier, said optical amplifier amplifying an input optical beam in accordance with an optical gain which varies as a function of both change in wavelength and a change in power level of the input optical beam, within a range of wavelengths and a range of power levels, respectively, within which the optical amplifier is operable, the relationship between the variation in optical gain with respect to wavelength of the input optical beam within the operable wavelength range defining for a fixed power level of the input optical beam within the operable power level range, a corresponding, fixed characteristic curve and defining for power levels varying throughout the operable power level range respectively corresponding, varying characteristic curves, each fixed characteristic curve defined a corresponding, fixed characteristic peak gain and a respective, fixed characteristic wavelength, said method comprising:

determining a first reference optical power level of the input optical beam, and thereby a corresponding first reference characteristic curve, below which first reference optical power level a further reduction in the optical power level of the input optical beam does not produce any substantial change in the relationship of the optical gain of the optical amplifier as a function of a change in wavelength of the input optical beam and accordingly of the first reference characteristic curve;

defining, in accordance with the first reference characteristic curve, a corresponding first reference peak gain and a respective, first reference characteristic wavelength;

determining a second reference optical power level of the input optical beam, greater than the first reference optical power level, at which the corresponding second reference characteristic curve has a corresponding, second reference peak gain which is lower than the first reference peak gain by approximately three decibels and defines a respective second reference characteristic wavelength;

limiting the variable optical power level of the input optical beam to a range having a maximum level equal to the second reference optical power level; and

limiting the variable wavelength of the input optical beam to a reference range between the first and second reference wavelengths.

5,317,449
PROJECTION TELEVISION SET

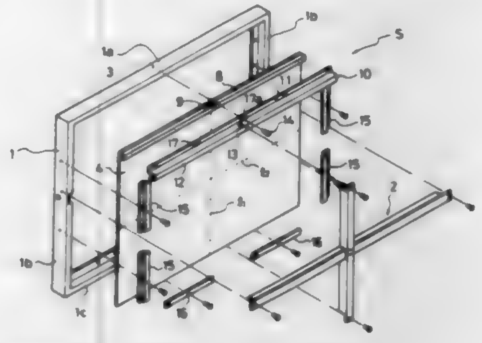
Takashi Furuno; Toshiya Wakasa; Jun Iizuka; Kanehiro Hagiwara, and Mitsuyoshi Mitake, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 20, 1993, Ser. No. 50,549

Claims priority, application Japan, Apr. 23, 1992, 4-104802; Apr. 23, 1992, 4-104803

Int. Cl.⁵ G03B *21/56*

U.S. Cl. 359—443 **15 Claims**



1. A projection television set comprising:

a body casing having a front face; and

a screen assembly provided at the front face of said body casing, said screen assembly including a screen composed of at least two right-and-left divided Fresnel lenses joined together and a lenticular sheet, a frame for defining a periphery of said screen, a screen support member mounted along an upper edge of said screen, and a screen suspension member engaged with said screen support member for supporting said screen to said frame,

wherein a first center engagement section is formed at a position of the screen support member corresponding to a joint line for right and left parts of the screen; a second center engagement section of said screen suspension member is engaged with said first center engagement section of said screen support member; and a first centering section of the screen support member formed corresponding to said second center engagement section of said screen suspension member is in alignment with a second centering section formed in an upper central side of said frame.

5,317,450
PROJECTION EXPOSURE APPARATUS

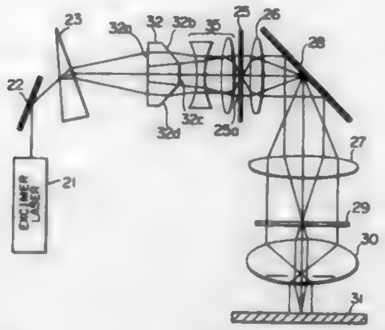
Kazuya Kamon, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1992, Ser. No. 972,419

Claims priority, application Japan, Dec. 17, 1991, 3-333334

Int. Cl.⁵ G02B *5/04, 27/12;* **G03B** *27/42, 27/52*

U.S. Cl. 359—566 **16 Claims**



1. A projection exposure apparatus comprising:

a light source emitting at least partially coherent light;

dispersion means for dispersing the light according to wavelength;

a polyhedron prism for dividing the dispersed light into plural light beams;

a condenser unit for directing each of the plural light beams onto a mask including circuit patterns so that the beams overlap; and

a projection lens unit for projecting the light passing through said mask onto a surface of a wafer.

5,317,451
ALBADA FINDER

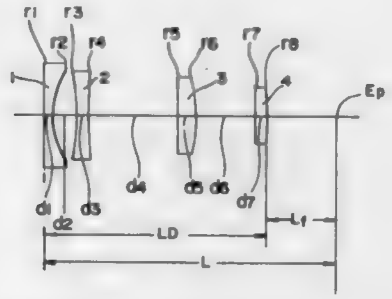
Sachio Hasushita, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1992, Ser. No. 946,646

Claims priority, application Japan, Sep. 19, 1991, 3-313009

Int. Cl.⁵ G02B *25/00, 17/00*

U.S. Cl. 359—643 **2 Claims**



1. An albada finder comprising an objective lens group, which includes of a 1st negative lens and a 2nd negative lens, and an eyepiece lens group, which includes a 3rd positive lens and 4th positive lens, arranged in this order from an object side, said eyepiece lens group being provided with a view frame on the object side surface, said objective lens group being provided with a half mirror on an eye point side surface, and satisfying the following condition:

$$LD/Lf \geqq 2 \qquad (1)$$

wherein,

LD is a lens full length (distance from a 1st surface to an 8th surface), and

Lf is an eye relief (distance from the 8th surface to an eye point); and

wherein said albada finder further satisfies the following condition:

$$0.2 \leqq d6/fAB \leqq 0.5 \qquad (2)$$

wherein,

d6 is a distance between the third lens and the 4th lens, fAB is a focal length of an albada optical system.

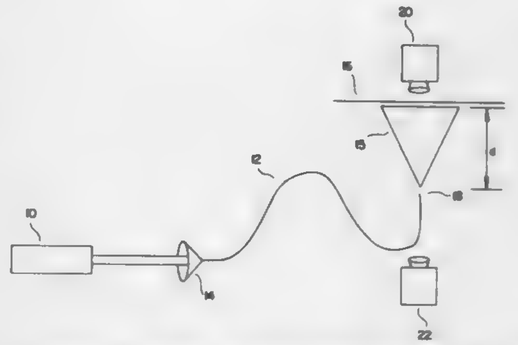
5,317,452
ALIGNING AND ATTACHING A LENS TO A SOURCE OF EMITTED LIGHT USING LIGHT PRESSURE FORCE

Mara Prentiss; Juliet A. Mervis, both of Cambridge, Mass.; Adam H. Bloom, Westbury, N.Y., and Farhad Zarinetchi, Brookline, Mass., assignors to Harvard University, Cambridge, Mass.

Filed Nov. 17, 1992, Ser. No. 977,816

Int. Cl.⁵ G02B *7/02, 6/32*

U.S. Cl. 359—819 **23 Claims**



13. A method for aligning and attaching a lens to an optical fiber emitting light having an intensity maximum comprising:

placing an optical fiber in proximity with a lens;

aligning the axis of said fiber vertically;

allowing light pressure from said fiber to center said lens; and

exposing said fiber and said lens to silicon tetrachloride.

5,317,453
OPTICAL COMPUTER ELEMENT

Tetsuya Nishimura; Motomu Yoshimura, and Mitsuo Maeda, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 571,761, Aug. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 312,073, Feb. 16, 1989, abandoned. This application Apr. 30, 1992, Ser. No. 875,839

Claims priority, application Japan, Feb. 17, 1988, 63-36024

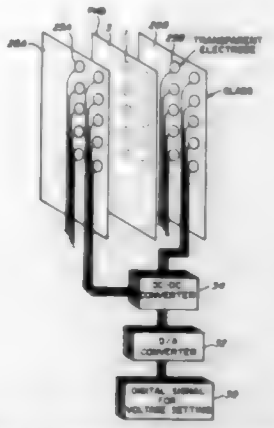
Int. Cl.⁵ G02B *5/22;* **G11C** *13/04;* **G11B** *7/00*

U.S. Cl. 359—885 **7 Claims**

1. An optical filtering element for use in an optical computer, comprising:

a photo-chemical hole burning element having at least a first pit and a second pit for respectively transmitting predetermined wavelength components of light rays each having a plurality of wavelengths incident on the at least first and second pits through the photo-chemical hole burning element; and

control means for independently controlling a light transmission characteristic of each of the at least first and second pits so that the first pit transmits a first predetermined wavelength component of the light rays and the second pit transmits a second predetermined wavelength component of the light rays, wherein the first predetermined wavelength component is different form the second predetermined wavelength component wherein said control means includes electrode means for providing an electric field for each pit.



5,317,454

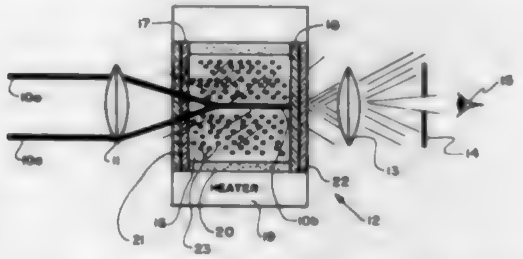
BROADBAND SELF-ACTIVATED OPTICAL POWER LIMITER SYSTEM AND DEVICE

Edward J. Sharp, Fort Washington, Md.; Gary L. Wood, Lorton, and Richard R. Shurtz, II, Oakton, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1984, Ser. No. 648,512

Int. Cl.⁵ C02B *5/28, 21/60*

U.S. Cl. 359—886 **8 Claims**



1. A system for limiting optical power to a sensitive photodetector comprising:

an optical device including a medium transparent to optical radiation below a predetermined threshold level, limiting to radiation above said threshold level, and consisting of a first material having a linear index of refraction distributed as particles in a second material with an index of refraction at least partially related to optical radiation intensity, whereby said materials have the same index of refraction to radiation below said threshold level and the particle size of said first material is on the order of or less than the wavelength of said radiation;

means for directing optical radiation into said medium; and

means for directing optical radiation which transmits through said medium toward said photodetector, whereby the index of refraction of said second material changes for radiation above said threshold level, whereby because of the resulting mismatch of indices of refraction of said materials, said particles act as scattering sites for said radiation.

5,317,455

RECORDING SYSTEM WHICH CAN RECORD SIGNALS FROM TWO FIELDS FOR THE COMPOSITION OF ONE PICTURE

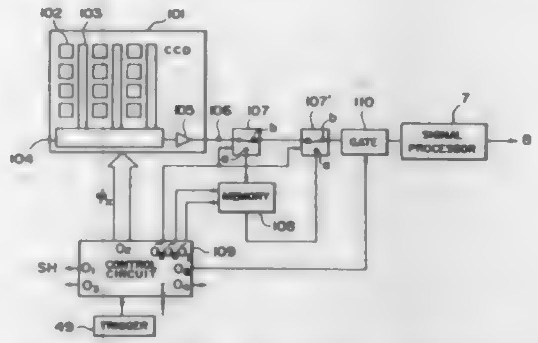
Susumu Kozuki, Tokyo; Nobuo Tezuka, Kawasaki, and Makoto Masunaga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 673,404, Mar. 14, 1991, abandoned, which is a continuation of Ser. No. 587,639, Sep. 20, 1990, Pat. No. 5,047,875, which is a continuation of Ser. No. 273,679, Nov. 21, 1988, abandoned, which is a continuation of Ser. No. 511,180, Jul. 6, 1983, abandoned. This application Dec. 17, 1992, Ser. No. 994,088

Claims priority, application Japan, Jul. 7, 1982, 57-119064

Int. Cl.⁵ H04N *5/76*

U.S. Cl. 360—35.1 **16 Claims**



1. A video signal recording apparatus comprising:

video signal supplying means for supplying a video signal for one picture from a signal generated by one exposure, including dividing the one exposure generated signal into a plurality of portions and sequentially outputting the plurality of portions of the divided signal, said video signal supplying means comprising a photoelectric conversion element for providing the one picture and a memory device for storing at least one of the plurality of portions of the divided signal;

recording means for recording, in respectively different portions of a recording medium, the plurality of portions of the video signal sequentially output from said video signal supplying means, after performing a predetermined operation which is performed before the recording operation;

indication signal producing means for producing an indication signal which indicates completion of the predetermined operation of said recording means; and

control means for receiving the indication signal and for synchronizing an output operation of said video signal supplying means and a recording operation of said recording means such that one of the plurality of portions of the supplied video signal is output from said video signal supplying means and recorded by said recording means in response to the indication signal.

5,317,456

METHOD AND APPARATUS FOR RECORDING SIGNALS WITH DIFFERENT RECORDING CURRENT LEVELS TO DETERMINE OPTIMUM RECORDING CHARACTERISTICS

Katsuhiro Sugiyama, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1992, Ser. No. 967,429

Claims priority, application Japan, Nov. 8, 1991, 3-319731

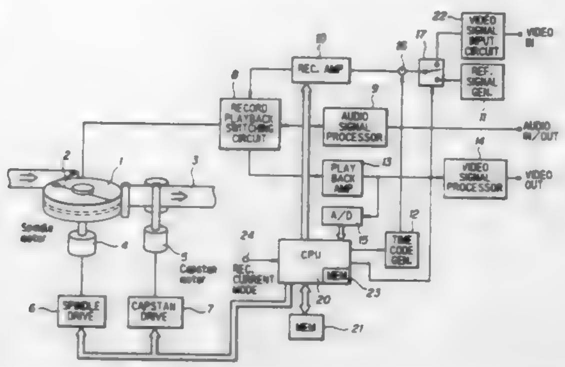
Int. Cl.⁵ G11B *5/09*

U.S. Cl. 360—46 **48 Claims**

1. A method of recording signals with different recording levels on different locations of a record medium, comprising the steps of:

providing a recording signal to a recording amplifier for recording on said record medium with a recording current level controllable by said recording amplifier;

selectively changing the recording current level of the signal recorded in different locations on said record medium;



generating location signals representing the locations on said recording medium whereat said recording signal is recorded; and

recording said location signals on said record medium.

5,317,457

DIGITAL SIGNAL RECORDING METHOD

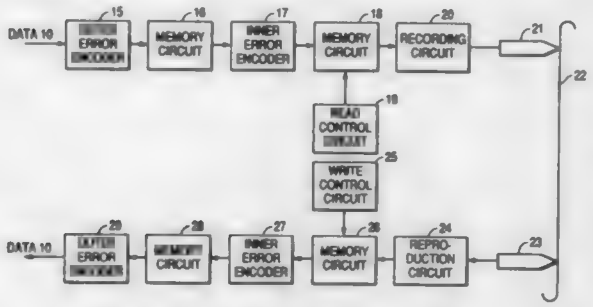
Chiyoko Matsumi, Suita; Akira Iketani, Higashiosaka; Akifumi Ide, Kawanishi, and Tatsuro Juri, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 6, 1991, Ser. No. 741,048

Claims priority, application Japan, Aug. 6, 1990, 2-208606

Int. Cl.⁵ G11B *5/09*

U.S. Cl. 360—48 **12 Claims**



1. A method of recording digital data and pilot tones superposed on the digital data in tracks formed on a recording medium, and performing tracking by using crosstalks of the pilot tones during reproducing, wherein only data recorded in a specific section of a track is subjected to DC free control so as to be set in a DC free state in which a recorded bit stream contains few DC components and few low-frequency components near DC, and wherein the pilot tones are not superposed on the data in the specific section, and wherein the tracking is performed in the specific section on the basis of the crosstalks of the pilot tones from adjacent tracks during reproducing.

5,317,458

APPARATUS FOR RECORDING A COUNT SIGNAL IN A FIXED LOCATION REGARDLESS OF TRANSPORT VELOCITY OF RECORD CARRIER

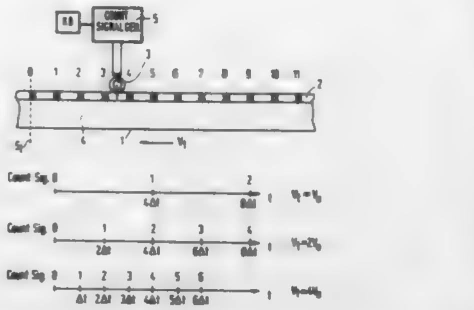
Pieter G. Van Leeuwen, and Albert M. A. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1993, Ser. No. 3,366

Claims priority, application European Pat. Off., Jan. 16, 1992, 92200110.2

Int. Cl.⁵ G11B *5/09, 27/02*

U.S. Cl. 360—48 **15 Claims**



1. Arrangement for recording an information signal in tracks on a record carrier, comprising:

an input for receiving the information signal;

signal processing means for processing the information signal such that it can be recorded in the tracks;

count signal generating means for generating at least one array of subsequent different count signals and for supplying the at least one array of subsequent different count signals to an output with a certain supply rate;

recording means for recording the information signal processed by said signal processing means in the tracks on the record carrier, and for recording the count signals in the tracks on the record carrier, said recording means having at least one recording head; and

transport means for transporting the record carrier with a certain transport velocity in a longitudinal direction of the record carrier, characterized in that, the count signal generating means are to supply the at least one array of subsequent different count signals such that, independent of the value of the transport velocity during recording, each respective count signal of said subsequent different count signals is recorded on said record carrier in a substantially fixed respective location, viewed in the longitudinal direction of the record carrier.

5,317,459

FLOPPY DISK APPARATUS HAVING POWER-SAVE SYSTEM DURING STANDBY MODE

Jun'ichi Ukai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 12, 1991, Ser. No. 730,242

Claims priority, application Japan, Jul. 12, 1990, 2-185018

Int. Cl.⁵ H03K *3/01;* **G11B** *15/18*

U.S. Cl. 360—69 **11 Claims**

1. A floppy disk apparatus comprising:

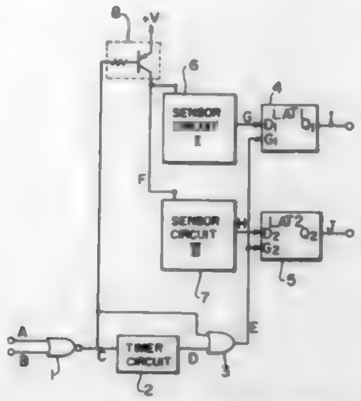
a logic circuit for detecting a standby mode of the apparatus and generating a standby signal;

a sensor circuit;

a power source control circuit connected to the sensor circuit and receiving the standby signal as an input signal from the logic circuit and controlling a power source of the sensor circuit in response to the input standby signal;

a delay circuit receiving the standby signal as an input signal from the logic circuit, delaying a trailing-edge timing of said standby signal and generating a trailing-edge delayed standby signal; and

a latch circuit having an input terminal receiving a sensor output signal as an input signal from the sensor circuit, a gate terminal receiving the trailing-edge delayed standby signal as a gate signal from the delay circuit, and an output terminal, the latch circuit acting to output the sensor output signal processed through the latch circuit during a period when the gate signal is in an inactive state and to output the sensor output signal in a state just before transition of the gate signal from the inactive state to an active state during a period when the gate signal is in the active state.



5,317,460

TIME DIFFERENCE SLOW MODE CONTROL CIRCUIT

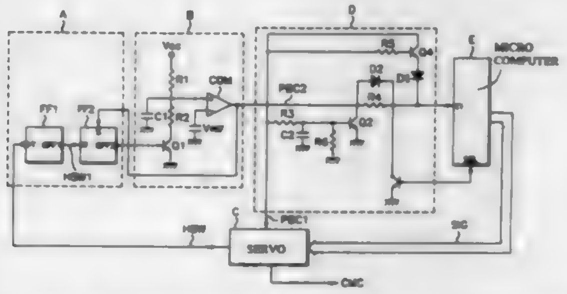
Hee-Man Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 3, 1991, Ser. No. 801,861

Claims priority, application Rep. of Korea, Feb. 13, 1991, 1991-2162

Int. Cl.⁵ G11B *15/46, 21/04;* **H04N** *5/78*

U.S. Cl. 360—73.05 **22 Claims**



1. A time difference slow mode control circuit of a video tape recorder having a normal mode of reproduction and a time difference slow mode wherein a capstan motor alternately stops and rotates to make video images appear to move in slow motion, said video tape recorder having servo means for generating a head switching pulse and for amplifying a reproduction control signal picked up by an audio/control head of the video tape recorder, said servo means controlling the capstan motor in response to time difference slow mode control signals, and a microcomputer generating said time difference slow mode control signals in response to said reproduction control signal, to control said servo means, said time difference slow mode control circuit comprising:

pseudo reproduction control signal generating means for generating a pseudo reproduction control signal in response to said head switching pulse; and

switching means for enabling transmission of said reproduction control signal to said microcomputer when said reproduction control signal is picked up, and for enabling transmission of said pseudo reproduction control signal to said microcomputer to enable generation of said time difference slow mode control signals when said reproduction control signal is not picked up, during said time difference slow mode.

5,317,461

MAGNETIC DISK APPARATUS HAVING A CIRCUIT FOR DETECTING A POSITION OF SERVO INFORMATION RECORDED ON A TARGET TRACK

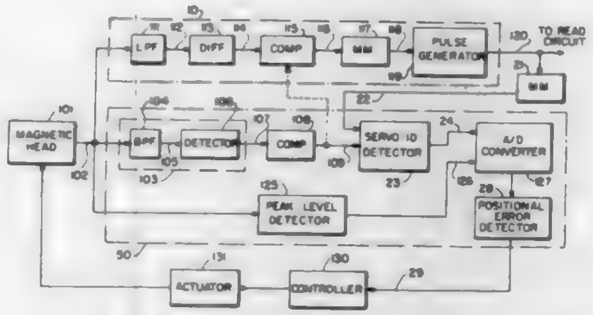
Terumitsu Okamoto, and Tomoaki Nakamura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 30, 1992, Ser. No. 860,015

Claims priority, application Japan, Mar. 29, 1991, 3-091523

Int. Cl.⁵ G11B *5/596*

U.S. Cl. 360—77.08 **8 Claims**



1. A magnetic disk apparatus for carrying out a recording/-reading operation for a magnetic disk including a plurality of concentric tracks each having data areas for storing data and servo areas, each of said servo areas including servo information for aligning a magnetic head with a center of a target track and an information signal recorded at a predetermined discrimination frequency to indicate a starting position of each of said servo areas, said magnetic disk apparatus comprising:

reproducing means for reading a signal recorded on said target track through said magnetic head and supplying a reproduced signal;

first identifying means for extracting a signal component from said reproduced signal within a predetermined range bounding said predetermined discrimination frequency and generating a first detection signal indicating a period during which said identification signal is generated;

second identifying means for detecting the presence of a read data pulse in said reproduced signal and generating a second detection signal indicating a period during which said read data pulse is generated;

pulse generating means for detecting a trailing edge of said second detection signal indicating a beginning of a period of time when output of said read data pulses has terminated while said first detection signal indicates generation of said identification signal, and for generating sampling pulses in a predetermined period of time beginning when said end edge of said second detection signal has been detected; and

positional error detecting means for reading a value of said reproduced signal corresponding to said servo information in synchronism with said sampling pulses, and detecting a positional error of said magnetic head relative to said target track.

8. A method of reading a magnetic disk comprising the steps of:

reproducing a signal recorded on a target track through a magnetic head to provide a reproduced signal;

detecting a servo area which includes servo information for aligning said magnetic head with a center of said target track, an identification signal recorded at a predetermined discrimination frequency to indicate a starting position of said servo area, and an identification marker arranged between said servo information and said identification signal in said servo area, wherein said identification marker is one of a blank interval and an area recorded at frequencies higher than a recording frequency of said servo information;

generating a first detection signal indicating a beginning of a period of time when said identification signal is generated;

generating a second detection signal indicating a beginning of a period of time when read data pulses are output in said reproduced signal;

detecting a trailing edge of said second detection signal while said first detection signal is output;

generating sampling pulses during a predetermined period of time beginning when said trailing edge of said second detection signal is detected; and

determining a positional error from said servo information corresponding to said reproduced signal in synchronism with said sampling pulses.

5,317,462

COVER SEAL FOR MAGNETIC DISK ENCLOSURE HAVING STEPPED MATING SURFACES

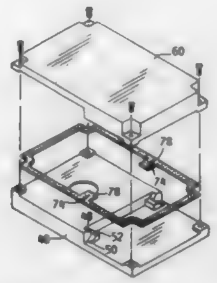
Yoshitaka Kakizaki, Fuchu; Hiroki Kitahori, Chigasaki, and Kazuhiko Takada, Yamato, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1992, Ser. No. 962,361

Claims priority, application Japan, Oct. 18, 1991, 3-297602

Int. Cl.⁵ G11B *17/02*

U.S. Cl. 360—97.02 **10 Claims**



1. An enclosure comprising:

a base having a periphery and a first peripheral mating surface extending around the periphery of the base, said first peripheral mating surface including
  (a) a first level portion lying in a first level;
  (b) a second level portion lying in a second level, said second level being substantially lower than said first level, said second level portion meeting said first level portion at the periphery of the base to form a step;
  (c) a step sealing portion at the juncture of said first level portion and said second level portion, said step sealing portion including
    (i) a landing portion lying in a level intermediate said first level and said second level;
    (ii) a first slope portion descending away from the periphery of the base from the first level portion of the first peripheral mating surface to the landing; and
    (iii) a second slope portion descending toward the periphery of the base from the landing portion to the second level portion of the first peripheral mating surface;

a cover which mates with the base and includes a second peripheral mating surface opposing said first peripheral mating surface of the base, said second peripheral mating surface including a step sealing portion which mates with the step sealing portion of the first peripheral mating surface; and

a seal lying between the first and second peripheral mating surfaces and covering the entire periphery of said base and said step sealing portion.

5,317,463

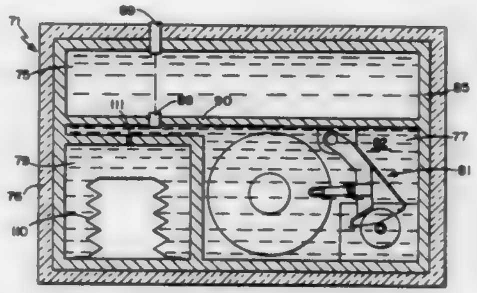
INFORMATION RECORDING APPARATUS WITH A LIQUID BEARING

James U. Lemke, San Diego, Calif.; William W. French, and William B. McHargue, La Jolla, Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Continuation of Ser. No. 985,457, Dec. 3, 1992, abandoned, which is a continuation of Ser. No. 675,433, Mar. 26, 1991, abandoned, which is a division of Ser. No. 590,608, Sep. 25, 1990, Pat. No. 5,193,046. This application Sep. 10, 1993, Ser. No. 119,805

Int. Cl.⁵ G11B *33/14, 5/60*

U.S. Cl. 360—97.02 **10 Claims**



1. A recording apparatus, which operates in an external environment for receiving and storing information and for preserving said stored information in a catastrophic environment, said recording apparatus comprising:

a monolithic cartridge enclosing an interior;

a disk chamber formed within said interior;

a magnetic recording system in said disk chamber, said magnetic recording system including a movable, rigid disk for receiving and storing information;

a relatively incompressible, magnetically inert, and nonflammable liquid entirely filling said disk chamber and submerging said magnetic recording apparatus;

a expansion chamber also formed within said interior, said expansion chamber adjacent to the disk chamber, sealed from the external environment, and having substantially fixed dimensions; and

means coupling said expansion chamber to said disk chamber for controlling the transfer of portions of said liquid thereinbetween in response to external thermal effects induced expansion and contraction of the volume of said liquid.

5,317,464

REMOVABLE CARTRIDGE DISK DRIVE WITH CARTRIDGE INTERLOCKING AND SPINDLE MOTOR TELESCOPING MECHANISMS

William F. Witt, Palo Alto, and Hans K. Tannert, Cupertino, both of Calif., assignors to SyQuest Technology, Inc., Fremont, Calif.

Filed Jun. 28, 1991, Ser. No. 723,452

Int. Cl.⁵ G11B *17/08*

U.S. Cl. 360—99.08 **17 Claims**

1. A disk drive adapted for receiving a removable cartridge containing a disk assembly for storing data, said disk drive comprising:

a housing;

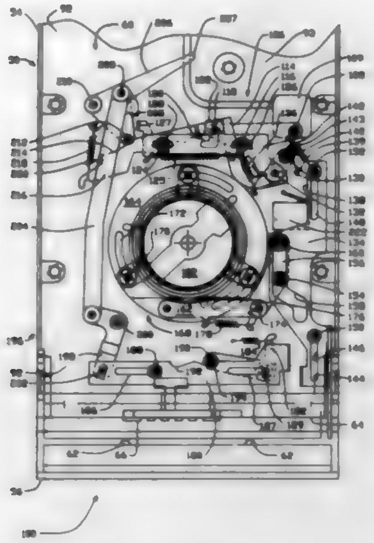
means adapted for receiving in a receiving plane a removable cartridge containing a disk assembly for storing data;

motor means adapted for engaging and causing a disk assembly inside a removable cartridge to spin at an appropriate speed;

means for movable mounting the motor means to the housing so that the motor means is moveable from a first position out of engagement with a disk assembly to a second position operable engaged with a disk assembly;

means extending from the housing for allowing a user to manually operate said mounting means in order to move said motor between said first and second positions;

interlocking means for ensuring (1) that the cartridge can not be removed from the receiving means while the motor means is engaged with the disk assembly and (2) that the motor means can not be energized if the cartridge is not received in the receiving means; and



wherein said interlocking means includes means for manually restricting the manual operation of the extending means.

5,317,465

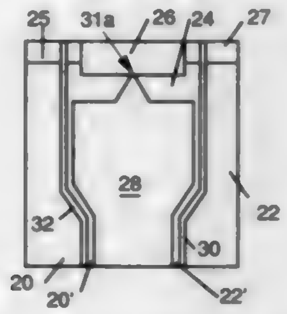
NEGATIVE PRESSURE AIR BEARING SLIDER WITH A CHOKE FOR RESTRICTING AIR FLOW

Robert E. Chapin, Burnsville, and Richard A. Strom, Eagan, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 867,760, Apr. 13, 1992, abandoned, which is a division of Ser. No. 528,925, May 25, 1990, Pat. No. 5,128,822. This application Apr. 9, 1993, Ser. No. 46,117

Int. Cl.^{5} G11B *21/21*

U.S. Cl. 360—103 **2 Claims**



1. A negative pressure air-bearing slider for supporting a transducer proximate a rotating disc, comprising:

a slider body having a surface with a leading edge, a trailing edge and first and second side edges;

first and second raised side rails positioned along the first and second side edges, respectively;

a raised cross rail extending between the first and second raised side rails, the raised cross rail having a leading edge and a trailing edge;

a negative pressure cavity extending from the raised cross rail toward the trailing edge of the slider body and between the raised side rails; and

a choke positioned within the raised cross rail and widening from the leading edge of the raised cross rail toward the trailing edge of the raised cross rail, the choke defining a flow restriction which is dimensioned for passing air through the flow restriction at low disc speeds in proportion to a pressure difference across the choke to spoil negative pressure in the negative pressure cavity as the slider takes-off from the disc and is dimensioned for passing air through the flow restriction at a constant flow substantially independent of the pressure difference during acceleration of the disc to higher disc speeds to limit spoiling of negative pressure in the negative pressure cavity at the higher disc speeds.

5,317,466

MAGNETIC HEAD DRUM APPARATUS HAVING UPPER AND LOWER STATIONARY DRUMS AND A ROTATABLE MEMBER THEREBETWEEN ARRANGED TO DAMP NOISE AND VIBRATION

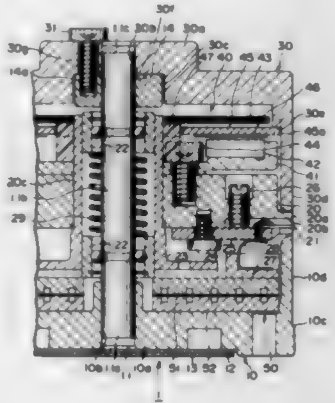
Shinichi Hasegawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1992, Ser. No. 855,585

Claims priority, application Japan, Apr. 1, 1991, 3-068129

Int. Cl.^{5} G11B *5/52, 15/61, 21/04, 21/18*

U.S. Cl. 360—107 **5 Claims**



1. A magnetic head drum apparatus for a video data recording and reading device, said apparatus comprising:

a spindle,

a first drum having a central bore into which said spindle is securely fitted,

a second drum securely mounted on said spindle,

an intermediate member rotatably supported on said spindle between said first and second drums,

a magnetic head coupled to an outer periphery of said intermediate member,

a back yoke retainer formed of a rubber-like material and being rotatably supported on said spindle,

a back yoke rotatably supported by said back yoke retainer and formed from a laminated plate having a plurality of layers in which one of said layers is formed of a resin-like material, and

a motor for rotating said intermediate member, said magnetic head, said back yoke retainer and said back yoke around said spindle, said motor having a rotor securely mounted on said intermediate and coupled to said back yoke by way of said back yoke retainer, and a stator securely mounted on said second drum and being interposed between said rotor and said back yoke.

5,317,467

DATA RECORDING CARTRIDGE INCLUDING A FLEXIBLE MAGNETIC RECORDING MEDIUM

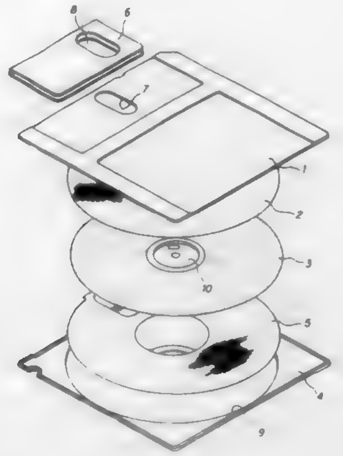
Yoshitake Kato, Mitsukaido; Kazuya Fukunaga, Ibaraki; Akira Katami, Ibaraki, and Shinichiro Oda, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 17, 1991, Ser. No. 701,823

Claims priority, application Japan, May 21, 1990, 2-129164; Oct. 25, 1990, 2-285757

Int. Cl.^{5} G11B *23/02*

U.S. Cl. 360—133 **6 Claims**



5. A data recording cartridge, comprising a cartridge case molded from the composition of uniformly dispersed styrol resin and polycarbonate resin wherein said polycarbonate resin is contained in the amount of 30 to 70 wt %.

5,317,468

MAGNETIC DISK HAVING RESERVE SERVO SECTORS AND PLURAL RESERVE TRACKS

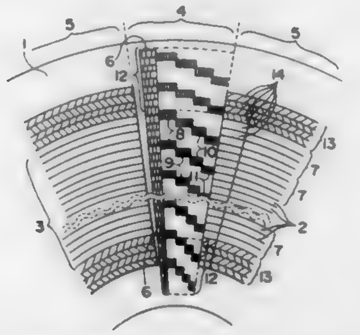
Noriaki Wakabayashi, and Tsukasa Yoshiura, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 14, 1992, Ser. No. 820,242

Claims priority, application Japan, Jan. 16, 1991, 3-003187

Int. Cl.^{5} G11B *5/82*

U.S. Cl. 360—135 **4 Claims**



1. A sector servo type magnetic disk having plural data recording tracks forming plural data recording track groups formed on a data recording surface, and servo sectors spaced at intermittent locations on the same data recording surface for head positioning, wherein each of said plural data recording track groups comprises N data recording tracks, N being determined by periodic servo marks arranged at each of said servo sectors, such that each of said data recording tracks may be individually distinguished, said magnetic disk comprising:

reserve servo sectors having servo marks and servo signal patterns for head positioning, provided outside the outside circumference and inside circumference of said plural data recording track groups; and

plural reserve tracks, each having an identification area in which at least a track identification code is recorded, provided outside the outside circumference and the inside circumference of said plural data recording track groups.

5,317,469

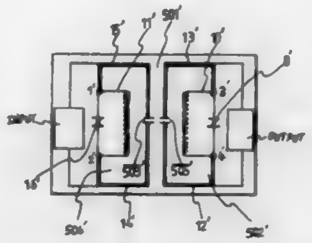
ARRANGEMENT OF AN OVER-VOLTAGE PROTECTION CIRCUIT

Chao-Cheng Lu, 4-4, Alley 27, Lane 143, Chun Kung Rd., Taipei 11614, Taiwan

Filed Mar. 19, 1992, Ser. No. 853,941

Int. Cl.^{5} H02H *3/20, 3/22, 7/04, 9/04*

U.S. Cl. 361—40 **9 Claims**



8. A circuit arrangement for protecting a transformer from over-voltage damage, said arrangement comprising:

an input side comprising a primary winding, a burst absorber connected between two ends of said primary winding for absorbing abnormal voltage and two conductive elements extending from said two ends of said primary winding to form a first at least partial enclosure; and

an output side comprising a secondary winding, a burst absorber connected between two ends of said secondary winding for absorbing abnormal voltage and two conductive elements extending from said two ends of said secondary winding to form a second at least partial enclosure; said first and second at least partial enclosures being separated by a space region;

wherein said two conductive elements extending from said two ends of the primary winding converge toward one another between the primary and secondary windings to thus define a first gap, and wherein said two conductive elements extending from said two ends of the secondary winding also converge toward one another between the primary and secondary windings to thus define a second gap, the rated breakdown voltage that said first and second gaps provide being higher whenever the size of said first and second gaps is increased.

5,317,470

CONTROL SYSTEM INCLUDING A SWITCHING CIRCUIT FOR ENSURING PROPER OPERATION WHEN OPERATING POWER IS REMOVED FROM A PORTION OF THE CONTROL SYSTEM

Jeffery B. Lendaro, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 6, 1991, Ser. No. 695,807

Int. Cl.^{5} H02H *3/24*

U.S. Cl. 361—92 **2 Claims**

1. In an electronic equipment which may be turned "on" and "off", apparatus comprising:

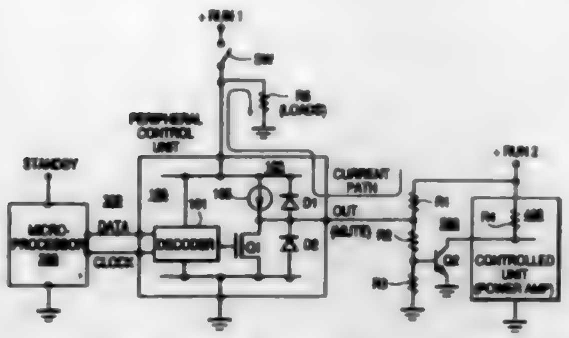
a controlled unit which receives a first supply voltage even when said equipment is "off" and which includes a control device for controlling a particular function of said controlled device in response to a control signal coupled to an input of said control device;

a control unit which receives a second supply voltage only when said equipment is "on" and which generates said control signal at an output of said control unit only when said equipment is "on"; and

a switch for coupling the control signal developed at said output of said control unit to said input of said control device when said second supply voltage is present and for decoupling said input of said control device from said output of said control unit when said second supply voltage is absent;

said switch being responsive to the presence of said second supply voltage for coupling the control signal developed at said output of said control unit to said input of said control device and is responsive to the absence of said second supply voltage for decoupling said input of said control device from said output of said control unit;

said switch including a transistor having first and second electrodes defining the ends of a conduction path and a control electrode for controlling the conduction state of said conduction path; said first electrode being coupled to said output of said control unit, said second electrode being coupled to said input of said control device and said second supply voltage being coupled to said control electrode.



5,317,471

PROCESS AND DEVICE FOR SETTING A THERMAL TRIP DEVICE WITH BIMETAL STRIP

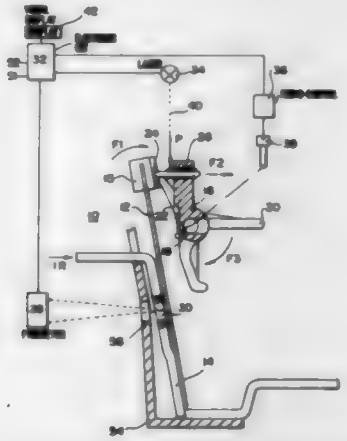
Jean Izoard, Bresson; M. Eric Menegaz, Villard-Bonnot; Jean-Louis Drillat, Les Marches, and Philippe Le Maitre, Grenoble, all of France, assignors to Gerin Merlin, France

Filed Nov. 2, 1992, Ser. No. 969,979

Claims priority, application France, Nov. 13, 1991, 91 14197

Int. Cl.⁵ H01H *71/16*

U.S. Cl. 361—105 **16 Claims**



1. A process for setting a thermal trip device, comprising the steps of;

inserting an adjusting pin into an orifice of a trip bar such that said adjusting pin is slidable therein;

heating a bimetal strip via application of a setting current such that said bimetal strip is deflected, said bimetal strip being positioned opposite said adjusting pin so as to contact and drive said adjusting pin in said orifice;

measuring the temperature of the bimetal strip during application of said setting current; and

immobilizing said adjusting pin in said orifice at an optimum position when the temperature of said bimetal strip reaches a first preset value.

5,317,472

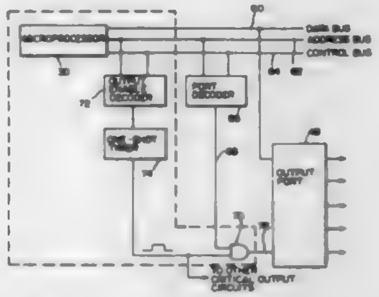
APPARATUS FOR INSURING THE SECURITY OF OUTPUT SIGNALS FROM PROTECTIVE RELAYS USED IN ELECTRIC POWER SYSTEMS

Edmund O. Schweitzer, III, Pullman, Wash., assignor to Schweitzer Engineering Laboratories, Inc., Pullman, Wash.

Filed Mar. 17, 1992, Ser. No. 853,035

Int. Cl.⁵ H02H *3/00, 3/05*

U.S. Cl. 361—115 **10 Claims**



1. An apparatus for insuring the correct assertion of output signals by a protective relay used in a power transmission system, comprising:

output port decoder means in a protective relay which includes a microprocessor and which is used in a power transmission system, said output port decoder means, in response to address information from the microprocessor, producing an address signal identifying a particular output port of the relay;

an enable decoder assembly in the protective relay responsive to an address enable signal from the microprocessor to produce an output enable signal for a selected period of time; and

means responsive to the coincidence in time of the output enable signal an the address signal to produce a control signal which is applied to said particular output port to enable said particular output port to receive instructions from the microprocessor.

5,317,473

SURGE ARRESTER ASSEMBLY

Jan Lundquist; Lennart Stenström, and Sven Akervall, all of Ludvika, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Aug. 31, 1992, Ser. No. 937,410

Claims priority, application Sweden, Sep. 16, 1991, 9102694

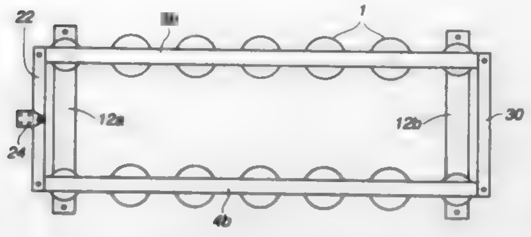
Int. Cl.⁵ H02H *9/06*

U.S. Cl. 361—117 **7 Claims**

1. A surge arrester assembly, comprising:

a plurality of parallel-connected surge arrester units, each of which comprises a stack of a plurality of cylindrical arrester elements made of metal oxide varistor material, each of said arrester units being arranged in a line in the axial direction of the arrester assembly between two electrodes and surrounded by an elongated outer casing of polymeric material;

the arrester units being arranged in parallel adjacent to each other in one or more rows so that those arrester units which are included in such a row are squeezed in the axial direction between two parallel metal support beams fixedly connected to each other by connecting elements extending between the beams; and



connection members for connection of the arrester assembly into an electric network are connected to the support beams at the end of one row.

5,317,474

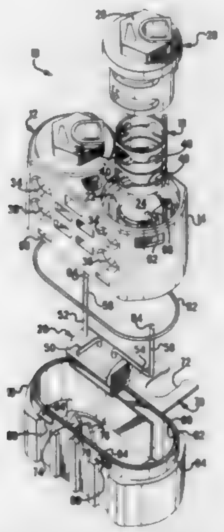
MODULE FOR TELEPHONE LINE CONDUCTOR PAIR HAVING SINGLE PROTECTOR UNIT

Harry M. Capper, Harrisburg, and James W. Robertson, Oberlin, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 880,449, May 8, 1992. This application May 7, 1993, Ser. No. 59,789

Int. Cl.⁵ H04H *1/04;* **H01R** *4/00, 9/24*

U.S. Cl. 361—119 **12 Claims**



1. A terminal block for crossconnecting respective conductors of two-wire service cables having integral surge protection for the circuits thus defined, comprising:

a terminal housing module section having a pair of housing sections for respective terminals, and two terminals disposed in respective terminal-receiving cavities of said housing sections each having a pair of conductor-terminating sections exposed in respective conductor-receiving openings of said housing sections;

a protector housing section including a cavity therein having disposed therein a protector unit having a ground electrode and a pair of active electrodes, and further having a module ground strap secured thereto having a first contact section in electrical engagement with said ground electrode of said protector unit and a second contact section exposed for grounding engagement with an external ground circuit for system ground; and

leads extending from said active electrodes of said protector unit to end portions secured in electrical engagement with respective said terminals upon complete assembly,

whereby a terminal block is defined adapted for first conductors of first and second twowire cables to be terminated to one of said terminals, and for second conductors of said first and second two-wire cables to be terminated to the other thereof thus crossconnecting the service cables, whereupon the module provides voltage and current surface protection for the circuits of the service cables thus crossconnected with a single protector unit.

5,317,475

CIRCUIT ARRANGEMENT FOR DRIVING A GROUP OF RELAYS

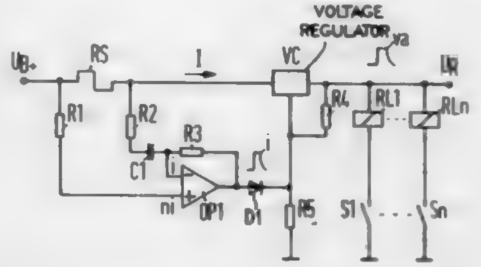
Richard Siepmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 3, 1991, Ser. No. 698,497

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1990, 4026427

Int. Cl.⁵ H01H *47/32*

U.S. Cl. 361—154 **11 Claims**



1. A circuit arrangement for controlled operating of a group of relays driven by a common drive voltage, comprising:

switching means for activating and deactivating individually each of the relays;

a voltage regulator having an input for receiving a control signal and an output connected to the group of relays to supply a holding voltage to the group of relays in the absence of the control signal and to supply an increased pick-up voltage to the group of relays when the control signal is received at said input; and

a current sensing means for detecting an increase in total current flowing through the group of relays resulting from activation of an additional relay and for transmitting for a predetermined period of time the control signal to said input of said voltage regulator upon detection of the increase in current.

5,317,476

ELECTRONICALLY MONITORED AND CONTROLLED ELECTROSTATIC DISCHARGE FLOORING SYSTEM

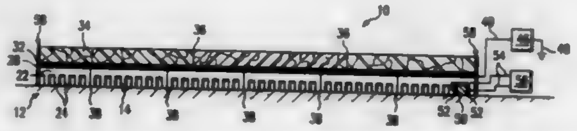
William D. Wallace, Fort Worth, and Larry E. Smith, Arlington, both of Tex., assignors to Loral Vought Systems Corporation, Grand Prairie, Tex.

Division of Ser. No. 693,959, Apr. 29, 1991, Pat. No. 5,257,159, which is a continuation-in-part of Ser. No. 357,299, May 26, 1989, Pat. No. 5,043,839. This application Mar. 29, 1993, Ser. No. 39,931

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.⁵ H05F *3/00*

U.S. Cl. 361—220 **18 Claims**



1. An electrostatic charge controlling structure for covering a base surface, comprising, in sequence:

a first layer of moisture resistant material;

a second layer of at least substantially rigid wood material;

a third layer of electrically conductive material; and

a fourth layer of semiconductive member having electrical contact with said third layer.

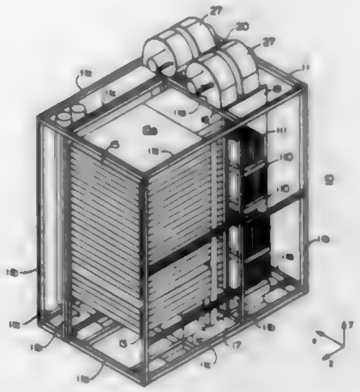
5,317,477
HIGH DENSITY INTERCONNECTION ASSEMBLY

John B. Gillett, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1992, Ser. No. 906,971

Int. Cl.^{5} H05K *7/10;* **G06F** *1/16*

U.S. Cl. 361—683 **8 Claims**



1. A computer assembly with shortened path lengths between computer elements comprising:

a rack frame,

a plurality of flat packages slidably mounted to the frame along one given plane, said packages comprising a planar power supply module coupled to a planar edge connected module with said power supply module providing power to said edge connected module, said edge connected module includes a plurality of multicircuit semiconductor chips mounted on a carrier and having connection means along one or more edges of said edge connected module, said edge connected modules being processor modules and switch modules,

a planar interconnection wiring circuit board extending perpendicular to said one given plane mounted juxtapositioned to the connector edge of said edge connected modules and coupled thereto on one broad surface to thereby provide coupling between said switch modules and processor modules, and

a memory card coupled to the opposite broad surface of said circuit board whereby coupling between said switch modules and said memory card is across the thickness of the planar interconnection wiring circuit board.

5,317,478
HERMETIC SEALING OF FLEXPRINT ELECTRONIC PACKAGES

Mohi Sobhani, Encino, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 790,898, Nov. 12, 1991. This application Mar. 30, 1993, Ser. No. 39,715

Int. Cl.^{5} H05K *7/20*

U.S. Cl. 361—689 **24 Claims**

1. A hermetically sealed electronics package comprising:

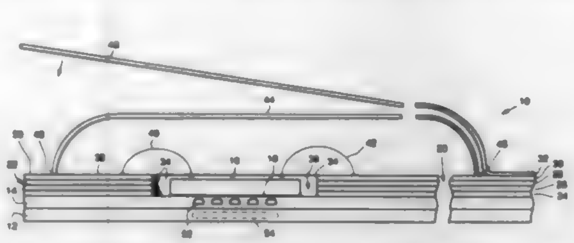
a flexprint comprising at least one layer and having cavity means defining at least one cavity;

an electronic element support secured to said flexprint and underlying at least said cavity means;

electronic element means defining at least one electronic element having electrical connections to said flexprint, said electronic element means located in said cavity means and on and supported by said electronic element support;

a deformation resistant frame structure extending above said electrical connections, said cavity means and said electronic element means therein, said frame structure having a base which is located on said flexprint; and

a cover located on said frame structure and also extending above said electrical connections, said cavity means and said electronic element means therein, said cover also having a base which is hermetically sealed to said flexprint to provide hermetic sealing of said cavity means and said electronic element means therein.



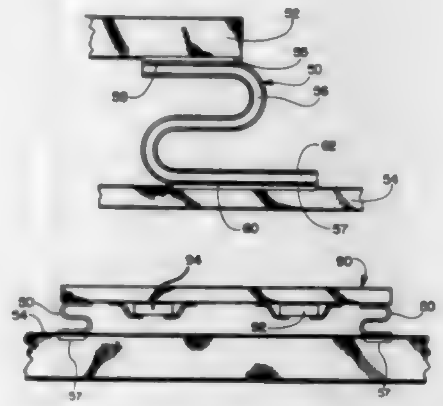
5,317,479
PLATED COMPLIANT LEAD

Deepak K. Pai, Burnsville, and Terrance A. Krinke, Roseville, both of Minn., assignors to Computing Devices International, Inc., Minneapolis, Minn.

Continuation of Ser. No. 767,500, Sep. 30, 1991. This application Oct. 1, 1993, Ser. No. 130,532

Int. Cl.^{5} H01R *9/00*

U.S. Cl. 361—773 **21 Claims**



1. A system for mounting at least one integrated circuit chip in spaced relation to a circuit board and for providing electrical contact between circuit contacts associated with the chip and board contacts on the circuit board, the system comprising:

a plurality of curved leads for providing a resilient connection between the board contacts and the circuit contacts, each curved lead being substantially entirely coated with solder plating in a range of 0.3 mils to 1.5 mils thick, and each curved lead being formed of a single piece of conductive material including:

a first leg having a first surface for connection to a circuit contact; and

a second leg generally parallel to the first leg and joined to the first leg by at least one curved portion, the second leg having a second surface for connection to a board contact.

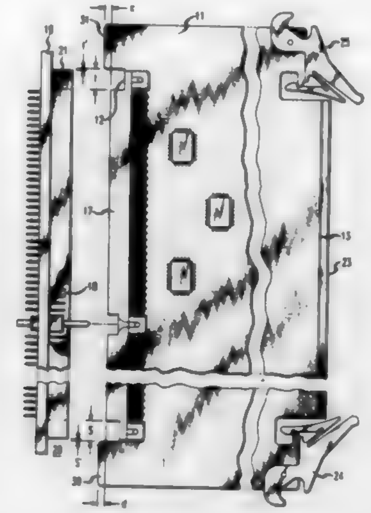
5,317,480
CIRCUIT PACK INTERCONNECTION

Vidyananda B. Chandraiah, Parsippany-Troy Hills Township, Morris County, N.J., and David J. Pongracz, Bangor, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 21, 1992, Ser. No. 930,051

Int. Cl.^{5} H01R *23/68, 13/62*

U.S. Cl. 361—785 **7 Claims**



1. A circuit pack comprising:

a printed circuit board having a forward edge;

a first electrical connector mounted on said forward edge and having a mating portion adapted for mating with a second electrical connector on a backplane; and

at least one tab extending from the forward edge beyond the first connector and spaced from the mating portion of the first connector to form a gap which accommodates a portion of said second connector when the two connectors are mated, the extension of the tab beyond the first connector and the gap between the tab and the first connector being such as to provide alignment and to inhibit rotation of the circuit board when the two connectors are mated.

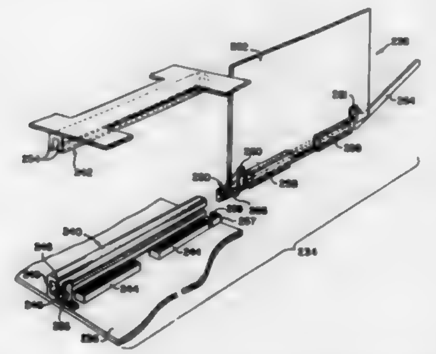
5,317,481
CIRCUIT BOARD AND INSERTION TOOL

W. Daniel Hillis, Cambridge, and William Gerner, Oxford, both of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Division of Ser. No. 860,191, Mar. 26, 1992, Pat. No. 5,238,423, which is a continuation-in-part of Ser. No. 715,102, Jun. 13, 1991, abandoned. This application Apr. 13, 1993, Ser. No. 47,139

Int. Cl.^{5} H05K *7/14*

U.S. Cl. 361—796 **19 Claims**



1. A system for inserting a circuit board connector on a circuit board into a motherboard connector on a motherboard, said system comprising:

a tool having a sliding surface adapted to convey the circuit board across the motherboard to a stop, pins of the motherboard connector being oriented orthogonal to the direction of conveyance of the circuit board;

said tool comprising a force transfer device including a handle for transferring force applied to said handle into force applied between the circuit board connector and motherboard connector in a direction to force the pins of the circuit board connector into contact with the pins of the motherboard connector.

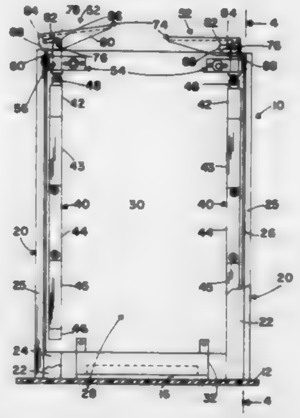
5,317,482
CLAMP ACTIVATOR AND CIRCUIT CARD EXTRACTOR

Geza Bujtas, Boonton, N.J., assignor to Smith Industries, N.J.

Filed Dec. 7, 1992, Ser. No. 987,169

Int. Cl.^{5} H05K *7/00*

U.S. Cl. 361—798 **10 Claims**



1. A wedge clamp activator and circuit card extractor for an electrical apparatus, the apparatus having a circuit board, a chassis mounted to the circuit board, the chassis having opposed card receiving channels, a socket mounted to the circuit board intermediate the channels, a circuit board having sides slidably receivable in the channels and having an edge region selectively engageable with the socket, wedge clamps mounted to the respective sides of the circuit card and being slidably receivable in the respective channel, each of the wedge clamps including a plurality of wedges and elongate threaded means having a first end and an opposed second end which is threadedly engaged with one of the wedges, the threaded means being rotatable about a rotational axis for selectively clamping the wedge clamp and the circuit card in one of the channels of the chassis, said wedge clamp activator and circuit card extractor comprising:

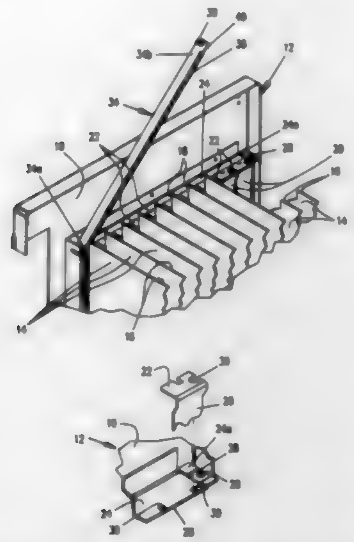
a level having an actuator end and an opposed fulcrum end, portions of said lever intermediate said ends being permanently pivotably connected to the first end of the elongate threaded means for rotatably driving the elongate threaded means about the rotational axis and for pivoting movement about a pivot axis orthogonal to the rotational axis of the elongated threaded means, said fulcrum end being spaced from the pivot axis a sufficient distance such that said fulcrum end selectively engages with the chassis when said lever is pivoted about said pivot axis and urges the circuit card from the socket.

5,317,483

COMPUTER EXPANSION CARD SUPPORT STRUCTURE

Dan E. Swindler, Round Rock, Tex., assignor to Dell U.S.A., L.P., Austin, Tex.

Filed Jan. 26, 1993, Ser. No. 8,923
Int. Cl.⁵ H05K *7/14*
U.S. Cl. 361—801 **15 Claims**



1. A computer expansion card cage structure into which a spaced series of parallel expansion cards operatively inserted in an insertion direction, each of the expansion cards having a connection bracket extending along a side edge thereof and having an outwardly projecting end tab, said computer expansion card cage structure comprising:

a ledge portion with a side surface positioned to be engaged by the connection bracket end tabs of the inserted expansion cards;

a locking member supported for movement relative to said ledge portion between a closed position in which said locking member overlies a plurality of the end tabs and blocks movement of the end tabs, and thus the inserted expansion cards, relative to said ledge portion in a direction opposite to said insertion direction, and an opened position unblocking the end tabs and freeing the inserted expansion cards for removal from said expansion card cage structure; and

means for releasably holding said locking member in said closed position thereof.

5,317,484

COLLECTION OPTICS FOR HIGH BRIGHTNESS DISCHARGE LIGHT SOURCE

John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike; Kenneth S. King, Willoughby Hills, Ohio, and William J. Cassarly, Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 1, 1993, Ser. No. 11,562
Int. Cl.⁵ F21V *7/06*
U.S. Cl. 362—32 **14 Claims**

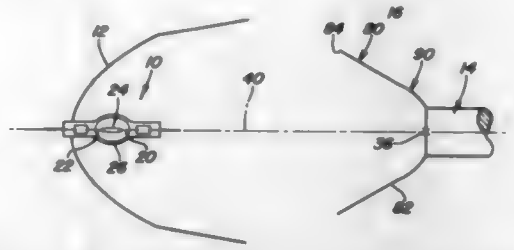
1. A lighting system comprising:

an elliptical reflective surface having first and second foci;

a light source disposed at the first focus of the reflective surface so that the reflective surface receives light therefrom and directs the light toward the second focus;

a light receptive component having an input end located at the second focus to receive light from the elliptical reflective surface and transmit the light to a remote location;

a non-imaging optical collector having a positive curvature located adjacent the input end of the light receptive component for collecting additional light from the source and directing the light into the input end of the light receptive component; and,



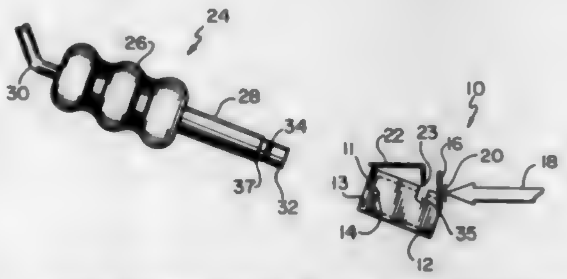
wherein said optical collector is a cone section and further includes a compound parabolic concentrator disposed adjacent said cone section.

5,317,485

CONNECTOR AND METHOD FOR COUPLING AN END OF A LIGHT-TRANSMITTING CONDUIT

John-Michael Merjanian, Burlington, Mass., assignor to American Surgical Technologies Corporation, Chelmsford, Mass.

Filed Jun. 4, 1993, Ser. No. 72,503
Int. Cl.⁵ F21V *8/00*
U.S. Cl. 362—32 **8 Claims**



1. A connector for coupling an end of a light-transmitting conduit, comprising:

a pivotable socket for mounting adjacent an opening through which light from a light source passes and having a passage therethrough formed to allow an end of a light-transmitting conduit to be coupled to the socket, and

a shutter piece extending from the socket so as substantially to block light passing through the opening from entering the passage when the socket is in a first position, and substantially to expose the opening to allow light passing through the opening to enter the passage and pass into the conduit when the socket is in a second position.

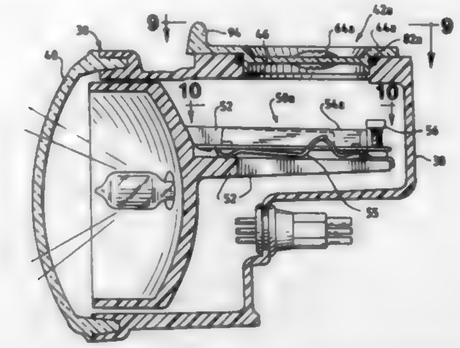
5,317,486

HORIZONTAL ZERO VIEWING PORT ASSEMBLY

Karl R. Schmitt, Rockford, Ill., assignor to Textron Inc., Providence, R.I.

Filed Mar. 26, 1993, Ser. No. 37,901
Int. Cl.⁵ F21M *3/20*
U.S. Cl. 362—66 **23 Claims**

1. A headlamp calibration assembly for use with an adjustable headlamp assembly having a housing, a relatively movable component such as a reflector adjustably retained in said housing, means for horizontally aiming said relatively movable component, and a viewing port in a surface of said housing for viewing inside said housing, said headlamp calibration assembly comprising: a relatively movable lens disposed over said viewing port; horizontal position indicating mean in the form of indicia operatively associated with said relatively movable component and positioned for viewing through said lens and viewing port; and sight means operatively associated with said lens for sighting said indicia, such that once the desired horizontal position for the relatively movable component is attained said lens may be moved to align said sight means with said indicia to provide a reproducible indication of said desired position.

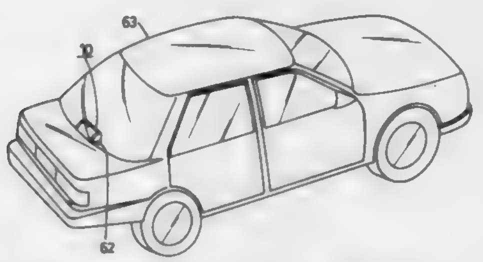


5,317,487

VEHICLE WARNING LIGHT ASSEMBLY

Wu-Shaun Su, No. 79, Chino-Cheng Rd., Ta-Li Hsiang, Taichung Hsien, Taiwan

Filed Aug. 30, 1993, Ser. No. 114,017
Int. Cl.⁵ B60Q *1/26*
U.S. Cl. 362—80.1 **4 Claims**



1. A vehicle warning light assembly, comprising:

an elongated hollow casing having an open front;

a lamp unit extending longitudinally between two sides of said casing adjacent to said open front;

a wheel member mounted rotatably in said casing on one of said two sides of said casing;

an elongated reflector plate disposed in said casing on one side of said lamp unit, said reflector plate having one end secured to said wheel member;

a driving mechanism activatable to rotate said wheel member and rotate correspondingly said reflector plate around said lamp unit; and

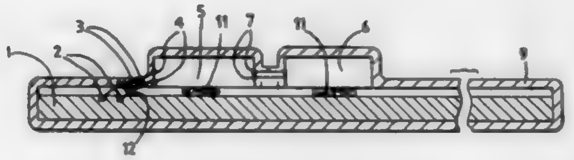
a transparent pane mounted on said casing at said open front of said casing.

5,317,488

INSULATED INTEGRAL ELECTROLUMINESCENT LIGHTING SYSTEM

Darlene Penrod, 1420 W. Cuyler, Chicago, Ill. 60613

Filed Nov. 17, 1992, Ser. No. 977,532
Int. Cl.⁵ F21V *9/16*
U.S. Cl. 362—84 **9 Claims**



1. An improved electroluminescent lighting system using a conventional electroluminescent light source having a luminescent face, a non-luminescent face, and external edges, the improvement comprising:

(a) at least two electric termination points positioned on the non-luminescent face of said light source and at a distance from the external edges;

(b) an energizing module attached to said termination points by a connecting means and positioned by an adhering means on the non-luminescent face of said light source at a distance from the external edges; and

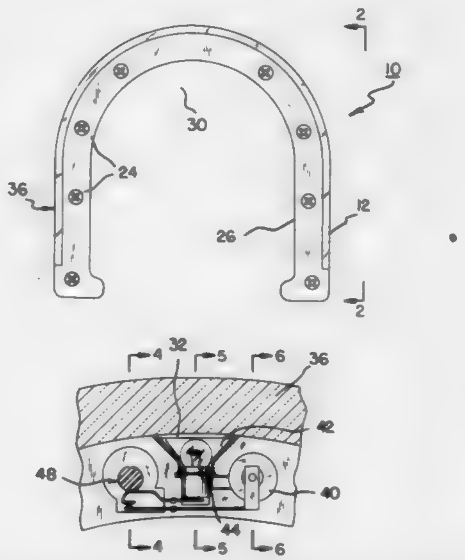
(c) a resilient and water resistant cover encapsulating the luminescent face, the non-luminescent face, and the external edges of said light source, said termination points, said energizing module, and said connecting means.

5,317,489

ILLUMINATED APPARATUS FOR PLAYING A GAME OF HORSESHOES

Sal Delli Gatti; Barbara Delli Gatti, both of 50-A Bettlewood Ave., Oaklyn, N.J. 08107, and Frank Delli Gatti, 106 Elgin Ave., Westmont, N.J. 08108

Filed Sep. 22, 1993, Ser. No. 126,960
Int. Cl.⁵ F21V *33/00*
U.S. Cl. 362—157 **4 Claims**



1. An illuminated horseshoe set comprising, in combination:

a hollow U-shaped member having a major bend adjacent to its center, a pair of legs extending in a generally common direction from the major bend with the legs defining a space therebetween, an inner edge located adjacent to the space, an outer edge located remote from the space, and at least one hole disposed on the outer edge;

a translucent strip coupled to the outer edge of the U-shaped member such that it covers the at least one hole;

a power source positioned within the U-shaped member;

a light source positioned in the U-shaped member with the light source adapted for directing light through the at least one hole to illuminate the translucent strip; and

a switch disposed on the U-shaped member with the switch coupled between the power source and light source and operable in one orientation to activate the light source and in another orientation to deactivate the light source.

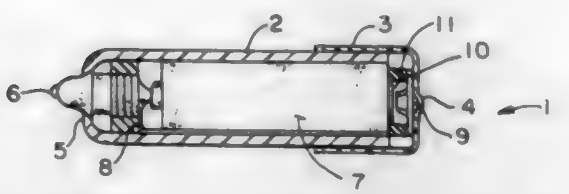
5,317,490
ENCASED FLASHLIGHT

Joseph T. Miller, Mehlville, Mo., assignor to Mocap Incorporated, St. Louis, Mo.

Filed Dec. 28, 1992, Ser. No. 997,014

Int. Cl.⁵ F21L *7/00*

U.S. Cl. 362—206 **14 Claims**



1. A flashlight comprising a casing member having a light exposing end and a battery insertion end, a sealing means to close said casing member, a light source for projecting light outwardly from said light exposing end of said casing member, a battery enclosed by said casing member, said battery for energizing said light source, a conductor joining said light source to said battery, said conductor includes a movable contact member for closing and opening a circuit of said flashlight, said movable contact member proximal to said sealing means, the improvement comprising a resilient means arranged between said movable contact member and said battery, wherein pressing said movable contact member towards said battery compresses aid resilient means connecting said movable contact member to said battery and closing said circuit, said sealing means further comprising a resilient material, said resilient material being a polymer, said battery operated components including said movable contact member, said resilient means, said battery, and said light source, all of said movable contact member, resilient means, battery, and said light source all being axially aligned within said casing member, whereby closing said circuit illuminates said light source, said movable contact member includes a raised portion positioned proximal to said battery, said raised portion being integrally flared, said integral flaring portion facilitates contacting of said movable contact member to said battery, wherein applying pressure on the back of said sealing means and movable contact member pushes the integral flared portion of said movable contact member into proximity with said battery by compressing said resilient means, said resilient means comprising a resilient sleeve, said flared portion of said movable contact member forming a shaft means located within said sleeve, and wherein pressing said movable contact member towards said battery compresses said resilient sleeve connecting said movable contact member to said battery and closing said circuit, said movable contact member further including a flange, integrally formed of its shaft means, wherein the insertion of the shaft means of the movable contact member within the resilient sleeve, the flange of the shaft means abuts against an end of the sleeve, and said conductor extending through said sleeve and electrically contacting said movable contact member to maintain electrical contact between the movable contact member and the light source when said movable contact member is compressed into engagement with said battery.

5,317,491
HOLDER FOR STRING OF ELECTRIC LIGHTS

Kuo-Hsing Lee, 10139 Duchamp, Houston, Tex. 77036

Filed Aug. 3, 1992, Ser. No. 923,557

Int. Cl.⁵ F21V *21/00*

U.S. Cl. 362—249 **11 Claims**

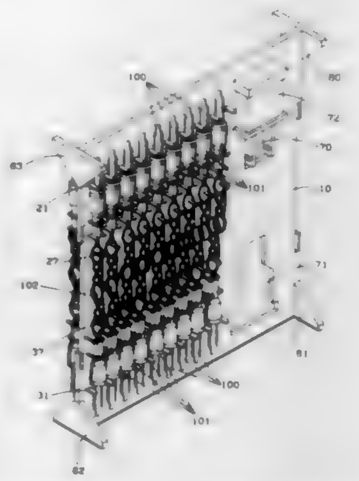
1. A holder for a string of electric lights which includes a plurality of lamps engaging corresponding lamp sockets each one of which has a base connected at spaced intervals to electrical wiring, said holder comprising:

a stiff flat mounting plate on at least one side of which is provided a first set of mounting elements for mounting a series of lamps and lamp sockets in a first row at a first end of said plate and a second set of mounting elements for mounting a series of lamps and lamp sockets in a second row at a second end of said plate;

each of said first and second sets of mounting elements comprising a row of uniformly spaced tabs between which are provided a row of uniformly spaced slots each for receiving one of said lamps near a corresponding one of said sockets;

each of said first and second set of mounting elements comprising a first row of projecting pairs of elements providing another row of uniformly spaced slots therebetween each for receiving wiring emanating from the base of said corresponding one of said sockets so that said sockets are confined between said first projecting pairs of elements at one end thereof and said tabs at the other end thereof;

each of said first and second sets of mounting elements also including a second row of projecting pair of elements between said tabs and said first row of projecting pairs of elements providing still another row of uniformly spaced slots therebetween each for receiving an intermediate portion of said corresponding ones of said sockets to aid in holding said sockets in said confined disposition between said first projecting pairs of elements and said tabs.



5,317,492
RAPID THERMAL HEATING APPARATUS AND METHOD

Christian M. Gronet, and James F. Gibbons, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 781,632, Oct. 24, 1991, Pat. No. 5,155,336, which is a continuation of Ser. No. 467,808, Jan. 19, 1990, abandoned. This application May 13, 1992, Ser. No. 882,656

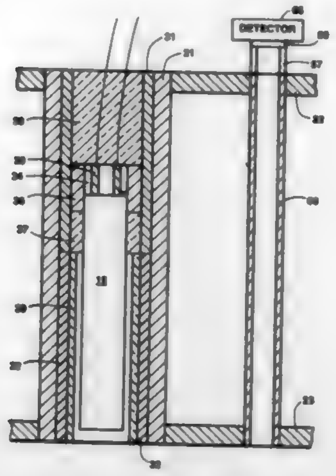
Int. Cl.⁵ F21V *29/00*

U.S. Cl. 362—294 **6 Claims**

1. A method of cooling a lamp base comprising

(a) surrounding the lamp base with a low melt temperature alloy, and

(b) maintaining the alloy in place with a ceramic potting compound, whereby when the lamp base temperature exceeds the melting temperature of the low melt temperature alloy, the low melt temperature alloy melts and transfers heat out of the lamp base.



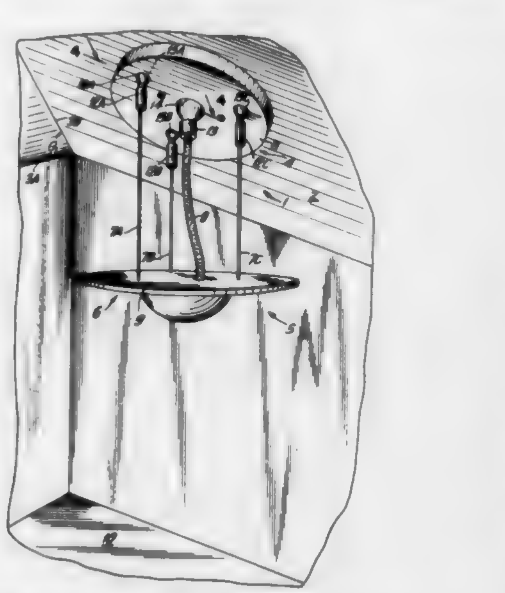
5,317,493
APPARATUS FOR INSTALLING LIGHTING FIXTURE ASSEMBLIES FROM INCLINED PLANAR SURFACES

Henry P. Muller, Forest Hills, N.Y., and Stanley Arasim, West Mildford, N.J., assignors to Lightolier Division of the Genlyte Group, Inc., Secaucus, N.J.

Filed Jul. 3, 1991, Ser. No. 725,018

Int. Cl.⁵ F21S *1/02*

U.S. Cl. 362—407 **11 Claims**



1. A lighting fixture mounting assembly comprising:

a first fixture suspension member for suspending a light fixture having at least one power cord;

a mounting base for attachment to a planar structure disposed relative to a reference plane, and including at least one power cord suspension aperture;

first suspension means having a first bearing surface operably associated with said mounting base and attached to one end of said first fixture suspension member; and

power cord suspension means mounted through said at least one power cord suspension aperture and attached to a portion of said at least one power cord,

said first suspension means and said power cord suspension means permitting pivotal movement of said first fixture suspension member and said at least one power cord, respectively, relative to said mounting base, and said first suspension means and said power cord suspension means being operable independent of each other, and

wherein said first suspension means permits pivotal movement of said first fixture suspension member independent of an angle of inclination formed between said planar structure and said reference plane, and

wherein said power cord suspension means permits pivotal movement of said at least one power cord independent of said angle of inclination.

5,317,494
POWER SUPPLY CIRCUIT UTILIZING VOLTAGE AND CURRENT RESONANCE FOR REDUCING SWITCHING LOSS

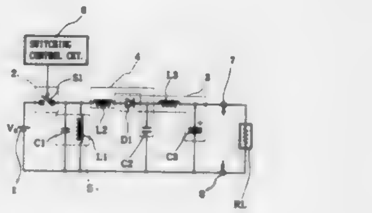
Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

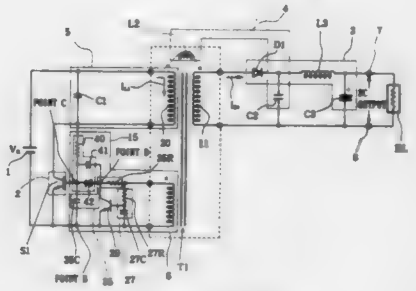
Filed Sep. 22, 1992, Ser. No. 949,079

Claims priority, application Japan, Sep. 24, 1991, 3-271963

Int. Cl.⁵ H02M *3/338*

U.S. Cl. 363—18 **6 Claims**





1. A power supply circuit comprising:

a dc power source;

switching means including a switching element for switching a dc input from the dc power source to convert the dc input to ac and outputting ac from an output terminal thereof, the ac changing between two different potentials;

series resonance means provided in series to current flowing from the output terminal of the switching means for generating current resonance;

parallel resonance means provided in parallel to voltage produced at the output terminal of the switching means for generating voltage resonance;

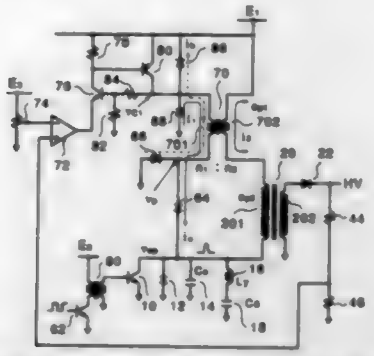
dc output control means for rectifying and smoothing an ac input supplied from the switching means through the series resonance means and the parallel resonance means; and

switching control means for controlling the switching element of the switching means so as to intermittently turn on the switching element,

wherein said switching control means, after turning on of the switching means, turns off the switching means when current flowing through the switching means has been reduced substantially to zero by the series resonance means and, after turning off of the switching means, turns on the switching means when voltage applied to the switching means has returned substantially to a voltage immediately before turning off of the switching means by the parallel resonance means.

5,317,495
STABILIZED HIGH VOLTAGE POWER SUPPLY CIRCUIT

Toshihiko Furukawa, Tsukimino Village, B-1-904, No. 4-5-1, Tsukimino, Yamato-shi, Kanagawa, Japan 242
PCT No. PCT/JP91/00856, § 371 Date Apr. 26, 1993, § 102(e) Date Apr. 26, 1993, PCT Pub. No. WO93/00765, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 26, 1991, Ser. No. 974,597
Int. Cl.^{5} H02M *3/335;* **H01J** *29/70*
U.S. Cl. 363—21 **1 Claim**



1. A stabilized high voltage power supply circuit in which a horizontal output pulse is inputted into a flyback transformer at its primary coil and a high voltage pulse generated in the flyback transformer at its secondary coil is so rectified through a diode as to obtain a high voltage output and also as to lower a variation in the high voltage output, characterized in that:

a secondary coil in a controlling transformer for controlling high voltage is connected with and arranged at the primary coil in said flyback transformer,

a controlling circuit is connected with and arranged at a primary side in said controlling transformer, so that a high voltage output level is maintained constant,

said controlling circuit comprises:

an operational amplifier for outputting a direct current in accordance with a voltage difference between a reference voltage and a feedback voltage in the high voltage output,

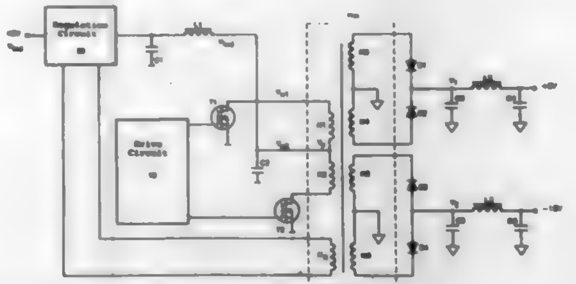
a first transistor for base-inputting rectangular wave forms and connecting an output of said operational amplifier with an emitter, said rectangular wave forms being automatically generated at the primary side in the controlling transformer due to saw-tooth-wave current synchronizing with the horizontal output pulse flowing at the secondary side in said controlling transformer on an inductance ratio of the primary coil in the flyback transformer and a deflecting coil and

a second transistor for controlling current flowing in the primary coil in said controlling transformer in accordance with ON/OFF in the first transistor.

5,317,496
DC/DC-CONVERTER WITH A PRIMARY CIRCUIT AND AT LEAST ONE SECONDARY CIRCUIT TUNED AS INDIVIDUALLY OSCILLATORY CIRCUITS

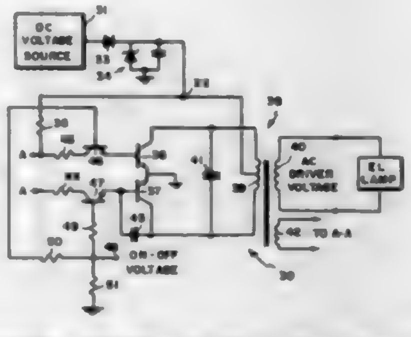
Ole S. Seiersen, Georginevej 2, DK-2970 Horsholm, Denmark
PCT No. PCT/DK90/00331, § 371 Date Jun. 19, 1992, § 102(e) Date Jun. 19, 1992, PCT Pub. No. WO91/09455, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 18, 1990, Ser. No. 861,836
Claims priority, application Denmark, Dec. 19, 1989, 6465/89
Int. Cl.^{5} H02M *3/335*
U.S. Cl. 363—24 **12 Claims**

1. A voltage converter comprising: a transformer coupling (TRA) through which a primary circuit having at least one primary winding (N_1-N_2) is coupled inductively to at least one secondary circuit having a secondary winding (N_3-N_4, N_4-N_6) where the primary circuit as regards AC voltage besides an inductive component (L'_p) in the form of the at least one primary winding (N_1, N_2) further comprises at least one capacitive component (C_2; C'_p) and where the at least one secondary circuit as regards AC voltage besides an inductive component ($L'_1-L'_N$) in the form of said secondary winding (N_3-N_4, N_5-N_6) further comprises capacitive and further inductive components, wherein the primary circuit and the at least one secondary circuit each comprise an oscillatory circuit with capacitive and inductive components ($C'p$, $C'_1-C'_N$ and L'_p, $L'_1-L'_N$) and wherein each oscillatory circuit is tuned individually to substantially the same resonance frequency.



5,317,497
INTERNALLY EXCITED, CONTROLLED TRANSFORMER SATURATION, INVERTER CIRCUITRY

Ronald E. Belek, Coventry, Conn., assignor to Loctite Luminescent Systems, Inc., Lebanon, N.H.
Filed May 18, 1992, Ser. No. 884,724
Int. Cl.^{5} H02M *1/12*
U.S. Cl. 363—40 **9 Claims**



1. An inverter circuit for providing a low harmonic content AC output driver voltage for an electroluminescent lamp, from a DC voltage source, said inverter circuit comprising

a transformer saturation control circuit which includes

means for controlling a DC and an AC feedback drive to a pair of balanced transistors having input and output electrodes;

a transformer having

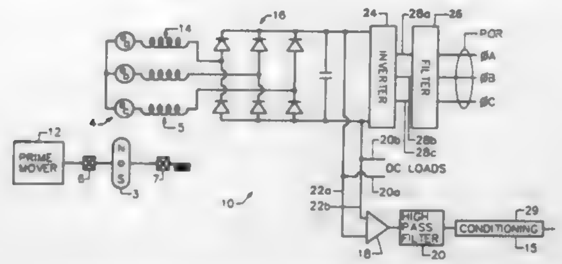
- a split primary winding having a first capacitance connected across said primary winding and connected to the output electrodes of said transistors;
- a feedback winding coupled to said primary winding for supplying said AC feedback drive to the input electrodes of said transistors; and
- an output secondary winding coupled to said primary winding for providing an AC output driver voltage to said electroluminescent lamp; and

a second capacitance connected between the input and output electrodes of one of said transistors;

said transformer saturation control circuit thereby suppressing the harmonic content of the AC output driver voltage.

5,317,498
ELECTRICAL POWER GENERATION SYSTEM

P. John Dhyandchand, and Vietson M. Nguyen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Jul. 9, 1992, Ser. No. 911,542
Int. Cl.^{5} H02M *5/458*
U.S. Cl. 363—43 **23 Claims**



1. A system for providing a controlled AC output comprising:

DC providing means for providing DC, said DC having a parameter related thereto;

inverter means connected to said DC providing means for inverting said DC into said controlled AC output;

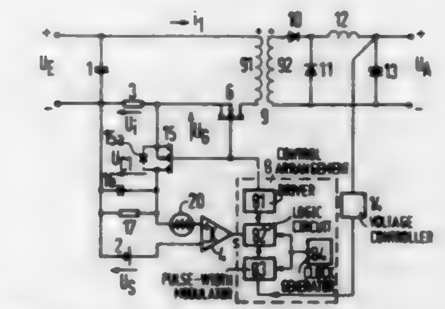
feedforward parameter sensing means for sensing said parameter related to said DC, said feedforward parameter sensing means providing a feedforward signal varying in accordance with said parameter;

feedback AC sensing means for sensing said controlled AC output, said feedback AC sensing means providing a feedback signal varying in accordance with said controlled AC output; and,

inverter controlling means connected to said inverting means, to said feedforward parameter sensing means, and to said feedback AC sensing means for controlling said controlled AC output in response to said feedforward signal and to said feedback signal, said inverter controlling means including comparing means for comparing said feedforward signal to said feedback signal.

5,317,499
DIRECT-CURRENT CONVERTER WITH CURRENT LIMITING

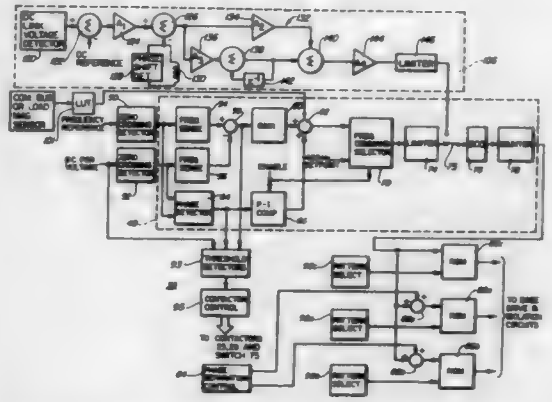
Bogdan Brakus, Stockdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
PCT No. PCT/EP91/00724, § 371 Date Oct. 26, 1992, § 102(e) Date Oct. 26, 1992, PCT Pub. No. WO91/16756, PCT Pub. Date Oct. 31, 1991
PCT Filed Apr. 16, 1991, Ser. No. 941,448
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1990, 90107934
Int. Cl.^{5} H02M *3/335*
U.S. Cl. 363—56 **7 Claims**



1. A pulsed converter with current limiting comprising: an electronic switch arranged in a main circuit and connected by its control input to a control circuit and capable of being alternately switched on and off by the control circuit; a current sensor arranged in series with the electronic switch; an evaluation arrangement arranged between the current sensor and a capacitor with a discharge circuit; a first control device connected to the capacitor and with capacitor voltages lying above a predetermined limiting value, controls a second device by limiting a pulse current flowing in the main circuit, wherein the current sensor is formed by a measuring resistor and the evaluation arrangement is formed by a further electronic switch wherein the further electronic switch which is otherwise inhibited can be placed in the conductive state by the control circuit in each case during the switched-on phase of the electronic switch arranged in the main circuit, wherein the further electronic switch is formed by the source-drain junction of a field-effect transistor and wherein the source-drain junction of the field-effect transistor is directed such that the reverse diode of the field-effect transistor is polarized in the conducting direction with respect to the voltage occurring on the measuring resistor and wherein the measuring resistor is dimensioned such that the voltage dropped at it is smaller than the threshold voltage of the reverse diode of the field-effect transistor.

5,317,500
ACTIVE NO-BREAK POWER TRANSFER CONTROL FOR A VSCF POWER GENERATING SYSTEM

Steven M. Iden, Belvidere; Edwin J. Shires, and Waleed Said, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Aug. 6, 1992, Ser. No. 926,608
Int. Cl.^{5} H02J *9/06;* **H02M** *7/537*
U.S. Cl. 363—98 **12 Claims**



1. In a DC link power converter wherein the power converter includes an inverter that receives DC power carried on a DC link and produces a first AC waveform having a phase displacement at an output of the power converter and wherein inverter and an AC power source are connected in parallel such that the first AC waveform produced by the inverter and a second AC waveform produced by the AC power source are supplied to a load, the converter further including means responsive to a command signal for controlling the phase displacement of the first AC waveform under circulating current conditions between the inverter and the AC power source, the improvement comprising:

a command signal generator responsive to the DC power and coupled to the controlling means wherein the command signal generator develops the command signal whereby the command signal causes a parameter of the DC power to approach a certain level under the circulating current conditions, said command signal generator including:

- a voltage detector that develops a voltage magnitude signal representing a DC voltage on the DC link;
- a first summer for summing the voltage magnitude signal with a reference signal to develop an error signal; and,
- means responsive to the error signal for deriving the command signal from the error signal.

5,317,501

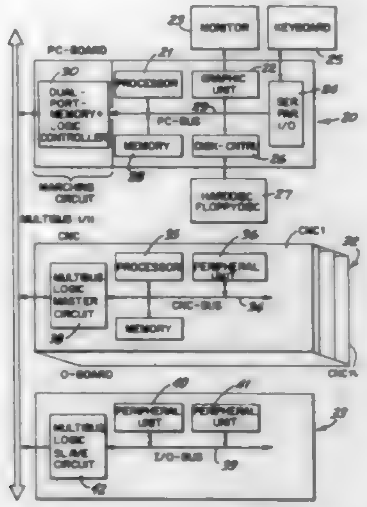
CONTROL SYSTEM FOR A NUMERICALLY CONTROLLED MACHINE

Bernhard Hilpert, Balingerstrabe 3, D-7140 Ludwigsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 107,440, Oct. 13, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 420,902

Int. Cl.⁵ G06F *15/46*

U.S. Cl. 364—132 **7 Claims**



1. A control system, integrated into a single housing, for at least one numerically controlled machine, especially for a machine tool, the control system comprising:

a personal computer board including an input device, a processor, a memory and a bus connecting said input device, said processor and said memory to each other, said bus having a control line and data lines;

at least one CNC board including a processor, a memory, and a CNC-bus;

a single, common control-system bus having a control line and data lines and being connected to the CNC-bus of said at least one CNC board, and

a personal computer matching circuit connected between the control-system bus and the bus of said personal computer board,

said personal computer matching circuit including:

a read-write memory having data connections and a read-write switch-over input,

an address multiplexer, an output side of which is connected to an address input of the read-write memory and an input side of which is connected to address lines of the control-system bus and also to address lines of the bus of said personal computer board,

a bi-directional data multiplexer, one side of which is connected to the data connections of the read-write memory and another side of which is connected to the data lines of the control-system bus and also to the data lines of the bus of said personal computer board, and

a control circuit having inputs thereof connected to the control lines of the control-system bus and the bus of said personal computer board, respectively and outputs thereof connected to switch-over inputs of the address multiplexer, the bi-directional data multiplexer and the read-write switch-over input of said read-write memory, respectively,

said control circuit, in dependence on control signals in the control lines of said control-system bus and said bus of said personal computer board, driving said address multiplexer, said bi-directional data multiplexer, and said read-write memory in such fashion that, through said bus of said personal computer board, data under the desired address are written into and read out from said read-write memory.

5,317,502

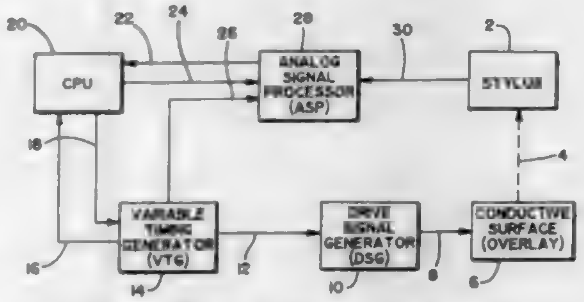
HIGH RESOLUTION SYSTEM FOR SENSING SPATIAL COORDINATES

Leonard Reiffel, Chicago; Wayne D. Jung, Skokie; Thomas Rosevear, and Thomas Jakobs, both of Chicago, all of Ill., assignors to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

Continuation of Ser. No. 746,285, Aug. 13, 1991, Pat. No. 5,251,123, which is a continuation of Ser. No. 616,732, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 363,287, Jun. 7, 1989, abandoned, which is a continuation of Ser. No. 110,140, Oct. 14, 1987, abandoned. This application Dec. 24, 1992, Ser. No. 996,734

Int. Cl.⁵ G05B *19/8;* **G08C** *21/00*

U.S. Cl. 364—167.01 **19 Claims**


20
22
24
26
28
30
2
CPU
ANALOG SIGNAL PROCESSOR (ASP)
STYLUS
4
18
VARIABLE TIMING GENERATOR (VTG)
DRIVE SIGNAL GENERATOR (DSG)
CONDUCTIVE SURFACE (OVERLAY)
16
14
12
10
8
6

1. An apparatus for determining the spatial position of a probe with respect to a surface, comprising:

drive means connected to the surface for providing alternating electrical current in the surface in predetermined directions and at predetermined intervals of time;

means for detecting and amplifying alternating electrical signals produced in the surface, the detected and amplified signals varying depending upon the position of the probe with respect to the surface;

rectifying means connected to the detect and amplify means for controllably rectifying the detected and amplified alternating electrical signals and for providing rectified electrical output signals, wherein the rectifying means during periodic intervals does not provide rectified electrical output signals;

integrating means for periodically integrating the rectified electrical output signals output form the rectifying means and for producing output signals in response to the rectified electrical output signals;

analog-to-digital converter means for producing digital signals in response to the output signals of the integrating means;

processing means connected to the analog-to-digital converter means for calculating the spatial position of the probe with respect to the surface based on the digital signals produced by the analog-to-digital converter means; and

control means for generating control signals for controlling the drive means, rectifying means, integrating means and processing means, wherein the integrating means is reset in a periodic interval during which the rectifying means is not providing rectified electrical output signals.

5,317,503

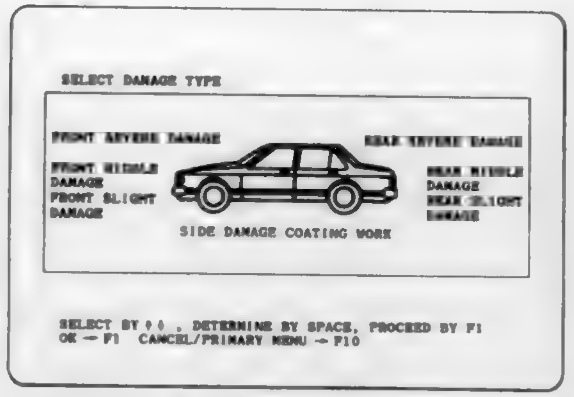
APPARATUS FOR CALCULATING A REPAIR COST OF A DAMAGED CAR

Isao Inoue, 8-12, Oide-cho, Nishinomiya-shi, Hyogo-ken, Japan

Filed Mar. 27, 1992, Ser. No. 858,951

Int. Cl.⁵ G06F *15/21*

U.S. Cl. 364—400 **6 Claims**



1. An apparatus for estimating a repair cost of a damaged car, comprising:

a processor;

an input device, operatively coupled to said processor, for inputting user instructions to said processor;

a display device, operatively coupled to said processor, having a display screen and responsive to said processor to display images on said display screen;

a CD-ROM, operatively coupled to said processor, having stored therein repair work data and coating work data associated with each of at least one car model, wherein said repair work data includes a plurality of car section data corresponding to respective plural car sections of the associated car model, each car section data including repair time information and repair part information for each of a plurality of car parts which make up the corresponding car section of the associated car model, and wherein said coating work data includes plural coating color and coating material information and coating time information associated with each part of the associated model for which an estimate of painting is necessary;

wherein said processor is responsive to said input device to select a region of the damaged car and to specify a degree of damage of the selected region, and then to display on said display device a listing of the plurality of car section data associated with the selected region of the damaged car having the specified degree of damage, and wherein said processor is further responsive to said input device to select at least one of the displayed plurality of car section data and to display on said display screen of said display device the repair time information and repair part information of the plurality of car parts of the selected car section data, and wherein said processor is further responsive to said input means to select at least one of plurality of car parts of the selected car section data and to calculate and display on said display device a car section repair cost according to the repair part information and repair time information of each selected car part of each selected car section data, and wherein said processor is further responsive to said input device to select a combination of a coating color and a coating material from among said coating color information and coating material information, respectively, and for calculating and displaying a coating cost for each selected car section in accordance with the selected combination of the coating color and coating material and the coating time information.

5,317,504

COMPUTER IMPLEMENTED PROCESS FOR EXECUTING ACCOUNTING THEORY SYSTEMS

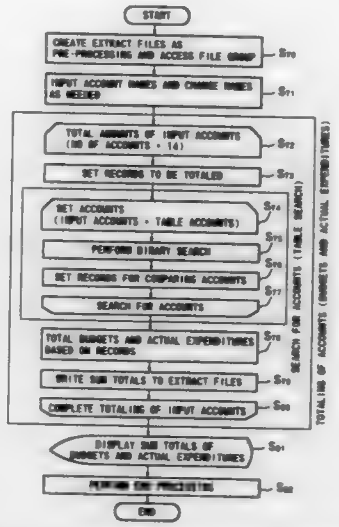
Mamoru Nakayama, Tokyo, Japan, assignor to T.A.S. & Trading Co., Ltd., Japan

Filed Oct. 8, 1992, Ser. No. 958,181

Claims priority, application Japan, Oct. 23, 1991, 3-302752

Int. Cl.⁵ G06F *15/00*

U.S. Cl. 364—406 **4 Claims**


START
CREATE EXTRACT FILES AS PRE-PROCESSING AND ACCESS FILE GROUP
S_{70}
INPUT ACCOUNT NAMES AND CHANGE NAMES AS NEEDED
S_{71}
TOTAL AMOUNTS OF INPUT ACCOUNTS (NO OF ACCOUNTS = 14)
S_{72}
SET RECORDS TO BE TOTALED
S_{73}
SET ACCOUNTS (INPUT ACCOUNTS = TABLE ACCOUNTS)
S_{74}
PERFORM BINARY SEARCH
S_{75}
SET RECORDS FOR COMPARING ACCOUNTS
S_{76}
SEARCH FOR ACCOUNTS
S_{77}
TOTAL BUDGETS AND ACTUAL EXPENDITURES BASED ON RECORDS
S_{78}
WRITE SUB TOTALS TO EXTRACT FILES
S_{79}
COMPLETE TOTALING OF INPUT ACCOUNTS
S_{80}
SEARCH FOR ACCOUNTS (TABLE SEARCH)
TOTALING OF ACCOUNTS (BUDGETS AND ACTUAL EXPENDITURES)
DISPLAY SUB TOTALS OF BUDGETS AND ACTUAL EXPENDITURES
S_{81}
PERFORM END PROCESSING
S_{82}
END

1. A method for creating programs and processing data by establishing a programming language using a data processing apparatus so that said programming language will represent the steps for executing an accounting theory system, said method comprising the steps of:

dividing and classifying by function a collection of accounting knowledge for executing accounting processing so that basic components of said accounting knowledge are extracted;

correlating unit programs and individual programming terms constituting said programing language with said basic components of said accounting knowledge to prepare a correspondence table;

creating an accounting execution procedure by putting together an appropriate number of said basic components of said accounting knowledge for obtaining desired results of accounting;

creating an execution program by selecting, from said correspondence table, those of said unit programs and of said individual programming terms corresponding to the basic components constituting said accounting executing procedure;

creating a processing program by combining the selected unit programs and individual programming terms with actual data representing accounting transactions;

creating a set of data cards by combining said actual data with a description of the attributes exhibited by said actual data in said programming language;

defining as execution information said basic components, said unit programs, said individual programming terms, said correspondence table, said accounting execution procedure, said execution program and said data cards;

recording said execution information in a reusable manner; and

defining and assigning said execution in formation to a command module, to a display module, to a print module and to a database module;

wherein the assignment of any part of said execution information to said command module is made from the viewpoint of creating another execution program similar to said execution program; the assignment of any part of said execution information to said display module and to said print module is made from the viewpoint of displaying said execution information; and the assignment of any part of said execution information to said database module is made from the viewpoint of storing said execution information for later duplication and reference.

5,317,505

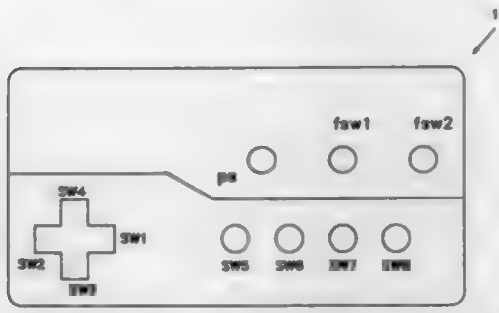
GAME CONTROLLER CAPABLE OF STORING AND EXECUTING STORED SEQUENCES OF USER PLAYING BUTTON SETTINGS

Raznik Karabed, 797 Honeywood Ct.; Siamack Nemazie, 1253 Qual Creek Cir., both of San Jose, Calif. 95120, and Edmond Sardariani, 3152 Evelyn St., Lacresenta, Calif. 91214

Filed Dec. 19, 1990, Ser. No. 630,170

Int. Cl.⁵ G06F *3/02*

U.S. Cl. 364—410 39 Claims



1. A user controller device for use with a game processing unit and for providing information to the unit for playing a game, said controller device comprising:

input means having a plurality of inputs for detecting user requests for recording a sequence of one or more user input settings, said settings including at least one non-trivial input setting;

means for storing said sequence;

execution means to provide to the said game processing unit information based on the said stored data, said device further comprising means for sampling at discrete user input sampling times the input means for the current user input settings and providing such settings to the game processing unit at every discrete user input sampling time.

5,317,506

INFUSION FLUID MANAGEMENT SYSTEM

James E. Coutré, Concord; Wayne P. Griffin, Dracut, both of Mass., and Charles M. Crisler, Windham, N.H., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 304,068, Jan. 30, 1989, Pat. No. 5,153,827. This application May 12, 1992, Ser. No. 882,692

Int. Cl.⁵ G06F *15/42;* A61M *5/00*

U.S. Cl. 364—413.02 41 Claims

1. A system for administering fluid infusions to patients comprising:

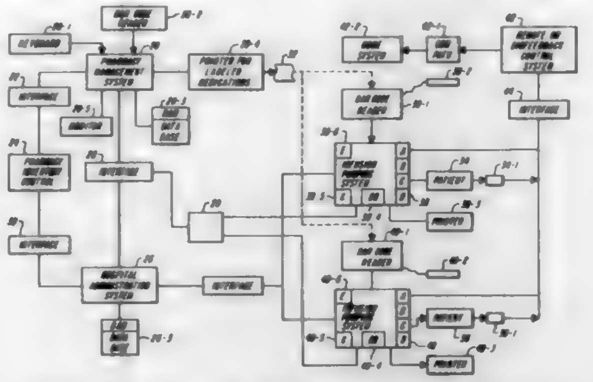
a plurality of infusion devices, each infusion device independently operable to infuse an infusate into an associated patient in accordance with instructions representative of an infusion regimen, and including memory located at each of the infusion devices for storing the instructions;

means located remotely from the plurality of infusion devices for processing data, the data including data representative of an infusion for each of the patients, the infusion data comprising data identifying the patients, data identifying an infusate associated with each patient, and data identifying a manner of infusion associated with each patient, the data processing means further comprising:

means for prompting a user to choose one of multiple tasks, the tasks including processing new infusion data, updating previously processed infusion data, storing infusion data, and outputting infusion data in a format readable by each of the infusion devices,

means for processing new infusion data to provide a new infusion regiment for each of the plurality of patients,

means for storing the infusion data for each of the plurality of patients,



means for processing stored infusion data to renew an infusion regimen for each of the plurality of patients, and

means for outputting the infusion data in a format readable by each of the infusion devices into memory; and

means for transferring the infusion data associated with each of the patients to the infusion device associated with the respective patient.

5,317,507

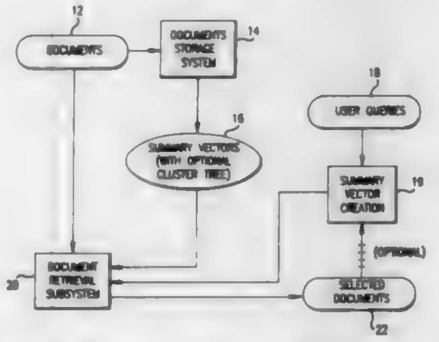
METHOD FOR DOCUMENT RETRIEVAL AND FOR WORD SENSE DISAMBIGUATION USING NEURAL NETWORKS

Stephen I. Gallant, 49 Fenno St., Cambridge, Mass. 02138

Filed Nov. 7, 1990, Ser. No. 610,430

Int. Cl.⁵ G06F *15/38*

U.S. Cl. 364—419.13 23 Claims



1. A method for storing a searchable representation of a document comprising the steps of:

inputting a document containing a series of words in machine readable form into a processing system;

removing from consideration any words in said series of words that are also found in a predetermined list of uninteresting words;

locating in a dictionary of context vectors a context vector for each word remaining in said series of words, each context vector providing for each of a plurality of word-based features, a component value representative of a conceptual relationship between said word and said word-based feature;

combining the context vectors for each word remaining in said series of words to obtain a summary vector for said document;

normalizing said summary vector to produce a normalized summary vector; and

storing said normalized summary vector.

5,317,508

IMAGE EDITING APPARATUS

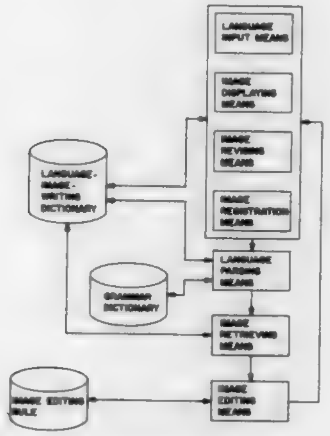
Shusaku Okamoto, Osaka, Japan; Toshiyuki Maeda, Cheadle, United Kingdom, and Fumio Maehara, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1992, Ser. No. 966,879

Claims priority, application Japan, Oct. 24, 1991, 3-277432; Jan. 14, 1992, 4-004524

Int. Cl.⁵ G06F *15/38;* G06G *7/60*

U.S. Cl. 364—419.01 21 Claims



1. An image editing apparatus comprising:

a first storing means to store information of simple words which form a linguistic sentence, and information on relation of meaning between the simple words,

a second storing means to store information solely on attributes of images or image information on attributes of images and data of image elements combined,

a third storing means to store the grammer of the language,

a fourth storing means to store the relation between the information stored in the first storing means and the information stored in the second storing means, if any relation exists,

a fifth storing means to store image editing rule to edit images using the result of parsing of the language and the image attribute,

a linguistic sentence input means to input a linguistic sentence,

a linguistic sentence parsing means to parse a linguistic sentence using the informations stored in the first and third storing means,

an image retrieving means to retrieve image information from the second storing means using the parsing result of the linguistic sentence parsing means and the information stored in the first and fourth storing means,

a displaying means to display the image element data stored in the second storing means, and

an image editing means to conjecture, using the parsing result of the linguistic sentence, the retrieved image information, and the information stored in the fifth storing means,

whether the editing of the meaning of the input linguistic sentence to an image is possible, and in case it is possible, to process and synthesize the retrieved image to edit an image showing the meaning of the input sentence.

5,317,509

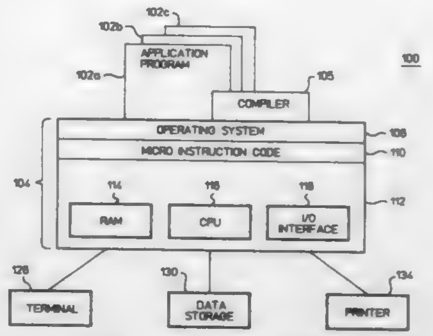
REGULAR EXPRESSION FACTORING FOR SCANNING MULTIBYTE CHARACTER SETS WITH A SINGLE BYTE AUTOMATA MACHINE

Jeffrey B. Caldwell, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 21, 1992, Ser. No. 822,911

Int. Cl.⁵ G06F *11/00*

U.S. Cl. 364—419.08 21 Claims



1. A computer-based system for building a lexical analyzer that can recognize a character set that is represented by both single byte values and multibyte values or only multibyte values, comprising:

(a) generating means for building a lexical analyzer, said generating means configured to accept an input specification that includes at least one regular expression having at least one multibyte character;

(b) factoring means for factoring said regular expression into a single byte representation if said regular expression contains at least one multibyte character.

5,317,510

METHOD AND APPARATUS FOR GENERATING SENTENCES FROM CONCEPTUAL STRUCTURES

Yumiko Yoshimura, Kawasaki; Hideki Hirakawa; Yoshimi Asahioka, both of Yokohama, and Mariko Kimura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 494,117, Mar. 14, 1990, abandoned. This application Mar. 16, 1992, Ser. No. 851,123

Claims priority, application Japan, Mar. 15, 1989, 1-63310

Int. Cl.⁵ G06F *15/30*

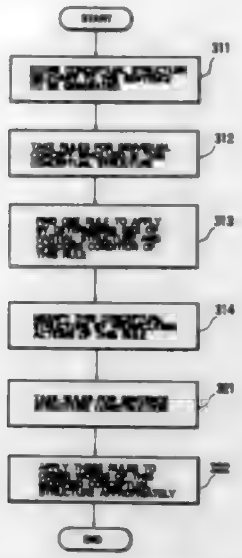
U.S. Cl. 364—419.08 22 Claims

1. An apparatus for generating sentences, comprising:

conceptual structure storage means for storing conceptual structures to be utilized as elements of sentences to be generated;

rule storage means for storing rules to be followed in generating sentences; and

sentence generation means for generating sentences from the conceptual structures stored in the conceptual structure storage means in accordance with the rules stored in the rule storage means by utilizing sizes of partial structures of the conceptual structures specified by the rules stored in



the rule storage means to determine a sentence structure of each sentence to be generated.

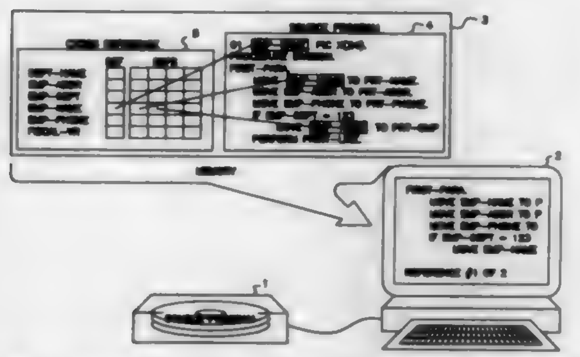
5,317,511
METHOD OF FINDING DEFINITIONS IN COMPUTER SOURCE PROGRAMS

Harvard R. Jacobson, 4221 Hemlock La., Plymouth, Minn. 55441

Continuation of Ser. No. 424,861, Oct. 20, 1989, abandoned. This application Feb. 23, 1993, Ser. No. 21,737

Int. Cl.⁵ G06F *15/40*

U.S. Cl. 364—419 **2 Claims**



1. In a computer having a memory, a display screen, a means for entering information, and a means for selecting positions on said screen, containing in said memory a text of a computer source program, said program containing definitions of and references to names, a method of finding and displaying said definitions and references, said method comprising the steps of:

(a) constructing in said memory a cross-reference containing locations of said definitions and references;

(b) displaying on said computer's display screen a page of text from said source program;

(c) highlighting a name within said page of text in response to selection of that name by a user using said means for selecting positions;

(d) locating an entry in said cross-reference that contains information about said highlighted name, in response to input from said user by said means for selecting positions;

(e) displaying a page of text containing the definition of or a reference to said highlighted name, depending on input from said user by said means for selecting positions;

(f) highlighting said definition or reference;

(g) saving on a return stack a location in said computer source program of said highlighted name of step (d);

(h) displaying a page of text containing a location that was previously saved on said return stack, in response to input from said user; and

(i) removing said location from said return stack.

5,317,512
ACTUATION SYSTEM FOR VEHICLE PASSENGER PROTECTIVE DEVICE

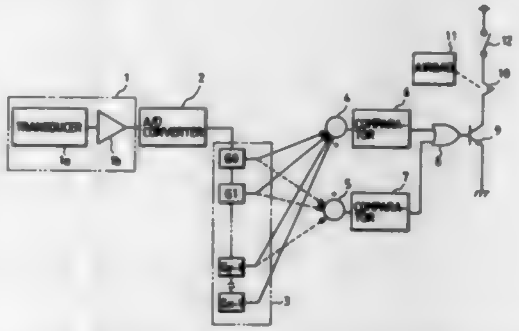
Toshiaki Ota, Toyohashi; Yoshihiko Teguri, Okazaki; Masahito Muto, Toyota; Koichi Fujita, Nagoya, and Motomi Iyoda, Seto, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Apr. 23, 1992, Ser. No. 872,767

Claims priority, application Japan, Apr. 23, 1991, 3-092357; Apr. 23, 1991, 3-092360

Int. Cl.⁵ B60R *21/32, 21/08*

U.S. Cl. 364—424.05 **6 Claims**



3. An actuation system of a passenger protective device for a motor vehicle, comprising:

a single acceleration detection device for detecting accelerations of said motor vehicle and generating an acceleration signal indicative of the detected motor vehicle accelerations;

first means for successively integrating samples of said acceleration signal over a first predetermined integration period and obtaining a first integration value;

means for deciding whether said motor vehicle is in a collision state based on comparing said first integration value with a first threshold value; and

means for actuating said passenger protective device in response to said deciding means.

5,317,513
APPARATUS FOR ACTIVELY CONTROLLING STEER ANGLE OF FRONT WHEELS OF VEHICLE

Hiroshi Mouri, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 28, 1991, Ser. No. 750,948

Claims priority, application Japan, Aug. 28, 1990, 2-224245

Int. Cl.⁵ B62D *5/00*

U.S. Cl. 364—424.05 **5 Claims**

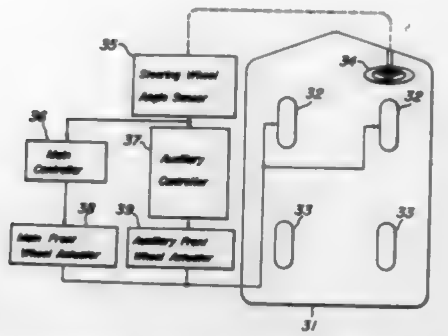
1. An apparatus for controlling a steer angle of front wheels of a vehicle comprising:

sensing means for detecting a steering wheel angle to derive a steering wheel angle signal;

signal processing means for processing said steering wheel angle signal to derive an active control signal including at least a first order differential of said steering wheel angle signal, said first order differential being delayed by a delay time such that a variation of a steering force can be suppressed; and

actuating means for steering the front wheels in accordance with said steering wheel angle signal as well as said active control signal

wherein said signal processing means is constructed such that said delayed first order differential is obtained by sampling said steering wheel angle signal at a predetermined sampling period to derive sample values, and by deriving a difference between sample values obtained at different sampling timings which are separated by N times of the sampling period, wherein N is an integer larger than 1.


35
Steering Wheel Angle Sensor
36
Main Controller
37
Auxiliary Controller
38
39
Main Front Wheel Actuator
Auxiliary Front Wheel Actuator
34
32
32
33
33
31

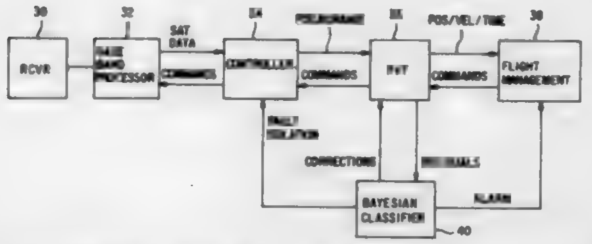
5,317,514
INTEGRITY MONITORING OF NAVIGATION SYSTEMS USING BAYE'S RULE

Stephen Bancroft, Olathe, and Susan S. Chen, Lenexa, both of Kans., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed May 29, 1992, Ser. No. 891,496

Int. Cl.⁵ B06G *7/78*

U.S. Cl. 364—449 **4 Claims**



1. A navigation system that receives signals from a plurality of transmitters and identifies an error producing transmitter, comprising:

means for transmitting a signal that causes at least one of the plurality of transmitters to transmit a signal;

means for receiving the transmitted signal;

means for determining ranges from the transmitters;

means for determining a least square residual error using said ranges;

means using said least square residual error and Bayes Rule for determining a conditional probability that one of the plurality of transmitters is an error producing transmitter, including means for determining an estimate of a sum of the squares of the least square residual error for a reduced system which does not use said transmitter, and means for determining a conditional probability of said least square residual error using said sum of the squares of the least square residual error for said reduced system; and

means for selecting a maximum conditional probability to identify the error producing transmitter.

5,317,515
VEHICLE HEADING CORRECTION APPARATUS

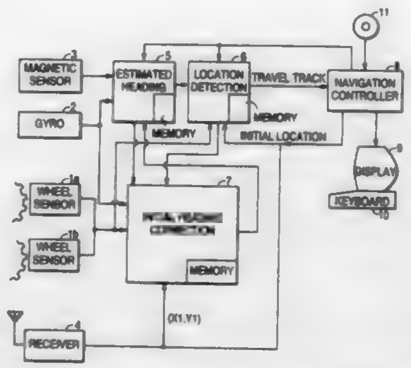
Shin-ichi Matsuzaki, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 15, 1992, Ser. No. 820,736

Claims priority, application Japan, Jan. 23, 1991, 3-006600

Int. Cl.⁵ G01C *21/20*

U.S. Cl. 364—454 **1 Claim**



1. A vehicle heading correction apparatus comprising:

a distance sensor;

a heading sensor;

estimated location detecting means for detecting an estimated vehicle location on the basis of outputs of said distance and heading sensors;

location data acquisition means comprising a global positioning system receiver for acquiring plural vehicle location data that are supplied from outside of the vehicle;

first arithmetic means for calculating a movement direction of said vehicle during the time that two of said vehicle location data are acquired by said location data acquisition means, on the basis of said two vehicle location data;

second arithmetic means for calculating an estimated movement direction of said vehicle during the time that said two vehicle location data are acquired, on the basis of said estimated vehicle location outputted from said estimated location detecting means; and

correction means for correcting an absolute heading of said vehicle with the aid of a difference between said movement direction calculated by said first arithmetic means and said estimated movement direction calculated by said second arithmetic means.

5,317,516
PRODUCTION METHOD AND SYSTEM FOR HANDLING PLATES CUT OUT OF A PLATE BLANK FOR FURTHER PRODUCTION

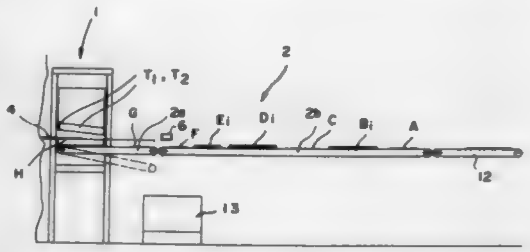
Jorma Taijonlahti, Kangasto, and Lauri Kohtamäki, Kauhava, both of Finland, assignors to Lillbacken Konepaja Oy, Kauhava, Finland

Filed Jun. 19, 1991, Ser. No. 717,897

Claims priority, application Finland, Jun. 19, 1990, 903072

Int. Cl.⁵ G06F *15/46*

U.S. Cl. 364—468 **18 Claims**



1. In an environment wherein material and information

flows are computer controlled, a production method for handling plates cut from a plate blank comprising the steps of:

(a) cutting a plate blank by means for a shearing mechanism into plates of at least one predetermined shape;

(b) transferring said plates successively cut from said plate blank onto a conveyor mechanism having at least two successive conveyors for transport to an unloading end;

(c) operating said conveyor mechanism intermittently during said cutting operation for receiving and transporting said plates to said unloading end;

(d) removing reject material and small pieces from said conveyor mechanism by moving vertically at least one end of at least a first conveyor of said conveyor mechanism;

(e) unloading said plates from said unloading end by means of an unloading and sorting mechanism;

(f) operating said conveyor mechanism, said shearing mechanism and said unloading and sorting mechanism as a flexible production system; and

(g) using said intermittently operated conveyor mechanism as a buffer conveyor storage for compensating momentary differences in the operating speeds of said shearing mechanism and said loading and sorting mechanism.

5,317,517
DIGITIZING METHOD

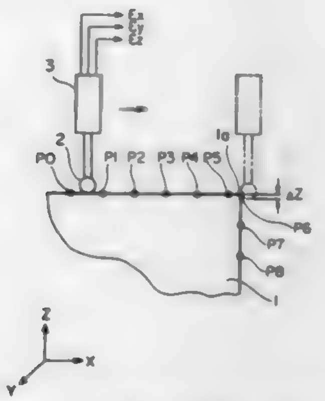
Hitoshi Matsuura, Hachioji; Hitoshi Aramaki, Hino, and Osamu Nakajima, Yamanashi, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 571,645, Sep. 4, 1990, abandoned. This application Jul. 22, 1993, Ser. No. 94,914

Claims priority, application Japan, Feb. 3, 1989, 1-26437

Int. Cl.^{5} G06F *15/46;* **G05B** *19/18*

U.S. Cl. 364—474.03 **3 Claims**



1. A method for generating numerical control data for machining a workpiece based on positional data generated by profiling a model surface with a stylus coupled to a tracer head, the tracer head generating a first signal ϵ_x representing a displacement of the stylus along an x-axis, a second signal ϵ_y representing a displacement of the stylus along a y-axis and a third signal ϵ_z representing a displacement of the stylus along a z-axis, said method comprising the steps:

a) calculating a composite amount of displacement $\epsilon=\sqrt{\epsilon_x^2\epsilon_y^2=\epsilon_z^2}$;

b) calculating a difference $\Delta\epsilon$ in magnitude between the composite amount of displacement ϵ and a reference amount of displacement ϵ_0; and

c) outputting specific positional data obtained when a magnitude of the difference $\Delta\epsilon$ exceeds a predetermined value.

5,317,518
METHOD OF PLOTTING LOADED CONDITIONS

Naoki Fujita, and Kota Miyamoto, both of Yamanashi, Japan, assignors to Fanuc Limited, Yamanashi, Japan

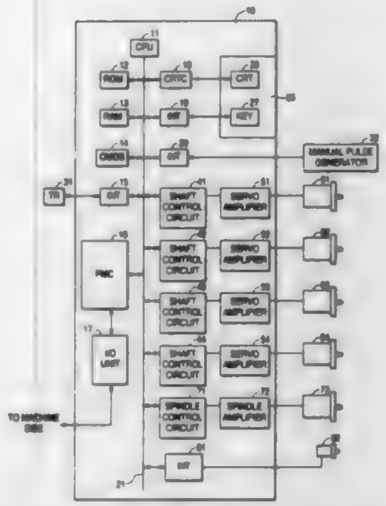
PCT No. PCT/JP91/01190, § 371 Date May 12, 1992, § 102(e) Date May 12, 1992, PCT Pub. No. WO92/05480, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 6, 1991, Ser. No. 856,047

Claims priority, application Japan, Sep. 13, 1990, 2-243129

Int. Cl.^{5} G06F *15/46;* **G05B** *19/405*

U.S. Cl. 364—474.26 **6 Claims**



1. A method of plotting a loaded condition in machining using as a drive source a motor controllable by a numerical control system executing a machining program, comprising the steps of:

(a) setting a plurality of tool locus plotting techniques in advance;

(b) determining a tool locus in accordance with said machining program during the machining operation;

(c) selecting correspondingly one of said plurality of tool locus plotting techniques with respect to each of motor load current values which have been periodically detected during the machining operation; and

(d) plotting a portion of the tool locus determined in said step (b), which corresponds to each of said detected motor load current values, onto a display screen in the tool locus plotting technique selected in said step (c).

5,317,519
MACHINING STIMULATION SYSTEM

Takeharu Maeda, Niwa, Japan, assignor to Okuma Corporation, Aichi, Japan

Filed Jun. 8, 1992, Ser. No. 896,045

Claims priority, application Japan, Jun. 14, 1991, 3-169277

Int. Cl.^{5} G06F *15/46*

U.S. Cl. 364—474.26 **5 Claims**

1. A machining simulation system for displaying an animation picture of a tool working a material, comprising:

a display device for displaying said material;

a timing generator for generating a synchronizing signal inputted to said display device, a dot position signal indicating a horizontal scanning position, a dot clock signal having a period which varies with every progress of a dot of a horizontal scanning, a line position signal indicating a vertical scanning position and a line clock signal having a period which varies with every progress of a line of a vertical scanning;

a three dimensional shape memory for saving a Z-directional height of the material at an address designated by values of X and Y directions; and

a cross-section display circuit comprising:

(a) a display start dot register for designating a starting position of a horizontal display in said display device;

(b) a dot count register for designating a width of the horizontal display in said display device;

(c) a display start line register for designating a starting position of a vertical display in said display device;

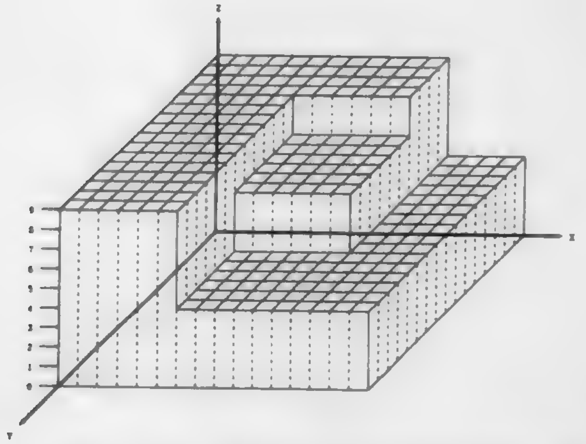
(d) a line count register for designating a width of the vertical display in said display device;

(e) a shape start X-register and a shape start Y-register for designating starting addresses for reading in said three dimensional shape memory;

(f) a Z-slice register for designating a Z-directional height of a displayed section;

(g) a dot counter for starting a count of value in said dot clock signal when said dot position signal coincides with the value in said display start dot register and then for stopping the count of value in said dot clock signal when the count number coincides with the value in said dot count register;

(h) a line counter for starting a count of value in said line clock signal when said line position signal coincides with the value in said display start line register and then for stopping the count of the value in said line clock signal when the count number coincides with the value in said line count register;



(i) a shape X-counter for starting a count of the value in said dot clock signal after loading an initial value from said shape start X-register when said dot position signal coincides with the value in said display start dot register and then for stopping the count of the value in said dot clock signal when the count number in said dot counter coincides with the value in said dot count register; and

(j) a shape Y-counter for starting a count of value in said line clock signal after loading an initial value from said shape start Y-register when said line position signal coincides with the value in said display start line register and then for stopping the count of the value in said line clock signal when the count number in said line counter coincides with the value in said line count register, so as to compare the Z-directional height read out from said three dimensional shape memory by the values in said shape X-counter and in said shape Y-counter as addresses and the value in said Z-slice register, and then inputting a high-luminance display signal to said display device when said Z-directional height is greater than said value in said Z-slice register or a low-luminance display signal to said display device when said Z-directional height is less than said value in said Z-slice register.

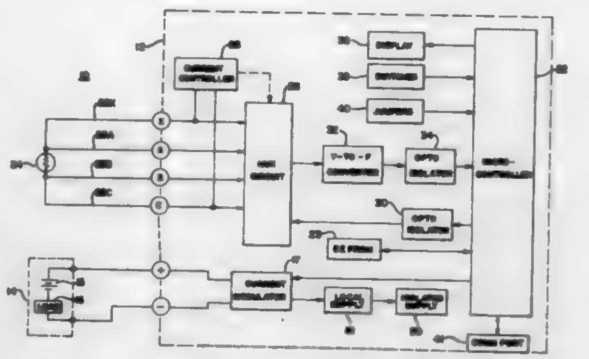
5,317,520
COMPUTERIZED REMOTE RESISTANCE MEASUREMENT SYSTEM WITH FAULT DETECTION

Jonathan Castle, Los Angeles, Calif., assignor to Moore Industries International Inc., Sepulveda, Calif.

Filed Jul. 1, 1991, Ser. No. 724,120

Int. Cl.^{5} G01R *27/00;* **G01K** *7/20, 7/00*

U.S. Cl. 364—482 **1 Claim**



1. A control circuit for a remote two-wire transmitter connected to at least one resistance temperature device (RTD), said RTD having at least three sensor wires connected to said transmitter, said control circuit comprising:

a four-channel analog multiplexer having at least three of its input terminals connected to said RTD sensor wires, having at least two address lines, and having at least one output port;

current source means for applying current to said sensor through two of said three sensor wires;

a switched impedance circuit, comprising at least a resistor and a switching device, for connecting a known impedance to said output port in response to a test signal;

a flip-flop connected to at least two of said address lines for providing said test signal;

one of said address lines is connected to a clock input port of said flip-flop, and another of said address lines is connected to a data input port of said flip-flop, wherein the phase relationship between said first and second address lines determines whether said known impedance is connected to said output port; and

means for controlling said address lines to operate said multiplexer and said flip-flop in a measurement mode, wherein said known impedance is not connected to said output port, and in a test mode, wherein said known impedance is connected to said output port, and for determining whether a faulty connection exists between said multiplexer and said RTD.

5,317,521
PROCESS FOR INDEPENDENTLY MONITORING THE PRESENCE OF AND CONTROLLING ADDITION OF SILVER AND HALIDE IONS TO A DISPERSING MEDIUM DURING SILVER HALIDE PRECIPITATION

Ming-Jye Lin, and Jong-Shinn Wey, both of Penfield, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1991, Ser. No. 745,668

Int. Cl.^{5} G06G *7/57*

U.S. Cl. 364—496 **14 Claims**

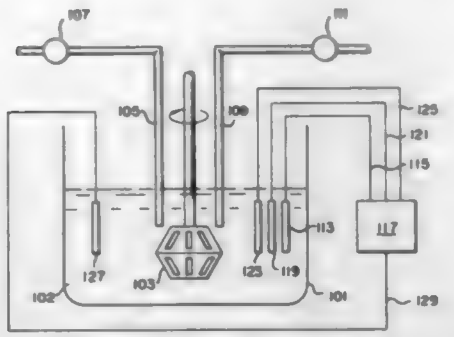
1. A process of precipitating a silver halide emulsion comprised of

(a) introducing a dispersing medium and dissolved halide ions into a reaction vessel,

(b) thereafter concurrently adding silver ions and halide ions to the dispersing medium to initiate growth of silver halide grains within the dispersing medium,

(c) during step (b), monitoring the temperature of the dispersing medium to establish the equilibrium solubility product constant of silver an halide ions within the dispersing medium,

(d) during step (b), using a reference electrode and a first indicator electrode each in contact with the dispersing medium within the reaction vessel, monitoring the halide ion activity within the dispersing medium and adjusting the level of dissolved halide ion in the reaction vessel by regulating the rate of addition to the reaction vessel of the halide ion to maintain a stoichiometric excess of halide ion, based on the equilibrium solubility product constant, and



(e) during step (b), using a silver ion specific second indicator electrode in contact with the dispersing medium within the reaction vessel, monitoring the potential difference between the silver ion specific second indicator electrode and at least one of the first indicator electrode and the reference electrode to allow the level of dissolved silver ion in the dispersing medium to be determined independently of the equilibrium solubility product constant and adjusting the level of dissolved silver ion in the dispersing medium by regulating the rate of addition to the reaction vessel of the silver ion based on the potential difference thereby to maintain a selected activity profile of dissolved silver ion during silver halide grain growth.

5,317,522

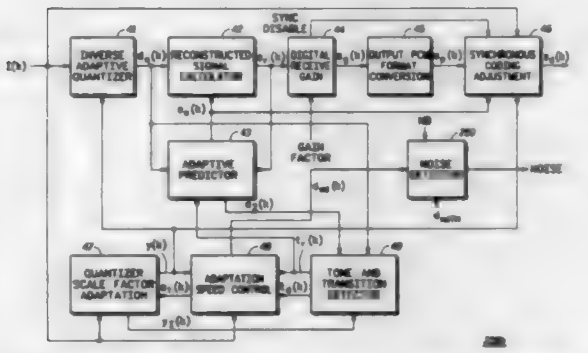
METHOD AND APPARATUS FOR NOISE BURST DETECTION IN A SIGNAL PROCESSOR

Luis A. Bonet; Carlos A. Greaves, and Jose G. Corleto, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 821,111, Jan. 15, 1992. This application Jul. 12, 1993, Ser. No. 88,944

Int. Cl.^{5} H04B *14/06*

U.S. Cl. 364—514 **22 Claims**


SYNC DISABLE
I(k)
INVERSE ADAPTIVE QUANTIZER
RECONSTRUCTED SIGNAL CALCULATOR
DIGITAL RECEIVE GAIN
OUTPUT PCM FORMAT CONVERSION
SYNCHRONOUS CODING ADJUSTMENT
ADAPTIVE PREDICTOR
GAIN FACTOR
NOISE
QUANTIZER SCALE FACTOR ADAPTATION
ADAPTATION SPEED CONTROL
TONE AND TRANSITION DETECTOR

15. A signal processor with noise burst detection, comprising:

an inverse adaptive quantizer for providing a quantized difference signal $d_q(k)$ in response to an input signal I(k) of the signal processor;

noise detection means coupled to said inverse adaptive quantizer, for receiving said signal $d_q(k)$, a predetermined number, and a product of a noise threshold and said predetermined number, for calculating a total energy estimate of said signal $d_q(k)$ sampled once for each of said predetermined number of samples of a plurality of samples, and for providing a noise indication in response to said total energy estimate exceeding said product of said noise threshold and said predetermined number; and

output means coupled to said inverse adaptive quantizer, for providing an output signal of the signal processor $s_q(k)$ in response to said quantized difference signal $d_q(k)$;

said inverse adaptive quantizer and said output means substantially forming a CCITT Recommendation G.726-1990 adaptive differential pulse code modulation (ADPCM) decoder for at least one data rate thereof.

5,317,523

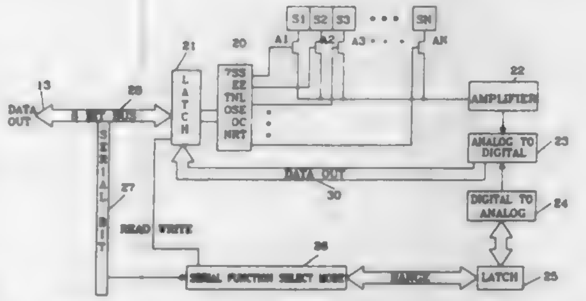
INTEGRATED REFLECTIVE IMAGE SENSOR

Billy R. Masten, Shallowater, and Lester L. Hodson, McKenny, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 18, 1990, Ser. No. 600,060

Int. Cl.^{5} G06F *15/20*

U.S. Cl. 364—525 **26 Claims**



1. An integrated multi-element sensor device, comprising:

an array of light sensor elements for detecting light impinging thereon and for outputting a voltage representative of the impinging light intensity, each of the light sensing elements being individually addressable;

a mode select circuit for activation of a select function to specify each light sensing element that is to be addressed;

a controller circuit for selecting each light sensing element that is to be addressed; and

an analog-to-digital converter for digitizing the amplitude of the output voltage of the selected light sensing element.

5,317,524

SPECTRAL SIGNAL ANALYZER SYSTEM

Promit Das, and Terrance R. Kinney, both of South Bend, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 19, 1991, Ser. No. 762,837

Int. Cl.^{5} G01K *7/02*

U.S. Cl. 364—557 **8 Claims**

1. A process for analyzing a plurality of multiple period spectrally modulated signals generated by a birefringent element and transmitted to an array, comprising the steps of:

establishing a reference wave form from an output of said spectrally modulated signals emanating from said array in response to the birefringent element being exposed to a known temperature, said reference wave form having a dominant frequency and initial phase;

storing said reference wave form;

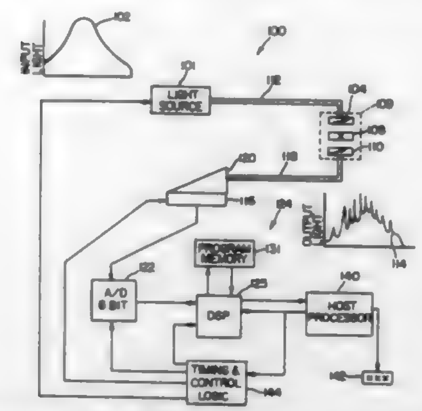
sampling said output spectrally modulated signals emanating from said array to establish a current wave form;

extracting a phase and frequency relationship between the current wave form and the reference wave form by cross correlating the current wave form and reference wave form;

performing a Fourier Transformation to determine the phase of the dominant frequency for said extracted phase and frequency relationship;

comparing said dominant frequency of said extracted phase and frequency relationship with said dominant frequency of said reference wave form to establish the temperature range for said extracted phase; and

matching said temperature range and phase with a reference schedule to determine the current temperature of the birefringent element.



5,317,525

ELECTRIC POWER SYSTEM SIMULATOR

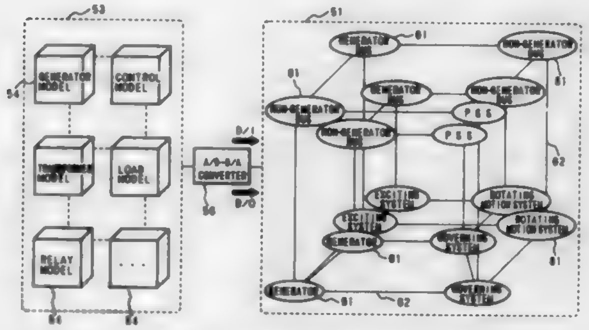
Hisao Taoka, Amagasaki; Isao Iyoda, Tokyo; Hideo Noguchi, Kobe; Yukio Kojima, Chofu; Shigeru Warashina, Chofu, and Nobuyuki Sato, Chogu, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and The Tokyo Electric Power Co., Inc., Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 665,192

Claims priority, application Japan, Mar. 6, 1990, 2-55621; Mar. 6, 1990, 2-55622; Mar. 6, 1990, 2-55623; Mar. 6, 1990, 2-55624; Mar. 6, 1990, 2-55625; Mar. 6, 1990, 2-55626

Int. Cl.^{5} G06F *15/60*

U.S. Cl. 364—578 **7 Claims**



1. An electric power system simulator comprising:

first calculating means for calculating a dynamic characteristic of a generator by cyclically obtaining an amplitude and a phase of internal induced voltage of said generator based on an output power and a terminal voltage of said generator;

second calculating means for calculating a dynamic characteristic of a load by obtaining an equivalent admittance of said load after simulation of the electric power system based on an amplitude of an A.C. voltage at an installation point of said load; and

third calculating means for calculating a power transmission condition of the electric power system network, indicative of fault or normal operation, by obtaining the output power and the terminal voltage of said generator by calculating an A.C. current flowing in each element of the electric power system with using the amplitude and the phase of said internal induced voltage of said generator obtained by said first calculating means, the equivalent admittance of said load obtained by said second calculating means and an impedance of the electric power system network;

wherein said condition change of the electric power system including said generator is serially simulated by alternately performing the calculations of said first and said second calculating means and the calculation of said third calculating means.

5,317,526

FORMAT CONVERSION METHOD OF FLOATING POINT NUMBER AND DEVICE EMPLOYING THE SAME

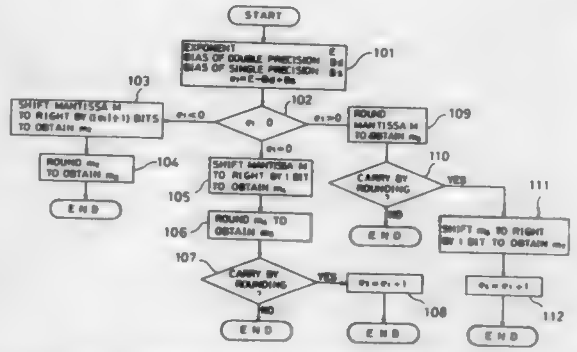
Miki Urano, and Takashi Taniguchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 23, 1992, Ser. No. 948,657

Claims priority, application Japan, Sep. 25, 1991, 3-245995

Int. Cl.^{5} G06F *7/38*

U.S. Cl. 364—715.03 **9 Claims**


START
EXPONENT E
BIAS OF DOUBLE PRECISION Bd
BIAS OF SINGLE PRECISION Bs
e₁=E−Bd+Bs
101
103
102
SHIFT MANTISSA M TO RIGHT BY (|e₁|+1) BITS TO OBTAIN m₁
ROUND MANTISSA M TO OBTAIN m₁
109
104
ROUND m₁ TO OBTAIN m₂
END
105
SHIFT MANTISSA M TO RIGHT BY 1 BIT TO OBTAIN m₁
110
CARRY BY ROUNDING
YES
NO
111
106
ROUND m₁ TO OBTAIN m₂
END
SHIFT m₂ TO RIGHT BY 1 BIT TO OBTAIN m₂
107
CARRY BY ROUNDING ?
YES
NO
108
112
END
END
END

1. A format conversion method for converting a higher-precision floating point number as a normalized operand having an exponent E to which a first bias is added and a mantissa M having a first bit length to a lower-precision floating point number having an exponent ϵ to which a second bias smaller than the first bias is added and a mantissa μ having a second bit length shorter than the first bit length, comprising the steps of:

obtaining a first exponent e_1 by subtracting the first bias from the exponent E of the operand and by adding the second bias thereto so that the exponent e_1 is the exponent ϵ of the lower-precision floating point number;

determining a shift amount according to whether the first exponent e_1 is a positive value, 0 or a negative value; and

obtaining a mantissa μ of the lower-precision floating point number based on a numerical value obtained by conducting to the mantissa M of the operand a right shift procedure of the shift amount.

5,317,527

LEADING ONE/ZERO BIT DETECTOR FOR FLOATING POINT OPERATION

Sharon M. Britton, Westboro; Randy Allmon, Hopedale, and Sridhar Samudrala, Westboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 10, 1993, Ser. No. 16,054

Int. Cl.^{5} G06F *7/00, 7/38*

U.S. Cl. 364—715.04 **17 Claims**

9. A leading one position or leading zero position detection circuit for a floating point operation comprising:

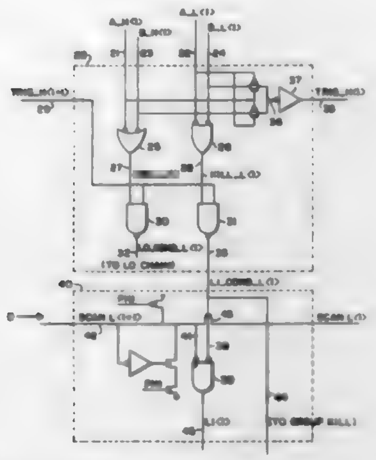
(i) means for scanning each bit position of both a first n-bit floating point operand and a second n-bit floating point operand from left to right to detect a trigger condition:

$$A_{i+1}\ \mathrm{XOR}\ B_{i+1}=0$$

where A is the first n-bit floating point operand, B is the second n-bit floating point operand, A_i or B_i is the value of a bit in position i in A or B, A_{i+1} or B_{i+1} is the value of a bit one position to the left of A_i or B_i, and XOR is an Exclusive-OR operator;

(ii) mans for continuing to scan from left to right, and, if a floating point result of said floating point operation is a positive value, detecting a next bit position j where:

$$[A_j,B_j]=NOT[0,0]$$



where $j<i$, A_j or B_j is the value of a bit in position j in A or B, and designating said bit position j where $[A_j,B_j]=NOT[0,0]$ as the leading one position in the floating point result, or, if said floating point result of said floating point operation is a negative value, detecting a next bit position j where:

$$[A_jB_j]=NOT[1,1]$$

and designating said bit position j where $[A_jB_j]=NOT[1,1]$ as the leading zero position in the floating point result.

5,317,528

RANDOM NUMBER GENERATOR

Emanuel Gofman, Haifa, Israel, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 954,186, Sep. 30, 1992, abandoned. This application Sep. 27, 1993, Ser. No. 127,104

Claims priority, application Israel, Oct. 7, 1991, 99660

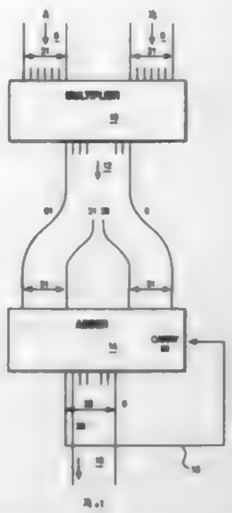
Int. Cl.^{5} G06F ***1/02***

U.S. Cl. 364—717 **5 Claims**

2. Random number generator for generating the next number in a pseudo-random sequence of numbers from a binary representation of an input number and a primitive root of a prime number P, where $P=2^m-1$, where m is an integer, the primitive root being represented as a binary number, the random number generator comprising:

binary multiplier for receiving signals on a first set of input lines, representing the current random number, and for receiving signals on a second set of input lines, representing the primitive root, and for generating responsive to the signals on the input lines product signals on a first set of output lines;

binary adder for receiving signals on lines carrying binary bits 0 to $m-1$ of the first set of output lines, where bit 0 represents the least significant bit, and for adding the binary number represented by the signals on lines carrying bits m to $2m-1$ of the first set of output lines to form sum signals on a second set of output lines, and for further adding the binary value of the signal on the line in the second set of output lines representing bit m, the next binary random number being represented by bits 0 to $m-1$ of the combined sum signals on the second set of output lines.



5,317,529

DIGITAL FILTER USING INTERMEDIATE HOLDING REGISTERS AND COMMON ACCUMULATORS AND MULTIPLIERS

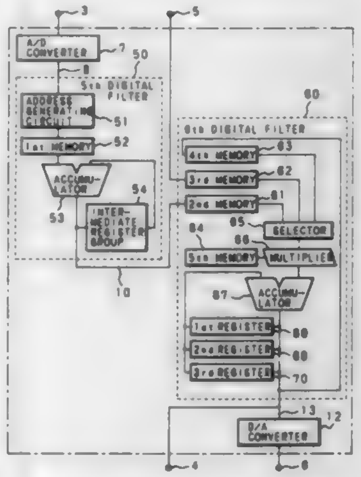
Eiichi Teraoka; Toru Kengaku, both of Itami, and Hiroichi Ishida, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1992, Ser. No. 859,208

Claims priority, application Japan, Apr. 23, 1991, 3-091892

Int. Cl.^{5} G06F ***15/31***

U.S. Cl. 364—724.1 **3 Claims**



1. An analog-to-digital converting apparatus, for generating a signal of digital output samples at an output sample rate representing an input analog signal, comprising:

an analog-to-digital sampler coupled to receive the input analog signal, the assigning a digital value to the input analog signal at a given point in time, wherein said analog-to-digital sampler outputs an intermediate digital signal comprising digital samples at an initial sample rate which is higher than the output sample rate by an integer factor of A and wherein said digital value is one of a finite number of values; and

an M-tap finite-impulse-response (FIR) filter, coupled at an input to receive said intermediate digital signal from said analog-to-digital sampler at said initial sample rate, which outputs the digital output signal at the output sample rate, wherein the digital output signal is said intermediate digital signal filtered according to tap coefficients of said M-tap FIR filter and decimated by a factor of A, and wherein M is a multiple of A, said M-tap FIR filter comprising:

a) an address generation means, coupled to said input of said M-tap FIR filter, for generating an address value;

b) a table look-up means, coupled to receive said address value, for outputting a stored value from a table entry addressed by said address value;

c) an accumulator coupled to received said stored value at a first input;

d) an intermediate register set, comprising M/A holding registers, each coupled to an output of said accumulator and a second input to said accumulator,

wherein, when one digital value from said intermediate digital signal is input to said address generation means, said address generation means outputs an address value which addresses a table entry of said table look-up means which contains the product of said one digital value and at least one tap coefficient, and said product is accumulated by said accumulator into a holding register which accumulates a value for a sample of the digital output sample which is a function of said one digital value.

5,317,530

ROUNDING OPERATION CIRCUIT

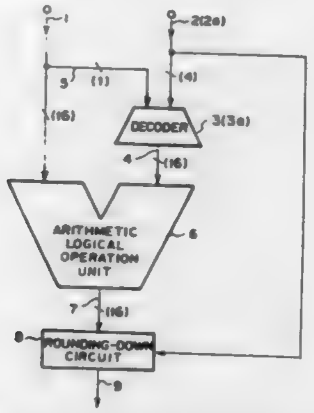
Yoshitaka Toriumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 22, 1993, Ser. No. 34,108

Claims priority, application Japan, Mar. 23, 1992, 4-64425

Int. Cl.^{5} G06F ***7/38***

U.S. Cl. 364—745 **4 Claims**



1. A rounding operation circuit for performing a rounding operation on a first input signal represented in a two's complement form, comprising decoder means for receiving a second input signal designating a rounding position of said first input signal and for outputting a decoded signal in which a bit corresponding to said rounding position takes logic "1" and remaining bits take logic "0" when said first input signal is positive and in which a bit or bits less significant that said bit corresponding to said rounding position takes logic "1" and remaining bit or bits take logic "0" when said first input signal is negative; operational means for performing an adding operation on said first input signal and said decoded signal and for outputting a resultant signal; and rounding-down means performing such a rounding-down operation on said resultant signal that bits of said resultant signal less significant than said rounding position take logic "0".

5,317,531

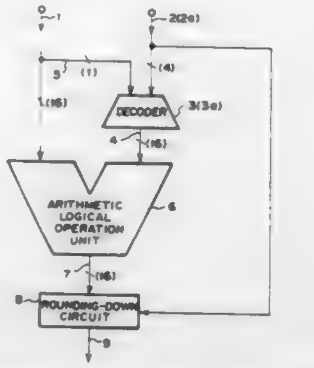
APPARATUS FOR REDUCING THE SIZE OF AN ARITHMETIC AND LOGIC UNIT NECESSARY TO PRACTICE NON-RESTORE DIVISION

Syed A. A. Zaidi, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 2, 1992, Ser. No. 862,348

Int. Cl.^{5} G06F ***7/52***

U.S. Cl. 364—766 **3 Claims**



1. A circuit for accomplishing arithmetic operations comprising:

an arithmetic and logic unit (ALU);

a first register for holding a dividend to be divided, the first register being connected to furnish input to the ALU and to receive intermediate and final results of a division operation from the ALU;

a second register for holding a divisor, the second register being connected to furnish input to the ALU;

a single bit register having an input connected to store a most significant bit of a dividend stored in the first register;

a logic circuit controlling the operation of the ALU to perform non-restore division operations in sequential steps in which bits of the dividend are cyclically shifted by one bit position toward the most significant bit position; and

an exclusive NOR (XNOR) circuit having a first input from the single bit register and a second input from a carryout bit of the ALU,

an output of the XNOR circuit being connected during division operations to furnish input to a lowest order bit of the first register and to the ALU to control the next sequential operation thereof.

5,317,532

SEMICONDUCTOR MEMORY DEVICE HAVING VOLTAGE STRESS TESTING CAPABILITY

Kiyofumi Ochii, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1992, Ser. No. 848,192

Claims priority, application Japan, Mar. 22, 1991, 3-059084

Int. Cl.^{5} G11C ***7/00***

U.S. Cl. 365—149 **2 Claims**

1. A semiconductor memory device comprising:

a plurality of memory cells arranged in rows and columns on a semiconductor substrate, each having one transistor and one capacitor;

a plurality of word lines each connected to said memory cells in the same row;

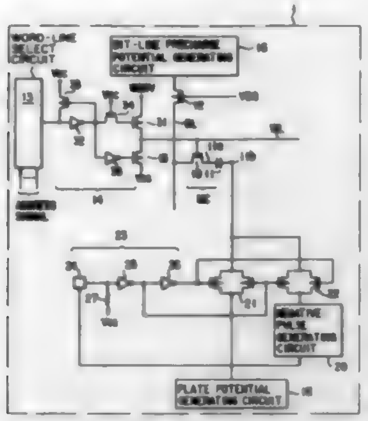
a plurality of bit lines each connected to said memory cells in the same column;

a plate voltage generating circuit for generating a capacitor plate voltage during normal operation;

a negative pulse generating circuit responsive to a control signal supplied thereto during voltage stress testing, for generating a pulse voltage of negative polarity;

a switch circuit for supplying the pulse voltage of negative polarity output from said negative pulse generating circuit to the plate electrodes of said capacitors of all memory cells simultaneously, in place of the output of said plate voltage generating circuit; and

a switch control circuit responsive to said control signal supplied thereto during voltage stress testing, for controlling said switch circuit,


WORD-LINE SELECT CIRCUIT
BIT-LINE PRECHARGE POTENTIAL GENERATING CIRCUIT
NEGATIVE PULSE GENERATING CIRCUIT
PLATE POTENTIAL GENERATING CIRCUIT
13
16
20
21
23
27
VDD

wherein the semiconductor memory device is formed in a chip region of a semiconductor wafer, and wherein said negative pulse generating circuit is also provided for other chip regions of the same semiconductor wafer.

5,317,533

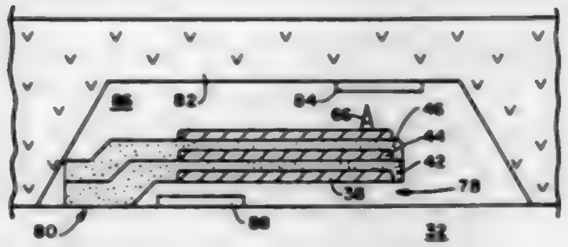
INTEGRATED MASS STORAGE DEVICE

Calvin F. Quate, Stanford; Mark J. Zdeblick, Los Altos, and Thomas R. Albrecht, San Jose, all of Calif., assignors to The Board of Trustees of the Leland Stanford University, Stanford, Calif.

Continuation-in-part of Ser. No. 149,236, Jan. 22, 1988, Pat. No. 4,906,840. This application Aug. 17, 1990, Ser. No. 566,335

Int. Cl.⁵ G11C *11/00, 13/00;* **G01N** *23/00;* **G21K** *7/00*

U.S. Cl. 365—151 **14 Claims**



1. An integrated memory device, comprising:

a substrate;

a recording surface having a recording medium associated therewith for storing information at various locations on said recording surface, said recording surface fixed with respect to said substrate;

a piezoelectric bimorph cantilever attached to said substrate at one end and having a free end with a tip fixed thereto, said bimorph cantilever including two layers of piezoelectric material sandwiched between multiple pairs of electrodes in such a manner that three axis movement of said bimorph cantilever is caused by applying suitable potentials to said multiple pairs of electrodes; and

control means coupled to said multiple pairs of electrodes of the piezoelectric bimorph cantilever, for adjusting the potentials applied between those pairs of electrodes so as to scan said tip over the recording surface to access the various locations on said recording surface.

5,317,534

A MASK READ ONLY MEMORY DEVICE

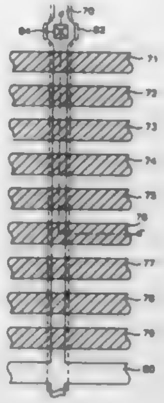
Jeong-Hyeok Choi, and Chul-Ho Shin, both of Seoul, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 792,590, Nov. 15, 1991, Pat. No. 5,200,355. This application Nov. 25, 1992, Ser. No. 981,488

Claims priority, application Rep. of Korea, Dec. 10, 1990, 90-20260; Dec. 10, 1990, 90-20261

Int. Cl.⁵ G11C *11/40*

U.S. Cl. 365—182 **23 Claims**



8. A logic mask ROM, comprising:

a semiconductor substrate having a plurality of diffusion regions of a given impurity adjacent to a contact region and a field oxide region and extending in a first direction said plurality of diffusion regions being separated and spaced-apart from each other by a first equidistance;

a gate oxide layer disposed on the surface of said semiconductor substrate;

a plurality of word lines positioned on the surface of said gate oxide layer extending in a second direction, said plurality of word lines being separated and spaced-apart by a second equidistance, each word line having a width substantially proportional to said first equidistance between adjacent diffusion regions, and each diffusion region having a width substantially proportional to said second equidistance between adjacent word lines;

a first insulation layer disposed on selected word lines of said plurality of word lines, said first insulation layer having a thickness directly proportional to said second equidistance between adjacent word lines;

a second insulation layer disposed to insulate said plurality of word lines; and

a conduction layer positioned on the surface of said second insulation layer extending in said first direction perpendicular to said plurality of word lines and connected to the contact region of said semiconductor substrate.

5,317,535

GATE/SOURCE DISTURB PROTECTION FOR SIXTEEN-BIT FLASH EEPROM MEMORY ARRAYS

Sanjay S. Talreja, Citrus Heights; Duane Mills, Folsom; Jahanshir J. Javanifard, Sacramento, and Sachidanandan Sambandan, Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

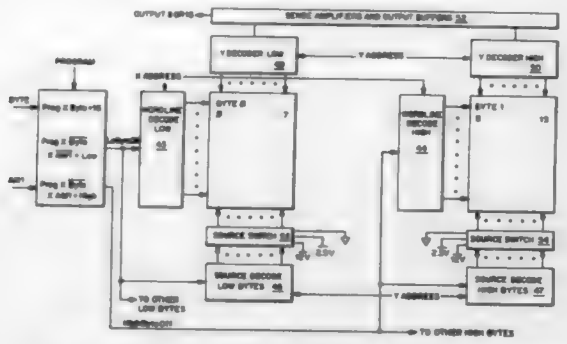
Filed Jun. 19, 1992, Ser. No. 901,110

Int. Cl.⁵ G11C *11/34, 7/00, 8/00*

U.S. Cl. 365—185 **9 Claims**

1. In a flash EEPROM memory array in which a plurality of floating gate field effect transistor memory devices having source, drain, and control gate terminals are arranged in rows and columns, in which wordlines are utilized to select the rows of such devices and bitlines are utilized to select the columns of such devices, in which groups of such devices are arranged in blocks which are independently erasable, and the blocks are divided into sub-blocks for storing lower and upper bytes of words to be stored, the improvement comprising:

means for disabling the wordlines to all high byte sub-blocks



when a byte of data is to be written to a low byte sub-block, and

means for disabling the wordlines to all low byte sub-blocks when a byte of data is to be written to a high byte sub-block.

5,317,536

DUAL-PORT TYPE SEMICONDUCTOR INTEGRATED MEMORY CIRCUIT

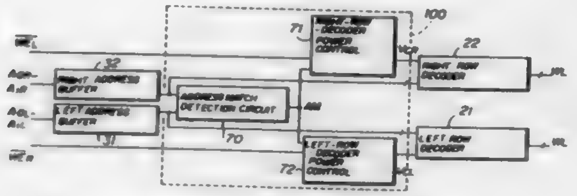
Keizo Aoyama, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 24, 1992, Ser. No. 840,127

Claims priority, application Japan, Feb. 22, 1991, 3-50545

Int. Cl.⁵ G11C *7/00*

U.S. Cl. 365—189.04 **19 Claims**


100
71
RIGHT-ROW DECODER POWER CONTROL
22
RIGHT ROW DECODER
32
RIGHT ADDRESS BUFFER
LEFT ADDRESS BUFFER
ADDRESS MATCH DETECTION CIRCUIT
AM
31
70
LEFT-ROW DECODER POWER CONTROL
72
21
LEFT ROW DECODER

1. A dual-port memory circuit comprising:

a memory cell having a pair of nodes, said pair of nodes controlling data transfer to and from said memory cell;

a first port having a first pair of bit lines and a first word line connected to said memory cell, each one of said first pair of bit lines connected to a corresponding one of said pair of nodes;

a second port having a second pair of bit lines and a second word line connected to said memory cell, each one of said second pair of bit lines connected to a corresponding one of said pair of nodes;

detection means for detecting that one of the first and second port is writing data to said memory cell and the other one of the first and second ports is reading data from said memory cell in a state wherein the memory cell is selected by both the first and second ports and, in response, generating a match signal; and

control means, coupled to said first and second ports and said detection means, for decreasing a potential of one of said pair of nodes in response to said match signal of said detection means.

5,317,537

MULTI-PORT MEMORY DEVICE HAVING PRECHARGED BIT LINES

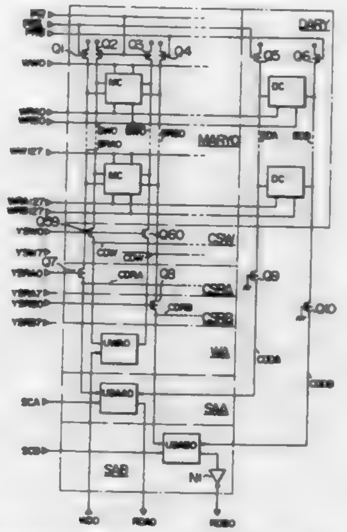
Satoshi Shinagawa, Akishima; Yoichi Sato, Iruma; Masami Hasegawa; Yasushi Shimono, both of Fussa; Masayuki Miyasaka, Sagamihara; Takatoshi Tamura, Akishima, and Yoshio Iioka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi VLSI Engineering Corp., Lodaira, both of Japan

Filed May 27, 1992, Ser. No. 888,493

Claims priority, application Japan, May 28, 1991, 3-152352

Int. Cl.⁵ G11C *13/00*

U.S. Cl. 365—189.04 **17 Claims**



10. A multi-port memory device comprising:

write bit lines each including complementary signal lines;

first and second read bit lines each including of a single-ended signal line;

first and second dummy bit lines provided in correspondence to said read bit lines, respectively; and

sense amplifiers of differential input type each having a non-inverted input terminal connected to a corresponding one of said read bit lines and an inverted input terminal connected to a corresponding one of said dummy bit lines;

a write word line and said first and second read word lines provided in correspondence to each of row address,

said write bit lines and the first and second read bit lines provided in correspondence to each of column addresses; and

wherein said multi-port memory device includes a plurality of static type memory cells, each of said memory cells comprising:

a latch circuit including first and second CMOS inverters cross-coupled to each other,

said latch circuits included in said plurality of static type memory cells, respectively, being disposed in rows and columns at cross-points between said write word lines and said first and second read word lines on one hand and said write bit lines and said first and second read bit lines on the other hand;

wherein each of said latch circuits has first non-inverted and inverted input/output nodes coupled to the corresponding ones of said write bit lines through a pair of write control MOSFETs having gates coupled to corresponding ones of said write word lines, said latch circuit having second non-inverted and inverted input/output nodes which are coupled to corresponding ones of said first and second read bit lines through first and second read control MOSFETs having a gate coupled to a corresponding one of said first or second read word lines.

5,317,538

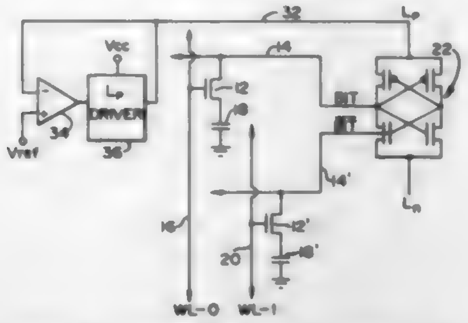
LOW POWER DRAM

S. Sheffield Eaton, Jr., Colorado Springs, Colo., assignor to United Memories, Inc., Colorado Springs, Colo.

Filed Mar. 30, 1992, Ser. No. 859,670

Int. Cl.⁵ G11C *5/14*

U.S. Cl. 365—189.09 **17 Claims**



1. A method of decreasing power consumption in an integrated circuit DRAM having a specified minimum power supply voltage, and wherein transistors in said DRAM have threshold voltages, the DRAM having memory cells associated with bit lines to which voltages are applied during read and refresh operations, the method comprising:

limiting the bit line voltages for said read and refresh operations substantially to a value no higher than the minimum specified power supply voltage minus one said threshold voltage, said limiting step including

comparing a reference signal to a drive signal applied to a sense amplifier coupled to one or more bit lines of the DRAM, and

controlling the magnitude of the drive signal in response to said comparing step.

5,317,539

DYNAMIC RANDOM ACCESS MEMORY FOR VIDEO

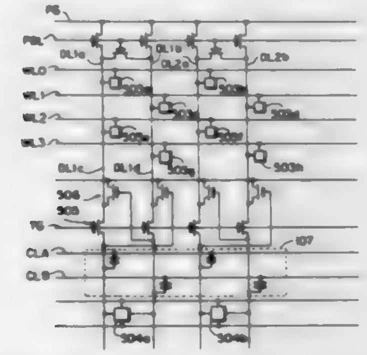
Yasuharu Hoshino, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 29, 1992, Ser. No. 905,418

Claims priority, application Japan, Jun. 27, 1991, 3-183104

Int. Cl.⁵ G11C *11/407;* **G06F** *12/00*

U.S. Cl. 365—207 **7 Claims**



1. A semiconductor memory device comprising: a memory cell array which includes a plurality of memory cells arranged in array form in row and column directions and a plurality of bit line pairs that respectively connect these memory cells in common for every column and word lines that respectively connect these memory cells in common for every row; a sense amplifier connected to each member of said bit line pair at one end of said bit line pair for amplifying the potential difference between said pair of bit lines; a transfer gate provided between said one end of said bit line and said sense amplifier, the energization thereof being controlled in response to a transfer gate control signal; a reference potential correction circuit connected to each of said bit line pair between said sense amplifier and said transfer gate for supplying a predetermined potential to one bit line member of said bit line pair in response to a reference potential control signal; a transfer gate control signal generation circuit which generates said transfer gate control signal; and a reference potential control signal generation circuit which generates said reference potential control signal, wherein

said transfer gate control signal generation circuit is controlled such that during ordinary operation mode the time at which said transfer gate control signal is brought to an active level occurs later than the time at which a predetermined one of said word lines is selected, said transfer gate control signal generation circuit being further controlled such that, during a simultaneous-writing mode in which a plurality of said memory cells are written simultaneously with the same data as each other, the time at which said transfer gate control signal is brought to the active level occurs earlier than the time at which said predetermined word line is selected, and

said reference potential control signal generation circuit is controlled so as to generate during said ordinary operation mode a reference potential control signal having a potential level that corresponds to a correction potential in one bit line member of said bit line pair, said reference potential control signal generation circuit being further controlled so as to generate during said simultaneous-writing mode a reference potential signal having a potential level that corresponds to said same data.

5,317,540

SEMICONDUCTOR MEMORY DEVICE

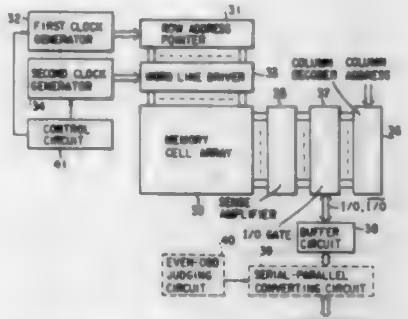
Tohru Furuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1992, Ser. No. 850,318

Claims priority, application Japan, Mar. 14, 1991, 3-74830; Mar. 5, 1992, 4-48312

Int. Cl.⁵ G11C *13/00*

U.S. Cl. 365—230.01 **53 Claims**



1. A semiconductor memory device, comprising:

a memory cell array in which cascade dynamic memory cell units each capable of storing a plurality of bits of information in bits are arranged in a matrix, the memory cells in the same row being connected in common to a corresponding one of a plurality of word lines and the memory cell units in the same column being connected in common to a corresponding one of a plurality of bit lines; and

serial access control means which serially accesses a plurality of memory cell units in a given column of said memory cell array, reads a plurality of bits of information in time-sequence from one of the memory cell units storing information through one of said bit lines connected to the one of said memory cell units, and then sequentially rewrites the bits of information into a different memory cell unit of the memory cell array unused for storing valid data, in the same column containing said one memory cell unit.

5,317,541

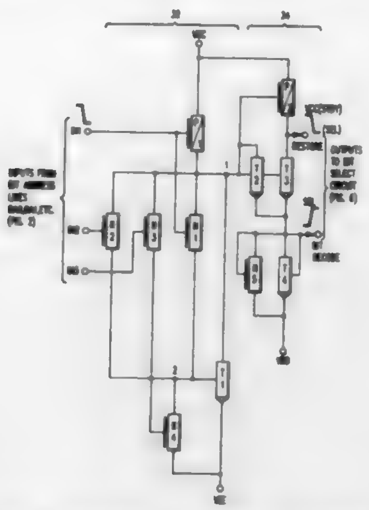
BIT DECODER FOR GENERATING SELECT AND RESTORE SIGNALS SIMULTANEOUSLY

Yuen H. Chan, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 428,794, Oct. 30, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 728,021

Int. Cl.⁵ G11C *7/00, 11/413, 8/00;* **H03K** *19/02*

U.S. Cl. 365—230.06 **1 Claim**



1. A BICMOS bit decoder circuit comprising:

at least three input field-effect transistors (FETs) of a first conductivity type connected in parallel between first and second nodes;

at least three input terminals, each of which is connected to a respective control gate of said at least three input FETs;

a pull-up FET of a second conductivity type, different from said first conductivity type, connected between the first node and a first voltage source, the control gate of said pull-up FET being connected to one of said input terminals;

a bipolar transistor connected between the first node and a second voltage source, the control terminal of said bipolar transistor being connected to the second node; and

output driving means connected between the first voltage source and a third voltage source, having an input that is connected to the first node, and arranged to produce bit decode and restore signals in proper timed relationship in response to signals at the first node.

5,317,542

SHIP'S ATTITUDE DATA CONVERTER

Peter J. Konopelski, Bensalem, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

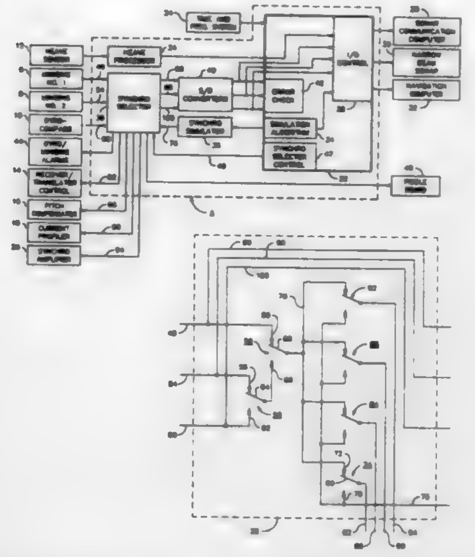
Filed Jul. 21, 1993, Ser. No. 96,088

Int. Cl.⁵ G01S *15/00;* **H04B** *17/00*

U.S. Cl. 367—12 **13 Claims**

1. In a shipboard attitude data system comprising multiple, redundant attitude sensor means, each sensor means providing a set of analog output signals representative of a plurality of attitude parameters, means for utilizing said output signals, and simulator means for generating a set of simulated attitude sensor output signals, in analog form, for testing purposes, a switching system comprising:

switching means, comprising a tree of binary switches, each having two inputs and one output, for selecting any one of said sets of signals and delivering the selected set of signals to said utilizing means;



whereby, at any given time, one and only one of said sets of signals is delivered to said utilizing means.

5,317,543

METHOD AND SENSOR FOR DETERMINING THE DISTANCE OF SOUND GENERATING TARGETS

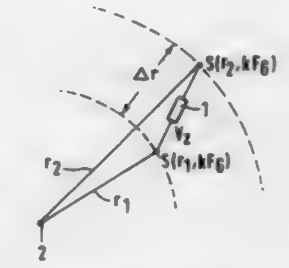
Hermann Grosch, Wülfrath, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Ratingen, Fed. Rep. of Germany

Filed Jan. 7, 1993, Ser. No. 1,722

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1992, 4200170

Int. Cl.⁵ G01S *11/14*

U.S. Cl. 367—125 **7 Claims**

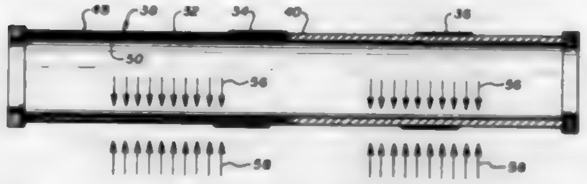


1. A method of determining the target distance of sound generating targets from acoustic signals that are subjected to a Fourier transformation, comprising the steps of: receiving acoustic signals with an acoustic sensor at two successive points in time from a target that is at a first distance r_1 and a second distance r_2, respectively, from the acoustic sensor; subjecting the received acoustic signals to a Fourier transformation to provide respective transformed acoustic signals; determining the phase difference in the sound spectrum of the transformed acoustic signals and evaluating the phase difference in the sound spectrum to yield the difference between the distances of the target from the sensor at the two points in time; and, calculating the target distance from the difference between the distances according to the spherical wave model.

5,317,544
MULTIPLE SEGMENT FIBER OPTIC HYDROPHONE

Steven J. Maas, Simi Valley, and A. Douglas Meyer, West Hills, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Nov. 9, 1992, Ser. No. 973,421
Int. Cl.^{5} H04R *23/00*
U.S. Cl. 367—149 **20 Claims**



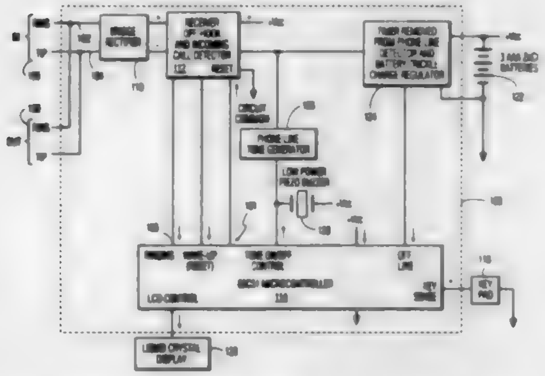
1. A hydrophone comprising, in combination:

a) a plurality of hydrophone components;
b) means for compliantly connecting adjacent hydrophone components;
c) each of said hydrophone components including a mandrel comprising an integral, substantially-cylindrical body that is apportioned into axially-disposed sensing and reference sections;
d) said hydrophone components being coaxially aligned with a finite separation distance between adjacent components and optically interconnected so that acoustic pressure-responsive signals generated by each are combined to form a single hydrophone output.

5,317,545
TELEPHONE TIMER APPARATUS

Gary A. Gray, Thompson, Pa.; Brian LaRocca, Little Falls, and Rodolfo Strauss, Union, both of N.J., assignors to Strauss Trading Corp., Union, N.J.

Filed Dec. 22, 1992, Ser. No. 994,826
Int. Cl.^{5} G04F *8/00;* **G04C** *3/00*
U.S. Cl. 368—4 **2 Claims**

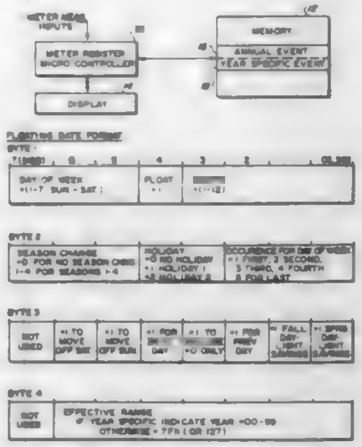


1. A telephone timing apparatus for use in timing the length of telephone calls comprising means for connecting the said apparatus to a telephone and to the incoming telephone line for the said telephone; circuit means for timing the length of a telephone call, said circuit means comprising one or more batteries to provide power to the circuit to operate the timer when the telephone is in use, and means for drawing power from the incoming telephone line when the telephone is not in use to keep said circuit means ready to sense a telephone call and to respond thereto.

5,317,546
TIME-OF-USE CALENDAR EVENTS METHOD AND APPARATUS FOR A METER REGISTER

Richard A. Balch, North Hampton; Marjorie J. Mancuso, Exeter, and Susan D. Dastous, Milford, all of N.H., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 764,874, Sep. 24, 1991, abandoned. This application Jun. 30, 1993, Ser. No. 86,190
Int. Cl.^{5} G04F *8/00;* **G04B** *47/00;* **G01R** *11/57, 21/00*
U.S. Cl. 368—9 **15 Claims**



1. A method of measuring time-of-use of electric energy consumed by an end user coupled to a power delivery system, the time-of-use measuring method comprising the steps of:

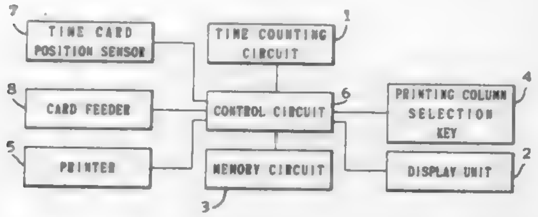
- formatting data within a storage device relating to a plurality of calendar events, including year specific calendar events and annual calendar events, said formatting step comprising the steps of:
  - formatting the corresponding months of said year specific calendar events;
  - formatting the corresponding days of the week of said year specific calendar events; and
  - formatting the occurrence numbers of the days of the week of said year specific calendar events; and associating a time-of-use function with each year specific calendar event;
- comparing a calendar date to the formatted month, the formatted day of the week and the formatted occurrence number of at least one of said year specific calendar events, to determine whether the calendar date matches a a year specific calendar date;
- receiving signals indicative of an amount of energy consumed by an end user from a power delivery system; and
- processing the received signals based upon the time-of-use function associated with the matched year specific calendar event.

5,317,547
TIME RECORDER

Katsumi Oishi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1992, Ser. No. 956,528
Claims priority, application Japan, Oct. 16, 1991, 3-267692
Int. Cl.^{5} G04B *47/00;* **G07C** *1/14*
U.S. Cl. 368—10 **8 Claims**

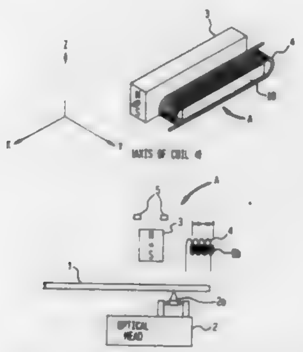
1. A time recorder comprising a time counter for counting current time, means for sensing a time card, a display means, and control means for controlling the display means to display a time, as a work ending time, corresponding to a rounded off time corresponding to a time sensing the time card plus a predetermined time period.



5,317,548
REDUCED HEIGHT MAGNETIC BIAS APPARATUS FOR A MAGNETOOPTICAL DISK DRIVE INCLUDING A COIL MEANS HAVING A CENTRAL AXIS PERPENDICULAR TO THE ROTATING AXIS OF A ROTATABLE MAGNET

Nobuhide Matsuda, Hirakata, and Motoki Kuroda, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 623,301, Dec. 4, 1990, abandoned. This application Jul. 29, 1993, Ser. No. 99,763
Claims priority, application Japan, Dec. 6, 1989, 1-316846; Sep. 10, 1990, 2-240814
Int. Cl.^{5} G11B *13/04, 11/12, 11/10*
U.S. Cl. 369—13 **5 Claims**



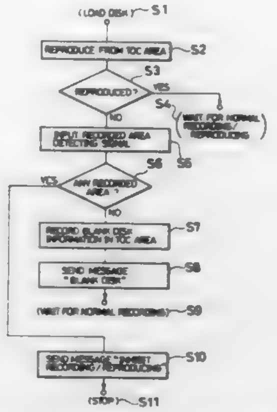
1. A magnetic biasing apparatus for use in a magnetooptical disk drive apparatus, said magnetic biasing apparatus being positioned adjacent to a magnetooptical disk generally opposite an optical head means, and

- said magnetic biasing apparatus comprising:
  - a permanent magnet being rotatable about a rotating axis extended along the length of said permanent magnet, said permanent magnet having north and south poles extended in the direction perpendicular to the rotating axis;
  - rotating means for rotating said permanent magnet, said rotating means consisting of only a single coil displaced adjacent to said permanent magnet so that said permanent magnet is positioned outside said coil, and said rotating means is oriented such that the central axis of said coil is perpendicular to a line connecting said north and south poles of said permanent magnet, the central axis of said coil is parallel to said magnetooptical disc; and
  - drive means for controllably driving said rotating means to produce a magnetic field.

5,317,549
INFORMATION RECORDING AND REPRODUCING APPARATUS

Shigemi Maeda, Yamatokoriyama, and Kunio Kojima, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1992, Ser. No. 876,072
Claims priority, application Japan, Apr. 30, 1991, 3-098878
Int. Cl.^{5} G11B *7/00*
U.S. Cl. 369—32 **21 Claims**


LOAD DISK
S1
REPRODUCE FROM TOC AREA
S2
S3
REPRODUCED?
YES
NO
S4
WAIT FOR NORMAL RECORDING/REPRODUCING
INPUT RECORDED AREA DETECTING SIGNAL
S5
S6
ANY RECORDED AREA?
YES
NO
RECORD BLANK DISK INFORMATION IN TOC AREA
S7
SEND MESSAGE "BLANK DISK"
S8
WAIT FOR NORMAL RECORDING
S9
SEND MESSAGE "INHIBIT RECORDING/REPRODUCING"
S10
STOP
S11

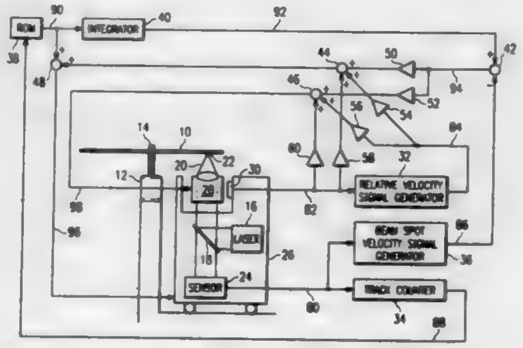
1. An information recording and reproducing apparatus for recording and reproducing on and from a recording medium including a main information recording area wherein plural pieces of main information can be recorded and a control information recording area wherein control information related to each piece of main information in the main information recording area can be recorded, comprising:

- blank medium detection means for detecting whether or not any pieces of main information exist in the main information recording area of a loaded recording medium; and
- recording means for recording in the control information recording area distinctive information indicating no piece of main information in the main information recording area of the loaded recording medium when it is detected by said blank medium detection means that no piece of main information exists in the main information recording area of the loaded recording medium.

5,317,550
APPARATUS AND METHOD FOR TRACK ACCESS

Tetsuo Semba, Zama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1993, Ser. No. 7,875
Claims priority, application Japan, Apr. 28, 1992, 4-109985
Int. Cl.^{5} G11B *7/00*
U.S. Cl. 369—32 **9 Claims**



1. Apparatus for moving a beam spot for writing or reading information onto or from a target track of an optical recording

medium having a plurality of tracks on a surface, the apparatus comprising:

a coarse actuator for moving an objective lens over a plurality of tracks on said surface of said optical recording medium, said objective lens directing a beam spot onto said surface;

a fine actuator, carried by said coarse actuator, for moving said objective lens relative to said coarse actuator in a tracking direction;

means for calculating a distance from a current beam spot position on said surface to a target track;

means for generating a relative position signal indicating a displacement of said objective lens relative to said coarse actuator and a relative velocity signal indicating a velocity of said objective lens relative to said coarse actuator;

means for generating a beam spot velocity signal indicating a velocity of the beam spot relative to said optical recording medium;

means for generating a reference drive signal from the distance calculated by said distance calculating means, said reference drive signal being proportional to a reference acceleration of the beam spot relative to said optical recording medium;

means for generating a reference velocity signal from said reference drive signal indicating a reference velocity of the beam spot relative to said optical recording medium; and

means for generating a velocity difference signal indicating a difference between said reference velocity and said the spot velocity;

wherein said coarse actuator is driven by a coarse actuator drive signal in accordance with said relative position and relative velocity signals of said objective lens, said velocity difference signal and said reference drive signal; and

wherein said fine actuator is driven in accordance with said relative position and relative velocity signals of said objective lens and said velocity difference signal.

5,317,551

AN OPTICAL DISK HEAD INCLUDING A LIGHT PATH HAVING A THICKNESS AND WIDTH GREATER THAN THE LIGHT BEAM WAVELENGTH BY A PREDETERMINED AMOUNT

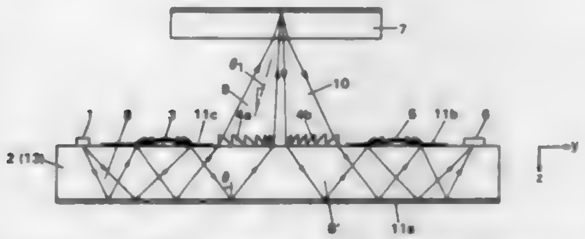
Teruhiro Shiono, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 12, 1991, Ser. No. 729,140

Claims priority, application Japan, Jul. 16, 1990, 2-189052; Jul. 16, 1990, 2-189053

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—44.12 **44 Claims**



1. An optical disk head comprising a substrate, a light path for allowing light beam to propagate in a zigzag form, having a thickness and width of at least 10 times greater than the wavelength, a light source optically connected to the light path so as to allow an incident light from the light source to propagate therethrough, a first light condensing means optically connected to the light path so as to radiate the light beam propagated through the light path upon an optical recording medium provided over a top surface of the substrate, a second light condensing means for guiding the light beam reflected from the optical recording medium into the light path, and an optical detector for detecting the light beam propagated through the light path guided by the second light condensing means, the first light condensing means being a diffractive optical component having a curved grating which comprises a plurality of curves which are bulged in the direction in which the light beam from the light source are propagated and symmetrical with respect to the center line of the propagating light beam.

5,317,552

LINEAR ACTUATOR FOR DRIVING AN OPTICAL HEAD INCORPORATED IN AN OPTICAL DISK

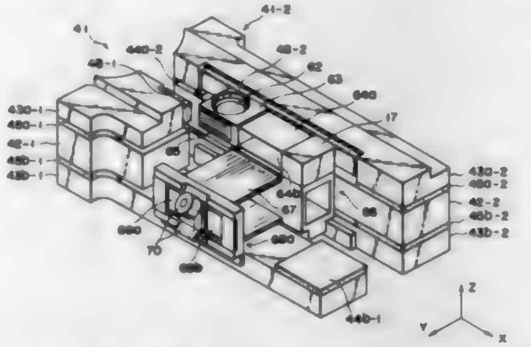
Hideo Yamasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 13, 1990, Ser. No. 538,098

Claims priority, application Japan, Jun. 13, 1989, 1-148451; Dec. 27, 1989, 1-336660; Feb. 27, 1990, 2-44404

Int. Cl.^{5} G11B *7/09*

U.S. Cl. 369—44.14 **31 Claims**



7. A system for optically reproducing information from an optical recording medium, comprising:

focusing means for focusing a light beam onto said optical recording medium in a first direction;

moving means for moving said focusing means in the first direction;

driving force generating means for generating a first driving force to convey said focusing means in a second direction perpendicular to the first direction, said driving force generating means including first and second magnetic circuit means arranged with an interval therebetween in a third direction perpendicular to the first and second direction, and

conveyor means for conveying said focusing means in the second direction;

each of said first and second magnetic circuit means including;

a first yoke, having a flat surface, for allowing magnetic fluxes to pass therethrough;

a second yoke, having one and opposite flat surfaces, said one surface opposing one surface of said first yoke via a first gap, and arranged in a first direction, for allowing magnetic fluxes to pass therethrough;

a third yoke, having one flat surface opposing the opposite surface of said second yoke via a second gap and arranged in the first direction, for allowing magnetic fluxes to pass therethrough;

first and second plate-like permanent magnets each having surfaces of one and another poles, separately arranged in said first gap in a second direction perpendicular to the first direction, the surface of the one pole being fixed to the surface of said first yoke, and the surface of another pole being fixed to said second yoke;

third and fourth plate-like permanent magnets each having surfaces of one and another poles, separately arranged in said second gap in the second direction, the surface of the another pole being fixed to said opposite surface of said second yoke, and the surface of the one pole being fixed to said one surface of said third yoke, said first, second, third and fourth plate-like permanent magnets supplying magnetic fluxes to said yokes to generate first and second magnetic fields across said first and second gaps in the first direction, respectively; and

magnetic field generating means, arranged close to one of said first and second yokes, for generating a third magnetic field in the third direction;

said conveyor means including:

an electro-magnetic tracking coil having first and second sections extending in said first and second magnetic circuits, said first and second sections extending in said first and second gaps of each of said first and second magnetic circuits, respectively, and first and second current components being supplied to the first and second sections in one and opposite directions in said first and second gaps in the third direction, respectively, and

first supporting means for supporting said electro-magnetic tracking coil to be conveyed in the second direction, said electro-magnetic coil being conveyed in the second direction by a first driving force generated by interactions between the first magnetic field and the first current component and between the second magnetic field and the second current component, and

said moving means including;

an electro-magnetic focusing coil having a section in which a third current component is flowed in the second direction, and

second supporting means, held on said first supporting means, for supporting said electro-magnetic focusing coil and said focusing means to move in the first direction, said focusing means and said electro-magnetic focusing coil being moved in the first direction by a second driving force generated by interaction between the third magnetic fields and the third current; and

optical guide means for guiding light beams to said focusing means being conveyed, wherein said magnetic field generating means includes a fifth permanent magnet having one and another poles arranged in the third direction and wherein said fifth permanent magnet is fixed to one of said first and second yokes.

5,317,553

OPTICAL DISC RECORDING AND/OR REPRODUCING APPARATUS HAVING A BUFFER MEMORY TO ACCOMMODATE TRACK JUMPS

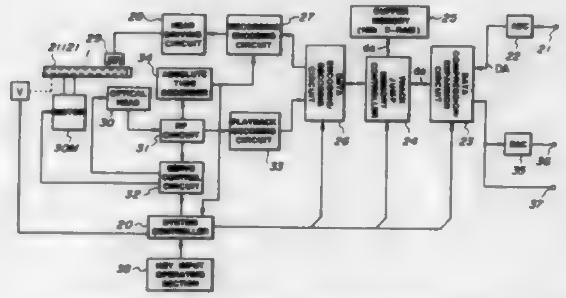
Norio Ohga, Tokyo; Katsuaki Tsurushima, and Tadao Yoshida, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 15, 1991, Ser. No. 745,486

Claims priority, application Japan, Aug. 23, 1990, 2-221725

Int. Cl.^{5} G11B *7/00, 20/10*

U.S. Cl. 369—54 **7 Claims**



1. A recording apparatus for a disc-shaped recording medium which has a disc-shaped transparent base plate, a recording layer provided on said base plate and a protective layer provided on said recording layer, wherein the base plate has a diameter not larger than 64 mm and an address information is previously recorded on said disc-shaped recording medium as a wobbled groove, a recording track is formed according to said wobbled groove at a track pitch of approximately 1.6 μm, and the track has an information recording capacity of not less than 130 Mbytes, said recording apparatus comprising:

a rotational driving means for detecting a signal from the wobbled groove and rotationally driving the disc-shaped recording medium at a constant linear velocity in accordance with the signal detected from the wobbled groove;

data compression means for data-compressing an input digital information;

recording encoding means for processing compressed data from said data compression means by error correction encoding and predetermined modulation;

recording means, including a recording head, for recording encoded data from said recording encoding means on said disc-shaped recording medium while rotating the recording medium at a constant linear velocity by said rotational driving means;

means for detecting a track jump by the recording means due to vibration and for resetting the recording means to a correct track position after the occurrence of the track jump;

a buffer memory provided between said data compression means and said recording encoding means, said buffer memory having at least a data capacity capable of storing data from said data compression means corresponding to a recording time which elapses between an occurrence of a track jump of a position of said recording means on said disc-shaped recording medium and a resetting of the recording head to a correct track position; and

wherein the means for detecting a track jump further includes buffer memory control means for causing data to be read out of the buffer memory during periods when no track jump is detected so as to always maintain a writing space in the buffer memory which is in excess of a predetermined data volume.

5,317,554

MAGAZINE LOADER HAVING AN EJECTOR ARM

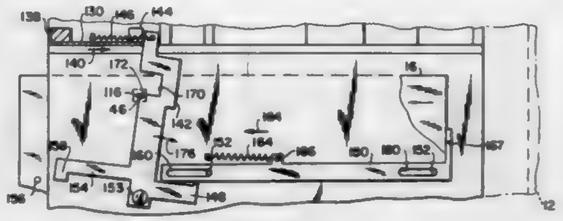
Wilhelm Taylor; Michael D. Faucett, and Daniel J. Woodruff, all of Colorado Springs, Colo., assignors to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 432,914, Nov. 6, 1989, Pat. No. 5,153,862.

This application Mar. 27, 1992, Ser. No. 859,190

Int. Cl.^{5} G11B *17/08, 5/016, 33/02*

U.S. Cl. 369—77.2 **4 Claims**



1. An apparatus for locking and ejecting a magazine from a magazine carrier, the carrier having a top and a first and second side, comprising:

a slide;

at least one pivot arm;

means for operatively connecting said pivot arm to said slide;

at least one ejector mounted for movement with respect to said carrier and said pivot arm; and

biasing means for urging said ejector for movement with respect to said carrier in an ejection direction,

wherein said pivot arm is arranged to latch said ejector against movement in said ejection direction, and comprises:

an elongated portion pivotally connected to at least one of the sides of the magazine carrier, and positioned between the magazine carrier and the magazine;

- a first transverse arm proximate a pivot point of said elongated portion for operatively connected said first transverse arm to said ejector; and
- a second transverse arm opposite said first transverse arm for interconnection to a magazine retaining pin on the magazine, and wherein said second transverse arm holds the magazine by said retaining pin and said first transverse arm holds said ejector while the magazine is in the magazine carrier, and

said means for operatively connecting causes said pivot arm to release said ejector to eject the magazine from the magazine carrier.

5,317,555

OPTICAL HEAD DEVICE UTILIZING PARTIALLY OVERLAPPING LIGHT SPOTS TO READ INFORMATION FROM A READOUT LAYER

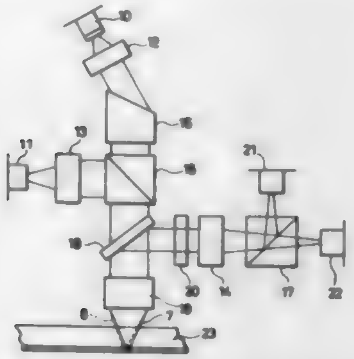
Akira Takahashi, Nara; Yoshiteru Murakami, Nishinomiya; Junsaku Nakajima, Yamatotakada, and Kenji Ohta, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1992, Ser. No. 910,837

Claims priority, application Japan, Jul. 8, 1991, 3-167205

Int. Cl.^{5} G11B *13/04*

U.S. Cl. 369—110 **9 Claims**



1. An optical head device for reproducing information from a magneto-optical recording medium in combination therewith, said medium comprises a recording layer whereon information is magneto-optically recorded by a magnetic field modulation method and a readout layer with a Curie temperature that is substantially higher than that of the recording layer, the readout layer having a direction of magnetization that is a parallel to the recording layer at room temperature, and that changes to be perpendicular to the recording layer within a predetermined temperature range between room temperature and the Curie temperature,

the optical head device comprising:

- a first irradiation means for irradiating the readout layer with a first light beam to form a first shifting light spot for raising the temperature of the readout layer; and
- a second irradiation means for irradiating the readout layer with a second light beam to form a second shifting light spot for detecting the magneto-optical effect of the readout layer, the second light spot being formed behind the first light spot with respect to a shift direction of the first light spot, the first and second light spots having predetermined diameters partially overlapping on each other with a predetermined space kept between their centers.

5,317,556

INFORMATION PROCESSING APPARATUS AND OPTICAL HEAD INCORPORATED THEREIN

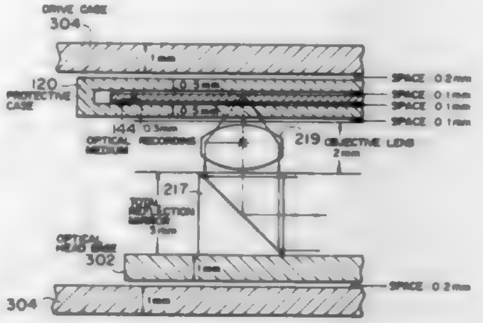
Nobuyoshi Tsuboi, Ibaraki; Yoshio Sato, Hitachi; Hiroyuki Minemura, Hitachi; Hisashi Andoh, Hitachi; Masaichi Nagai, Hitachi; Isao Ikuta, Iwaki; Yoshimi Katou, Takahagi; Yoshihito Maeda, Mito; Tatsuya Sugita, Hitachi, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,609

Claims priority, application Japan, Dec. 13, 1989, 1-321448

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—112 **29 Claims**



1. An information storage device for an information processing apparatus comprising:

- an optical memory having an optical recording medium for storing information and being rotatably mounted in a case in such a way that surface fluctuations of the optical recording medium are limited to a range of from 0.1 mm to 0.9 mm during rotation in the case;
- an optical head for irradiating light, which is focused by means of an objective lens having an effective diameter of 1.0 to 3.8 mm on said optical recording medium, to perform at least one of recording information on said optical recording medium, reproducing information recorded on said optical recording medium and erasing information recorded on said optical recording medium;
- rotation means for rotating said optical recording medium in said case; and
- drive means electrically connected to said optical head and said rotation means for controlling operation of said optical head and the speed of rotation of said optical recording medium by said rotation means.

5,317,557

OPTICAL HEAD FOR RECORDING AND REPRODUCING INFORMATION ON AND/OR FROM OPTICAL RECORD MEDIUM

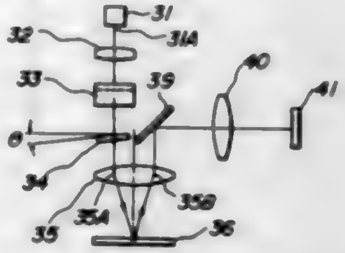
Atsuo Goto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,860

Claims priority, application Japan, May 31, 1990, 2-139839

Int. Cl.^{5} G11B *7/00*

U.S. Cl. 369—112 **8 Claims**



1. An optical head for recording and/or reproducing information on and/or from an optical record medium, said optical head comprising a semiconductor laser diode for emitting a diverging laser beam, a collimator lens for converting the diverging laser beam emitted from a laser emitting point of the semiconductor laser diode into a parallel laser beam, a transmissive diffraction grating for dividing the parallel laser light beam emanating from the collimator lens into a plurality of laser beams, and an objective lens for projecting said plurality of laser beams onto the optical record medium, wherein said transmissive diffraction grating is arranged to be inclined with respect to a plane which is perpendicular to an optical axis of light from the semiconductor laser diode incident on the transmissive diffraction grating.

5,317,558

ELECTRONIC VOLUME VARYING APPARATUS RESTRICTED BY MUTING MODE

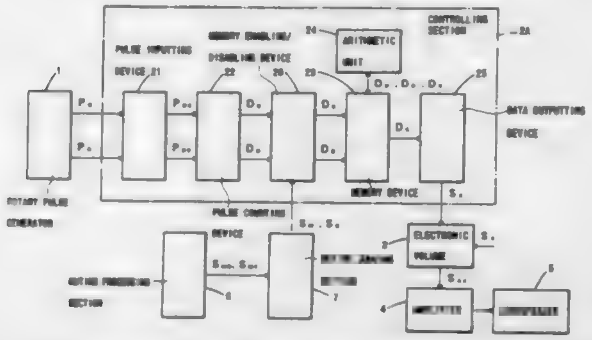
Heihachiro Yagami; Kazuhiro Kimizuka, and Masahiro Odashima, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 27, 1992, Ser. No. 889,145

Claims priority, application Japan, Oct. 9, 1991, 3-262069; Oct. 23, 1991, 3-275363; Oct. 24, 1991, 3-087213[U]

Int. Cl.^{5} H03G *3/02;* G11B *9/00*

U.S. Cl. 369—126 **10 Claims**



1. An electronic volume varying apparatus for producing a controlling signal to control an audio volume level comprising:

- pulse inputting means for receiving an input pulse signal from a manually operable audio level controlling means;
- pulse counting means for counting pulses of the input pulse signal;
- memory means for storing therein an input of said pulse counting means;
- muting judging means for outputting a memory disabling signal in response to a muting-on signal
- memory enabling/disabling means interposed between said pulse counting means and said memory means for normally permitting the output of said pulse counting means to be stored into said memory means but inhibiting, when the memory disabling signal is received from said muting judging means, the output of said pulse counting means from being stored into said memory means; and
- means for generating a controlling signal in response to data stored in said memory means.

5,317,559

DUAL PIVOT DISC DRIVE APPARATUS AND METHOD

Efim Bronsvatch, Saratoga, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

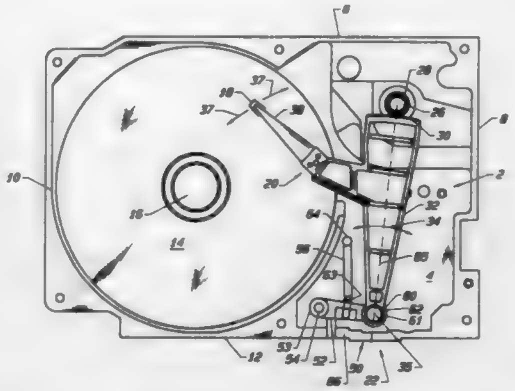
Continuation of Ser. No. 497,395, Mar. 22, 1990, abandoned. This application Jun. 26, 1992, Ser. No. 906,037

Int. Cl.^{5} G11B *5/55, 21/08*

U.S. Cl. 369—244 **13 Claims**

8. A dual pivot apparatus for a disc drive having a base plate, comprising:

- actuator arm means driven by a pinion means for moving a transducer head mounted to said actuator arm means across a disc to read and write to said disc, said actuator arm means including a pivot aperture distal from said pinion means for receiving a first pivot pin;
- pivot arm means comprising 1) said first pivot pin extending from a first end, and 2) a second pivot aperture distal from said first pivot pin on a second end of said pivot arm means, said first pivot pin of said first end of said pivot arm means pivotally disposed within said first pivot aperture in said actuator arm means opposite said pinion means, said second end of said pivot arm means having a fixed pivot connection to said base plate, said fixed pivot connection to said pivot arm means being fixed axially; and
- preload means for biasing said pivot arm means so that said actuator arm means is in constant contact with said pinion means, said preload means coupled to said pivot arm means at a point spaced from said actuator.



5,317,560

STAR DATA NETWORK WITH LOGICAL RING FUNCTION PREFERABLY USING TOKEN ACCESS

Lars Ingre, Huddinge; Svante Axling, Älvsjö , and Per-Ove Johansson, Stockholm, all of Sweden, assignors to Joing Invest AB, Huddinge, Sweden

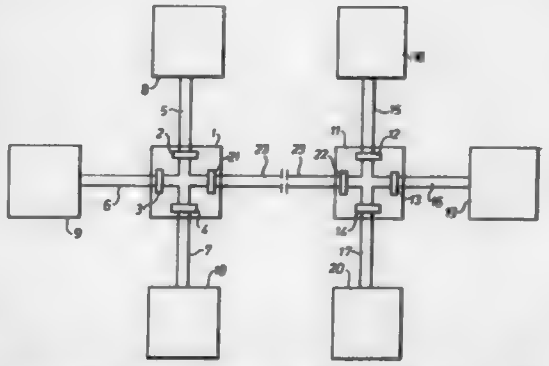
PCT No. PCT/SE90/00131, § 371 Date Aug. 21, 1991, § 102(e) Date Aug. 21, 1991, PCT Pub. No. WO90/10345, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 26, 1990, Ser. No. 582,941

Claims priority, application Sweden, Feb. 27, 1989, 8900674

Int. Cl.^{5} H04L *12/44*

U.S. Cl. 370—16 **5 Claims**



1. Star data network with logical ring function utilizing token access, including line concentrators with a plurality of bypass switching means each arranged for a corresponding link to a node in the data network, wherein each of said links comprises at least one transmission line, and wherein each of said bypass switching means is provided with an active signal processing means having first and second signal sides, said active signal processing means being adapted for superimposing on said first signal side a first incoming and a first outgoing signal on a single transmission line in said corresponding link,

and on said second signal side for smoothing out a second incoming signal's contribution to a second outgoing signal, said first incoming and first outgoing signals on said first signal side corresponding to said second outgoing and second incoming signals on said second signal side, respectively, said single transmission line in said corresponding link being connected to said node via another signal processing means with a function corresponding to the function of said active signal processing means.

5,317,561

METHOD FOR SWITCHING ATM MESSAGE CELL STREAMS HAVING A HIGH BIT RATE VIA A SWITCHING EQUIPMENT HAVING A LOWER BIT RATE

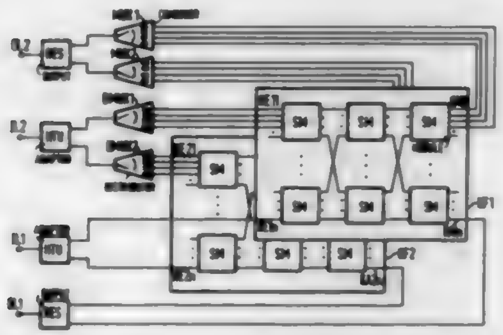
Wolfgang Fischer, Germering, and Juergen Storm, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 5, 1992, Ser. No. 880,188

Claims priority, application European Pat. Off., May 7, 1991, 91107434.2

Int. Cl.^{5} H04L *1/22*

U.S. Cl. 370—16 **8 Claims**



1. A method for switching message cells of a message cell stream of a transmission system that transports the message cell stream according to an asynchronous transfer mode across a switching network having modules, each of the modules having switching elements, comprising the steps of: providing the switching network with a plurality of redundant switching network matrices, each of said redundant switching network matrices having modules; for a transport bit rate of the transmission system that is a multiple of a transmission bit rate of the switching elements, distributing the message cells of the message cell stream over a plurality of switching network inputs of the switching network that corresponds in number to said multiple of the transmission bit rate of the switching elements, the message cells being separately distributed for each switching network matrix of the plurality of redundant switching network matrices; adding to the message cells information that indicates all modules via which respective message cells are through-connected to a respective switching network output of a plurality of switching network outputs of the switching network, message cells that are through-connected via a plurality of modules and that are through-connected via different modules having information attached to them that designate different routes via different modules for successive message cells, and given outage of a down module, the message cells being only provided with information that respectively indicates a route through the switching network that by-passes the down module; call-individually attaching a cyclically continuous sequence number to the message cells of the message cell stream, a sequence of the message cells in the message cell stream being assured on the basis of the sequence number when the message cells are recombined to form the message cell stream; through-connecting the message cells to the appertaining outputs via respectively indicated modules; and recombining the message cells to form the message cell stream.

5,317,562

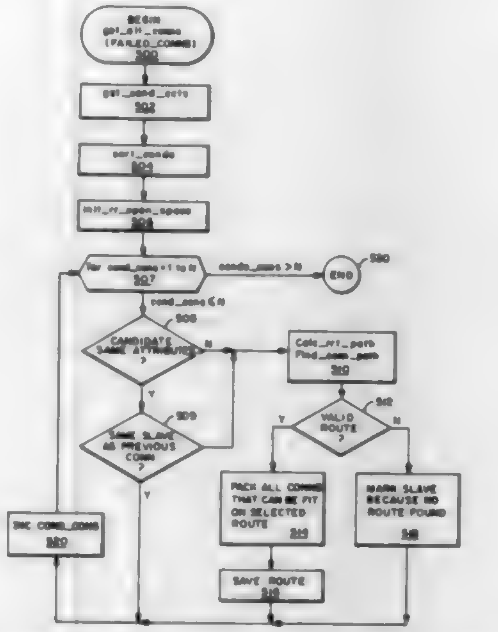
METHOD AND APPARATUS FOR ROUTING CELL MESSAGES USING DELAY

Raffaele P. Nardin, Mountain View, and Charles M. Corbalis, Milpitas, both of Calif., assignors to Stratacom, Inc., San Jose, Calif.

Continuation of Ser. No. 663,256, Feb. 28, 1991, abandoned. This application May 7, 1993, Ser. No. 58,781

Int. Cl.^{5} H04L *12/56*

U.S. Cl. 370—16 **7 Claims**


BEGIN
(FAILED_CONNS)
300
302
304
306
307
END
330
308
CANDIDATE SAME ATTRIBUTES ?
N
Y
309
SAME SLAVE AS PREVIOUS CONN ?
Y
310
312
VALID ROUTE ?
Y
N
PACK ALL CONNS THAT CAN BE FIT ON SELECTED ROUTE
MARK SLAVE BECAUSE NO ROUTE FOUND
SAVE ROUTE

1. In a cell switching network having a multiplicity of nodes, a method of rerouting connections, each connection connecting a master node and a slave node, the master node and the slave node each being a one of the multiplicity of nodes, each connection having an associated loading and being a type of a multiplicity of types of connections accommodated by the cell switching network, the method comprising the steps of:

a) identifying connections needing to be rerouted;

b) ordering the connections needing to be rerouted according to their associated loading;

c) selecting a selected connection from the connections needing to be rerouted and that have been ordered, the selected connection connecting a selected master node and a selected slave node; and

d) rerouting the selected connection by:

  1) selecting candidate routes from among working routes connecting the selected master node and the selected slave node, each candidate route having the smallest route delay in terms of a total node delay between the selected master node and the selected slave node as compared to route delays of other working routes between the selected master node and selected slave node, each candidate route having a bandwidth;

  2) validating true each candidate route if the route delay of the candidate route is within a user configurable prescribed limit for the type of the selected connection and if the bandwidth of the candidate route is sufficient to accommodate the selected connection;

  3) rerouting the selected connection via a one of the candidate routes that have been validated true; and

  4) updating a validated route description table in the selected master node to reflect packing of the candidate route by which the selected connection has been rerouted, the validated route table including the route delay, bandwidth, and packing of each candidate route.

5,317,563

METHOD OF AND SYSTEM FOR MONITORING PACKET RATE IN PACKET NETWORK

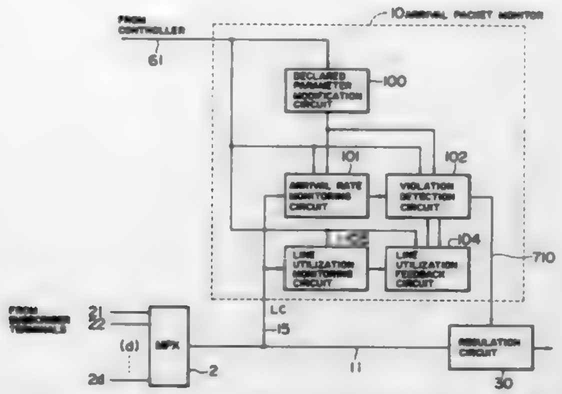
Toshiya Oouchi, Kokubunji; Keiko Kuroda, Tokyo, and Nobuhiko Ido, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1992, Ser. No. 865,051

Claims priority, application Japan, Apr. 10, 1991, 3-077568

Int. Cl.^{5} H04J *3/14;* **H04L** *12/56, 12/26*

U.S. Cl. 370—17 **16 Claims**


FROM CONTROLLER
10 ARRIVAL PACKET MONITOR
61
DECLARED PARAMETER MODIFICATION CIRCUIT
100
101
102
ARRIVAL RATE MONITORING CIRCUIT
VIOLATION DETECTION CIRCUIT
104
LINE UTILIZATION MONITORING CIRCUIT
LINE UTILIZATION FEEDBACK CIRCUIT
710
LC
15
FROM SUBSCRIBER TERMINALS
21
22
(d)
2d
MPX
2
11
REGULATION CIRCUIT
30

1. A method of monitoring the packet rate by a monitoring system at the entrance to a packet network, said monitoring system being connected with a communication line to which a plurality of subscriber terminal devices are coupled through a connecting apparatus which fluctuates the interval of packets on a communication path between the subscriber terminal devices and the packet network, said method comprising the steps of:

- presenting to a controller of the packet network from each of said subscriber terminal devices declared parameters representative of the packet rate in communication, which will be performed by the subscriber terminal device, on request of call connection for a call;
- determining by said controller of said packet network which accepts the request of the call connection whether transmission of the call from the subscriber terminal device is permissive based upon utilization condition of the packet network and the declared parameters;
- permitting a subscriber terminal device, by said controller, to transmit packets within a range of said declared parameters;
- automatically modifying at least one of the declared parameters depending upon at least one of a status of said connecting apparatus and a transmission status of packets on the communication path between the subscriber terminal devices and the packet network monitored by said monitoring system;
- transmitting packets from the subscriber terminal device; and
- monitoring by said monitoring system at the entrance to the packet network based upon the modified declared parameters whether or not transmission of excessive packets which violates the modified declared parameters is carried out.

5,317,564

MERGING NETWORK FOR COLLECTION OF DATA FROM MULTI-COMPUTERS

Steven F. Nugent, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

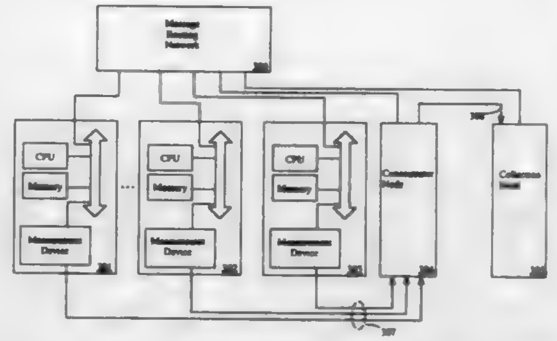
Filed Dec. 30, 1992, Ser. No. 998,528

Int. Cl.^{5} H04J *3/14, 3/24;* **H04L** *12/56*

U.S. Cl. 370—17 **7 Claims**

1. A system for collecting data in a multi-processor including a message routing network for routing messages, the system comprising:

- a plurality of processing nodes, each node communicating with another node through the message routing network, each node having a measurement circuit for measuring predetermined events occurring within the node to produce a plurality of measurement data packets;
- a concentrator bus coupled to each node for receiving the measurement data packets from each node;



- a concentrator, coupled to the concentrator bus, for outputting a multiplexed serial sequence of the measurement data packets in response to a parallel asynchronous input of the measurement data packets received over the concentrator bus from said plurality of nodes;
- a collection bus coupled to said concentrator for receiving the serial sequence of measurement data packets; and
- a collection node coupled to said collection bus for receiving the serial sequence of measurement data packets and demultiplexing the measurement data packets.

5,317,565

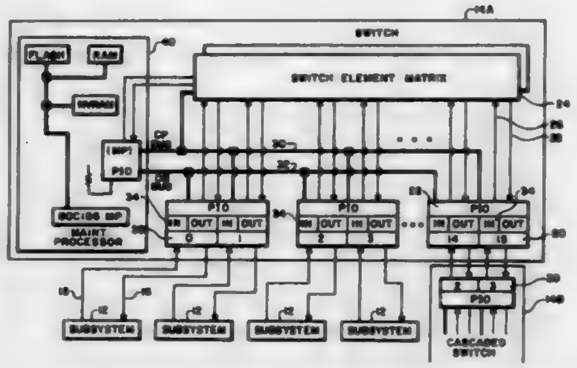
METHOD OF SEQUENCING BUS OPERATIONS IN A SIMPLEX SWITCH

Richard S. Crouse, Boca Raton, Fla.; John J. Cazzolla, Cary, N.C.; Luke L. Chang, Boca Raton, Fla.; Marco M. Hurtado, Boca Raton, Fla.; Kha D. Nguyen, Boca Raton, Fla.; Jose L. Rivero, Boca Raton, Fla.; Jose J. Ruiz, Boca Raton, Fla., and Louis Salcedo, Delray Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1993, Ser. No. 9,602

Int. Cl.^{5} H04Q *11/04*

U.S. Cl. 370—58.2 **13 Claims**



1. A prioritization scheme for determining a predefined sequential order of processing each contending connection and disconnection request through a simplex switch which is initiated by interconnected subsystems in a data communications system, independent of the order in which said requests are initiated, said prioritization scheme comprising the steps of:

(i) determining which of said contending requests are disconnect requests and processing all disconnect requests before processing any connect requests;

(ii) for each contending group of disconnect requests, determining a first subset of disconnect requests which are destined for an interconnected subsystem which currently has pending against it a connection request and processing said first subset of requests before processing a second subset of disconnect requests which are destined for interconnected subsystems which currently have no connection requests pending against them; and then

(iii) for each contending group of connect requests, processing non-queued requests before processing queued requests.

5,317,566

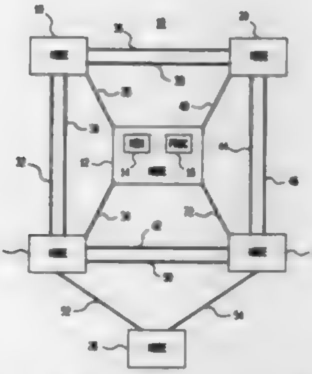
LEAST COST ROUTE SELECTION IN DISTRIBUTED DIGITAL COMMUNICATION NETWORKS

Ramchandra Joshi, Montville, N.J., assignor to Ascom Timeplex Trading AG, Bern, Switzerland

Filed Aug. 18, 1993, Ser. No. 107,869

Int. Cl.^{5} H04Q *11/04;* H04J *3/24*

U.S. Cl. 370—60 **14 Claims**



1. A method for selecting a least cost route from an originating node in a distributed digital communications network to one of a plurality of destination nodes in said network, the nodes in said network being interconnected by links with at least some of said destination nodes being accessible to said originating node only by multiple links, and at least said originating node having a memory and a processor associated therewith, the method comprising the steps of:

receiving in said processor a connection request including a first set of transmission requirements for a route from said originating node to a designated one of said destination nodes;

storing said first set of transmission requirements in said memory;

calculating in said processor and storing in said memory the least cost route from said originating node to said designated destination node in which each link satisfies said first set of transmission requirements;

establishing the route stored in said memory from said originating node to said designated destination node;

receiving in said processor a second service request including a second set of transmission requirements for a route from said originating node to said designated destination node;

comparing, in said processor, said second set of transmission requirements to said first set of transmission requirements stored in said memory;

if said second set of transmission requirements matches said first set of transmission requirements, then validating the route stored in said memory to determine that it is still functional; and

establishing the route stored in said memory from said originating node to said designated destination node.

5,317,567

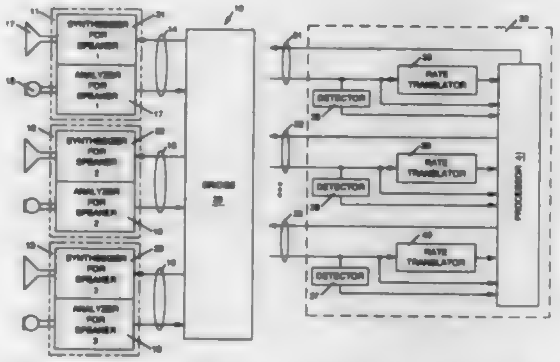
MULTI-SPEAKER CONFERENCING OVER NARROWBAND CHANNELS

Terrence G. Champion, Hudson, N.H., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 12, 1991, Ser. No. 760,021

Int. Cl.^{5} H04L *12/18*

U.S. Cl. 370—62 **9 Claims**



1. A process of facilitating multispeaker conferencing for users of a digitally encoded voice system, wherein each of said users is capable of outputting encoded digital voice signals in a bit stream at a system data rate, wherein said process comprises the steps of:

counting a number of active conferees to produce thereby a count number N, said active conferences being users of said digitally encoded voice system which are speaking when said counting step is performed;

compressing each of the encoded digital voice signals produced by said active conferees down to a plurality of compressed digital signals which each have a compressed data rate, wherein said counting and compressing steps are performed using a microprocessor which is electrically connected to each of said users of said digitally encoded voice system using telephone lines and a plurality of modem units, wherein said microprocessor is programmed to perform as a conferencing bridge and to perform said counting and compressing steps, wherein said compressing step comprises digitally compressing each of said encoded digital voice signals into said compressed digital signals such that their compressed data rate has a bit rate given by SDR/N, where SDR is the system data rate, and N is the number of active conferees;

a digital signal summation step, in which the compressed digital signals are combined to output thereby a combined compressed digital signal which is transmitted to said users at the system data rate; and

decoding said combined compressed digital signal to output thereby an artificial voice signal to said users of the digitally encoded voice system, wherein said artificial voice signal represents voices of all the active conferees which are speaking.

5,317,568

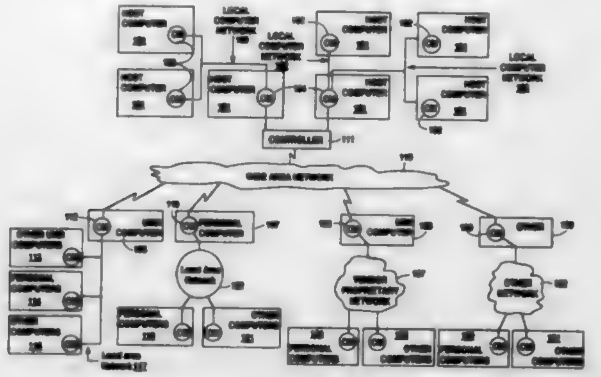
METHOD AND APPARATUS FOR MANAGING AND FACILITATING COMMUNICATIONS IN A DISTRIBUTED HETERGENEOUS NETWORK

Joy P. Bixby, Castle Rock, Colo.; Michael C. Eorgoff, Glen Ellyn, Ill.; Bruce N. Gagne; Richard D. Houser, both of Littleton, Colo.; Mario J. Ivanoff, Denver, Colo.; Daniel W. Osband, Evergreen, Colo.; Darrel D. Richardson, Littleton, Colo., and Mary Z. Skaates, Englewood, Colo., assignors to Galileo International Partnership, Rosemount, Ill.

Filed Apr. 11, 1991, Ser. No. 685,073

Int. Cl.^{5} H04L *12/48*

U.S. Cl. 370—85.6 **20 Claims**



1. A method of communicating between communications managers of a distributed heterogeneous network, each communications manager being connected to a respective plurality of privileged and non-privileged end users, comprising:

transferring information distribution units from an origin non-privileged end user to a corresponding communications manager, each information distribution unit including a first priority designation and indicia of a destination non-privileged end user;

transferring system management distribution units from a privileged end user to said corresponding communications manager, each system management distribution unit including a second priority designation greater than or equal to said first priority designation and indicia of a destination privileged end user;

for each of said information and system management distribution units, determining respective adjacent communications managers along at least one path between respective origin privileged or non-privileged end users and respective destination privileged or non-privileged end users;

configuring each of said information and system management distribution units according to a convention of network protocol stacks between said corresponding communications manager and said respective adjacent communications managers, at least two of said network protocol stacks capable of being different from one another; and

transmitting said information and system management distribution units to said respective adjacent communications managers according to priority designations included in said information and system management distribution units.

5,317,569

ALTERNATE PATH FDDI STANDARD LAN

Stanley F. Ralph, Moorestown; Leonard Weinberg, Haddonfield, and Joseph J. Hart, Mt. Holly, all of N.J., assignors to General Electric Co., Moorestown, N.J.

Filed Jan. 31, 1992, Ser. No. 829,782

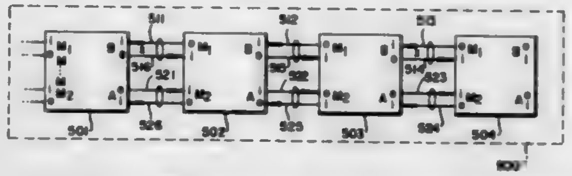
Int. Cl.^{5} H04J *3/02*

U.S. Cl. 370—85.9 **10 Claims**

5. A communication system, comprising:

first, second, and last communication nodes in accordance with FDDI standards, each of said nodes including first and second main input ports and first and second main output ports, each of said nodes further including first and second auxiliary input ports and first and second auxiliary output ports, each of said nodes including access control means for, in normal operation, coupling data from said first main input port to said second main output port, and for, in normal operation, coupling data from said first auxiliary input port to said second auxiliary output port, and for, in normal operation, coupling data from said second auxiliary input port to said first main output port, and for, in the presence of an upstream fault which is upstream from said second auxiliary input port, coupling data from said first auxiliary input port to said first main output port, and for, in the presence of an upstream fault which is upstream from said first auxiliary input port, coupling data from said second auxiliary input port to said first main output port, and for, in the presence of a downstream fault which is downstream from said first main output port, coupling data from said second auxiliary input port to said second main output port;

a first data path interconnecting said second main output port of said first node to said second auxiliary input port of said second node;



a second data path interconnecting said second main output port of said second node to said second auxiliary input port of said last node;

a third data path interconnecting said first main input port of said first node with said second auxiliary output port of said second node;

a fourth data path interconnecting said first main input port of said second node with said second auxiliary output port of said last node;

a fifth data path interconnecting said second main input port of said first node to said first auxiliary output port of said second node;

a sixth data path interconnecting said second main input port of said second node to said first auxiliary output port of said last node;

a seventh data path interconnecting said first main output port of said first node with said first auxiliary input port of said second node; and

an eighth data path interconnecting said first main output port of said second node with said first auxiliary input port of said last node.

5,317,570

SYSTEM AND METHOD FOR LEARNING TRANSMISSION BAND OF MULTIPLEX PACKET

Tamiya Ochiai, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 15, 1991, Ser. No. 729,732

Claims priority, application Japan, Jul. 16, 1990, 2-187673; Jul. 16, 1990, 2-187674

Int. Cl.^{5} H04J *3/24*

U.S. Cl. 370—94.1 **14 Claims**

1. A connection type exchange which, prior to a communication between terminals, determines a communication path and a communication channel in accordance with previously registered call data for performing actual packet communication, comprising:

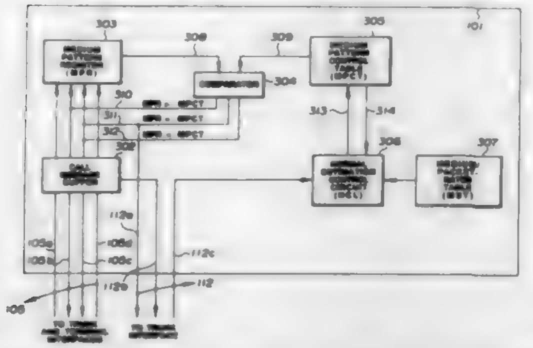
a trunk interface connected to a trunk line;

medium pattern memory means for storing, in correspondence with the trunk interface, medium patterns indicative of combinations of communication media of the terminal corresponding to the registered call data;

limit medium pattern memory means for storing, in correspondence with the trunk interface, limit medium patterns used as bases for judging whether a new call is to be accepted or not;

call acceptance judging means for comparing the medium patterns stored in the medium pattern memory means and the limit medium patterns stored in the limit medium pattern memory means to judge whether the new call is to be accepted or not;

communication channel establishing means for establishing a communication channel between the terminals so that the terminals may exchange data when said call acceptance judging means judges that the new call is to be accepted;



communication packet number measuring means provided in the trunk interface for measuring the number of communication packets per unit time; and

learning means for estimating a normal distribution value of the number of communication packets in the actual packet communication corresponding to the medium patterns stored in the medium pattern memory means on the basis of the measured value of the communication packet number measuring means and updating the limit medium patterns stored in the limit medium pattern memory means in correspondence with the estimated normal distribution value.

5,317,571

METHOD FOR DETERMINING THE TRANSMISSION TIME BETWEEN REMOTE AND CENTRAL TERMINAL STATIONS IN A POINT-TO-MULTIPOINT BIDIRECTIONAL TRANSMISSION NETWORK

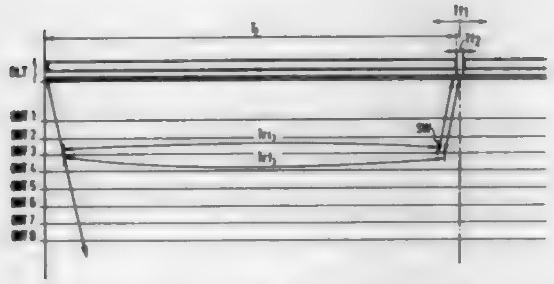
Francois Marcel, Orsay, France; Dany Sallaerts, Anvers, Belgium; Serge Allaire, Beaumont Le Roger, and Pierre Dore, Levallois-Perret, both of France, assignors to Alcatel Cit, Paris, France

Filed Jan. 29, 1993, Ser. No. 11,147

Claims priority, application European Pat. Off., Jan. 31, 1992, 92400266.0

Int. Cl.^{5} H04J *3/06*

U.S. Cl. 370—103 **11 Claims**



1. A method for determining the transmission time between remote terminal stations and a central terminal station in a point-to-multipoint bidirectional transmission network, said method comprising the steps of: measuring by the central station of a time interval between a first reference time for sending of information signals by said central station and reception by said central station of a location signal sent by a remote station after a time-delay starting from a second reference time for reception of said information signals by said remote station so that said location signal is received by said central station in a predetermined location window which has a width and which is not assigned to reception by said central station of information signals; for a given remote station, varying said time delay from an initial value such that the location signal is not necessarily received in said window; and then, when the location signal is not received in said window, repeating said location signal sent by the remote station until said location signal is received by said central station in said window.

5,317,572

HYBRID MULTIPLEX SYNCHRONIZING METHOD AND APPARATUS THEREFOR

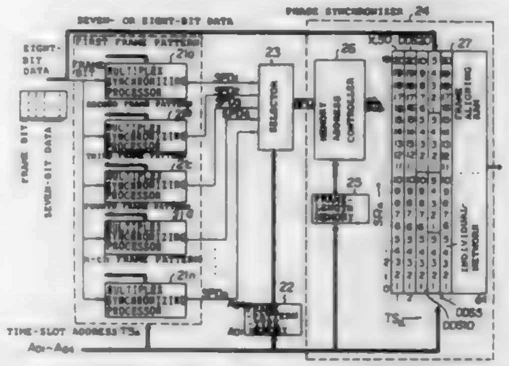
Junichi Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Jul. 21, 1992, Ser. No. 917,811

Claims priority, application Japan, Jul. 23, 1991, 3-182543

Int. Cl.^{5} H04L *7/04;* **H04J** *3/06*

U.S. Cl. 370—105.1 **11 Claims**



1. A hybrid multiplex synchronizing method in a data multiplex communication apparatus having multiplex synchronizing processors in which, when time-shared multiplexed data having prescribed frame patterns, some of which are different than others, are inputted in different phases every time slot, said multiplex synchronizing processors perform detection processing to detect frame patterns of time-shared multiplexed data allocated to said time slots and output synchronized-phase detection signals in response to detection of the frame patterns, and a phase synchronizer for rearranging the time-shared multiplexed data of each time slot in memory based upon the synchronized-phase detection signals and making the phases of the time-shared multiplexed data identical, said method comprising the steps of:

storing in advance, in correlation with time slots, information as to the types of frame patterns and frame lengths of time-shared multiplexed data allocated to each time slot, in a case where plural items of time-shared multiplexed data having different frame patterns and different frame lengths are processed;

providing multiplex synchronizing processors designated for respective ones of the frame patterns, performing frame-pattern detection processing in each of the multiplex synchronizing processors whenever a frame bit identifying one of the frame patterns is inputted, and outputting a synchronized-phase detection signal in response to detection of the frame pattern; and

when the synchronized-phase detection signal is generated by a multiplex synchronizing processor conforming to the type of frame pattern which corresponds to a present time slot, as determined from the stored information, having said phase synchronizer rearrange the time-shared multiplexed data in the present time slot in memory, upon taking into consideration the frame length of these data, based upon the synchronized-phase detection signal, and similarly rearrange the time-shared multiplexed data of each time slot in memory to make the phases of the time-shared multiplexed data of the time slots identical to one another.

5,317,573

APPARATUS AND METHOD FOR REAL TIME DATA ERROR CAPTURE AND COMPRESSION REDUNDANCY ANALYSIS

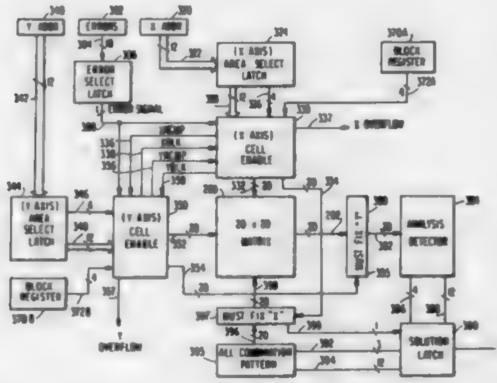
Orest Bula, Shelburne; Garrett S. Koch, Cambridge; Justin A. Woyke, Essex Junction, all of Vt., and Richard S. Gomez, Forest Grove, Oreg., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 400,860, Aug. 30, 1989, abandoned.

This application Feb. 24, 1992, Ser. No. 839,678

Int. Cl.^{5} G11C *29/00*

U.S. Cl. 371—10.3 **1 Claim**



1. A tester for testing fail cells in a semiconductor array having a plurality of cells arranged in rows and columns and having redundant rows and columns, and containing a best solution generator for redundancy repair, said tester comprising:

a fail matrix, said matrix comprising a plurality of cells, smaller than the number of cells in the array, arranged in rows and columns, the number of rows in said fail matrix being equal to (the number of redundant rows in said array) times (the number of redundant columns in said array plus 1), and the number of columns in said fail matrix being equal to (the number of redundant columns in said array) times (the number of redundant rows in said array plus 1); and

means for loading said fail matrix with information pertaining to failed cells as such failed cells are detected by the tester, said means for loading including a row enable circuit and a column enable circuit; wherein each of said enable circuits comprises:

a counter connected to a comparator circuit which is also connected to a preset register;

input means including AND means for receiving said failed information from the tester coupled to said counter and said fail matrix for counting unique fails and recording each of the unique fails in a respective selected matrix cell, and

feedback means, coupled between said comparator and said AND means, for disabling said AND means and the counter to disable the other enable circuit when the count of said fails on any selected row or column in the array reaches the number preset in the register.

5,317,574

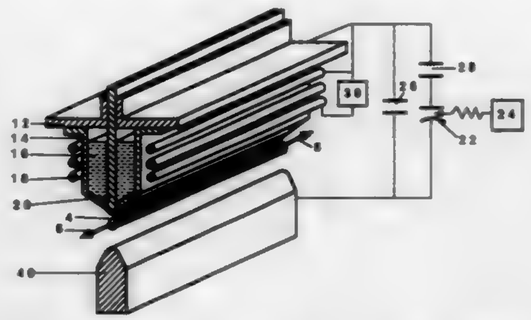
METHOD AND APPARATUS FOR GENERATING X-RAY AND/OR EXTREME ULTRAVIOLET LASER

Hui Wang, 540 Canyon Woods Cir. #108, San Ramon, Calif. 94583

Filed Dec. 31, 1992, Ser. No. 999,127

Int. Cl.^{5} H01S *3/097, 3/30*

U.S. Cl. 372—5 **31 Claims**



1. An apparatus for producing x-ray and/or EUV laser comprising:

(1) a liquid edge-shape anode structure including: a liquid material, a reservoir for holding said liquid material, said reservoir having a trough-shape opening for passage of said liquid material, and liquid material feeding and liquid edge forming means operatively associated with said reservoir for feeding liquid material through the trough-shape opening in said reservoir and for forming a liquid edge from said liquid material;

(2) a cathode electrode opposite said liquid edge-shape anode;

(3) pulse power supply and electrical discharge circuit having a low impedance circuit configuration for providing a sufficient large current pulse passing through said liquid edge-shape anode and said cathode, which generates both a plasma and a magnetic field which helps confine said plasma to a thin column, said confined thin plasma column emits x-ray and/or ultraviolet laser.

5,317,575

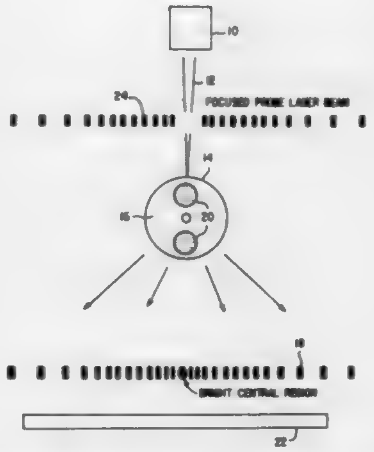
SYSTEM FOR DETERMINING BIREFRINGENT AXES IN POLARIZATION-MAINTAINING OPTICAL FIBER

John B. Aniano, High Bridge, N.J., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Dec. 11, 1992, Ser. No. 989,448

Int. Cl.^{5} H01S *3/30*

U.S. Cl. 372—6 **5 Claims**



1. A method which determines the position of birefringent axes in a polarization maintaining optical fiber, comprising the steps of:

generating a beam from a coherent light source;

causing the beam to interact with non-symmetrical glass elements within an optical fiber, thereby scattering light in a pattern;

sensing the scattered light pattern; and

analyzing the sensed scattered light pattern to determine the position of the birefringent axes of the optical fiber.

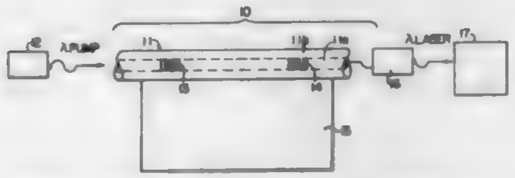
5,317,576
CONTINOUSLY TUNABLE SINGLE-MODE RARE-EARTH DOPED PUMPED LASER ARRANGEMENT

Frederick Leonberger, Glastonbury; William H. Glenn, Vernon, and Gary A. Ball, Newington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 732,552, Jul. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 457,118, Dec. 26, 1989, abandoned, and Ser. No. 659,952, Feb. 26, 1991, abandoned. This application Feb. 1, 1993, Ser. No. 13,117

Int. Cl.^{5} H01S *3/30*

U.S. Cl. 372—6 **3 Claims**



1. A tunable optical waveguide laser arrangement comprising:

a solid optical waveguide guiding light along an axis between axially spaced ends thereof and being located within a portion of an excitable material that emits coherent light in response to stimulation by pump light;

means for launching said pump light into the waveguide for axial propagation therein and attendant emission of coherent light by the excitable material;

two end reflectors each situated in the waveguide at one of the axially spaced ends thereof and extending normal to the axis to delimit a laser cavity, each of said reflectors being constituted by a Bragg grating consisting of a plurality of axially consecutive grating elements constituted by periodic refractive index perturbations with a given periodicity, the length of said cavity, the narrow peak reflectivity of said Bragg gratings and the frequency response of the gain of the excitable material being coordinated with one another such that lasing occurs only at a single longitudinal mode; and

means for uniformly controlledly varying the length of that portion of said optical waveguide that incorporates the two Bragg gratings and an intervening region of said optical waveguide such that attendant continuous tuning of the laser output wavelength occurs without longitudinal mode hopping.

5,317,577
OPTICAL WAVELENGTH SHIFTER USING NONLINEAR REFRACTIVE MEDIUM DISPOSED INTERIORLY OF LASER RESONATOR

Tsuneyuki Urakami, and Shinichiro Aoshima, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan

Continuation-in-part of Ser. No. 826,061, Jan. 27, 1992. This application Jun. 8, 1992, Ser. No. 895,130

Claims priority, application Japan, Jan. 25, 1991, 3-25770; Jun. 6, 1991, 3-167370

Int. Cl.^{5} H01S *3/10*

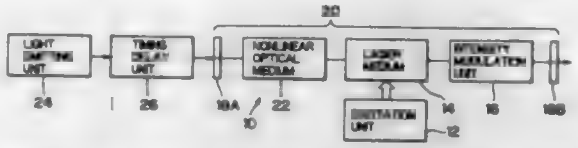
U.S. Cl. 372—21 **8 Claims**

1. An optical wavelength shifter comprising:

a laser resonator having a first laser mirror, a second laser mirror, a laser medium disposed between said first and second laser mirrors, and exciting means for exciting said laser medium to produce a pump pulse from said laser medium;

a nonlinear optical medium having a nonlinear refractive index for modulating light having a phase and a wavelength, said nonlinear optical medium being disposed interiorly of said laser resonator so that the pump is incident on said nonlinear optical medium;

light emitting means for emitting said light to be modulated by said nonlinear optical medium; and



timing delay means, disposed between said light emitting means and said nonlinear optical medium, for receiving said light emitted from said light emitting means and for transmitting said light to said nonlinear optical medium after delaying said light by a desired period of time,

wherein the application of the pump pulse upon said nonlinear optical medium causes said refractive index of said nonlinear optical medium to change, thereby causing said nonlinear optical medium to modulate the phase of said light and to thus shift the wavelength of said light,

and wherein said nonlinear optical medium is disposed between said light emitting means and said laser medium.

5,317,578
LASER LIGHT OUTPUT CONTROL APPARATUS

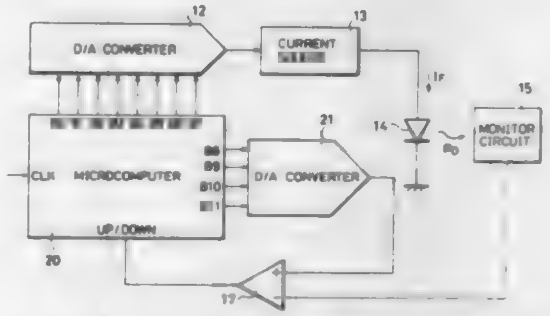
Kenji Ogou, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 17, 1992, Ser. No. 945,890

Claims priority, application Japan, Sep. 26, 1991, 3-277200

Int. Cl.^{5} H01S *3/13*

U.S. Cl. 372—29 **6 Claims**



1. A laser light output control apparatus for controlling a laser light output from a semiconductor laser, comprising:

current applying means for applying a driving current to said semiconductor laser based on a given value;

a microcomputer including

memory means having a capacity for storing first and second values to be given to said current applying means to set the laser light output at first and second output values, respectively,

supplying means for supplying said first and second values, respectively, to said memory means to store said first and second values in said memory means, having

voltage value outputting means for outputting first and second set voltage values, respectively, corresponding to said first and second output values of laser light outputs, and

counting means for generating an output signal to be given to said current applying means, and

calculating means for calculating a value to be given to said current applying means for the laser output between said first and second output values from said stored first and second values;

monitoring means for monitoring a laser light from said semiconductor laser and outputting monitor voltage; and

comparing means for comparing said monitor voltage output of said monitoring means with said first and second set voltage values, respectively, and outputting comparing result signal to be supplied to said counting means to change gradually a value of said output signal of said counting means.

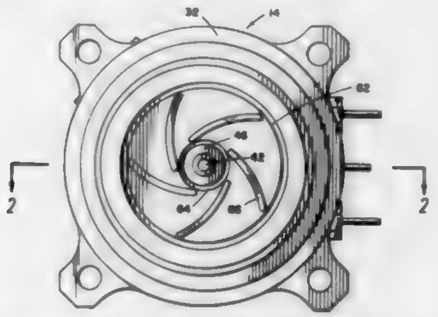
5,317,579
LASER PUMP

Anthony P. Adsett, Orlando, Fla., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 7, 1992, Ser. No. 925,658

Int. Cl.^{5} H01S *3/04*

U.S. Cl. 372—35 **19 Claims**



1. An apparatus for pumping a liquid coolant comprising:

a casing having a cavity therein and a casing inlet and a casing outlet for the flow of liquid coolant into and from said casing cavity;

a housing attached to one end of said casing, said housing having a cavity therein;

an impeller rotatably mounted inside said housing cavity and operative for moving a liquid coolant through said casing inlet, through said casing cavity and out said casing outlet;

a shaft extending axially through said casing cavity and into said housing cavity and having said impeller coupled to one end thereof;

a permanent magnet attached to said shaft within said casing cavity, said magnet being encased in titanium, whereby said magnet is isolated from the liquid coolant passing through said casing cavity to prevent corrosion thereof and contamination of said liquid coolant;

a source of electric current; and

an electrical winding electrically coupled to said source of electric current, said electrical winding being located adjacent said casing and external to said casing cavity for inducing a magnetic field within said casing cavity in response to electric current passing through said electrical winding to thereby rotate said shaft having said permanent magnet and impeller attached thereto, whereby said impeller moves said coolant through said casing inlet into said casing cavity and out said casing outlet to thereby cool said casing and electrical winding.

5,317,580
BIDIRECTIONAL TRANSMISSION SYSTEM WITH IDENTICAL LASER COMPONENTS

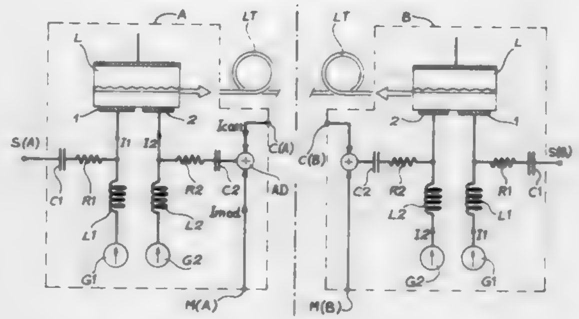
René Auffret, Perros Guirec; Mouhammad Chawki, Lannion, and Louis Berthou, Rospez, all of France, assignors to France Telecom Etablissement Autonome de Droit Public, Issy Les Moulineaux, France

PCT No. PCT/FR91/00464, § 371 Date Mar. 27, 1992, § 102(e) Date Mar. 27, 1992, PCT Pub. No. WO92/22965, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 11, 1991, Ser. No. 842,152

Int. Cl.^{5} H01S *3/00*

U.S. Cl. 372—38 **4 Claims**



1. A bidirectional transmission system comprising an optical transmission line and two emission-reception assemblies, wherein the two emission-reception assemblies are identical and each comprises:

a semiconductor laser structure;

first and second electrodes formed on the semiconductor laser structure;

a first polarization tee connected to the first electrode and comprising a first branch supplied by a first current source of an intensity below an emission threshold of the semiconductor laser and a second branch comprising a first signal output, the first polarization tee operating for receiving signals from the semiconductor laser structure and outputting the received signals on the first signal output; and

a second polarization tee connected to the second electrode and comprising a first branch supplied by a second current source and a second branch supplied by a selectively applied switching current and a modulating current, wherein when the switching current is applied to the second branch, a mean value of a total intensity of current supplied to the semiconductor laser structure through the second electrode exceeds the emission threshold of the semiconductor laser structure so that the semiconductor laser structure operates in emission.

5,317,581
ELECTRIC FIELD ABSORPTION LIGHT MODULATION DRIVING APPARATUS AND METHOD HAVING IMPROVED FEATURE TO ELIMINATE NOISE FROM OPTICAL OUTPUT

Masaru Onishi, and Kazuhiro Suzuki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 29, 1992, Ser. No. 968,444

Claims priority, application Japan, Oct. 31, 1991, 3-286142

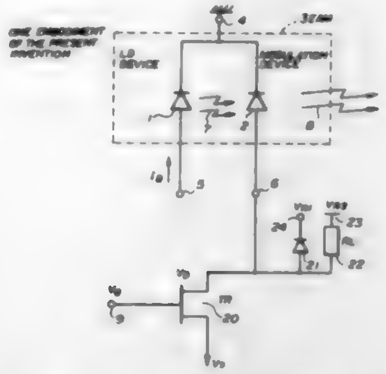
Int. Cl.^{5} H01S *3/10;* **H04B** *10/04;* **G02F** *1/01, 1/29, 1/29*

U.S. Cl. 372—38 **20 Claims**

1. An electric field absorption light modulation driving apparatus comprising:

an electric field absorption light modulation unit comprising a light emission device for emitting light and a modulation device for varying a light transmittance thereof of light applied by said light emission device so as to provide said light as a result of modifying thereof; and

driving signal generating means, responsive to an input information signal, for generating a driving signal to be applied to said modulation device, said modulation device varying said light transmittance thereof in response to said driving signal level, said driving signal generating means providing said driving signal so that a portion of a driving voltage of said driving signal, in which an undesirable level fluctuation occurs, corresponds to a constant working range of said modulation device; said constant working range characterized by a constant value of light transmittance of said modulation device.



5,317,582

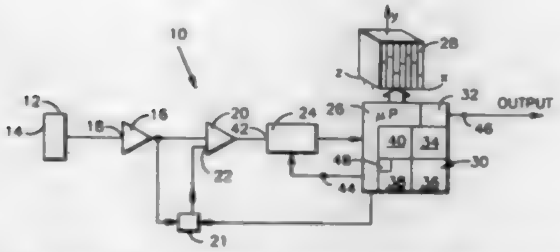
SYSTEM FOR DETECTING MODULATED LASER SIGNALS

Edward T. Siebert, New Fairfield, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 12, 1993, Ser. No. 46,062

Int. Cl.^{5} H01S *3/00*

U.S. Cl. 372—38 **22 Claims**



1. A system for detecting modulated laser signals, said system comprising:

means for detecting a laser signal;

means for determining pulse intervals;

means for counting the occurrences of a plurality of different pulse intervals;

means for storing said counted occurrences;

means for processing said stored counted occurrences and determining a weighted sum of said number of different pulse intervals; and

means for outputting a signal when said weighted sum of said number of different pulse intervals counted for said different pulse intervals exceeds a preselected threshold number such that a modulated laser signal is detected.

5,317,583

SEMICONDUCTOR LASER SCREEN OF A CATHODE-RAY TUBE

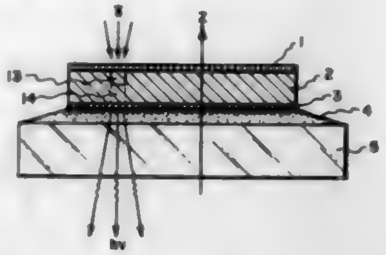
Alexander S. Nasibov, and Pavel V. Reznikov, both of Moscow Oblast, Russian Federation, assignors to Principia Optics Incorporated, Los Angeles, Calif. and P.N. Lebedev Institute of Physics, Moscow, Russian Federation

Filed Apr. 30, 1992, Ser. No. 875,824

Claims priority, application Russian Federation, Dec. 26, 1991, N5016150/21

Int. Cl.^{5} H01S *3/19*

U.S. Cl. 372—43 **18 Claims**



1. A laser screen comprising:

a pair of mirrors; and

a semiconductor member positioned between the two mirrors of said pair of mirrors, said semiconductor member being made of a material selected from the group consisting of an $A^{II}B^{VI}$ compound whereby the semiconductor material is doped with a donor impurity.

5,317,584

SURFACE EMISSION TYPE SEMICONDUCTOR LASER

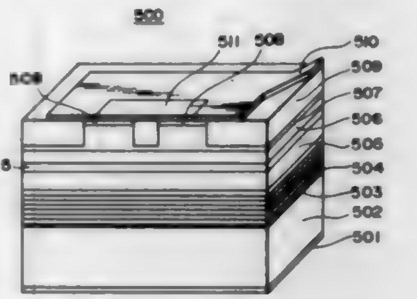
Katsumi Mori; Tatsuya Asaka; Hideaki Iwano, and Takayuki Kondo, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 756,981, Sep. 9, 1991, Pat. No. 5,182,757, and a continuation-in-part of Ser. No. 756,979, Sep. 9, 1991, Pat. No. 5,181,219, and a continuation-in-part of Ser. No. 756,980, Sep. 9, 1991, Pat. No. 5,181,221. This application Dec. 28, 1992, Ser. No. 997,177

Claims priority, application Japan, Sep. 12, 1990, 2-242000

Int. Cl.^{5} H01S *3/19*

U.S. Cl. 372—46 **40 Claims**



1. A surface emission type semiconductor laser for emitting a beam in a direction perpendicular to a semiconductor substrate in which said laser is formed comprising:

an optical resonator means including a pair of reflecting mirrors having different reflectivities and a plurality of semiconductor layers between said reflecting mirrors, said semiconductor layers including at least a cladding layer in said semiconductor layers being formed into at least one column-like portion; and

a II-VI group compound semiconductor epitaxial layer surrounding said at least one column-like portion, said epitaxial layer being formed of an adduct consisting of II group organometallic compound and VI group organometallic compound and a VI group hydride in accordance with a chemical vapor deposition.

5,317,585

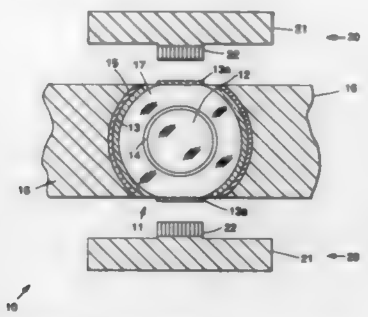
LASER REFLECTING CAVITY WITH ASE SUPPRESSION AND HEAT REMOVAL

Eduard Gregor, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 17, 1992, Ser. No. 930,259

Int. Cl.^{5} H01S *3/045, 3/094*

U.S. Cl. 372—35 **19 Claims**



1. Laser apparatus comprising:

a laser medium adapted to provide laser light;

a pump light source for providing pump light to said laser medium;

a thermally conducting transparent member disposed adjacent to said laser medium and having an entrance window disposed adjacent said pump light source;

an optically transmitting antireflecting coating disposed on said thermally conducting transparent member that transmits said pump light provided by said pump light source that is transmitted to said laser medium through said entrance window of said thermally conducting transparent member;

a dielectric coating disposed on said thermally conducting transparent member that reflects said pump light and transmits said laser light to suppress amplified stimulated emission;

an absorbing elastic material disposed on the outer surface of said thermally conducting transparent member around said dielectric coating that is adapted to absorb said laser light; and

a heat sink disposed in contact with said absorbing elastic material to conduct heat away from said laser medium.

5,317,586

BURIED LAYER III-V SEMICONDUCTOR DEVICES WITH IMPURITY INDUCED LAYER DISORDERING

Robert L. Thornton, East Palo Alto, and Fernando A. Ponce, Sunnyvale, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1992, Ser. No. 928,906

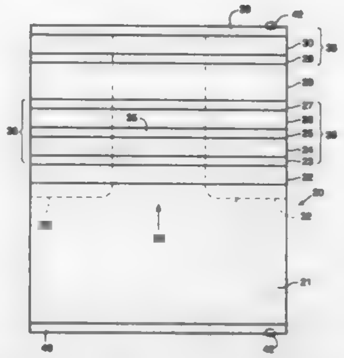
Int. Cl.^{5} H01S *3/19*

U.S. Cl. 372—45 **28 Claims**

9. A visible light-emitting semiconductor laser based on impurity induced layer disordering and having electrodes and a resonant cavity and comprising:

a semiconductor body portion made up of column III-Column V constituent crystal or mixed crystal compound regions, where the Column III constituent is selected from the group consisting of Ga, Al, and In, and the Column V constituent is selected from the group consisting of As, P, and Sb;

said body portion comprising a first acting as a substrate, over the first region second and third layers for optical guiding and carrier confining functions, a fourth layer located between the second and third layers and constituting the active laser region, said fourth layer containing at first portions Column III or Column V impurities in quantities sufficient to produce impurity induced layer disordering, the impurity induced layer disordering tending to cause strain generation at adjacent second portions of the fourth layer, said fourth layer having a thickness below a maximum value and such that said fourth layer remains substantially free of defects, said second and third layers also being substantially defect-free.



5,317,587

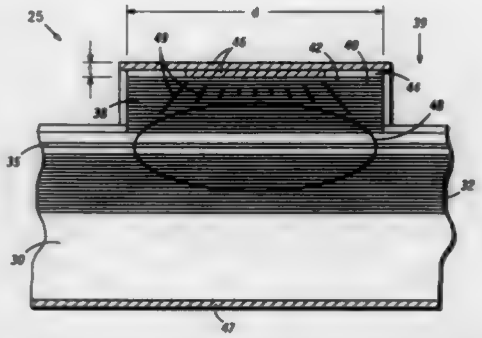
VCSEL WITH SEPARATE CONTROL OF CURRENT DISTRIBUTION AND OPTICAL MODE

Donald E. Ackley, and Chan-Long Shieh, both of Paradise Valley, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 6, 1992, Ser. No. 925,139

Int. Cl.^{5} H01S *3/19*

U.S. Cl. 372—45 **22 Claims**



12. A vertical cavity surface emitting laser with separately controlled current distribution and optical mode, comprising:

a substrate;

a first parallel stack of mirrors positioned on the substrate;

an active and spacer layer positioned on the first parallel mirror stack;

a second parallel mirror stack positioned on the active and spacer layer, the second parallel mirror stack being etched to define a mesa shaped area; and

material positioned on the mesa shaped area having an optical thickness such that the mesa shaped area has a predetermined reflectivity profile, the material positioned on the mesa shaped area including optically transparent, electrically conductive material defining an electrical contact window to control current distribution within the laser.

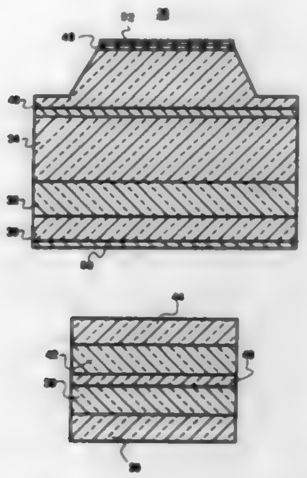
5,317,588
RIDGE WAVEGUIDE DISTRIBUTED-FEEDBACK LASER DIODE WITH A DEPRESSED-INDEX CLADDING LAYER

Keith B. Kahen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1992, Ser. No. 971,648

Int. Cl.^{5} H01S *3/086*

U.S. Cl. 372—96 **8 Claims**



1. A ridge waveguide distributed-feedback semiconductor laser diode comprising;

(a) a semiconductor substrate of a first conductivity type;

(b) a lower cladding layer of such first conductivity type deposited on the semiconductor substrate;

(c) a depressed-index cladding layer of such first conductivity type formed on the lower cladding layer;

(d) a spacer layer of such first conductivity type deposited on the depressed-index cladding layer;

(e) a semiconductor active layer formed on the spacer layer;

(f) a barrier layer of a second conductivity type deposited on the semiconductor active layer;

(g) a grating layer of such second conductivity type deposited on the barrier layer;

(h) an upper cladding layer of such second conductivity type deposited on the grating layer;

(i) a capping layer of such second conductivity type formed on the upper cladding layer;

(j) a rib structure etched into the capping and upper cladding layers so as to provide lateral guiding; and

(k) electrically conductive layers formed on the substrate and capping layers.

5,317,589
LASER OSCILLATOR HAVING A CURVED MIRROR WITH A THROUGH-HOLE

Shuji Ogawa, and Shigenori Yagi, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1993, Ser. No. 3,725

Claims priority, application Japan, Jan. 14, 1992, 4-004770

Int. Cl.^{5} H01S *3/08*

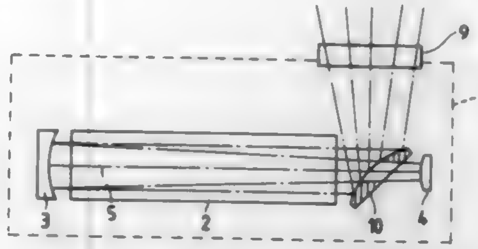
U.S. Cl. 372—99 **20 Claims**

1. A laser oscillator, comprising:

a housing including a laser medium gas therein such that said laser medium gas is isolated from the atmosphere;

first and second curved mirrors positioned in said housing and having said laser medium gas positioned therebetween;

an apertured mirror positioned between said first and second mirrors on a line connecting spherical centers of said first and second mirrors at an angle of less than 45° relative to said line, said apertured mirror having a curved reflective surface; and



a window formed in said housing through which a laser beam reflected by said apertured mirror is output from said housing.

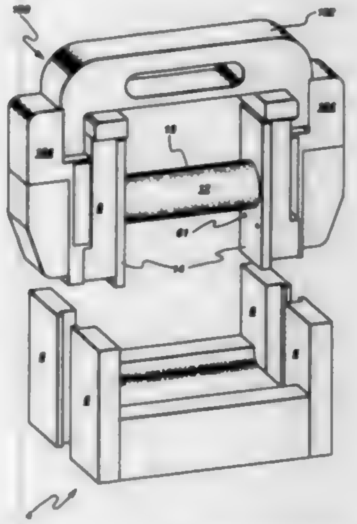
5,317,590
POSITIONING, COMPRESSION AND STORAGE DEVICE FOR A MODULAR FACE-PUMPED LASER

John L. August, Jr., Schenectady, and Mark J. Kukla, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1992, Ser. No. 952,080

Int. Cl.^{5} H01S *3/00*

U.S. Cl. 372—109 **3 Claims**



1. A positioning, compression and storage device for a modular face-pumped laser head which is comprised of:

a modular slab laser assembly having a slab; and

a handle means operatively connected to said slab such that said slab can be removed from said modular slab laser assembly and stored.

5,317,591
DIRECT-CURRENT ARC FURNACE

Sven-Einar Stenkvist, Brugg, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jun. 19, 1992, Ser. No. 901,022

Claims priority, application Switzerland, Jun. 20, 1991, 1827/91

Int. Cl.^{5} H05B *7/144*

U.S. Cl. 373—107 **5 Claims**

1. A direct-current arc furnace comprising:

a furnace vessel for containing a melt;

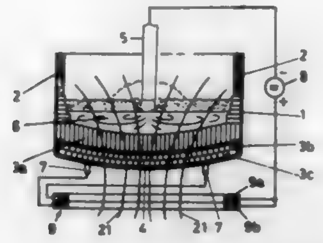
a top cathode located above the furnace vessel;

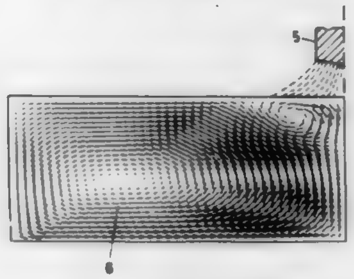
at least one anode connected to the furnace vessel;

a current supply means for supplying a furnace current to

the top cathode and to the at least one anode to agitate the melt in a direction from the cathode to the anode;

a coil located underneath a bottom of the furnace vessel, wherein a furnace current flows through the coil for generating a magnetic field, wherein the coil has a predetermined number of ampere-turns causing a direction of agitation from the cathode to the anode to be at least partly reversed by the magnetic field generated by the coil, wherein said predetermined number of ampere-turns is at least twice the furnace current.





5,317,592
DIRECT RESISTANCE HEATING ELECTRICAL FURNACE ASSEMBLY AND METHOD OF OPERATING SAME

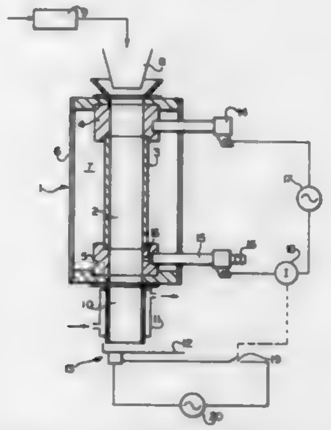
Petrus J. Van Staden, Edenvale, South Africa, assignor to Mintek, South Africa

Filed Apr. 9, 1992, Ser. No. 865,253

Claims priority, application South Africa, Apr. 10, 1991, 91/2647

Int. Cl.^{5} H05B *3/00*

U.S. Cl. 373—109 **19 Claims**



1. A direct resistance heating electrical furnace, comprising:

a heating chamber having an inlet for feeding material thereto and an outlet for discharging heated material therefrom, the heating chamber constituting means for receiving an electrically conductive bed of solid particulate material;

a pair of spaced electrodes associated with the chamber;

means for determining a variable electrical quantity selected from a group consisting of current flow between the spaced electrodes, and (2) electrical resistance at a predetermined voltage across the spaced electrodes; and

control means, coupled to the determining means, for controlling the feed and discharge of material to and from the heating chamber according to the variable electrical quantity;

wherein operation of the control means is carried out independently of direct temperature measurements of the electrically conductive bed of solid particulate material.

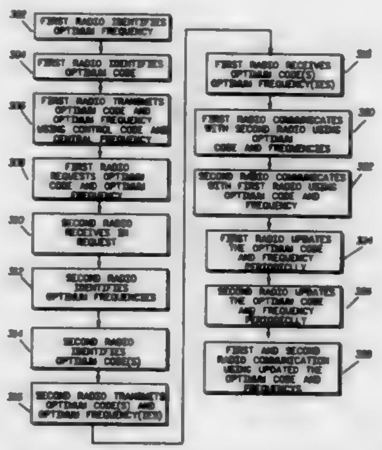
5,317,593
COMMUNICATION DEVICE WITH CODE SEQUENCE AND FREQUENCY SELECTION SYSTEM

Tracy L. Fulghum; Edward K. B. Lee, both of Sunrise, and Jimmy W. Cadd, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1993, Ser. No. 25,494

Int. Cl.^{5} H04K *1/00*

U.S. Cl. 375—1 **24 Claims**


FIRST RADIO IDENTIFIES OPTIMUM FREQUENCY
FIRST RADIO IDENTIFIES OPTIMUM CODE
FIRST RADIO TRANSMITS OPTIMUM CODE AND OPTIMUM FREQUENCY USING CONTROL CODE AND CONTROL FREQUENCY
FIRST RADIO REQUESTS OPTIMUM CODE AND OPTIMUM FREQUENCY
SECOND RADIO RECEIVES IN REQUEST
SECOND RADIO IDENTIFIES OPTIMUM FREQUENCIES
SECOND RADIO IDENTIFIES OPTIMUM CODE(S)
SECOND RADIO TRANSMITS OPTIMUM CODE(S) AND OPTIMUM FREQUENCY(IES)
FIRST RADIO RECEIVES OPTIMUM CODE(S) OPTIMUM FREQUENCY(IES)
FIRST RADIO COMMUNICATES WITH SECOND RADIO USING OPTIMUM CODE AND FREQUENCIES
SECOND RADIO COMMUNICATES WITH FIRST RADIO USING OPTIMUM CODE AND FREQUENCY
FIRST RADIO UPDATES THE OPTIMUM CODE AND FREQUENCY PERIODICALLY
SECOND RADIO UPDATES THE OPTIMUM CODE AND FREQUENCY PERIODICALLY
FIRST AND SECOND RADIO COMMUNICATION USING UPDATED THE OPTIMUM CODE AND FREQUENCY

1. A Code Division Multiple Access (CDMA) communication system for reuse of available spreading codes, the system having a control spreading code and a control frequency and comprising:

a first communication device for transmitting a signal having the control frequency and spread by the control spreading code, the signal includes a request for an optimum spreading code and an optimum operating frequency;

a second communication device, including:

a receiver for receiving the signal;

first means for identifying a first operating frequency optimum for the second communication device;

second means for identifying a first spreading code optimum for the reception of signals by the second communication device; and

a transmitter for transmitting the identity of the first spreading code and the first optimum operating frequency to the first communication device;

whereby the first and second communication devices communicate using the first operating frequency and the first spreading code.

5,317,594
SYSTEMS FOR AND METHOD OF IDENTIFYING V.FAST MODEM WITHIN EXISTING AUTOMATIC INTERWORKING PROCEDURE STANDARDS

Yuri Goldstein, Southbury, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Jan. 13, 1992, Ser. No. 819,277

Int. Cl.^{5} H04B *1/38;* **H04L** *5/16*

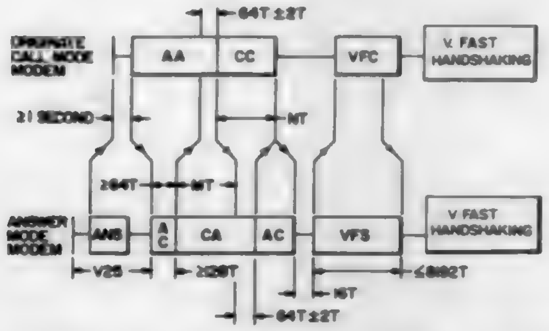
U.S. Cl. 375—8 **20 Claims**

1. A method for identifying communications between a

calling modem and a V.fast compatible answering modem, comprising:

a) in said calling modem and V.fast compatible answering modem, using standard V.32/V.32bis interworking methods for identifying said calling modem as a V.32/V.32bis modem up and through a first standard V.32/V.32bis ranging sequence;

b) after an at lest sixteen baud silent time period which occurs after termination of said first standard V.32/V.32bis ranging sequence by said V.fast compatible answering modem, sending a V.fast identification signal from said V.fast compatible answering modem to said calling modem before completion of an 8192 baud time period after said at least sixteen baud silent time period;



c) detecting said V.fast identification signal at said calling modem;

d) sending a V.fast confirmation signal from said calling modem to said V.fast compatible answering modem; and

e) detecting said V.fast confirmation signal at said V.fast compatible answering modem, wherein said V.fast identification signal is substantially different from a V.32/V.32bis S signal and wherein upon said detecting of said V.fast confirmation signal, said V.fast compatible answering modem and said calling modem switch into a V.fast interworking protocol, but if said V.fast confirmation signal is not detected by said V.fast compatible answering modem, said V.fast compatible answering modem and said calling modem continue with said standard V.32/V.32bis interworking methods.

5,317,595

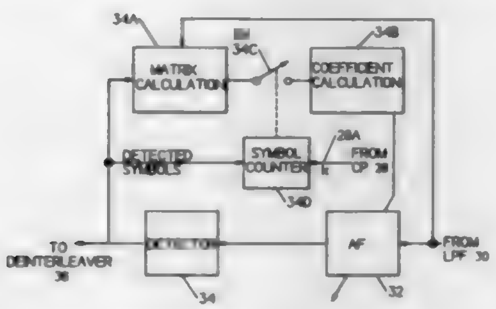
RAPIDLY ADAPTABLE CHANNEL EQUALIZER

Kjell Ostman, San Diego, Calif., assignor to Nokia Mobile Phones Ltd., Helsinki, Finland

Filed Jun. 30, 1992, Ser. No. 907,693

Int. Cl.^{5} H03H *7/30, 7/40*

U.S. Cl. 375—14 **10 Claims**



1. For use in a digital data transfer apparatus that includes an adaptive equalizer means for receiving, correcting, and outputting symbols, a method of determining correction coefficients for the adaptive equalizer means that includes the steps of:

for every symbol output by the adaptive equalizer means, maintaining a first matrix R that is a N×N channel correlation matrix and a second matrix P that is a N×1 crosscorrelation vector between a received signal and transmitted symbols;

for every kth symbol output by the adaptive equalizer means, where k is equal to or greater than two,

determining a set of equalizer coefficients (C) for the adaptive equalizer means based upon matrices R and P; and

applying the set of determined correction coefficients to the adaptive equalizer means so as to correct a subsequently received data symbol.

5,317,596

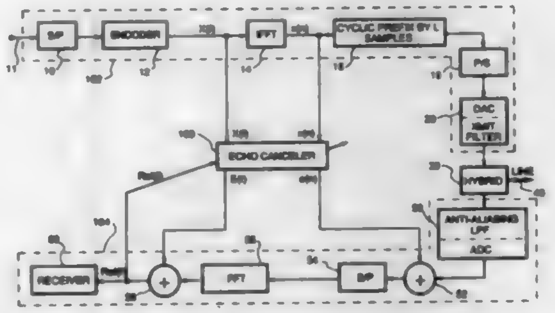
METHOD AND APPARATUS FOR ECHO CANCELLATION WITH DISCRETE MULTITONE MODULATION

Minnie Ho, Stanford, and John M. Cioffi, Cupertino, both of Calif., assignors to The Board of Trustees of the Leland Stanford, Junior Univsersity, Stanford, Calif.

Filed Dec. 1, 1992, Ser. No. 984,938

Int. Cl.^{5} H03H *7/30, 7/40;* **H03K** *5/159;* **H04J** *1/00*

U.S. Cl. 375—14 **3 Claims**



1. A multicarrier transceiver system, comprising;

a multicarrier transmitter, responsive to input data, and operative to generate a frequency-domain transmit signal X(f), a time-domain transmit signal x(n) and an output transmit signal for communication to a remote receiver through a data link;

a multicarrier receiver, responsive to an input receive signal received from a remote transmitter through said data link, a time-domain echo signal e(n), and a frequency-domain echo signal E(f), and operative to generate an error-free receive signal $R_{ef}(f)$ and output data; and

an echo canceller, responsive to said frequency-domain transmit signal X(f) and said time-domain transmit signal x(n), and adaptively responsive to said error-free received signal $R_{ef}(f)$ and operative to generate an echo component of said output transmit signal appearing in said input receive signal including said time-domain echo signal e(n) and said frequency-domain echo signal E(f) for input to said receiver.

5,317,597

RESISTANCE COUPLED DATA TRANSMISSION ARRANGEMENT

Harald Eisele, Pinneberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 842,781, Feb. 26, 1992, abandoned, which is a continuation of Ser. No. 566,728, Aug. 13, 1990, abandoned. This application Mar. 5, 1993, Ser. No. 27,543

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3926885

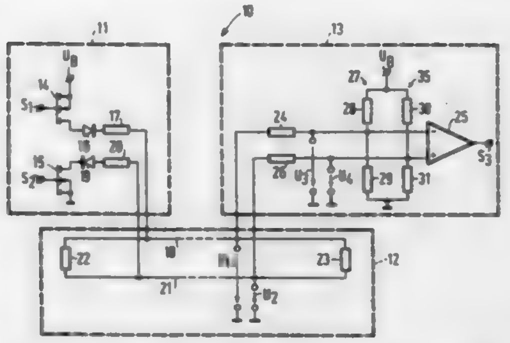
Int. Cl.^{5} H04B *3/54*

U.S. Cl. 375—36 **16 Claims**

1. A data transmission arrangement comprising a two-wire direct-coupled transmission path operated in the differential mode and terminated by terminations having its characteristic impedance; a data signal transmitter comprising output means for connecting to said transmission path; and a receiver comprising input means for connecting to said transmission path, a supply voltage source and a comparator,

characterized in that portions of said transmission path, output means for connecting, and input means for connecting together form a pure resistance coupling network providing conductive coupling between said transmitter and receiver, and

said network comprises two transmitter resistors, in said output means for connecting; at least two termination resistors, in the data transmission path terminations; and a plurality of receiver divider resistors and two matching resistors, in said input means for connecting,



each transmitter resistor being connected to a respective wire of said transmission path, for coupling to said path a signal to be transmitted,

each matching resistor being connected between a respective wire of said transmission path and a corresponding input of said comparator for producing opposite voltage level differences at the comparator input in response to transmission of a given signal, and

each said receiver divider resistor being respectively connected between said supply voltage source and one or the other of said corresponding inputs of said comparator for producing an absolute voltage level at the corresponding comparator input in response to loss of signal from one wire in the transmission path.

5,317,598

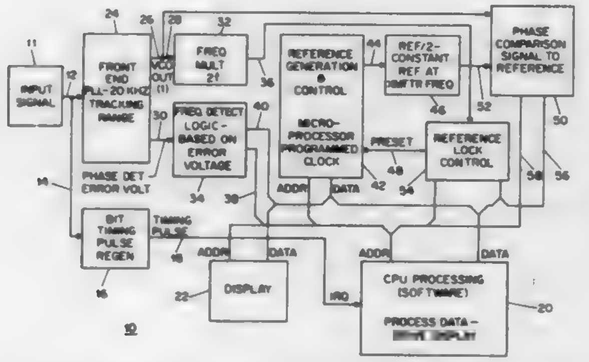
PORTABLE TEST RECEIVER FOR REMOTE MONITORING SYSTEM

Irving W. Cahalan, Huntington Station; Michael La Clair, Yapank; Paul Seiter, Middle Village, and John Weber, Northport, all of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jun. 24, 1992, Ser. No. 903,648

Int. Cl.^{5} H03K *9/04*

U.S. Cl. 375—75 **5 Claims**


11
INPUT SIGNAL
12
24
FRONT END PLL-20 KHZ TRACKING RANGE
26
28
VCO OUT (1)
32
FREQ MULT 21
36
30
FREQ DETECT LOGIC - BASED ON ERROR VOLTAGE
40
PHASE DET ERROR VOLT
34
38
14
REFERENCE GENERATION & CONTROL
MICRO-PROCESSOR PROGRAMMED CLOCK
44
REF/2-CONSTANT REF AT XMTR FREQ
46
PRESET
48
42
54
REFERENCE LOCK CONTROL
52
PHASE COMPARISON SIGNAL TO REFERENCE
50
58
56
ADDR
DATA
BIT TIMING PULSE REGEN
TIMING PULSE
18
16
DISPLAY
22
IRQ
CPU PROCESSING (SOFTWARE)
PROCESS DATA -
20
10

1. A portable test receiver apparatus for receiving a message signal with bit timing from a remote monitoring system transmitter with alternating current zero crossings having a plurality of transmitting frequencies, wherein said message signal has a plurality of data bit phase flips and corresponding signal nulls providing information about the status of a monitored transformer, said portable test receiver apparatus comprising:

regeneration means for regenerating the bit timing provided by said remote monitoring system transmitter by utilizing the signal nulls of said message signal that correspond to the alternating current zero crossings in said remote monitoring system transmitter to provide a timing signal corresponding to the data bits of said message signal;

phase-locked loop means, having a capture range corresponding to the transmitting frequency range of said transmitter, for converting said message signal, via voltage controlled oscillator (VCO) output, to transistor-transistor logic (TTL) levels for digital manipulation;

frequency detecting means for providing an indication of the frequency of said message signal;

reference means, driven by a crystal oscillator and connected to said message signal, for providing a constant phase and frequency reference signal for phase flip identification;

frequency doubling means for doubling the frequency of the VCO output of said phase-locked loop means to eliminate 180° phase flips between bits of said message signal;

phase comparison means for identifying phase flips by comparing the VCO output signal from said phase-locked loop means to the reference signal provided by said reference means;

microprocessor means, connected to said regeneration means and said reference means, and said phase comparison means, for demodulating said message signal using the bit timing from said regeneration means and the output of said comparison means to a data bit signal corresponding to said message signal.

5,317,599

METHOD AND CIRCUIT FOR DETECTING CN RATIO OF QPSK SIGNAL

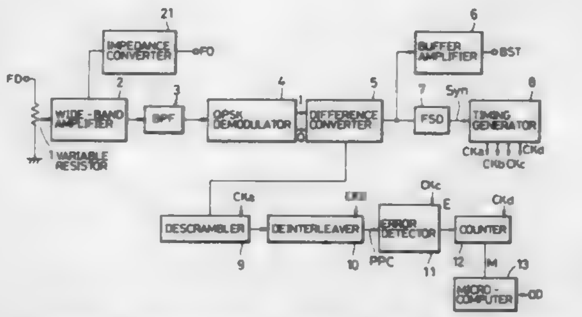
Tomoji Obata, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 3, 1992, Ser. No. 985,637

Claims priority, application Japan, Jan. 14, 1992, 4-004385

Int. Cl.^{5} H04N *5/445;* **H04L** *27/10*

U.S. Cl. 375—86 **8 Claims**



3. A circuit for detecting the carrier-to-noise ratio of a quaternary phase shift keying ("QPSK") signal which includes a binary signal representing at least a message and an information for error-control in order to detect a double-error, said circuit comprising

converter means which receives said QPSK signal and reproduces said binary signal from said QPSK signal,

error-control means which at least detects said double-error included in said binary signal, and which delivers an occurrence pulse in response to a detection of said double-error,

counter means which counts said occurrence pulses and provides an occurrence number of said double-errors during a predetermined time period which is long enough to compare said occurrence number with an average occurrence time to indicate that successive double-errors have occurred, and

computer means which computes said carrier-to-noise ration from said occurrence number in accordance with a theoretical relation between carrier-to-noise ratios and occurrence numbers of said double-errors.

5,317,600
COARSE TUNING OF THE CHANNEL FREQUENCY

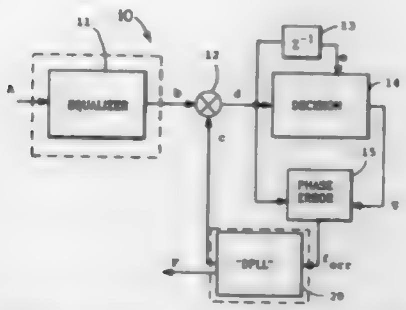
Antti Känsäkoski, Oulu, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed May 12, 1992, Ser. No. 882,452

Claims priority, application Finland, May 14, 1991, 912347

Int. Cl.⁵ H04L *27/06, 7/04, 7/00, 25/36*

U.S. Cl. 375—97 **11 Claims**



1. A method for coarse tuning of a channel frequency in a digital radiotelephone receiver, whereby phase information contained in symbols of a differentially encoded, quadrature amplitude modulated (QAM) signal transmitted on the channel is used for the coarse turning, comprising the steps of:
   a) measuring a phase of a received symbol;
   b) generating a signal indicating a phase change between the measured phase of the received symbol and a measured phase of a previously received symbol;
   c) comparing the signal indicating the phase change with predefined allowed phase changes;
   d) deciding, based on the comparison, a transmitted phase of the received symbol;
   e) generating a phase error signal indicting a phase difference between the decided transmitted phase and the measured phase of the received symbol; and
   f) adjusting a frequency generator which controls the channel frequency according to the phase error signal.

5,317,601
CLOCK DISTRIBUTION SYSTEM FOR AN INTEGRATED CIRCUIT DEVICE

Thomas J. Riordan, Los Altos; Albert M. Thaik, San Jose, and Hai N. Nguyen, Milpitas, all of Calif., assignors to Silicon Graphics, Mountain View, Calif.

Filed Aug. 21, 1992, Ser. No. 933,467

Int. Cl.⁵ H04L *7/00;* **H03K** *7/00, 17/00, 17/26*

U.S. Cl. 375—107 **10 Claims**

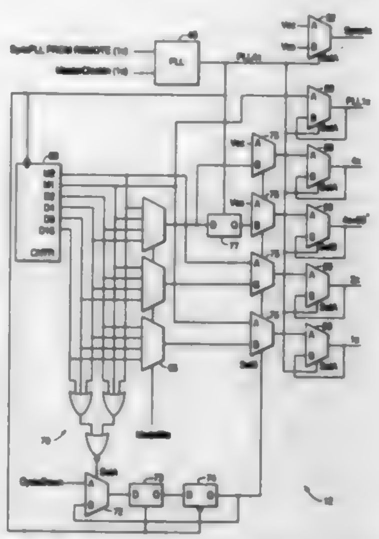
1. A clock signal distribution system for a chip comprising:

means for generating a synchronization signal and a plurality of clock signals having respective frequencies that are in an integral fraction relationship to one another and are synchronized at a location, designated the initial location, on the chip;

first distributing means for distributing at least one of said plurality of clock signals to each of a plurality of M locations, designated remote locations, on the chip with delay times among said remote locations being approximately equal to one another to a first level of precision;

second distributing means for distributing said synchronization signal to each of said remote locations with delay times being approximately equal to one another to a second level of precision greater than said first level of precision; and

a plurality of M synchronization means, each located at a respective remote location and responsive to said at least one of said plurality of clock signals at the respective remote location and to said synchronization signal at the respective remote location, for synchronizing said at least one of said plurality of clock signals at the respective remote location;



whereby said pluralities of clock signals at said remote locations are characterized by delay times that are approximately equal to each other to said second level of precision notwithstanding the fact that said distributing first means distributes said plurality of clock signals to said remote locations with said first level of precision.

5,317,602
BASE-BAND DELAYED DETECTOR WITH SYNCHRONIZING CIRCUIT

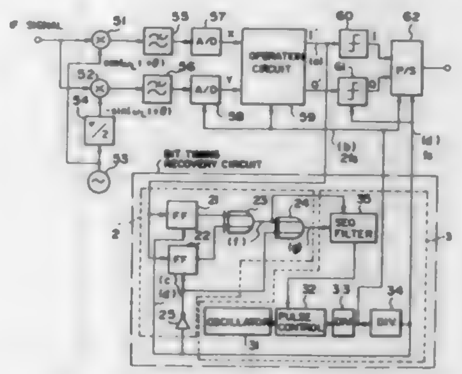
Masahiro Onoda, and Yoshifumi Toda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 13, 1992, Ser. No. 851,559

Claims priority, application Japan, Mar. 14, 1991, 3-074777

Int. Cl.⁵ H04L *7/033*

U.S. Cl. 375—118 **10 Claims**



1. A base-band delayed detector receiving an input signal and having operation means performing, in synchronism with a clock signal, a delayed detecting operation on the input signal, said operation means outputting an altered signal having a predetermined symbol rate, said base-band delayed detector comprising:

clock generation means for generating a clock signal having a frequency 2×n times as high as the predetermined symbol rate, said clock signal being used as a timing signal for said operation means, where n is an integer;

dividing means for dividing said frequency of said clock signal, generating a divided signal;

inverting means for inverting said divided signal, generating an inverted signal;

detection means for detecting a pattern of polarities of said altered signal at predetermined timings defined by said divided signal and said inverted signal;

determining means for making a determination whether a phase of said clock signal one of lags and precedes a phase of said altered signal based on said pattern of polarities detected by said detection means;

shifting means for shifting the phase of the clock signal based upon said determination in order to synchronize said clock signal with said altered signal; and

data determination means for identifying a synchronized state when said altered signal is synchronized with said clock signal, and outputting said altered signal during said synchronized state.

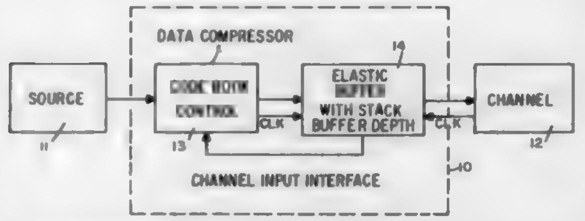
5,317,603
ISOCHRONOUS INTERFACE APPARATUS

Josef Osterweil, Rockville, Md., assignor to GTE Government Systems Corporation, Waltham, Mass.

Filed Dec. 30, 1992, Ser. No. 999,476

Int. Cl.⁵ H04B *1/66;* **H04J** *15/00*

U.S. Cl. 375—122 **1 Claim**



1. Isochronous interface apparatus for transferring data having a data rate from a source over a clocked channel having a traffic rate to a destination, comprising:
   a) a channel input interface interposed between said source and said channel, including:
      a data compressor adapted to compress said data with a compression ratio responsive to a signal;
      a first elastic buffer coupled between said data compressor and said channel, having a first variable stack and providing a first signal representing the depth of said first variable stack, said first elastic buffer having an input coupled to said data compressor and having an output clocked by said channel at said traffic rate and providing a signal representing the depth of said first variable stack, said first signal feedback to said data compressor for controlling the compression ratio of said data compressor; and
   b) a channel output interface interposed between said clocked channel and said destination, including:
      a data expander coupled to said channel;
      a second elastic buffer coupled between said data expander and said destination, having a second variable stack and providing a second signal representing the depth of said second variable stack; and
      a variable clock responsive to said second signal and adapted to maintain said second variable stack at a constant depth.

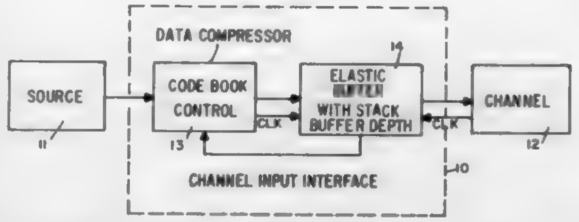
5,317,604
ISOCHRONOUS INTERFACE METHOD

Josef Osterweil, Rockville, Md., assignor to GTE Government Systems Corporation, Waltham, Mass.

Filed Dec. 30, 1992, Ser. No. 999,477

Int. Cl.⁵ H04B *1/66;* **H04J** *15/00*

U.S. Cl. 375—122 **1 Claim**



1. Method of transferring isochronous data having a data rate from a source over a clocked channel having a traffic rate to a destination comprising the steps of:

compressing said data by a compression ratio responsive to a depth of a first variable stack;

storing compressed data in said first variable stack;

clocking said first variable stack by said channel at said traffic rate;

expanding compressed data from said channel;

storing expanded data in a second variable stack; and clocking said second variable stack at a clock rate to maintain said second variable stack at a constant depth, said clock rate equal to said data rate.

5,317,605
METHOD OF MEASURING REDUCTION OF SURFACE LAYER MATERIAL AND APPARATUS THEREFOR

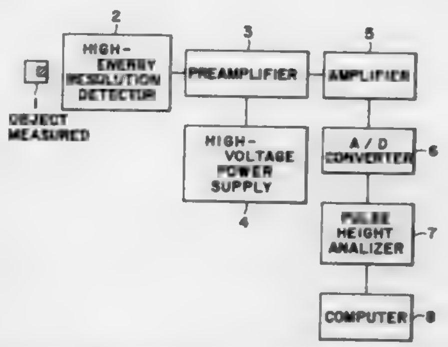
Toshiso Kosako, Meguro, and Kazuo Nishimura, Yokohama, both of Japan, assignors to General Sekiyu Kabushiki Kaisha, Japan

Continuation of Ser. No. 488,977, Mar. 5, 1990, abandoned. This application Feb. 18, 1993, Ser. No. 19,336

Claims priority, application Japan, Mar. 7, 1989, 1-54770; Aug. 18, 1989, 1-212181

Int. Cl.⁵ G21G *1/10*

U.S. Cl. 376—157 **3 Claims**



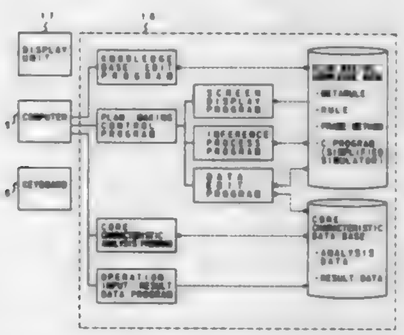
1. A method of measuring the reduction of surface layer material of a test object by comparison with a reference object made of the same material as the test object comprising the steps of:
   (a) activating the surface layer material of the reference object with charged particles to cause an activation reaction so as to produce different ratios of at least two radioactive nuclides produced by the activation reaction at different depths;
   (b) subsequently removing a predetermined thickness of the surface layer material of said reference object to produce a reduced surface layer;
   (c) measuring the radioactivity caused by the activation reaction in the initial surface layer material and in the

reduced surface layer material of the reference object using a high energy resolution detector;
(d) determining a distribution ratio of the at least two radioactive nuclides produced by the activation reaction in the reference object;
(e) repeating steps (a) to (d) a sufficient number of times to establish a relationship which can be used to relate the reduction of the surface layer material with a change in the radioactivity in the surface layer material;
(f) activating the surface layer material of the test object with a beam of charged particles identical to that used with said reference objects to cause an activation reaction;
(g) measuring the radioactivity caused by the activation reaction in the surface layer material of the test object using a high energy resolution detector after the test object has been subjected to wear over a predetermined period of time;
(h) determining a distribution ration of the at least two radioactive nuclides produced by the activation reaction in the test object; and
(i) calculating any reduction in the surface layer material of the test object due to wear based on the relationship between the ratio of the at least two radioactive nuclides and the reduction in the surface layer which was established for said reference object.

5,317,606
AUTOMATION SYSTEM FOR NUCLEAR POWER PLANTS

Mitsuo Kinoshita; Takaharu Fukuzaki, both of Hitachi; Kanji Kato, Katsuta; Akira Nishimura, Hitachi; Yuichi Higashikawa, Hitachi; Yoshiyuki Miyamoto, Hitachi; Yukihisa Fukasawa, Hitachi; Kazuo Asami, Hitachi; Koji Kurokawa, Hitachi, and Tatsuo Hayashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 571,220
Claims priority, application Japan, Aug. 25, 1989, 1-217358
Int. Cl.^{5} G21C *7/36*
U.S. Cl. 376—217 **8 Claims**

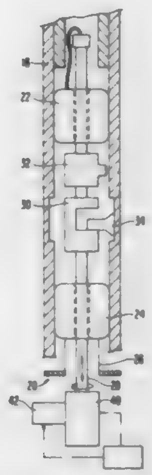

DISPLAY UNIT
KNOWLEDGE BASE EDIT PROGRAM
COMPUTER
PLAN MAKING CONTROL PROGRAM
SCREEN DISPLAY PROGRAM
INFERENCE PROCESS PROGRAM
KEYBOARD
DATA EDIT PROGRAM
RULE
C PROGRAM (SIMPLIFIED SIMULATOR)
CORE
OPERATION INPUT RESULT DATA PROGRAM
CORE CHARACTERISTIC DATA BASE
ANALYSIS DATA
RESULT DATA

1. An automation system for nuclear power plants, comprising:
operation plan making means for, after a nuclear power plant has been operated according to an operation plan under abnormal condition, making an operation plan to return to the normal operating condition, which had existed before the plant condition deviated from the normal operation range, from a condition that the operation according to the operation plan under abnormal condition has been finished;
means for storing said operation plan under abnormal condition to decrease the reactor power to a level of power within said normal operation range when the operating condition of said nuclear power plant deviates from said normal operation range;
means for deciding from detected plant data whether or not to perform an operation according to said operation plan under abnormal condition;
control and arithmetic means for outputting control commands according to the operation plan;
means for transmitting said operation plan under abnormal condition to said control and arithmetic means when said decision means makes a decision to perform an operation according to said operation plan under abnormal condition;
supervisory control means having the control and arithmetic means for outputting control commands according to said new operation plan when said operation plan under abnormal condition has been executed; and
control means for controlling controlled operation conditions of the plant according to said control commands.

5,317,607
EDM CRACK REMOVAL TOOLING

Frank J. Formanek, West Suffield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 30, 1993, Ser. No. 54,269
Int. Cl.^{5} G21C *17/00;* **B23H** *1/00*
U.S. Cl. 376—260 **7 Claims**



2. A crack removal tool comprising:
an elongate shaft structure;
first and second inflatable members disposed on said shaft structure;
a crack sensor supported on said shaft structure at a location between said first and second inflatable members;
a crack removal head supported on said shaft between said first and second inflatable members at a predetermined distance from said crack sensor, said crack removal head including a removal electrode and electrode servo means for selectively displacing said removal electrode radially with respect to an axis of said shaft structure; and
head servo means for selectively displacing said crack sensor and said crack removal head with respect said first and second inflatable members and for causing the crack removal head to undergo rotation about the axis of said shaft structure in at least one of first and second rotational directions.

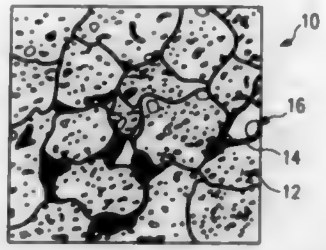
5,317,608
METHOD FOR THERMALLY TREATING DISCHARGED NUCLEAR FUEL

English C. Pearcy, and Hersh K. Manktala, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Sep. 14, 1992, Ser. No. 944,672
Int. Cl.^{5} G21F *9/30*
U.S. Cl. 376—261 **17 Claims**

1. A method for enhancing retention of nuclear fission products within irradiated nuclear fuel, comprising the steps of:

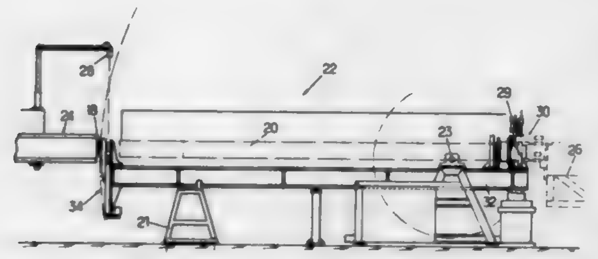
heating said irradiated nuclear fuel to a predetermined temperature for a predetermined period of time;
said predetermined temperature being sufficiently high to diffuse said nuclear fission products within said irradiated nuclear fuel to form insoluble nuclear fission-product phases within said irradiated nuclear fuel and sufficiently low to avoid movement of volatile fission products from said irradiated nuclear fuel; and
said predetermined period of time ranging from approximately 7 hours to approximately 10 days and being sufficiently long to cause substantially all of said nuclear fission products within said irradiated nuclear fuel to form into said nuclear fission-product phases.



5,317,609
METHOD AND APPARATUS FOR INSTALLING FUEL RODS IN A NUCLEAR FUEL ASSEMBLY SKELETON

Claude Fichet, and Roland Villaeys, both of Romans, France, assignors to Societe Franco-Belge-de Fabrication de Combustibles, Courbevoie, France

Filed Apr. 28, 1993, Ser. No. 53,396
Claims priority, application France, Apr. 28, 1992, 92-05231
Int. Cl.^{5} G21C *21/00*
U.S. Cl. 376—261 **13 Claims**

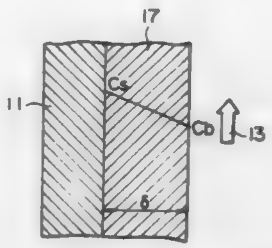


11. A method of installing fuel rods in a skeleton of a nuclear fuel assembly, comprising the steps of:
placing a skeleton devoid of end nozzles horizontally between a storage magazine for storing rods in alignment with rod-receiving locations in the skeleton and a longitudinal displacement mechanism for displacing pull bars terminated by rod-grasping clamps towards the magazine and away from the magazine;
passing said pull bars through the skeleton until they reach the magazine and grasping respective rods; and
pulling said pull rods through the skeleton;
further comprising the steps of:
loading caps in housings in a receptacle, said housings being distributed in the same array as the rods;
locating the receptacle between the displacement mechanism and the skeleton;
moving the pull bars forwardly to engage the clamps in the caps as they pass through the receptacle and prior to going through the skeleton; and
removing the caps when they leave the receptacle without manual intervention prior to moving the clamps up to the magazine.

5,317,610
DEVICE FOR THERMAL ELECTRIC AND NUCLEAR POWER PLANTS

Isamu Kita; Masayuki Kobashi; Susumu Tabuchi; Yoshiyuki Doi; Noboru Nakamura; Managu Ishihara; Koji Arioka, and Isamu Kayano, all of Takasago, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1992, Ser. No. 853,050
Claims priority, application Japan, Mar. 26, 1991, 3-61543
Int. Cl.^{5} G21C *3/00*
U.S. Cl. 376—414 **7 Claims**

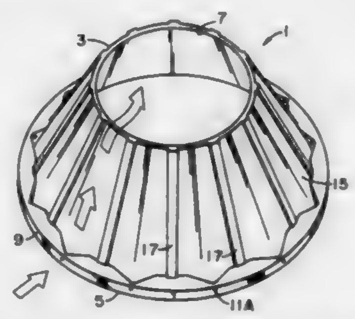


1. A protective coating for steel in at least part of a system constituting at least one of a wet steam system, a feedwater and condensate system, and a drain system of thermal and nuclear power plants, said system being exposed to a fluid flowing therein, said coating comprising:
a a film layer of a material selected from the group consisting of a metal comprising a major component other than Fe and a ceramic, said material being formed on a surface of the system to be protected by a spraying technique selected from the group consisting of atmospheric plasma thermal spraying and high energy plasma thermal spraying so that said film layer is a boundary film chemically stable against said fluid flowing through said system and resistant against the efflux of Fe^{2+} to prevent erosion-corrosion of said coated part of said system.

5,317,611
STACKABLE TRUNCATED CONICAL SHELL FUEL ELEMENT AND AN ASSEMBLY THEREOF FOR A NUCLEAR THERMAL ENGINE

Lyman J. Petrosky, Unity Township, Westmoreland County; Joseph F. Ivanenok, III, North Huntingdon, and Mario D. Carelli, Greensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 5, 1992, Ser. No. 878,934
Int. Cl.^{5} G21C *3/02*
U.S. Cl. 376—433 **18 Claims**



8. A stack of fuel elements for a nuclear thermal engine having a plurality of fuel elements, each fuel element having a truncated conical shell with a base, characterized in that an annular lip with radial passages therethrough extends radially outward from said base, said fuel elements being stacked with said lips positioned on top of one another to form said stack with frusto-conical flow passages between adjacent elements and with said radial passages communicating with said frusto-conical flow passages.

5,317,612

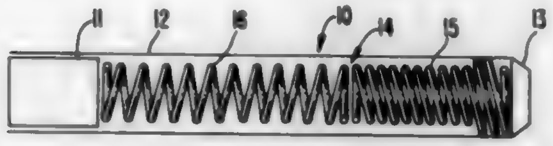
USE OF SHAPE MEMORY ALLOYS IN FUEL PELLET HOLDDOWN SPRINGS

William J. Bryan, and Lawrence V. Corsetti, both of Granby, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 25, 1992, Ser. No. 950,590

Int. Cl.^{5} G21C *3/10*

U.S. Cl. 376—451 **8 Claims**



1. An apparatus comprising:

a nuclear rector fuel rod including a plurality of fuel pellets comprising a fuel pellet stack in said nuclear fuel rod;

means, including a composite holddown spring, for applying an axial force to said fuel pellet stack in a nuclear reactor fuel rod, said axial force applying means comprising a shape-memory alloy spring portion having an overall transformation temperature range substantially above atmospheric temperature and substantially below an operating temperature experienced by said composite holddown spring, said shape-memory alloy spring portion having a two-way memory characteristic such that said shape-memory alloy spring portion contracts to a first configuration below said overall transition temperature range wherein said axial force exerted by said shape-memory alloy spring portion on said fuel pellets in said stack is minimized and expands to a second configuration above said overall transition temperature range wherein said axial force exerted by said shape-memory alloy spring portion on said fuel pellets in said stack is maximized; and

a conventional metal spring portion having the characteristic that said conventional metal spring portion weakens and contracts at said operating temperature and strengths and expands at said atmospheric temperature.

5,317,613

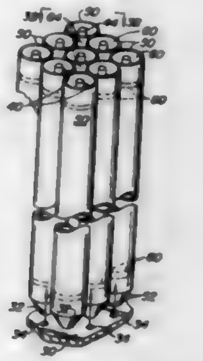
FUEL DESIGN FOR HIGH POWER DENSITY BOILING WATER REACTOR

Larry E. Fennern, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 31, 1991, Ser. No. 785,839

Int. Cl.^{5} G21C *3/34*

U.S. Cl. 376—439 **16 Claims**



1. In a core for a nuclear reactor wherein said reactor includes:

a reactor pressure vessel;

a core central of said pressure vessel for containing fuel in sealed tubes for undergoing fission reaction;

moderator coolant for circulation through said pressure vessel for extracting the heat of fission from said sealed tubes;

a defined flow path for circulation of said moderator coolant through said vessel including a first upwardly passing leg in said flow path from the bottom of sad core to the top of said core in contact with said sealed tubes for undergoing fission reaction for the extraction of heat to said moderator coolant and a second upwardly passing leg in said flow path from the bottom of said core to the top of said core away from said sealed tubes for undergoing fission;

a power discharge path interior of said pressure vessel for the discharge of energy imparted at said core to said moderator coolant; and

a moderator-coolant inflow for resupplying said reactor with moderator coolant for producing in said vessel a continuous power generation cycle;

the improvement to said core comprising:

a plurality of vertically upstanding fuel rods;

a corresponding plurality of vertically upstanding channels, each said channel surrounding discretely a fuel rod to define interiorly of each said channel said first upwardly passing leg in said flow path from the bottom of said core to the top of said core in contact with said sealed tubes for undergoing fission reaction for the extraction of heat to said moderator coolant and to define exterior of each said channel said second upwardly passing leg in said flow path from the bottom of said core to the top of said core away from said sealed tubes for undergoing fission;

means for connecting each said channel to receive moderator coolant at the bottom of each said core;

means for connecting each said channel to discharge said moderator coolant at the top of said core; and,

means for connecting the regions exterior of said channels to said moderator coolant inflow whereby said second upwardly passing leg in said flow path from the bottom of said core to the top of said core away from said sealed tubes for undergoing fission bypasses the interior of said channels.

5,317,614

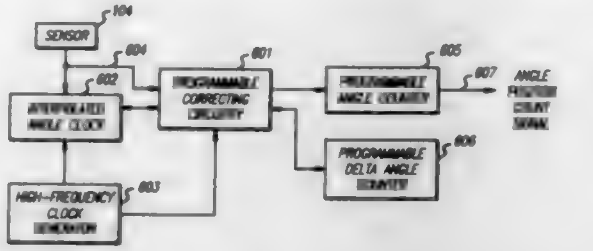
PROGRAMMABLE ELECTRONIC ANGULAR POSITION INDICATOR BASED UPON ENGINEERING UNITS

Richard D. Davis, and Jeff Kotowski, both of Nevada City, Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Aug. 26, 1992, Ser. No. 935,823

Int. Cl.^{5} G07C *3/02*

U.S. Cl. 377—17 **18 Claims**



1. A circuit comprising:

a detector for detecting the presence and absence of a reference marking on a rotating rotor, said detector outputting a first signal when the presence of a reference marking is detected;

an interpolator coupled to said detector, said interpolator responsive to said first signal, said interpolator outputting a maximum of N interpolated position pulses between occurrences of said first signal, where the value of N changes and is dependent on angular distance between said reference markings;

an angle counter coupled to said interpolator, said angle counter responsive to said first signal and to said interpolated position pulses and generating an angle position signal indicating angular position of said rotor relative to said reference marking.

5,317,615

EXPOSURE APPARATUS

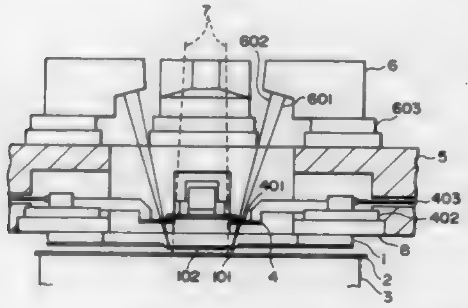
Ryuichi Ebinuma, Kawasaki; Nobutoshi Mizusawa, Yamato; Takao Kariya, Hino; Shigeyuki Suda, Yokohama, all of; Shunichi Uzawa, Nakamachi, and Takayuki Hasegawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,408, Feb. 28, 1991, abandoned. This application Dec. 8, 1992, Ser. No. 987,554

Claims priority, application Japan, Mar. 2, 1990, 2-49583; May 10, 1990, 2-118680

Int. Cl.^{5} G21K *5/00*

U.S. Cl. 378—34 **22 Claims**



1. An exposure apparatus for exposing a workpiece to a pattern of an original with X-rays, said apparatus comprising:

a masking device having a movable blade for variably defining an aperture to selectively block and transmit the X-rays to define on the workpiece a desired exposure zone corresponding to said aperture, said movable blade having a window; and

detecting means comprising a source of alignment light for detecting a positional relationship between the original and the workpiece by using alignment light having a wavelength longer than the X-rays passing through said window of said movable blade, wherein said source of alignment light is displaced with said movable blade.

5,317,616

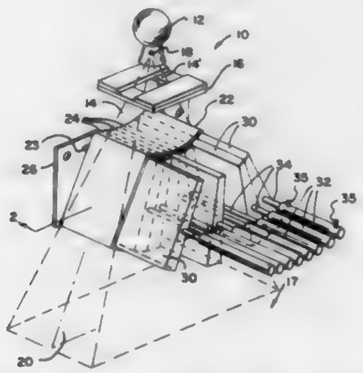
METHOD AND APPARATUS FOR RADIATION THERAPY

Stuart Swerdloff; Thomas R. Mackie, and Timothy Holmes, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 19, 1992, Ser. No. 854,521

Int. Cl.^{5} A61N *5/10*

U.S. Cl. 378—65 **6 Claims**



1. In a radiation therapy machine having a radiation source for producing a radiation beam directed toward a patient at a gantry angle, the beam including a plurality of adjacent rays dispersed within a beam plane, a compensator comprising:

a plurality of radiation attenuating leaves;

a rack positioned generally between the radiation source and the patient and having a plurality of adjacent sleeves for guiding the leaves across the beam plane between a closed state within the radiation beam, each leaf thus fully occluding one ray of the beam, and an open state outside of the radiation beam to allow unobstructed passage of the ray;

motivation means for independently moving each leaf between the open and closed state; and

timing means communicating with the motivation means for controlling the ratio of the period of time during which each leaf is in the closed state to the period during which each leaf is in the open state to control the average energy fluence of each ray of the beam.

5,317,617

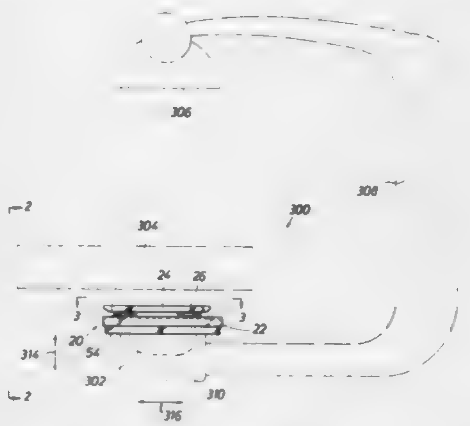
METHOD AND APPARATUS FOR MOUNTING THE DETECTOR ARRAY OF A CT SCANNER TO A RADIATION THERAPY SIMULATOR

Jon T. Lange, 25111 Arrow Ridge, San Antonio, Tex. 78258

Filed Jan. 22, 1993, Ser. No. 7,493

Int. Cl.^{5} G21K *4/00*

U.S. Cl. 378—65 **14 Claims**



13. A method for utilizing a radiation therapy simulator comprised of an x-ray source, table for supporting a target object in the field of radiation produced by the x-ray source, and image intensifier tube for acquiring computed tomography scans comprising the steps of:

mounting a box formed of a cover and tray over the image intensifier tube and below the table of the radiation therapy simulator;

positioning a detector array in the box within the field produced by the x-ray source for producing output readings proportional to the degree of attenuation of the field by the target object;

rotating the x-ray source and the image intensifier tube, having the box mounted thereto, around the target object while storing the output readings of the detector array to memory to obtain attentuation data at a plurality of angles of rotation; and

stopping the rotation of the x-ray source and image intensifier tube in the event of a change in the distance from the radiation source to the cover of the box, the change being detected by sensing a change in the relative positions of the cover and the tray of the box.

5,317,618
LIGHT TRANSMISSION TYPE VACUUM SEPARATING WINDOW AND SOFT X-RAY TRANSMITTING WINDOW

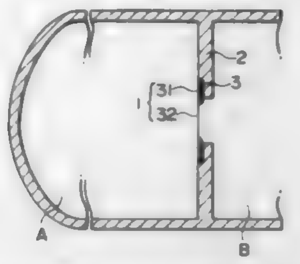
Takehiko Nakahara; Masao Koshinaka, and Nobuyuki Kosaka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1993, Ser. No. 4,596

Claims priority, application Japan, Jan. 17, 1992, 4-006617; May 22, 1992, 4-130581; Dec. 1, 1992, 4-343525

Int. Cl.^{5} **G21K** *1/00*

U.S. Cl. 378—161 **48 Claims**



1. A light transmission type vacuum separating window comprising:

a film transmitting a light wavelength range; and

a supporting means comprising gallium for supporting said film, whereby partitioning into a plurality of vacuum areas is effected.

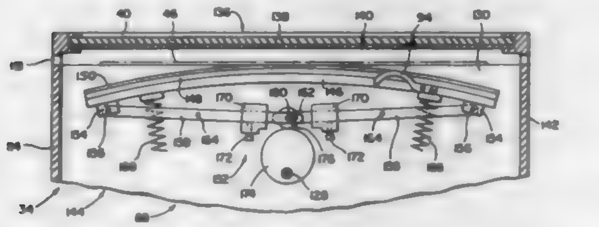
5,317,619
FILM CHANGER

Mark Hellmick, Canoga Park; Leif A. Johansson, Agourn, and Otto Weber, Chatsworth, all of Calif., assignors to Medrad, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 739,835, Aug. 2, 1991, abandoned, which is a continuation of Ser. No. 461,974, Jan. 8, 1990, Pat. No. 5,042,056, which is a continuation of Ser. No. 798,310, Nov. 15, 1985, Pat. No. 4,893,322. This application Feb. 16, 1993, Ser. No. 17,950

Int. Cl.^{5} **G03B** *42/02*

U.S. Cl. 378—173 **24 Claims**



1. A medical film exposure device for an x-ray apparatus, which comprises:

a film backing plate and a film pressure plate for receiving unexposed sheets of film therebetween in sequence for exposure of the films;

means for moving the pressure plate between film clamping and unclamping positions relative to the backing plate, the means for moving the pressure plate causing the pressure plate to initially clamp a center portion of one of the unexposed sheets of film and then progressively clamp the remainder of the one of the unexposed sheets of film outward from the center portion as it moves the pressure plate from the unclamping position to the clamping position;

film feeding means for essentially simultaneously feeding one of the unexposed sheets of film between the film backing and pressure plates, and one of the exposed sheets of film from between the film backing and pressure plates, when the pressure plate is in the film unclamping position;

a continuously running drive motor; and

a single revolution clutch for connecting the drive motor to the pressure plate moving means and the film feeding means, to cause, sequentially, the moving of the pressure plate to the film unclamping position, the essentially simultaneous feeding of the unexposed and exposed films, and the moving of the pressure plate back to the film clamping position.

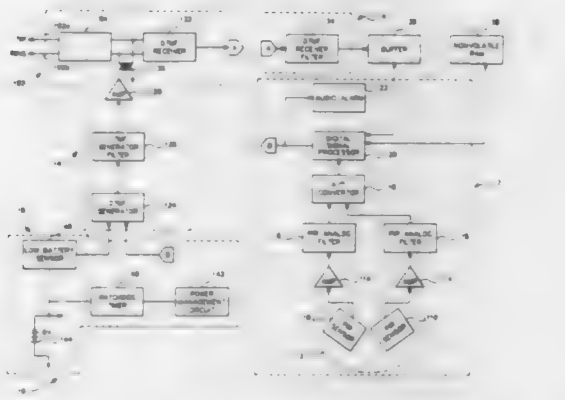
5,317,620
INFRARED ALARM SYSTEM

Milton O. Smith, Bothell, Wash., assignor to Orca Technology, Inc., Seattle, Wash.

Filed Apr. 2, 1992, Ser. No. 862,834

Int. Cl.^{5} **H04M** *11/04, 11/00;* **G08B** *13/18*

U.S. Cl. 379—40 **81 Claims**



1. A security system connectable to a telephone line, the system comprising:

a connector for connecting the system to the telephone line;

a battery providing power to the system;

a lens system for producing multiple detection ranges and radial detection zones;

at least a first and second infrared sensor positioned behind said lens system providing substantially uniform detection through a field of view of 180 degrees and generating fluctuating sensor signals in response to external thermal sources crossing boundaries between said detection ranges or said radial detection zones within said field of view;

an analog preamplifier electrically coupled to said first and second sensors for amplifying said sensor signals to generate amplified sensor signals;

an alarm filter electrically coupled to said analog preamplifier and filtering said amplified sensor signals to generate filtered sensor signals;

an analog to digital convertor electrically coupled to said alarm filter for converting said filtered sensor signals to generate digital sensor signals;

memory for storing a plurality of stored signature values each containing a predetermined digital value corresponding to an authorized activity which should not trigger an alarm condition;

a digital signal processor electrically coupled to said analog to digital convertor to provide real-time analysis said digital sensor signals, said digital signal processor providing digital filtering of said digital sensor signals to create high pass filtered signals, and storing said filtered signals in a signal buffer to create a time sequence of said filtered signals, calculating a continuous mean value of said stored filtered signals and determining a variance level between said running mean and said digital sensor signals, determining a coherence value between said digital sensor signals from said first infrared sensor and said second infrared sensor, and determining a similarity value between said digital sensor signals and each of said plurality of stored signature values, said digital signal processor generating a trigger to indicate the presence of an intruder if said variance level exceeds a predetermined variance level, said coherence value is below a predetermined coherence level, and each of said similarity value is below a predetermined similarity level for each of said plurality of stored signature values;

an alarm, responsive to said trigger, to indicate the presence of an intruder;

a DTMF tone generator electrically coupled to the telephone line through said connector to generate dual-tone multiple frequency (DTMF) tones to communicate status information about the security system, including said alarm indicating the presence of an intruder, to a remote location over the telephone line;

a DTMF receiver electrically coupled to the telephone line through said connector to receive a sequence of tones over the telephone line;

a DTMF filter electrically coupled to said receiver and analyzing each of said tones from said receiver to determine if one of said tones is a valid DTMF tones, said DTMF filter generating a detection signal within a specified period of time if one of said tones is the valid DTMF tone;

a timer circuit continuously powered by said battery and generating periodic signals;

a power manager, responsive to said periodic signals and said detection signal, to generate a control signal, said power manager ceasing generation of said control signal if said DTMF filter does not generate said detection signal within said specified period of time;

a controller, responsive to said control signal, to selectively enable power to said receiver when said control signal is present and disable power to said receiver when said control signal is not present;

a delay circuit to delay operation of said receiver circuit until said enabling power to said receiver is stabilized;

a buffer electrically coupled to said receiver to store each of said valid DTMF tones received as digital data if said DTMF filter generates said detection signal;

a security circuit preventing unauthorized access to said digital data in said buffer by requiring for access a predetermined DTMF access code sequence that is received by said receiver from the remote location over the telephone line; and

a command circuit, responsive to said digital data, to process status request commands and digital signal processing commands received over the telephone line from the remote location if said predetermined DTMF access code sequence has been received by said receiver, whereby the security system provides real-time digital analysis of infrared sensor signals, a two direction DTMF communicator and reduced power consumption such that said battery will provide power to the securing system for at least one year.

5,317,621
MULTI-ADDRESS RADIO DISPLAY PAGER

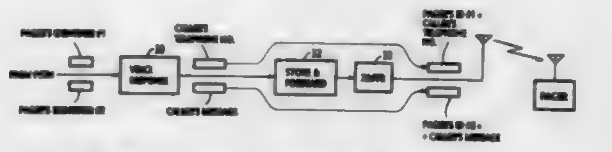
Hiroaki Shibayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,304

Claims priority, application Japan, Dec. 20, 1990, 2-412534

Int. Cl.^{5} **H04M** *11/00, 1/64;* **G08B** *5/22*

U.S. Cl. 379—57 **2 Claims**



1. A radio display pager comprising:

receive means for receiving a paging signal broadcast from a transmitter station, said paging signal containing a pager's first identifier and a caller's identifier or a pager's second identifier and a message identifier;

decoder means coupled to the receive means for determining whether the received paging signal contains the pager's first identifier or the pager's second identifier;

memory means for storing a plurality of message data;

a display unit; and

control means for causing the caller's identifier to be displayed on the display unit if the decoder means determines that the received paging signal contains the pager's first identifier, and for reading one of the message data from the memory means according to the message identifier contained in the received paging signal if the decoder means determines that the received paging signal contains the pager's second identifier and causing the message data read from the memory means to be displayed on the display unit.

5,317,622
RINGING CIRCUIT FOR USE IN A TELEPHONE SET FOR DETECTING A MOBILE MODE OR A PORTABLE MODE OF THE TELEPHONE SET

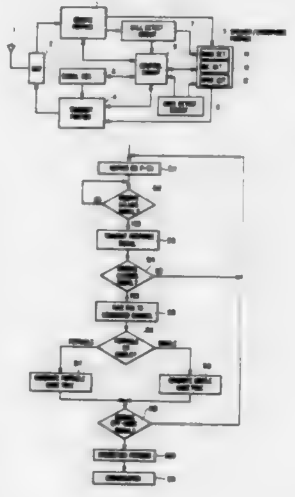
Nobuhisa Shinozaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 648,759, Jan. 31, 1991. This application Feb. 23, 1993, Ser. No. 21,121

Claims priority, application Japan, Jan. 31, 1990, 2-21233

Int. Cl.^{5} **H04M** *11/00*

U.S. Cl. 379—58 **2 Claims**



1. A telephone set comprising:

means for receiving a calling signal to produce a calling detection signal;

means responsive to said calling detection signal for transmitting a response signal;

means for receiving a channel designate signal designating a specific speech channel to produce a channel designate detection signal;

means responsive to said channel designate detection signal for tuning said telephone set to said specific speech channel;

means for detecting whether said telephone set in a portable or mobile mode;

means for generating a portable-mode ringing signal when said telephone set is in said portable mode, the frequency of said portable-mode ringing signal being detectable by to an internal loudspeaker built in said telephone set;

means for generating a mobile-mode ringing signal when said telephone set is in said mobile-mode, the frequency of said mobile-mode ringing signal being detectable by to an external loudspeaker; and

means for providing said portable-mode and mobile-mode ringing signals to said internal and external loudspeakers, respectively.

5,317,623
METHOD OF HANDOVER AND ROUTE DIVERSITY IN MOBILE RADIO COMMUNICATION

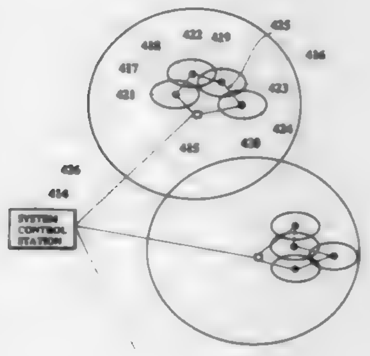
Masayuki Sakamoto, and Masaharu Hata, both of Yokosuka, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 2, 1991, Ser. No. 770,104

Claims priority, application Japan, Oct. 2, 1990, 2-263136; Oct. 2, 1990, 2-263137; Oct. 2, 1990, 2-263138; Oct. 4, 1990, 2-265145

Int. Cl.⁵ H04M *11/00*

U.S. Cl. 379—60 **25 Claims**



18. A method of handover in a mobile radio communication using a cellular system formed by a plurality of control base stations each of which is covering a cell within a service area of the system, a plurality of base stations each of which is covering a mini-cell within a cell area of the cell covered by each of the control base stations, wherein the plurality of base stations within a cell area of a control base station and the control base station form a ring topology, method comprising the steps of:

providing a single directional loop transmission line by which a control base station and each base station are connected with neighboring base stations;

transmitting a handover information through the loop transmission line, where the handover information is relayed by each base station from one of the neighboring base stations to another one of the neighboring base station such that the handover information is circulated through the loop transmission line in a predetermined direction; and

carrying out the handover of a communication of a mobile station from one traffic channel of one base station to an idle traffic channel of another base station by using the handover information circulated through the loop transmission line when a mobile station moves from one mini-cell to another mini-cell.

5,317,624
CORDLESS AUTOMATIC ANSWERING TELEPHONE SET

Noboru Obana, Machida, and Mitsuo Satoh, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 14, 1991, Ser. No. 715,807

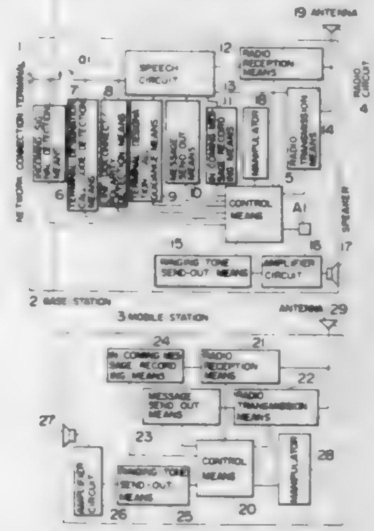
Claims priority, application Japan, Jun. 18, 1990, 2-159045

Int. Cl.⁵ H04M *11/00, 1/64*

U.S. Cl. 379—61 **4 Claims**

1. A cordless automatic answering telephone set comprising, as a terminal, a base station connected to a telephone circuit and a mobile station connected to said base station through a radio circuit,

in which said base station includes: control signal detection means for detecting a control signal sent from a caller; terminal-designation code detection means for detecting a terminal designation code sent from said caller after detection of said control signal; special ringing tone send-out means for sending out a special ringing tone; and control means connected to said control signal detection means, said terminal-designation code detection means, and said special ringing tone send-out means;



in which said mobile station includes special ringing tone send-out means for sending out ringing tone;

whereby said control means selects said special ringing tone send-out means of either one of said base station and said mobile station in accordance with the control signal and terminal designation code sent from the caller to said base station.

5,317,625

Patent Not Issued For This Number

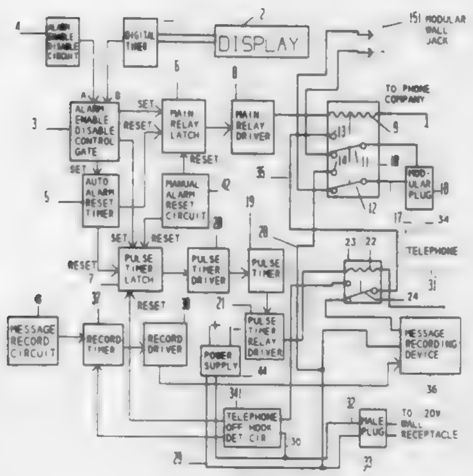
5,317,626
WAKE-UP AND REMINDER SYSTEM FOR A TELEPHONE

Brian Jaynes, 121 Piedmont Ave., Hampton, Va. 23661, and Steven Slowikowski, 709B Poquoson Ave., Poquoson, Va. 23662

Filed May 13, 1991, Ser. No. 699,251

Int. Cl.⁵ H04M *1/64, 9/00*

U.S. Cl. 379—67 **12 Claims**



1. A wake-up and reminder system for a telephone comprising:

means for connecting the system to the Central Office via a telephone line;

means for connecting the system to the telephone;

timer means for establishing an alarm time;

first relay means responsive to said timer means for disconnecting the telephone temporarily from the Central Office;

means for energizing a telephone ring line upon establishment of an alarm time by said timer means so that the telephone will ring at a predetermined rate upon reaching the alarm time;

off-hook detection means for detecting when the telephone has been taken off the hook; and

second relay means responsive to said off-hook detection means for disconnecting the telephone from the ring line and connecting the telephone to an internal recorder means disposed within the system for playing a prerecorded message.

5,317,627
ENHANCED WIDE AREA AUDIO RESPONSE NETWORK

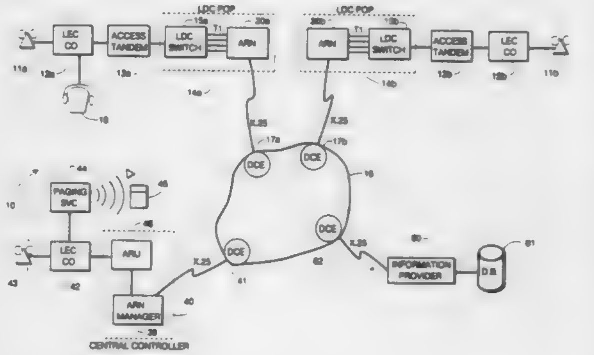
Charles T. Richardson, Jr., Gwinnett County, and Kevin L. Austin, Fulton County, both of Ga., assignors to United States Advanced Network, Inc., Norcross, Ga.

Continuation of Ser. No. 591,047, Oct. 1, 1990, Pat. No. 5,113,430. This application Mar. 16, 1992, Ser. No. 852,491

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.⁵ H04M *1/64, 11/00*

U.S. Cl. 379—88 **8 Claims**



1. Method of providing audio response services to callers from a wide area audio response network system, said method comprising the steps of:

providing a plurality of audio peripherals remotely distributed over a wide area and connected to user telephone lines;

connecting each of the plurality of audio peripherals through a network to a central controller which controls the operation of each of the plurality of audio peripherals;

receiving user information at an audio peripheral through a user telephone line;

transferring the user information from the audio peripheral through the network to the central controller;

processing the transferred information at the central controller;

transferring command signals from the central controller through the network to the audio peripheral;

converting digital representations of analog audio signals stored at the audio peripheral into reproduced analog audio signals according to the transferred command signals;

supplying the reproduced analog audio signals to the user telephone line; and

repeating the steps of receiving user information, transferring user information, processing the transferred information, transferring command signals, converting digital representations, and supplying the reproduced analog audio signals until an audio response service is concluded,

wherein every supplying of a reproduced analog audio signal to a user telephone line is in response to receipt of at least one command signal from the central controller, and

wherein the transferred command signals include signals corresponding to the address of stored digital representations of analog audio signals.

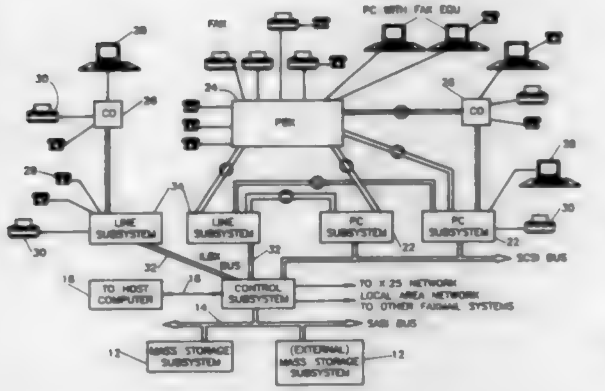
5,317,628
MESSAGE MANAGEMENT SYSTEM

Boaz Misholi, Ramat 'Hasharon, Israel; Itzchak Danziger, Plainview; Stephen R. Kowarsky, Massapequa, both of N.Y., and Nimrod Sandlerman, Ramat Gan, Israel, assignors to Efrat Future Technology Ltd., Tel Aviv, Israel and Comverse Technology Inc., Woodbury, N.Y.

Continuation of Ser. No. 580,521, Sep. 11, 1990, abandoned, which is a continuation of Ser. No. 887,793, Jul. 17, 1986, Pat. No. 5,008,926. This application Dec. 2, 1992, Ser. No. 985,231

Int. Cl.⁵ H04M *3/50, 11/00;* **H04N** *1/32, 1/42*

U.S. Cl. 379—89 **21 Claims**



12. A message management system comprising:

means for storing messages having at least visually sensible portions in any of a plurality of mailboxes; and

means for connecting said storing means with a direct inward dial (DID) line so that said messages may be transmitted to or received from a selected mailbox identified by a DID number sent over said DID line without the need for command signals generated from a DTMF telephone set to identify the selected mailbox.

20. A message management system comprising:

means for storing facsimile messages;

means for interfacing said storing means with a telephone network to which a facsimile machine and a telephone set are connected; and

means, connected to said interfacing means and said storing means, for allowing a first subscriber, receiving a message stored in said storing means to transfer said message to a second subscriber and for allowing said first subscriber to attach a voice message to said message being transferred.

5,317,629
DATA COMMUNICATION APPARATUS CONNECTABLE WITH A PLURALITY OF TELEPHONE SETS AND A TELEPHONE LINE

Tsunehiro Watanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1991, Ser. No. 702,388

Claims priority, application Japan, May 21, 1990, 2-129122; Jun. 4, 1990, 2-144405

Int. Cl.⁵ H04M *11/00*

U.S. Cl. 379—93 **11 Claims**

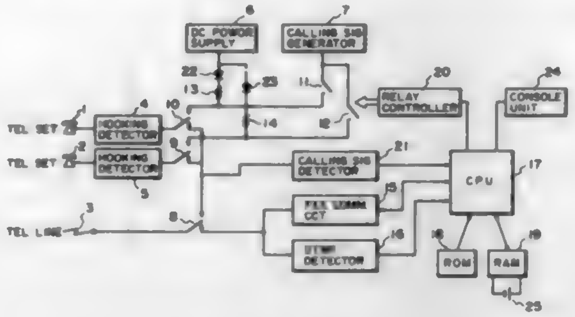
5. A data communication apparatus comprising:

connecting means for selectively connecting a data communication circuit and a plurality of telephone sets to a communication line;

setting means connected to the telephone sets for manually setting, in advance, any one of the telephone sets to be rung in response to an incoming call;

ringing means connected to the telephone sets for ringing the one of the plurality of telephone sets set by said setting means in response to the incoming call; and

responding means connected to the telephone sets for responding to the incoming call by connecting the one of the plurality of telephone sets to the communication line by said connecting means, when the one of the plurality of telephone sets is rung and off-hooked.



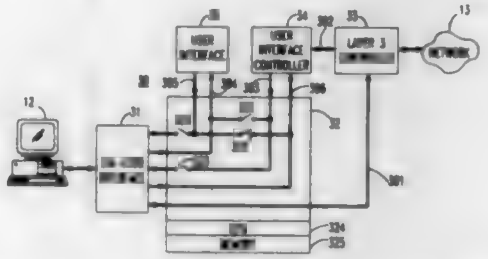
5,317,630
INTERFACE FOR A DATA TELEPHONE AND DATA TERMINAL IN A DIGITAL TELEPHONE SYSTEM

Lee A. Feinberg, Manalapan, and Yiu K. Leung, Aberdeen, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 10, 1990, Ser. No. 580,238

Int. Cl.⁵ H04M *11/00*

U.S. Cl. 379—94 **28 Claims**



1. In a terminal adapter arranged for attaching to a digital network and for attaching to a data terminal, a data terminal interface comprising:

means for receiving an incoming control message from the digital network for a user interface in the terminal adapter;

means for configuring the data terminal interface for operating in a plurality of operating modes;

means for routing said incoming control message from the digital network directly to the user interface while said data terminal interface is configured in a first one of the plurality of operating modes;

means for routing said incoming control message from the digital network to the data terminal in accordance with a first protocol while said data terminal interface is configured in a second one of the plurality of operating modes; and

means for forwarding to said user interface from said data terminal a substitute message generated by said data terminal, said substitute message being forwarded in a format different from said first protocol while said data terminal interface is configured in said second one of the plurality of operating modes.

5,317,631
LOCAL SWITCHING SYSTEM

Abraham Y. Chen, Mountain View, Calif., assignor to Arcanex Technology, Inc., Cupertino, Calif.

Filed Feb. 27, 1992, Ser. No. 843,468

Int. Cl.⁵ H04M *1/00, 1/64, 3/42, 7/00*

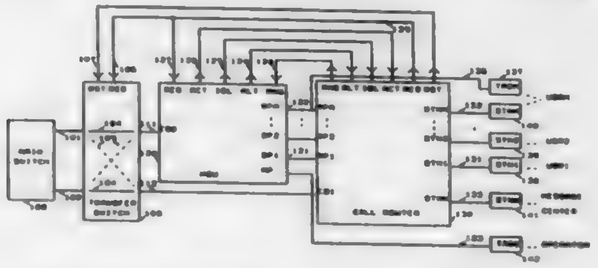
U.S. Cl. 379—164 **8 Claims**

1. An improved local switching system comprising:

a line transfer switch (103) comprising: first and second bi-directional line input ports for connection to a main communication switching system (100); first and second output ports; line transfer switching means (104, 105) for selectively connecting said first and second input ports respectively to said first and second output ports and for alternatively selectively connecting said first and second input ports respectively to said second and first output ports; and first control means (304) for controlling said switching means; said first control means comprising reset and request control signal input terminals;

a master switching unit (120) comprising: a first line transfer port (CO0), a plurality of router ports (SP1–SPM); means (111) for coupling said first line transfer port to said first output port; and means within said master switching unit for: selectively completing originating and terminating calls between said first line transfer port and said router ports and among said router ports; means for maintaining stable talking connections; and means for generating master switching unit status signals; comprising: idle, busy, and available status signals;

call routing means (130) comprising: a plurality of master switching unit ports (RP1–RPM) corresponding in number to said router ports (SP1–SPM) and individually connected to said router ports (SP1–SPM); a second line transfer port (CO1); a plurality of station ports (STN1–STNM); and internal switching means (210, 212) for selectively connecting said station ports individually to said master switching unit ports (RP1–RPM); and alternatively selectively individually connecting said station ports to said second transfer port (CO1); second control means (209) for controlling said line transfer switch, said internal switching means, and said call routing means; and means (124–126) for coupling said master switching unit status signals to said second control means.



5,317,632
TIMED TELEPHONE SILENCER. (TELEPHONE SILENCER WITH TIMER FUNCTION)

David W. Ellison, 130 N. Small Ave., Kankakee, Ill. 60901

Filed Oct. 18, 1991, Ser. No. 779,042

Int. Cl.⁵ H04M *1/66*

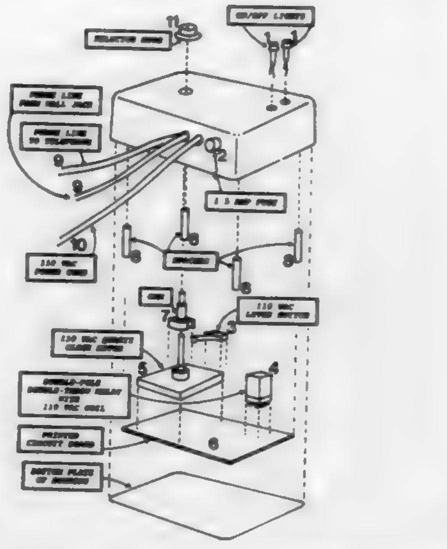
U.S. Cl. 379—199 **1 Claim**

1. A device for disabling the dialing and ringing functions of a telephone for a period of time selected by the user, after which period of time the telephone automatically is restored to full function; the device comprises:

(a) one knob on the exterior of the device for setting or controlling the device as opposed to various programming buttons and switches;

(b) an internal design based on the use of a clock-driven cam, operating a lever switch, with the lever switch operating a double-pole-double-throw relay, the latter disabling or enabling the telephone's function;

(b1) the external knob is affixed by means of a set screw to the upper end of the shaft of the cam, which upper end protrudes slightly through the top of the housing of the device; the knob can therefore turn the cam, which is slip-fitted onto the hour shaft of the clock motor; turning the knob, therefore, causes a little depression machined into the outer face of the cam to move away from the lever switch, activating the lever switch, it, in turn, activating the relay, the relay, in turn, disabling telephone function; the clock motor now functions, and brings the cam slowly back around to where the depression in the cam face causes the lever switch to trip and actuate the relay, thereby restoring telephone function, and stopping the clock.



5,317,633
EXCHANGING SYSTEM AND METHOD OF ESTABLISHING DATA CALL THEREOF

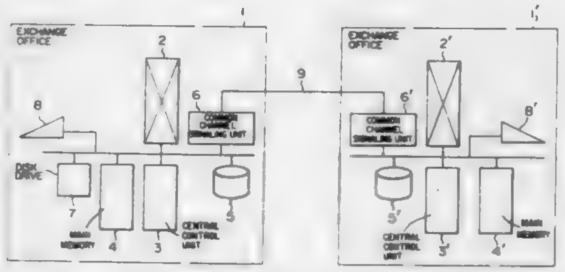
Masashi Hiraiwa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1990, Ser. No. 570,112

Claims priority, application Japan, Oct. 30, 1989, 1-279990

Int. Cl.⁵ H04M *7/06*

U.S. Cl. 379—230 **9 Claims**



5. A method of transferring data between exchange offices for use in an exchanging system in which data transfers are conducted between a plurality of exchange offices connected to each other by a singaling line such that data is transferred between file means for storing files associated with the respective exchange offices, comprising the steps of:

establishing, for each input/output request from a user, a singaling connection to be employed in a data transfer between an exchange office associated with the user and a particular exchanging system of a communicating exchange office;

subdividing data to be transferred between the exchange offices into packets each having a fixed length; and

transmitting the packets each having the fixed length via a common channel signaling network, thereby achieving a transfer of the packets.

5,317,634

TELEPHONE SUBSET ARRANGEMENT

Ronald C. S. Fox, Randwick, Australia, assignor to Alcatel N.V., Amsterdam, Netherlands

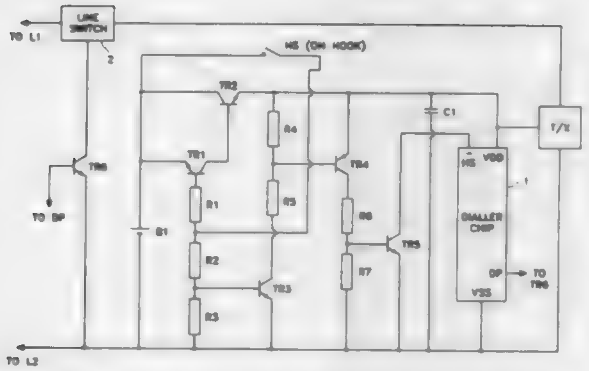
PCT No. PCT/AU89/00493, § 371 Date Jun. 19, 1991, § 102(e) Date Jun. 19, 1991, PCT Pub. No. WO90/00783, PCT Pub. Date Jul. 12, 1990

PCT Filed Nov. 17, 1989, Ser. No. 691,004

Claims priority, application Australia, Dec. 23, 1988, PJ 2096

Int. Cl.^{5} H04M *3/00*

U.S. Cl. 379—362 **5 Claims**



1. A telephone subset circuit arrangement comprising
first and second line terminals for respectively connecting the subset to first and second conductors of an exchange line,
a transmission circuit connected between said first and second line terminals,
a loop current circuit,
a battery, and
a line switch circuit further comprising
 control means associated with the transmission circuit and having power terminal means for applying energizing power to enable said control means and hook-switch signal input means responsive to a control signal for thereupon producing a line switch signal,
 first controllable semiconductor switch means responsive to said line switch signal and having a control element coupled to a first output of said control means and a conductive path forming a switching element in series with said loop current circuit,
 second controllable semiconductor switch means for, when the subset is in an on-hook mode, connecting energy from said battery to said power terminal means,
 third controllable semiconductor switch means for applying said control signal to said hook-switch signal input means, and
 hook-switch means for, when the subset is in the off-hook mode, rendering said second controllable semiconductor switch means non-conducting to thereby disconnect said battery from said power terminal means, and rendering said third controllable semiconductor switch means conducting to thereby couple said power terminal via the transmission circuit to said first and second line terminals.

5,317,635

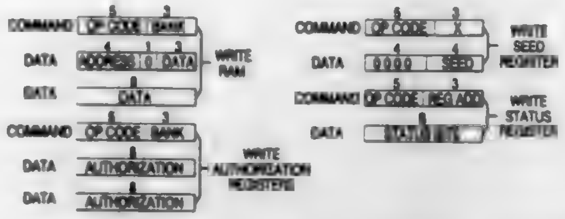
INTERDICTION METHOD AND APPARATUS WITH MODE CONTROL FOR VARIABLE FREQUENCY ELEMENTS

Ronald C. Stirling, Lilburn; Mark E. Schutte, Sugar Hill, and Neil C. Robertson, Norcross, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Jun. 10, 1992, Ser. No. 896,261

Int. Cl.^{5} H04N *7/167*

U.S. Cl. 380—7 **14 Claims**



1. An interdiction apparatus for selectively interdicting unauthorized channel signals in a broadband CATV signal with jamming signals, the interdiction apparatus located off premises from a subscriber location and receiving the broadband CATV signal from a headend over a distribution network, said apparatus comprising:
common circuitry including means for compensating and for distributing the broadband CATV signal to one or more subscriber modules, and control processor means for communicating with the headend over the distribution network and adapted to receive addressable instructions and data;
said one or more subscriber modules including master processor means for communicating with said control processor means and adapted to receive instructions and data from said control processor means;
means for storing frequency control words, each of said frequency control words representing a particular jamming frequency and including at least one mode control bit;
a plurality of jamming frequency generators for receiving said frequency control words and for generating a plurality of jamming frequencies representative of said frequency control words;
jamming processor means for controlling said storing means to selectively output said stored frequency control words in a predetermined sequence and for controlling said jamming frequency generators to generate the plurality of jamming frequencies representative of said predetermined sequence, and for generating mode control signals from said at least one mode control bit;
switch control means for selecting one of said plurality of jamming frequency generators in response to said mode control signals; and
means for combining said jamming frequencies with the broadband CATV signal to interdict the unauthorized channels.

5,317,636

METHOD AND APPARATUS FOR SECURING CREDIT CARD TRANSACTIONS

Gerardo Vizcaino, Nashua, N.H., assignor to Arris, Inc., Nashua, N.H.

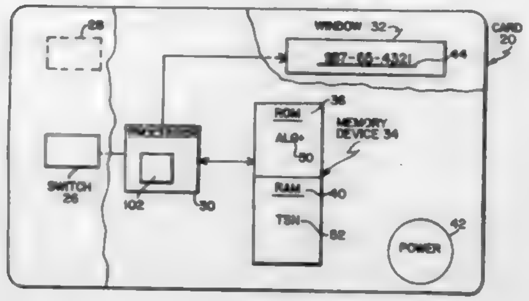
Filed Dec. 9, 1992, Ser. No. 988,418

Int. Cl.^{5} H04K *1/00*

U.S. Cl. 380—23 **33 Claims**

1. A credit card apparatus comprising:
a memory means for storing data;
an encryption algorithm stored in said credit card for encrypting data, said algorithm being complementary to a

de-encryption algorithm stored in an authorization computer;
a first transaction sequence number stored in said memory means, said transaction sequence number corresponding to a second transaction sequence number stored in the computer;
a display means;
a processing means for processing said encryption algorithm and said first transaction sequence number to produce a verification number, which is visually displayed in said display means, for conveyance to the computer which computes a transaction sequence number using the de-encryption algorithm and which tests the correspondence of the computed transaction sequence number with the second transaction sequence number for determining whether a given credit card transaction is to be authorized; and
said processing means changes said first transaction sequence number, and stores the changed first transaction sequence number in said memory means.



5,317,637

DATA EXCHANGE SYSTEM WITH A CHECK OF THE APPARATUS FOR ITS AUTHENTICATION STATUS

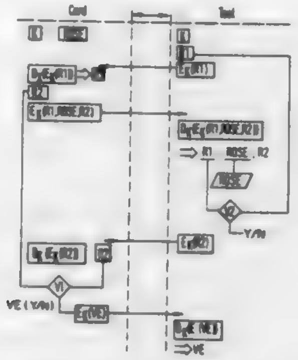
Albert Pichlmaier, and Gisela Meister, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Dec. 22, 1992, Ser. No. 995,458

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1991, 4142964

Int. Cl.^{5} H04K *1/00*

U.S. Cl. 380—25 **10 Claims**



1. A data exchange system wherein the entitlement of an entitled user is detected by a check of a personal feature inputted by the entitled user, comprising a data carrier associated with the entitled user, an apparatus communicating with the data carrier and a display unit, characterized in that a data word is stored on the data carrier in encoded form, said data word is assigned and known to the entitled user and is transmitted to the apparatus in an encoded form and displayed to the entitled user for comparison after being decoded by a cryptographic unit contained in the apparatus and characterizing the authenticity of the apparatus.

5,317,638

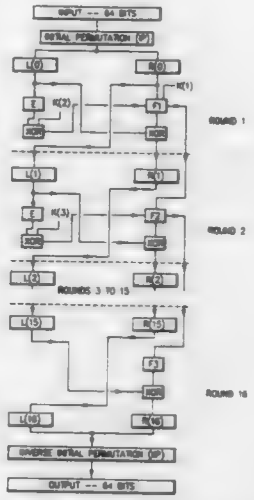
PERFORMANCE ENHANCEMENT FOR ANSI X3.92 DATA ENCRYPTION ALGORITHM STANDARD

Chang Y. Kao, Endwell, N.Y.; James P. Kuruts, Forest City, Pa., and Sivarama K. Kodukula, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 17, 1992, Ser. No. 916,777

Int. Cl.^{5} H04K *1/00*

U.S. Cl. 380—29 **6 Claims**



1. A data processing system for executing cryptographic functions based on DES algorithm implemented in hardware, comprising:
a hardware Data Encryption Standard (DES) element conforming to ANSI X3.92 data encryption standards;
said standard element having a critical path with 16 rounds utilized for data encryption processing; and a standard E-table; and characterized in that there is provided:
means for removing a stage of logical XOR function of the ANSI X3.92 data encryption DES element from the critical path in rounds 2 through 15 and for decreasing the logical delays to provide higher performance;
said critical path being identified as a 48 bit XOR function between expanded dat and key which indexes into S-boxes in the f-function of the DES algorithm; and
said critical path for rounds 2 through 15 are restructured whereby the XOR function performed between the expanded left half of the input data and the key during the current round and this result is fed to the next round of f-function during encryption; and whereby
the left half of the input data is pre-expanded using the standard E-table to match the size of the keys.

5,317,639

NON-LINEAR BLOCK SUBSTITUTION DEVICES DERIVED BY CONSTRUCTIVE CORRUPTION

Lothrop Mittenthal, Thousand Oaks, Calif., assignor to Teledyne Industries, Inc., Newbury Park, Calif.

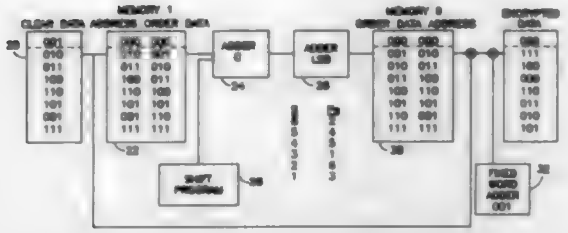
Continuation-in-part of Ser. No. 741,097, Aug. 5, 1991, Pat. No. 5,214,704, which is a continuation-in-part of Ser. No. 416,953, Oct. 4, 1989, Pat. No. 5,038,376. This application May 25, 1993, Ser. No. 68,910

Int. Cl.^{5} H04K *1/04*

U.S. Cl. 380—37 **12 Claims**

1. A method of encryption by substituting for any one of the 2^n unique clear text blocks of n bit binary numbers an associated unique encrypted block of n bit binary numbers comprising the steps of:

(a) finding a first matrix G^n of 2^n equations, representing a linear orthomorphism, each equation representing the modulo 2 additions of one of the 2^n clear text blocks in the left column, with a unique one of 2^n n-bit blocks in the middle column to provide an associated unique n-bit block in the right column, all of the equations in the first matrix of 2^n equations being characterized by the vector sum modulo 2 of any number of the equations also being one of the equations in the first matrix, the equations including the identity equation $\Theta\oplus\Theta=\Theta$ and the remaining 2^n-1 equations being orderable as follows:



$$
\begin{array}{ll}
\text{Equation \#} & \\
1 & x_m \oplus x_1 = x_{1-p} \\
2 & x_1 \oplus x_2 = x_{2-p} \\
\cdot & \\
\cdot & \\
\cdot & \\
j & x_j \oplus x_j = x_{j-p} \\
\cdot & \\
\cdot & \\
\cdot & \\
m & x_{m-1} \oplus x_m = x_{m-p}
\end{array}
$$

where $m=2^n$. L, M and R are the left, middle and right columns respectively, $G^n=L_n\times M_{n\times Rn}$, represents the set of equations, G^{n-1} is a subgroup of G^n generated by $n-1$ consecutive equations in G^n, being a submatrix of 2^{n-1} equations, $\overline{G}^{n-1}$ is the complement of G^{n-1} in G^n, $G^{n-1}=L_{n-1}X$ $M_{n-1}\times R_{n-1}$, $\overline{G}^{n-1}=\overline{L}_{n-1}\times\overline{M}_{n-1}\times\overline{R}_{n-1}$, $W_{n-1}=L_{n-1}\cap M_{n-1}$, G^{n-2} is a subgroup of G^{n-1} generated by $n-2$ equations in G^{n-1}, being a submatrix of 2^{n-2} equations, $\overline{G}^{n-2}$ is the complement of G^{n-2} in G^{n-1}, $G^{n-2}=L_{n-2}\times M_{n-2}\times R_{n-2}$, $\overline{G}^{n-2}=\overline{L}_{n-2}\times\overline{M}_{n-2}\times\overline{R}_{n-2}$, $W_{n-2}=L_{n-2}\cap M_{n-2}$, $\overline{W}_{n-2}$ is the complement of W_{n-2} in W_{n-1}, with like subgroups being defined with indices n-2 to 2 wherein $W_2=\{x, \theta\}=W_1\cup\overline{W}$, where $x\neq\theta$ and $W_1=\{\theta\}$ and $\overline{W}_1=\{x\}$;

G^{n-1} being a submatrix of G^n, including the identity equation, and the remaining 2^{n-1} equations being orderable as follows:

$$
\begin{array}{ll}
\text{Equation No.} & L_{n-1} \times M_{n-1} \times R_{n-1} \\
i_1 & x_{i1} \oplus x_{i1} = x_{i1-p} \\
i_2 & x_{21} \oplus x_{21} = x_{21-p} \\
\cdot & \\
\cdot & \\
\cdot & \\
i_j & x_{ij} \oplus x_{ij} = x_{ij-p} \\
\cdot & \\
\cdot & \\
\cdot & \\
i_s & x_{is} \oplus x_{is} = x_{is-p}
\end{array}
$$

where s - $2^{n-1}-1$ and $\overline{G}^{n-1}$ is all of the remaining 2^{n-1} equations from G^n which are not included in G^{n-1}, and corresponding for G^{n-2} being a subset of 2^{n-2} equations from G^{n-1} selected by choosing n-2 consecutive equations from G^{n-1} and taking all sums of these and identity equations, and wherein $\overline{G}^{n-1}$ is all of the remaining 2^{n-2} equations from G^{n-1} which are not included in G^{n-2} and so on, for successively smaller subgroups until G^2 is selected with $2^2=4$ equations, including the identity equations, two consecutive equations and their sum from G^3 with $\overline{G}^2$ being four equations of G^3 not including G^2,

(b) modifying a plurality of the non-zero 2^n-1 equations in the first matrix of 2^n equations to provide a second matrix of 2^n equations, representing a nonlinear orthomorphisms, the plurality of equations being modified so that the modified plurality of equations collectively map the clear text blocks in the left column to unique encrypted n-bit blocks in the right column, but in a nonlinear manner so that each of the modified equations is not generally the sum modulo 2 of any number of the equations in the unmodified first step wherein said modification of said plurality of the non-zero 2^{n-1} equations is achieved by

applying the 2^{n-3} mixing transforms in $\overline{W}_{n-2}$ to $\overline{G}^{n-1}$;

applying the 2^{n-4} mixing transforms in $\overline{W}_{n-3}$ to $\overline{G}^{n-2}$;

continuing applying mixing transforms until reaching $\overline{G}^2$; and

(c) for each clear text block in the left column to be encrypted, adding modulo 2 to that block, the unique one of the 2^n n-bit blocks associated therewith in the middle column in accordance with the associated equation of the second matrix of 2^n equations to obtain the encrypted block in the right column.

5,317,640
SWITCHED AMPLIFIER

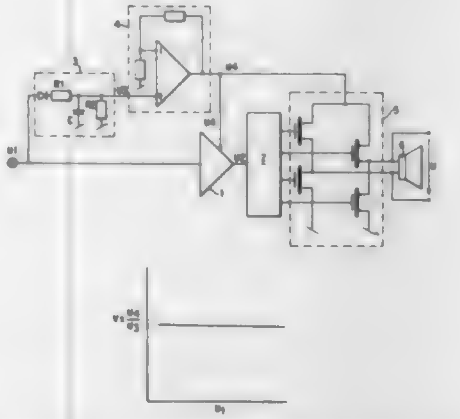
Francois Callias, Neuchatel, Switzerland, assignor to Ascom Audiosys AG, Flamatt, Switzerland

Filed Oct. 30, 1991, Ser. No. 785,093

Claims priority, application Switzerland, Oct. 30, 1990, 3446/90

Int. Cl.⁵ H04R *25/00*

U.S. Cl. 381—68.4 **1 Claim**



1. A hearing aid comprising: an amplifier circuit including a switched amplifier providing a switched output signal, and circuit means for adjusting the pulse amplitude of the switched output signal as a function of the envelope curve of the audio signal to be amplified, in which the circuit means includes a controllable amplifier in series with and ahead of the switched amplifier and is controlled by the audio signal to be amplified so that the product of the amplifier gain of the switched amplifier and of the controllable amplifier remains substantially constant for all levels of the audio signal to be amplified.

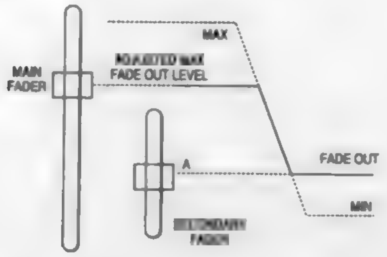
5,317,641
FADER DEPTH CONTROL APPARATUS

Fujio Yasuda, Coral Springs, and Alan Flum, Ft. Lauderdale, both of Fla., assignors to Sony Electronics Inc., N.J.

Filed Apr. 11, 1991, Ser. No. 683,887

Int. Cl.⁵ H04B *1/00;* **H03G** *3/00*

U.S. Cl. 381—119 **5 Claims**



1. An audio mixing apparatus comprising:

a first fader level control means for adjusting a maximum level of a FADE signal;

second fader level control means for adjusting a minimum level of said FADE signal, wherein said minimum level is adjusted independently of said maximum level; and

further comprising editor means associated with said mixing apparatus and wherein said editor means generates said FADE signal which is received by said mixing apparatus and wherein said first fader level control means is operable to adjust the maximum level of said FADE signal received from said editor means; and

wherein said second fader level control means is operable to adjust the minimum level of said FADE signal received from said editor means independent of the maximum level set by said first level control means.

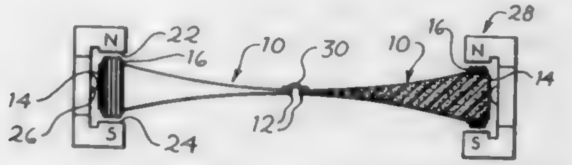
5,317,642
LOUDSPEAKERS HAVING TORQUE DRIVE RADIATORS

Thomas J. Danley, Highland Park, and Charles A. Rey, Riverwoods, both of Ill., assignors to Intersonics Incorporated, Northbrook, Ill.

Filed Feb. 24, 1993, Ser. No. 21,884

Int. Cl.⁵ H04R *25/00*

U.S. Cl. 381—182 **13 Claims**



1. A loudspeaker responsive to an electrical signal comprising a substantially rigid radiator having a surface area defined by opposed sides and opposed first and second edges, a conductive coil wrapped around said radiator near said first edge and extending along opposed sides thereof, means for supporting said radiator for rotation about an axis near said first edge generally in parallel with a longitudinal axis of said coil, and magnet means having opposite poles disposed adjacent to the coil at opposite sides thereof, such that an electrical signal on said coil causes torque to be exerted on said radiator around the axis.

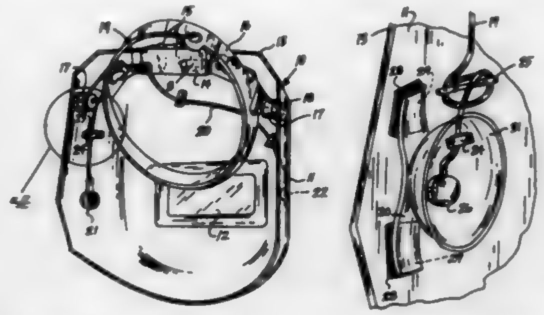
5,317,643
AUDIO HELMET APPARATUS

Richard D. Patricelli, 500 3rd Ave., Aberdeen, Wash. 98520

Filed Feb. 8, 1993, Ser. No. 17,429

Int. Cl.⁵ H04R *25/00*

U.S. Cl. 381—187 **1 Claim**



1. An audio welding helmet apparatus, comprising in combination,

a welding helmet, including an elongate helmet defined by a generally semi-cylindrical configuration including a continuous perimeter edge, the perimeter edge including an upper edge portion and spaced side edge portions, and

the helment including a band pivotally mounted within the helmet for mounting of the helmet to an individual, and the helmet including a viewing window mounted through a forward surface of the helmet positioned medially between the side edge portions, and

a radio receiving module mounted interiorly of the helmet adjacent the upper edge portion, and

including a first head phone and a second head phone mounted to opposed interior side walls of the helmet in electrical communication with the radio receiving module, and

the radio receiving module is mounted adjacent the upper edge portion of the helmet, and wherein the radio receiving module further includes respective volume and channel selector dials projecting beyond the upper edge portion to provide enhanced manual access to the dials during use of the helmet, and

a respective first and second head phone transmission line in electrical communication with the radio receiving module, wherein the first and second head phone transmission lines are in respective communication with the first and second head phone to direct audio signals to the first and second head phones, and

each respective first and second head phone transmission lines include a plurality of first hook and loop fastener patches fixedly mounted to the interior surface of the helmet, wherein the first hook and loop fastener patches are cooperative with second hook and loop fastener patches, and wherein each head phone transmission line is secured between the first and second hook and loop fastener patches to secure the audio transmission lines adjacent the interior surface of the helmet, and

a clevis hook member; wherein the clevis hook member further includes a plurality of opposed hook portions to permit winding of excessive head phone transmission lines of each respective first and second head phone transmission lines thereabout to effect selective vertical adjustment of each head phone relative to each clevis hook, and

a cushion member selectively securable overlying each head phone, wherein each cushion member includes an audio transmission cushion member, and wherein each cushion member includes an elastomeric skirt, wherein the elastomeric skirt is selectively securable about each head phone, and

a first and second respective flexible semi-spherical speaker cup, wherein each speaker cup is mounted adjacent each side edge portion of the side edge portions of the helmet, and wherein each speaker cup is fixedly mounted to an elongate, flexible strap member, the elongate flexible strap member includes fourth hook and loop fastener portions mounted to the strap and spaced apart a predetermined distance, and the fourth hook and loop fastener portions are selectively securable to third hook and loop fastener portions spaced apart a predetermined spacing and fixedly mounted to the interior surface of the helmet adjacent each side portion thereof.

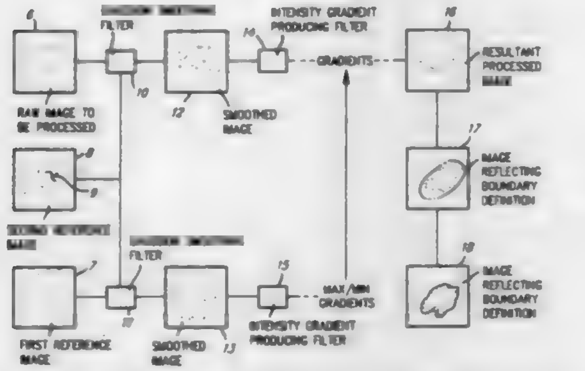
5,317,644

METHOD FOR THE ENHANCEMENT OF CELL IMAGES

Christopher Kenyon; Peter Macklem, and David Eidelman, all of Montreal, Canada, assignors to McGill University, Montreal, Canada

Filed Jun. 16, 1992, Ser. No. 899,602
Int. Cl.^{5} G06K *9/54*

U.S. Cl. 382—6 **6 Claims**


6
GAUSSIAN SMOOTHING FILTER
INTENSITY GRADIENT PRODUCING FILTER
16
14
10
12
RAW IMAGE TO BE PROCESSED
SMOOTHED IMAGE
GRADIENTS
RESULTANT PROCESSED IMAGE
8
9
SECOND REFERENCE IMAGE
17
IMAGE REFLECTING BOUNDARY DEFINITION
18
IMAGE REFLECTING BOUNDARY DEFINITION
7
GAUSSIAN SMOOTHING FILTER
15
MAX/MIN GRADIENTS
11
FIRST REFERENCE IMAGE
SMOOTHED IMAGE
13
INTENSITY GRADIENT PRODUCING FILTER

1. A method of processing one or more raw light microscope optical image sections of a specimen to generate one or more processed optical image sections therefrom, wherein said raw image sections are raw Nomarski optical image sections of the specimen in digitised form such that the raw image sections are each composed of a plurality of digitised pixel points, said method comprising,

- a) subjecting a said raw Nomarski image section and a raw first reference optical image section to one dimensional Gaussian smoothing, in the direction of the Nomarski effect, with a predetermined decay constant so as to obtain a smoothed original image section and a smoothed first reference image section,
  - said raw first reference image section being an out of focus optical image section with respect to the specimen, said raw first reference optical image section being a raw Nomarski optical image section in digitised form such that the raw first reference image section is composed of a plurality of digitised pixel points,
  - said constant being equal to the thickness in pixel points of a focused boundary of the specimen in a raw second reference Nomarski optical image section thereof, said raw second reference optical image section being a raw Nomarski optical image section in digitised form such that the raw second reference image section is composed of a plurality of digitised pixel points,
- b) determining for each of the smoothed image sections obtained from step a) a gradient of image pixel intensity, in the direction of the Nomarski effect, for all of the pixel points thereof,
- c) determining the maximum and minimum intensity gradient values for the smoothed first reference image section, and
- d) setting to zero, the intensity of each pixel point of the smoothed original image section which has an intensity gradient value within the range defined by the maximum and minimum intensity gradients for the smoothed first reference image so as to obtain a processed digitised optical image section, any remaining pixel points of non zero intensity in the processed image section being feature pixel points.

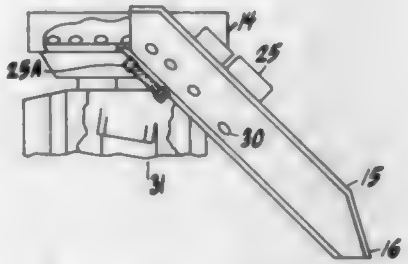
5,317,645

METHOD AND APPARATUS FOR THE RECOGNITION AND COUNTING OF DISCRETE OBJECTS

Barbara Perozek, New Canaan, and Timothy R. Smith, Stamford, both of Conn., assignors to Kirby Lester Inc., Stamford, Conn.

Filed Feb. 28, 1991, Ser. No. 662,418
Int. Cl.^{5} G06K *9/00;* **G06M** *7/00*

U.S. Cl. 382—8 **30 Claims**



1. An apparatus for counting a plurality of differently shaped objects comprising:

- a) an object supply receptacle;
- b) an object feeding device coupled to the object supply receptacle and adapted to receive one or more batches of objects at a time, each batch of objects including objects shaped differently to objects in other batches, and to dispense each of the one or more batches of objects therefrom, the objects being dispensed in a random orientation relative to each other;
- c) an electronic sensing device arranged adjacent to said object feeding device including a linear array of electronic detectors to detect the presence of differently shaped objects being dispensed from the object feeding device and passing thereby in a random orientation in each of a series of evenly timed signal reception periods, each one of the electronic detectors being in a blocked state when an object or objects are detected by the electronic detector in any one timed signal reception period and generating a signal representative of the blocked state; and
- d) an electronic counting device including a programmed microprocessor system, the electronic counting device coupled to said electronic sensing device to receive, during each of the series of evenly timed signal reception periods, the signals generated by said electronic sensing device, and to utilize the received signals from the multiple of signal reception periods to develop an image representative of the detected objects as they pass in a random orientation, said programmed microprocessor including a processing hierarchy comprising a main control program and a set of image processing modules to analyze the relative number and position of blocked detectors in each of a multiple of successive timed signal reception periods to determine the presence of more than one object, the image processing modules being called by the main control program upon the reception of a signal from at least one blocked detector in a preselected hierarchal order and each image processing module being adapted to detect a preselected geometric condition in the number and positions of detectors blocked by the randomly oriented objects in a multiple of successive timed signal reception periods, the set of image processing modules including:
  - a first image processing module adapted to detect a gap geometric condition in the number and positions of blocked detectors in a multiple of successive timed signals reception periods,
  - a second image processing module adapted to detect a shift geometric condition in the number and positions of blocked detectors in a multiple of successive timed signal reception periods,
  - a third image processing module adapted to detect a dimple geometric condition in the number and positions of blocked detectors in a multiple of successive timed signal reception periods, and
  - a fourth image processing module adapted to detect a corner geometric condition in the number and positions of blocked detectors in a multiple of successive timed signal reception periods;
  - wherein said electronic counting device is further coupled to said object feeding device to control the operation thereof in response to indications of the image processing.

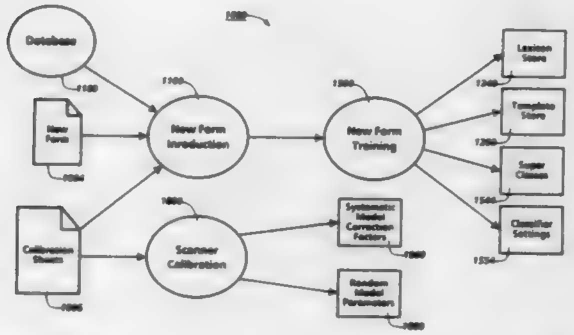
5,317,646

AUTOMATED METHOD FOR CREATING TEMPLATES IN A FORMS RECOGNITION AND PROCESSING SYSTEM

Henry W. Sang, Jr., Cupertio; Whei-Tsu H. Tahn, Sunnyvale, and Xiao B. Zhang, Foster City, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1992, Ser. No. 856,434
Int. Cl.^{5} G06K *9/34, 9/64, 9/68, 9/20*

U.S. Cl. 382—9 **18 Claims**



13. A method for assisting creation of an electronic template in a forms recognition system, said forms recognition system having a graphical display and a pointing device, including the steps of:

- a) scanning a master from having plural regions indicating fields wherein said fields are devoid of data, said scanning creating a master bitmap;
- b) displaying said master bitmap on said graphical display;
- c) selecting a single point within a first irregular region with said pointing device;
- d) expanding automatically about said single point to determine a first regular region within said first irregular region about said point;
- e) moving said single point automatically to the center of said first regular region;
- f) repeating steps d and e until coordinates of a maximum regular region within said first irregular region are found;
- g) storing said coordinates of said maximum regular region within said first irregular region, said coordinates to be used in assisting creation of said electronic template; and
- h) repeating steps c through g for each of said plural regions on said master.

5,317,647

CONSTRAINED ATTRIBUTE GRAMMARS FOR SYNTACTIC PATTERN RECOGNITION

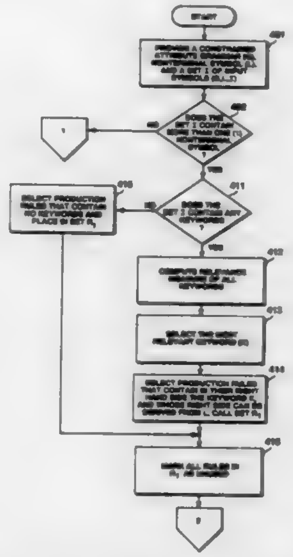
Giulia Pagallo, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 7, 1992, Ser. No. 864,607
Int. Cl.^{5} G06K *9/62*

U.S. Cl. 382—14 **4 Claims**

1. In a pattern recognition system, a method for determining that a pattern is invalid according to a predetermined grammar, said pattern comprised of a plurality of terminal subpatterns, said terminal subpatterns representing characters in a language implemented in said grammar, said method comprising the steps of:

- a) generating and storing a language implementation of a predetermined grammar, said predetermined grammar having a plurality of production rules, each of said plurality of production rules including a plurality of nonterminal symbols each capable of having a corresponding constraint for defining multi-dimensional spatial relationships between symbols;
- b) receiving and storing an input set of symbols, said set of symbols representing subpatterns of a pattern to be recognized according to said language, each of said symbols having a spatial attribute for identifying a spatial placement of said subpattern;



- c) identifying a production rule associated with said input set of symbols;
- d) comparing spatial attributes of nonterminal symbols of said identified production rules to spatial attributes of symbols in said input set of symbols according to a corresponding constraint of said identified production rule;
- e) determining that no symbols in said input set of symbols satisfy said constraints part of said identified production rule; and
- f) returning a signal identifying said pattern as invalid.

5,317,648

PROCESS FOR EXTRACTING A PARTICULAR COLOR IMAGE OF AN OBJECT AND A COLOR PROCESSING DEVICE THEREFOR

Kazuo Sawada, Hirakata, and Kenji Sasaki, Moriguchi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 1, 1992, Ser. No. 890,823
Claims priority, application Japan, May 31, 1991, 3-130093
Int. Cl.^{5} H04N *7/18*

U.S. Cl. 382—17 **3 Claims**

1. A process of extracting a particular color image of an object comprising the steps of:

- monitoring said object by a color television camera to provide a video signal including three primary color components;
- defining a color space by a rectangular coordinate system having three mutually perpendicular coordinates each designating each one of said three primary color components, said rectangular coordinate system having a color triangle which has its three vertices located on respective

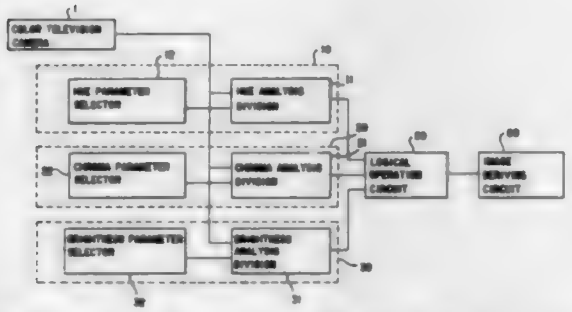
coordinates at points equidistant from the origin of said coordinate system;

selecting a spaced pair of chroma separation planes extending through the origin of said coordinate system and in parallel with one side of said cclor triangle so as to define a particular chroma region bounded between said chroma separation planes, each of said chroma separation planes being defined by the following equation [1]:

$$X-(Y+Z)/2=C(X+Y+Z)\ [0\leqq c\leqq 1] \qquad [1]$$

wherein X, Y, and Z are coordinates, respectively, of said rectangular coordinate system, and C is a chroma parameter which is varied to widen or narrow said particular chroma region, said chroma parameter C being determined by combining the following equation [2] into the equation [1]:

$$F(\alpha)=(1+n)|\alpha|-n\alpha \qquad [2]$$



where α is $X-(Y+Z)/2$, $|\alpha|$ is an absolute value of α, and n is selected in the following region:

$$0\leqq n\leqq 0.5,$$

n being determined such that the pair of the chroma separation planes are selected on the opposite of said achromatic axis in such a manner as to define, in said chroma separation planes, respectively two colors which have the same chroma level but are of opposite hue to each other; and

analyzing said video signal with respect to the three primary color components within said color space such that said video signal is determined to denote a particular chroma when the three primary color components are found to fall within said particular chroma region, wherein an extraction of said video signal as a particular color signal indicates a filtered image of said object with regard to said particular chroma.

5,317,649

METHOD FOR CLASSIFYING LINE PATTERNS OF CHARACTERS IN DICTIONARY

Hirobumi Nishida, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 798,319

Claims priority, application Japan, Nov. 30, 1990, 2-339695

Int. Cl.⁵ G06K *9/46, 9/48*

U.S. Cl. 382—21 **5 Claims**

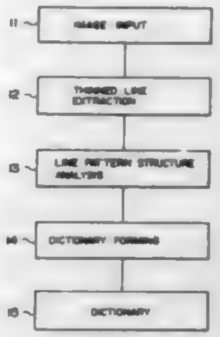
1. A method for classifying character line patterns in a dictionary of a character recognition system operating by recognizing characters using structural information of the characters, the character recognition system including an input device, a processing portion, and a memory in which the dictionary is formed, said method comprising the steps of:

(a) obtaining a first class to which one or a plurality of first line patterns belongs, the first line patterns being related to characters having been input through the input device to determine the first line patterns stored in the memory;

(b) obtaining a second class to which one or a plurality of second line patterns belongs, the second line patterns being related to characters having been input through the input device to determine the second line patterns stored in the memory;

wherein each of the first and second line patterns is characterized by respective structural information;

(c) using the processing portion, determining whether or not the structural information of the first line pattern and the structural information of the second line pattern are similar to each other, in accordance with a predetermined rule which is applied to the structural information by the processing portion; and



(d) when said step (c) determines that the structural information of the first line pattern and the structural information of the second line pattern are similar, using the processing portion to carry out a step of combining said first class and said second class so as to form a new class to which the first and second line patterns belong so that line patterns stored in the dictionary may be stored in the memory differently than before said step (d) because of said formation of said new class.

5,317,650

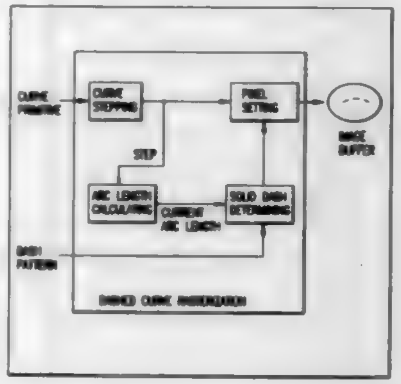
DETERMINATION OF THE ARC LENGTH OF A CURVE

Steven J. Harrington, Holley, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 736,998, Jul. 29, 1991, abandoned. This application Mar. 23, 1993, Ser. No. 33,563

Int. Cl.⁵ G06K *9/00*

U.S. Cl. 382—22 **13 Claims**



1. A method of producing an image with an imaging system, comprising the steps of:

receiving an image description representative of an image to be produced;

rasterizing said image description;

determining arc length of a curve, said arc length being determined by the steps of:

determining a sequence of steps of movement along the curve on a pixel grid in one of several predetermined directions;

determining whether the sequence of steps terminates in a terminating step along the curve in another of said predetermined directions, said another direction neighboring said one direction; and

if the sequence of steps terminates in the terminating step, determining the length of a line segment connecting a starting point of the sequence of steps to an end point of the terminating step, said line segment length corresponding to the arc length; and

producing an image in accordance with said rasterized image description, said image including characteristics that are derived from said arc length determination.

5,317,651

NON-LINEAR AND ADAPTIVE SIGNAL-PROCESSING DEVICE

Philippe Refregier, Gif sur Yvette, and Jean-Pierre Huignard, Paris, both of France, assignors to Thomson-CSF, Puteaux, France

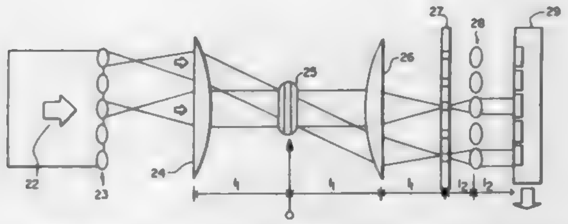
PCT No. PCT/FR89/00326, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO89/12870, PCT Pub. Date Dec. 28, 1989

Continuation of Ser. No. 845,789, Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 460,974, Feb. 13, 1990, abandoned. This PCT application Jun. 23, 1989, Ser. No. 58,229

Claims priority, application France, Jun. 24, 1988, 88 08521

Int. Cl.⁵ G06K *9/62, 9/76;* **G03H** *1/16;* **G02B** *27/46*

U.S. Cl. 382—31 **19 Claims**



1. A device for processing non-linear adaptive signals, comprising:

an image source outputting an image signal to an optical valve, said optical valve including a means for producing and outputting coherent optical waves;

an optical interconnection device receiving said output coherent optical waves from said optical valve wherein said optical interconnection device includes an optical filter wherein said optical filter includes a means for optically providing a Fourier plane of said image from said source and wherein said optical interconnection device provides an output;

a non-linear, adaptive neuronal processor receiving the output of said optical interconnection device.

5,317,652

ROTATION AND POSITION INVARIANT OPTICAL CHARACTER RECOGNITION

Chanchal Chatterjee, Sterling Heights, Mich., assignor to Phoenix Imaging, Sterling Heights, Mich.

Filed Jun. 5, 1991, Ser. No. 710,840

Int. Cl.⁵ G06K *9/54, 9/00*

U.S. Cl. 382—49 **8 Claims**

1. A method for rapid recognition of a sequence of features in an optical recognition system having a camera means, parallel processing means, I/O means, parallel memory means, CPU means and display means, said method comprising the steps of:

acquiring an image with said camera of a first feature in said sequence;

storing said image in a first buffer;

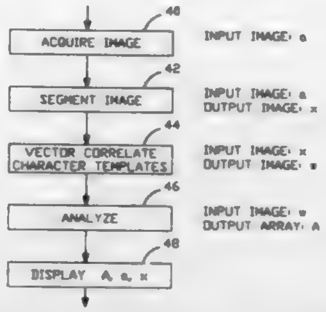
transferring said image in said first buffer to a second buffer;

segmenting said image in said second buffer and storing said segmented image in a third buffer;

vector correlating said segmented image in said third buffer with feature templates to create a correlation image in a fourth buffer;

said segmentation and correlation steps being done by said parallel processing means simultaneously while said step of acquiring an image acquires new images in said sequence;

transferring said vector correlation from said fourth buffer to a fifth buffer;



analyzing said vector correlation in said fifth buffer using said CPU means after two images are acquired by said camera to recognize said features; and

transferring said recognized feature into an array, wherein said camera, parallel processor and said CPU can process from an input buffer and output it to an output buffer without disturbing the contents of the other components in the system, whereby the operation of said camera means, said parallel processing means, and CPU means overlap to provide greater processing speed.

5,317,653

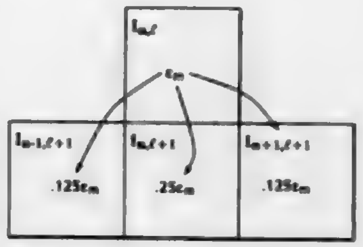
METHOD FOR QUANTIZATION GRAY LEVEL PIXEL DATA WITH APPLICATION OF UNDER COMPENSATED ERROR DIFFUSION

Reiner Eschbach, Webster; Keith T. Knox, Rochester, and David Birnbaum, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 755,380, Sep. 5, 1991, abandoned. This application May 20, 1993, Ser. No. 65,088

Int. Cl.⁵ G06K *1/38*

U.S. Cl. 382—50 **1 Claim**



1. An arrangement for quantizing pixel values in an image formed by a plurality of pixels, each pixel representing an optical density of the image at a discrete location within the image, and having an original optical density value associated therewith selected from one of a set of c original optical density values that has a number of members larger than a desired output set of d optical density values, the quantizing arrangement comprising:

a source of image data including pixels, each pixel having an original optical density value that is one of c original optical density values;

an adder for determining the sum of a weighted portion of a fractional error term derived from a quantization of at least one previous pixel, and the original optical density value of a current pixel;

a comparator for comparing the sum to at least one reference value, and producing an output value that is a member of the desired output set of d optical density values;

an error term comparator for comparing the output value and the sum, and producing an error term that is the difference therebetween;

means for determining weighted portions of the error term, where a sum of said weighted portions is a preselected fraction of the error term, where said fraction is less than 1 and greater than 0;

a memory storing the weighted portions of the error term to be applied to each original optical density value in a predetermined set of neighboring pixels;

means for applying the weighted portions of the value of said error term to the adder for addition to each optical density value in the predetermined set of neighboring pixels, wherein the predetermined set of neighboring pixels of a pixel n, l, where n is the position of the pixel in scan line l, includes the set of pixels n,l+1, n+1,l+1, and n−1,l+1, wherein the weighted portions are as follows: 0.25 of the error term to pixel (n,l+1), 0.125 of the error term to pixel (n+1,l+1), and 0.125 of the error term to pixel (n−1,l+1).

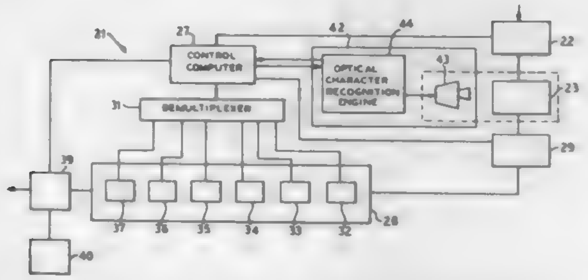
5,317,654
SELECTIVE COLLATING AND INSERTING APPARATUS

Alan Perry, Milton Keynes, England; Roger K. Newman, Bishop Waltham, United Kingdom, and Robert R. Kruk, Crestwood, Ill., assignors to Inscerco Mfg. Inc., Crestwood, Ill.

Continuation-in-part of Ser. No. 766,198, Sep. 26, 1991, abandoned. This application Mar. 11, 1992, Ser. No. 849,231

Int. Cl.^{5} G06K *9/20*

U.S. Cl. 382—61 **11 Claims**



1. Apparatus for serially selectively collating each one of a plurality of individual prime documents each having imprinted recipient address information with respective individual non-addressed secondary documents selected from a preset plurality of different individual said secondary documents in which copies of individual said secondary documents are each organized into respective sets, comprising in combination:

(a) means for serially advancing in a stop-and-go manner each one of said plurality of prime documents along a processing route with each successive stop position corresponding to a different work station on said route;

(b) means for executing a different work functions at each successive said stop position, said work function executing means comprising:

(1) serial feeding means at a first said work station on said route for serially advancing into said route individual ones of said prime documents from said plurality of prime documents,

(2) intelligent optical character recognition means at a second successive said work station on said route for reading said address information on each successive said prime document and for converting the so read information into representative output signals, said intelligent optical character recognition means including

(a) first video camera means for imaging said address information in a raster field and for converting said so imaged information into black and white video data comprised of pixels, and

(b) an N-tuple classifier means that

(i) incorporates a plurality of discriminators each adapted to recognize a respective class of a predetermined group of classes of said video data, each said class being represented by a group of said pixels, and

(ii) presents each said pixel group to said discriminators in a predetermined sequence, and

(3) a plurality of individually actuatable collating means, each one being associated with a different respective successive said work station on said route after said second work station, each one holding a different said set, and each one being operable to combine one copy of its so held said individual secondary document with each successive said prime document when said prime document is in said associated work station; and

(c) computer means for regulating apparatus operation and for selectively operating individual ones of said collating means responsive to said output signals; thereby to produce from said address information on each said prime document a document bundle comprised of that prime document and selected individual said secondary documents of said secondary document plurality.

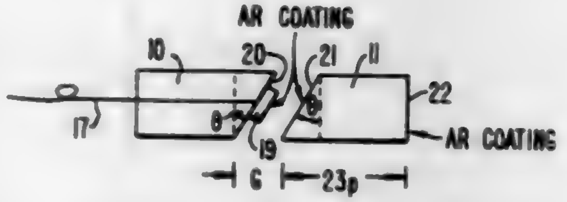
5,317,655
OPTICAL ISOLATOR

Jing-Jong Pan, San Jose, Calif., assignor to E-Tek Dynamics, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 786,434, Nov. 1, 1991, Pat. No. 5,208,876. This application Feb. 22, 1993, Ser. No. 20,471

Int. Cl.^{5} G02B *6/00, 6/32*

U.S. Cl. 385—11 **4 Claims**



1. In an improved optical isolator for optical fibers having a first sleeve for holding a first optical fiber, a first GRIN lens, a first polarizer, a optical rotator, a second polarizer, a second GRIN lens and a second sleeve for holding a second optical fiber, the improvement comprising

said first sleeve and said first optical fiber having parallel longitudinal axes and coplanar end surfaces, said end surfaces at a slant with respect to a plane perpendicular to said longitudinal axes;

said first GRIN lens having longitudinal axis coincident with said longitudinal axis of said first optical fiber and having a surface facing said first sleeve and first optical fiber, said surface at a reciprocal slant with respect to said GRIN lens longitudinal axis so that said surface is parallel with said end surfaces;

at least one of said polarizers comprises a birefringent crystal of lithium tantalate; and

at least one of said GRIN lenses having a length of 0.23 pitch.

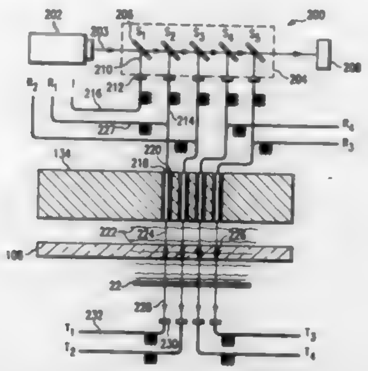
5,317,656
FIBER OPTIC NETWORK FOR MULTI-POINT EMISSIVITY-COMPENSATED SEMICONDUCTOR WAFER PYROMETRY

Mehrdad M. Moslehi, and Habib N. Najm, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 702,798, May 17, 1991, abandoned. This application Feb. 11, 1993, Ser. No. 17,359

Int. Cl.^{5} G02B *6/02*

U.S. Cl. 385—12 **33 Claims**



1. A fiber-optic network for communicating multi-point, non-invasive, in-situ, pyrometry-based, emissivity-compensated temperature measurements of a semiconductor wafer in a fabrication reactor, comprising:

a plurality of optical fibers for transmitting electromagnetic energy, said optical fibers comprising a set of incident beam optical fibers and a set of received beam optical fibers; and

a fiber-optic bundle associated with each said optical fiber to receive said optical fibers, each of said bundles associated with the incident beam optical fibers for directing a plurality of incident beams to the semiconductor wafer, and each of said bundles associated with the set of received beam optical fibers for receiving a plurality of reflected beams and a plurality of radiant heat energy signals from the semiconductor wafer.

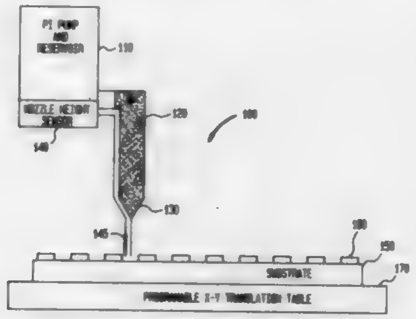
5,317,657
EXTRUSION OF POLYMER WAVEGUIDES ONTO SURFACES

Antonio R. Gallo, Pleasant Valley; James J. McDonough, Fishkill; Gordon J. Robbins, Wappingers Falls, and Robert R. Shaw, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1992, Ser. No. 922,267

Int. Cl.^{5} B29C *47/00*

U.S. Cl. 385—14 **24 Claims**



1. A method of forming a waveguide on a surface, said method including the steps of

positioning an extrusion nozzle a predetermined distance above said surface,

forcing a viscous waveguide material through said extrusion nozzle,

relatively moving said nozzle and said surface, and

maintaining a predetermined level of tension in said viscous waveguide material between said nozzle and said surface.

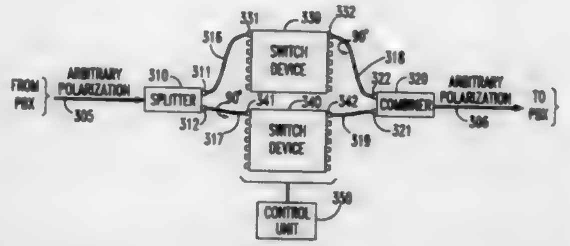
5,317,658
APPARATUS AND METHOD FOR PROVIDING A POLARIZATION INDEPENDENT OPTICAL SWITCH

Glenn D. Bergland, Berkeley Heights; John V. Camlet, Cranford; Saul J. Einbinder, Holmdel; Walter M. Pitio, Old Bridge; Robert C. Pritchard, Middletown; George J. Shevchuk, Old Bridge, and Donald D. Shugard, Middletown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 6, 1992, Ser. No. 864,293

Int. Cl.^{5} G02B *6/26*

U.S. Cl. 385—16 **22 Claims**



1. An apparatus for providing a polarization independent optical switch comprising:

means for splitting arbitrary polarized light waves into a first TE radiation component and a first TM radiation component;

first converting means connected to the splitting means for converting the first TE radiation component into a second TM radiation component;

photonic switching means for switching both the first and second TM radiation components, the switching means receiving both the first and second TM radiation components at a pair of input ports and routing both switched first and switched second TM radiation components to a pair of output ports;

second converting means connected to the switching means for converting the switched first TM radiation component into a switched TE radiation component; and

means connected to the switching means and second converting means for combining the switched second TM radiation component and the switched TE radiation component into arbitrary polarized light waves.

5,317,659
CONICAL FIBEROPTIC SWITCH

Ho-Shang Lee, El Sobrante, Calif., assignor to Dicon Fiberoptics, Berkeley, Calif.

Filed Feb. 9, 1993, Ser. No. 15,458

Int. Cl.^{5} G02B *6/26*

U.S. Cl. 385—22 **6 Claims**

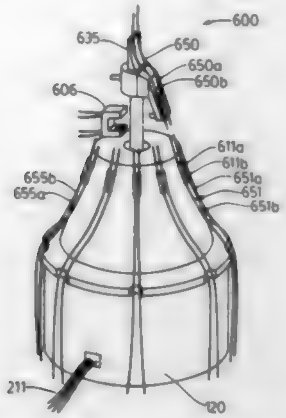
1. An optical switching device comprising:

n fixed optical fiber cables each having an end portion, n being an integer greater than 1, each cable including at least one optical fiber, said n cables located so that the end portion of each cable lies substantially on a conical surface having an axis and the optical fiber in each cable is optically aligned with a point on said axis;

a movable optical fiber cable having an end portion rotatable about said axis, said movable cable including at least one optical fiber that has an end portion, said end portion of said movable optical cable being at an angle to said axis so that it is also substantially on said conical surface when it is rotated;

a stepping motor for rotating the rotatable end portion of the movable cable about said axis;

a stepping motor control system for controlling the rotation of the stepping motor to align the rotatable end portion of the movable cable with any one of the n fixed cables, so that the stepping motor rotates the end portion of the movable cable by one of n preset numbers of steps, each of said n numbers of steps corresponding to the position of the end portion of a fixed cable, so that when the rotatable end portion of the movable cable is rotated by a number of steps selected from said n numbers of steps, the end portion of the optical fiber in the movable cable will be substantially optically aligned with the end portion of the optical fiber in the fixed cable whose position corresponds to said selected number of steps.



5,317,660
OPTICAL TRANSMISSION SYSTEM WITH OPTICAL FILTER FOR PROVIDING PROTECTION AGAINST GIANT PULSES

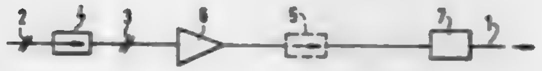
Gustav Veith, Bad Liebenzell, Fed. Rep. of Germany, assignor to Alcatel SEL A.G., Stuttgart, Fed. Rep. of Germany

Filed Jun. 21, 1993, Ser. No. 80,352

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1992, 4222208

Int. Cl.^{5} G02B *6/26;* **H01L** *15/00*

U.S. Cl. 385—24 **3 Claims**



1. An optical transmission system for transmitting an optical signal over an optical waveguide containing at least one fiber-optic amplifier, wherein the wavelength of the optical signal lies outside the wavelength region of the maximum gain of the fiber-optic amplifier, and that an optical filter having a stop band in the wavelength region of the maximum gain of the fiber-optic amplifier is provided before or after at least one fiber-optic amplifier.

5,317,661
LASER REMOVAL OF ALTERED INDEX OF REFRACTION LAYER ON GLASS FIBERS

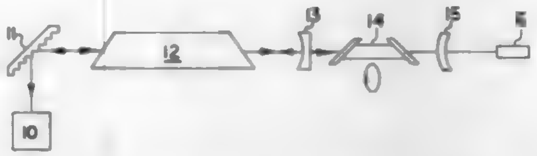
Otto I. Szentesi, and James P. Luther, both of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Jul. 6, 1993, Ser. No. 85,791

Int. Cl.^{5} G02B *6/26*

U.S. Cl. 385—31 **15 Claims**

1. A method of treating glass light waveguide ends, comprising mechanically polishing a light waveguide end and thereafter reducing the reflectance of the light waveguide end by vaporizing at least some glass at the light waveguide end by use of a laser beam directed thereon.



5,317,662
OPTICAL STAR COUPLER ASSEMBLY

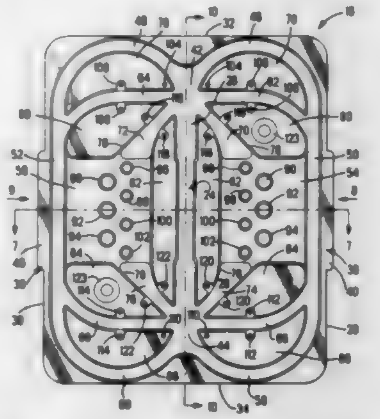
Gheorghe Hotea, Griesheim, Fed. Rep. of Germany, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 8, 1993, Ser. No. 28,029

Claims priority, application United Kingdom, Mar. 26, 1992, 9206574

Int. Cl.^{5} G02B *6/28*

U.S. Cl. 385—46 **16 Claims**



1. An assembly housing an optical star coupler comprising an optical mixing rod having a bundle of optical cables optically and mechanically connected to each end thereof, lengths of said cables extending from said bundles;

characterized by a housing having a base and external walls upstanding from the base and being formed with through bores, the mixing rod being secured to the base and the cable lengths extending from said bundles also being secured to the base with end portions of said lengths projecting through respective ones of said bores and outwardly of said walls for connection to respective optical devices;

the mixing rod is received in a central groove in the base and is held down in the groove by means securing the portions of said cable lengths proximate to said bundles;

and wherein said cable lengths extend through further grooves in the base, communicating with the central groove at each end thereof, said lengths extending from said further grooves between cable guiding posts to said bores, said posts being disposed laterally of said central groove, said external walls upstanding on opposite sides of said central groove.

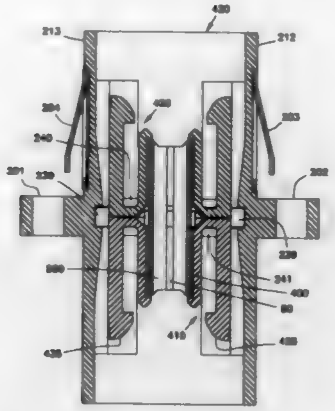
5,317,663
ONE-PIECE SC ADAPTER

Michael S. Beard, Eden Prairie; Curtis Puetz, Apple Valley, and James W. Conroy, Prior Lake, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed May 20, 1993, Ser. No. 65,139

Int. Cl.^{5} G02B *6/00, 6/36*

U.S. Cl. 385—70 **3 Claims**



1. An adapter for holding two fiber optic connectors in coaxial alignment, each of said connectors including a generally cylindrical ferrule having an axial bore, a ferrule holder having means for retaining said ferrule and having, an outer surface with at least one raised ridge located on said outer surface of said ferrule holder, said connector further including a grip housing having an axial bore, said ferrule holder being located within said axial bore of said grip housing,and said ferrule being located within said axial bore of said ferrule holder, said grip housing further having at least one cut-out, said raised ridge of said ferrule holder being exposed through said cut out; said adapter comprising:

a) a unitary molded main body having an axial cavity, said axially cavity extending from a first opening to a second opening, with a first side-wall extending from said first to second opening, an inner housing sized to be received within said axial cavity, said inner housing having an axial chamber and at least one retaining clip located exterior to said chamber and said clip being generally parallel to said axial chamber, said clip having locking means for releasable locking onto said raised ridge of said ferrule holder, said main body further having an access opening formed through said first side-wall, wherein said ferrule is received within said chamber, and said clip is locked onto said ridge on said ferrule holder.

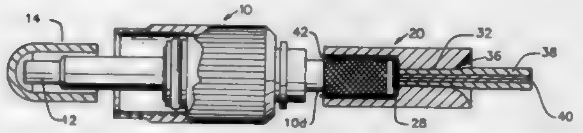
5,317,664
FIBER OPTIC ASSEMBLY AND CRIMP SLEEVE USED WITH THE ASSEMBLY

Alan R. Grabiec, Lake Hiawatha; William G. Frey, Union, both of N.J., and Scott T. Davies, Germantown, Tenn., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Dec. 15, 1992, Ser. No. 991,048

Int. Cl.^{5} G02B *6/26*

U.S. Cl. 385—87 **9 Claims**



1. A connector for a fiber optic cable of a type including a buffered optic fiber having an encircling jacket inclusive of fibrous matter, the connector including a back shell and a crimp sleeve connecting said back shell and said fiber optic cable, the crimp sleeve including a crimpable body member having first and second open ends and defining a passage between the first and second open ends, the crimpable member having first, second and third interior surfaces bounding the passage successively lengthwise of the body member, the first interior surface extending from the first open end interiorly of the body member and having a first radius relative to a central axis of the body member, the second interior surface having a second radius relative to the central axis of the body member of measure less than the first radius, the third interior surface extending from the second open end interiorly of the body member and having radii relative to the central axis of the body member progressively therealong of measure successively exceeding the second radius, the first interior surface retentively engaging fibrous matter of the cable and circumscribing the back shell, the second interior surface retentively engaging the jacket of the cable adjacent the fibrous matter, the third interior surface being selectively engageable with the cable, upon pulling of the cable transversely of the body member.

5,317,665
JACKET STRUCTURE FOR OPTICAL CABLES, FOR USE IN HIGH-VOLTAGE ENVIRONMENTS

Albert V. Herrebrugh, Waddinxveen, Netherlands, assignor to NKF Kabel B.V., Waddinxveen, Netherlands

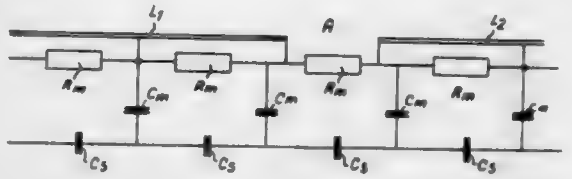
PCT No. PCT/NL91/00069, § 371 Date Oct. 23, 1992, § 102(e) Date Oct. 23, 1992, PCT Pub. No. WO91/16648, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 26, 1991, Ser. No. 940,869

Claims priority, application Netherlands, Apr. 26, 1990, 9001007

Int. Cl.^{5} G02B *6/00, 6/36, 6/44*

U.S. Cl. 385—101 **20 Claims**



1. A jacket structure for energy-transmissive cables (1) intended for use in a high-voltage environment, said jacket structure comprising:

a) at least one elongated plastic outer sheath (8) with an external surface extending in a longitudinal direction and subject to the formation of interrupted, conductive layers on said external surface; and

b) a plurality of capacitive elements (C_1, C_2, $C_3 \ldots C_n$) disposed along, and electrically connected in series in said longitudinal direction of said outer sheath (8), said capacitive elements (C_1, C_2, $C_3 \ldots C_n$) being covered by said external surface of said outer sheath (8);

whereby said jacket structure forms a capacitive voltage divider to limit voltage differences across said conductive layer interruptions and prevent undesired discharges.

5,317,666
WAVEGUIDE NONLINEAR OPTICAL FREQUENCY CONVERTER WITH INTEGRAL MODULATION AND OPTIMIZATION MEANS

John A. Agostinelli, Rochester; Jose M. Mir, Webster, and Joseph F. Revelli, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1992, Ser. No. 953,925

Int. Cl.^{5} G02B *6/10*

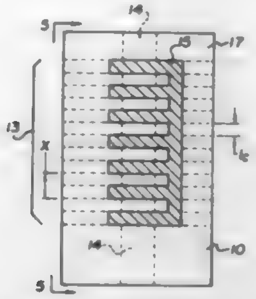
U.S. Cl. 385—122 **35 Claims**

1. A method for converting the frequency ω_{on} of an input signal to create an output signal having frequency ω_{out} and

modulating the intensity of the output signal, comprising the steps of:

(a) applying the input signal to a waveguide including a variable dispersion, nonlinear active region of length L having a periodically poled grating of period X for quasi-phase-matching;

b) quasi-phase-matching the input signal and the output signal;



c) varying the dispersion of the active region to maintain a coherence length between the input and output signals equal to (n/2)X, where n equals an odd integer; and

d) one of discretely and continuously changing the dispersion from a value for optimum frequency conversion by an amount equal to plus or minus $m\lambda/2L$ where m is an integer and λ is the free space wavelength, to produce less than optimum frequency conversion.

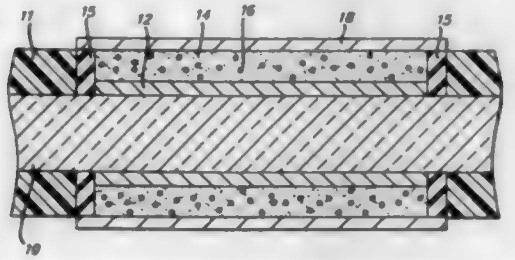
5,317,667
ELECTROPHORETIC SWITCH FOR A LIGHT PIPE

Willes H. Weber; Jeffrey T. Remillard, both of Ann Arbor, and John M. Ginder, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1992, Ser. No. 980,066

Int. Cl.^{5} G02B *6/22*

U.S. Cl. 385—147 15 Claims



1. A device for modulating light output of a light pipe comprising:

a light pipe having a first index of refraction;

a transparent first conductor coating said light pipe having a second index of refraction greater than said first index of refraction;

a cylindrical second conductor located substantially concentrically with respect to said light pipe and having a diameter greater than or equal to the diameter of said first conductor forming a space therebetween; and

a solution having a third index of refraction less than said first index of refraction containing charged particles having a fourth index of refraction greater than said third index of refraction filling the space between said first conductor and said second conductor, said charged particles adapted to move in response to a potential difference between said first conductor and said second conductor; and

retaining means for holding said second conductor in a fixed location with respect to said first conductor and for retaining said solution in said space.

5,317,668
MOTOR CONTROL DEVICE FOR CONTROLLING MOTOR SPEED DEPENDING ON IMPARTED LOAD

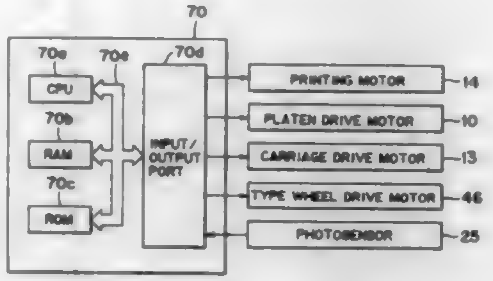
Norio Kobayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 8, 1992, Ser. No. 895,098

Claims priority, application Japan, Jun. 19, 1991, 3-147524

Int. Cl.^{5} H02P *5/17*

U.S. Cl. 388—811 13 Claims



1. A motor control device for controlling rotation speed of a single motor driving a plurality of mechanisms, an electrical current level which is applied to the single motor being changeable in accordance with the operation of one of the mechanisms, the control device comprising:

detection means for detecting an actual rotation speed of the single motor:

storage means for storing a prestored rotation speed value of the single motor;

means for comparing the actual rotation speed of the single motor detected by the detection means with the prestored rotation speed value stored in the storage means;

means for selecting a current level necessary to obtain the prestored rotation speed, the selected current level being substantially proportional to a level of load imparted on the single motor;

means for setting an offset current level and an offset current applying period to obtain said necessary current level on a basis of the level of load; and

means for applying said offset current level to said motor for said offset current applying period.

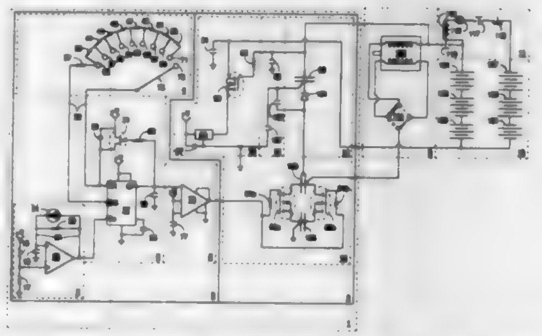
5,317,669
DIRECT CURRENT MOTOR SPEED CONTROL APPARATUS

James D. Anderson, San Antonio, and John V. Searcy, II, Spring Branch, both of Tex., assignors to John Svoboda, New Braunfels, Tex.

Filed May 4, 1992, Ser. No. 878,342

Int. Cl.^{5} H02P *7/29*

U.S. Cl. 388—829 12 Claims



1. A control system for varying the duty cycle of current supplied to a utilizing device from a constant DC current source, comprising:

a contact/resistor network means for producing a variable resistance in response to an operator input;

a timer means coupled to said contact/resistor network for producing a duty cycle signal representative of said operator input;

a trigger signal generator means coupled to said timer means for producing a trigger signal which establishes the frequency of said duty cycle signal;

a threshold signal generator means coupled to said contact/resistor network means and said timer means for producing a threshold signal which establishes the duration of said duty cycle signal;

an amplification means coupled to said timer means for amplifying said duty cycle signal; and

a high speed electronic switching means connected between said amplification means and said utilizing device to deliver said current from said constant DC current source to said utilizing device in response to said duty cycle signal.

5,317,670
HOT WATER STORAGE SYSTEM

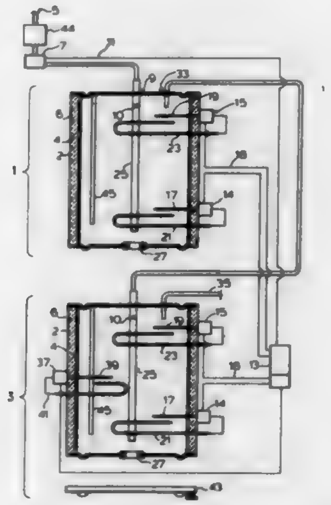
Paul Elia, 68 Hazelton Avenue, Toronto, Ontario, Canada M5R 2E2

Filed Oct. 19, 1992, Ser. No. 963,587

Claims priority, application United Kingdom, Oct. 19, 1991, 9122220

Int. Cl.^{5} F24H *1/18*

U.S. Cl. 392—464 11 Claims



1. A hot water system for connection to a water supply and a local hot water usage system, for minimizing power consumption during peak power consumption hours and apportioning power consumption during off-peak hours, comprising:

a) a first hot water tank having an inlet and an outlet, said inlet being connected to said water supply for receiving water therefrom into said first tank;

b) a second hot water tank having an inlet connected to said outlet from said first hot water tank for receiving water from said first tank into said second tank, and an outlet for discharging water from said second tank to said local hot water usage system;

c) first heating means disposed in said first hot water tank for heating water therein;

d) second heating means disposed in said second hot water tank for heating water therein;

e) controller means connected to said first heating means and to said second heating means for:

i) disabling said first heating means and said second heating means during said peak power consumption hours;

ii) enabling said second heating means and disabling said first heating means during a first portion of said off-peak hours; and

iii) enabling said first heating means and disabling said second heating means during a second portion of said off-peak power hours.

5,317,671
SYSTEM FOR METHOD FOR PRODUCING SYNTHETIC PLURAL WORD MESSAGES

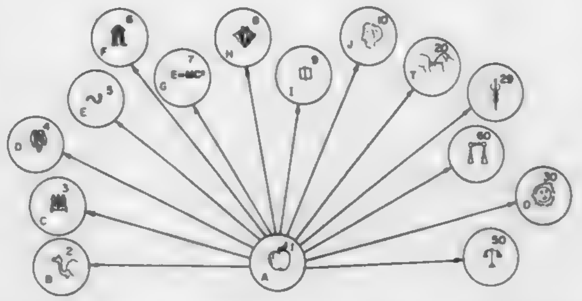
Bruce R. Baker, 840 Rolling Rock Rd., Pittsburgh, Pa. 15234; Richard D. Creech, Rt. 3, Box 170A, Siler City, N.C. 27344, and Kenneth W. Smith, 3316 Englewood Rd., Wilmington, Del. 19810

Continuation of Ser. No. 573,276, Aug. 27, 1990, abandoned, which is a continuation of Ser. No. 325,044, Mar. 16, 1989, abandoned, which is a continuation of Ser. No. 3,464, Jan. 15, 1987, abandoned, which is a continuation of Ser. No. 815,916, Dec. 27, 1985, which is a continuation of Ser. No. 659,878, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 340,287, Nov. 18, 1982, abandoned. This application Nov. 22, 1991, Ser. No. 796,926

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.^{5} G01L *5/02*

U.S. Cl. 395—2 18 Claims



1. A method for enabling an operator to retrieve and generate a selected plural word message from a large number of plural word messages relating to varied kinds of information stored in a system for producing messages, the system comprising memory means and a plurality of input devices actuable in any sequence the method comprising:

associating with each respective input device different polysemic pictorial illustrations of real life objects, said polysemic pictorial illustrations not including alphanumeric characters or formal, contemporary, oriental language characters, each illustration being suggestive to an operator of the system of a plurality of types of information;

defining a plurality of sequences of said polysemic pictorial illustrations, each sequence of illustrations being suggestive to an operator of the system of a semantic summary of a different plural word message;

selecting a sequence of a plurality of said polysemic pictorial illustrations which is suggestive to an operator of said semantic summary of said selected message, the number of polysemic pictorial illustrations in the selected sequence being much less than the number of alphanumeric characters which constitute the plural word message when represented by formal alphanumeric language characters;

actuating about two to four of said input devices having respectively and sequentially associated therewith said plurality of polysemic pictorial illustrations which is suggestive to an operator of said semantic summary of said selected message, thereby inputting a plurality of signals to the system indicative of which input devices have been actuated and in what sequence;

retrieving said selected message corresponding to said plurality of signals from the memory means of the system; and

outputting said selected plural word message.

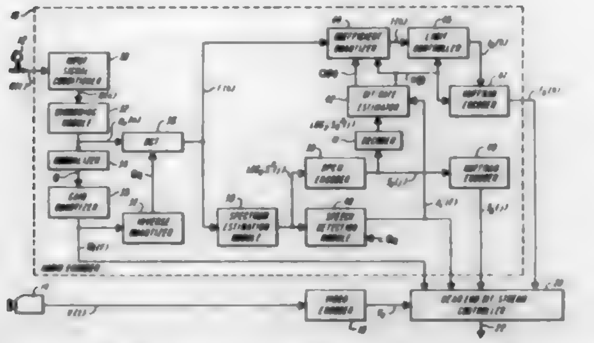
5,317,672
VARIABLE BIT RATE SPEECH ENCODER

Antony H. Crossman, Swampscott, and Edmund S. Thompson, Burlington, both of Mass., assignors to Picturetel Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 665,948, Mar. 6, 1991, abandoned, which is a continuation of Ser. No. 664,579, Mar. 5, 1991, abandoned. This application Mar. 4, 1992, Ser. No. 847,710

Int. Cl.^{5} G10L *9/00*

U.S. Cl. 395—238 22 Claims



12. An encoding device for allocating a variable number of transmission bits on a frame-by-frame basis for use in transmitting samples of a digital signal, the encoding device comprising:

means for selecting an aggregate allowable quantization distortion value representing a collective allowable quantization distortion error for a frame of samples of said digital signal,

means for selecting from said frame of samples, a set of samples wherein each of a plurality of samples of said set is greater than a noise threshold,

means for computing, for each sample of said set, a sample quantization distortion value representing an allowable quantization distortion error for said sample, wherein a sum of all sample quantization distortion values for all samples of said set approximately equal to said aggregate allowable quantization distortion value,

means for selecting, for each sample of said set, a quantization step size which yields a quantization distortion error approximately equal to said sample's corresponding quantization distortion value, and

means for quantizing said sample using said quantization step size.

5,317,673
METHOD AND APPARATUS FOR CONTEXT-DEPENDENT ESTIMATION OF MULTIPLE PROBABILITY DISTRIBUTIONS OF PHONETIC CLASSES WITH MULTILAYER PERCEPTRONS IN A SPEECH RECOGNITION SYSTEM

Michael H. Cohen, Burlingame, and Horacio E. Franco, Menlo Park, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jun. 22, 1992, Ser. No. 901,716

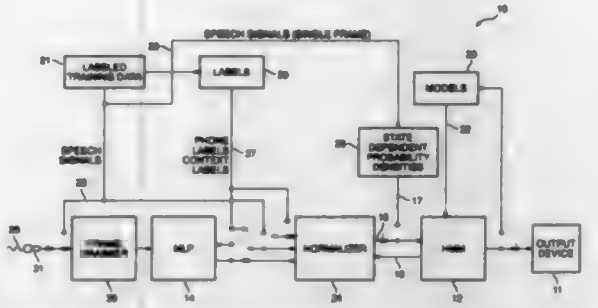
Int. Cl.^{5} G10L *5/06*

U.S. Cl. 395—2.41 20 Claims

1. In a speech recognition apparatus having a hidden Markov model speech recognizer, a method for using a multilayer perceptron (MLP) for recognizing speech by context-dependent estimation of a plurality of state-dependent observation probability distributions of phonetic (phone) classes which has weights that have been obtained based on a training set of speech vectors, wherein said training set of said speech vectors has been used to create context-dependent phone classes for use in said method, said speech vectors being characterized by phone classes, the method comprising the steps of:

applying input speech vectors containing unknown data to a single input layer of a multilayer perceptron, said multilayer perceptron having a single input layer, a single hidden layer, a single set of weights between said input layer and said hidden layer, and a plurality of output layers with an associated plurality of sets of weights between said hidden layer and said output layers, each one of said output layers having a plurality of output units for storing a plurality of probability values;

forward propagating each input speech vector through said multilayer perceptron to produce an activation level representative of a probability value at each output unit within each one of said output layers;


SPEECH SIGNALS (SINGLE FRAME)
LABELED TRAINING DATA
LABELS
MODELS
SPEECH SIGNALS
PHONE LABELS CONTEXT LABELS
STATE DEPENDENT PROBABILITY DENSITIES
MLP
NORMALIZER
HMM
OUTPUT DEVICE
27
17
11
12
14

determining likelihood of observing each said input speech vector, assuming a specific state of a hidden Markov model by factoring, according to Bayes rule, said likelihood of observing being in terms of posterior probabilities of phone classes of the speech vector assuming context and the input speech vector, thereby obtaining values representative of context-dependent estimation; and

employing as input to said hidden Markov model speech recognizer said values representative of context-dependent estimation as state-dependent observation probabilities to identify a specific estimated word sequence from said input speech vectors.

5,317,674
CENTER-OF-GRAVITY DETERMINING CIRCUIT FOR PULSE GENERATION

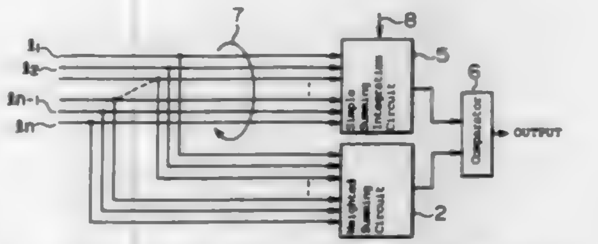
Tetsuo Muraji, Odawara, Japan, assignor to Mikuni Corporation, Tokyo, Japan

Filed Mar. 2, 1992, Ser. No. 844,309

Claims priority, application Japan, Mar. 4, 1991, 3-062637

Int. Cl.^{5} G06F *9/44*

U.S. Cl. 395—3 6 Claims



1. A center-of-gravity determining circuit for pulse generation comprising:

weighted summing circuit means for receiving electric signals from a plurality of lines representative of fuzzy information distributed over a plurality of lines, multiplying said signals by respective values corresponding to grades of said lines, summing the multiplied signals and providing and output based thereon;

simple summing integration circuit means for receiving said electric signals, executing summing integration of said electric signals without weighting and providing an output based thereon; and

comparator means for comparing said outputs from said weighted summing circuit means and said simple summing integration circuit means.

5,317,675
NEURAL NETWORK PATTERN RECOGNITION LEARNING METHOD

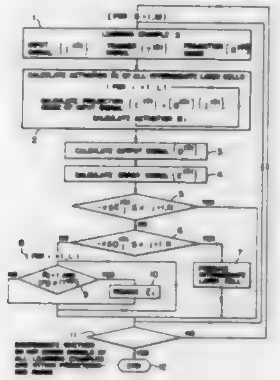
Tadashi Ikehara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

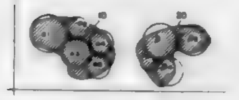
Filed Jun. 27, 1991, Ser. No. 722,295

Claims priority, application Japan, Jun. 28, 1990, 2-170685

Int. Cl.^{5} G06F *15/18*

U.S. Cl. 395—23 3 Claims





1. A method of classifying a pattern in a neural network, the method comprising the steps of:

inputting an input signal into an input layer of said network, said input layer having input cells in a plurality at least as great as a number of dimensions of an input vector represented by said input signal;

transmitting said input signal to each cell in an intermediate layer, each said cell in said intermediate layer storing at least a partial dimensional space of said input vector;

activating in varying degrees those of said intermediate cells having a predetermined partial dimensional space corresponding in said varying degrees to said input vector, thereby projecting said input signal to said predetermined partial dimensional spaces and setting an activation value for each said intermediate cell; and

transmitting to each output cell in an output layer of said network each activation value weighted by a predetermined attribute vector defining coupling between each said intermediate cell and each said output cell, wherein a said input vector, I, is projected onto a said predetermined partial dimensional space by an operator G_1, such that an image projection $I' = G_1 \cdot I$ and said activation value R_1 for a first intermediate cell is:

$$f\left(\left(\sum_{i=1,M} (I_i' - W_{i,1})^2\right)^{\frac{1}{2}}, \xi_1\right)$$

and wherein W_1 is a coupling vector, and ξ_1 is a threshold.

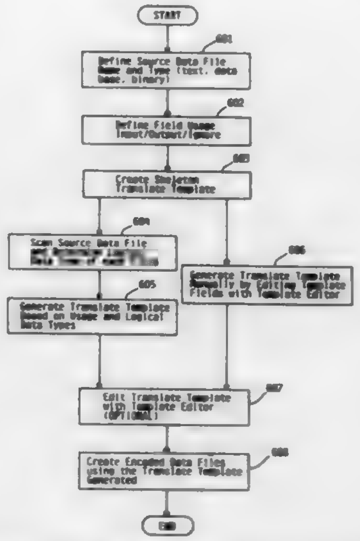
5,317,676
APPARATUS AND METHOD FOR FACILITATING USE OF A NEURAL NETWORK

Shawn M. Austvold; Joseph P. Bigus; Jonathan D. Henckel, and Paul A. Hospers, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 687,364, Apr. 18, 1991, abandoned. This application Dec. 3, 1992, Ser. No. 986,889

Int. Cl.^{5} G06F *15/18*

U.S. Cl. 395—26 25 Claims


START
Define Source Data File Name and Type (text, data base, binary)
601
Define Field Usage Input/Output/Ignore
602
Create Skeleton Translate Template
603
Scan Source Data File
604
Generate Translate Template Based on Usage and Logical Data Types
605
Generate Translate Template Manually by Editing Template Fields with Template Editor
606
Edit Translate Template with Template Editor (OPTIONAL)
607
Create Encoded Data Files using the Translate Template Generated
608
END

1. An apparatus for facilitating the use of a neural network, comprising:

means for receiving source data for the neural network, said source data comprising a plurality of source data fields;

translation definition means for defining, with respect to each of said source data fields, a corresponding data transformation, wherein at least one of said data transformations is a transformation of data of one data type to data of another data type, and wherein said translation definition means comprises means for automatically generating a default data transformation definition with respect to each of said source data fields; and

means, responsive to said translation definition means, for translating source data contained in each said source data field according to the data transformation corresponding to said source data field, to produce a neural network input.

5,317,677
MATCHING TECHNIQUE FOR CONTEXT SENSITIVE RULE APPLICATION

Charles P. Dolan, Culver City; David M. Keirsey, Aquora, and Kurt Reiser, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 16, 1992, Ser. No. 869,402

Int. Cl.^{5} G06F *15/20*

U.S. Cl. 395—77 13 Claims

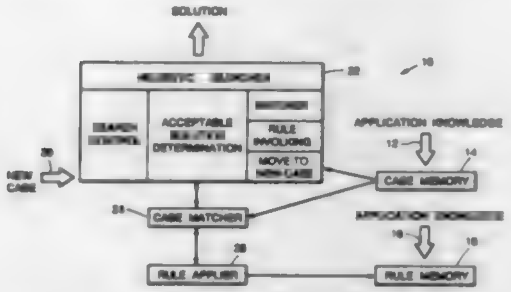
1. A knowledge-based system for solving a problem in a given domain, said knowledge-based system comprising:

case memory means for storing a set of exemplary cases from said domain, said case memory means containing a plurality of fields, each field containing data describing features of said exemplary cases;

rule memory means for storing a set of rules, each rule associated with one or more stored exemplary cases;

heuristic search means for receiving a new case comprising a plurality of fields, each field containing data describing features of said problem to be solved, said heuristic search means including means for controlling a search of said case memory means and rule memory means for cases and

rules which relate to said new case, said means for controlling a search choosing selected exemplary cases in said case memory means for comparison with said new case;
case matcher means, coupled to said heuristic search means and to said case memory means for determining how close the selected exemplary cases are to the new case, and for determining which fields of said new case do not match with said stored exemplary cases; and
rule applier means for using said set of rules to elaborate the new case by deriving new features and creating an elaborated new case, so that the elaborated new case will be closer to one of the selected exemplary cases;



wherein said heuristic search means is coupled to said rule applier means, said heuristic search means maintaining a plurality of elaborated new cases and determining a goodness metric for each elaborated new case, wherein the goodness metric is measured by the match between the elaborated new case and said selected exemplary cases, wherein said heuristic search means includes a means coupled to said means for controlling a search for determining when an elaborated new case represents an acceptable solution to said problem based on said goodness metric.

5,317,678

METHOD FOR CHANGING COLOR OF DISPLAYED IMAGES BY USE OF COLOR COMPONENTS

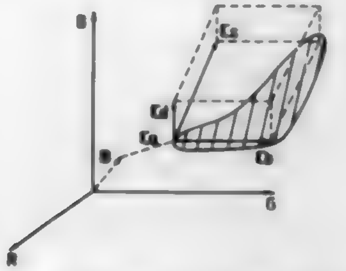
Hiroyuki Okawara, Tokyo; Makoto Kato, Kawasaki; Shinichiro Miyaoka, Kawasaki; Makoto Nohmi, Kawasaki, and Yuri Takizawa, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 14, 1990, Ser. No. 493,447

Claims priority, application Japan, Mar. 15, 1989, 1-60976; Jul. 10, 1989, 1-175463

Int. Cl.⁵ G06F *15/62, 15/72*

U.S. Cl. 395—126 **50 Claims**



2. A color changing method for changing color in a display, the method comprising the steps of:
inputting individual picture element values of a color image through an image input device;
plotting the individual picture element values of the color image in a three-dimensional three-primary color space;
displaying the three-dimensional three-primary color space including the plotted individual picture element values of the color image;
presuming from the plotted picture element values at least three vectors, including a bias vector which expresses the bias of said plotted data from an origin, a light source color vector, and an object color vector which starts from a point displaced from the origin by said bias vector, from among four vectors including said bias vector, said light source color vector, said object color vector and a color texture vector;
determining either three-dimensional positional coordinates of said picture element values in the three-dimensional space, which is defined by said light source color vector, said object color vector and said color texture vector, or two dimensional positional coordinates of said picture element values in a plane which is defined by said light source color vector and said object color vector;
changing the presumed three vectors either collectively or individually; and,
accomplishing a color change of the color image by using the collectively changed vectors or individually changed vector and said positional coordinates; and,
displaying the color image incorporating the color change or the display.

5,317,679

DIGITAL IMAGE PROCESSOR INCLUDING CORRECTION FOR UNDESIRABLE EDGE EMPHASIS IN OUTLINE-DEMARCATED FONTS

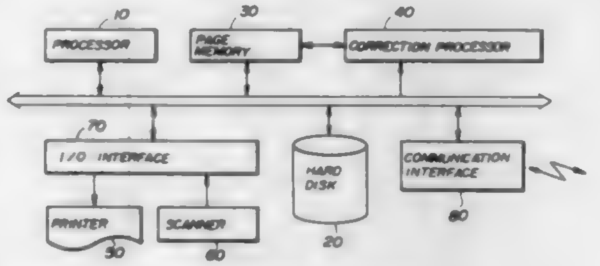
Naofumi Ueda, Urayasu, and Hiroaki Suzuki, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 654,530, Feb. 13, 1991, abandoned. This application Mar. 16, 1993, Ser. No. 31,916

Claims priority, application Japan, Feb. 21, 1990, 2-16312[U]; Oct. 9, 1990, 2-270990

Int. Cl.⁵ G06F *7/00*

U.S. Cl. 395—132 **7 Claims**



1. An image processing system, comprising:
a) means for receiving vector information;
b) means for converting the vector information into an image signal that includes intensity information;
c) re-writable memory means for storing the image signal;
d) means for carrying out an anti-aliasing process with respect to the image signal;
e) first means for judging whether or not the image signal to be written into the memory means relates to an outline of a graphic formation;
f) second means for judging whether or not vector information to be written over the image signal describes an outline; and
g) means for correcting the intensity information of the image signal which is to be written into the memory means, the correcting means ensuring that the edge will not be emphasized, if both the first and second judging means judge that the respective image signal and the vector information to be written describe the outline; wherein the correcting means includes:
1) means for comparing (i) with (ii) and for comparing (i) with (iii):
(i) a first intensity of image information that describes an outline of the graphic formation, the first intensity being that which has been subject to the anti-aliasing process;

(ii) a second intensity related to image information inside the outline of the graphic formation; and
(iii) a third intensity which has already been written into the memory means in response to previous image information;
2) means for changing the first intensity in response to the means for comparing, if the first intensity is the highest among the first, second and third intensities, the changing being carried out so that the first intensity is no longer the highest among the first, second and third intensity; and
3) means for writing the first intensity into the memory means if the first intensity has been corrected by the changing means, so that the digital signal is corrected in a manner so as to prevent the outline from being emphasized.

5,317,680

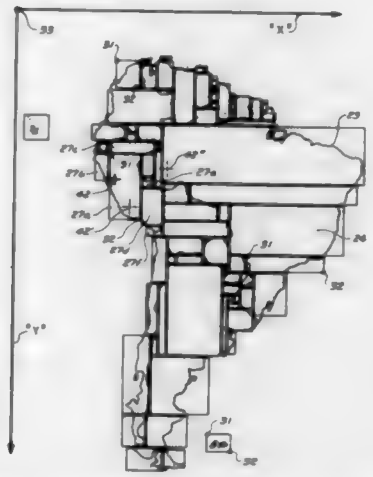
USING REGULAR GRAPHIC SHAPES TO IDENTIFY A POINTER-SELECTED GRAPHIC OBJECT

Donald J. Ditter, Jr., Phoenix, Ariz., assignor to Brøderbund Software, Inc., Novato, Calif.

Filed Jun. 22, 1990, Ser. No. 542,109

Int. Cl.⁵ G06F *15/62*

U.S. Cl. 395—135 **25 Claims**



4. A method of operating a video terminal to display at least a portion of a drawing while further displaying accessory data related to a selected one of a plurality of irregular graphic shapes included in said drawing, said method comprising the steps of:
storing drawing data which describe said irregular graphic shapes of said drawing with respect to a drawing coordinate system;
storing overlay data which describe regular graphic shapes, each of said regular graphic shapes being associated through said drawing coordinate system with a corresponding one of said irregular graphic shapes;
for each of said regular graphic shapes, managing said regular graphic shapes so that each of said regular graphic shapes occupies an area of said drawing which is unoccupied by another one of said regular graphic shapes;
for each of said regular graphic shapes, associating accessory data with said overlay data;
converting said drawing data into a display of said drawing at said video terminal;
obtaining selected coordinates of said drawing coordinate system;
determining the one of said regular graphic shapes in which said selected coordinates reside; and
displaying the accessory data which correspond to said one of said regular graphic shapes.

5,317,681

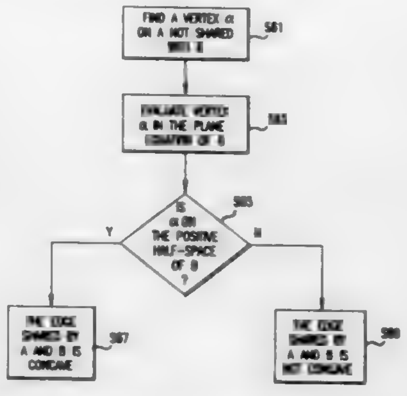
SEQUENCING AND SCHEDULING MOVES FOR CONVERTING CONCAVE POLYHEDRA TO THEIR CONVEX HULLS

Andrew S. Glassner, San Francisco, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1991, Ser. No. 814,783

Int. Cl.⁵ G06F *15/62*

U.S. Cl. 395—141 **16 Claims**


FIND A VERTEX α ON A NOT SHARED
501
EVALUATE VERTEX α IN THE PLANE
IS α ON THE POSITIVE HALF-SPACE OF B ?
505
Y
N
THE EDGE SHARED BY A AND B IS CONCAVE
507
THE EDGE SHARED BY A AND B IS NOT CONCAVE

1. A computer method for transforming a concave shape into a convex hull of said concave shape, said shape stored as electronic signals which represent said shape as a non-self-intersecting, simply connected, triangulated polyhedron of genus-0, defined as a plurality of triangular faces, each triangular face defined as a set of three coordinate points, said method comprising:
a) identifying all concave edges in said concave shape, each of said concave edges being located between two adjacent triangular faces and defining a shared edge and two shared vertices of said two adjacent triangular faces;
b) selecting one of said identified concave edges;
c) performing a concave edge elimination procedure on said selected concave edge by modifying the set of three coordinate points which define each of said two adjacent triangular faces associated with said selected concave edge, so that said selected concave edge is eliminated, said elimination procedure changing said concave shape so that said concave shape is closer to said convex hull; and
d) repeating steps (a)–(c) so that any new concave edges created by said concave edge elimination procedure are identified, and eventually eliminated, steps (a)–(c) repeating until no concave edges remain.

5,317,682

PARAMETRIC CURVE EVALUATION METHOD AND APPARATUS FOR A COMPUTER GRAPHICS DISPLAY SYSTEM

William L. Luken, Jr., Ulster Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 821,246, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 426,912, Oct. 24, 1989, abandoned. This application Jan. 21, 1993, Ser. No. 6,713

Int. Cl.⁵ G06F *15/62*

U.S. Cl. 395—142 **22 Claims**

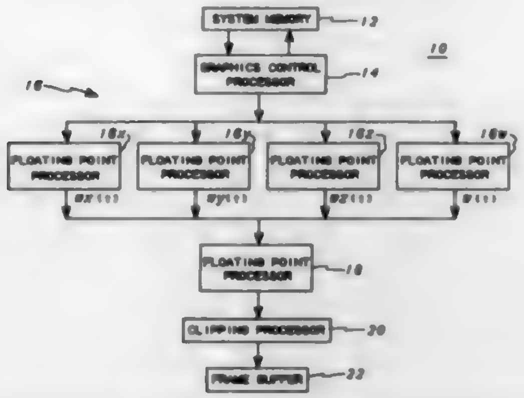
1. Apparatus for converting non-uniform rational b-spline (NURBS) data representative of a parametric curve to geometric coordinates for subsequent rendering and display by a computer graphics system, said curve having parameter points (t) therealong and comprising one or more spans, each span being defined by control points and knot values, said NURBS data including control point data defining said control points and a knot vector defining said knot values, said apparatus comprising:
means for storing said NURBS data as a sequence of data records such that each successive span of the curve is

defined by a corresponding individual data record in conjunction with a predetermined number of immediately preceding data records of the sequence;

a graphics control processor (**14**) for reading the data records in said sequence and for converting the control point data included in said NURBS data to homogeneous coordinates (wx, wy, wz, w) to generate converted control point data;

a plurality of parallel floating point processors (**16*x*, 16*y*, 16*z*, 16*w***), corresponding respectively to said homogeneous coordinates, for receiving said converted control point data and for simultaneously determining the homogeneous coordinates of said curve at each of said parameter points along the curve to produce outputs (wx(t), wy(t), wz(t), w(t)) representing said coordinates at said points, each of said processors determining the corresponding homogeneous coordinate of said curve at each of said parameter points; and

a further floating point processor (**18**) for receiving the outputs of the parallel floating point processors and converting said outputs to geometric coordinates (x, y, z,) of said parameter points for subsequent rendering and display of the curve by said graphics system.



5,317,683

METHOD AND APPARATUS FOR AUTOMATED MEETING AGENDA GENERATION IN A DATA PROCESSING SYSTEM

Dean J. Hager, Rochester; Robert P. Resch, Byron, and Curtis G. Rose, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 10, 1990, Ser. No. 579,473

Int. Cl.^{5} G06F *15/62*

U.S. Cl. 395—145 **11 Claims**

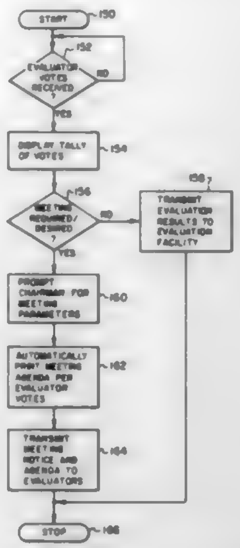
1. A method in a data processing system having a plurality of users enrolled therein for automatically generating a meeting agenda for a requested meeting concerning a document stored within said data processing system, said document having a document profile associated therewith, said document profile including at least an identification of a technical area relating to said document, said method comprising the steps of:

identifying a document stored within said data processing system;

soliciting an evaluation of said document from a selected group of said plurality of users enrolled within said data processing system, said selected group of said plurality of users determined in response to said identification of said technical area within said document profile;

soliciting an indication of each user's knowledge level regarding said document; and

automatically creating a meeting agenda incorporating said evaluation of said document from each of said selected group of said plurality of users in response to a user for a meeting concerning said document.


START
150
EVALUATOR VOTES RECEIVED ?
152
NO
YES
DISPLAY TALLY OF VOTES
154
156
MEETING REQUIRED/DESIRED ?
NO
YES
158
TRANSMIT EVALUATION RESULTS TO EVALUATION FACILITY
PROMPT CHAIRMAN FOR MEETING PARAMETERS
160
AUTOMATICALLY PRINT MEETING AGENDA PER EVALUATOR VOTES
162
TRANSMIT MEETING NOTICE AND AGENDA TO EVALUATORS
164
STOP
166

5,317,684

METHOD OF STORING CHARACTER DATA IN A DISPLAY DEVICE

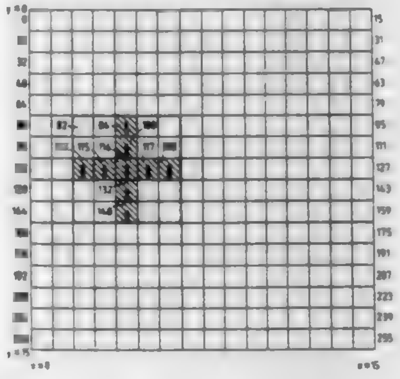
David E. Penna, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 860,198, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 646,515, Jan. 25, 1991, abandoned, which is a continuation of Ser. No. 012,967, Feb. 10, 1987, abandoned. This application Oct. 15, 1992, Ser. No. 962,165

Claims priority, application United Kingdom, Feb. 17, 1986, 8603850

Int. Cl.^{5} G06F *15/62*

U.S. Cl. 395—150 **8 Claims**



1. A method of storing character data for use in the display of characters selected from a pre-defined character set in an output image of a display device, said output image comprising a regular array of discrete pixels, the display device including a background memory, a microprocessor operable to execute machine code program instructions stored in the background memory, and a display memory, the display memory storing the output image in the form of a display bit map and having a plurality of locations which correspond to and store color data for respective pixels of the image, said method comprising;

defining a character bit map for each character of the set, said character bit map identifying a plurality of character-

shape-defining foreground pixels and a plurality of other, background pixels, each pixel having a corresponding pixel location relative to a character base location;

encoding each character bit map to generate a machine code routine which, when executed, will cause the microprocessor to write color data to all the pixel locations of the display memory which correspond to foreground locations of the character bit map; and

storing said machine code routines for the character set in the background memory of the display device;

the step of encoding the machine code subroutine corresponding to each character of the set including the steps of identifying the relative locations of the foreground pixels of the character shape and encoding said relative locations within the instructions of the machine code subroutine in such a form that when the machine code subroutine is executed the microprocessor neither tests pixel locations of the character bit map to identify the foreground pixels, nor writes color values for the entire character bit map.

5,317,685

MOTION VECTOR DETECTING APPARATUS AND IMAGE STABILIZER INCLUDING THE SAME

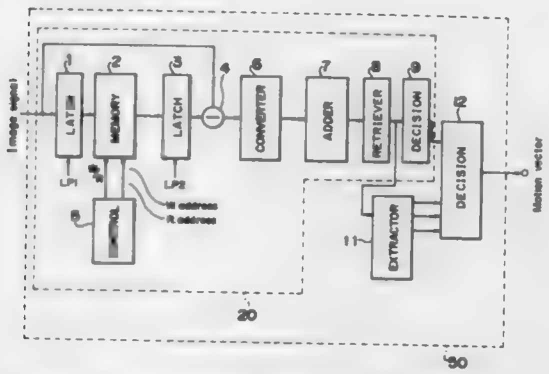
Atsushi Morimura, Nara, and Kenya Uomori, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed May 21, 1991, Ser. No. 703,773

Claims priority, application Japan, May 21, 1990, 2-130676; May 23, 1990, 2-133360

Int. Cl.^{5} G06F *15/00*

U.S. Cl. 395—152 **6 Claims**



1. A motion vector detecting apparatus comprising:

a motion vector detector which divides an image of an inputted image signal into a plurality of regions each having a plurality of image points, and which calculates respective motion vectors based on the image points within the plurality of regions;

a characteristics detector for determining at least one predetermined characteristic of each of the respective motion vectors of the plurality of regions, or of calculation data of the respective motion vectors of the plurality of regions, so as to detect a state for each region in which a number of image points exhibit a close correlation relative to one another in the image; and

a vector control and decision unit which determines when said characteristics detector has detected the state, an overall motion vector of the inputted image signal based on selected motion vectors from at least one of the regions in which the state is not detected by said characteristics detector and by neglecting the motion vectors from the regions in which the state is detected by said characteristic detector.

5,317,686

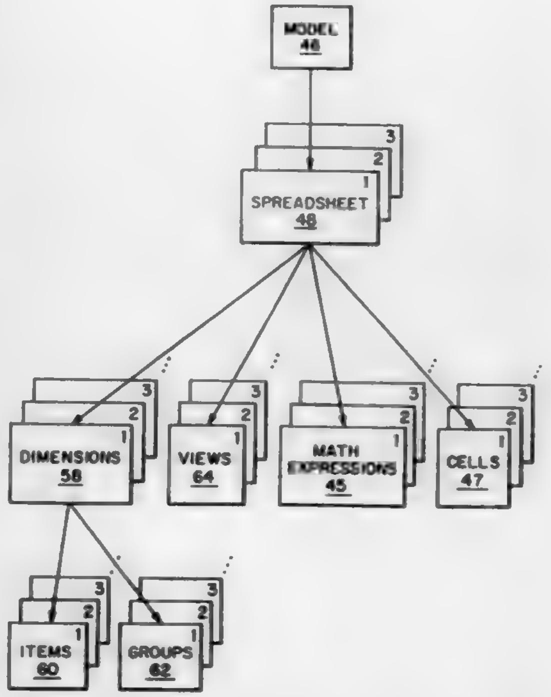
DATA PROCESSING APPARATUS AND METHOD FOR A REFORMATTABLE MULTIDIMENSIONAL SPREADSHEET

R. Pito Salas, Arlington; Glenn D. Edelson, Boston; Paul S. Kleppner, Cambridge, and Robert S. Shaver, Watertown, all of Mass., assignors to Lotus Development Corporation, Cambridge, Mass.

Continuation of Ser. No. 580,320, Sep. 10, 1990, abandoned. This application Mar. 10, 1993, Ser. No. 33,052

Int. Cl.^{5} G06F *15/62*

U.S. Cl. 395—157 **38 Claims**



35. In a computer system, a method of displaying a multidimensional spreadsheet comprising the steps of:

providing a plurality of user defined indicators in a working screen view, each indicator for indicating a series of category items displayable along an axis in the working screen view, axis along which a series of category items is displayed depending on position of the indicator in the working screen view, the series of items being displayed along a different axis in response to change of position of the corresponding indicator in the working screen view, and each item having a name which is user changeable;

storing in memory user desired information for items of different indicators in the working screen view, information of each item being stored in the memory according to memory index; and

in response to user positioning of indicators in the working screen view:

(a) cross-referencing names of items displayed in the working screen view to respective memory index for accessing from memory corresponding information of said items;

(b) accessing from memory, information for items of indicators in the working screen view; and

(c) displaying in the same working screen view (i) a series of items along respective axes according to position of indicators in the working screen view, and (ii) information corresponding to the items in areas extending from respective axes according to position of items along respective axes.

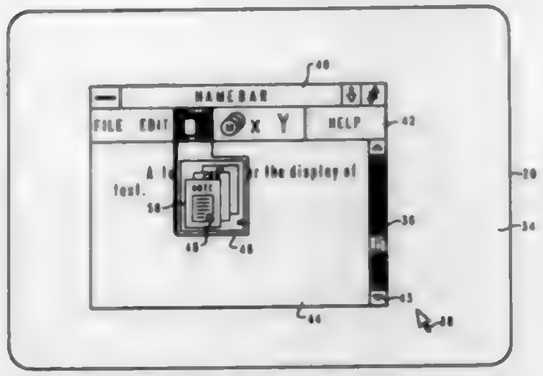
5,317,687
METHOD OF REPRESENTING A SET OF COMPUTER MENU SELECTIONS IN A SINGLE GRAPHICAL METAPHOR

Robert J. Torres, Colleyville, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 783,641, Oct. 28, 1991, abandoned. This application Nov. 2, 1993, Ser. No. 146,821

Int. Cl.^{5} G06F *15/62*

U.S. Cl. 395—159 **8 Claims**



1. A method of executing a graphical user interface to enhance display and manipulation through icons of objects in a menu on a data processing system which supports direct manipulation of icons, the method comprising the steps executed by the data processing system of:

associating icons with each of a plurality of objects from a menu;

displaying, on a video display device, an ordered arrangement of the icons, including an icon for a first object available for selection;

upon user selection of the ordered arrangement, visually marking the ordered arrangement and enabling direct manipulation of the ordered arrangement by the user;

responsive to user command, scrolling the icons in the ordered arrangement of the icons to present an icon for a second object available for selection;

upon user selection on a presented icon, providing visual emphasis for the presented icon; and

upon user deselection of the ordered arrangement, removing visual marking from the ordered arrangement while leaving the visual emphasis on any icon then having visual emphasis.

5,317,688
SOFTWARE AGENT USED TO PROVIDE INSTRUCTION TO A USER FOR A PLURALITY OF COMPUTER APPLICATIONS

Ralph T. Watson, San Jose; Barbara B. Packard, Los Altos Hills, and Glenn Stearns, Scotts Valley, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 674,439, Mar. 22, 1991, abandoned, which is a continuation of Ser. No. 225,115, Jul. 26, 1988, abandoned. This application Feb. 26, 1993, Ser. No. 23,758

Int. Cl.^{5} G06F *15/64*

U.S. Cl. 395—161 **10 Claims**

1. A computing system comprising:

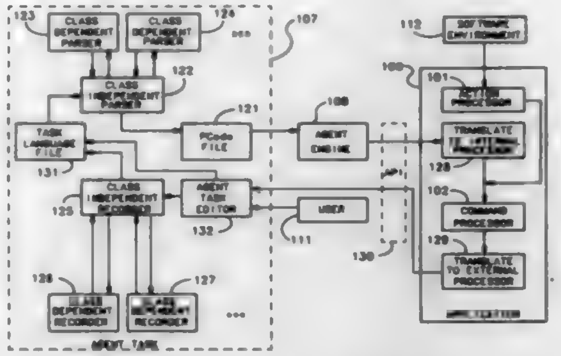
a monitor,

a first application process for interacting with a user to facilitate the user accomplishing a task, the first application process displaying on the monitor information pertaining to the task, the first application process being responsive to first syntactic actions taken by the user and the first application process including

first action processor means for receiving messages which indicate the syntactic actions taken by the user and for generating first semantic commands based on the first syntactic actions, and

first command processor means for receiving the first semantic commands from the first action processor and for executing the first semantic commands;

an INSTRUCTION process, the INSTRUCTION process being responsive to second syntactic actions taken by the user, and the INSTRUCTION process displaying information on the monitor, the information being directed to training the user in operating the first application process; and,



an agent process, coupled to the first application process and to the INSTRUCTION process, for sending second semantic commands to the INSTRUCTION process to indicate to the INSTRUCTION process which information to display on the monitor and for intercepting the first semantic commands sent from the first action processor means to the first command processor means.

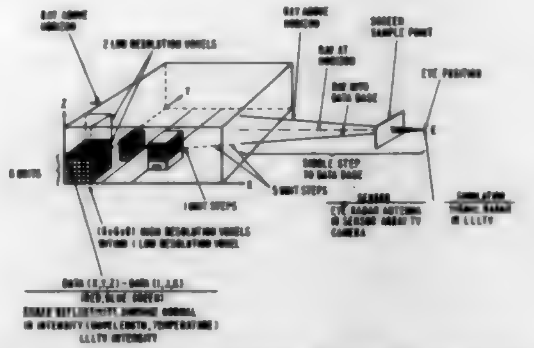
5,317,689
DIGITAL VISUAL AND SENSOR SIMULATION SYSTEM FOR GENERATING REALISTIC SCENES

Myron L. Nack, Los Alamitos; Thomas O. Ellis, Playa Del Rey; Norton L. Moise, Pacific Palisades; Andrew Rosman, Los Alamitos; Robert J. McMillen, Long Beach; Chao Yang, Cerritos, and Gary N. Landis, Hermosa Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 925,855, Sep. 11, 1986, abandoned. This application Aug. 10, 1990, Ser. No. 565,864

Int. Cl.^{5} G06F *15/16, 15/66*

U.S. Cl. 395—163 **18 Claims**



6. A computer image generation system for generating encoded image signals representing a selected scene, comprising:

storage means providing a three-dimensional surface data base of discrete volume elements individually representative of different subimages of said scene;

means for accessing said data base for retrieving the data of all of the subimages comprising said selected scene;

a plurality of processors, each for processing data using a three dimensional visible surface technique with ray tracing for a corresponding subimage of said selected scene independently and in parallel with other subimages of said selected scene; and

image generation means coupled to said means for processing the data for simultaneously processing the data for all of said subimages to generate encoded image signals representing said selected scene.

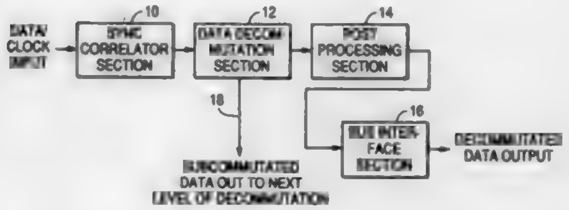
5,317,690
SPECIAL SENSOR APPLIED METEOROLOGICAL IMAGE PROCESS

Edwin A. Krzycki, Omaha; Troy R. Luster, Bellevue, and David L. Stone, Omaha, all of Nebr., assignors to Harris Corporation

Filed Jan. 14, 1992, Ser. No. 820,490

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—200 **18 Claims**



18. A method for operating with a host system a data decommutator architecture to decommutate input data streams of different data formats, the method comprising the steps of:

downloading software from the host system to the data decommutator architecture for a specific data format;

configuring field programmable gate arrays in the data decommutator architecture with said software to process the specific data format;

providing a decommutated data output from the data decommutator architecture;

cascading a second data decommutator architecture to said data decommutator architecture; and

performing subcommutation of the decommutated data output from the data decommutator architecture in the second data decommutator architecture.

5,317,691
DATA COMMUNICATION SYSTEM WITH COMMUNICATING AND RECHARGING DOCKING APPARATUS FOR HAND-HELD TERMINAL

Robert J. Traeger, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 759,807, Sep. 16, 1991, abandoned, which is a continuation of Ser. No. 400,833, Aug. 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 347,298, May 2, 1989, abandoned, and a continuation-in-part of Ser. No. 347,849, May 3, 1989, abandoned. This application Jul. 31, 1992, Ser. No. 921,408

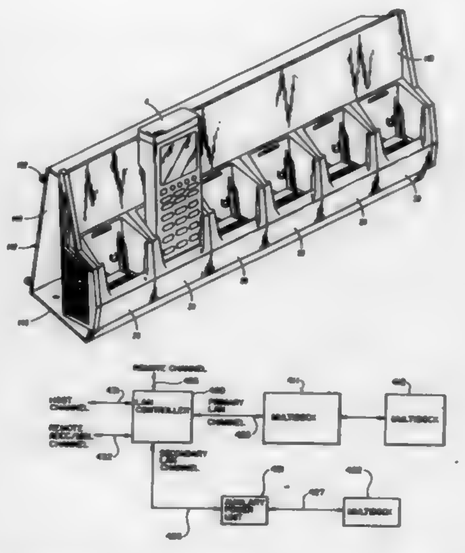
Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—200 **31 Claims**

1. In a system for gathering data from a plurality of portable data entry terminals, said data comprising a series of address bits designating a particular one of the plurality of portable data entry terminals, each portable data entry terminal having an array of terminal contacts,

an expandable arrangement of one or more units, each unit comprising a series of docking receptacles, each docking receptacle having a like array of receptacle contacts, each docking receptacle adapted to receive one of the portable data entry terminals such that corresponding ones of said arrays of terminal and receptacle contacts mate with each other upon insertion of the one portable data entry terminal into any of said docking receptacles,

each unit having a set of main conductive paths, each main conductive path extending adjacent said series of docking receptacles and continuously from a first end of said main conductive paths to a second end thereof, and a plurality of sets of branch conductive paths, one set of branch conductive paths for each of said docking receptacles, each branch conductive path extending continuously from one of said main conductive paths to a corresponding one of said receptacle contacts of its docking receptacle to ensure the transmission of the data appearing at a given receptacle contact of said array of any one docking receptacle in said expandable arrangement to a corresponding receptacle contact of said array of each docking receptacle in said expandable arrangement, said first ends of said main conductive paths of one unit being adapted to be connected to said second ends of said main conductive paths of another unit such that at least one further unit can be added to said arrangement.



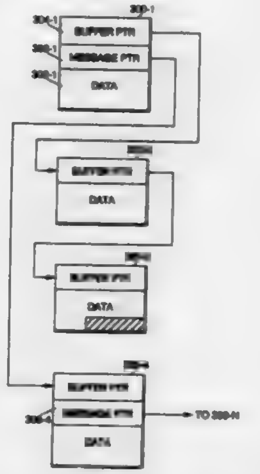
5,317,692
METHOD AND APPARATUS FOR BUFFER CHAINING IN A COMMUNICATIONS CONTROLLER

James L. Ashton, Cary, and Keith E. Karlsson, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1991, Ser. No. 645,077

Int. Cl.^{5} G06F *9/00*

U.S. Cl. 395—200 **4 Claims**



1. In a system comprising a host computer, a communications controller and a data link connecting the communications controller to the host computer, wherein the communications

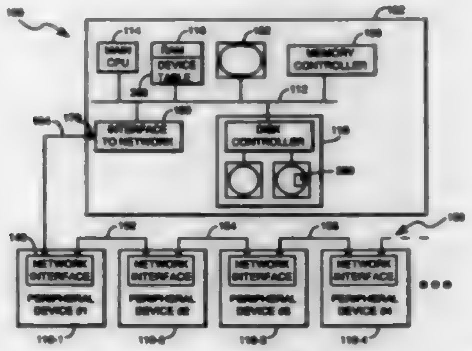
controller includes a main memory, a channel adapter (CA) as the data interface to the data link, and a central control unit (CCU) for controlling the CA, a method of transmitting data between the host computer and the communications controller, said data including one or more individual delineated messages, and a plurality of buffers in the main memory for storing the data, wherein each of the buffers contains a next buffer pointer for forming a linked list and a next message pointer, said method comprising the steps of

A) transmitting a data transfer request, including a pointer to the first buffer in a linked list, from the CCU to the CA, in response to the data transfer request at the CA,
B) transferring data until the present buffer is exhausted or until an End-of-Message (EOM) signal is received,
C) if an EOM signal has not been received, determining the next buffer pertaining to the present message and repeating step B),
D) otherwise, determining if there is another message to be transferred,
E) if there is another message to be transferred, determining from the next message pointer of one of the buffers of the last message the first buffer pertaining to the next message, and repeating steps B through D, and
F) if there is no other message to be transferred, interrupting the CCU.

5,317,693
COMPUTER PERIPHERAL DEVICE NETWORK WITH PERIPHERAL ADDRESS RESETTING CAPABILITIES

Jean-Christophe E. Cuenod , Mountain View, Calif., and Peter A. Sichel, Westford, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 4, 1991, Ser. No. 680,313
Int. Cl.⁵ G06F *13/00, 13/22*
U.S. Cl. 395—275 **13 Claims**



7. Apparatus for coupling a plurality of peripheral devices to a data processing device, comprising:

a communications medium, coupled to said data processing device, for transmitting messages between said data processing device and said plurality of peripheral devices, each said message denoting a destination address denoting a device to which said message is to be sent, and a source address denoting which device transmitted said message;
a plurality of communications interfaces, each coupled to one of said peripheral devices, each said communications interface including:
interface memory means for storing:
(A) a predefined default address value,
(B) a currently assigned address value for said communications interface, and
(C) a distinct identification message which identifies said peripheral device coupled to said communications interface; and
interface control means, coupled to said interface memory means and said communications medium, for controlling receipt of messages from said communications medium and transmission of messages by said communications interface onto said communications medium, including:
(A) reset means coupled to said communications medium, which, when said data processing device is powered up or reset, transmits an attention message onto said communications medium, said reset means including:
(i) means for setting said currently assigned address value stored in its interface memory means to said predefined default address value whenever said communications interface receives a reset message not sent by itself;
(ii) means for sending said reset message after said communications interface has been first assigned a unique address value distinct from said predefined default address value, said reset message being sent via said communications medium to said communications interfaces whose currently assigned address value is the same as said unique address value;
(B) identification message means, coupled to said communications medium and to said interface memory means, for responding to identification command messages received from said communications medium by transmitting said distinct identification message stored in said interface memory means to said data processing device via said communications medium, said identification message means including means for responding to an address assignment message which includes said currently assigned address value and an identification string matching said distinct identification message stored in said interface memory means by storing said currently assigned address value in said interface memory means as the currently assigned address value for said communications interface;
controller memory means in said data processing device for storing data; and
configuration means, in said data processing device, coupled to said communications medium, said configuration means including:
identification command means for responding to said attention message with a destination address equal to said predefined default address value; and
address assignment means for receiving from said communications medium said distinct identification messages transmitted by said communications interfaces, storing said distinct identification messages in said controller memory means, assigning to each unique one of said distinct identification messages a corresponding unique address value, and transmitting onto said communications medium said address assignment message corresponding to each said unique address value which message denotes said unique address value and said identification string matching said distinct identification message, said address assignment means further including:
(A) means for retrieving said distinct identification messages from all communications interfaces which are reset in response to said reset message; and
(B) means for assigning a new unique address value to each such communications interface from which said distinct identification message is retrieved in response to said reset message.

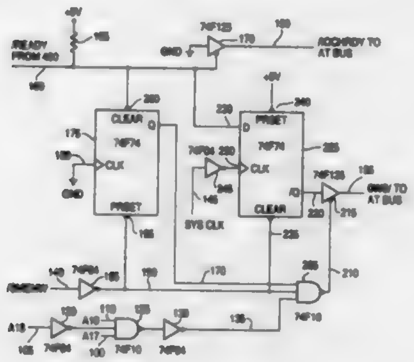
5,317,694
FAST WRITE SUPPORT FOR VGA CONTROLLER

Viren Shah, Fremont, Calif., assignor to Chips and Technologies, Inc., San Jose, Calif.

Filed Mar. 16, 1992, Ser. No. 852,436
Int. Cl.⁵ G06F *13/00*
U.S. Cl. 395—275 **1 Claim**

1. A video graphics array (VGA) controller, for coupling to a system bus of a computer processor, said system bus having a zero wait state signal, wherein said system bus further includes a system clock signal and a system memory write signal, said VGA controller comprising:

a) a controller not-ready signal; and
b) means for asserting said zero wait state signal when a system memory write has been performed to said VGA controller and said controller not-ready signal is not asserted, whereby a cycle time for memory writes by said computer processor to said VGA controller is reduced, said means for asserting said zero wait state signal comprising
i) means for asserting a fast-write signal if said controller not-ready signal has not been in an asserted state after a most recent state transition of said system memory write signal from not asserted to asserted, comprising a D type flip-flop having
1) a grounded clock input;
2) a flip-flop clear signal coupled to said controller not-ready signal;
3) a flip-flop preset signal coupled to said system memory write signal;
4) said fast-write signal as an output;



ii) means for generating a zero wait state driver select signal in response to a concurrence of said fast-write signal, said system memory write signal, and a VGA controller address decoder signal, comprising a nand gate having as inputs said fast-write signal, said system memory write signal, and said VGA controller address decoder signal, said nand gate generating said zero wait state driver select signal as an output; and
iii) means for asserting a zero wait state driver input signal at a falling edge of said system clock signal, comprising a D type flip-flop having
1) a flip-flop clear signal coupled to said system memory write signal;
2) a clock input coupled through an inverter to said system clock signal, and
3) a data input coupled to said controller not-ready signal; and
iv) a zero wait state driver having as an input said zero wait state driver input signal, controlled by said zero wait state driver select signal, for driving said zero wait state signal.

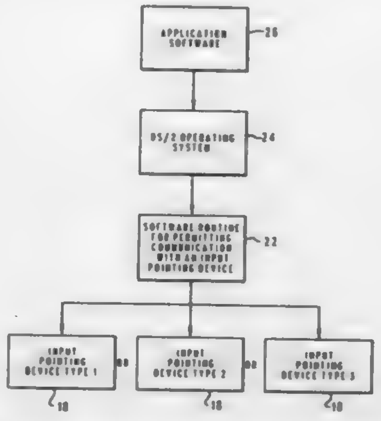
5,317,695
METHOD AND SYSTEM FOR PERMITTING COMMUNICATION BETWEEN A DATA PROCESSING SYSTEM AND INPUT POINTING DEVICES OF MULTIPLE TYPES

Joseph Celi, Jr., Boynton Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1992, Ser. No. 862,670
Int. Cl.⁵ G06F *15/02*
U.S. Cl. 395—275 **4 Claims**

1. A method in a data processing system for permitting communication between said data processing and one of a plurality of mouse pointer input pointing devices of multiple types, wherein said data processing system includes an operating system and a port for coupling a mouse pointer input pointing device to said data processing system, said method comprising the steps of:

providing a plurality of selectable software routines within said data processing system;
during initialization of said operating system, automatically determining if a selected one of said plurality of mouse pointer input pointing devices is coupled to said port of said data processing system;
thereafter, in response to a determination that a selected one of said plurality of mouse pointer input pointing devices is coupled to said port of said data processing system, automatically determining the type of said selected one of said plurality of mouse pointer input pointing devices which is coupled to said port of said data processing system; and
thereafter, automatically selecting a particular one of said plurality of selectable software routines for permitting communication between said data processing system and said type of said selected one of said plurality of mouse pointer input pointing devices coupled to said port of said data processing system.


APPLICATION SOFTWARE
26
OS/2 OPERATING SYSTEM
24
SOFTWARE ROUTINE FOR PERMITTING COMMUNICATION WITH AN INPUT POINTING DEVICE
22
INPUT POINTING DEVICE TYPE 1
OR
INPUT POINTING DEVICE TYPE 2
OR
INPUT POINTING DEVICE TYPE 3
18
18
18

5,317,696
BUS ARBITRATION SCHEME

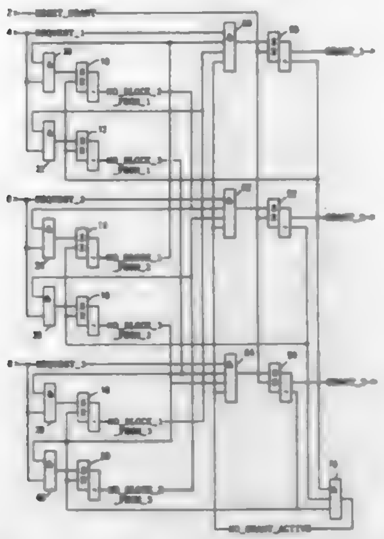
Rolf B. Hilgendorf, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1991, Ser. No. 721,749
Claims priority, application European Pat. Off., Jul. 3, 1990, 90112661.5
Int. Cl.⁵ G06F *13/36*
U.S. Cl. 395—325 **12 Claims**

1. Apparatus for arbitrating requests from at least three devices for access to a common bus, said apparatus comprising:

first, second and third grant latch and gate means, each coupled to receive a bus access request from a respective one of said devices, for presenting one of the bus access requests at a time to a bus controller to grant bus access to the device making said one request; and
first, second and third pluralities of block latch and gate means, each of said pluralities having inputs coupled to receive a bus access request from a respective one of said devices and block and no block signals from the other two pluralities of block latch and gate means, having outputs coupled to inputs of the two grant latch and gate means coupled to the other two devices, and issuing block and no block signals to said two grant latch and gate means, said block signal blocking other subsequent, copending bus access requests by the devices coupled to said two grant latch and gate means, said outputs also being coupled to the inputs of said other two pluralities of block latch and gate means to supply said block and no block signals, said block signal input to either one of said other two pluralities of block latch and gate means preventing said one

plurality of block latch and gate means from issuing a block signal to the grant latch and gate means coupled to a same device as the block latch and gate means which provides said block signal input.

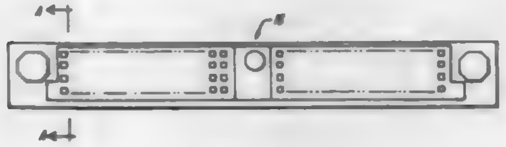


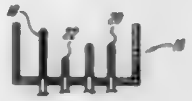
5,317,697

METHOD AND APPARATUS FOR LIVE INSERTION AND REMOVAL OF ELECTRONIC SUB-ASSEMBLIES

David J. Husak, Windham; Jay L. Madnick, Derry, both of N.H., and Stephen A. Hauser, Burlington, Mass., assignors to Synernetics Inc., N. Billerica, Mass.

Filed Jul. 31, 1991, Ser. No. 738,581
Int. Cl.^{5} G06F *13/20*
U.S. Cl. 395—325 29 Claims





1. Apparatus to permit insertion of an electronic sub-assembly into a live electronic assembly comprising:

a first connector portion in continuous electrical communication with said live electronic assembly,

a second connector portion in continuous electrical communication with said sub-assembly and adapted for mating with said first connector portion;

at least one pin of a first length, at least one pin of a second length, and at least one pin of a third length each being disposed in one of said first and second connector portions;

at least one first contact, at least one second contact, and at least one third contact each being disposed on the other of said first and second connector portions such that said contacts oppose respective first, second, and third length pins for mating therewith upon mating of said first and second connector portions;

a controlled active current limiting device;

a first power source operative to apply a bias voltage to said sub-assembly upon engagement of said at least one pin of said first length and said at least one first contact;

a controller for controlling current passing through said controlled active current limiting device and operative to apply power to said sub-assembly at a controlled rate in response to engagement of said at least one pin of said second length and said at least one second contact,

a bypass path for bypassing said controlled active current limiting device effected by engagement of said at least one pin of said third length and said at least one third contact; and

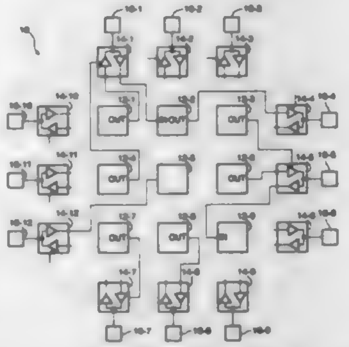
bypass circuitry operative to sense engagement of said at least one pin of said third length and said at least one third contact and to determine a status of engagement thereof and to route transmissions to said subassembly and in the alternative to route transmissions away from said subassembly in accordance with said status.

5,317,698

FPGA ARCHITECTURE INCLUDING DIRECT LOGIC FUNCTION CIRCUIT TO I/O INTERCONNECTIONS

King W. Chan, Los Altos, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Filed Aug. 18, 1992, Ser. No. 931,717
Int. Cl.^{5} G06F *13/00;* H03K *19/177*
U.S. Cl. 395—325 14 Claims



1. A user-programmable FPGA architecture disposed on an integrated circuit, said architecture comprising:

an array including a plurality of logic function circuits, each of said logic function circuits having a plurality of inputs and at least one output;

a plurality of input/output pads;

a plurality of input/output modules, each input/output module including an input node, an output node, a control node, an input buffer having an input communicating with one of said input/output pads and an output communicating with said output node, and an output buffer having an input communicating with said input node, an output communicating with said one of said input/output pads, and a control input communicating with said control node, said control input for selectively placing said output buffer in a high impedance state;

a general interconnect structure including

a plurality of first interconnect conductors and a plurality of second interconnect conductors superimposed on said array, said first interconnect conductors disposed parallel to one another and running in a first direction, said second interconnect conductors disposed parallel to one another and running in a second direction substantially perpendicular to said first direction,

a plurality of interconnect intersections located where individual ones of said first interconnect conductors cross individual ones of said second interconnect conductors,

said first interconnect conductors and said second interconnect conductors forming a grid of interconnect conductors which surrounds a plurality of said logic function circuits;

a plurality of user-programmable interconnect elements, first individual ones of said interconnect elements connected between said inputs of said logic function circuits and selected ones of said interconnect conductors, second individual ones of said interconnect elements connected between said outputs of said logic function circuits and selected ones of said interconnect conductors, third individual ones of said interconnect elements connected between selected ones of said first interconnect conductors and selected ones of said second interconnect conductors at selected ones of said interconnect intersections, and fourth individual ones of said interconnect elements connected between said input nodes and said output nodes of said input/output modules and selected ones of said interconnect conductors; and

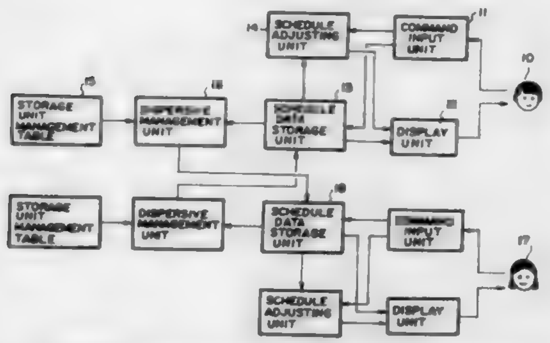
at least one direct interconnect conductor connected between an output of a selected one of said logic function circuits and the input node of one of said input/output modules.

5,317,699

SCHEDULE MANAGEMENT SYSTEM WITH COMMON MEMORY FOR MULTIPLE USERS

Koji Sugita, Tokyo, and Yuji Izuwa, Hiroshima, both of Japan, assignors to NEC Corporation, Japan

Filed Dec. 14, 1992, Ser. No. 989,772
Claims priority, application Japan, Dec. 27, 1991, 3-360213
Int. Cl.^{5} G06F *13/00*
U.S. Cl. 395—325 1 Claim


SCHEDULE ADJUSTING UNIT
COMMAND INPUT UNIT
STORAGE UNIT MANAGEMENT TABLE
DISPERSIVE MANAGEMENT UNIT
SCHEDULE DATA STORAGE UNIT
DISPLAY UNIT
STORAGE UNIT MANAGEMENT TABLE
DISPERSIVE MANAGEMENT UNIT
SCHEDULE DATA STORAGE UNIT
COMMAND INPUT UNIT
SCHEDULE ADJUSTING UNIT
DISPLAY UNIT
10
11
14
15
17

1. A schedule management system comprising a plurality of user stations;

command means and display means coupled to a schedule data storage unit at each of said user stations for entering, displaying, and storing scheduling data;

management table means individually associated with each user station for storing information indicating regular schedule data entered by the user at the individually associated station and auxiliary schedule data entered by a user at a station other than the individually associated station;

said schedule data being stored in said schedule data storage unit under addresses accompanying entered data;

a plurality of dispersive management means, each of said dispersive management means being coupled between an individually associated one of said schedule data storage units and the management table means associated with that user station,

each of said dispersive management means determining from received data and the management table associated therewith whether said received data is related to said regular or to said auxiliary data;

means for intercoupling the plurality of dispersive management means and schedule data storage units so that each dispersive management means directs received data to any of said schedule data storage units at a station other than the individually associated station; and

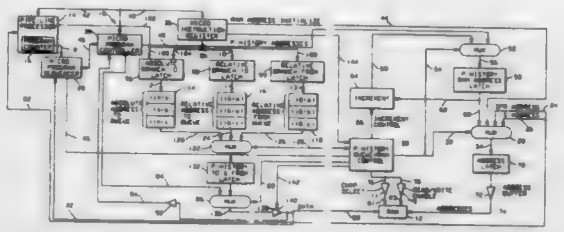
said dispersive management means including means responsive to a detection of received auxiliary data for directing a storage of the auxiliary data in the schedule data storage unit individually associated with the user station identified by the address accompanying said auxiliary data, and said dispersive management means including means responsive to a detection of regular data for not directing a storage of the received regular data.

5,317,700

PROGRAM HISTORY FOR PIPELINED PROCESSOR INCLUDING TEMPORARY STORAGE QUEUES FOR STORING BRANCH ADDRESSES

Gregory F. Hammitt, Eagan, Minn., and Scott D. Koenigsman, St. Joseph, Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Filed May 1, 1992, Ser. No. 877,508
Int. Cl.^{5} G06F *9/38, 11/30*
U.S. Cl. 395—375 4 Claims



1. In a pipeline data processing system comprising processor means that execute branch-type instructions, program control means and a random access memory (RAM) coupled to said processor means and to said program control means for sorting processing function data for processes that are performable by said processor means, the improvement comprising a program history processing means which comprises:

(a) first queue temporary storage means coupled to said processor means and to said program control means for storing the absolute "to" address program history data to which a branch instruction will jump,

(b) second queue temporary storage means coupled to said processor means and to said program control means for storing the relative "to" address program history data to which the branch instruction will jump,

(c) third queue temporary storage means coupled to said processor means and to said program control means for storing the relative "from" address program history data from which the branch instruction will jump,

(d) queue multiplexing means coupled to said RAM and to said first, second and third queue temporary storage means for transferring said program history data stored in said queue temporary storage means to said RAM in a first-in-first-out manner for storage in said RAM at program history addresses that are specified by said program control means, and for receiving said processing function data for storage in said RAM as processing function addresses,

(e) address multiplexing means coupled to said RAM and to said program control means for receiving said program history addresses and said processing function addresses, and

(f) RAM means comprising write means coupled to said processor means, and to said program control means and to said queue and address multiplexing means for controlling the writing of said program history data and said processing function data into said RAM at controlled times that are determined by said processor means and said program control means, whereby said first, second and third queue temporary storage means allow the storage of the program history in said RAM means without interference with the use of said RAM means by the other functions that access it and without interference with the pipelining of said processor means.

5,317,701

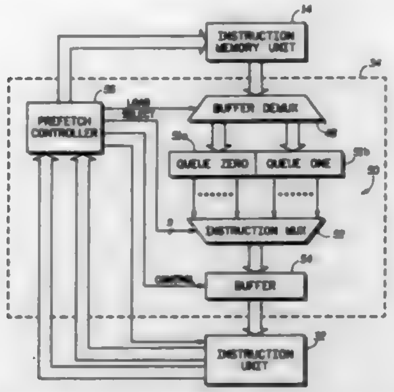
METHOD FOR REFILLING INSTRUCTION QUEUE BY READING PREDETERMINED NUMBER OF INSTRUCTION WORDS COMPRISING ONE OR MORE INSTRUCTIONS AND DETERMINING THE ACTUAL NUMBER OF INSTRUCTION WORDS USED

Russell Reininger, and William B. Ledbetter, Jr., both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 459,602, Jan. 2, 1990, abandoned. This application Jan. 19, 1993, Ser. No. 5,924

Int. Cl.^{5} G06F *9/38*

U.S. Cl. 395—375 **11 Claims**



1. In a data processor having a prefetch controller for prefetching a sequence of instructions from a memory, where each instruction in said sequence of instructions is comprised of a variable number of instruction words, said prefetch controller being coupled to said memory for loading a predetermined number of instruction words from said sequence of instructions into an instruction queue, said instruction queue having a predetermined number of buffers, each buffer having a predetermined n-word instruction boundary for storing a set of n instruction words retrieved from said memory, where n is an integer, a method for filling said instruction queue based upon movement of said predetermined number of instruction words within a pipelined instruction unit, said method comprising the steps of:

loading said pipelined instruction unit, with a first set of instruction words comprising one or more instructions from a first sequence of instructions, said first set of instruction words being selected from said instruction queue, in response to a first control signal provided to said instruction queue by a queue pointer in said prefetch controller, during a first part of a machine cycle;

decoding, via said pipelined instruction unit, said first set of instruction words to determine a word length of a first instruction in said first set of instruction words, said word length corresponding in value to an amount of movement of said pipelined instruction unit occurring as a result of loading said first set of instruction words;

providing, via said pipelined instruction unit, a second control signal to said prefetch controller, during a second part of said machine cycle, said second control signal indicating said word length of said first instruction;

incrementing a current value of said queue pointer by an amount corresponding in value to said amount of movement of said pipelined instruction unit, in response to said prefetch controller receiving said second control signal, said queue pointer thereafter pointing to a second set of instruction words comprising one or more instructions stored in said instruction queue, to be subsequently loaded into said pipelined instruction unit; and

retrieving a next sequence of instructions from said memory to refill said instruction queue, if any one of the following conditions are met:

the current value of the queue pointer combined with the amount of movement of said pipelined instruction unit occurring as the result of loading said first set of instruction words points to a last instruction word in one of said predetermined number of buffers, in said instruction queue; or

the current value of the queue pointer combined with the amount of movement of said pipelined instruction unit occurring as the result of loading said first set of instruction words crosses said n-word instruction boundary of one of said predetermined number of buffers in said instruction queue.

5,317,702

DEVICE FOR EFFECTIVELY CONTROLLING A BRANCH HISTORY TABLE FOR AN INSTRUCTION PREFETCHING SYSTEM EVEN IF PREDICTIONS ARE BRANCH UNSUCCESSFUL

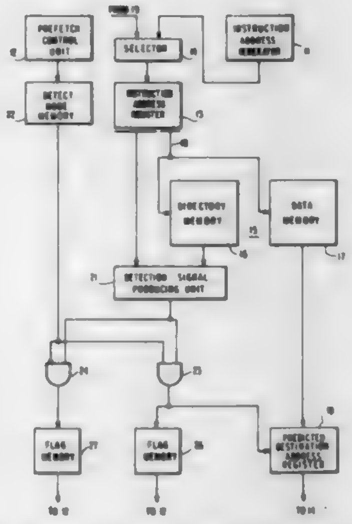
Tsuyoshi Morisada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 24, 1990, Ser. No. 527,911

Claims priority, application Japan, May 25, 1989, 132321

Int. Cl.^{5} G06F *9/00*

U.S. Cl. 395—375 **2 Claims**


PREFETCH CONTROL UNIT
SELECTOR
INSTRUCTION ADDRESS GENERATOR
DETECT MODE MEMORY
INSTRUCTION ADDRESS REGISTER
DIRECTORY MEMORY
DATA MEMORY
DETECTION SIGNAL PRODUCING UNIT
FLAG MEMORY
FLAG MEMORY
PREDICTED DESTINATION ADDRESS REGISTER

1. A device for use in an instruction prefetching system for carrying out instruction prefetch in controlling branch history table means supplied with a request address signal representative of a current request address for producing a signal pair of a branch instruction address signal representative of a previously executed branch instruction address and a branch destination address corresponding to said previously executed branch instruction address, said device comprising:

a prefetch control unit for outputting a detect mode signal;

a detect mode register for receiving and memorizing the detect mode signal output from said prefetch control unit, said detect mode signal being indicative of, in relation to said current request address, whether said branch destination address signal should or should not be used in the instruction prefetch;

detection signal producing means connected to the branch history table means and supplied with said request address signal and said branch instruction address signal for producing a detection signal indicative of whether or not said current request address coincides with said previously executed branch instruction address;

first signal register means connected to said detect mode register and said detection signal producing means for indicating, when said detect mode signal indicates that said branch destination address signal should be used in the instruction prefetch, a first signal indicative of whether the instruction prefetch should or should not proceed in accordance with said branch destination address signal; and

second signal register means connected to said detect mode register and said detection signal producing means for indicating, when said detect mode signal indicates that said branch destination address signal should not be used in the instruction prefetch, a second signal indicative of whether or not said current request address coincides with said historical branch instruction address;

said detect mode register memorizes said detect mode signal with first and second logic levels when said branch destination address signal should and should not be used in the instruction prefetch, respectively;

said detection signal producing means producing said detection signal with a predetermined one and a different one of said first and said second logic levels when said current request address is and is not coincident with said previously executed branch instruction address, respectively;

said first signal register means memorizing said first signal with a preselected one and the other of said first and said second logic levels when the instruction prefetch should and should not proceed in accordance with said branch destination address signal, respectively, said preselected one of the first and the second logic levels depending on said predetermined one of the first and the second logic levels.

5,317,703

INFORMATION PROCESSING APPARATUS USING AN ADVANCED PIPELINE CONTROL METHOD

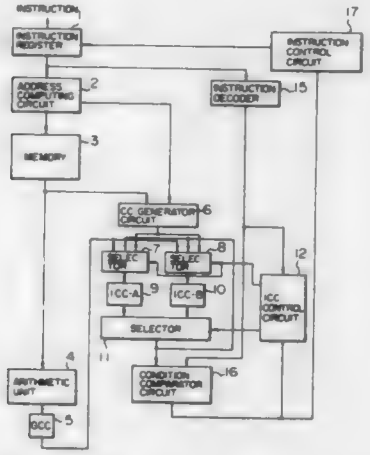
Tooru Hiraoka; Kouji Nakamura, both of Hadano, and Tohru Shonai, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 724,113, Jul. 1, 1991. This application Nov. 26, 1991, Ser. No. 797,892

Claims priority, application Japan, Jun. 29, 1990, 2-170036; Nov. 28, 1990, 2-326499

Int. Cl.^{5} G06F *9/38, 9/30*

U.S. Cl. 395—375 **10 Claims**



1. An information processing apparatus having a memory in which a pipeline control is applied to a sequence of instructions to be executed, the sequence of instructions including a plurality of conditional branch instructions, each of which determines whether a branch is successful or not based on a condition code obtained from a previously executed instruction, said apparatus comprising:

instruction providing meand for sequentially providing each individual instruction of the sequence of instructions to effect a pipeline operation thereon, wherein the instruction proividing means provides instructions, which occur in said sequence subsequent to a conditional branch instruction, before determining whether the branch is successful or not;

computing means for obtaining a first condition code by executing a first type of conditional branch instruction which is capable of execution without a memory address thereof, and for obtaining the memory address for a second type of instruction which requires the memory address information for execution;

arithmetic means for receiving, from the memory, advance operation data specified by a memory address obtained by the computing means, and for obtaining a second condition code resulting from the execution of the second type of instruction using the received advance operation data;

holding means responsive to said computing means and said arithmetic means for holding therein both of the first and second condition codes, wherein the holding means includes means for selecting the second condition code resulting from the execution of the second type of instruction before determining whether an objective conditional branch specified by that conditional branch instruction is successful or not; and

determining means for comparing branch control information of the objective condition branch instruction with the selected second condition code output from the holding means, and for determining whether the objective conditional branch instruction is successful or not.

5,317,704

STORAGE RELOCATING METHOD AND HIERARCHY STORAGE SYSTEM UTILIZING A CACHE MEMORY

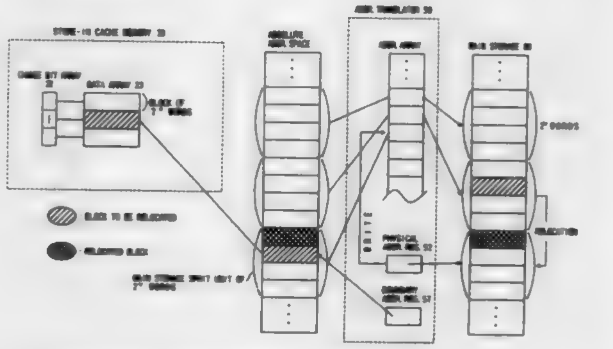
Satoshi Izawa; Masaya Watanabe, both of Hadano, and Seiji Kaneko, Yokohama, all of Japan, assignors to Hitachi, Ltd., Kodaira and Hitachi Microcomputer Engineering, Ltd., Tokyo, both of Japan

Filed Jul. 18, 1990, Ser. No. 553,699

Claims priority, application Japan, Jul. 18, 1989, 1-185749

Int. Cl.^{5} G06F *12/10*

U.S. Cl. 395—400 **1 Claim**



1. A hierarchy storage system, comprising:

a storage;

an address translation table for translating an absolute address into a physical address for a predetermined split storage unit of said storage;

a store-in cache memory including a data array composed of plural blocks for storing a part of a data content stored in said storage, and a change bit array for storing change bits, each of said change bits indicating that data stored in a block of said data array is different from data of a corresponding part of said storage, said predetermined split storage unit having a larger capacity than said block of said cache memory data array;

first address holding means for holding physical address data of an object predetermined split storage block to be relocated;

second address holding means for holding absolute address information of object predetermined split storage block to be relocated;

third address holding means for holding boundary absolute address for an un-relocated block and said object predetermined split storage block to be relocated;

boundary address updating means for updating one block of said boundary absolute address of said third address holding means for every block relocation;

first determining means for determining whether said absolute address information stored in said second address holding means corresponds to said object predetermined split storage unit to be relocated;

second determining means for determining a physical comparison between an new absolute address and said boundary absolute address;

selecting means for selecting either of, according to a determined results of said first and second determining means, physical address information from said address translation table and said physical address data from said first address holding means to give a selected one to said storage; and

writing means for writing the physical address data content of said first address holding means into a corresponding portion of said address translation table after all blocks in said object split storage unit have been relocated.

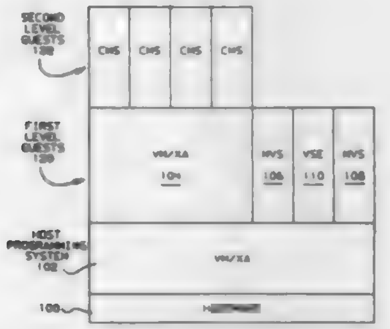
5,317,705
APPARATUS AND METHOD FOR TLB PURGE REDUCTION IN A MULTI-LEVEL MACHINE SYSTEM

Patrick M. Gannon; Peter H. Gum, both of Poughkeepsie; Roger E. Hough, Highland, and Robert E. Murray, Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 605,192, Oct. 24, 1990, abandoned. This application Aug. 26, 1993, Ser. No. 112,174

Int. Cl.^{5} G06F *12/02*

U.S. Cl. 395—400 **5 Claims**



1. A computer system having a real processor and a random access memory, the computer system having a host hypervisor operating with virtual machines, and guests operating in any address translation mode of: a virtual=fixed guest, a virtual=-real guest and a pageable guest, the system comprising

translation lookaside buffer means in the processor for storing guest-translated virtual addresses and associated absolute addresses provided for virtual machines executing at plural guest address translation levels,

a region relocation facility (RRF) mode indicator which is set on when the memory is divided into fixed contiguous memory locations for use by different virtual=fixed guests,

a pageable-guest-was-processed (PGWP) indicator associated with the buffer means, the PGWP indicator being set on when a pageable guest's address translation information is stored in any entry in the buffer means, and the PGWP indicator being set of when the buffer means is purged by invalidation of all entries in the buffer means,

means for signalling to the buffer means an invalidation request provided by a program, the request containing a table index for locating entry(s) in the buffer means to be invalidated and indicating a particular translation level for the request,

means responsive to the signalling means for invalidating all entries in the buffer means upon detecting predetermined combined settings of the PGWP indicator and the region relocation facility mode indicator, and the signalling means indicating a translation level other than a lowest guest translation level.

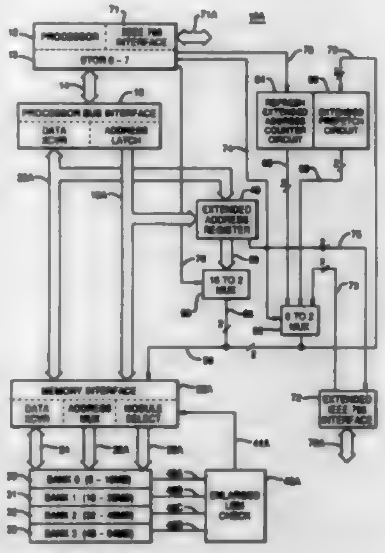
5,317,706
MEMORY EXPANSION METHOD AND APPARATUS IN A VIRTUAL MEMORY SYSTEM

Richard G. Pechter, Escondido, Calif., assigner to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 437,050, Nov. 15, 1989, abandoned. This application Jul. 26, 1993, Ser. No. 97,725

Int. Cl.^{5} G06F *12/02, 12/06, 12/10*

U.S. Cl. 395—400 **10 Claims**



1. A memory expansion apparatus for a system having an extended main memory, said apparatus comprising:

a processor accessing an address location in extended main memory, said processor is connected to an address-and-data bus, and to a control bus;

a processor bus interface is also connected to said address-and-data bus, said processor bus interface also is connected to a non-extended address bus, and a data bus, said processor bus interface receives a first plurality of address bits from said processor, corresponding to the address location in extended memory which first plurality of address bits is outputted to said non-extended address bus;

external register means for storing an extended address control word connected to said processor bus interface via said non-extended address bus at an address input port, and to said data bus at a data input/output port of said external register means;

extended address selector means connected to said external register means for selecting a plurality of extended address bits from said extended address control word according to the extended address location in extended memory being accessed by said processor, said plurality of extended address bits are outputted from said extended address selector means to an extended address bus;

memory interface means, connected to said non-extended address bus, said data bus, and said extended address bus, for receiving said first plurality of address bits and said extended address bits, concatenating said extended address bits and said first plurality of address bits, and accessing said extended address location in said extended main memory;

said extended main memory is of a dynamic random access type that requires periodic refreshing in order to maintain digital information stored therein; and

extended counter means for providing an extended refresh address for refreshing said extended main memory, said counter means is connected to said processor by a second control bus.

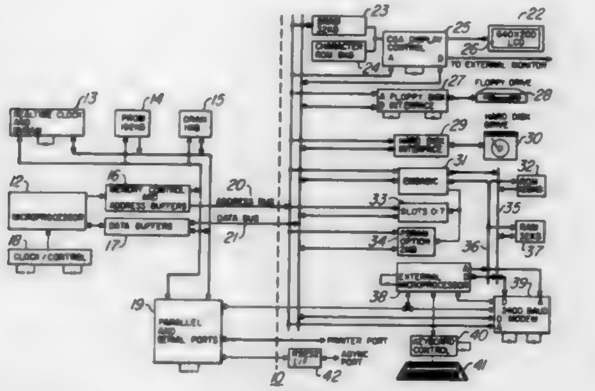
5,317,707
EXPANDED MEMORY INTERFACE FOR SUPPORTING EXPANDED, CONVENTIONAL OR EXTENDED MEMORY FOR COMMUNICATION BETWEEN AN APPLICATION PROCESSOR AND AN EXTERNAL PROCESSOR

Steven J. Wallace, and LaVaughn F. Watts, both of Temple, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 20, 1989, Ser. No. 424,853

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—425 **25 Claims**



1. A microcomputer, comprising:

an application processor having conventional memory;

an external processor; and

an expanded memory interface coupled between said application processor and said external processor for communication therebetween via said expanded memory interface;

wherein said expanded memory interface comprises at least one status port coupled to said external processor and having at least one register, wherein said external processor uses the register to indicate peripheral configurations to the application processor by writing a bit change to the register in response to peripheral configuration changes which is communicated to the application processor via the expanded memory interface and wherein the application processor dynamically responds to the peripheral configuration indications in real-time.

5,317,708
APPARATUS AND METHOD FOR AN IMPROVED CONTENT ADDRESSABLE MEMORY

Ron Edgar, Raymond, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,414

Int. Cl.^{5} G06F *12/00*

U.S. Cl. 395—425 **1 Claim**

1. A content addressable memory comprising

a content addressable memory input, for inputting one of a plurality of data entities, each of the plurality of data entities being divided into n slices;

a content addressable memory output;

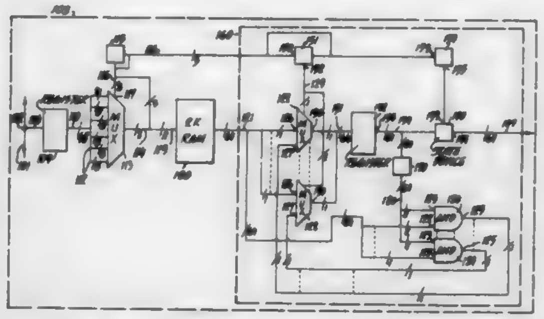
an array of n RAMs, each having an address input coupled to said content addressable memory input and a data output coupled to said content addressable memory output, wherein

a 1st of the n RAMs includes a plurality of data storage locations uniquely addressable by each of a plurality of 1st slices of the plurality of data entities and containing certain ones of the plurality of data entries, said certain ones including predetermined match information for each corresponding one of said plurality of 1st slices; and

a 2-nth of the n RAMs includes a plurality of data storage locations uniquely addressable by each of a plurality of 2-nth slices of the plurality of data entities and containing certain ones of the plurality of data entries, said certain ones including predetermined match information for each corresponding one of said plurality of 2-nth slices;

the content addressable memory operating to receive at the content addressable memory input a first of the plurality of data entities;

the content addressable memory operating to apply the 1st slice of the first of the plurality of data entities to the address input of the 1st of the n RAMs;



the 1st of the n RAMs operating to fetch a 1st one of the plurality of data entries corresponding to the 1st slice of the first of the plurality of data entities;

the content addressable memory operating to apply the 2-nth slice of the first of the plurality of data entities to the address input of the 2-nth of the n RAMs;

the 2-nth of the n RAMs operating to fetch an 2-nth one of the plurality of data entries corresponding to the 2-nth slice of the first of the plurality of data entities; and

said content addressable memory output operating to output said 1st one of the plurality of data entries and said 2-nth one of the plurality of data entries.

5,317,709
MICROCOMPUTER INCLUDING MEMORY CONTROLLER FOR DRAM

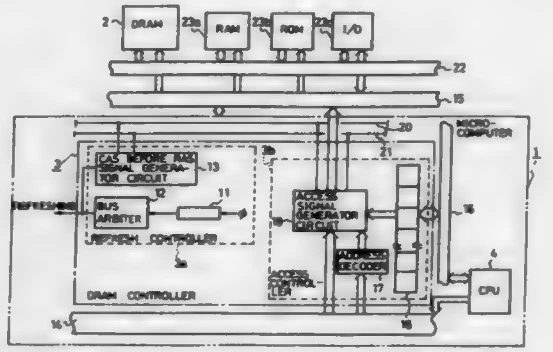
Masaki Sugimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 664,185

Claims priority, application Japan, Mar. 5, 1990, 2-054006

Int. Cl.^{5} G06F *13/18*

U.S. Cl. 395—425 **8 Claims**



1. A memory controller for a memory comprising:

a refresh controller coupled to the memory for issuing a plurality of signals to control memory refresh;

an access controller coupled to the memory for controlling memory access and having:

- (a) a memory control register including:
  - (i) a memory area selection bit for designating a given memory area; and
  - (ii) a memory access effective bit, wherein when said memory access effective bit is asserted, access to the given memory area designated by said memory area selection bit is enabled;
- (b) an access signal generator circuit, coupled to said memory control register, for generating row and column addresses and RAS and CAS signals when said effective bit is asserted; and

a bus arbiter, coupled to said memory, to said access controller and to said refresh controller, for assigning a priority to one of a refresh request or an access request to said given memory area.

5,317,710

INVALIDATION OF ENTRIES IN A TRANSLATION TABLE BY PROVIDING THE MACHINE A UNIQUE IDENTIFICATION THEREBY DISALLOWING A MATCH AND RENDERING THE ENTRIES INVALID

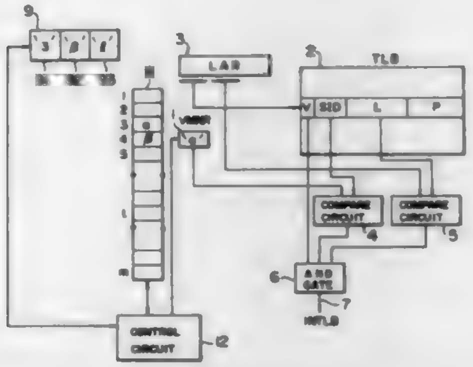
Mari Ara, Isehara; Hideo Sawamoto, and Ryo Yamagata, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 222,767, Jul. 22, 1988, abandoned. This application Apr. 3, 1991, Ser. No. 681,446

Claims priority, application Japan, Jul. 24, 1987, 62-183322

Int. Cl.^{5} G06F *12/02, 7/04*

U.S. Cl. 395—425 **8 Claims**



1. A system for carrying out an invalidation process with a translation lookaside buffer in a computer system which has a register means for storing identification information identifying a currently running machine state, said translation lookaside buffer having bits for storing identification information in respective columns of the translation lookaside buffer and means for converting a virtual address to a real address, wherein the identification information from the translation lookaside buffer is compared in a compare circuit with the identification information from said register mean, and invalidating said converting the virtual address to the real address when the compare circuit does not detect coincidence between the identification information stored in the register means and the identification information stored in the translation lookaside buffer, said system comprising:

a data holding means for holding data indicative of identification information identifying machine states which have been run up to a current time point;

means, when an invalidation command for said translation lookaside buffer is issued by the system during a run of a one running machine state, for selecting an identification information which does not identify a past running machine state and assigning the selected identification information to the currently running machine state, said selection based on the content of said data holding means wherein the selected identification information reidentifies said one running machine state; and

means for setting the selected identification information in said register means whereby all translation lookaside buffer entries with identification information equal to the currently running machine state's prior identification information are simultaneously disabled from being used in the virtual to real address conversion since the compare circuit cannot detect coincidence between the selected identification information stored in the register means and identification information of entries in the translation lookaside buffer, thereby rendering the entries invalid.

5,317,711

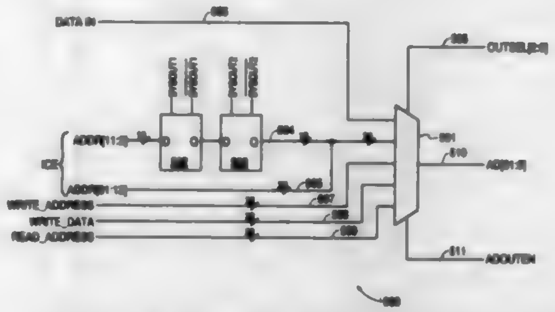
STRUCTURE AND METHOD FOR MONITORING AN INTERNAL CACHE

Philip A. Bourekas, San Jose; Yeshayahu Mor, Cupertino, and Scott Revak, Castro Valley, all of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Jun. 14, 1991, Ser. No. 715,526

Int. Cl.^{5} G01R *31/28*

U.S. Cl. 395—425 **14 Claims**



1. A structure for monitoring internal signals of a microprocessor having a plurality of pins for outputting data signals, said structure comprising:

a first circuit for receiving an external control signal having an active state, said active state indicating monitoring of said internal signals is desired;

a second circuit, coupled to receive said external control signal, for providing said internal signals to said pins in response to said external control signal; and

a third circuit for indicating that said internal signals are provided on said output pins, said third circuit providing an indicating signal on a control signal pin, said indicating signal indicating, when said external control signal is in said active state, whether internal signals or data signals are provided on said plurality of pins.

5,317,712

METHOD AND APPARATUS FOR TESTING AND CONFIGURING THE WIDTH OF PORTIONS OF A MEMORY

Greg A. Peek, and Craig D. Cedros, both of Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1991, Ser. No. 812,072

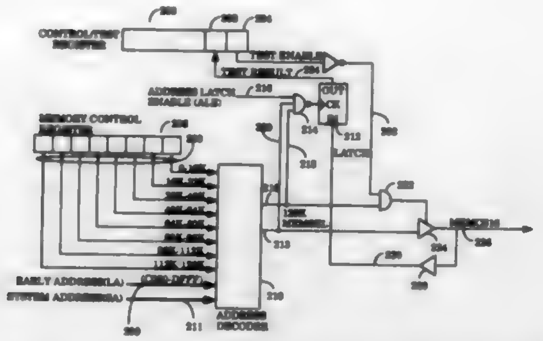
Int. Cl.^{5} G06F *12/00, 13/00*

U.S. Cl. 395—425 **14 Claims**

1. A circuit for testing and configuring a width of various portions of memory, comprising:

an address decoder for receiving an address presented on address lines coupled to said address decoder and for generating a memory control signal on an output line, a state of said memory control signal specifying a width of a portion of the memory corresponding to said address;

a latch coupled to said output line for retaining the state of said memory control signal, said latch being activated when a valid address is presented on said address lines; and



a control/test register coupled to said latch for receiving the state of said memory control signal retained by said latch, said control/test register being readable by a processor.

5,317,713

MICRO-WINCHESTER DISK DRIVE HAVING ON-BOARD SEGMENTED CACHE MEMORY

Tim R. Glassburn, Milpitas, Calif., assignor to Quantum Corporation, Milpitas, Calif.

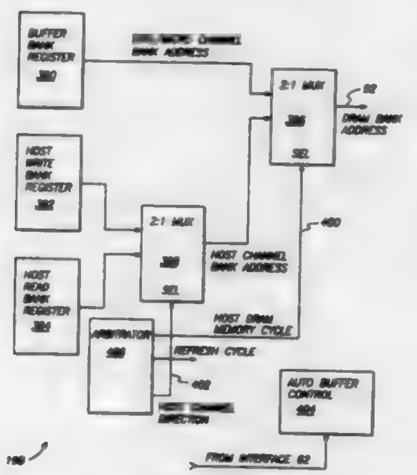
Filed Sep. 19, 1991, Ser. No. 762,683

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—425 **4 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 126 Pages)



1. A disk drive including a head and disk assembly means having a rotating data storage disk for storing blocks of data, voice coil actuator means for positioning at least one data transducer head means in order to store and retrieve said blocks of data to and from the disk, and spindle motor means for rotating the disk; the drive further comprising a circuit board attached to the head and disk assembly means and including:

head positioner servo means for providing control signals to said voice coil actuator means,

read and write electronic channel means for formatting said blocks from digital to analog signal format,

sequencing means for controlling sequencing of said blocks to and from the disk,

cache buffer memory means for temporarily storing said blocks of data,

memory controller means for addressing said cache buffer memory means,

digital interface means for connecting a digital signal bus carrying data and control values to and from a host computing system, and

single embedded microcontroller means for directly controlling said read and write electronic channel means, said sequencing means, said memory controller means, said interface means, and said head positioner servo means,

said cache buffer memory means being arranged as a plurality of segments of memory,

said memory controller means for defining a plurality of channels including a host data channel, and a disk and microcontroller data channel, and including multiplexing means for switching cache memory segment addresses between predetermined segments in response to a particular one of said channels being presently active such that data can be transferred over said host channel to a predetermined host segment while data is being transferred over said drive channel on another predetermined drive segment.

5,317,714

DIGITAL SOUND SOURCE APPARATUS AND EXTERNAL MEMORY CATRTRIDGE USED THEREFOR

Katsuya Nakagawa; Satoshi Yamato, and Hideki Tanaka, all of Kyoto, Japan, assignors to Nintendo Co., Ltd., Kyoto, Japan

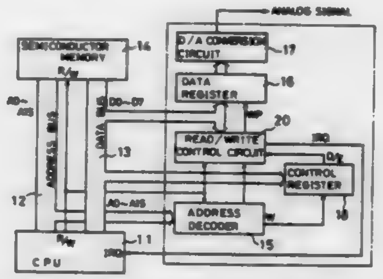
PCT No. PCT/JP91/00085, § 371 Date Sep. 2, 1991, § 102(e) Date Sep. 2, 1991, PCT Pub. No. WO91/11811, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 25, 1991, Ser. No. 768,613

Claims priority, application Japan, Jan. 26, 1990, 2-16473

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—425 **4 Claims**



1. A digital sound source apparatus comprising:

a central processing unit for processing information in a digital manner;

an address bus connected to said central processing unit;

a data bus connected to said central processing unit;

a semiconductor memory connected to said address bus and said data bus and having a data storage area for storing quantized data in a predetermined address space and a data storage area for storing program data for reading and controlling at least the quantized data in response to access from said central processing unit, said semiconductor memory storing a plurality of quantized data for generating a series of sounds as a quantized data train and a stop code in a last address of the quantized data train in said quantized data storage area, and start address data for designating a start address of the quantized data train in a certain address in said program data storage area;

temporary storing means connected to said data bus for temporarily and sequentially storing the quantized data applied from said data bus every time a write signal is applied;

detecting means connected to said address bus for detecting that the address data applied to said semiconductor memory from said central processing unit designates said quantized data storage area;

write control means connected to said data bus for generating said write signal in response to an output of said detecting means to apply the write signal to said temporary storing means and for stopping the generation of the write signal in response to detection of said stop code; and

digital/analog converting means for sequentially converting the quantized data temporarily stored in said temporary storing means into an analog signal.

5,317,715

REDUCED INSTRUCTION SET COMPUTER SYSTEM INCLUDING APPARATUS AND METHOD FOR COUPLING A HIGH PERFORMANCE RISC INTERFACE TO A PERIPHERAL BUS HAVING DIFFERENT PERFORMANCE CHARACTERISTICS

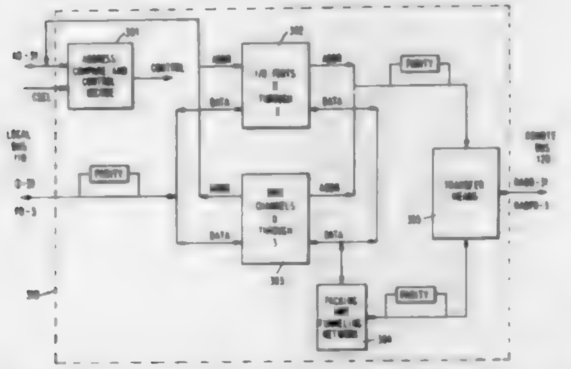
William M. Johnson, San Jose; Timothy A. Olson, Sunnyvale; Drew J. Dutton, Santa Monica; Sherman Lee, Palos Verdes Estates, and David W. Stoenner, El Toro, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 593,540, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 133,092, Dec. 15, 1987, abandoned. This application Jul. 10, 1992, Ser. No. 911,783

The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.

Int. Cl.⁵ G06F *13/00, 13/23*

U.S. Cl. 395—425 **9 Claims**



1. A reduced instruction set processing (RISC) system comprising:

a set of high performance devices including a RISC processor unit coupled to a Local bus; a program storage unit coupled to said Local bus and to said processor unit by an instruction bus; a data storage unit coupled to said Local bus; and at least one data transfer controller (DTC) that is coupled to said Local bus and to a Remote bus, said DTC having means for performing overlapped input/output, whereby the DTC can simultaneously service a second I/O request from said processor unit before the completion of a first I/O request, completing both I/O requests without interruption, said Remote bus being coupled to a second set of devices have a comparatively lower performance level than said first set of devices;

said DTC comprising a direct memory access means, coupled to said Local bus, including at least one direct memory access channel means, for channelling direct memory access transfers from said Local bus to said Remote bus and from said Remote bus to said Local bus; input/output controller means, coupled to said Local bus and to said Remote bus, including at least one address mapped input-/output port means, for providing direct access to said second set of devices by said processor unit; means for connecting said Local bus to said direct memory access means and to said input/output controller means; and packing and funneling network means for interconnecting said Remote bus to said direct memory access means and said input/output controller means to accommodate variable width data transfers between said Local Bus and said Remote bus;

wherein said DTC facilitates communication between said first and second sets of devices while insulating the performance of said first set of devices from the lower performance of said second set of devices and permits data transfer operations to be performed by said direct memory access means and said input/output controller means in parallel with the operation of said first set of devices.

5,317,716

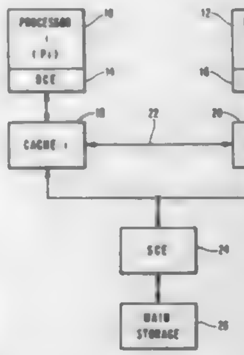
MULTIPLE CACHES USING STATE INFORMATION INDICATING IF CACHE LINE WAS PREVIOUSLY MODIFIED AND TYPE OF ACCESS RIGHTS GRANTED TO ASSIGN ACCESS RIGHTS TO CACHE LINE

Lishing Liu, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 689,121, Apr. 22, 1991, abandoned, which is a continuation of Ser. No. 232,722, Aug. 16, 1988, abandoned. This application Aug. 20, 1992, Ser. No. 932,457

Int. Cl.⁵ G06F *12/14, 12/16*

U.S. Cl. 395—425 **8 Claims**



1. In a multiprocessor system having main storage and a plurality of caches of storing lines of information and a cache-to-cache transfer facility interconnecting said caches for directly transferring lines among said caches without castout to said main storage, each line stored in any of said caches having either a valid state or invalid state and also having either a read-only state or exclusive state, any particular one of said lines stored in any particular one of said caches and having said valid and exclusive states being readable and modifiable by said multiprocessor system, any particular one of said lines stored in any particular one of said caches and having said valid and read-only states being readable and not modifiable by said multiprocessor system, and any particular one of said lines stored in any particular one of said caches and having said invalid state being not readable and not modifiable by said multiprocessor system, improved apparatus for determining whether said read-only state or said exclusive state is assigned to a line of information fetched into one of said caches when said fetched line is already stored in another one of said caches in order to improve concurrency in said caches, comprising: means for maintaining local change state information for each line stored in any of said caches, said local change state information for a particular one of said lines stored in a particular one of said caches indicating whether or not said particular one of said lines stored in said particular one of said caches has been modified by said multiprocessor system while said particular one of said lines has been resident in said particular one of said caches;

means coupled to said maintaining means for assigning said read-only state to said fetched line in said one cache if said fetched line has said read-only state in said another cache or has said exclusive state in said another cache and has not been modified by said multiprocessor system based upon said local change state information for said fetched line while said fetched line has been in said another cache; and

means coupled to said maintaining means for assigning said exclusive state to said fetched line in said one cache only if said fetched line has said exclusive state in said another cache and has been modified in said another cache by said multiprocessor system based upon said local change state information for said fetched line while said fetched line has been in said another cache.

5,317,717

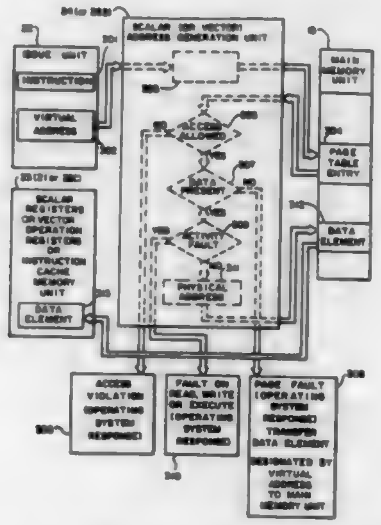
APPARATUS AND METHOD FOR MAIN MEMORY UNIT PROTECTION USING ACCESS AND FAULT LOGIC SIGNALS

David N. Cutler, Bellevue; David A. Orbits, Redmond, both of Wash.; Dileep Bhandarkar, Shrewsbury, Mass.; Wayne Cardoza, Merrimack, N.H., and Richard T. Witek, Littleton, Mass., assignors to Digital Equipment Corp., Maynard, Mass.

Continuation of Ser. No. 471,055, Jan. 23, 1990, abandoned, which is a continuation of Ser. No. 69,290, Jul. 1, 1987, abandoned. This application Aug. 20, 1992, Ser. No. 932,913

Int. Cl.⁵ G06F *12/14*

U.S. Cl. 395—425 **20 Claims**



1. Apparatus for controlling access to and use of stored elements by a processor that requests said access by identifying one of said stored elements and indicating an indicated use for said one stored element from a set of uses, said apparatus comprising:

a memory that includes a plurality of regions each of which stores multiple said stored elements,

storage for a plurality of records each of which corresponds to one region of said plurality of regions and includes access information that defines uses in said set of uses for which said processor is permitted to access said one region and use information stored separately from said access information, said use information designating one or more uses for the multiple stored elements stored in said one region from said set of uses, and

a controller for responding to one of said requests by:

examining the access information in a corresponding record for a particular region in which the stored element identified in the request is stored and selectively granting said processor access to said particular region if said access information indicates that said processor is permitted to access said particular region for said indicated use, and

if said access is granted, then examining the use information is said corresponding record and regulating use of said element by said processor based on said use information and said indicated use.

5,317,718

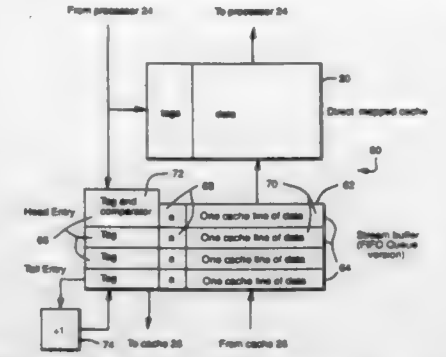
DATA PROCESSING SYSTEM AND METHOD WITH PREFETCH BUFFERS

Norman P. Jouppi, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 500,062, Mar. 27, 1990, abandoned. This application Jan. 25, 1993, Ser. No. 10,446

Int. Cl.⁵ G06F *12/08*

U.S. Cl. 395—425 **20 Claims**



1. A data processing system, comprising:

a first memory for storing information to be supplied to a processor;

a second memory for storing information to be supplied to said processor through said first memory; and

a stream buffer connected between said first memory and said second memory, for supplying information from said second memory to said first memory when a miss occurs in said first memory for addressed information at a processor specified address, said stream buffer including prefetch means for retrieving from said second memory, in addition to said information supplied to said first memory, additional information at at least one address successive with respect to said processor specified address and for storing said additional retrieved information;

said stream buffer having substantially smaller storage than said first memory; and

said stream buffer including means for storing an address tag corresponding to said information stored in said stream buffer, for comparing said address tag with said processor specified address when a miss occurs in said first memory, and when said address tag matches said processor specified address supplying the corresponding information stored in said stream buffer to said first memory.

5,317,719

SYSTEM FOR FORMING SERIAL M-BIT INFORMATION INTO BLOCKS WHOSE LOCATIONS CORRESPOND TO BITMAP LOCATIONS

Bernard A. Rozmovits, Londonderry, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 438,036, Nov. 20, 1989, abandoned. This application Mar. 11, 1993, Ser. No. 29,936

Int. Cl.⁵ G06F *12/06*

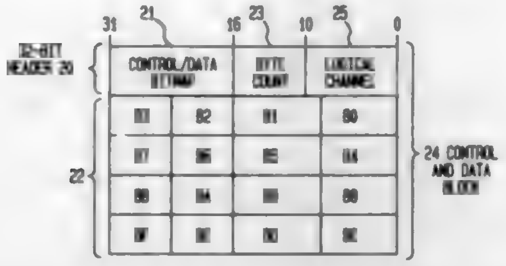
U.S. Cl. 395—425 **11 Claims**

1. A method of formatting m-bit information units sent by an m-bit network into a block, each m-bit information unit including a control/data indicator and actual information corresponding to the respective control/data indicator, each control/data indicator indicating whether the corresponding actual information in the information unit is control information or data information, the method comprising the steps of:

a) providing a control/data bitmap having a number of bitmap storage locations;

b) providing a storage device for storing a block of information, said storage device having a header storage location and a number of information unit storage locations, each information unit storage location corresponding to one of the bitmap storage locations;

- c) receiving m-bit information units;
- d) storing each control/data indicator of the corresponding received m-bit information units in a corresponding one of the bitmap storage locations;
- e) storing the actual information from each of the received m-bit information units in the information unit storage location corresponding to the bitmap storage location in which the control/data indicator was stored for the corresponding received m-bit information unit; and
- f) thereafter transferring the control/data indicators stored in the bitmap storage locations from the bitmap to the storage device and storing the control/data indicators in the header storage location of said storage device to form the block.



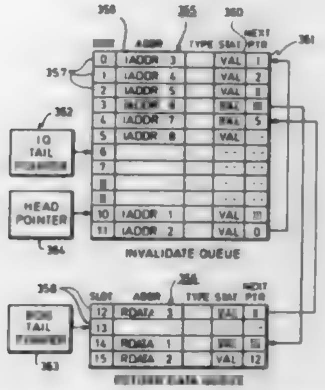
5,317,720
PROCESSOR SYSTEM WITH WRITEBACK CACHE USING WRITEBACK AND NON WRITEBACK TRANSACTIONS STORED IN SEPARATE QUEUES

Rebecca L. Stamm, Boston; John Edmondson, Somerville; David Archer, Marlborough; Samyojita Nadkarni, Shrewsbury, and Raymond Strouble, Southbridge, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 547,699, Jun. 29, 1990, abandoned. This application Mar. 22, 1993, Ser. No. 34,581

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—425 **30 Claims**



8. A method of operating a processor having a cache connected by a bus to a memory, comprising the steps of:

storing outgoing non-writeback read or write transactions information in a first queue;

storing outgoing writeback transactions information from a cache in a second different queue;

issuing non-writeback read or write transactions and writeback transactions by said processor by transmitting onto said bus said non-writeback transaction information from said first queue and said writeback transaction information from said second different queue;

storing incoming cache coherency transactions information in a third queue until the transactions can be implemented in the cache;

when said third queue is full, asserting a suppress signal by said processor to said bus to suppress certain further cache coherency transactions from being sent to said processor until said third queue is no longer full; and

upon receiving a writeback-only signal from said bus, suppressing issuance of said non-writeback read or write transactions from said processor while continuing to issue said writeback transactions.

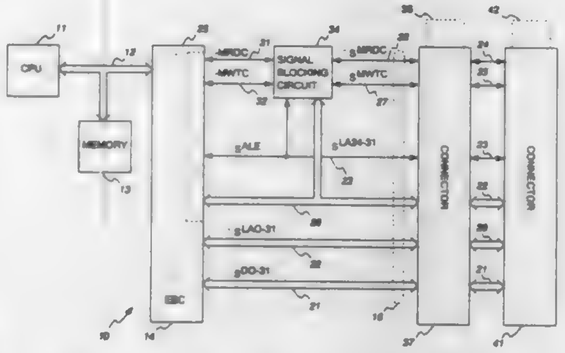
5,317,721
METHOD AND APPARATUS TO DISABLE ISA DEVICES FOR EISA ADDRESSES OUTSIDE THE ISA RANGE

Thomas N. Robinson, Stevensville, Mich., assignor to Zenith Data Systems Corporation, Buffalo Grove, Ill.

Filed Nov. 6, 1989, Ser. No. 432,688

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—500 **3 Claims**



1. An apparatus comprising: a bus which includes a first control line and a plurality of address lines; a second control line; first means for applying an address to said address lines of said bus and for applying a control signal to one of said first and second control lines; second means selectively operable in first and second modes, wherein in said first mode said second means effects application of signals from said second control line to said first control line, and in said second mode said second means effects application of signals from said first control line to said second control line, said second means including means responsive to said address lines and said first and second control lines for causing said second means to operate in said first mode in response to sad control signal being applied to said second control line when the address on said address lines is within a predetermined group of addresses. for causing said second means to operate in a mode other than said first mode in response to said control signal being applied to said second control line when the address on said address lines is outside said predetermined group of addresses, and for causing said second means to operate in said second mode in response to said control signal being applied to said first control line regardless of the address on said address lines; wherein said second means includes first and second buffers which each have a data input, a data output and a control input, said first buffer having its data input connected to said first control line and its data output connected to said second control line, and said second buffer having its data output connected to said second control line and its data output connected to said first control line, said second means applying an actuating signal to said control input of said first buffer to effect said application of said control signal from said first control line to said second control line, and said second means applying an actuating signal to said control input of said second buffer to effect said application of said control signal from said second control line to said first control line; wherein said second means includes first gate means having an input coupled to said first control line and having an output, second gate means having an input coupled to said second control line and having an output, address monitoring means for determining whether an address present on said address lines is within said predetermined group of addresses, first detecting means coupled to said output of said first gate means and responsive to an output signal from said first gate means for disabling said second gate means and for applying said actuating signal to said control input of said first buffer, and second detecting means coupled to said address monitoring means and said output of said second gate means for disabling said first gate means and for applying said actuating signal to said control input of said second buffer in response to an output signal from said second gate means when an address on said address lines id determined by said address monitoring means to be within said predetermined group of addresses; wherein said first gate means includes a first AND gate means a first input which is said data input of said first gate means, having a second input, and having an output which is said output of said first gate means; wherein said first detecting means includes a second AND gate having a first input which is coupled to said first control line, having a second input and having an output, includes a first OR gate having two inputs which are respectively coupled to said output of said first and second AND gates and having an output, and includes a first inverter having an input coupled to said output of said first OR gate and having an output; wherein said second gate means includes a third AND gate having a first input which is said data input of said second gate means, having a second input, and having an output which is said output of said second gate means; wherein said second detecting means includes a fourth AND gate having a first input coupled to said second control line, having a second input and having an output, includes a second OR gate having two inputs respectively coupled to said outputs of said third and fourth AND gates and having an output, and includes a second inverter having an input coupled to said output of said second OR gate and having an output; wherein said output of said second OR gate is coupled to said second input of said second AND gate, said output of said first inverter is coupled to said second input of said third AND gate, said output of said second OR gate is coupled to said second input of said fourth AND gate, and said output of said second inverter is coupled to said second input of said first AND gate; wherein said first detecting means includes further means responsive to a signal at said output of said first OR gate for applying the actuating signal to said control input of said first buffer; wherein said second detecting means includes further means responsive to a signal at said output of said second OR gate when said address monitoring means has determined that an address on said address lines is within said predetermined group for applying the actuating signal to said control input of said second buffer; wherein said bus includes an address valid line; wherein said address monitoring means includes a fifth AND gate having a plurality of inputs coupled to respective most significant bits of said address lines and having an output, includes a sixth AND gate having two inputs which are respectively coupled to said output of said fifth AND gate and to said address valid line and having an output, includes a third OR gate having first, second and third inputs and having an output, said second input of said third OR gate being coupled to said output of said sixth AND gate, includes a seventh AND gate having two inputs respectively coupled to said output of said fifth AND gate and said output of said third OR gate, and having an output coupled to said first input of said third OR gate, includes a fourth OR gate having first and second inputs which are respectively coupled to said first and second control lines and having an output, includes an eighth AND gate having inputs which are respectively coupled to said output of said third OR gate and said output of said fourth OR gate, includes a ninth AND gate having a first input coupled to said output of said fourth OR gate, having a second input, and having an output, includes a fifth OR gate having two inputs respectively coupled to said outputs of said eighth and ninth AND gates and having an output coupled to said second input of said ninth AND gate, includes a third inverter having an input coupled to said output of said fifth OR gate and having an output, and includes a tenth AND gate having two inputs respectively coupled to said output of said third OR gate and said output of said third inverter and having an output coupled to said third input of said third OR gate, said further means of aid second detecting means being responsive to a signal at said output of said second OR gate occurring simultaneously with a signal at an output of said fifth OR gate for applying the actuating signal to said control input of said second buffer; wherein said further means to said first detecting means includes an AND gate having a first input coupled to said output means of said first OR gate, a second input coupled to said first control line, and an output coupled to said control input of said first buffer; and wherein said further means of said second detecting means includes an eleventh AND gate having three inputs respectively coupled to said output of said second OR gate, said second control line and said output of said fifth OR gate and having an output coupled to said control input of said second buffer.

5,317,722
DYNAMICALLY ADAPTING MULTIPLE VERSIONS ON SYSTEM COMMANDS TO A SINGLE OPERATING SYSTEM

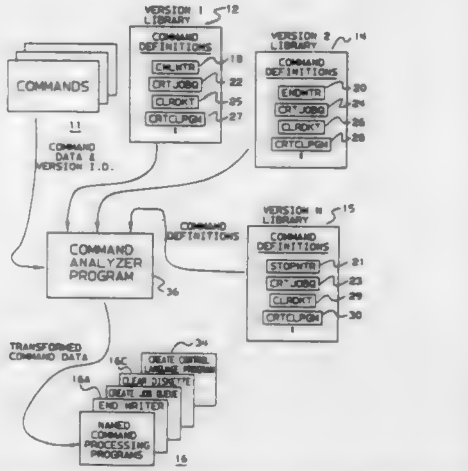
Wayne O. Evans, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 515,772, Apr. 23, 1990, Pat. No. 5,179,703, which is a continuation of Ser. No. 121,965, Nov. 17, 1987, abandoned. This application Sep. 8, 1992, Ser. No. 941,999

The portion of the term of this patent subsequent to Jan. 12, 2010, has been disclaimed.

Int. Cl.^{5} G06F *15/38*

U.S. Cl. 395—500 **13 Claims**



1. A computer system for executing user programs having different versions of system commands, the computer system comprising:

a command execution means for executing system commands having a format common to all versions;

a library for storing a first version of system commands in the common format;

a library for storing a second version of system commands in the common format;

means for searching said libraries while executing said user programs for system commands invoked by the user programs;

means responsive to the user program for determining the sequence in which said libraries are searched while executing the user program;

said command execution means coupled to receive commands from said libraries for executing common format system commands invoked by said user programs, wherein both version of system commands are executed by the same command execution program executing the respective common format of each system command without regard to the version of the system command invoked by the user program.

5,317,723

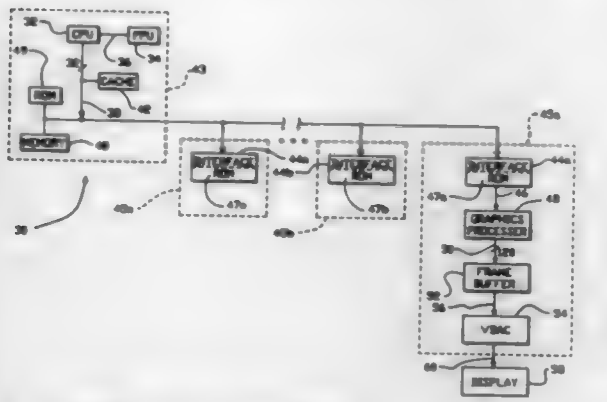
SYSTEM AND METHOD FOR AUTOMATICALLY RELOCATING AND CONFIGURING FIRMWARE STORED IN SUBSYSTEM MODULES

A. Randall Heap, Fremont, and Eduardo A. Santiago, Woodside, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 438,717, Nov. 17, 1989, abandoned. This application Mar. 29, 1993, Ser. No. 39,503

Int. Cl.^{5} G06F *9/00, 9/445*

U.S. Cl. 395—500 **10 Claims**



1. A computer system, comprising:

a host data processor;

a first memory, comprising a random access memory, coupled to said host data processor by a bus;

a plurality of subsystem modules connected to said bus, wherein said plurality of subsystem modules are connectable to said bus in multiple different configurations;

each of said plurality of subsystem modules including a respective read only memory (ROM) storing firmware specific to that one of said plurality of subsystem modules, said stored firmware in each subsystem module ROM including relocatable object code programs, and relocation data identifying memory cells in said relocatable object code programs whose value requires adjustment upon relocation of said relocatable object code programs, said relocation data including relocation type data specifying at least first, second and third types of value adjustments for respective ones of said identified memory cells in said relocatable object code programs; and

a second memory coupled to said host data processor, said second memory storing an automatic reconfiguration program that is automatically executed by said host data processor whenever said computer is powered on; wherein said automatic reconfiguration program, when executed by said host data processor, allocates a region of said first memory to said relocatable object code programs in each said ROM, copies said relocatable object code programs from each said ROM into said allocated region of said first memory, retrieves said relocation data from said ROM in each of said subsystem modules, and adjusts the value of each memory cell in said copied object code programs identified by said relocation data in accordance with the predefined type of adjustment specified by said retrieved relocation data;

said automatic reconfiguration program including means, when executed by said host data processor, for adjusting the value of each said identified memory cell in said copied object code programs by performing one of at least first, second and third distinct, predefined mathematical operations that combines each said identified memory cell with a relocation displacement value, wherein which one of said at least first, second and third distinct, predefined mathematical operations is performed on each said identified memory cell is specified by said relocation type data.

5,317,724

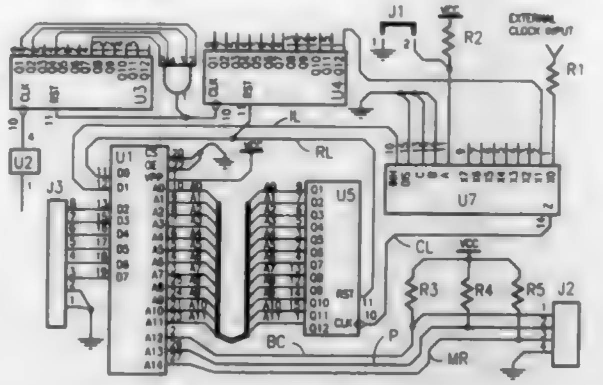
SIMPLEX SEQUENCE CONTROLLER

Stephen R. Clippard, Tampa, Fla., assignor to Helix Research & Development, Inc., Tampa, Fla.

Filed Apr. 1, 1992, Ser. No. 861,449

Int. Cl.^{5} G06F *13/00, 15/46*

U.S. Cl. 395—550 **15 Claims**



1. A simplex sequence controller for transmittal of output data of user specified duration and content, comprising

a time base generator for generating a timing signal and including means for determining the pulse duration of said output data;

memory means having a plurality of addressable sequential storage locations for storing a sequence of data patterns within each said storage location for random access thereof, said memory means including

a plurality of output lines connected to said storage locations, and

a plurality of input address lines connected to said storage locations;

addressing means connected to said memory means input address lines for directing access to predetermined memory means storage locations at predetermined points in said data sequence; and

address reset means providing feedback from a first predetermined one of said output lines of said memory means to said addressing means to direct access to a predetermined initial data sequence for output from said memory means.

5,317,725

LANDMARK DATA ABSTRACTION PARADIGM TO DIAGNOSE DATA COMMUNICATION NETWORKS

Mark S. Smith, and Scott A. Godlew, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 12, 1991, Ser. No. 668,282

Int. Cl.^{5} G06F *11/00;* **G01R** *31/28*

U.S. Cl. 395—575 **17 Claims**

1. A computer-based method for diagnosing data communication networks, said method comprising the steps of:

(a) detecting landmarks by interpreting network data collected from a communication network, comprising the steps of:

(1) selecting one of said landmarks;

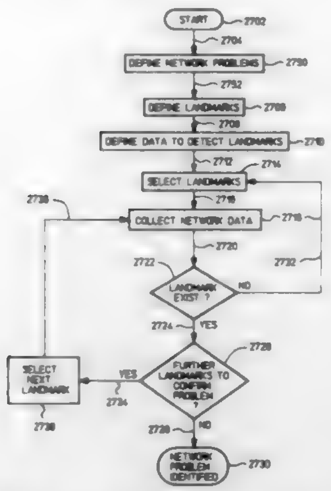
(2) collecting first network data;

(3) interpreting said first network data to determine whether said selected landmark exists;

(4) identifying related landmarks if said selected landmark exists;

(5) collecting second network data; and

(6) interpreting said second network data to determine whether said related landmarks exist; and



(b) interpreting said detected landmarks to determine whether network problems exist.

5,317,726

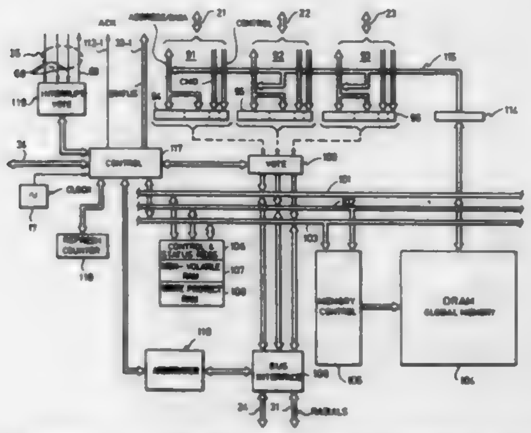
MULTIPLE-PROCESSOR COMPUTER SYSTEM WITH ASYNCHRONOUS EXECUTION OF IDENTICAL CODE STREAMS

Robert W. Horst, Champaign, Ill., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 283,141, Dec. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 118,563, Nov. 9, 1987, abandoned. This application Jun. 26, 1991, Ser. No. 722,609

Int. Cl.^{5} G06F *9/00*

U.S. Cl. 395—575 **17 Claims**



1. A fault-tolerant computer system for executing an instruction stream and for providing data to external devices, comprising:

a) a plurality of processors, each executing the same instruction stream, each processor having an independent clock, and each processor having a memory independent of the other processors, wherein output data from each processor is held in a separate output storage buffer for each processor, said output data being outbound processor data issued from each of said processors;

b) input/output (I/O) means for providing output data from said processors to said external devices; and

c) a plurality of vote circuits, coupled between said processors and said I/O means, each one of the vote circuits separately receiving output data from said output storage buffer of each one of the processors asynchronously to the respective processors, and producing a voter output to said I/O means only when multiple processors have sent the same data output, wherein said produced voter output is an identical copy of said held output data, and a copy of said outbound processor data is passed through from said issuing processors to said I/O means only when at least one of said vote circuits detects identical outbound processor data from a majority of said issuing processors.

5,317,727

METHOD APPARATUS FOR DETERMINING PREFETCH OPERATING FOR A DATA BASE

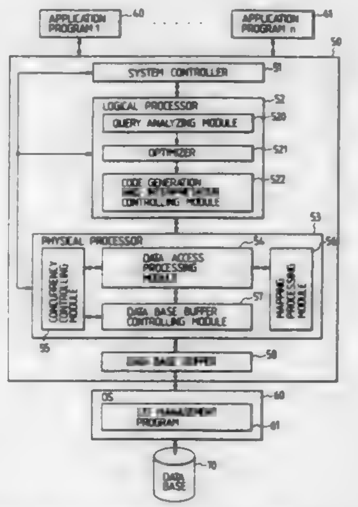
Masashi Tsuchida, Tokyo; Kazuhiko Ohmachi, Kawasaki; Toshio Honma, Yokohama; Yasuhiro Imai, Hadano, and Nobuo Kawamura, Ebina, all of Japan, assignors to Hitachi Software Engineering co., Ltd., Yokohama and Hitachi, Ltd., Tokyo, both of Japan

Filed May 17, 1989, Ser. No. 353,698

Claims priority, application Japan, May 19, 1988, 63-120478

Int. Cl.^{5} G06F *15/403*

U.S. Cl. 395—600 **18 Claims**



1. A data base processing method for use in a multi-user system including a central processing unit for analyzing a plurality of queries from a plurality of users so as to determine an internal processing procedure with respect to a data base, and for executing the internal processing procedure in response to a query; a main storage for said central processing unit; a secondary storage for storing data capable of being shared by each user; and an input/output control unit including at least one cache storage, for controlling a transfer of a plurality of records which are required for input/output processing operations between the central processing unit and the secondary storage; said data base processing method comprising the steps of:

(a) determining whether or not a prefetching operation is to be carried out at a start of an input/output processing operation by judging the internal processing procedure which has been formed by said query;

(b) setting a retrieval range in which records to be fetched are stored when said prefetching operation is carried out; and

(c) determining a unit size to be prefetched including a number of prefetching records for said input/output processing operation based on access characteristics of the internal processing procedure and also system characteristics concerning the size of the cache storage, the performance of said central processing unit, and the traffic of said input/output control unit;

wherein a concurrency control is performed by locking a plurality of prefetched records in the cache storage before said prefetching records are accessed.

5,317,728

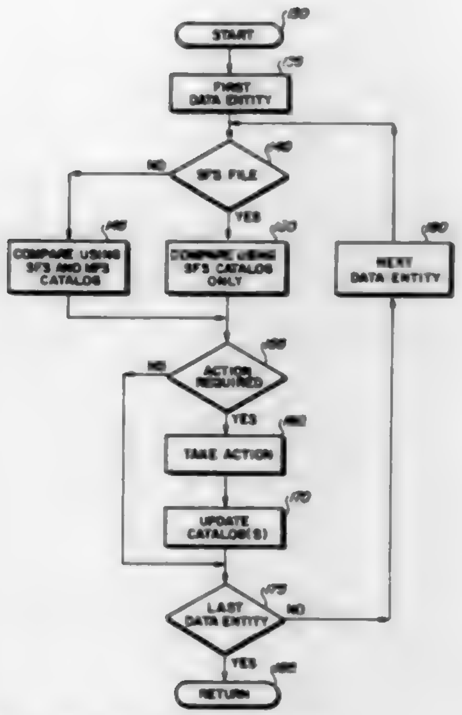
STORAGE MANAGEMENT OF A FIRST FILE SYSTEM USING A SECOND FILE SYSTEM CONTAINING SURROGATE FILES AND CATALOG MANAGEMENT INFORMATION

Gregory J. Tevis, and Ellen J. Waldo, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1990, Ser. No. 578,386

Int. Cl.⁵ G06F *15/40*

U.S. Cl. 395—600 **5 Claims**



1. A data storage hierarchy comprising:

peripheral level 0 storage including a first storage space having a plurality of files thereon organized according to a first file system and a second storage space having a plurality of files thereon organized according to a second file system, the first file system including a first catalog storing information associated with the files therein and the second file system including a second catalog storing information associated with the files therein, the first storage space including a repository file space having an empty file therein for each file organized according to the second file system and on the second storage space, the first catalog storing first management information for storage management of the files organized according to the second file system and on the second storage space by means of the file entries in said repository file space;

peripheral level 1 storage;

a host processor coupled to the peripheral level 0 and peripheral level 1 storage;

management means coupled to the host processor for moving and/or copying the files on the second storage space, between level 0 and level 1 storage to balance performance, storage, and cost, using the first management information; and

a catalog of second management information for storage management of the files on the first storage space and management means coupled to the host processor for instructing the host processor to manage the files on the first storage space using the second management information.

5,317,729

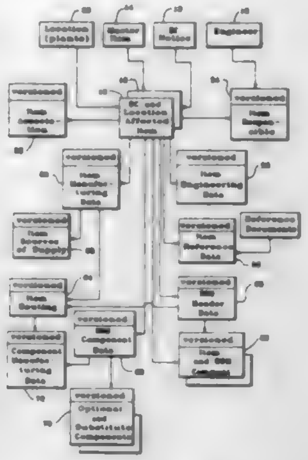
METHOD FOR THE STORAGE OF MULTI-VERSIONED DATA WITH RETRIEVAL BASED ON SEARCHED QUERY

Sujan K. Mukherjee, Roswell; James L. Ryan, Smyrna, both of Ga., and James R. Wason, Tuxedo, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1990, Ser. No. 602,600

Int. Cl.⁵ G06F *7/06*

U.S. Cl. 395—600 **14 Claims**



1. A method for implementing the control of versioned data objects affected by engineering changes to a product design in a computer-based information processing system in which a master item file comprised of items resides on a non-volatile storage device with each of said items representing a part to be used to assemble a product, said method comprising:

creating a first engineering change notice that identifies a first plurality of items in a master item file, said first plurality of items comprised of at least a first item, said first item affected by a first engineering change;

creating a first affected item record for said first item and storing said first affected item record in an affected item file on said non-volatile storage device;

identifying said first affected item record by a first sequence number;

determining a first plurality of versioned data objects that are affected by said first engineering change,

modifying each of said first plurality of versioned data objects, said modification including modifying a plurality of version control attributes, said attributes comprising at least a sequence number field and said modification comprising at least modifying said sequence number field to contain said first sequence number, the result of such modification being a first modified plurality of versioned data objects and

storing said first modified plurality of versioned data objects in a plurality of versioned data object data files on said non-volatile storage device;

creating a second engineering change notice that identifies a second plurality of items in said master item file, said second plurality of items comprised of at least a second item, said second item affected by a second engineering change;

creating a second affected item record for said at least one item and storing said second affected item record in said affected item file;

identifying said second affected item record by a second sequence number;

determining a second plurality of versioned data objects that are affected by said second engineering change,

modifying each of said second plurality of versioned data objects, said modification comprised of modifying said plurality of version control attributes, said attributes

comprising at least said sequence number field and said modification comprising at least modifying said sequence number field to contain said second sequence number, the result of such modification being a second modified plurality of versioned data objects and storing said second modified plurality of versioned data objects in said plurality of versioned data object data files; and

if said first engineering change satisfies a search query, retrieving said first affected item record and said first modified plurality of versioned data objects by means of said first sequence number; and

if said second engineering change satisfies a search query, retrieving said second affected item record and said second modified plurality of versioned data objects by means of said second sequence number.

5,317,730

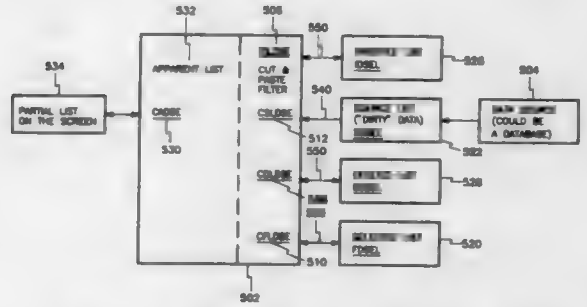
SYSTEM FOR MODIFYING PERSISTENT DATABASE BASED UPON SET OF DATA ELEMENTS FORMED AFTER SELECTIVE INSERTION OR DELETION

Richard E. Moore, Marietta; Mary K. Nix, Alpharetta, and Floyd W. Shackelford, Buford, all of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1991, Ser. No. 641,021

Int. Cl.⁵ G06F *15/403, 15/415*

U.S. Cl. 395—600 **8 Claims**


532
506
550
534
PARTIAL LIST ON THE SCREEN
APPARENT LIST
CUT & PASTE FILTER
530
540
512
510
502
526
504
DATA SOURCE (COULD BE A DATABASE)
SOURCE LIST ("DIRTY" DATA)
522
528
520

1. A system for permitting a user to dynamically process a list of data elements stored in a non-volatile memory having storage portions, for use with any persistent database, comprising:

a source list storage portion for receiving and storing a stream of data elements from the persistent database, said stream of data elements ordered according to a first sequence value, said first sequence value determining the relative position of each data element of said stream of data elements relative to every other data element of said stream of data elements;

an insert list storage portion for storing a first set of data elements corresponding to data elements sought by the user to be added to said stream of data elements, wherein each of said user-added data elements includes a second sequence value, and wherein said first set of data elements is ordered according to said second sequence values in said insert list storage portion, and wherein said second sequence values determine the relative position of each of said user-added data elements relative to every other user-added data element of said first set of data elements in said insert list storage portion;

merging means for merging said stream of data elements and said first set of data elements to generate a second set of data elements and for storing said second set of data elements in an apparent list storage area, said second set of data elements ordered in said apparent list storage area according to said first and second sequence values, wherein said first and second sequence values determine the relative position of each of said second set of data elements with every other data element of said second set of data elements;

first display means, coupled to said apparent list storage portion, for displaying said second set of data elements to the user and for permitting the user to view and update said second set of data elements without committing said updates to the persistent database or modifying said stream of data elements;

a select list storage portion for storing a third set of data elements corresponding to data elements in said second set of data elements which have been selected by the user, said third set of data elements ordered in said select list storage portion according to said first and second sequence values, wherein said first and second sequence values determine the relative position of each of said third set of data elements with respect to every other data element of said third set of data elements in said select list storage portion;

designation means for comparing said second set of data elements to said third set of data elements and for designating those data elements common to said second set of data elements and said third set of data elements;

second display means for indicating to the user said designated data elements of said second set of data elements; and

modification means for modifying the persistent database and said stream of data elements when a commit is initiated by the user, said modification causing the persistent database and said stream of data elements to contain the same data elements as those in said second set of data elements.

5,317,731

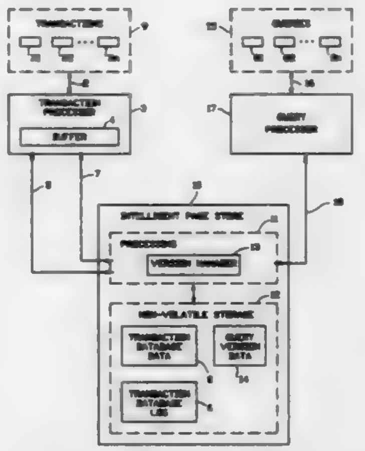
INTELLIGENT PAGE STORE FOR CONCURRENT AND CONSISTENT ACCESS TO A DATABASE BY A TRANSACTION PROCESSOR AND A QUERY PROCESSOR

Daniel M. Dias, Mahopac; Ambuj Goyal, Amawalk, and Francis N. Parr, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1991, Ser. No. 660,769

Int. Cl.⁵ G06F *15/40*

U.S. Cl. 395—600 **8 Claims**



1. A database transaction and query processing system for simultaneously running transactions and queries against the same database without ever having a transaction wait for a query to complete or ever having a query wait for a transaction to complete, comprising:

an intelligent page store for non-volatile storage of a primary version of each page of a database and for creating and maintaining at least one consistent snapshot version of said database for access by queries which do not require access to the most recently updated database pages, said intelligent page store maintaining only one physical copy of any page of said database which is the same in said primary

version and said at least one snapshot version of said database;
a transaction processor having a buffer for receiving needed pages of said primary version of said database from said intelligent page store,
said transaction processor running transactions only against said pages of said data base stored in said buffer of said transaction processor and forming an updated version of at least some of said pages stored in said buffer,
said transaction processor sending back to said intelligent page store any updated pages of said database which are replaced in said buffer of said transaction processor,
a most recently committed version of any particular page of said database possibly being stored in said buffer of said transaction processor instead of in said intelligent page store at any particular arbitrary time; and
a query processor independent of said transaction processor for running queries against said at least one consistent snapshot version of said database, said at least one consistent version of said database being made available by said intelligent page store to said query processor;
wherein said intelligent page store creates a consistent snapshot version of said database by flushing said page buffer into said intelligent page store, said primary version of said database after said flushing being the consistent snapshot version.

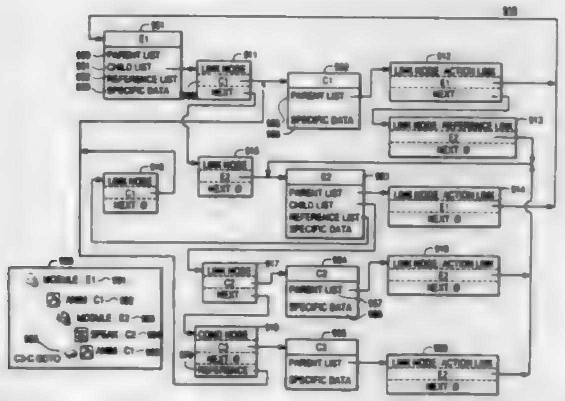
5,317,732
SYSTEM FOR RELOCATING A MULTIMEDIA PRESENTATION ON A DIFFERENT PLATFORM BY EXTRACTING A RESOURCE MAP IN ORDER TO REMAP AND RELOCATE RESOURCES

John D. Gerlach, Jr., Falls Church, Va., and Michael E. Weiblen, College Park, Md., assignors to Commodore Electronics Limited, Nassau, The Bahamas

Filed Apr. 26, 1991, Ser. No. 692,236

Int. Cl.^{5} G06F *13/00, 15/40*

U.S. Cl. 395—600 **8 Claims**



1. In a data processing system having a first memory and a second memory, wherein the first and second memories are adapted for storing a plurality of multimedia presentations and a plurality of resources, wherein each one of the plurality of multimedia presentations includes a plurality of linked data structures, wherein a plurality of the linked data structures identify a plurality of resources each having a name including a location identifier, the method comprising the steps performed in the data processing system of:
receiving an input selecting one of the multimedia presentations to be relocated from the first memory to the second memory;
scanning the linked data structures of the selected multimedia presentation to determine the plurality of resources identified by the selected multimedia presentation;
generating a resource-name list of names including location identifiers corresponding to the plurality of resources identified by the selected multimedia presentation;
changing the location identifiers on the resource-name list;
updating the names of the identified plurality of resources in the selected multimedia presentation to reflect the changed location identifiers on the resource-name list; and
relocating the updated multimedia presentation and the resources listed on the resource-name list to the second memory.

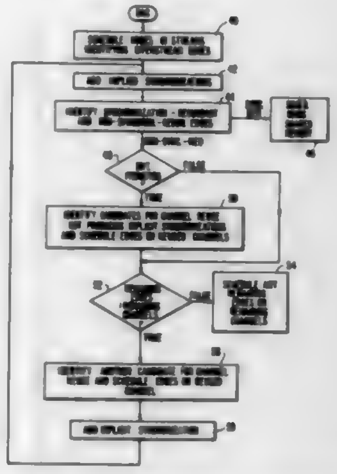
5,317,734
METHOD OF SYNCHRONIZING PARALLEL PROCESSORS EMPLOYING CHANNELS AND COMPILING METHOD MINIMIZING CROSS-PROCESSOR DATA DEPENDENCIES

Rajiv Gupta, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 29, 1989, Ser. No. 400,178

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—650 **15 Claims**



1. A compiling method for scheduling data-dependent operations, describable as a directed acyclic graph of nodes, representing operations, and edges, representing data dependencies, into a plurality of parallel instruction streams for execution by a plurality of respective digital processors and for scheduling synchronizing data transfers on a plurality of inter-processor data transfer means, each being usable for transfer of synchronizing data from one to another of said processors, said method comprising:
scheduling all nodes of said graph into said plurality of streams with each edge of said graph being describable as either an intra-stream edge directed between nodes scheduled in the same stream or an inter-stream edge directed between nodes scheduled in different streams, said nodes being scheduled in a manner that the intra-stream edges are directed in the same direction;
identifying synchronization redundant edges among said inter-stream edges; and
scheduling inter-stream edges which are not synchronization redundant as synchronizing data transfers on said inter-processor data transfer means.

5,317,735
SYSTEM FOR PARALLEL COMPUTATION WITH THREE PHASE PROCESSING IN PROCESSOR TIERS IN WHICH NEW INSTRUCTIONS TRIGGER EXECUTION AND FORWARDING

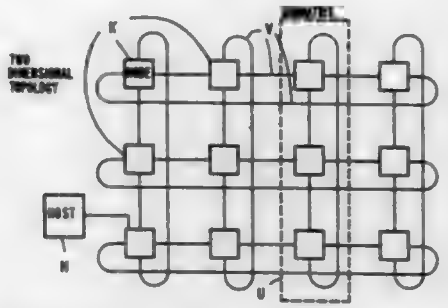
Hermann Schomberg, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1991, Ser. No. 715,193

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1990, 4019040

Int. Cl.^{5} G06F *15/16*

U.S. Cl. 395—650 **11 Claims**



1. In a multicomputer system comprising:
A) a host computer,
B) a parallel computer comprising a network of independent node computers connected to one another via first bidirectional connection lines,
C) said host computer being connected directly to at least a first node computer but being unconnected directly to second node computers whereby communication between the host computer and the second node computers can only take place via other node computers,
D) each said node computer comprising a distributor and a work processor, each said work processor functioning to execute a program or part program in response to an instruction generated by the host computer and only exchanging information with the distributor of its own node computer via second bidirectional connection lines internal to the node computer,
E) each said distributor, except for the distributor in the first node computer, being connected to exchange information only with the work processor of its own node computer and with only those distributors of other node computers to which it is connected via the first bidirectional connection lines,
the improved process comprising the steps of:
(a) in response to each instruction received from the host computer, each node computer executing a repeating cycle comprised of:
(i) a first instruction part wherein, if the received instruction is not the same as a previous instruction, each distributor forwards the instruction from the host computer to distributors directly connected to it and also to the work processor of its own node computer, and if the instruction is the same as a previous instruction, it does not forward the instruction to all distributors directly connected to it,
(ii) a second execution part following the first instruction part during which the work processor of each node computer starts the execution of the program corresponding to the instruction received from its own distributor and at the same time its own distributor independently executes the forwarding of any data packet received from its own work processor or via external connection lines to a destination determined by the data packet,
(iii) a third ready message part following completion of the second execution part during which each distributor outputs a ready message via a predetermined connection line when the work processor in the same node computer and the distributors of neighboring node computers have output a ready message to said each distributor such that the first node computer directly connected to the host computer outputs a ready message to the host computer only after its own work processor and the work processors of all the other node computers have output a ready message.

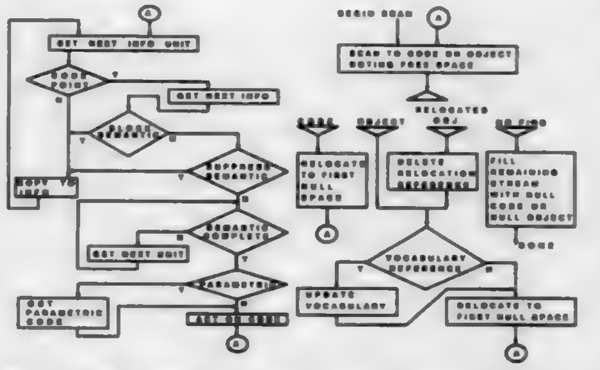
5,317,736
SYSTEM FOR MANAGING INFORMATION USING CODES AND CODED OBJECTS

Frederic W. Bowen, 518 N. Waterman St., Arlington Heights, Ill. 60004

Continuation of Ser. No. 377,239, Jul. 7, 1989, abandoned. This application Mar. 24, 1992, Ser. No. 856,850

Int. Cl.^{5} G06F *7/14*

U.S. Cl. 395—600 **18 Claims**



10. A method within a computer system, processor or microprocessor for uniformly managing, as codes and typed objects within streams, user and system information from other systems of codes and possibly having values including those of the codes specified herein, including system and peripheral unit commands and control and status information, said streams comprising static streams comprised of contiguous memory and contiguous storage and dynamic streams comprised of consecutive information units within communications media, wherein the term static is used to distinguish streams resident in memory and storage from dynamic streams, comprising the steps of:
a) composing encoded information containing said user and system information by scanning said user and system information for each information unit equal to a code point, said code point comprising a uniquely valued information unit denoting the start of a code, and inserting a block semantic code immediately after each said information unit equal to said code point, said block semantic code comprising a uniquely valued information unit denoting said immediately preceding information unit as information,
b) composing a typed object containing said encoded information by determining the type of said encoded information and appending a begin typed object code to the beginning of said encoded information and an end typed object code to the end of said encoded information, said begin typed object code comprised of a code point, a semantic code comprising a uniquely valued information unit denoting the beginning of a typed object of the type of said encoded information, and an optional parametric code, said end typed object code comprised of a code point and a semantic code comprising a uniquely valued information unit denoting the end of a typed object of the type of said encoded information, and said type including the type untyped, said type untyped using including when type cannot be determined and is unknown,
c) embedding said typed object in a second typed object by concatenating together a left part of said second typed object, followed by said typed object and followed by a right part of said second typed object, said left part comprised of at least the begin typed object code of said second typed object and said right part comprised of at least

the end typed object code of said second typed object, wherein if said typed object immediately follows a begin typed object code or immediately precedes an end typed object code, said typed object is said to be added to said second typed object, otherwise side object is said to be inserted into said second typed object,

d) concatenating said second typed object containing said typed object to the end of a third typed object, scanning said concatenated second and third typed objects for each information unit equal to said code point and inserting a suppress semantic code after each said information unit equal to said code point, said suppress semantic code comprising a uniquely valued information unit, and appending a begin typed object code to the beginning of said concatenated second and third typed object and an end typed object code to the end of said concatenated second and third typed objects.

5,317,737

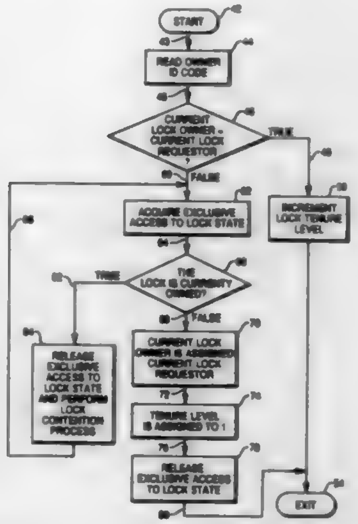
METHOD AND APPARATUS FOR CONTROLLING A RE-ENTRANT SYNCHRONIZATION LOCK TENURE IN A MULTIPROCESSOR SYSTEM

Richard R. Barton, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 29, 1991, Ser. No. 737,115

Int. Cl.⁵ G06F *12/14*

U.S. Cl. 395—650 **8 Claims**


START
READ OWNER ID CODE
CURRENT LOCK OWNER = CURRENT LOCK REQUESTOR ?
TRUE
FALSE
INCREMENT LOCK TENURE LEVEL
ACQUIRE EXCLUSIVE ACCESS TO LOCK STATE
THE LOCK IS CURRENTLY OWNED?
TRUE
FALSE
RELEASE EXCLUSIVE ACCESS TO LOCK STATE AND PERFORM LOCK CONTENTION PROCESS
CURRENT LOCK OWNER IS ASSIGNED CURRENT LOCK REQUESTOR
TENURE LEVEL IS ASSIGNED TO 1
RELEASE EXCLUSIVE ACCESS TO LOCK STATE
EXIT
72
70

1. A method for use in a multiple processor computer system for changing a tenure of a current owner of a re-entrant synchronization lock, comprising the steps of:

a. accessing a first set of data identifying a first process as the current owner of a synchronization lock;

b. determining if a second process that is requesting ownership of the synchronization lock is the first process, and if the first and second processes are the same then increasing a tenure level of the synchronization lock by one and exiting the method;

c. acquiring exclusive access to a second set of data if said second process is not the same as the first process;

d. determining if the synchronization lock is owned and if it is not owned by any process assigning the second process as the current owner, assigning a current tenure level of one, releasing said exclusive access to said second set of data, and exiting the method.

5,317,738

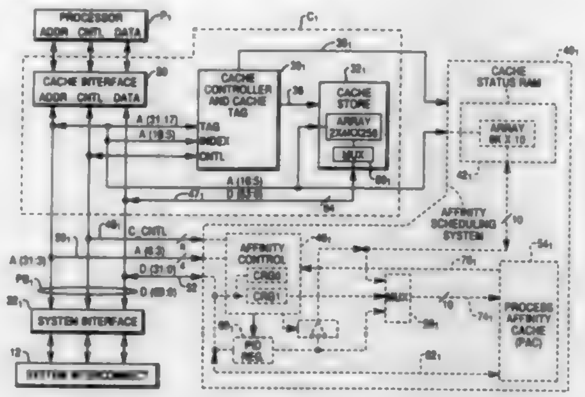
PROCESS AFFINITY SCHEDULING METHOD AND APPARATUS

Arthur F. Cochcroft, Jr., West Columbia, and Jimmy D. Pike, Greenville, both of S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 18, 1992, Ser. No. 836,487

Int. Cl.⁵ G06F *12/08*

U.S. Cl. 395—650 **7 Claims**



1. An apparatus for use with a computer system having a plurality of processors each having a local external cache memory, comprising:

an affinity cache means for storing in a plurality of cache data lines identification codes that identify the most recently executed user processes;

each of said cache data lines containing data which indicates the number of data lines occupied in the local external cache by a respective user process; and

means for comparing an identification code of a ready-to-run process listed in a run queue of the computer system to each of said identification codes in said affinity cache means to determine if a user process has an affinity for an available processor.

5,317,739

METHOD AND APPARATUS FOR COUPLING DATA PROCESSING SYSTEMS

David A. Elko, Poughkeepsie; Jeffrey A. Frey, Fishkill; John F. Isenberg, Jr., Poughkeepsie; Jeffery M. Mick, Fishkill, all of N.Y.; Jimmy P. Strickland, Saratoga, Calif.; Michael D. Swanson, Poughkeepsie, N.Y.; Audrey A. Helffrich, Poughkeepsie, N.Y., and Brian B. Moore, Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 30, 1992, Ser. No. 860,803

Int. Cl.⁵ G06F *15/16, 13/00*

U.S. Cl. 395—650 **24 Claims**

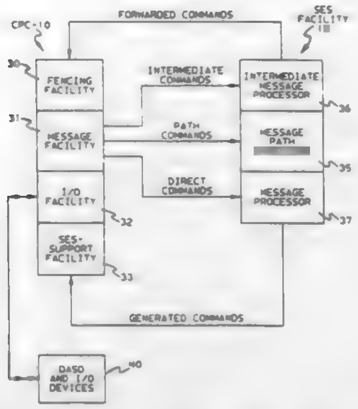
18. A method for updating a data structure within a Structured External Storage (SES) processor by a process executing in a Central Electronic Complex (CEC) attached to said SES, said data structure having data entries each located by a directory entry in a directory, said method comprising the steps of:

a) formulating and initiating the transmission to the SES, by said process, of a command comprising a command object and a data object,

b) selecting a message processor to process said command, by a message processor selector within the SES,

c) allocating a new data area within the SES by said message processor;

d) copying said data object to said new data area by said message processor; and



e) placing an address of said new data area in an associated directory entry in said directory, by said message processor, after said step of copying.

5,317,740

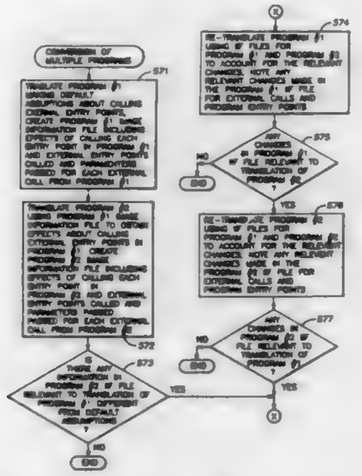
ALTERNATE AND ITERATIVE ANALYSIS OF COMPUTER PROGRAMS FOR LOCATING TRANSLATABLE CODE BY RESOLVING CALLBACKS AND OTHER CONFLICTING MUTUAL DEPENDENCIES

Richard L. Sites, Boylston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 7, 1991, Ser. No. 666,223

Int. Cl.⁵ G06F *9/45, 9/00*

U.S. Cl. 395—700 **20 Claims**



1. A computer-implemented method of operating a digital computer for analyzing a first computer program to determine locations of instructions in said first computer program, and for analyzing a second computer program to determine locations of instructions in said second computer program; said digital computer including a memory; said instructions in said first computer program including call instructions that call external entry points including program entry points in a second computer program; some of said locations of instructions in said first computer program being unknown and undiscoverable without information about callbacks by said second computer program to program entry points in said first computer program; said instructions in said second computer program including call instructions that call external entry points including program entry points in said first computer program; some of said locations of instructions in said second computer program being unknown and undiscoverable without information about callbacks by said first computer program to program entry points in said second computer program; determination of said information about callbacks of said second computer program to said first computer program being dependent upon information about calls by said first computer program to said program entry points in said second computer program; and determination of said information about callbacks by said first computer program to said program entry points in said second computer program being dependent upon information about calls by said second computer program to said program entry points in said first computer program; said method comprising the steps of:

(a) operating said digital computer for a first analysis of said first computer program, and during said first analysis of said first computer program:

(a1) determining locations of some of said instructions in said first computer program;

(a2) determining external entry points called by call instructions having been located in said first computer program in said step (a1), and making a first record in said memory of the determined external entry points called by said call instructions having been located in said first computer program in said step (a1);

(a3) determining for each known program entry point in said first computer program whether callbacks occur, based on an assumption that calls from said first computer program to said second computer program have normal returns without callbacks from said second computer program to said first computer program, and making a second record in said memory of whether callbacks are known to occur from each known program entry point in said first computer program; and then

(b) operating said digital computer for an analysis of said second computer program, and during said analysis of said second computer program:

(b1) reading said first record and said second record in said memory, and finding locations of some of said instructions in said second computer program using information read from said first record and said second record;

(b2) determining external entry points called by call instructions having been located in said second computer program in said step (b1), and making a third record in said memory of the determined external entry points called by said call instructions having been located in said second computer program in said step (b1); and

(b3) determining for each known program entry point in said second computer program whether callbacks occur, and making a fourth record in said memory of whether callbacks occur from each known program entry point in said second computer program; and then

(c) operating said digital computer for a second analysis of said first computer program, and during said second analysis of said first computer program:

(c1) reading said third record and said fourth record in said memory, an analyzing said first computer program to search for locations of additional ones of said instructions in said first computer program using information read from said third record and said fourth record in said memory.

5,317,741

COMPUTER METHOD FOR IDENTIFYING A MISCLASSIFIED SOFTWARE OBJECT IN A CLUSTER OF INTERNALLY SIMILAR SOFTWARE OBJECTS

Robert W. Schwanke, North Brunswick, N.J., assignor to Siemens Corporate Research, Inc., Princeton, N.J.

Filed May 10, 1991, Ser. No. 698,635

Int. Cl.⁵ G06F *9/44, 15/40*

U.S. Cl. 395—700 **5 Claims**

1. A method for use in a programmable computer system for identifying software objects that have been assigned to a wrong group, said group being intended to represent a respec-

tive cluster of internally similar software objects, wherein the similarity between objects is determined, such as by evaluating a similarity function, and wherein the input comprises a set of software objects, assigned to various groups, peer parameter K, and confidence parameter N, said method comprising the computer-implemented steps of:

(a) ascertaining the similarity between each pair of objects, such as by computing a similarity function such as Feature Ratio With Linking;

(b) for each object O,

(b.1) sorting O's neighbors, nearest first,

(b.2) examining O's neighbors in order, counting how many of them are assigned to one or another group, until K are found that are assigned to the same group, recording the group name, say G, and the number of neighbors examined, say E,

(b.3) if G is the group to which O is currently assigned, marking O as being correctly classified with confidence E–K and skipping to step (c), and

(b.4) otherwise, continuing examining the neighbors in order until K have been found that are assigned to the same module as O, or until all neighbors have been examined, recording the number of neighbors examined, say F, marking O as being misclassified, with confidence F–K, and as likely belonging to group G with confidence E–K;

(c) sorting the misclassified objects according to their misclassification confidence, greatest first (here "greater" corresponds to "worse"), and outputing the list, reporting for each object the current group assignment, the mis-classification confidence, the group that the object likely belong to, and the confidence with which it likely belongs; and

(d) sorting the objects that are correctly classified but with confidence greater than N (here "greater" corresponds to "worse"), sorting by confidence, greatest first, and outputing the sorted list, reporting for each object the confidence with which it belongs to the module to which it is currently assigned, whereby the likelihood of misclassification of objects is ascertainable by the respective confidence level.

5,317,742

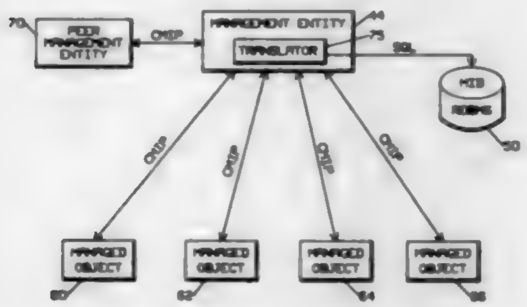
DYNAMIC TRANSLATION OF NETWORK MANAGEMENT PRIMITIVES TO QUERIES TO A DATABASE

Subodh Bapat, Fort Lauderdale, Fla., assignor to Racal-Datacom, Inc., Sunrise, Fla.

Filed Jun. 21, 1991, Ser. No. 719,214

Int. Cl.^{5} G06F *15/38*

U.S. Cl. 395—700 **15 Claims**



1. A method for translating Common Management Information Protocol (CMIP) network management operations using a digital computer, comprising in combination the steps of:

retrieving a network management operation and argument from a network management processing machine;

ascertaining if said network management operation comprises one m-Create, m-Delete, m-Set, m-Get and m-Event Report CMIP operations;

translating said ascertained CMIP operation into a database query, said database query being a Structured Query Language (SQL) query; and

executing said database query with respect to a relational database.

5,317,743

SYSTEM FOR COMPILING ITERATED LOOPS BASED ON THE POSSIBILITY OF PARALLEL EXECUTION

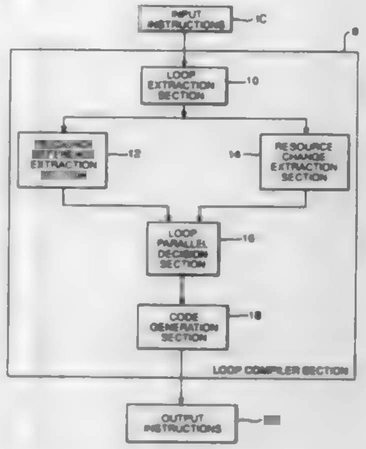
Toru Imai, and Kenji Sirakawa, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,063

Claims priority, application Japan, Jul. 18, 1990, 2-188138

Int. Cl.^{5} G06F *9/30*

U.S. Cl. 395—700 **10 Claims**



1. A loop compiler in a data processing system comprised of a plurality of processors, each capable of executing object programs, wherein the loop compiler compiles an object program consisting of a plurality of instructions to be executed by the data processing system, wherein a loop consists of a plurality of instructions to be executed a plurality of iterations by a one of the plurality of processors, the loop compiler comprising:

loop instructions extraction means for extracting a loop from the plurality of instructions;

resource reference extraction means for extracting resources read by at least one of the instructions in the extracted loop;

resource change extraction means for extracting resources changed by at least one of the instructions in the extracted loop;

loop parallel decision means for determining, in accordance with the extracted resources extracted by the resource reference extraction means and the resource change extraction means, whether it is impossible, possible or unknown if a first iteration and a second iteration of the loop can be parallely executed; and

code generation means for generating, in accordance with the determination of the loop parallel decision means, object instructions, including at least one of a plurality of types of object instructions for the object program wherein the following types correspond, respectively, to the determination of possible, impossible or unknown

a first type wherein the object instructions are parallely executed by the plurality of processors,

a second type wherein the object instructions are executed by a one of the plurality of processors, and

a third type wherein the object instructions include branch parallel execution instructions, non-parallel execution instructions and parallel execution instructions, wherein the branch parallel execution instructions are used, during execution of the object program, to determine whether the non-parallel execution instructions are to be executed by a one of the parallel processors or the parallel execution instructions are to be executed by the plurality of processors.

5,317,744

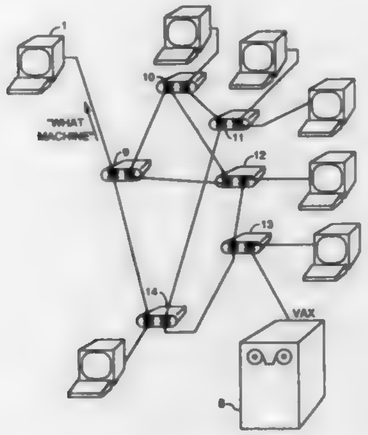
METHOD FOR CONFIGURING A COMPUTER SERVER TO OPERATE WITH NETWORK OPERATING SYSTEM SOFTWARE TO PREVENT MEMORY ADDRESS CONFLICTS BETWEEN WORKSTATIONS

Reginald W. Harwell, Bellevue, Nebr., and Darrold J. Parker, Aurora, Colo., assignors to The United States of America as Represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 15, 1991, Ser. No. 793,068

Int. Cl.^{5} G06F *12/00, 12/02*

U.S. Cl. 395—700 **7 Claims**



1. A process that enables a distributed computer network to operate with a network operating system software program, wherein said distributed computer network includes a computer server unit which has output ports and a central processing unit that controls the distributed computer network, said distributed computer network also including a plurality of computer workstations which are electrically connected to the computer server unit, and wherein said process comprises the steps of:

searching the computer server unit to find an unoccupied area of memory;

loading the network operating system software program into the unoccupied area of memory of the computer server unit; and

reconfiguring the computer server unit output ports to eliminate memory address problems with the plurality of computer workstations, wherein said computer server unit has a configurable system board, and wherein said reconfiguration step comprises moving jumpers on said system board to eliminate said memory address problems, and wherein said computer server unit comprises a "UNISYS" 800/20 server unit and wherein said reconfiguration step comprises moving jumper JP12 from a 1-2 setting to a 2-3 setting, and reconfiguring a switchblock SW2 on said system board.

5,317,745

MINIMAL INTERRUPT LATENCY SCHEME USING MULTIPLE PROGRAM COUNTERS

Stephen H. Chan, Sunnyvale, Calif., assignor to Zilog, Inc., Campbell, Calif.

Filed Jan. 10, 1992, Ser. No. 818,609

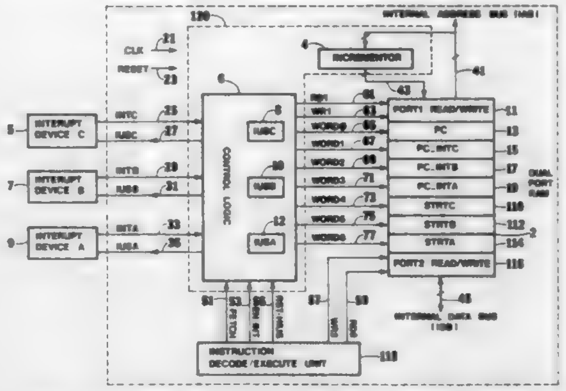
Int. Cl.^{5} G06F *9/00*

U.S. Cl. 395—700 **14 Claims**

1. A program counter apparatus for reducing the latency time of a computer in response to an interrupt, said apparatus comprising:

a memory having memory locations, wherein a general program counter value is located at one of said memory locations and alternate program counter values are located at a number of other of said memory locations; and

control means connected to said memory for controlling which one of said memory locations contains the current program counter value.



5,317,746

MESSAGE-BASED DATA PROCESSING SYSTEM THAT PROVIDES CHECKING FOR ACCESS TO SERVER SPACE

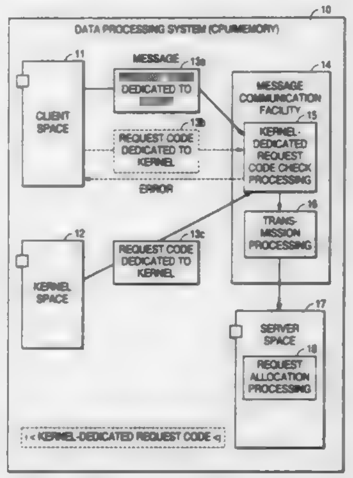
Kazuko Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 2, 1992, Ser. No. 889,925

Claims priority, application Japan, Jun. 12, 1991, 3-139355

Int. Cl.^{5} G06F *12/14*

U.S. Cl. 395—700 **7 Claims**


10
DATA PROCESSING SYSTEM (CPU/MEMORY)
11
CLIENT SPACE
MESSAGE
13a
DEDICATED TO
13b
REQUEST CODE DEDICATED TO KERNEL
ERROR
14
MESSAGE COMMUNICATION FACILITY
15
KERNEL-DEDICATED REQUEST CODE CHECK PROCESSING
16
TRANSMISSION PROCESSING
12
KERNEL SPACE
13c
REQUEST CODE DEDICATED TO KERNEL
17
SERVER SPACE
18
REQUEST ALLOCATION PROCESSING
< KERNEL-DEDICATED REQUEST CODE <

1. A data processing system including a central processing unit and a memory and operating on a message basis, said data processing system comprising:

at least one kernel space, each kernel space issuing a processing request message with a request code classified by the data processing system as a kernel-space dedicated request code, and with sender information indicating issuance of the processing request message by the kernel space;

at least one client space, each client space issuing a processing request message with a request code classified by the data processing system as a client-space dedicated request code and with sender information indicating issuance of the processing request message by the client space, the client-space dedicated request code being subject to alteration within the data processing system;

at least one server space, each server space receiving said processing request message and allowing processing designated by the processing request message to be executed in accordance with the request code of the received processing request message; and

message communication means for transferring the processing request message from one of the kernel space and the client space to the server space and further comprising check means for checking whether the sender information of the processing request message indicates a kernel space as the sender when the request code contained in the processing request message is a kernel-space dedicated request code, wherein the processing request message is rejected when the request code is one of the kernel-space dedicated request codes and the sender is a space other than the kernel space.

5,317,747

MULTIPROCESSOR SYSTEM AND INTERRUPTION CONTROL DEVICE FOR CONTROLLING INTERRUPTION REQUESTS BETWEEN PROCESSORS AND PERIPHERAL DEVICES IN THE MULTIPROCESSOR SYSTEM

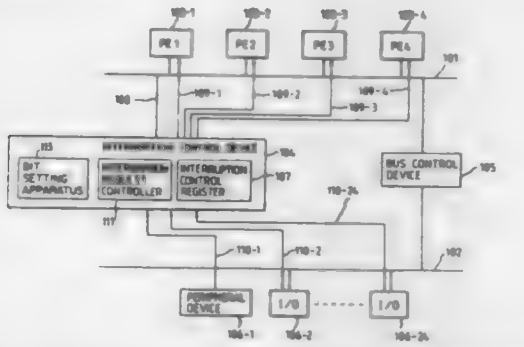
Tetsuya Mochida, Yokohama; Kouichi Okazawa, Tokyo; Kouichi Kimura; Hitoshi Kawaguchi, both of Yokohama, and Kazushi Kobayashi, Ebina, all of Japan, assignors to Hitachi, Ltd, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,066

Claims priority, application Japan, Mar. 8, 1990, 2-57424; Mar. 20, 1990, 2-70866

Int. Cl.^{5} **G06F** *9/46, 13/24, 15/16*

U.S. Cl. 395—725 **17 Claims**



1. An interruption control device for controlling interruption requests between processor elements in a multiprocessor system including a plurality of interconnected processor elements, said interruption control device comprising:

a plurality of interruption request lines respectively connected to said processor elements, said interruption request lines being lines other than address lines;

an interruption control register having a plurality of interruption request registers corresponding to said processor elements, each interruption request register permits a respective processor element to read information stored therein and at least processor elements other than the receptive processor element to write information therein, each interruption request register includes a plurality of interruption request bits corresponding to said processor elements, wherein each interruption request bit can be set by a corresponding processor element to indicate an occurrence of an interruption request from said corresponding processor element to a processor element corresponding to said interruption request register; and

an interruption request controller, connected to said interruption control register and said processor elements and responsive to the setting of an interruption request bit, for directly outputting an interruption request through the interruption request line to a processor element corresponding to an interruption request register when an interruption request bit in said interruption request register is set.

5,317,748

INFORMATION PROCESSING APPARATUS FOR PERFORMING TWO-WAY INTERRUPTION PROCESSING

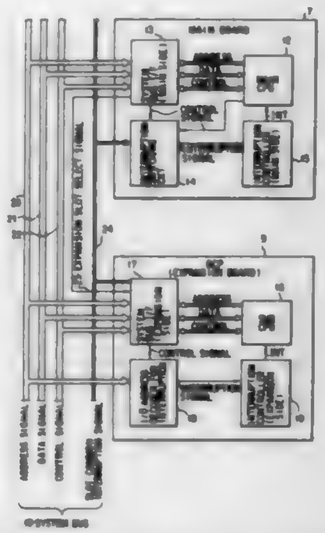
Noriaki Shimuzu, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 16, 1992, Ser. No. 913,714

Claims priority, application Japan, Jul. 17, 1991, 3-176831

Int. Cl.^{5} **G06F** *9/46, 13/14*

U.S. Cl. 395—725 **5 Claims**



1. An information processing apparatus comprising:

means for storing information;

input/output means for inputting the information to the storing means and for outputting the information from the storing means; and

control means, disposed between the storing means and the input/output means, for performing information processing control, wherein the control means comprises:

- a main board,
- at least one expansion slot,
- an expansion board disposed in the at least one expansion slot, and
- a system bus connecting the main board to the expansion board;

wherein the main board comprises:

- an input/output port,
- a main central processing unit for controlling the information, managing the presence and absence of the expansion board and accessing the input/output port by an interruption that corresponds to the expansion board, and
- an expansion board select means, connected to the main central processing unit, for selecting the expansion board by producing an expansion slot select signal and thereby causing the expansion board to be interrupted; and

wherein the expansion board comprises:

- a system bus interface means for receiving the expansion slot select signal and for generating a control signal,
- an interruption detection means for decoding an input-/output address entered from the system bus, for receiving the control signal and for generating an interruption signal,
- an interruption control means, connected to the interruption detection means, for receiving the interruption signal and for generating an interruption request signal, and
- a sub central processing unit, connected to the interruption control means and the system bus interface means, for receiving the interruption request signal and for performing interruption processing.

5,317,749

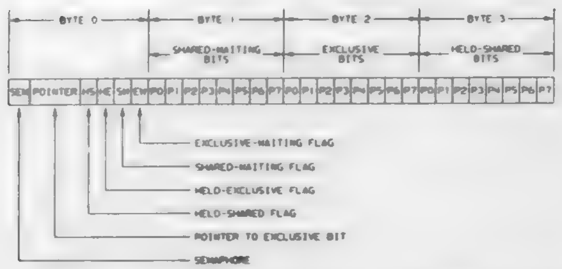
METHOD AND APPARATUS FOR CONTROLLING ACCESS BY A PLURALITY OF PROCESSORS TO A SHARED RESOURCE

Dennis J. Dahlen, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 25, 1992, Ser. No. 951,486

Int. Cl.^{5} **G06F** *13/364*

U.S. Cl. 395—725 **15 Claims**



1. A method of controlling access by a plurality of processors to a shared resource, said method comprising the steps of:

reading a latch-control word from a memory location in response to an access request by a first processor, said access request reflecting said first processor's desire for access to said shared resource, said latch-control word indicating an access status of said shared resource;

reading a held-exclusive flag and a held-shared flag from said latch-control word;

granting said first processor access to said shared resource and setting one of said held flags if said held flags indicate said shared resource is not held;

setting one of two waiting flags in said latch-control word if said held flags indicate said shared resource is already held and said one of two waiting flags is not already set, said waiting flags denoting that at least one of said plurality of processors is waiting for access to said resource; and

writing said latch-control word back to said memory location.

5,317,750

MICROCONTROLLER PERIPHERAL EXPANSION BUS FOR ACCESS TO INTERNAL SPECIAL FUNCTION REGISTERS

Robert Wickersheim, Mesa, and Hamed H. Amini, Queen Creek, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

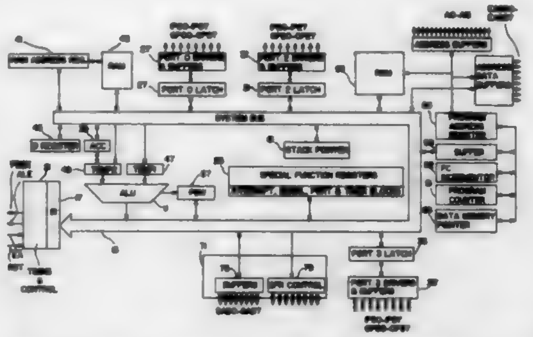
Continuation of Ser. No. 541,477, Jun. 22, 1990, abandoned, which is a continuation of Ser. No. 289,198, Dec. 23, 1988, abandoned. This application Dec. 1, 1992, Ser. No. 984,280

Int. Cl.^{5} **G06F** *13/00*

U.S. Cl. 395—725 **4 Claims**

1. An integrated circuit microcontroller having an internal bus, an arithmetic logical unit for manipulating data on said internal bus, a special function register area which includes an addressing space for accessing certain registers on board the microcontroller used by the arithmetic logical unit, and timing and control logic for generating timing and control signals necessary for the operation of the microcontroller based upon a microcontroller instruction to be executed by said microcontroller, said microcontroller adapted to provide access to said special function register area and certain of said timing and control signals by a peripheral cell external to the microcontroller wherein at least one register in said special function register area is assigned to said peripheral cell such that each of said at least one registers has a unique address, said microcontroller comprising:

a) a plurality of buffer means, each coupled to a corresponding set of input/output pins and to said internal bus, each of said sets of input/output pins for coupling to said peripheral cell, each of said buffer means for transferring address information and data information from said at least one assigned register in said special function register area using said unique address to its said corresponding set of input/output pins, and for transferring address information and data information to said at least one assigned register in said special function register area using said unique address from said corresponding set of input/output pins; and



b) control logic means coupled to said internal bus and to a set of control pins for coupling to said peripheral cell for receiving a first set of control and timing signals generated by said timing and control logic, generating a second set of control and timing signals corresponding to said first set of control and timing signals, and transferring said second set of control and timing signals to said control pins;

c) wherein said set of control pins and said set of input/output pins are in parallel with each other.

5,317,751

METHOD AND APPARATUS FOR PLACING A TRAINLINE MONITOR SYSTEM IN A LAYUP MODE

Michael R. Novakovich, Pittsburgh, and Richard D. Roberts, Elizabeth, both of Pa., assignors to AEG Westinghouse Transportation Systems, Inc., Pittsburgh, Pa.

Filed Mar. 18, 1992, Ser. No. 853,251

Int. Cl.^{5} **G06F** *1/26*

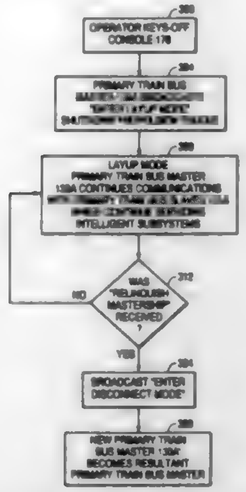
U.S. Cl. 395—750 **7 Claims**

1. A method for placing a multi-car train with a communication network in an energy saving layup mode, the communication network having a master node interconnected to at least one node via a train bus, the train having a head car for carrying the master node and at least one other car for carrying the at least one other node with an intelligent subsystem unit coupled to the train bus by the other node, the intelligent subsystem unit controlling auxiliary systems of the at least one other car, the head car including an operator console for controlling the train through the master node, the method comprising the steps of:

transmitting a shutdown signal from the operator console to the master node to disable operation of the train;

sending in response to the shutdown signal an shutdown message from the master node to the at least one other node after a delay of a predetermined amount of time, the train being in a layup mode during the predetermined amount of time wherein the train is not operational but auxiliary systems controlled by the intelligent subsystem unit of the train are kept running; and

subsequently shutting down power to the intelligent subsystem unit with the at least one other node in response to receiving the shutdown message at the at least one other



OPERATOR KEYS-OFF CONSOLE 178
380
384
PRIMARY TRAIN BUS
386
LAYUP MODE
PRIMARY TRAIN BUS MASTER
INTELLIGENT SUBSYSTEMS
312
WAS "RELINQUISH MASTERSHIP" RECEIVED
NO
YES
394
BROADCAST "ENTER DISCONNECT MODE"
396
NEW PRIMARY TRAIN BUS MASTER
BECOMES RESULTANT PRIMARY TRAIN BUS MASTER

node after the expiration of the predetermined amount of time.

5,317,752

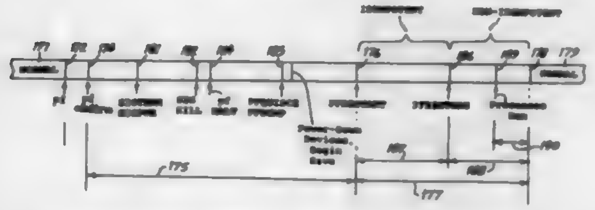
FAULT-TOLERANT COMPUTER SYSTEM WITH AUTO-RESTART AFTER POWER-FALL

Douglas E. Jewett; Phil Webster, both of Austin; Dave Aldridge, Lago Vista; Peter C. Norwood, and Nikhil A. Mehta, both of Austin, all of Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 461,402, Jan. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 455,127, Dec. 22, 1989, abandoned. This application Nov. 16, 1992, Ser. No. 977,734

Int. Cl.⁵ G06F *11/00*

U.S. Cl. 395—750 **16 Claims**



1. A method of operating a computer system having a central unit (CPU), memory including volatile memory and non-volatile memory, a main power supply, a backup power supply, and a plurality of devices peripheral to said CPU said method comprising the steps of:

(a) executing processes in the central processing unit (CPU) from memory, while the main power supply provides power to said computer system;

(b) detecting a failure of said main power supply and, in response thereto, providing power to said computer system from the backup power supply and executing a shutdown procedure in said CPU, said shutdown procedure including first warning said processes of an impending shutdown of the computer system, said processes responding to said warning in a manner varying from process to process, and then copying state information of said computer system from said memory to said non-volatile storage, wherein said state information includes state information of the processes and state information of the devices;

(c) after completing said shutdown procedure, if said power supply has been restored, automatically initiating a restart procedure;

(d) said restart procedure including reading said stored state from said non-volatile storage and restarting said processes and continuing executing without rebooting;

(e) or, if said power supply has not been restored within a predetermined period of time after completion of said shutdown procedure, automatically shutting down said backup power and ceasing execution by said CPU.

5,317,753

COORDINATE ROTATION DIGITAL COMPUTER PROCESSOR (CORDIC PROCESSOR) FOR VECTOR ROTATIONS IN CARRY-SAVE ARCHITECTURE

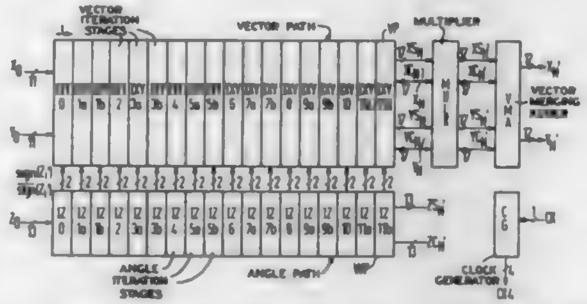
Ronald Kuenemund, Dietramszell, and Tobias Noll, Neufahrn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,289

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1990, 4012709

Int. Cl.⁵ G06F *7/544*

U.S. Cl. 395—800 **8 Claims**



1. A coordinate rotation digital computer processor for vector rotations, particularly for solving real-time processing of a vector of the vector components X_0, Y_0, by an angle Z_0, where X_0, Y_0 and Z_0 are each digital words having a plurality of data bits, said data bits having particular significances relative to one another, said processor comprising:

a vector path comprising a plurality of series-connected clocked vector iteration stages, a first of said vector iteration stages including vector inputs for exclusively receiving the vector components X_0, Y_0;

an angle path including a plurality of series-connected clocked angle iteration stages, a first of said angle iteration stages including angle inputs for exclusively receiving the data bits describing the angle Z_0;

a plurality of transmission gates between said vector iteration stages;

a plurality of registers between said angle iteration stages;

each of said vector iteration stages and said angle iteration stages comprising addition/subtraction circuits for providing, during a clock interval, only incomplete addition/-subtraction operations with only intermediate results at the end of a clock interval in the form of a carry word of carry bits and a separate sum word of sum bits for further processing;

said plurality of vector iteration stages and said plurality of angle iteration stages each further comprising shift means for shifting the carry and sum bits;

said plurality of angle iteration stages further comprising sign detectors using the carry and sum bits to detect the sign of the respective intermediate results;

said plurality of series-connected vector iteration stages comprising a last stage of the series including inputs for the respective carry and sum words XC_n, YC_n, XS_n, YS_n;

a multiplier including respective inputs and outputs, said inputs connected to said outputs of said last stage of said plurality of series-connected vector iteration stages for multiplying the output carry and sum words of the respective vector components XC_n, XS_n, YC_n, YS_n by a predetermined correction factor K; and

added means connected to said outputs of said multiplier for adding the carry and sum words output therefrom to form components of a result vector X_N, Y_N.

5,317,754

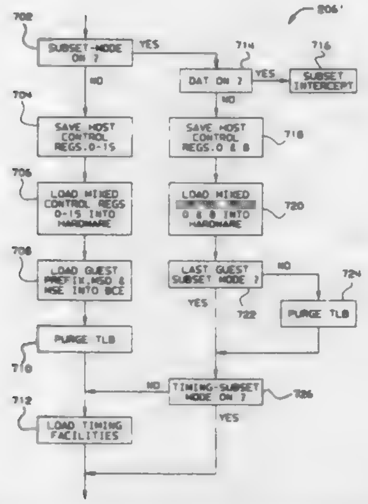
METHOD AND APPARATUS FOR ENABLING AN INTERPRETIVE EXECUTION SUBSET

Geoffrey O. Blandy, Vestal; Lisa C. Heller, Saugerties, and Robert E. Murray, Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1990, Ser. No. 602,029

Int. Cl.⁵ G06F *9/46*

U.S. Cl. 395—800 **5 Claims**



1. A method of operating virtual machines (VMs) in a data processing system having one or more processors and an electronic storage, a host control program (host) overseeing the system and all VMs in the system, each VM having an associated quest control program (quest) using interpretive execution means on a processor in the system, the method comprising the steps of:

requesting the host to initiate a process for establishing interpretive execution by a VM on a processor,

testing by the process for an indication associated with the VM for indicating whether the VM has a subset state,

bypassing specified steps in the process if the testing step detects the subset state, but executing the specified steps if the testing step does not detect the subset state,

structuring the content of the state description to include a subset indication of whether the process can bypass code for controlling a VM associated with the state description, and the state description further including one or more of bypass-defining indicators including a first indicator to control bypassing a first set of specified steps in the process for providing one function for the VM, and a second indicator to control bypassing a second set of specified steps in the process for controlling another function for the VM, and

structuring the first indicator to control bypassing a set of specified steps in the process that provide dynamic address translation for the VM, and structuring the second indicator to control bypassing another set of specified steps in the process that control a timing facility in the system.

5,317,755

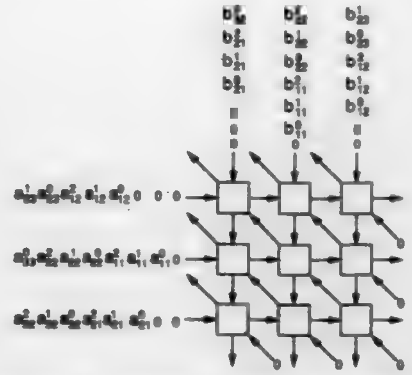
SYSTOLIC ARRAY PROCESSORS FOR REDUCING UNDER-UTILIZATION OF ORIGINAL DESIGN PARALLEL-BIT PROCESSORS WITH DIGIT-SERIAL PROCESSORS BY USING MAXIMUM COMMON DIVISOR OF LATENCY AROUND THE LOOP CONNECTION

Richard I. Hartley, Schenectady, and Peter F. Corbett, White Plains, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 10, 1991, Ser. No. 683,002

Int. Cl.⁵ G06F *3/00, 7/00*

U.S. Cl. 395—800 **17 Claims**



1. A method for designing a systolic array of processors including therewithin loop connections of processors as well as internal pipeline connections of processors, which method reduces any under-utilization of the processors, each of said loop connections being adapted to introduce a latency in its respective loop, said method comprising the steps of:

initially developing an original design for said systolic array, said original design using parallel-bit processors;

determining the latency around each loop connection of parallel-bit processors in said original design for said systolic array;

determining a maximum common divisor P of the latencies around the loop connections of parallel-bit processors in said original design for said systolic array;

if said maximum common divisor P is one, indicating that there are no under-utilized processors in said original design for said systolic array using parallel-bit processors, using said original design for said systolic array using parallel-bit processors as a final design for said systolic array; and

if said maximum common divisor P is larger than one, indicating that there are under-utilized processors in said original design for said systolic array using parallel-bit processors, modifying said original design for said systolic array by replacing each parallel-bit processor in said original systolic array with a corresponding digit-serial processor adapted to input and output one digit containing a predetermined number of bits per clock cycle, thereby to achieve a final design for said systolic array, said step of modifying comprising the substeps of:

for each digital word comprising a number of digits, selecting the number of digits per digital word and inserting delay elements, where necessary, to assure that the respective latencies of said loop connections in a modified design for said systolic array are similar multiples of the latencies of the corresponding loop connections in said systolic array of parallel-bit processors, that the number of digits per word equals the maximum common divisor of the respective latencies of said loop connections in said modified design for said systolic array, and the number of bits per digit is equal to the number of bits per word divided by the number of digits per word.

5,317,756

DATA PROCESSOR FOR DETECTING IDENTICAL DATA COEXISTING IN A PLURALITY OF DATA SECTION OF DATA TRANSMISSION PATHS

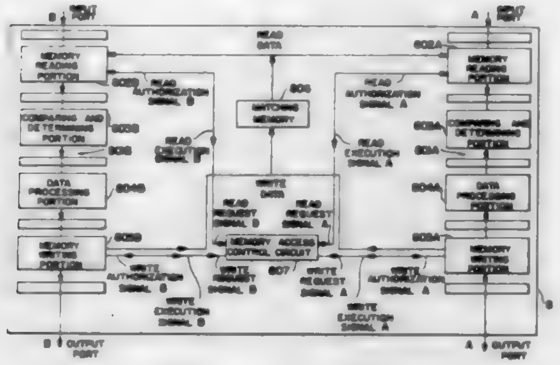
Koji Komatsu, Tenri; Shinichi Yoshida, Kashihara; Souichi Miyata, Nara, and Daisuke Azuma, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 260,061, Oct. 20, 1988, Pat. No. 5,113,339. This application Oct. 21, 1991, Ser. No. 779,805

Claims priority, application Japan, Oct. 20, 1987, 62-265734; Oct. 20, 1987, 62-265735; Oct. 20, 1987, 62-265736; Oct. 20, 1987, 62-265737; Oct. 20, 1987, 62-265741

Int. Cl.^{5} G06F *13/00*

U.S. Cl. 395—800 **12 Claims**



1. A data processor comprising:

a pre-detecting portion;

said pre-detecting portion including,

- a data detecting means, having a plurality of parallel input ports and a plurality of data transmission paths, each of a plurality of stages, subsequent to the input ports, for detecting a time period in which data exist for each of the data transmission paths,
- comparing and determining means for comparing identifiers, each identifier being at least a part of the data, during a time period in which data are detected by said data detecting means in each of the data transmission paths, and
- flag generating means for generating a flag indicating a match of identifiers for the data on each of the data transmission paths and access contention in a matching memory based on a result of the comparison obtained by said comparing and determining means, for detecting in advance said access contention, for maintaining the data on each of the data transmission paths, and for adding said flag to the maintained data; and
- a template matching portion, wherein said template matching portion includes data transmission paths, each having one or more input ports corresponding to outputs of said pre-detecting portion and capable performing in a pipeline processing mode,
- a matching memory having addresses corresponding to the identifiers of the data in which one or more identifiers are allocated to one address when a number of identifiers is larger than a number of the addresses,
- memory access control means for arbitrating data transmission such that accesses to said matching memory are not simultaneously made with respect to at least one data transmission path, access being made in the order from reading and writing data not being read out until writing of previous data is terminated,
- coincidence determining means for determining data queuing in said matching memory according to a priority added in advance to an identifier of the data when access contention occurs in said matching memory, and
- data processing means for replacing data in said matching memory, combining data or erasing data in said matching memory based on a result of the determination by said coincidence determining means such that pipeline processing of respective data is performed in parallel with respect to an input of data on at least one parallel data transmission paths and template matching is performed at high speed.

5,317,757

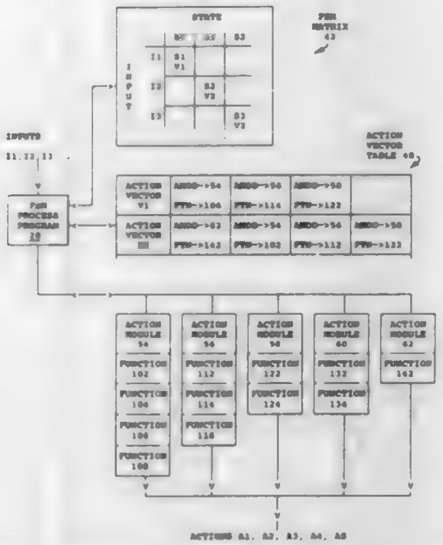
SYSTEM AND METHOD FOR FINITE STATE MACHINE PROCESSING USING ACTION VECTORS

John A. Medicke, Gaithersburg, and Paul Posharow, Frederick, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 6, 1992, Ser. No. 834,188

Int. Cl.^{5} G06F *9/30, 15/16*

U.S. Cl. 395—800 **7 Claims**



1. A data processing method for managing a finite state machine, in a data processing system having a memory for storing program instructions, an input means for receiving inputs, a processing unit for executing program instructions in response to said inputs, and an output means for producing an output in response to said processing unit executing said program instructions, comprising the steps of:

- storing a first finite state machine transition matrix in said memory, having a plurality of next state indicators and vector pointers that can be accessed by a current state value in said memory and an input value;
- storing a vector table of action vectors in said memory, said vector pointers identifying action vectors in said vector table, each of said action vectors including a sequence of vector elements having module pointers and function pointers;
- storing a plurality of action modules in said memory, each action module including program instructions organized into a plurality of function segments, each of said module pointers identifying one of said plurality of action modules and said function pointers identifying one of said plurality of function segments;
- receiving an input value from said input means and accessing said first finite state machine transition matrix with said input value and said current state value, for obtaining a first next state indicator and a first vector pointer;
- accessing a first action vector from said vector table using said first vector pointer, for obtaining a first module pointer and a first function pointer from a first vector element in a first sequence; and
- executing program instructions in a first function segment pointed to by said first function pointer, in a first action module pointed to by said first module pointer, for producing a first output action by said output means.

5,317,758

METHOD PREVENTING OVERHEATING OF A THERMAL LINE PRINT HEAD BY VARYING THE NUMBER OF PRINT DATA BEING SIMULTANEOUSLY PRINTED

Hajime Tatsuzawa, Tokyo, Japan, assignor to Mutoh Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 446,287, Dec. 5, 1989, Pat. No. 5,159,693. This application Mar. 31, 1992, Ser. No. 861,282

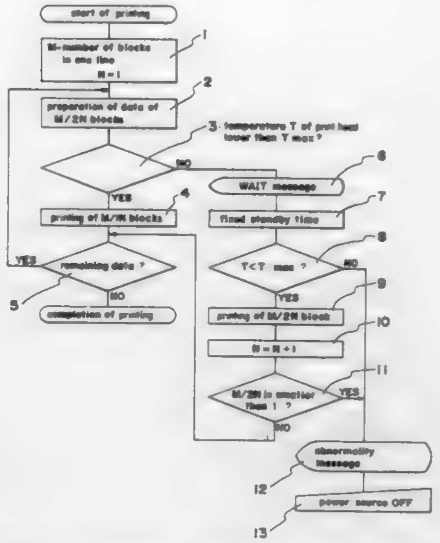
Claims priority, application Japan, Mar. 31, 1989, 1-80867

Int. Cl.^{5} G06F *15/46;* **G01D** *15/10*

U.S. Cl. 395—800 **1 Claim**

1. A computer implemented method of preventing overheating of a line print head having a plurality of line print elements, said method comprising:

- a first step of printing a print line using the line print head according to an N-strobe line print head driving operation in which said line print elements are divided into N groups and said N groups of line print elements are successively driven, N being a positive integer,
- a second step of detecting a temperature of the line print head and comparing the temperature of the line print head with a threshold temperature, and
- a third step of increasing a value of N to obtain a new value of N and returning to said first step using the new value of N to print a next print line when the temperature of the print head exceeds the threshold temperature in said second step, wherein a number of print data simultaneously printed of the next print line is reduced due to the increased value of N to lower the temperature of the line print head.



DESIGN PATENTS

GRANTED MAY 31, 1994

ERRATA

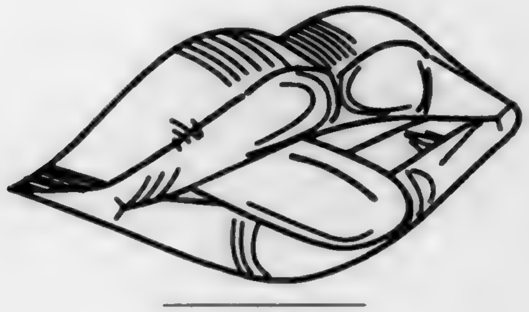
For CLASS	See PATENT NO.
006-634	D 347,320
006-630	D 347,321
003-202	D 347,365
021-087	D 347,461
023-301	D 347,496
016-242	D 347,501
032-033	D 347,504
003-304	D 347,512
003-304	D 347,513
003-308	D 375,514

DESIGNS

MAY 31, 1994

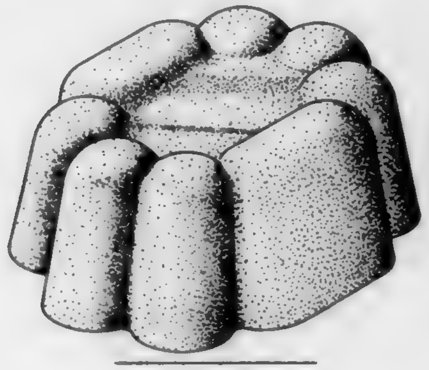
347,307
LIP CONFECTION

Ping Yang, 13879 Silverwood Ln., Chino Hills, Calif. 91709
Filed Sep. 14, 1992, Ser. No. 948,770
Term of patent 14 years
U.S. Cl. D1—106



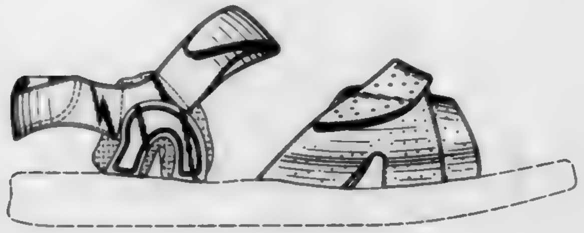
347,308
CAKE

Daniel C. Lundberg, Coon Rapids, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.
Filed Dec. 9, 1991, Ser. No. 805,781
Term of patent 14 years
U.S. Cl. D1—129



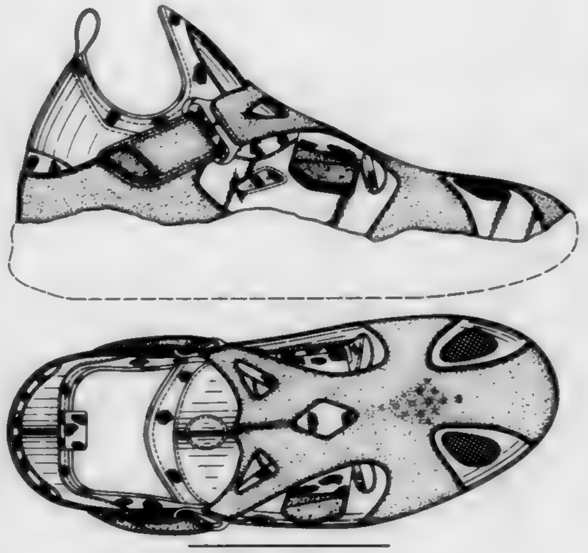
347,309
SHOE UPPER

Steven C. McDonald, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 4, 1993, Ser. No. 9,042
Term of patent 14 years
U.S. Cl. D2—969



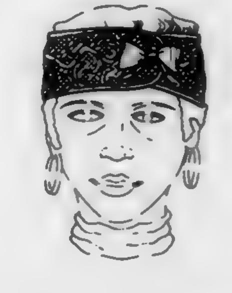
347,310
SHOE UPPER

Bradford A. Johnson, and William J. Worthington, both of Portland, Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 4, 1993, Ser. No. 9,049
Term of patent 14 years
U.S. Cl. D2—969



347,311
HAIR WRAP

Cecelia L. Butler, 255 W. Foothill Blvd., Rialto, Calif. 92376
Filed May 26, 1992, Ser. No. 888,128
Term of patent 14 years
U.S. Cl. D2—871



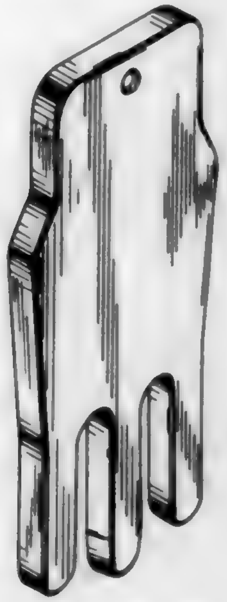
347,312
GLOVE FORM

Walter L. Spiece, New Berlin, Wis., assignor to Allen-Edmonds Shoe Corporation, Fort Washington, Wis.

Filed Sep. 30, 1992, Ser. No. 954,486

Term of patent 14 years

U.S. Cl. D2—623



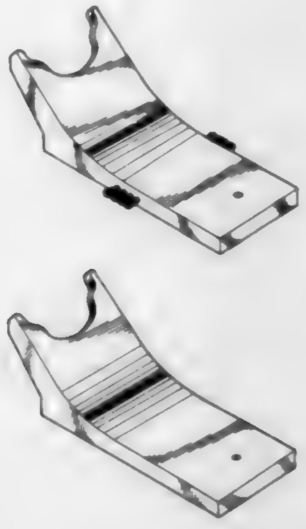
347,313
BOOT REMOVER

W. Michael Whitaker, Asheboro, N.C., assignor to Whit Corporation, Ramseur, N.C.

Filed Nov. 4, 1992, Ser. No. 1,119

Term of patent 14 years

U.S. Cl. D2—642



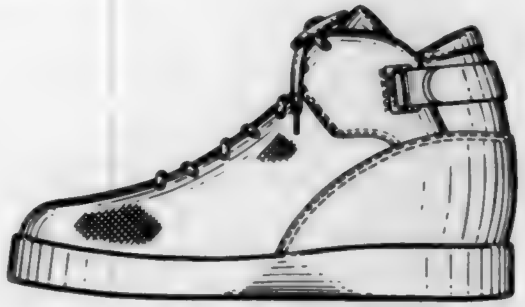
347,314
REAR ENTRY SHOE

Robert Uda, Lido Beach, N.Y., assignor to E. S. Originals, Inc., New York, N.Y.

Filed Aug. 20, 1992, Ser. No. 931,545

Term of patent 14 years

U.S. Cl. D2—902



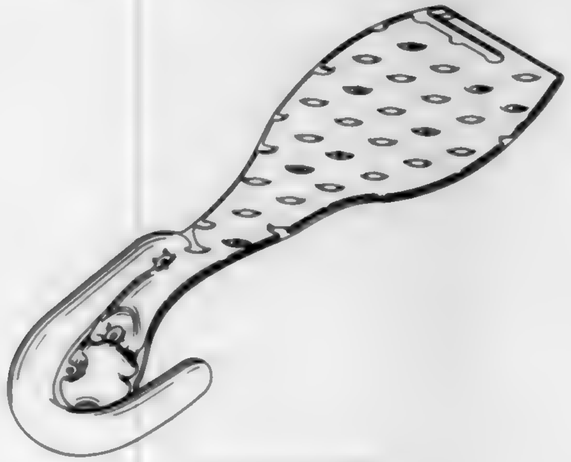
347,315
BLADDER FOR A SHOE SOLE

James C. Sell, Jr., Beaverton; Robert J. Lucas; Michael T. Donaghu, both of Portland, and Robert M. Lyden, Beaverton, all of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Sep. 1, 1993, Ser. No. 12,415

Term of patent 14 years

U.S. Cl. D2—961



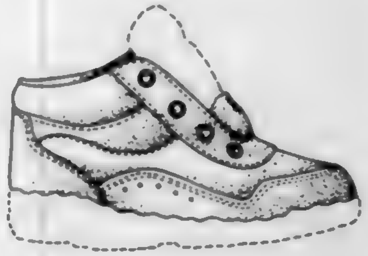
347,316
SHOE UPPER

Amy S. Minkin, Walpole, Mass., assignor to Reebok International Ltd., Stoughton, Mass.

Division of Ser. No. 923,350. Jul. 31, 1992, Pat. No. D. 336,151. This application Apr. 5, 1993, Ser. No. 6,720

Term of patent 14 years

U.S. Cl. D2—969



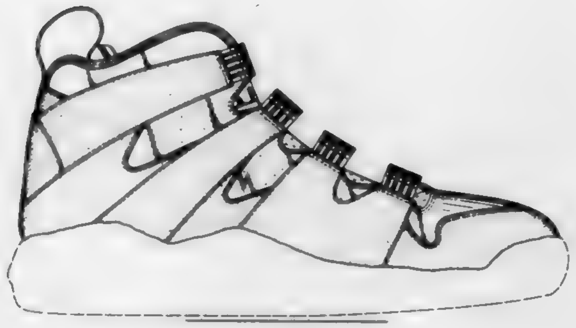
347,317
SHOE UPPER

Eric P. Avar, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Sep. 1, 1993, Ser. No. 12,416

Term of patent 14 years

U.S. Cl. D2—970



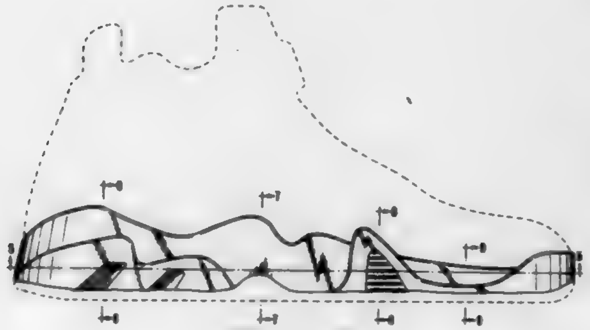
347,318
MIDSOLE OF A SHOE

Eric P. Avar, Beaverton, Oreg., assignor to Nike Inc., Beaverton, Oreg.

Filed Dec. 11, 1992, Ser. No. 2,408

Term of patent 14 years

U.S. Cl. D2—977



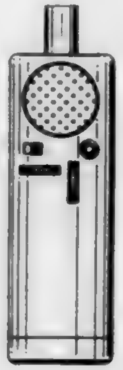
347,319
UMBRELLA HANDLE WITH RADIO

Larry D. Friedman, 2545 Cavell Ave. North, Golden Valley, Minn. 55427

Filed Sep. 14, 1992, Ser. No. 945,354

Term of patent 14 years

U.S. Cl. D3—13



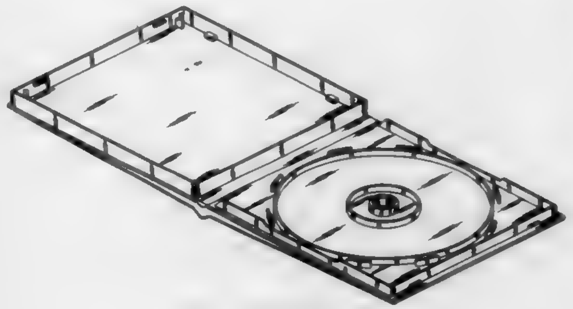
347,320
PLASTIC SINGLE COMPACT DISC CASE

Gerard M. Du Corday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Jul. 11, 1991, Ser. No. 728,946

Term of patent 14 years

U.S. Cl. D6—634



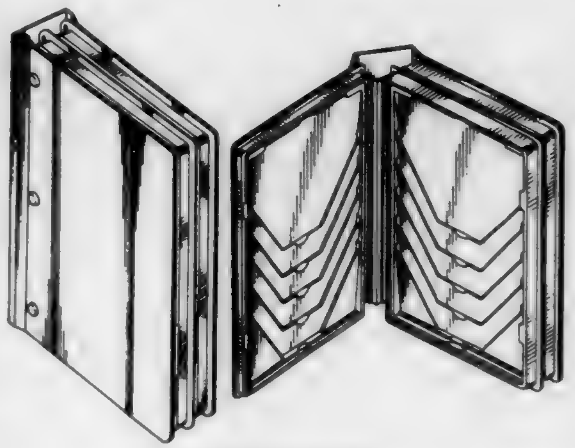
347,321
RECORDING MEDIUM STORING CASE

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 896,561

Term of patent 14 years

U.S. Cl. D6—630



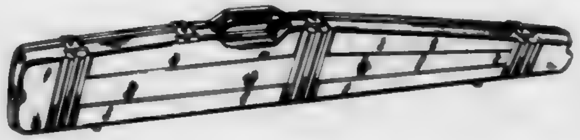
347,322
GUN CASE

Joseph F. Fiore, Lebanon, Pa., assignor to Doskocil Manufacturing Company, Inc., Arlington, Tex.

Filed Oct. 14, 1992, Ser. No. 423

Term of patent 14 years

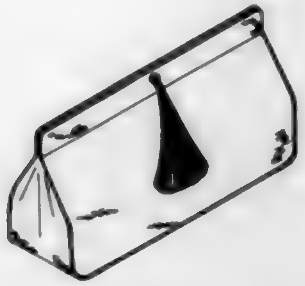
U.S. Cl. D3—262



347,323

PURSE

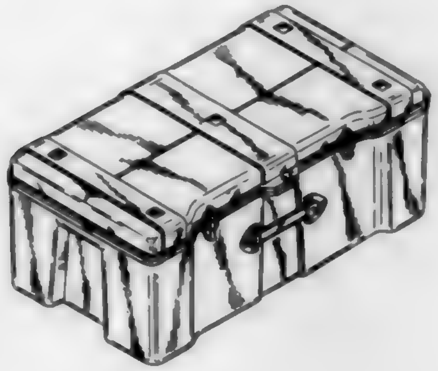
Ronald D. Ringblum, 18788 Marsh La., Dallas, Tex. 75287
Filed Nov. 25, 1992, Ser. No. 1,929
Term of patent 14 years
U.S. Cl. D3—239



347,324

FOOT LOCKER

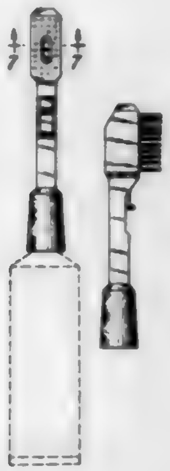
Thomas Dickinson, St. Louis, Mo., assignor to Contico International, Inc., St. Louis, Mo.
Filed Oct. 19, 1992, Ser. No. 635
Term of patent 14 years
U.S. Cl. D3—272



347,325

COMBINED TOOTHBRUSH AND TOOTHPASTE CAP

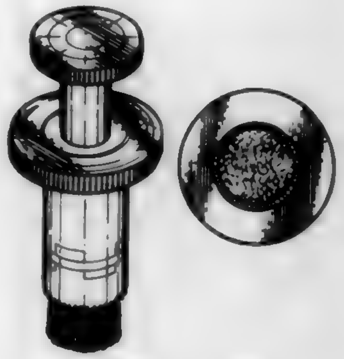
Bob L. Davis, 1501 S. King St., Denver, Colo. 80219
Filed Jul. 26, 1991, Ser. No. 736,137
Term of patent 14 years
U.S. Cl. D4—108



347,326

LIGHT SOCKET CLEANER

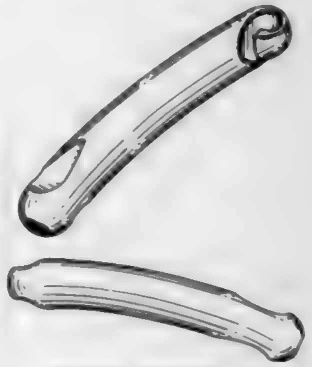
Edgar Coleman, Rte. 1, Box 84C, Bogue Chitto, Miss. 39629
Filed May 14, 1992, Ser. No. 881,553
Term of patent 14 years
U.S. Cl. D4—135



347,327

BRUSH HANDLE

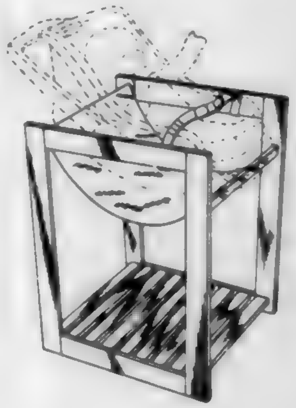
Paul A. Ricciarelli, Ayden, N.C., and Sean Simmons, Seacliff, N.Y., assignors to Empire Brushes, Inc., Greenville, N.C.
Filed May 18, 1992, Ser. No. 884,986
Term of patent 14 years
U.S. Cl. D4—138



347,328

CRADLE FOR INFANT CARRIER

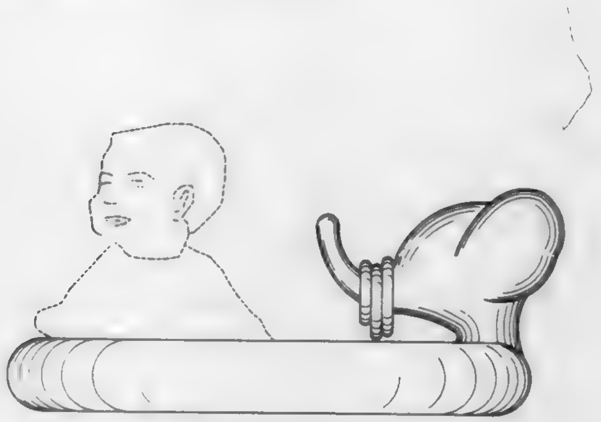
Peter S. Efthimion, 1912 White Rose Ave., Carrollton, Tex. 78007
Filed Jun. 23, 1992, Ser. No. 903,821
Term of patent 14 years
U.S. Cl. D6—333



347,329

PLAYPEN

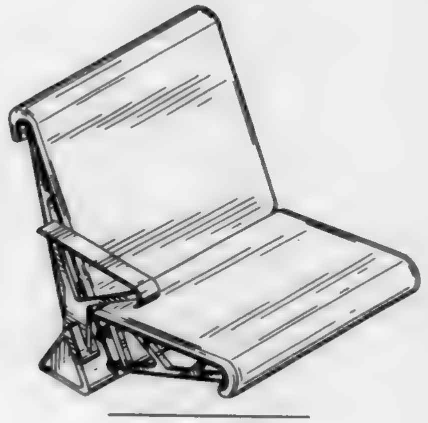
Yvonne L. Wilkins, and Timothy H. Wilkins, both of 275 Richland Ave., Merritt Island, Fla. 32953
Filed Sep. 8, 1992, Ser. No. 939,870
Term of patent 14 years
U.S. Cl. D6—333



347,330

SEAT

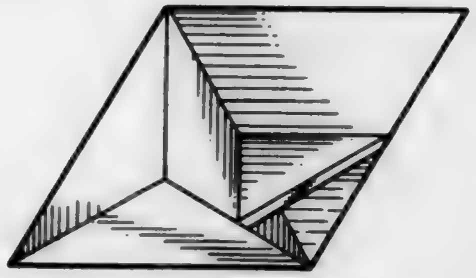
Rodney W. Kinsman, London, United Kingdom, assignor to Kinsman Associates Limited, London, United Kingdom
Filed Jan. 23, 1990, Ser. No. 468,830
Term of patent 14 years
U.S. Cl. D6—334



347,331

MODULAR CHAIR

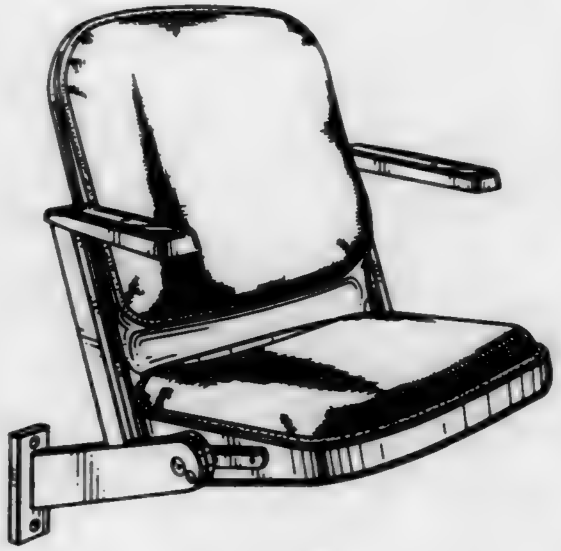
Howard A. Fromson, 49 Main St., Stonington, Conn. 06378
Filed Mar. 9, 1992, Ser. No. 847,818
Term of patent 14 years
U.S. Cl. D6—334



347,332

PUBLIC SEATING CHAIR

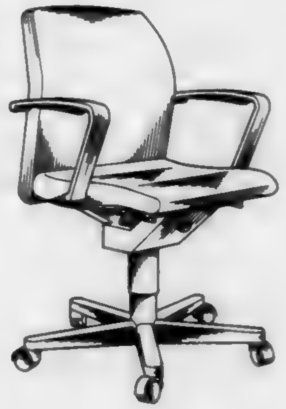
Philip K. Donnelly, Barto, Pa., assignor to J.G. Furniture Systems, Inc., Quakertown, Pa.
Filed May 12, 1992, Ser. No. 882,160
Term of patent 14 years
U.S. Cl. D6—362



347,333

CHAIR

Hans Von Klier, Milan, Italy, assignor to Olivetti Synthesis S.p.A., Ivrea, Italy
Filed Feb. 28, 1992, Ser. No. 841,751
Claims priority, application Italy, Aug. 29, 1991, TO910000185
Term of patent 14 years
U.S. Cl. D6—366



347,334

SIDE CHAIR

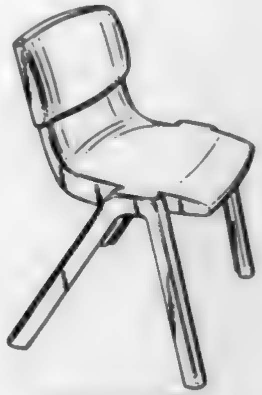
Michael A. Fewchuk, Eastwood, Australia, assignor to Sebel Furniture Limited, Bankstown, Australia

Filed Sep. 11, 1992, Ser. No. 948,696

Claims priority, application Australia, Mar. 12, 1992, 617/92

Term of patent 14 years

U.S. Cl. D6—375



347,335

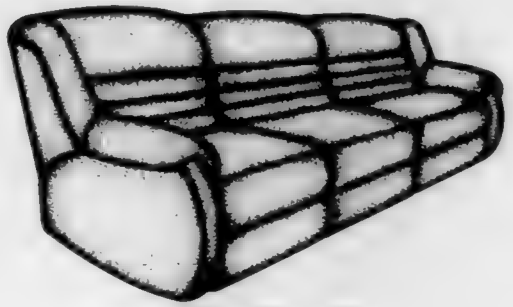
SEAT

Herbert B. Goldberg, Northbrook, Ill., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Jul. 21, 1992, Ser. No. 918,384

Term of patent 14 years

U.S. Cl. D6—381



347,336

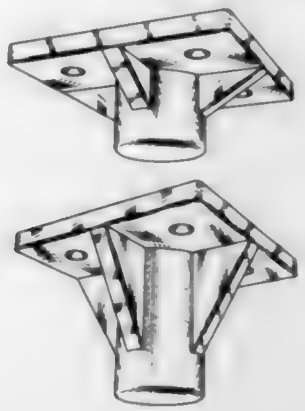
PLANTER SUPPORT

Basil S. Gemette, 944 Summerfield Rd., Santa Rosa, Calif. 95405

Filed Jun. 18, 1993, Ser. No. 9,555

Term of patent 14 years

U.S. Cl. D6—403



347,337

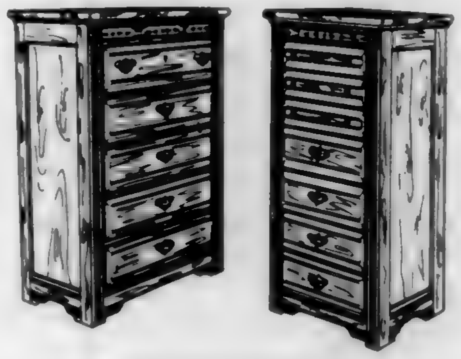
CHEST

H. Thomas Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Apr. 10, 1992, Ser. No. 867,810

Term of patent 14 years

U.S. Cl. D6—434



347,338

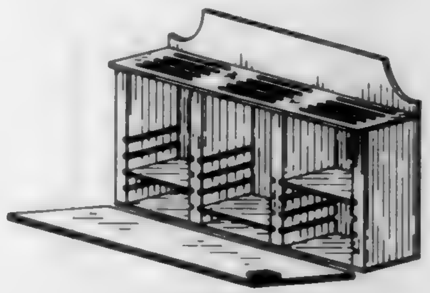
COMBINED ORGANIZER AND STORAGE BOX FOR CORRESPONDENCE

Bernard Randle, 16 Fox Run Dr., Little Rock, Ark. 72209

Filed Jun. 3, 1992, Ser. No. 892,957

Term of patent 14 years

U.S. Cl. D6—470



347,339

OFFICE TABLE

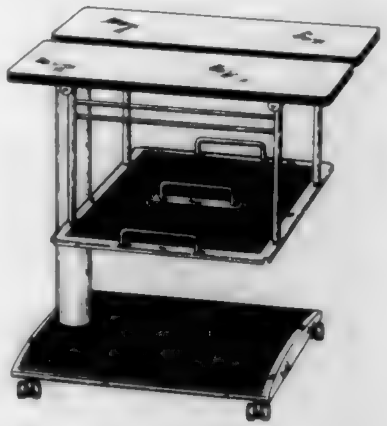
Mario Bellini, 11 Corso Venezia, Milano, Italy I-20121 , and Dieter Thiel, Maiengasse 1, Basel, Switzerland CH-4056

Filed Apr. 24, 1991, Ser. No. 690,799

Claims priority, application Int'l Pat. Institute, Oct. 24, 1990, DM/017 923

Term of patent 14 years

U.S. Cl. D6—477



347,340

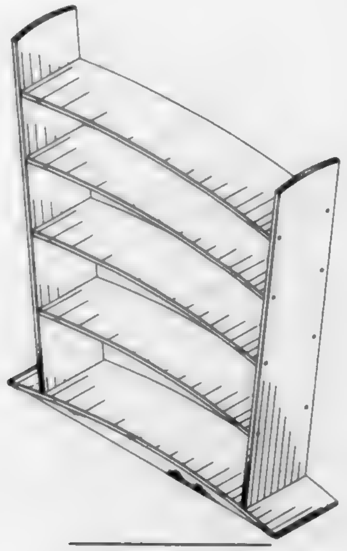
BOOKCASE

Scott S. Willens, San Francisco, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1993, Ser. No. 5,776

Term of patent 14 years

U.S. Cl. D6—479



347,341

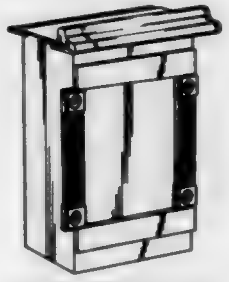
MODULAR BAR CABINET

David J. Handley, 3285 Landview Dr., Rochester, Mich. 48306, and Patrick G. Costigan, 3019 W. 13 Mile Rd., Apt. N., Royal Oak, Mich. 48073

Filed Mar. 22, 1991, Ser. No. 674,718

Term of patent 14 years

U.S. Cl. D6—481



347,342

TABLE

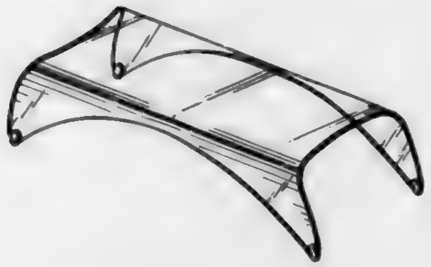
Massimo I. Ghini, Bologna, Italy, assignor to Fiam Italia, S.p.A., Tavullia (PS), Italy

Filed Sep. 15, 1992, Ser. No. 945,331

Claims priority, application Italy, Apr. 6, 1992, MI 920000204

Term of patent 14 years

U.S. Cl. D6—485



347,343

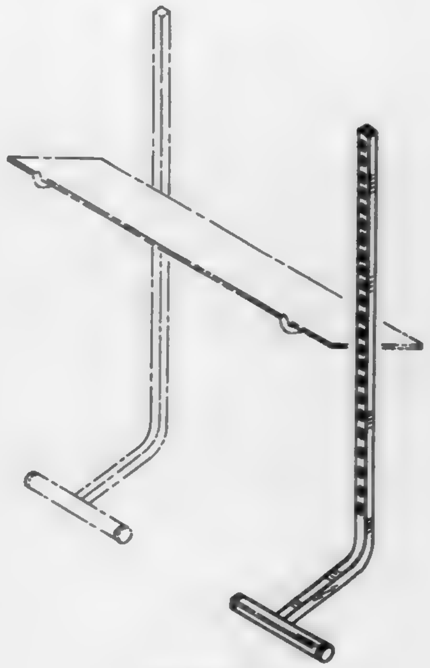
SHELF STRUCTURE

Judy Von Gunten, and Lee Von Gunten, both of 64 Newtown Dr., Buffalo Grove, Ill. 60090

Filed Dec. 2, 1991, Ser. No. 801,723

Term of patent 14 years

U.S. Cl. D6—491



347,344

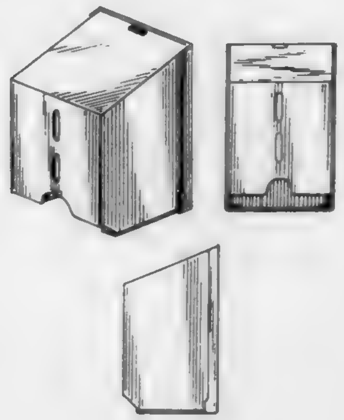
DISPENSER FOR STACKED ARTICLES

Donald D. Schumaker, P.O. Box 21690, Carson City, Nev. 89721

Filed Nov. 25, 1992, Ser. No. 1,876

Term of patent 14 years

U.S. Cl. D6—515



347,345

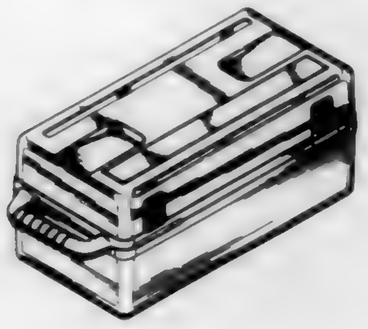
ROLL FILM DISPENSER

Ian R. Kaiser, Encinitas; Michael C. Kaiser, Malibu, and Sean A. Neiberger, La Costa, all of Calif., assignors to Allen Reed Company, Incorporated, Los Angeles, Calif.

Filed Nov. 23, 1992, Ser. No. 1,844

Term of patent 14 years

U.S. Cl. D6—518



347,346

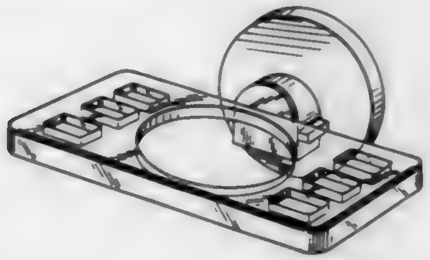
COMBINED TOOTHBRUSH AND TUMBLER HOLDER

Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502

Filed May 15, 1992, Ser. No. 884,548

Term of patent 14 years

U.S. Cl. D6—531



347,347

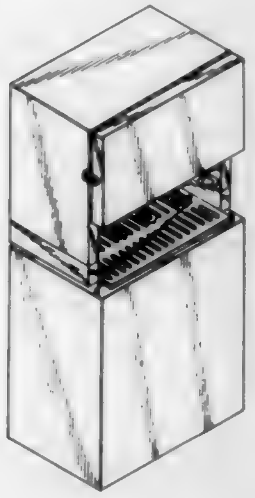
CUSTOM HAIR CARE PRODUCT DISPENSER

Yehuda Erdman, Givataim, Israel, assignor to E.S. Engineering & Software Services Ltd., Israel

Filed Jul. 6, 1992, Ser. No. 909,457

Term of patent 14 years

U.S. Cl. D6—544



347,348

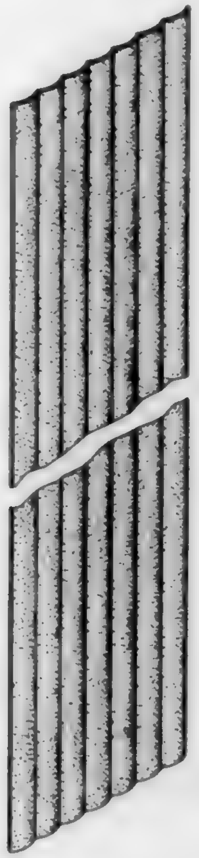
TEXTURED VENETIAN BLIND SLAT

Chang-Than Chen, 181, Po-Hai Street, Kaohsiung, Taiwan

Filed Feb. 25, 1991, Ser. No. 660,120

Term of patent 14 years

U.S. Cl. D6—580



347,349

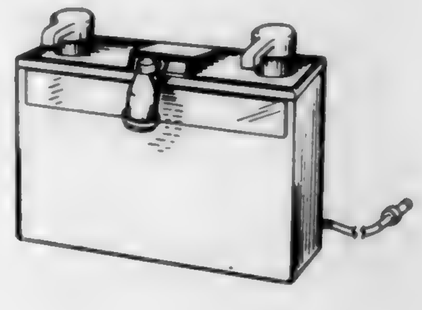
SODA FOUNTAIN POSTMIX BEVERAGE DISPENSER

John W. Burton, #4 Woodland Dr., Pittsburgh, Pa. 15228

Filed May 22, 1992, Ser. No. 888,217

Term of patent 14 years

U.S. Cl. D7—306



347,350

COFFEE MACHINE

Roland Ullmann, Offenbach/M, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

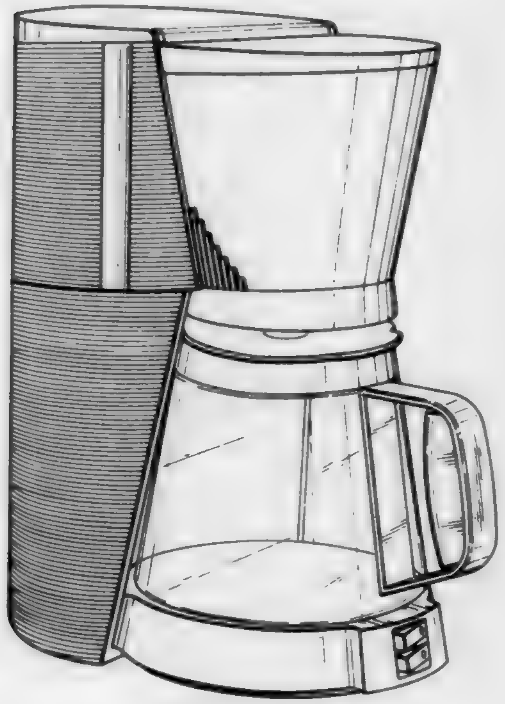
Filed Apr. 15, 1992, Ser. No. 869,035

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1991, 9107623

The portion of the term of this patent subsequent to Dec. 28, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—309



347,351

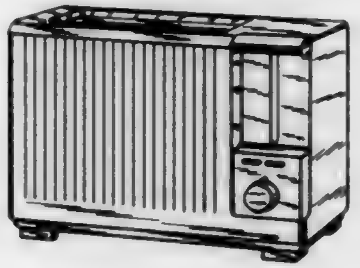
TOASTER

Günter Storsberg, Solingen, Fed. Rep. of Germany, assignor to Robert Krups GmbH & Co. KG, Solingen, Fed. Rep. of Germany

Filed Aug. 1, 1991, Ser. No. 739,390

Term of patent 14 years

U.S. Cl. D7—330



347,352

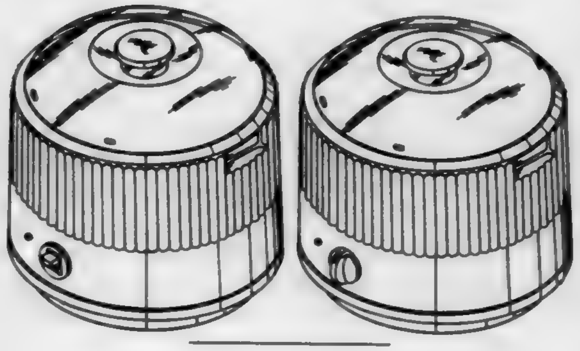
VEGETABLE/RICE STEAMER

Terry L. Myers, Richmond, Va., and Phillip L. Brookshire, Cincinnati, Ohio, assignors to Hamilton Beach/Proctor-Silex, Inc., Glen Allen, Va.

Filed Jan. 8, 1993, Ser. No. 3,490

Term of patent 14 years

U.S. Cl. D7—354



347,353

HOUSEHOLD DEEP FAT FRYER

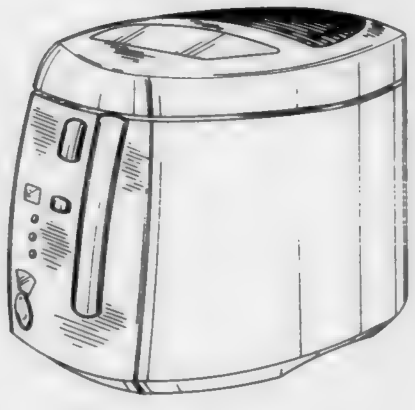
Philippe Piret, Les Jardins d'Ifs, 1876 Route de Breteville, 14123 Ifs, and Angus Ross, 13 Rue Vauquelin, 14000 Caen, both of France

Filed Mar. 2, 1993, Ser. No. 5,352

Claims priority, application France, Sep. 2, 1992, 925,316

Term of patent 14 years

U.S. Cl. D7—354



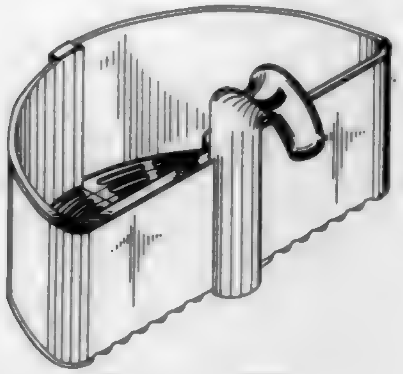
347,354
DIVIDER BASKET FOR A FOOD STEAMING APPLIANCE

Stuart Naft, Fairfield, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed May 17, 1993, Ser. No. 8,365

Term of patent 14 years

U.S. Cl. D7—354



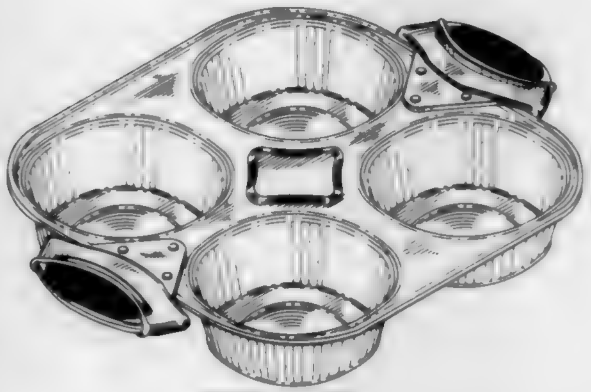
347,355
FOOD COOKING TRAY FOR A COOKING APPLIANCE

Stuart Naft, Fairfield, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Mar. 11, 1993, Ser. No. 7,192

Term of patent 14 years

U.S. Cl. D7—357



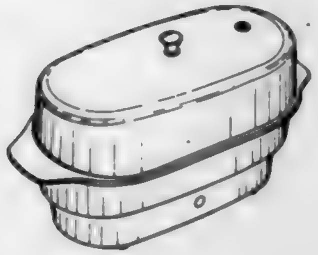
347,356
VEGETABLE AND RICE COOKER

Yung S. Yim, Tai Wai, Hong Kong, assignor to Chiaphua Industries Limited, Hong Kong, Hong Kong

Filed Mar. 12, 1992, Ser. No. 850,077

Term of patent 14 years

U.S. Cl. D7—360



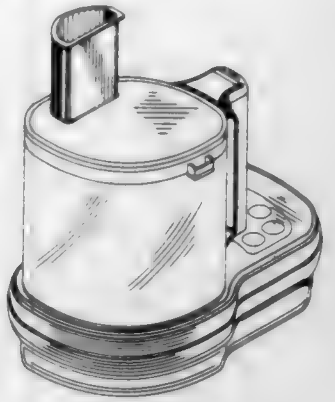
347,357
FOOD PROCESSOR

Paul Gildersleeve, Ridgefield, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 18, 1993, Ser. No. 12,906

Term of patent 14 years

U.S. Cl. D7—384



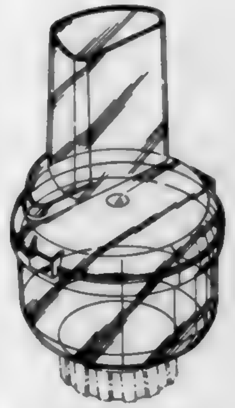
347,358
FOOD PROCESSOR ATTACHMENT HOUSING

Martin Brady, Richmond, Va., assignor to Hamilton Beach/-Proctor-Silex, Inc., Glen Allen, Va.

Filed Apr. 21, 1992, Ser. No. 871,674

Term of patent 14 years

U.S. Cl. D7—412



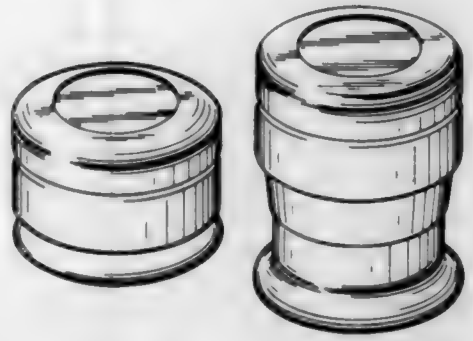
347,359
COLLAPSIBLE CONTAINER

Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35630

Filed Mar. 11, 1992, Ser. No. 849,703

Term of patent 14 years

U.S. Cl. D7—512



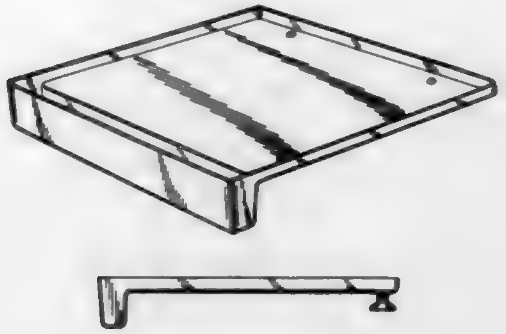
347,360
TRAY

Anne Wheeler, 44 W. River St., Upton, Mass. 01568

Filed Sep. 30, 1992, Ser. No. 954,965

Term of patent 14 years

U.S. Cl. D7—550



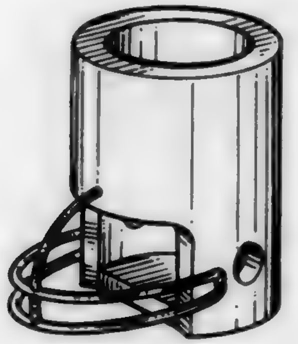
347,361
CANNED DRINK HOLDER

Fred Herrera, 9414 Brenham Ct., Houston, Tex. 77064

Filed Sep. 8, 1992, Ser. No. 940,799

Term of patent 14 years

U.S. Cl. D7—606



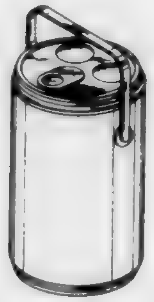
347,362
STYROFOAM ICE CHEST

Christopher L. Redmon, Houston, Tex., assignor to Cooler Concepts, Inc., Houston, Tex.

Filed Nov. 13, 1992, Ser. No. 1,417

Term of patent 14 years

U.S. Cl. D7—606



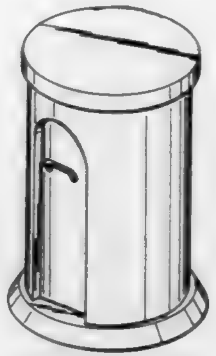
347,363
BACK BAR FREEZER UNIT

David H. van de Velde, 13200 Fiori La., Sebastopol, Calif. 95472

Filed Jul. 29, 1992, Ser. No. 923,153

Term of patent 14 years

U.S. Cl. D7—608



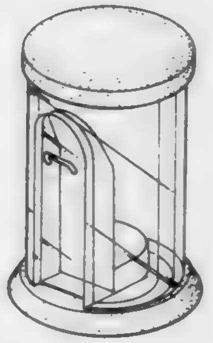
347,364
BACK BAR FREEZER UNIT

David H. van de Velde, 13200 Fiori La., Sebastopol, Calif. 95472, and Anthony Y. Guido, San Francisco, Calif., assignors to David H. van de Velde, Sebastopol, Calif.

Continuation-in-part of Ser. No. 923,153, Jul. 29, 1992, and a continuation-in-part of Ser. No. 942,668, Sep. 9, 1992. This application Sep. 10, 1992, Ser. No. 943,430

Term of patent 14 years

U.S. Cl. D7—608



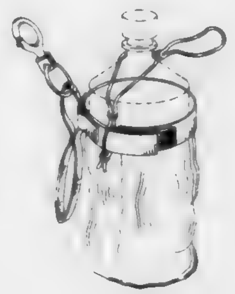
347,365
BEVERAGE CONTAINER SUPPORT

Charles H. McKay, P.O. Box 6804-E, Hwy. 6 South #229, Houston, Tex. 77083

Filed Oct. 6, 1992, Ser. No. 193

Term of patent 14 years

U.S. Cl. D3—202



347,366

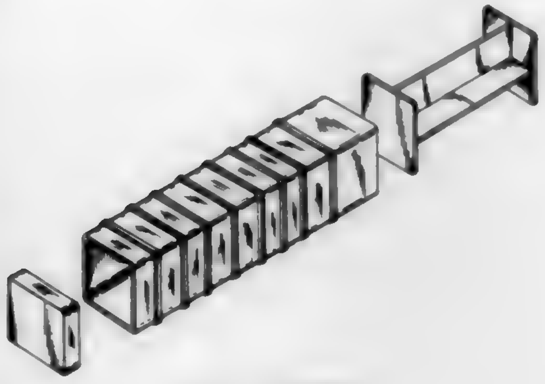
BUTTER OR MARGARINE DISPENSER

Larry Harmen, and Mildred Harmen, both of 4606 Eggers Dr., Fremont, Calif. 94536

Filed Jan. 4, 1993, Ser. No. 3,180

Term of patent 14 years

U.S. Cl. D7—670



347,367

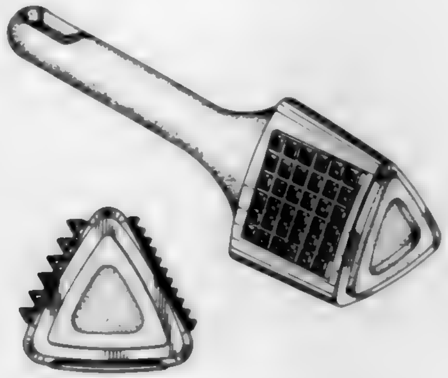
MEAT HAMMER

Ming-Hsiang Li, No. 4, Lane 263, Sec. 2, Chien-Kang Rd., Tainan City, Taiwan

Filed Oct. 1, 1992, Ser. No. 67

Term of patent 14 years

U.S. Cl. D7—682



347,368

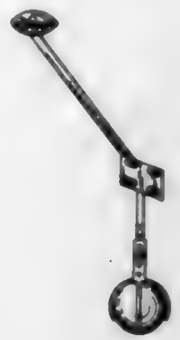
COMBINED SUPPORT AND LEVEL FOR LINE TRIMMER

Leon J. Gedert, 7442 S. Dixie, Erie, Mich. 48133

Filed Apr. 2, 1991, Ser. No. 729,193

Term of patent 14 years

U.S. Cl. D8—8



347,369

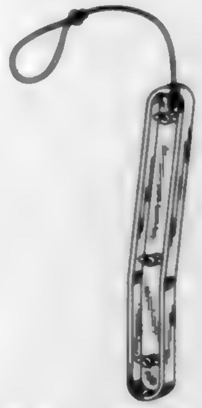
AUTOMOTIVE TIMING CHAIN TOOL

Donavan J. West, 9314 SE. Evergreen Hwy., Vancouver, Wash. 98664

Filed Mar. 4, 1993, Ser. No. 5,431

Term of patent 14 years

U.S. Cl. D8—14



347,370

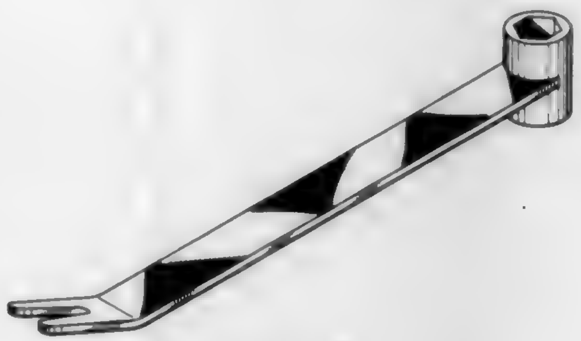
BRAKE SLACK ADJUSTING TOOL

Edward E. Runevitch, 48655 C-H Rd., Cadiz, Ohio 43907

Filed Dec. 28, 1992, Ser. No. 3,109

Term of patent 14 years

U.S. Cl. D8—21



347,371

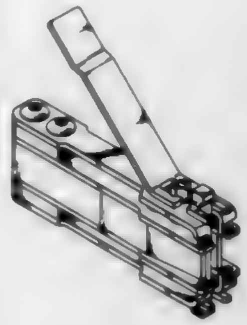
OPTICAL FIBER SPLICE RE-ENTRY TOOL

Walter S. Konik, Lilburn, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1991, Ser. No. 810,777

Term of patent 14 years

U.S. Cl. D8—51



347,372

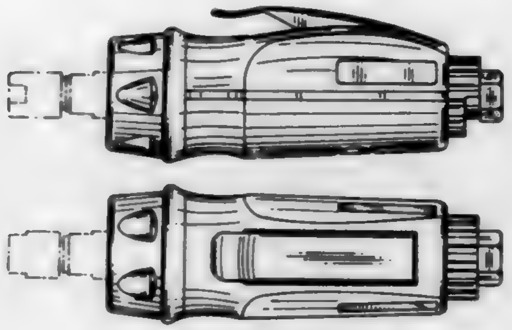
AIR TOOL

Anil P. Ghode, Mundelein, Ill.; Thomas J. Diedrich, Racine; Steven R. Wente, Kenosha, both of Wis., and Christopher W. Chudek, Chicago,, Ill., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Mar. 13, 1992, Ser. No. 850,787

Term of patent 14 years

U.S. Cl. D8—61



347,373

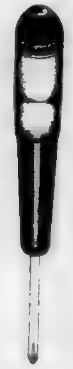
HANDLE FOR A SCREWDRIVER

Chien L. Tsai, No. 19, Jen Ho Rd., Nantou, Taiwan

Filed Dec. 8, 1992, Ser. No. 2,436

Term of patent 14 years

U.S. Cl. D8—83



347,374

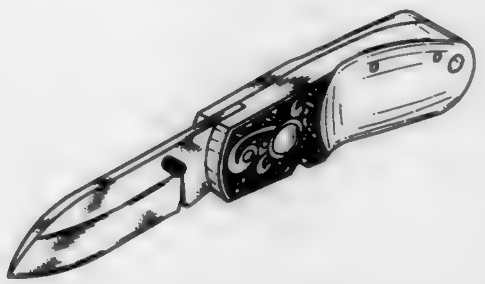
KNIFE

Kimiyuki Sakai, Seki, Japan, assignor to Gerber. Sakai, Gifu, Japan

Filed Oct. 26, 1992, Ser. No. 802

Term of patent 14 years

U.S. Cl. D8—99



347,375

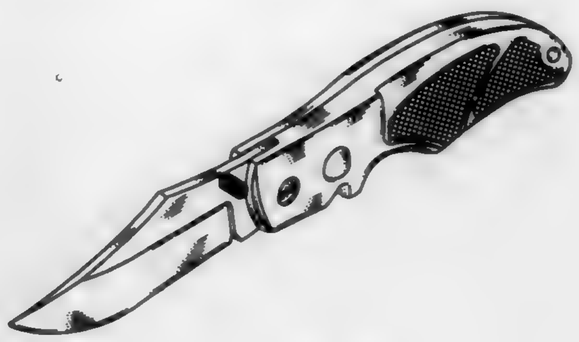
KNIFE

Kimiyuki Sakai, Seki, Japan, assignor to Gerber. Sakai, Gifu, Japan

Filed Oct. 26, 1992, Ser. No. 805

Term of patent 14 years

U.S. Cl. D8—99



347,376

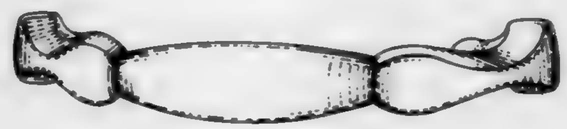
PULL

Deborah Mattson, Plainwell; Doyle Watt, Grand Rapids, both of Mich.; Emil Bocade, Savannah, Ga., and Carl W. Hendrick, High Point, N.C., assignors to Keeler Brass Company, Grand Rapids, Mich.

Continuation of Ser. No. 491,125, Mar. 8, 1990, Pat. No. D. 333,082. This application Dec. 14, 1992, Ser. No. 2,525

Term of patent 14 years

U.S. Cl. D8—317



347,377

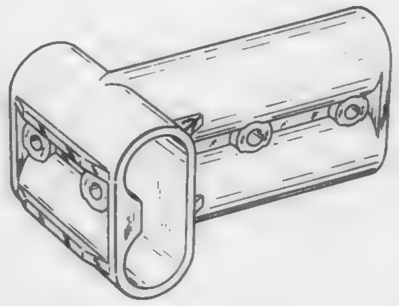
JOINT SUPPORT FOR SHELVES

Keiichi Nakamura, and Asao Shoda, both of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co Ltd., Shizuoka, Japan

Filed Jul. 7, 1992, Ser. No. 909,437

Term of patent 14 years

U.S. Cl. D8—354



347,378

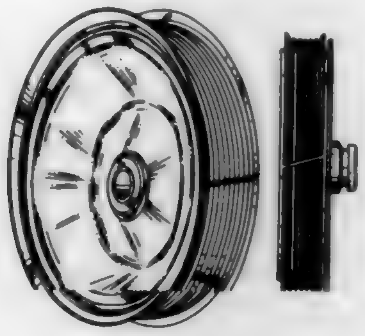
DAMPER PULLEY

A. Fred Warner, 641 West Schleier, Frankenmuth, Mich. 48768

Filed Dec. 16, 1991, Ser. No. 807,373

Term of patent 14 years

U.S. Cl. D8—360



347,379

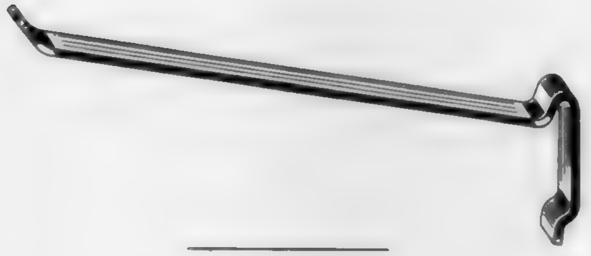
HOOK FOR DISPLAYING ARTICLES

Richard Alt, 1500 Big Oaks Ct., Lake Forest, Ill. 60045

Filed Jan. 14, 1993, Ser. No. 3,700

Term of patent 14 years

U.S. Cl. D8—367



347,380

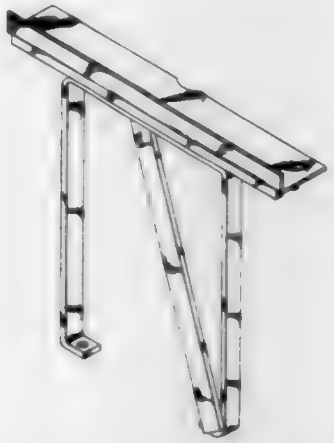
TRAY SUPPORT BRACKET

Michael C. Herber, 16019 92nd Ave., Court East, Puyallup, Wash. 98373-2243

Filed Jan. 15, 1993, Ser. No. 3,803

Term of patent 14 years

U.S. Cl. D8—380



347,381

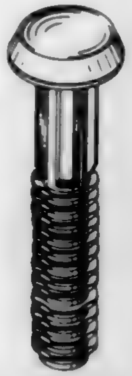
FASTENER FOR ATTACHMENT OF WALL PANELS AND FIXTURES TO WALLS AND CEILINGS

Philip D. Carruthers, 5300 Welcome Glen, Austin, Tex.

Filed Jul. 28, 1992, Ser. No. 920,981

Term of patent 14 years

U.S. Cl. D8—382



347,382

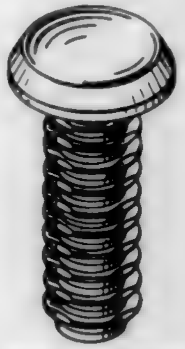
FASTENER FOR ATTACHMENT OF WALL PANELS AND FIXTURES TO WALLS AND CEILINGS

Philip D. Carruthers, 5300 Welcome Glen, Austin, Tex.

Filed Jul. 28, 1992, Ser. No. 920,982

Term of patent 14 years

U.S. Cl. D8—382



347,383

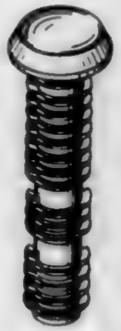
FASTENER FOR ATTACHMENT OF WALL PANELS AND FIXTURES TO WALLS AND CEILINGS

Philip D. Carruthers, 5300 Welcome Glen, Austin, Tex.

Filed Jul. 28, 1992, Ser. No. 920,983

Term of patent 14 years

U.S. Cl. D8—382



347,384

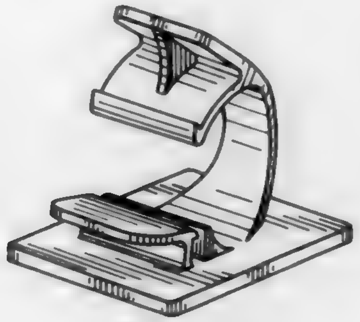
WIRE RETENTION CLIP

Fred E. White, Marietta; Barry O. Page, Woodstock, and Joseph A. Dukes, Dawsonville, all of Ga., assignors to Panduit Corp., Tinley Park, Ill.

Continuation of Ser. No. 925,359, Aug. 3, 1992, Pat. No. 5,230,489. This application Jul. 2, 1993, Ser. No. 10,338

Term of patent 14 years

U.S. Cl. D8—395



347,385

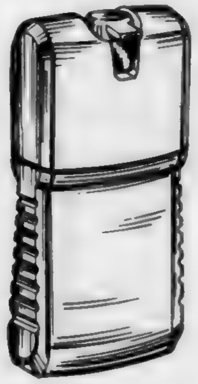
DISPENSING CONTAINER

Edward J. Kunesh, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Oct. 26, 1992, Ser. No. 803

Term of patent 14 years

U.S. Cl. D9—300



347,386

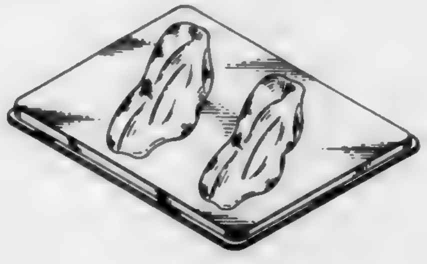
TRAY FOR FROZEN CRABS

Terrence N. Conway, Salisbury, Md., assignor to Taiyo Oil Company, Ltd., Tokyo, Japan

Filed Jul. 25, 1991, Ser. No. 738,732

Term of patent 14 years

U.S. Cl. D9—345



347,387

BOTTLE AND CAP

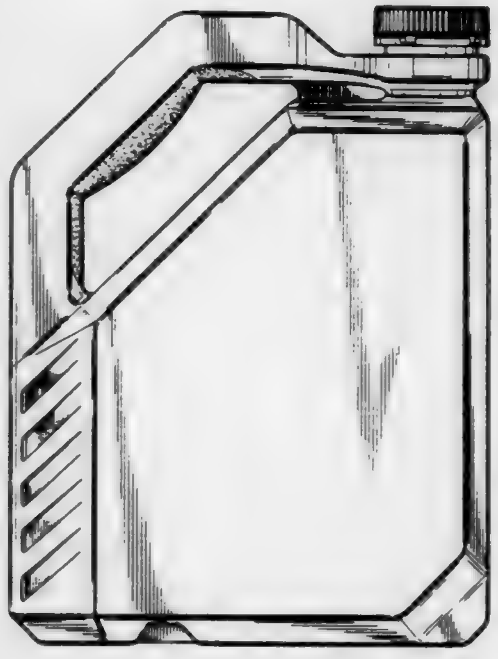
Peter E. W. Bridger, Berkshire, England; John T. Klette, Annandale, Va.; Jule G. Lambeck, Wayne, Ill., and Elena Portoles, Alexandria, Va., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 18, 1992, Ser. No. 854,450

The portion of the term of this patent subsequent to Oct. 26, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—520



347,388

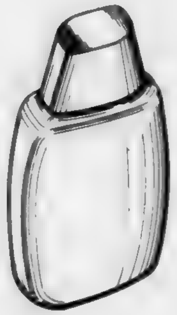
COMBINED BOTTLE AND CAP

John C. Crawford, Lake Mahopac, N.Y., assignor to Abdul Hafeez, Loomis, Calif.

Filed Jan. 15, 1993, Ser. No. 3,814

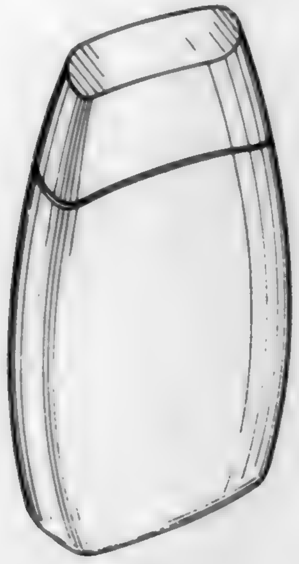
Term of patent 14 years

U.S. Cl. D9—529



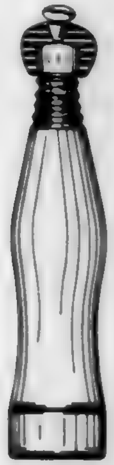
347,389
COMBINED BOTTLE AND CAP

John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 15, 1993, Ser. No. 3,815
Term of patent 14 years
U.S. Cl. D9—529



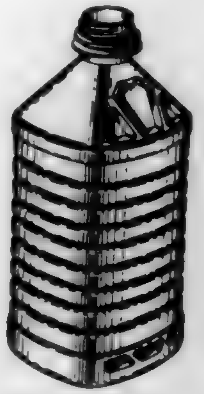
347,390
COMBINED ONE-PIECE BOTTLE AND TWIST-OFF CLOSURE

Theodore J. Kovacic, Bedford; Richard H. Kaufman, Chappaqua, both of N.Y.; Martin M. Bostwick, Norwalk, Conn.; Donald C. Crescenzi, Killingsworth, Conn.; William H. Valls, Harwinton, Conn., and Thomas Bucaccio, Westmount, Canada, assignors to Kraft General Foods, Inc., Northfield, Ill.
Filed Jun. 5, 1992, Ser. No. 894,717
Term of patent 14 years
U.S. Cl. D9—539



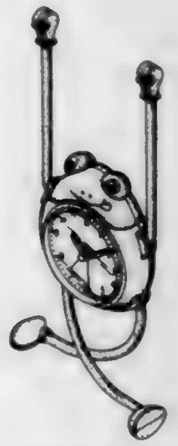
347,391
BOTTLE

Gilles Guertin, Rougemont, Canada, assignor to A. Lassonde Inc., Rougemont, Canada
Filed Nov. 19, 1992, Ser. No. 1,684
Term of patent 14 years
U.S. Cl. D9—566



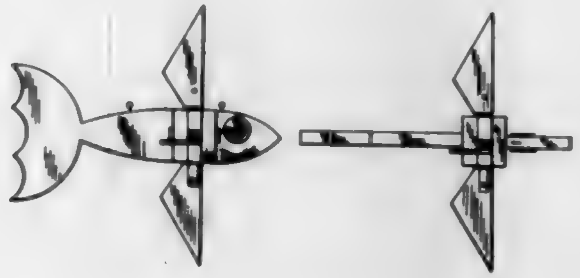
347,392
ALARM CLOCK

David Kuo, No. 4, Shin-Ho Rd., Tainan City, Taiwan
Filed Jul. 10, 1992, Ser. No. 912,629
Term of patent 14 years
U.S. Cl. D10—7



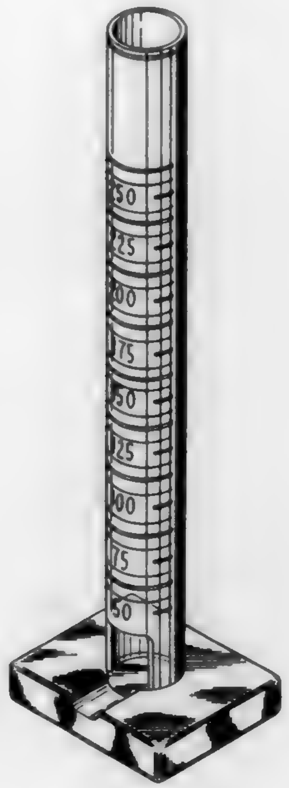
347,393
FISH MOBILE

Wayne K. Young, 1516 Shuman, Westland, Mich. 48134
Filed May 21, 1991, Ser. No. 703,339
Term of patent 14 years
U.S. Cl. D10—59



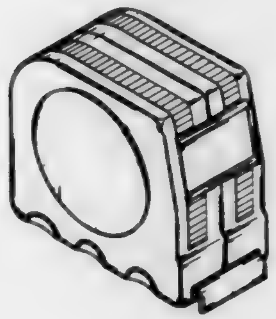
347,394
GOLF BALL TESTER

Daniel J. Schlesinger, 6633 Forest Ave., Hammond, Ind. 46324, and Daniel C. Curran, 95 Sioux Trail, Pine, Colo. 80470
Filed Jan. 14, 1993, Ser. No. 3,777
Term of patent 14 years
U.S. Cl. D10—65



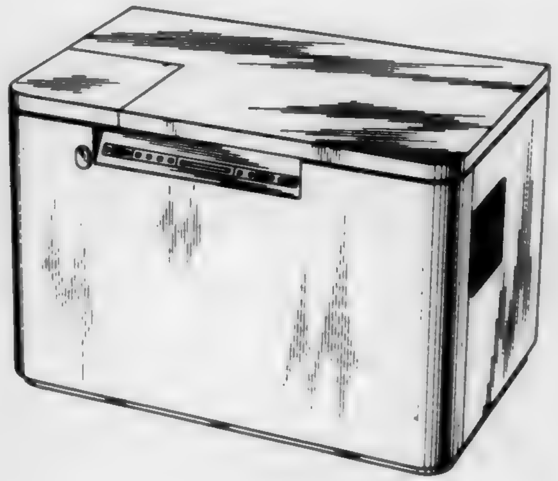
347,395
MEASURING TAPE

Tse-Chung Yang, Taoyuan Hsien, Taiwan, assignor to Taiwan Woei Shing Co., Ltd., Taiwan
Filed May 19, 1993, Ser. No. 8,588
Term of patent 14 years
U.S. Cl. D10—72



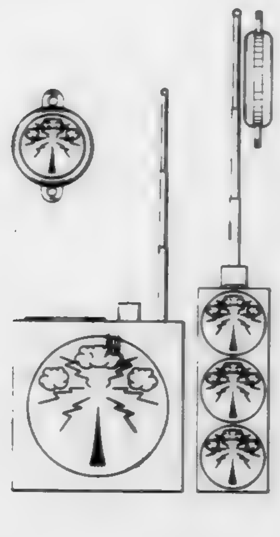
347,396
MASS SPECTROMETER COMBINED WITH LIQUID CHROMATOGRAPH

Mitsuru Ohnuma, Tokyo; Tomoyuki Miyata, Kokubunji; Kazunori Hashimoto, Tachikawa; Yoshiaki Kato, Mito, and Tadao Mimura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 3, 1993, Ser. No. 4,365
Claims priority, application Japan, Aug. 28, 1992, 4-25285
Term of patent 14 years
U.S. Cl. D10—81



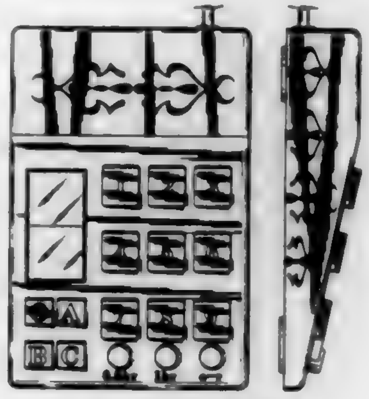
347,397
COMBINED TRANSMITTER AND RECEIVER FOR LOCATING CHILDREN

Charles H. Schmauch, 8 Spruce Dr., Brookfield, Conn. 06804
Filed Jul. 1, 1993, Ser. No. 10,184
Term of patent 14 years
U.S. Cl. D10—104



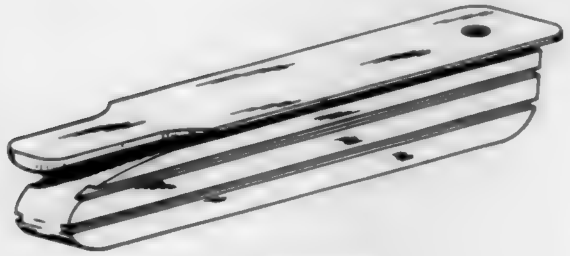
347,398
KEYPAD FOR AN ANTI-THEFT ALARM FOR AUTOMOBILES

Desmond M. Hodge, 16 McGotty Pl., Irvington, N.J. 07111
Filed Aug. 12, 1992, Ser. No. 928,218
Term of patent 14 years
U.S. Cl. D10—106



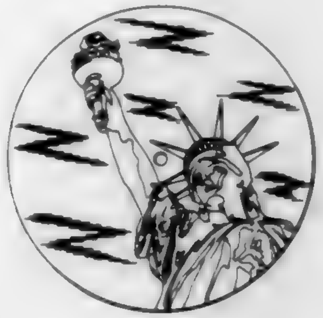
347,399
TURKEY CALLER

William T. White, Jr., Rte. 3 Box 393, Abbeville, Ala. 36310
Filed Dec. 22, 1992, Ser. No. 2,909
- Term of patent 14 years
U.S. Cl. D10—116



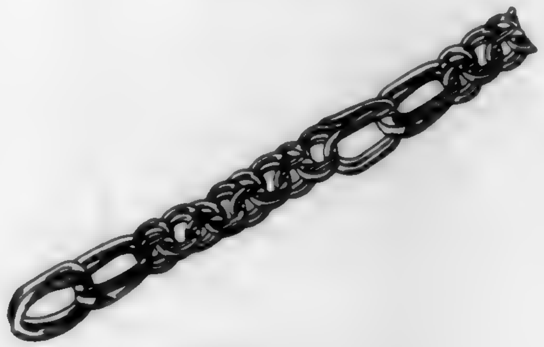
347,400
WATCH DIAL

Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed May 31, 1991, Ser. No. 709,144
Term of patent 14 years
U.S. Cl. D10—126



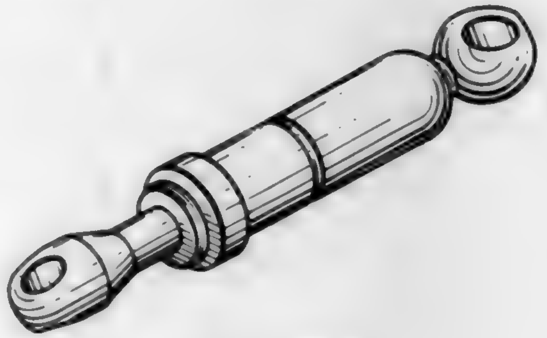
347,401
ORNAMENTAL CHAIN

David Rozenwasser, Savion, Israel, assignor to David Rozenwasser, Ltd., Petah Tikva, Israel
Filed Nov. 26, 1991, Ser. No. 798,424
Claims priority, application Israel, May 29, 1991, 17899
The portion of the term of this patent subsequent to Jan. 11, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—13



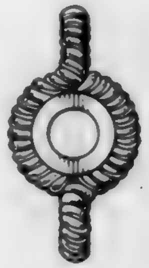
347,402
JEWELRY CONNECTOR

Dewey F. Kemp, and Nina A. Kemp, both of 30739 La Brisa Dr., Malibu, Calif. 90265
Filed Sep. 28, 1992, Ser. No. 951,557
Term of patent 14 years
U.S. Cl. D11—86



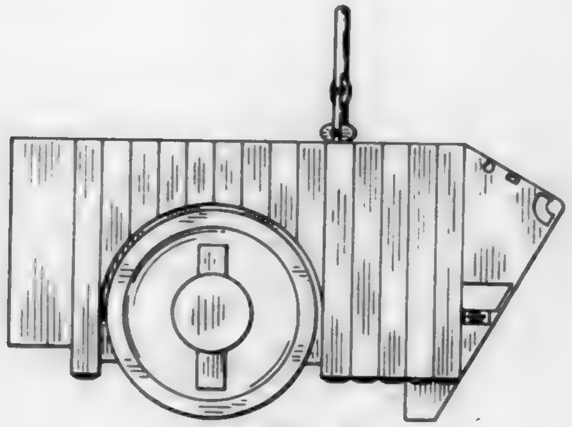
347,403
JEWELRY SETTING

Pepi Kelman, Los Angeles, Calif., assignor to Pepi Kelman, Inc., Los Angeles, Calif.
Filed Mar. 17, 1993, Ser. No. 6,025
Term of patent 14 years
U.S. Cl. D11—91



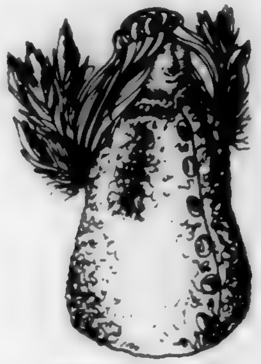
347,404
FLOWER GARDEN CART

J. Edwin Ek, 5161 S. Marion Pl., Tulsa, Okla. 74135
Filed Jan. 29, 1993, Ser. No. 4,244
Term of patent 14 years
U.S. Cl. D11—143



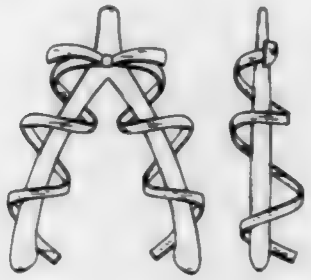
347,405
ANGEL SOFT SCULPTURE

Inger Corson, Box 339A, Yarmouth, Me. 04096, and Linda White, Box 367F, Chebeague Island, Me. 04017
Filed Mar. 17, 1993, Ser. No. 6,017
Term of patent 14 years
U.S. Cl. D11—160



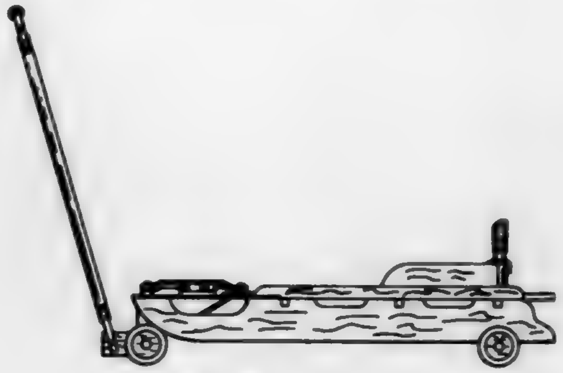
347,406
BOW

Jessica Mooney, and Doug Mooney, both of Apt. C-12 East Campus, Big Rapids, Mich. 49307
Filed Apr. 22, 1991, Ser. No. 688,876
Term of patent 14 years
U.S. Cl. D11—184



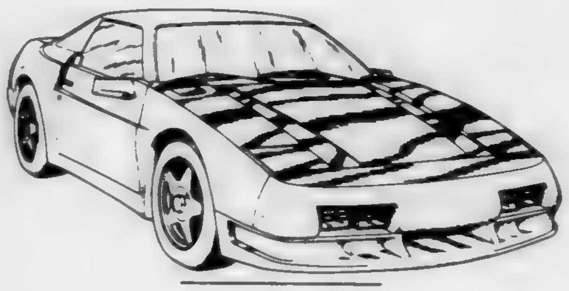
347,407
COMBINATION SLED AND WAGON FOR CHILDREN

Robert G. Dowell, P.O. Box 903, Radcliff, Ky. 40160
Filed Apr. 20, 1992, Ser. No. 872,683
Term of patent 14 years
U.S. Cl. D12—6



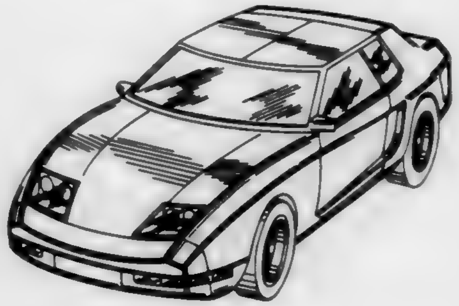
347,408
AUTOMOBILE

Steven C. Dreyer, 3½ E. Central Ave., Zeeland, Mich. 49464
Filed Mar. 12, 1992, Ser. No. 851,348
Term of patent 14 years
U.S. Cl. D12—92



347,409
AUTOMOBILE

Fritz Jüngst, Hans Böckler-Strasse 15, 5620 Velbert 1, Fed. Rep. of Germany
Filed Aug. 14, 1992, Ser. No. 930,342
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1992, 9201540
Term of patent 14 years
U.S. Cl. D12—92



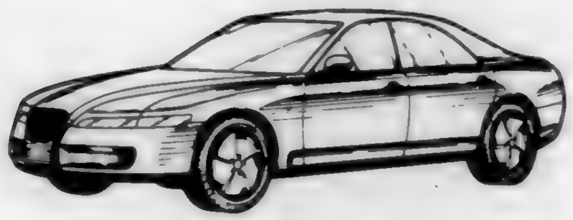
347,410
AUTOMOBILE

Mitsuhiro Honda, Saitama, and Toshihiko Shimizu, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1992, Ser. No. 3,008

Term of patent 14 years

U.S. Cl. D12—92



347,411
MOTORCYCLE

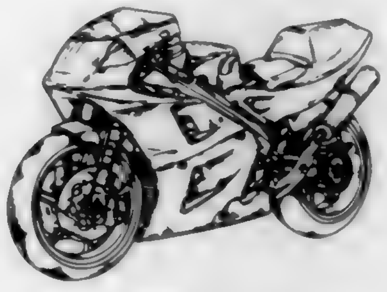
Yoshiyuki Horii, Saitama, and Toshiaki Kishi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1992, Ser. No. 931,307

Claims priority, application Japan, May 1, 1992, 4-13224

Term of patent 14 years

U.S. Cl. D12—110



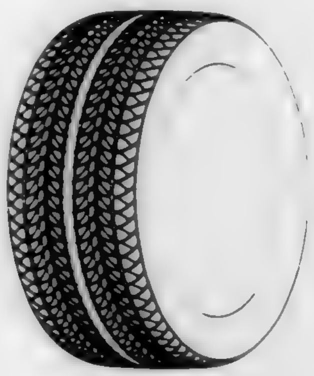
347,412
TIRE TREAD

Warren L. Croyle, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 20, 1992, Ser. No. 915,179

Term of patent 14 years

U.S. Cl. D12—147



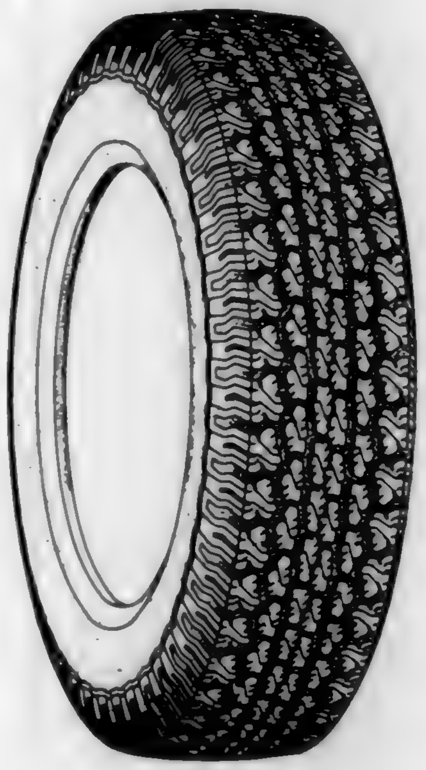
347,413
TIRE

Miroslav Manestar, Barberton, Ohio, assignor to Michelin Recherche et Technique-Euroresidence, Fribourg, Switzerland

Filed Aug. 3, 1992, Ser. No. 924,329

Term of patent 14 years

U.S. Cl. D12—147



347,414
MOTORCYCLE TIRE

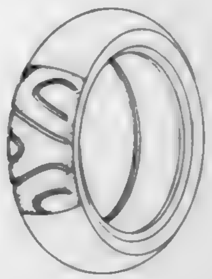
Johann Haas, and Ernst Mader, both of Munich, Fed. Rep. of Germany, assignors to Metzeler Reifen GmbH, Breuberg, Fed. Rep. of Germany

Filed Aug. 18, 1992, Ser. No. 932,005

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1992, 9203390

Term of patent 14 years

U.S. Cl. D12—151



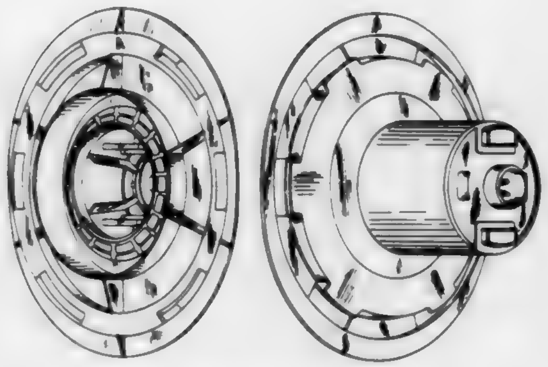
347,415
FRONT PARTITION FOR A TANDEM BRAKE BOOSTER

Louis P. Rossigno, Granger, Ind.; Jon R. Dodson, Niles, Mich.; Thomas E. Dodd, South Bend, Ind.; Thomas M. O'Brien, Buchanan, Mich., and John E. Steer, South Bend, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 21, 1992, Ser. No. 994,186

Term of patent 14 years

U.S. Cl. D12—180



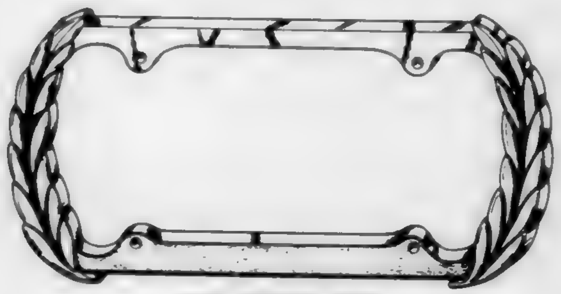
347,416
DECORATIVE FRAME FOR LICENSE PLATE

Ming-Liang Hu, #8, Alley 18, Lane 149, Su Wei St., Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Jul. 28, 1992, Ser. No. 920,629

Term of patent 14 years

U.S. Cl. D12—193



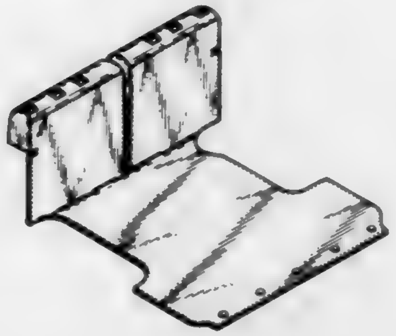
347,417
INTERIOR CARGO COVER FOR MOTOR VEHICLES

Thomas F. Hamilton, 1769 Hillsdale Ave., San Jose, Calif. 95124-9998

Filed Apr. 12, 1993, Ser. No. 6,972

Term of patent 14 years

U.S. Cl. D12—221



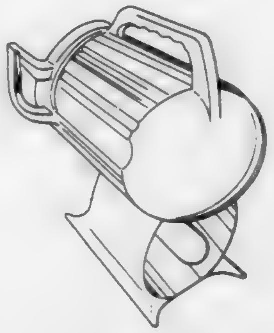
347,418
SCUBA SCOOTER

Albert De Santis, Margate, and Morton Lashman, Ft. Lauderdale, both of Fla., assignors to Mode Industries Inc., Ft. Lauderdale, Fla.

Filed Mar. 20, 1992, Ser. No. 854,960

Term of patent 14 years

U.S. Cl. D12—308



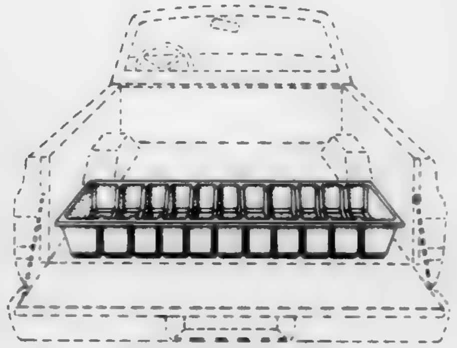
347,419
ARTICLE TRAY FOR THE BED OF A PICKUP TRUCK

Claude T. Jackson, P.O. Box 1597, Henderson, N.C. 27536

Filed Jul. 12, 1993, Ser. No. 10,574

Term of patent 14 years

U.S. Cl. D12—425



347,420
PERSONAL COMPUTER

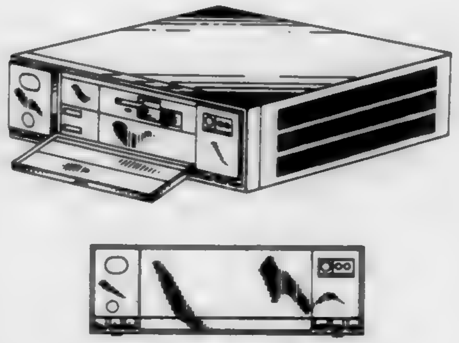
Kazuhiko Yamazaki, Hiratuka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1992, Ser. No. 866,609

Claims priority, application Japan, Oct. 11, 1991, 3-30446

Term of patent 14 years

U.S. Cl. D14—100



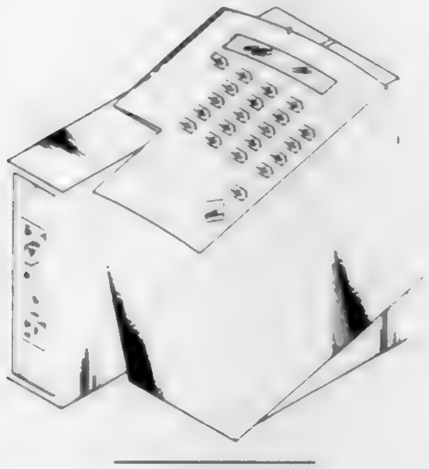
347,421
ELECTRONIC FILE COMMUNICATION UNIT USED TO RECEIVE AND TRANSMIT ELECTRONIC INFORMATION

Alan S. Lorenz, and Jeff Brown, both of Seattle, Wash., assignors to Lynx Automation, Inc., Lynnwood, Wash.

Filed Sep. 15, 1992, Ser. No. 948,866

Term of patent 14 years

U.S. Cl. D14—105



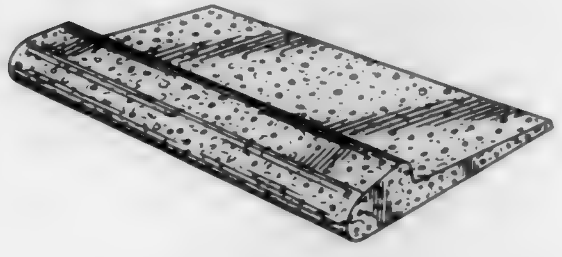
347,422
WRIST SUPPORT

Neal J. Taslitz, 984 Oak, Glencoe, Ill. 60022

Filed Sep. 4, 1992, Ser. No. 940,716

Term of patent 14 years

U.S. Cl. D14—114



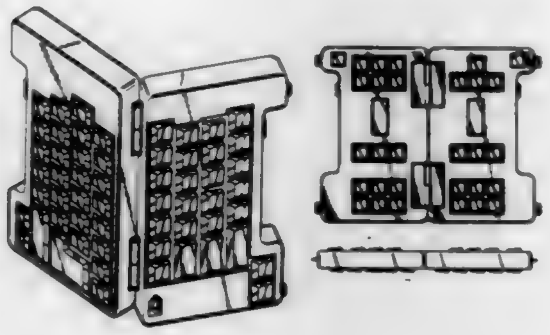
347,423
COMPUTER KEYBOARD

Kevin M. Conway, 130 Walnut Ct., Santa Rosa, Calif. 95404

Filed Mar. 18, 1992, Ser. No. 853,329

Term of patent 14 years

U.S. Cl. D14—115



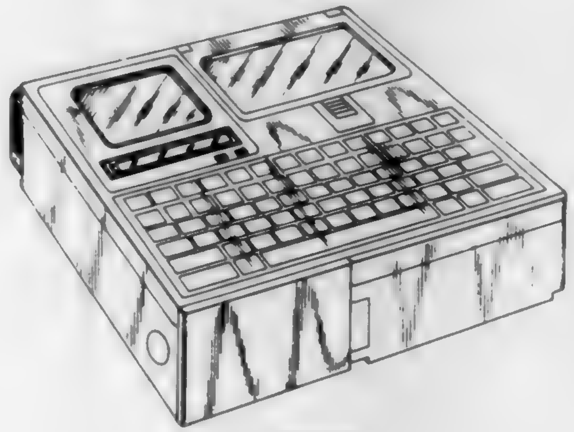
347,424
VIDEO PROCESSOR TERMINAL

Kenneth Hill, Webster, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 21, 1992, Ser. No. 916,407

Term of patent 14 years

U.S. Cl. D14—125



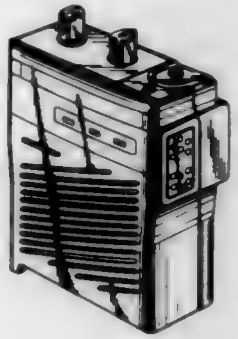
347,425
PORTABLE RADIO

Richard Culbertson; Steven L. Sands, both of Lynchburg, and Ralph R. Sherman, Forest, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Jul. 23, 1992, Ser. No. 917,448

Term of patent 14 years

U.S. Cl. D14—137



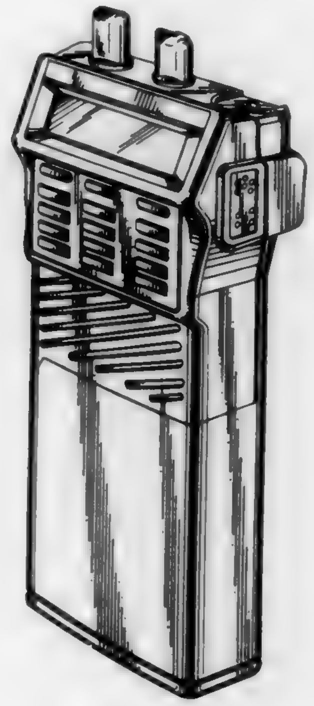
347,426
PORTABLE RADIO WITH ATTACHED BATTERY

Richard Culbertson; Steven L. Sands, both of Lynchburg, and Ralph R. Sherman, Campbell, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Jul. 23, 1992, Ser. No. 917,449

Term of patent 14 years

U.S. Cl. D14—137



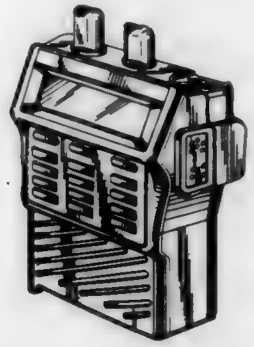
347,427
PORTABLE RADIO

Richard Culbertson; Steven L. Sands, both of Lynchburg, and Ralph R. Sherman, Forest, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Jul. 23, 1992, Ser. No. 917,450

Term of patent 14 years

U.S. Cl. D14—137



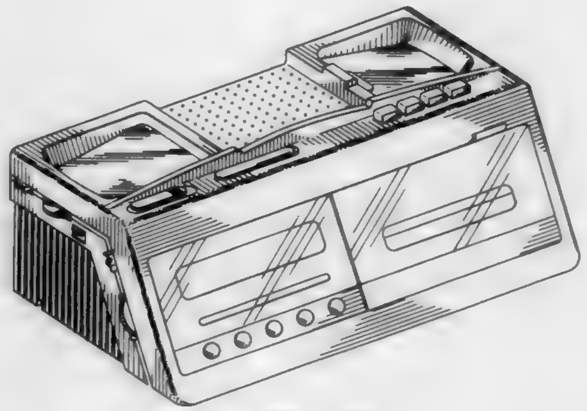
347,428
TELEPHONE BASE CLOCK RADIO WITH CASSETTE

Anthony Solomita, Norwalk; Nancy Baron, Stamford, and Barry M. Haber, Westport, all of Conn., assignors to Conair Corporation, Stamford, Conn.

Filed Sep. 21, 1992, Ser. No. 948,959

Term of patent 14 years

U.S. Cl. D14—144



347,429
TAPE RECORDER COMBINED WITH A RADIO TUNER

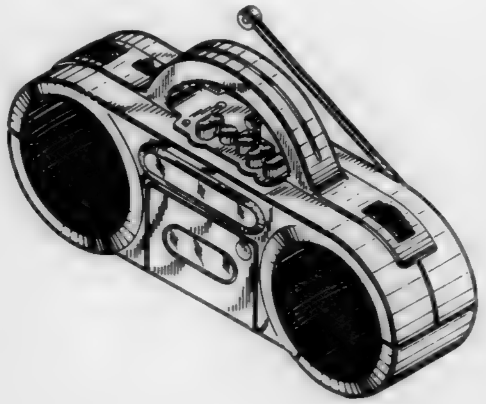
Masakazu Kanatani; Jun Uchiyama, and Richard Gioscia, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1992, Ser. No. 915,197

Claims priority, application Japan, Mar. 9, 1992, 4-6746

Term of patent 14 years

U.S. Cl. D14—163



347,430

TAPE PLAYER

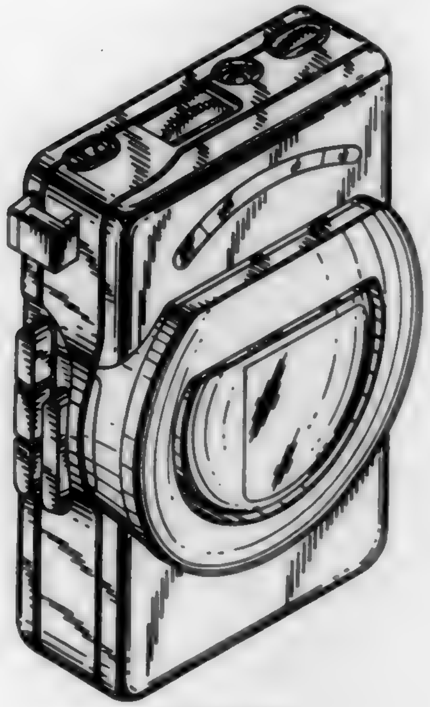
Jun Uchiyama, and Yan Minjin, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1992, Ser. No. 915,193

Claims priority, application Japan, Feb. 28, 1992, 4-5535

Term of patent 14 years

U.S. Cl. D14—165



347,431

TAPE PLAYER

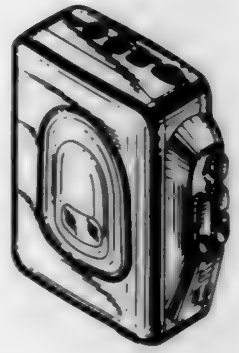
Shintaro Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1992, Ser. No. 915,376

Claims priority, application Japan, Jan. 29, 1992, 4-2136

Term of patent 14 years

U.S. Cl. D14—165



347,432

TAPE PLAYER

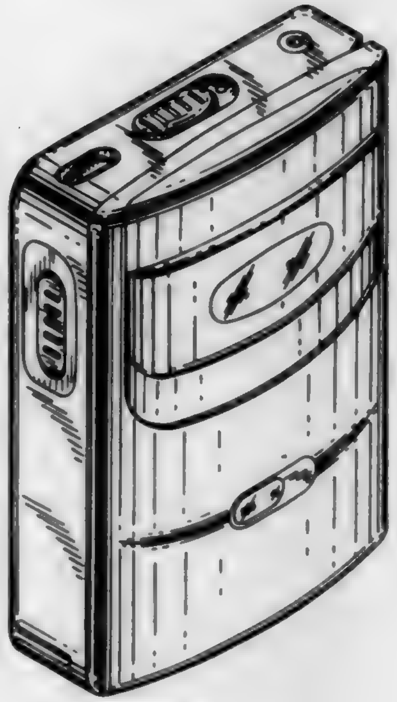
Keisuke Tejima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1992, Ser. No. 2,644

Claims priority, application Japan, Jul. 13, 1992, 4-20946

Term of patent 14 years

U.S. Cl. D14—165



347,433

PAGER

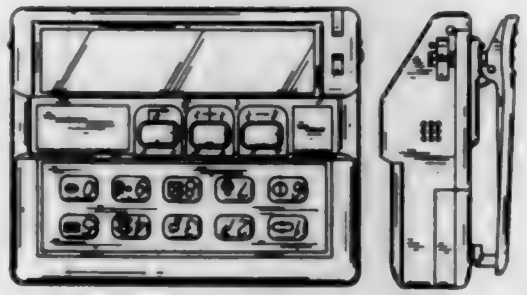
Kam F. Wong, Kowloon, Hong Kong, assignor to Star Paging (Communications Equipment) Manufacturing Ltd., Kowloon, Hong Kong

Filed Dec. 20, 1991, Ser. No. 812,362

Claims priority, application China, Sep. 6, 1991, 91 3 02327.2; Oct. 26, 1991, 91 3 04530.6

Term of patent 14 years

U.S. Cl. D14—191



347,434

HEADPHONE

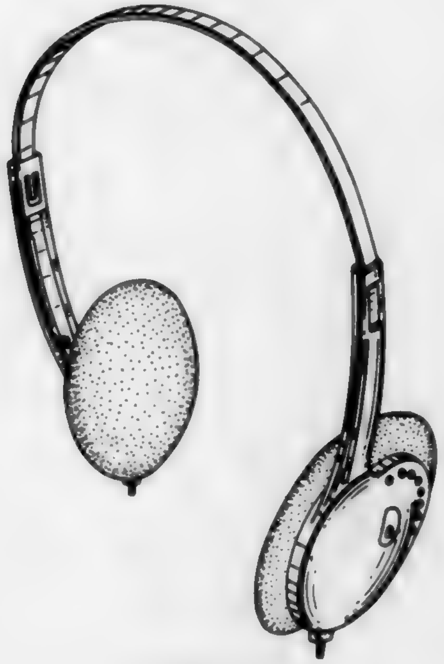
Katsumi Yamatogi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 741,828, Aug. 7, 1991, Pat. No. D. 338,010. This application Oct. 13, 1992, Ser. No. 281

Claims priority, application Japan, Mar. 9, 1991, 3-9187

Term of patent 14 years

U.S. Cl. D14—205



347,435

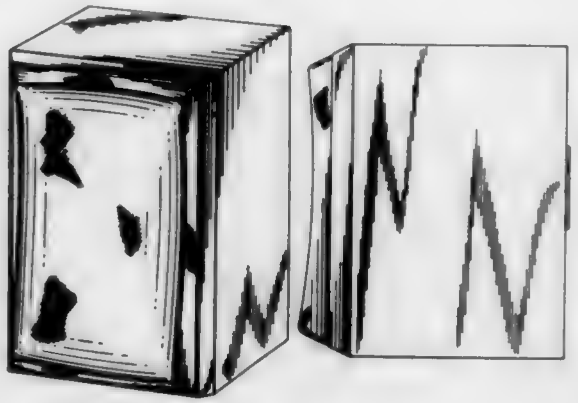
BOOKSHELF SPEAKER

Russell Snell, Ridgewood, N.J., assignor to Sony Electronics Inc., Park Ridge, N.J.

Filed Feb. 18, 1992, Ser. No. 836,609

Term of patent 14 years

U.S. Cl. D14—214



347,436

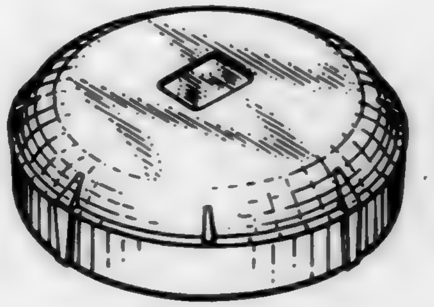
COMBINED GLOBAL POSITIONING SYSTEM ANTENNA AND PREAMPLIFIER

John G. Tang, San Carlos, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Apr. 17, 1992, Ser. No. 870,703

Term of patent 14 years

U.S. Cl. D14—230



347,437

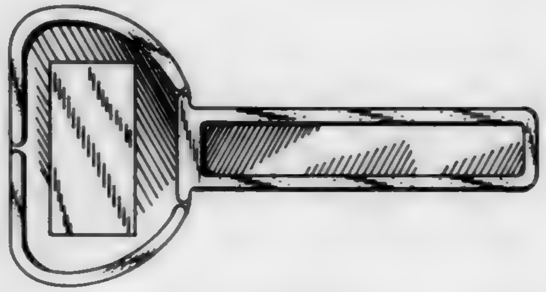
PROTECTIVE COVER FOR AN INTEGRATED ANTENNA/DOWNCONVERTER

Todd G. Brehmer; Christine L. Chow, both of San Jose, and Allen F. Podell, Palo Alto, all of Calif., assignors to Pacific Monolithics, Sunnyvale, Calif.

Filed May 15, 1992, Ser. No. 883,722

Term of patent 14 years

U.S. Cl. D14—230



347,438

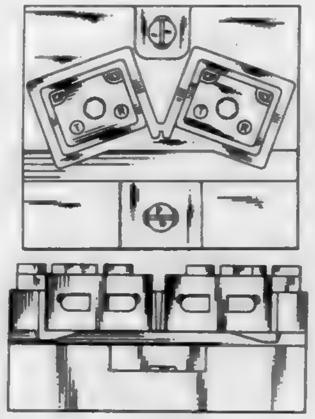
TELEPHONE TERMINAL APPARATUS

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries, Inc., Copiaque, N.Y.

Filed Jan. 13, 1992, Ser. No. 819,944

Term of patent 14 years

U.S. Cl. D14—240



347,439
RECEIVER FOR INFRARED LANGUAGE DISTRIBUTION SYSTEM

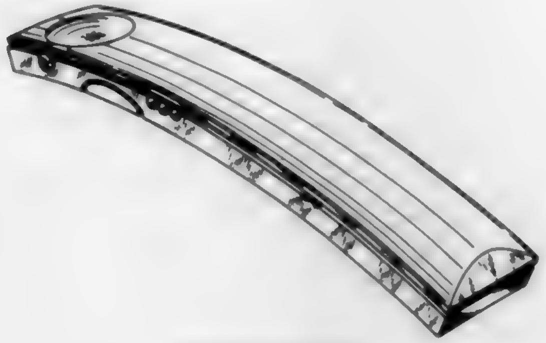
Dirk J. N. Vananderoye, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1992, Ser. No. 864,006

Claims priority, application Hague, Nov. 21, 1991, DM/021.191

Term of patent 14 years

U.S. Cl. D14—299



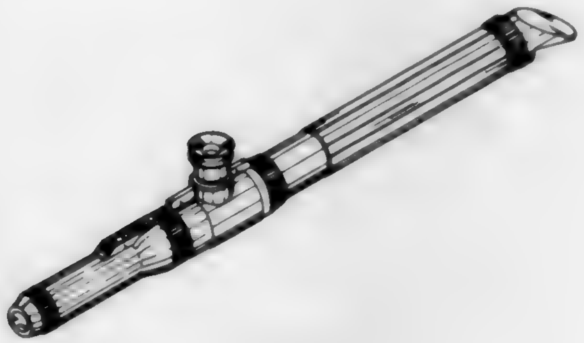
347,440
COMBINED PERISCOPE AND FLASHLIGHT

Melvin A. Holznagel, 18638 SW. Holznagel Rd., Sherwood, Oreg. 97140

Filed Aug. 10, 1992, Ser. No. 927,375

Term of patent 14 years

U.S. Cl. D16—130



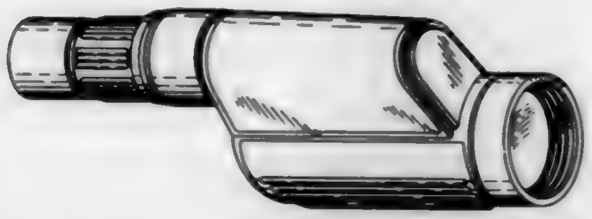
347,441
OPTICAL TELESCOPE

Hart D. Lutter, Lake Oswego; Neil T. Mai, Beaverton; Forrest D. Babcock, Banks, and Allen D. Tucker, Portland, all of Oreg., assignors to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed Nov. 18, 1992, Ser. No. 1,645

Term of patent 14 years

U.S. Cl. D16—132



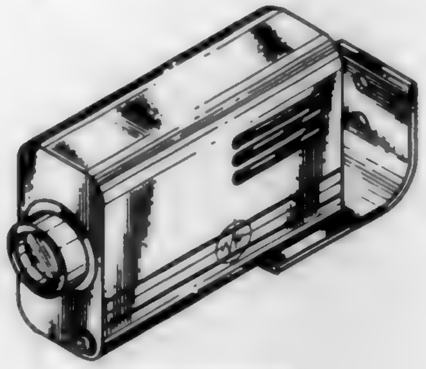
347,442
COMBINED IMITATION SURVEILLANCE CAMERA AND SUPPORT THEREFOR

Leonard S. Falconer, 5149 W. 136th St., Hawthorne, Calif. 90250

Filed Nov. 6, 1992, Ser. No. 1,211

Term of patent 14 years

U.S. Cl. D16—203



347,443
CAMERA

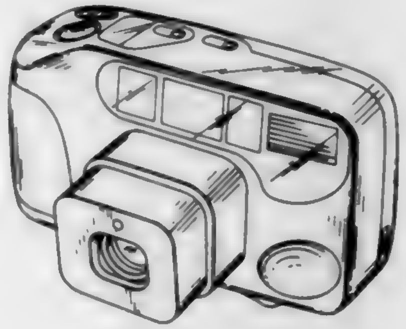
Takahiro Tago, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 5, 1992, Ser. No. 893,359

Claims priority, application Japan, Dec. 6, 1991, 036,808/1991

Term of patent 14 years

U.S. Cl. D16—209



347,444
COMPACT CAMERA

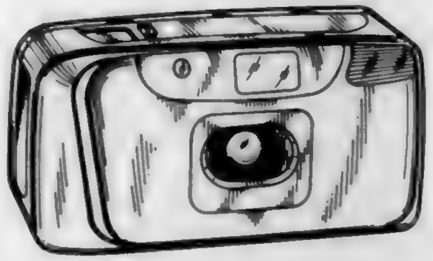
Kazuhisa Horikiri, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1992, Ser. No. 2,495

Claims priority, application Japan, Jun. 11, 1992, 4-17318

Term of patent 14 years

U.S. Cl. D16—209



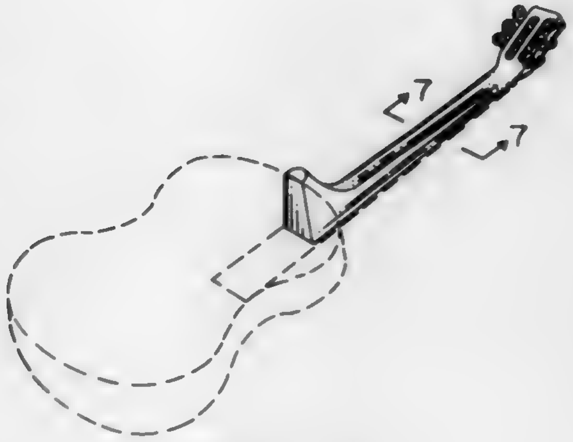
347,445
NECK OF A MUSICAL INSTRUMENT

James Attias, 19470 NW. 59th Ave., Miami, Fla. 33015

Filed May 6, 1991, Ser. No. 695,774

Term of patent 14 years

U.S. Cl. D17—20



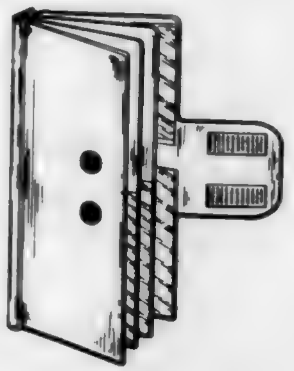
347,446
ORGANIZER NOTEBOOK

Vicki Riss, 11860 97th Ave. N., Maple Grove, Minn. 55369

Filed Nov. 6, 1990, Ser. No. 610,985

Term of patent 14 years

U.S. Cl. D19—26



347,447
COLLAPSILE; PORTABLE DOCUMENT FILE

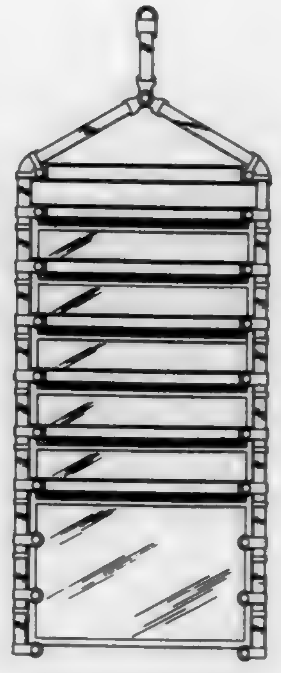
Robert K. Isserstedt, 37 Thurloe Street, London, SW7 2LQ, England

Filed Feb. 5, 1990, Ser. No. 475,095

Claims priority, application United Kingdom, Aug. 4, 1989, 2000124

Term of patent 14 years

U.S. Cl. D19—90



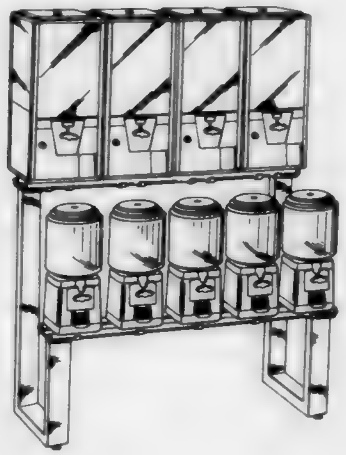
347,448
COMBINED VENDING MACHINE AND STAND

James H. Hinton, Vernon, Calif., assignor to Oak Manufacturing Company, Los Angeles, Calif.

Filed Oct. 26, 1992, Ser. No. 774

Term of patent 14 years

U.S. Cl. D20—7



347,449

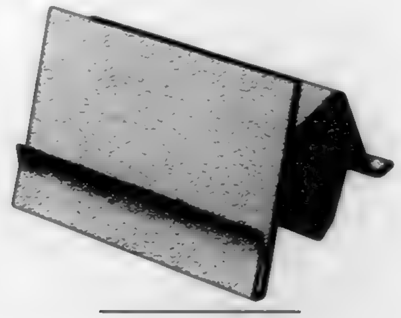
TAG HOLDER

Benjamin L. Garfinkle, 1120 Portal Ave., Piedmont, Calif. 94610

Filed Oct. 20, 1992, Ser. No. 668

Term of patent 14 years

U.S. Cl. D20—43



347,450

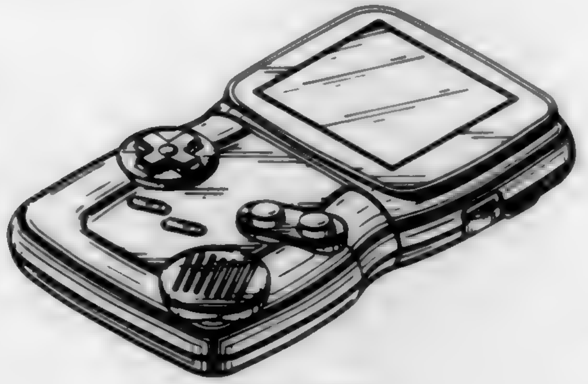
HAND-HELD ELECTRONIC GAME MACHINE

Hideo Nagata, and Shin Kojo, both of Kyoto, Japan, assignors to Nintendo Co., Ltd., Japan

Filed Dec. 10, 1992, Ser. No. 2,369

Term of patent 14 years

U.S. Cl. D21—13



347,451

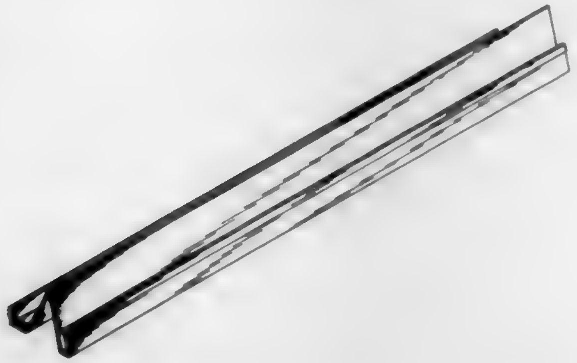
HOLDING TRAY FOR PLAYING CARDS, DOMINOS AND OTHER GAMES

Harry D. Kazakowitz, 7435 Holly Ridge Dr., New Port Richey, Fla. 34653

Filed Aug. 10, 1992, Ser. No. 926,957

Term of patent 14 years

U.S. Cl. D21—54



347,452

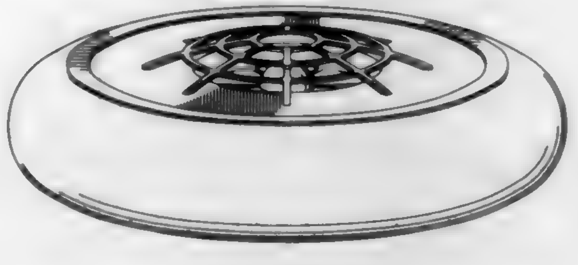
HOVERCRAFT TOY

Eugene L. Timperman, 10639 Silverbrook Dr., Cincinnati, Ohio 45240, and Le T. Phan, 3235 Ferncroft, Cincinnati, Ohio 45211

Continuation-in-part of Ser. No. 248, Jan. 4, 1993. This application Mar. 10, 1993, Ser. No. 5,721

Term of patent 14 years

U.S. Cl. D21—86



347,453

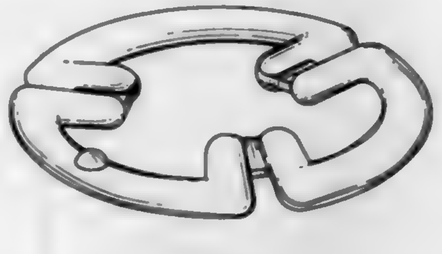
INTERLOCKING CONSTRUCTION TOY ELEMENT

Antonio C. Pronsato, and Ernesto D. Gyurec, both of 3941 S. "B" Bristol 336, Santa Ana, Calif. 92704

Filed Jul. 30, 1990, Ser. No. 559,601

Term of patent 14 years

U.S. Cl. D21—108



347,454

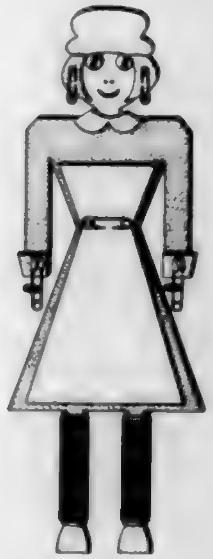
CLOTH FIGURE

John E. Hoyt, and Magda Hoyt, both of 22532 Ventura Blvd., Woodland Hills, Calif. 91364

Filed Jan. 24, 1991, Ser. No. 719,536

Term of patent 14 years

U.S. Cl. D21—154



347,455

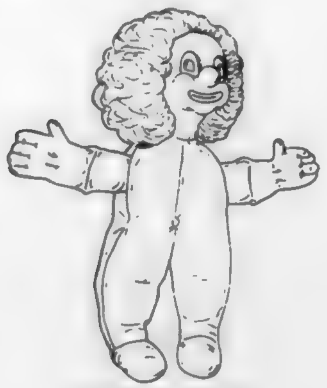
DOLL

Bonnie D. Romero, 318 Welch St., Mesquite, Tex. 75149

Filed Oct. 29, 1991, Ser. No. 786,909

Term of patent 14 years

U.S. Cl. D21—166



347,456

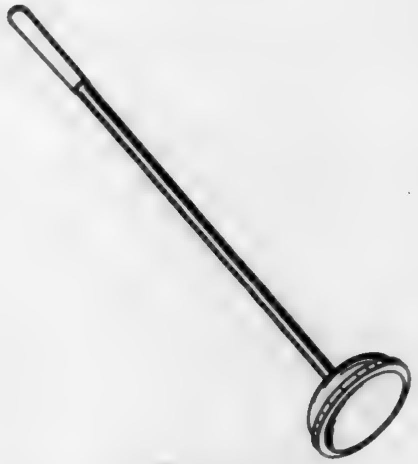
BOWLING BALL PUSHING APPARATUS

Dorsey D. Wire, 9508 Lower Azusa Rd., Temple City, Calif. 91780

Filed Mar. 12, 1993, Ser. No. 5,924

Term of patent 14 years

U.S. Cl. D21—233



347,457

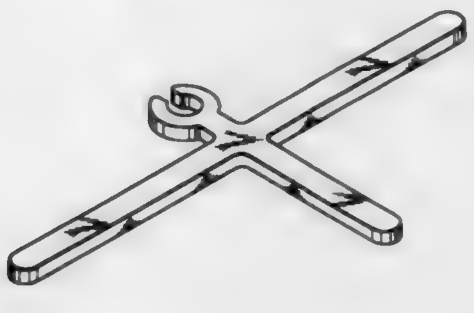
GOLF PUTTER SWING ALIGNMENT DEVICE

Walter E. Armstrong, III, Maitland, Fla., assignor to Wally Armstrong Golf, Inc., Paoli, Pa.

Filed Nov. 2, 1992, Ser. No. 995

Term of patent 14 years

U.S. Cl. D21—234



347,458

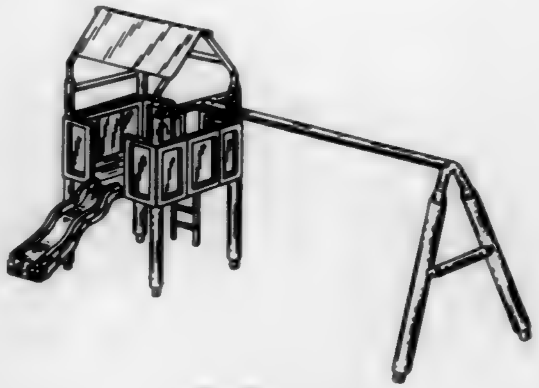
CHILDREN'S PLAY GYM

Joel C. Cunard; Robert J. Boudreau, and William H. Ziegler, Jr., all of Bedford, Pa., assignors to Hedstrom Corporation, Bedford, Pa.

Filed Feb. 3, 1993, Ser. No. 4,370

Term of patent 14 years

U.S. Cl. D21—243



347,459

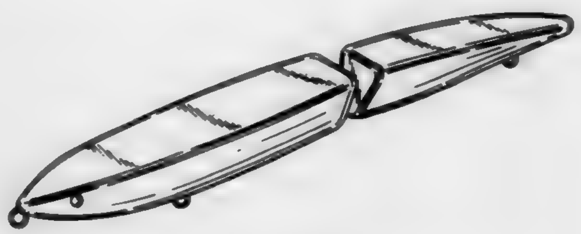
FISHING LURE

Jim Gowing, Altus, Ark., and Timothy W. Bullard, Gainesville, Tex., assignors to EBSCO Industries, Inc., Leeds, Ala.

Filed May 29, 1992, Ser. No. 890,129

Term of patent 14 years

U.S. Cl. D22—126



347,460

FISHING REEL

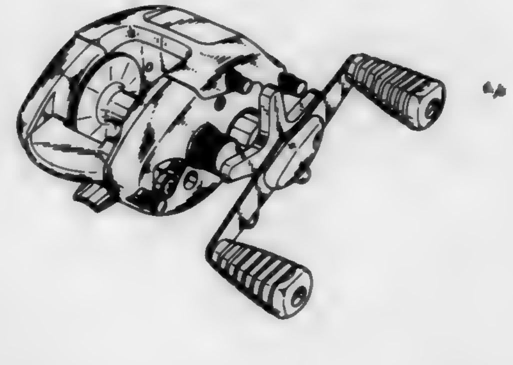
Taku Ohi, Tokyo, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 19, 1992, Ser. No. 902,284

Claims priority, application Japan, Dec. 24, 1991, 3-39120

Term of patent 14 years

U.S. Cl. D22—140



347,461

TOY SPACE COMMAND MODULE

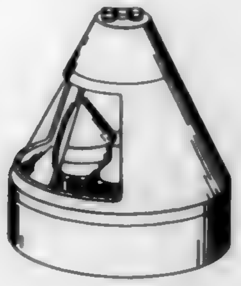
Victor J. Bertrand, Ile Bizard, Canada, assignor to The Ritvik Group Inc., Dorval, Canada

Filed Sep. 11, 1992, Ser. No. 943,601

Claims priority, application Canada, May 12, 1992, 12-05-92-6

Term of patent 14 years

U.S. Cl. D21—87



347,462

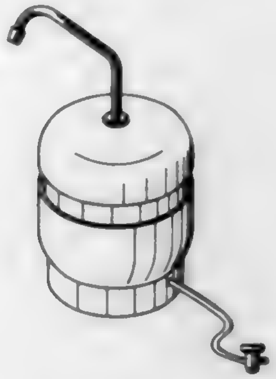
WATER PURIFICATION UNIT

John H. Douglas, Boca Raton, Fla., assignor to H. T. Manufacturing, Inc., Clearwater, Fla.

Filed Feb. 21, 1992, Ser. No. 837,987

Term of patent 14 years

U.S. Cl. D23—209



347,463

SPRAY GUN

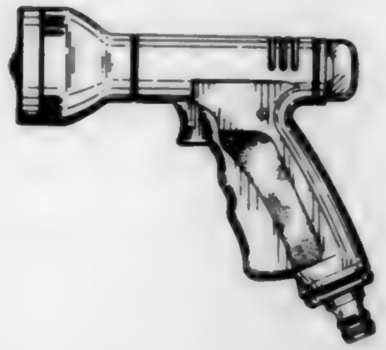
Jonathan F. M. Kingston, Monks Risborough, and Robert D. Boughton, Buckingham, both of England, assignors to Hozelock Limited, Buckinghamshire, England

Filed Aug. 27, 1992, Ser. No. 936,906

Claims priority, application United Kingdom, Aug. 29, 1991, 9118510

Term of patent 14 years

U.S. Cl. D23—223



347,464

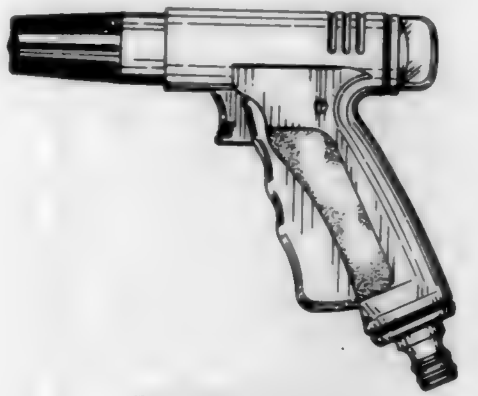
SPRAY GUN

Jonathan F. M. Kingston, Monks Risborough, and Robert D. Boughton, Buckingham, both of England, assignors to Hozelock Limited, Buckinghamshire, England

Filed Aug. 27, 1992, Ser. No. 936,905

Term of patent 14 years

U.S. Cl. D23—223



347,465

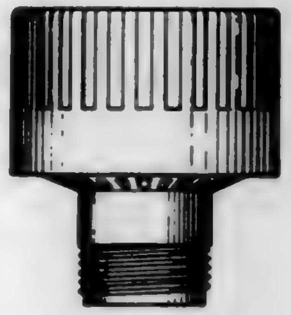
BACKFLOW PREVENTION VALVE

Cosmo Luppino, Murray Bridge, Australia, assignor to James Hardie Irrigation Pty Limited, Australia

Filed Aug. 26, 1993, Ser. No. 12,221

Term of patent 14 years

U.S. Cl. D23—233



347,466

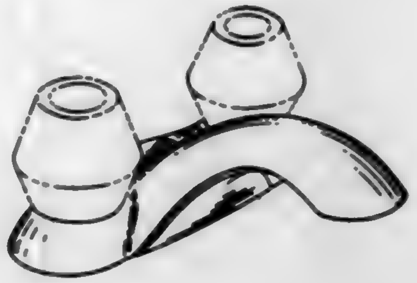
FAUCET BODY

Paul P. Kolada, Bexley; Michael J. Painter, Delaware, and Terry Birchler, Westerville, all of Ohio, assignors to Moen Incorporated, Elyria, Ohio

Filed Mar. 20, 1992, Ser. No. 854,968

Term of patent 14 years

U.S. Cl. D23—241



347,467

SLEEVE FOR A QUICK CONNECT FLUID COUPLING

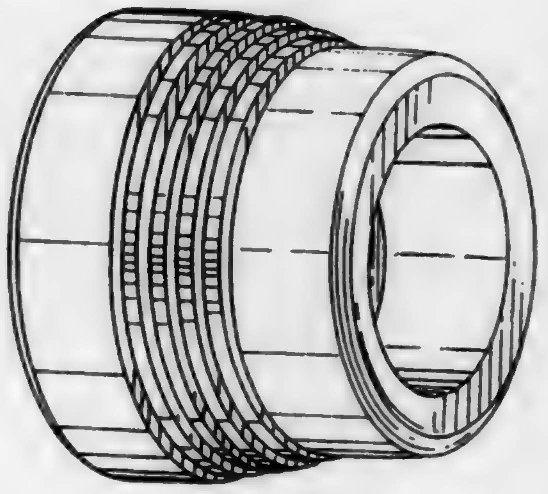
Richard J. Medvick, Shaker Heights, Ohio, assignor to Swagelok Quick-Connect Co., Hudson, Ohio

Filed Sep. 1, 1988, Ser. No. 239,419

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—262



347,468

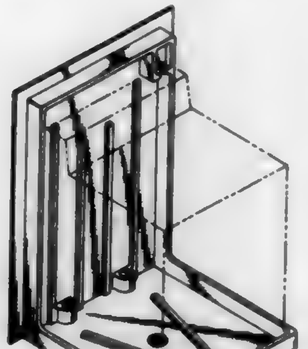
CLOTHES WASHER INSTALLATION RECEPTACLE

Addison M. Johnson, 1346 E. Juniper Beach Rd., Camano Island, Wash. 98292

Filed May 29, 1992, Ser. No. 891,458

Term of patent 14 years

U.S. Cl. D23—270



347,469

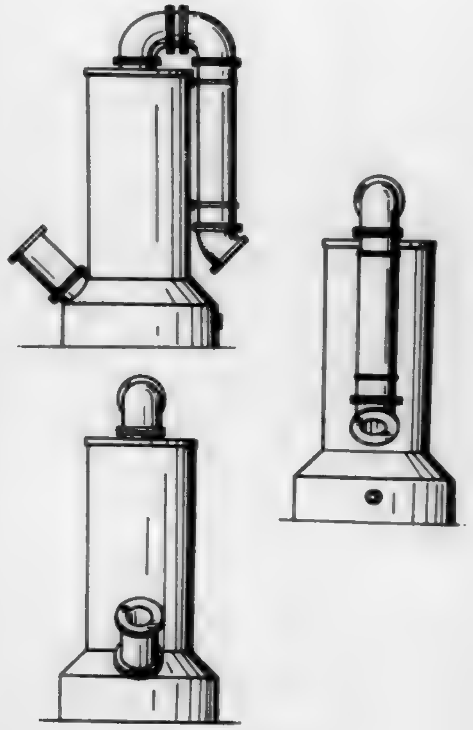
AIR SCRUBBER UNIT FOR USE IN REMOVAL OF POLLUTANTS FROM THE AIR

David J. Hunniford, Sarasota, Fla., assignor to Davis Water & Waste Industries, Inc., Tallevast, Fla.

Filed May 31, 1991, Ser. No. 708,624

Term of patent 14 years

U.S. Cl. D23—364



347,470

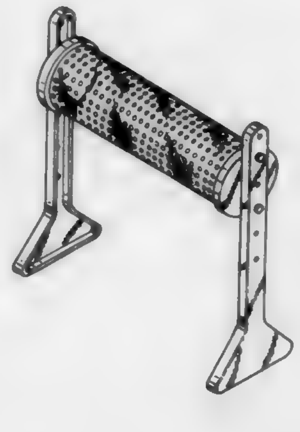
POTPOURRI CANISTER

Ethel Kehrberger, 885 Hawthorne, Ypsilanti, Mich. 48198

Filed Sep. 21, 1992, Ser. No. 948,888

Term of patent 14 years

U.S. Cl. D23—366



347,471

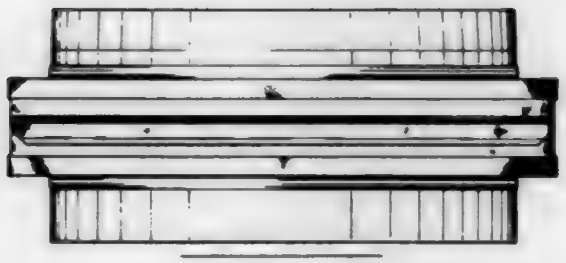
DAMPER FOR A VENTILATION TURBINE

Carlos DeHerrera, 2106 Timberview La., Arlington, Tex. 76014

Filed Aug. 5, 1991, Ser. No. 740,217

Term of patent 14 years

U.S. Cl. D23—373



347,472

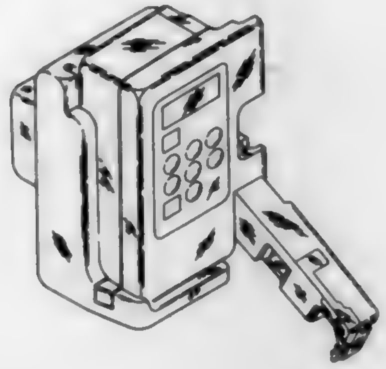
COMBINED PERISTALTIC INFUSION PUMP AND CHARGER UNIT

Richard A. Sunderland, St. Charles; Clarence L. Walker, Webster Groves, and Mark A. Davis, O'Fallon, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 683,760, Apr. 11, 1991, and a continuation-in-part of Ser. No. 689,597, Apr. 19, 1991, Pat. No. Des. 342,231, and a continuation-in-part of Ser. No. 538,791, Jun. 15, 1990, Pat. No. 5,057,081. This application Sep. 23, 1991, Ser. No. 764,402

Term of patent 14 years

U.S. Cl. D24—111



347,473

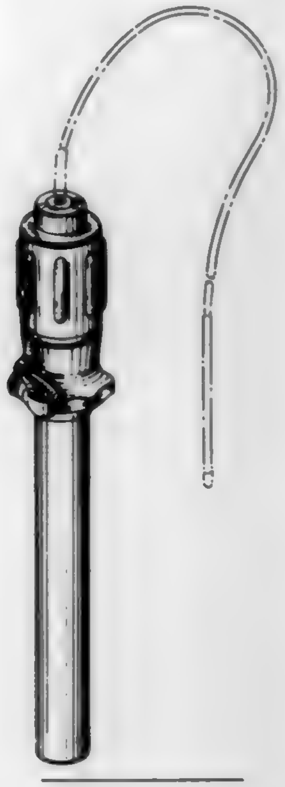
STEERABLE CATHETER HANDLE

Raymond P. Nitzsche, Edison, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Filed Apr. 10, 1992, Ser. No. 866,837

Term of patent 14 years

U.S. Cl. D24—112



347,474

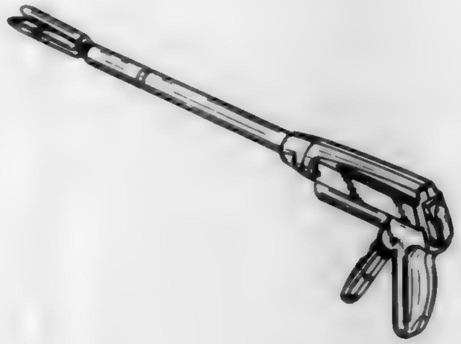
ENDOSCOPIC STAPLER

Todd J. Olson, Loveland, Ohio, assignor to Ethicon, Inc., Somerville, N.J.

Filed Oct. 11, 1991, Ser. No. 775,371

Term of patent 14 years

U.S. Cl. D24—145



347,475

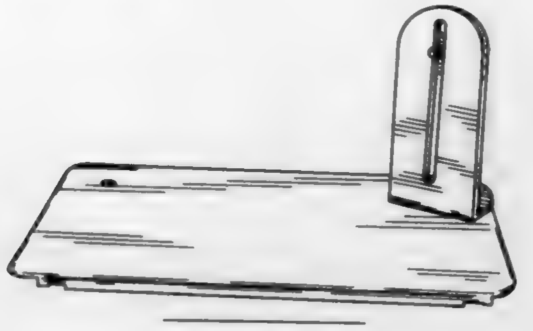
MAGNETIC RESONANCE IMAGING COIL BRACKET

Kenneth S. Meacham, 1502 Woodknoll Dr., West Carrolton, Ohio 45449

Filed Feb. 21, 1992, Ser. No. 837,998

Term of patent 14 years

U.S. Cl. D24—158



347,476

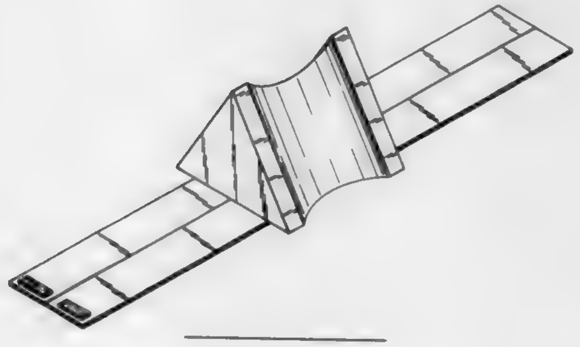
COMBINED KNEE CUSHION AND ELEVATOR

Jack D. McDonald, Pensacola, Fla., assignor to Florida Foam Fabricators, Inc., Pensacola, Fla.

Filed Jun. 15, 1992, Ser. No. 897,973

Term of patent 14 years

U.S. Cl. D24—190



347,477

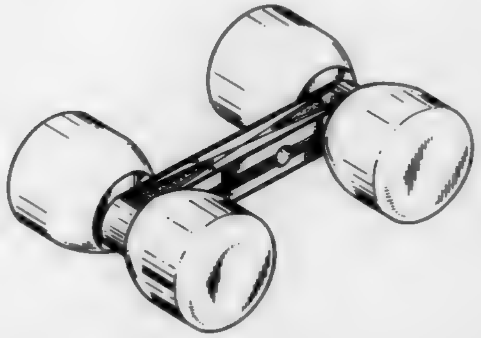
BODY MASSAGING ROLLER

Louis Morales, 2243 W. Taylor St., Chicago, Ill. 60612

Filed Dec. 11, 1992, Ser. No. 2,393

Term of patent 14 years

U.S. Cl. D24—211



347,478

LABORATORY INSTRUMENT FOR HANDLING BIMOLECULAR SAMPLES

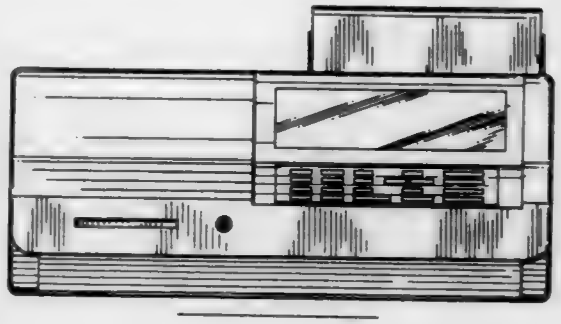
Arthur J. Pinkney, Cambridge, Great Britain, assignor to Hybaid Ltd., Great Britain

Filed Apr. 27, 1992, Ser. No. 874,576

Claims priority, application United Kingdom, Nov. 5, 1991, 2018757

Term of patent 14 years

U.S. Cl. D24—216



347,479

BOTTLE FOR A LABORATORY ANALYZER

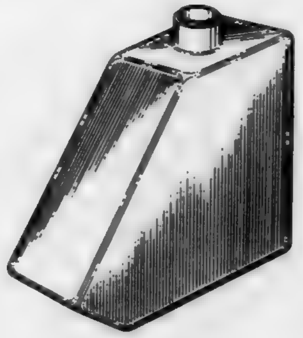
Christian M. Hansen; Robert C. Butcher, Jr., both of Medway, and Kevin D. Lear, Franklin, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Apr. 15, 1992, Ser. No. 869,344

The portion of the term of this patent subsequent to Nov. 9, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—224



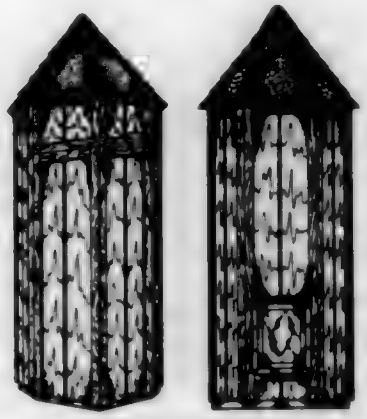
347,480
MINI SQUARE SILO

Ronald V. Deeke, 110 Glen Ellyn Rd. (I.N.), and Gary A. Deeke, 110 Glen Ellyn Rd. (G.S.), both of Bloomingdale, Ill. 60108

Filed Jun. 18, 1992, Ser. No. 900,590

Term of patent 14 years

U.S. Cl. D25—26



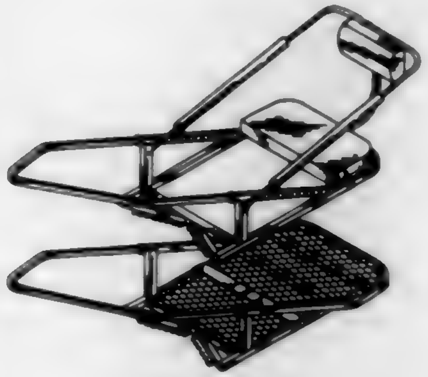
347,481
DEER STAND

Jimmy Ashley, 305 W. Albemarle St., Edenton, N.C. 27932, and Thomas E. Graham, Sr., P.O. Box 1727, Wilmington, N.C. 28406

Filed Feb. 18, 1992, Ser. No. 837,336

Term of patent 14 years

U.S. Cl. D25—62



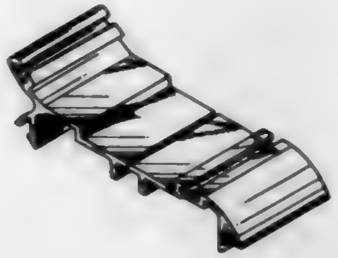
347,482
SHAPED BAR FOR WINDOW FRAMES

Maurice Meshulam, Kiryat Motzkin, Israel, assignor to Klil Industries Ltd., Motzkin, Israel

Filed Mar. 27, 1990, Ser. No. 499,678

Term of patent 14 years

U.S. Cl. D25—119



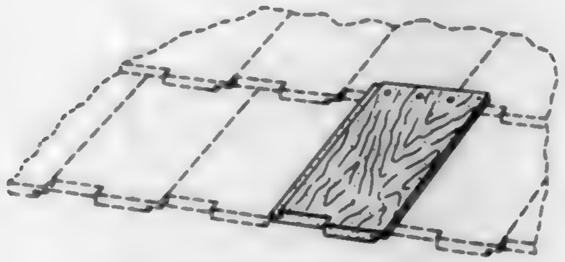
347,483
CONCRETE ROOF TILE

John F. Thomas, Villa Park, Calif., assignor to Monier Roof Tile Inc., Orange, Calif.

Filed Sep. 21, 1990, Ser. No. 591,847

Term of patent 14 years

U.S. Cl. D25—139



347,484
TAILLIGHT FOR BICYCLE

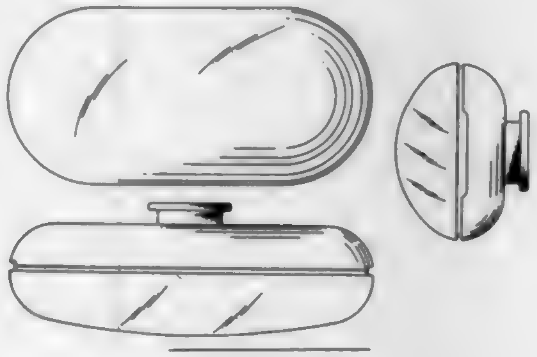
Masao Tsushi, Osaka, Japan, assignor to Cateye Co., Ltd., Osaka, Japan

Filed Mar. 4, 1993, Ser. No. 5,434

Claims priority, application Japan, Sep. 4, 1992, 4-26236

Term of patent 14 years

U.S. Cl. D26—36



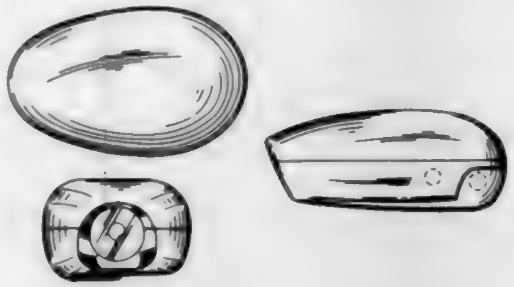
347,485
GARDEN LAMP HOUSING

Hitoshi Kira, Westlake Village, Calif., assignor to Lumiere Design & Manufacturing, Inc., Westlake Village, Calif.

Filed May 4, 1992, Ser. No. 878,426

Term of patent 14 years

U.S. Cl. D26—67



347,486
SUSPENDED LUMINAIRE

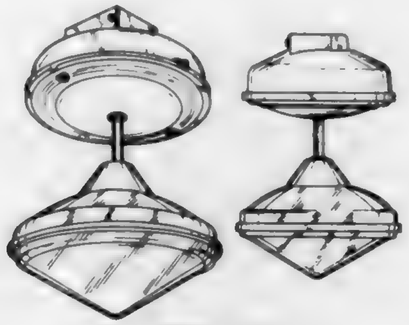
Harold T. Gruber, Summit Station; Bonnie J. Brohard, Newark; William W. Belisle, Newark, and Herbert A. Fouke, Newark, all of Ohio, assignors to Holophane Lighting, Inc., Newark, Ohio

Filed Feb. 27, 1992, Ser. No. 844,375

The portion of the term of this patent subsequent to Mar. 22, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D26—85



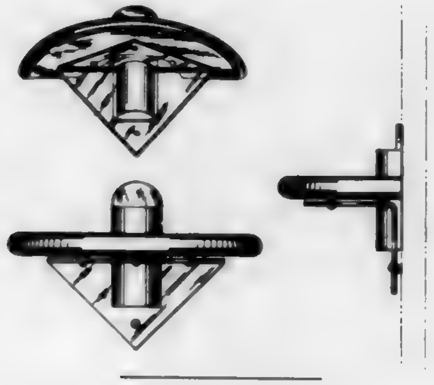
347,487
WALL LIGHTING FIXTURE

Dennis E. Johnson, Grafton, and Scott P. Malmsten, West Bend, both of Wis., assignors to SPI Lighting, Inc., Mequon, Wis.

Filed Oct. 15, 1992, Ser. No. 962

Term of patent 14 years

U.S. Cl. D26—85



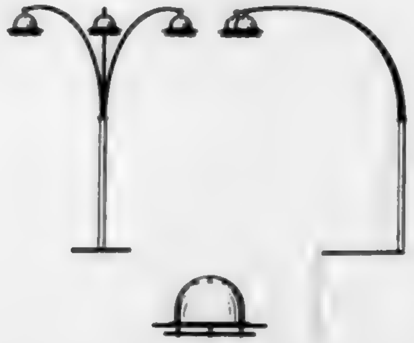
347,488
MULTI-SHADE ARC BOOM LAMP

Barry L. Kramer, 6180 S. St. Andrews Pl., Los Angeles, Calif. 90047

Filed Jun. 22, 1992, Ser. No. 902,058

Term of patent 14 years

U.S. Cl. D26—102



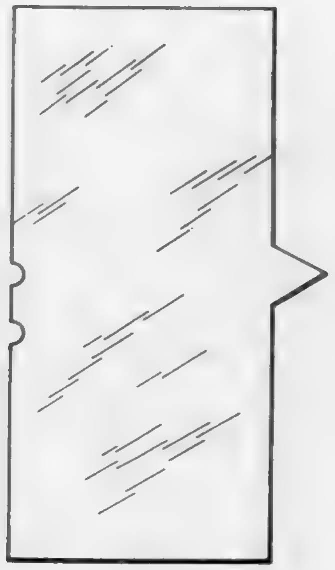
347,489
CIGARETTE SHEET ROLLING DEVICE FOR FORMING CIGARETTES

Arnold Kastner, 10220 Armand-Lavergne, Montreal, Quebec H1H 3N5, Canada

Filed Apr. 6, 1992, Ser. No. 864,021

Term of patent 14 years

U.S. Cl. D27—194



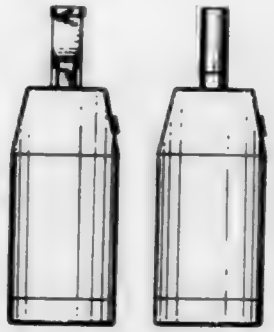
347,490
ELECTRICAL CIGARETTE

Edward S. Gee, Midlothian; A. Clifton Lilly, Chesterfield; D. Bruce Losee, Richmond; James L. Myracle, Jr., Midlothian; Jerry F. Whidby, Richmond; Francis V. Utsch, Midlothian; Constance H. Morgan, Midlothian, and F. Murphy Sprinkel, Glen Allen, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 675,463, Mar. 25, 1991. This application May 25, 1993, Ser. No. 8,754

Term of patent 14 years

U.S. Cl. D27—194



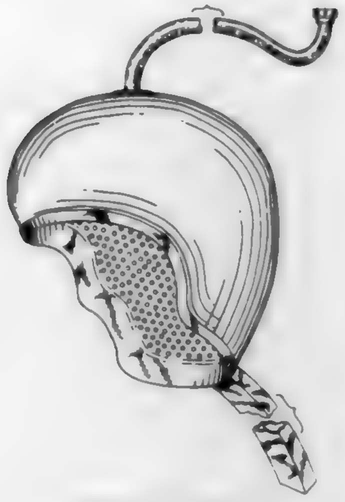
347,491
HAIR RINSING CAP

Ruth T. Holloway, 20123-G Henderson Rd., Davidson, N.C. 28036

Filed Apr. 18, 1991, Ser. No. 687,422

Term of patent 14 years

U.S. Cl. D28—20



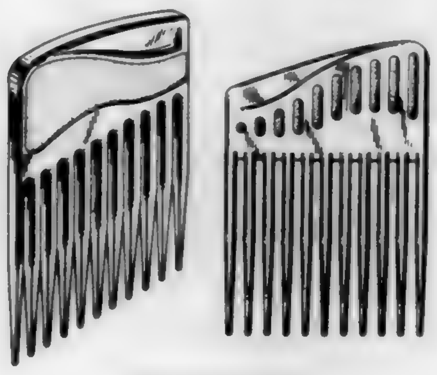
347,492
HAIR PICK

Delton A. Kruschke, Apple Valley, and Douglas A. Soller, Eden Prairie, both of Minn., assignors to Mebco Industries, Inc., Shakopee, Minn.

Filed Oct. 2, 1992, Ser. No. 72

Term of patent 14 years

U.S. Cl. D28—31



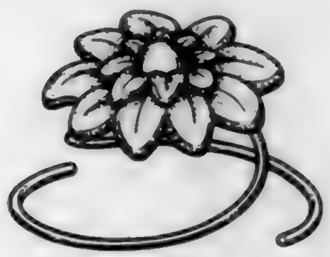
347,493
HAIR ORNAMENT

Irja Connolly, 23941 Rockford, Dearborn, Mich. 48124

Filed Oct. 6, 1992, Ser. No. 162

Term of patent 14 years

U.S. Cl. D28—41



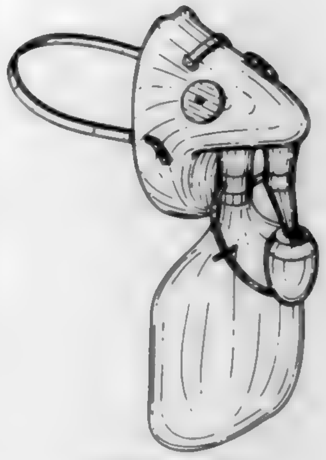
347,494
RESCUE OXYGEN-MEDICATION MASK

Enrique Mustelier, Jr., 400 Sarto Ave., Coral Gables, Fla. 33134-7156

Filed Aug. 25, 1992, Ser. No. 934,345

Term of patent 14 years

U.S. Cl. D29—7



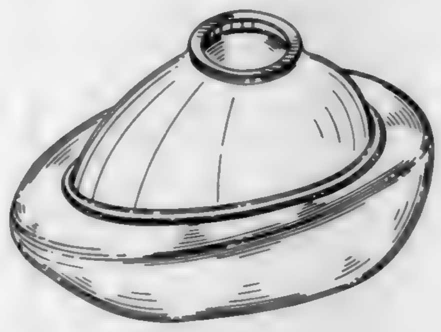
347,495
NASAL POCKET MASK

Gene R. Baldwin, 324 N. Gardiner Ave., Rockford, Ill. 61107

Filed Feb. 3, 1992, Ser. No. 829,177

Term of patent 14 years

U.S. Cl. D29—8



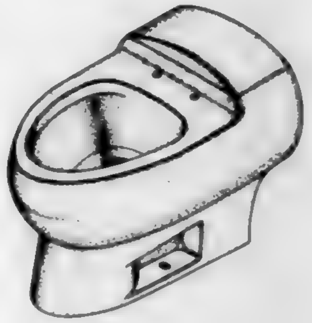
347,496
WATER CLOSET

Ming-kuo Wei, Taipei, Taiwan, assignor to Hocheng Pottery Mfg. Co. Ltd., Taipei, Taiwan

Filed Jun. 10, 1992, Ser. No. 896,550

Term of patent 14 years

U.S. Cl. D23—301



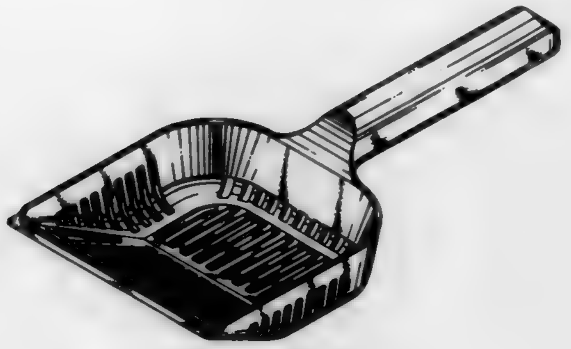
347,497
LITTER SCOOP

Ralph VanSkiver, Arlington, Tex., assignor to Doskocil Manufacturing Company, Inc., Arlington, Tex.

Filed May 25, 1993, Ser. No. 8,722

Term of patent 14 years

U.S. Cl. D30—162



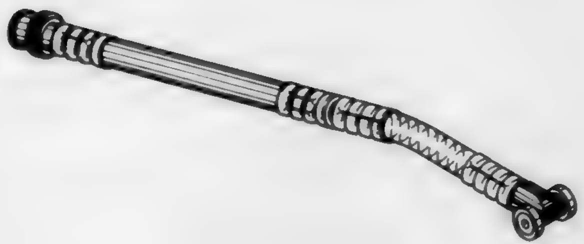
347,498
PIPE CLEANING APPARATUS

Charles M. Cannon, 1355 E. 66 Pl., Tulsa, Okla. 74136

Filed Feb. 13, 1990, Ser. No. 479,584

Term of patent 14 years

U.S. Cl. D32—14



347,499
SWEEPING MACHINE

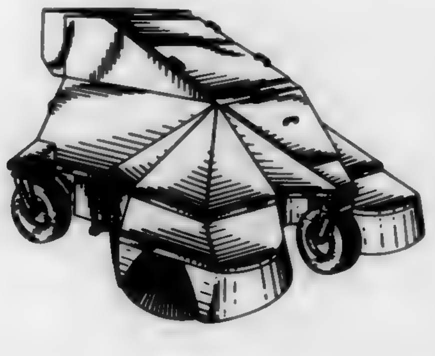
Owe Westin, P.O. Box 322, S-951 25 Lulea, Sweden

Filed Dec. 9, 1991, Ser. No. 805,708

Claims priority, application Sweden, Jun. 7, 1991, 91-1174

Term of patent 14 years

U.S. Cl. D32—20



347,500
ELECTRIC VACUUM CLEANER

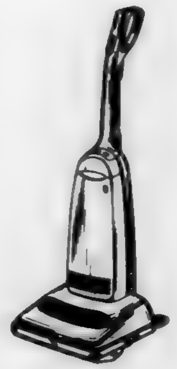
Toru Abe, Hyogo; Takashi Shoji, and Toshiaki Tsuruha, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 5, 1992, Ser. No. 1,502

Claims priority, application Japan, Jun. 18, 1992, 4-18307

Term of patent 14 years

U.S. Cl. D32—22



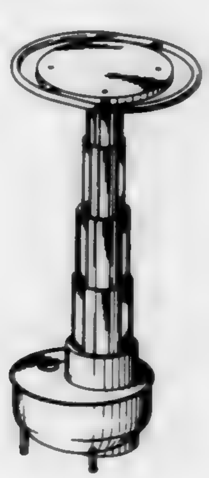
347,501
EXPANDABLE SUPPORT PEDESTAL FOR A CAMERA

Leonard T. Chapman, North Hollywood, Calif., assignor to Leonard Studio Equipment, Inc., North Hollywood, Calif.

Continuation-in-part of Ser. No. 591,527, Oct. 1, 1990, Pat. No. Des. 338,030. This application Sep. 16, 1991, Ser. No. 761,039

Term of patent 14 years

U.S. Cl. D16—242



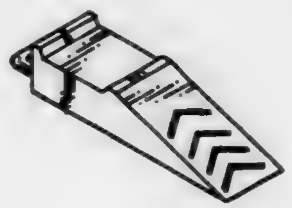
347,502
MICRO AUTOMOBILE RAMP

Stephen D. Mazza, 140 River St., Milton, Vt. 05468

Filed Jan. 4, 1993, Ser. No. 3,255

Term of patent 14 years

U.S. Cl. D34—32



347,503

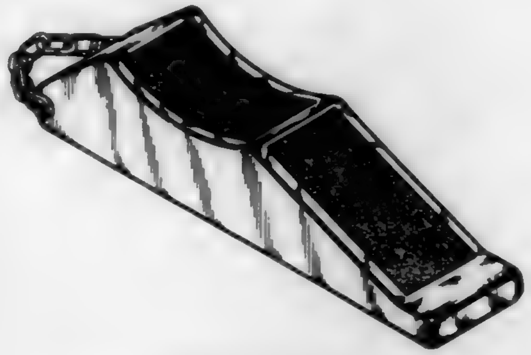
TRAILER RAMP

Harry L. Wallace, Medford, N.J., and Frederick W. Taht, Port St. Lucie, Fla., assignors to E-Quest, Inc., Medford, N.J.

Filed Jan. 8, 1993, Ser. No. 3,369

Term of patent 14 years

U.S. Cl. D34—32



347,504

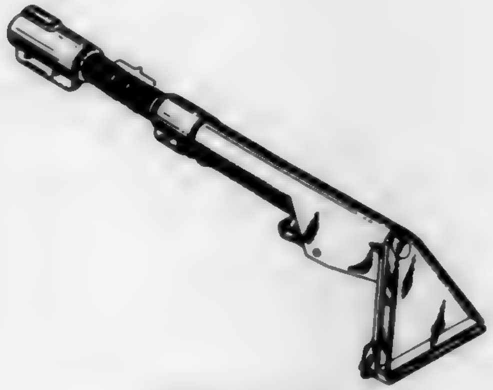
HAND TOOL FOR A CLEANING DEVICE

Kent J. Furcron, Bristol, Va., and Ricky A. Owens, Bristol, Tenn., assignors to The Regina Company, Atlanta, Ga.

Filed Jul. 15, 1991, Ser. No. 730,292

Term of patent 14 years

U.S. Cl. D32—33



347,505

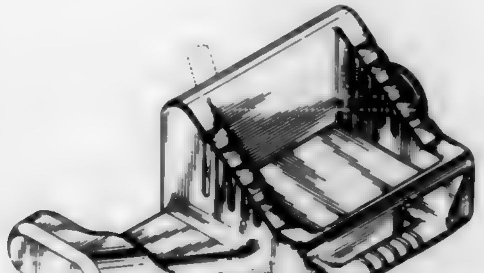
MOTORIZED GOLF BAG CART CHASSIS

Edmund Machen; Edgar Montague, and James Machen, all of Charlotte, N.C., assignors to Kangaroo Products Company, Columbus, N.C.

Filed Dec. 4, 1992, Ser. No. 2,328

Term of patent 14 years

U.S. Cl. D34—15



347,506

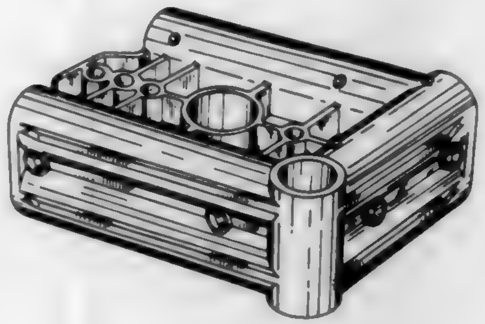
CORNER JOINT OF A CHASSIS FOR A CART

Takeyasu Murakami; Chizuru Morioka, and Keiichi Nakamura, all of Shizuoka, Japan, assignors to Yazuki Industrial Chemical Co., Ltd., Shizuoka, Japan

Filed Mar. 31, 1992, Ser. No. 860,875

Term of patent 14 years

U.S. Cl. D34—27



347,507

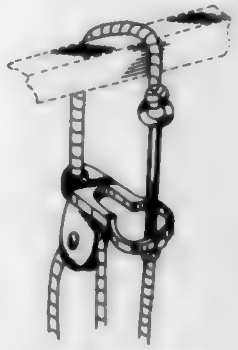
COMBINATION HOOK AND PULLEY

Theodore R. Austin, Box 2227, Minot, N. Dak. 58702

Filed Nov. 16, 1992, Ser. No. 1,500

Term of patent 14 years

U.S. Cl. D34—35



347,508

MAIN BODY OF LEVER-TYPE WINDING MACHINE

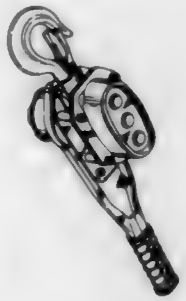
Haruo Kubota, and Yoshio Nishi, both of Osaka-Sayama, Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan

Continuation of Ser. No. 802,430, Dec. 4, 1991, abandoned. This application Jun. 10, 1993, Ser. No. 9,331

Claims priority, application Japan, Jun. 6, 1991, 3-16786

Term of patent 14 years

U.S. Cl. D34—35



347,509

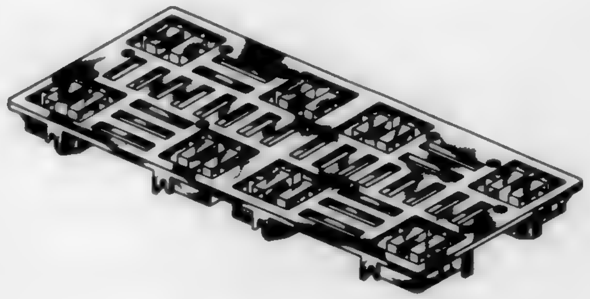
PALLET ASSEMBLY

Satria Junaedi, Arcadia, Calif., assignor to Satria International, Temple City, Calif.

Filed Dec. 21, 1992, Ser. No. 2,861

Term of patent 14 years

U.S. Cl. D34—38



347,510

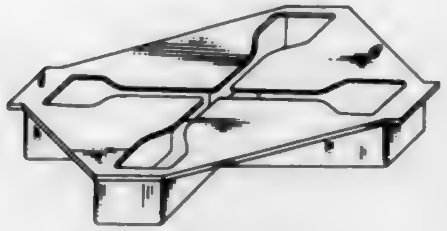
NEWSPAPER BUNDLING ARTICLE

Arthur D. Riddick, 36 Norton Rd., East Brunswick, N.J. 08816

Filed Mar. 15, 1993, Ser. No. 5,874

Term of patent 14 years

U.S. Cl. D34—38



347,511

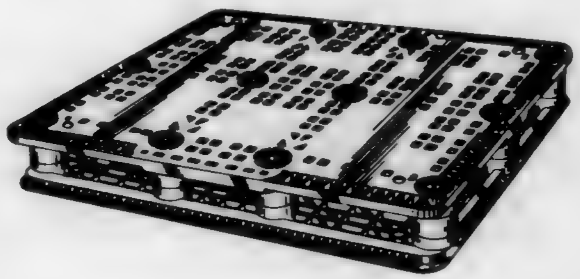
TWO PART INTERLOCKING PLASTIC PALLET ASSEMBLY

Brandon L. Pigott, 1017 Elmwood Ave., Wilmette, Ill. 60091; Schuyler F. Pigott, 1122 N. Patton St., Arlington Heights, Ill. 60004; Peter S. Pigott, 803 Elmwood Ave., Wilmette, Ill. 60091, and Maurice J. Pigott, 591 Cherry St., Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 7,372, Apr. 21, 1993, which is a continuation-in-part of Ser. No. 961,396, Oct. 15, 1992, which is a continuation-in-part of Ser. No. 644,928, Jan. 23, 1991, Pat. No. 5,197,395, which is a continuation-in-part of Ser. No. 230,025, Aug. 9, 1988, Pat. No. 4,843,976. This application Sep. 2, 1993, Ser. No. 12,508

Term of patent 14 years

U.S. Cl. D34—38



347,512

BASKET

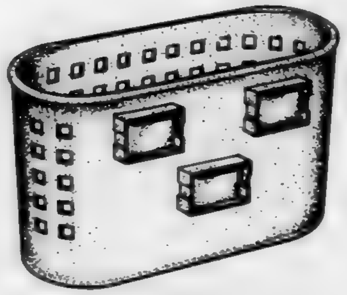
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan

Filed Aug. 27, 1992, Ser. No. 935,744

Claims priority, application Japan, May 15, 1992, 4-14211

Term of patent 14 years

U.S. Cl. D3—304



347,513

BASKET

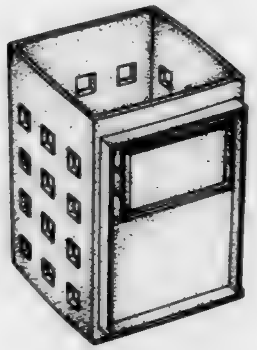
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan

Filed Aug. 27, 1992, Ser. No. 935,781

Claims priority, application Japan, May 15, 1992, 4-14212

Term of patent 14 years

U.S. Cl. D3—304



347,514

BASKET

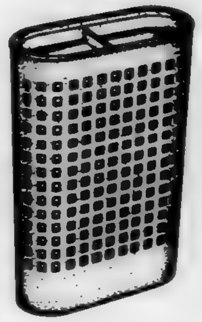
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan

Filed Aug. 27, 1992, Ser. No. 935,748

Claims priority, application Japan, May 15, 1992, 4-14218

Term of patent 14 years

U.S. Cl. D3—308



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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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  - Layton, Mark R.; Palmer, Ramon L., Jr.; and Smith, Lester L., 5,316,484, Cl. 434-226.000.
- AB Volvo: *See—*
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- ABB Mineral Slurry Transportation Pty. Ltd.: *See—*
  - Hore, Donald G., deceased; Longworth, Norman J.; McCarthy, David; and Pullum, Lionel, 5,316,451, Cl. 417-392.000.
- ABB Stal AB: *See—*
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- ABB Vetco Gray Inc.: *See—*
  - Fernandez, Randolfo M., 5,316,089, Cl. 175-7.000.
- Abbott Laboratories: *See—*
  - Coutre, James E.; Griffin, Wayne P.; and Crisler, Charles M., 5,317,506, Cl. 364-413.020.
  - Hirschi, Richard E.; Karbowski, James P.; Tiefenthal, James L.; and Isaac, Ronald M., 5,316,024, Cl. 128-899.000.
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- Adger, Brian: *See—*
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- Adir et Compagnie: *See—*
  - Fauchere, Jean-Luc; Kucharczyk, Nathalie; Morris, Angela D.; Paladino, Joseph; Bonnet, Jacqueline; and Thurieau, Christophe, 5,317,014, Cl. 514-17.000.
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- Advanced Cardiovascular Systems: *See—*
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  - Brunken, Dean E.; and Hagen, Arnulf P., 5,316,799, Cl. 427-421.000.
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- Advanced Polymer Systems, Inc.: *See—*
  - Eury, Robert P.; and Patel, Rajesh, 5,316,774, Cl. 424-501.000.
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  - Bloodworth, Robert; Podszun, Wolfgang; Defieuw, Geert; Uytterhoeven, Herman; and Schulze, Hans, 5,317,000, Cl. 503-227.000.
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  - Dewhurst, John E.; Pearlstein, Ronald M.; Panunto, Thomas W.; and Machado, Reinaldo M., 5,317,075, Cl. 528-44.000.
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- Aisin Seiki Kabushiki Kaisha: *See—*
  - Yagi, Wataru; Yamada, Masuo; Ishii, Masami; Makimura, Yukuo; Kurikuma, Tsutomu; and Akita, Norihiro, 5,316,068, Cl. 164-58.100.
- Ajinomto Co., Inc.: *See—*
  - Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.
- Ajiro, Taiko: *See—*
  - Fujimori, Haruo; Matsui, Tetsuya; Ajiro, Taiko; Yokose, Kenji; and Izumi, Shigeru, 5,316,983, Cl. 437-250.000.
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  - Maehara, Toshifumi, 5,316,378, Cl. 303-84.200.
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  - Lundquist, Jan; Stenstrom, Lennart; and Akervall, Sven, 5,317,473, Cl. 361-117.000.
- Akimoto, Kenji: *See—*
  - Yamamoto, Tamotsu; and Akimoto, Kenji, 5,316,862, Cl. 428-522.000.
- Akimoto, Osamu: *See—*
  - Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.
- Akita, Norihiro: *See—*
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- Akita, Ryuya; and Hirabayashi, Shigefumi, to Mazada Motor Corporation. System for steering rear wheels of an automotive vehicle. 5,316,098, Cl. 180-140.000.
- Akiyama, Setsuo: *See—*
  - Yoshikawa, Masato; Kusano, Yukihiro; Akiyama, Setsuo; Naito, Kazuo; Okazaki, Satiko; and Kogoma, Masuhiro, 5,316,739, Cl. 433-186.050.
- Akzo N.V.: *See—*
  - Subramanian, Ramaswamy, 5,317,091, Cl. 424-1.530.
  - Walsh, Jill, 5,316,764, Cl. 424-89.000.
- Albany International Corp.: *See—*
  - Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabs, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.
- Albrecht, Bernard M., Jr.: *See—*
  - Yung, Ming L.; Albrecht, Bernard M., Jr.; Muhlhauser, Nicholas L.; and Herbusky, Stephen T., 5,317,288, Cl. 332-144.000.
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  - Johnson, John J.; and Timsit, Roland S., 5,316,863, Cl. 428-548.000.
- Alcatel Cit: *See—*
  - Marcel, Francois; Sallaerts, Dany; Allaire, Serge; and Dore, Pierre, 5,317,571, Cl. 370-103.000.
- Alcatel Network Systems, Inc.: *See—*
  - Bowdon, Edward K., 5,317,310, Cl. 340-826.000.
  - Weber, William F., 5,317,105, Cl. 174-35.0GC.
- Alcatel N.V.: *See—*
  - Fox, Ronald C. S., 5,317,634, Cl. 379-362.000.
  - Thomas, Gerard; and Oliveros, Alain, 5,317,318, Cl. 342-44.000.
- Alcatel SEL A.G.: *See—*
  - Veith, Gustav, 5,317,660, Cl. 385-24.000.
- Alder, Michael J.: *See—*
  - Baedke, William D.; and Alder, Michael J., 5,316,106, Cl. 184-6.120.
- Aldissi, Mahmoud, to Champlain Cable Corporation. Conductive polymer cable assembly. 5,317,109, Cl. 174-84.00C.
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  - Jewett, Douglas E.; Webster, Phil; Aldridge, Dave; Norwood, Peter C.; and Mehta, Nikhil A., 5,317,752, Cl. 395-750.000.
- Alessi, Donald P., Jr.: *See—*
  - Perry, John H., Jr.; Person, Abraham; Misiaszek, Steven M.; and Alessi, Donald P., Jr., 5,316,869, Cl. 429-19.000.
- Alewelt, Wolfgang: *See—*
  - Freitag, Dieter; Wulff, Claus; Alewelt, Wolfgang; and Kauth, Hermann, 5,317,083, Cl. 528-499.000.
- Alexander, Robert H., Jr.: *See—*
  - Rubacha, Robert F.; Alexander, Robert H., Jr.; Keenan, Glenn M.; and Lagonegro, Paul R., 5,317,377, Cl. 355-319.000.
- Alexandrescu, Carol: *See—*
  - Loesch-Fries, L. Sue; Eagan, Nancy J.; Merlo, Donald J.; and Alexandrescu, Carol, 5,316,930, Cl. 435-172.300.
- Alfred Teves GmbH: *See—*
  - Dreilich, Ludwig; Woeradoerfer, Karl-Friedrich; Egerer, Thomas; and Worms, Reinhold, 5,315,860, Cl. 73-9.000.
- Alkaitis, Saulius A.: *See—*
  - Pinsky, Naum; and Alkaitis, Saulius A., 5,316,846, Cl. 428-325.000.
- Alkaloida Chemical Company Ltd.: *See—*
  - Borsodi, Anna; Furst, Zsuzsa; Hosztafi, Sandor; Varga, Schafferne E.; Buzas, Beata; Friedmann, Tamas; Benyhe, Sandor; and Szucs, Maria, 5,317,022, Cl. 514-282.000.
- Allaire, Serge: *See—*
  - Marcel, Francois; Sallaerts, Dany; Allaire, Serge; and Dore, Pierre, 5,317,571, Cl. 370-103.000.
- Alland, Stephen W.: *See—*
  - Fagarasan, John T.; Alland, Stephen W.; and Jakaub, Ronald J., 5,317,319, Cl. 342-53.000.
- Allemand, Charly D., to Inspex, Inc. Particle detection method and apparatus. 5,317,380, Cl. 356-338.000.
- Allen-Bradley Co., Inc.: *See—*
  - Bruski, Gary P.; and Malkowski, Chester, Jr., 5,317,117, Cl. 200-144.00R.
- Allen, Daniel C., to Gabriel Electronics Incorporated. Horn reflector antenna with absorber lined conical feed. 5,317,328, Cl. 343-786.000.
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  - Turangan, Farid J., 5,316,294, Cl. 273-65.0EG.
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  - Chan, Jimmy C.; and Kocsis, Betty H., 5,316,790, Cl. 427-142.000.
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  - Lavin, Thomas J., 5,317,381, Cl. 356-350.000.
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  - Page, George W.; High, Glen T.; Looper, David L.; Frew, James S.; Prevallet, Larry C.; and Free, Joseph W., 5,315,819, Cl. 60-39.282.
- AlliedSignal Inc.: *See—*
  - Aniano, John B., 5,317,575, Cl. 372-6.000.
  - Bancroft, Stephen; and Chen, Susan S., 5,317,514, Cl. 364-449.000.
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  - Ono, Yasuichi; Miura, Akito; and Okumura, Hirofumi, 5,315,758, Cl. 29-878.000.
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  - Patel, Rakesh H., 5,317,210, Cl. 307-465.000.
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  - Purkiss, Dennis, 5,316,140, Cl. 206-287.100.
- American Needle: *See—*
  - Kronenberger, Robert A., 5,315,715, Cl. 2-183.000.
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  - Wickersheim, Robert; and Amini, Hamed H., 5,317,750, Cl. 395-725.000.
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  - Fish, David J.; Andela, Jeffrey L., deceased; and Chiavaroli, Henry T., 5,316,288, Cl. 271-250.000.
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  - Sandstrom, Roland; Maxe, Ann; Strandberg, Tore; Lundsten, Lars; and Andersson, Alvar, 5,316,076, Cl. 165-84.000.
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  - Carlson, David K.; and Riley, Norma B., 5,316,794, Cl. 427-248.100.
  - Gronet, Christian M.; and Gibbons, James F., 5,317,492, Cl. 362-294.000.
  - Sherstinsky, Semyon; Chang, Mei; Harris, Charles C.; Mak, Alfred; Roberts, James F.; Tam, Simon W.; and Chang, Wen T., 5,316,278, Cl. 269-254.00R.
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  - Smith, Michael J., 5,315,936, Cl. 108-165.000.
- Ary Lift, Inc.: *See—*
  - Smith, Gene A., 5,315,723, Cl. 5-85.100.
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  - Konishi, Yoshihiro; Asa, Masahito; and Fujiwara, Hideki, 5,317,289, Cl. 333-17.100.
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  - Takeshi, Sano, 5,316,309, Cl. 273-273.000.
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  - Ishimura, Kazuhiko; Saito, Fumiaki; Yoshikawa, Masaaki; Okada, Misao; and Nakajima, Shinsuke, 5,316,563, Cl. 65-32.500.
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  - Monma, Yoshio; and Yamaguchi, Hiroyuki, 5,317,371, Cl. 355-274.000.
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  - Guttag, Karl M.; Asal, Michael D.; Van Aken, Jerry R.; Tebbutt, Neil; and Novak, Mark F., 5,317,333, Cl. 345-133.000.
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  - Kinoshita, Mitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.
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  - Callias, Francois, 5,317,640, Cl. 381-68.400.
- Ascom Timeplex Trading AG: *See—*
  - Joshi, Ramchandra, 5,317,566, Cl. 370-60.000.
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  - Lundquist, Jan; Stenstrom, Lennart; and Akervall, Sven, 5,317,473, Cl. 361-117.000.
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  - Berger, Steven D.; and Liddle, James A., 5,316,879, Cl. 430-5.000.
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  - Smithgall, David H.; and Woodward, Alan T., 5,316,562, Cl. 65-3.110.
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  - Enning, Norbert; Krein, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, 5,316,367, Cl. 296-189.000.
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  - Denham, Keith; and Miles, Michael, 5,315,744, Cl. 29-243.530.
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  - Rossi, Alessandro, 5,317,125, Cl. 219-110.000.
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  - Banker, Robert O.; Bacon, Kinney C.; and Bagley, Julius B., 5,317,391, Cl. 348-6.000.
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  - Banker, Robert O.; Bacon, Kinney C.; and Bagley, Julius B., 5,317,391, Cl. 348-6.000.
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Gass, Michael, 5,317,043, Cl. 521-43.500.

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Crochon, Michel; and Bellon, Veronique F., 5,315,879, Cl. 73-818.000.

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Liebermann, Benno E., 5,315,920, Cl. 99-391.000.

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Mould, Henry M.; and Bennett, Robert, 5,317,378, Cl. 356-301.000.

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Dupont, Antoine; Hepp, Bernard; and Benoit, Eric, 5,317,401, Cl. 366-678.000.

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Kassebaum, James W.; and Berk, Howard C., 5,317,003, Cl. 504-116.000.

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Lin, Chia-Cheng; Basil, John D.; Hunia, Robert M.; and Bihuniak, Peter P., 5,316,854, Cl. 428-426.000.

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LeBlanc, Ralph W.; and Bingham, Robert M., 5,316,743, Cl. 422-256.000.

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Suominen, Hannu L., 5,316,847, Cl. 428-327.000.

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Donson, Jon; Dawson, William O.; Granthan, George L.; Turpen, Thomas H.; Turpen, Ann M.; Garger, Stephen J.; and Grill, Laurence K., 5,316,931, Cl. 435-172.300.

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Kinicki, Rachel M.; Short, Kerry; Kobrenski, Joseph; and Bisson, Janice, 5,315,999, Cl. 128-660.070.

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Chundury, Deenadayalu; and Bitsch, Bernard G. J., 5,317,059, Cl. 525-66.000.

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Hartel, Gunter; Losing, Karl-Heinrich; Schurfeld, Armin; Blasczyk, Johann; and Kerkmann, Harald, 5,315,867, Cl. 73-149.000.

Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; Dejean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, to Institut Pasteur. Steroid/thyroid hormone receptor-related gene, which is inappropriately expressed in human hepatocellular carcinoma, and which is a retinoic acid receptor. 5,317,090, Cl. 530-387.100.

Blaupunkt-Werke GmbH: *See—*

Kasser, Jurgen, 5,317,313, Cl. 341-163.000.

Bloink, Raymond L.; and Powell, Bob R., to General Motors Corporation. Electrorheological compositions including $A_{1+x}Zr_2Si_xP_{3-x}O_{12}$. 5,316,687, Cl. 252-71.000.

Blonski, Robert P., to Ferro Corporation. Stable heavy metal free zircon pigments for use in plastics and paints and method for coloring thereof. 5,316,570, Cl. 106-451.000.

Bloodworth, Robert; Podszun, Wolfgang; Defieuw, Geert; Uytterhoeven, Herman; and Schulze, Hans, to AGFA-Gevaert AG. Acceptor element for thermosublimation printing. 5,317,000, Cl. 503-227.000.

Bloom, Adam H.: *See—*

Prentiss, Mara; Mervis, Juliet A.; Bloom, Adam H.; and Zarinetchi, Farhad, 5,317,452, Cl. 359-819.000.

Blum, Ronald D.; Gupta, Amitava; and Bennington, Steve, to InnoTech, Inc. Method of producing durable bonds between an optical preform and an optical resin layer cast on the preform surface. 5,316,702, Cl. 264-1.700.

Blume, Robert F. Foundation drainage system. 5,316,410, Cl. 405-45.000.

Board of Regents, The University of Texas System: *See—*

Deckard, Carl R., 5,316,580, Cl. 118-110.000.

Georgiou, George; Phelps, Patricia; and Speitel, Gerald E., Jr., 5,316,940, Cl. 435-252.100.

Sherry, A. Dean; and van Westrenen, Jeroen, 5,316,757, Cl. 424-9.000.

Boatman, L. Terry; Ethridge, Charles O.; Pedersen, Kristen L; and Poranski, Peter F., Sr., to Sofec, Inc. Disconnectable mooring system. 5,316,509, Cl. 441-3.000.

Boc Group, Inc., The: *See—*

Alcala, J. Ricardo, 5,315,993, Cl. 128-634.000.

BOC Group plc, The: *See—*

Lethbridge, Paul G., 5,317,270, Cl. 324-460.000.

BOC Health Care, Inc.: *See—*

Tobia, Ronald L., 5,315,989, Cl. 128-204.280.

Boche, Daniel K.: *See—*

Gladfelter, Elizabeth J.; Outlaw, Tina O.; Copeland, James L.; Schulz, Rhonda K.; Boche, Daniel K.; and Peterson, Jeff W., 5,316,688, Cl. 252-90.000.

Bocinski, D. Michael; Kaufman, Craig A.; Kisacky, Randy J.; Kunz, Barton H.; Stone, Lawrence A.; Raski, Jerry Z.; Schaefer, David B.; and Schmidt, Douglas A., to International Business Machines Corporation. Band line printer with grooved platen. 5,315,928, Cl. 101-93.140.

Boehringer Ingelheim International GmbH: *See—*

Adolf, Gunther, 5,317,089, Cl. 530-351.000.

Boehringer Mannheim GmbH: *See—*

Maurer, Eberhard; and Deeg, Rolf, 5,316,784, Cl. 427-2.000.

Boeing Company, The: *See—*

Thompson, R. Bruce, 5,316,151, Cl. 209-223.100.

Boesel, Robert P. Encapsulated high efficiency transformer and power supply. 5,317,300, Cl. 336-96.000.

Boettcher, Thomas E.: *See—*

Lu, Shih-Lai; Kobe, James J.; Moon, John D.; Freeman, Maurice E.; Rouser, Forrest J.; Heiti, Robert V.; and Boettcher, Thomas E., 5,316,849, Cl. 428-355.000.

Bofors AB: *See—*

Paulsson, Lars; and Eriksson, Lennart, 5,315,933, Cl. 102-489.000.

Bogen, Steven A.; and Loeffler, Herbert H., to Gilbert Corporation. Dispensing assembly with interchangeable cartridge pumps. 5,316,452, Cl. 417-412.000.

Bohnet, Hartmut; Haug, Willi; and Lind, Stefan, to fischerwerke Artur Fischer GmbH & Co. KG. Device for making a drilled hole with an undercut. 5,316,419, Cl. 408-236.000.

Boissonnat, Philippe: *See—*

Roncato, Giordano; Fedorowsky, Robert; Boissonnat, Philippe; and Loubinoux, Dominique, 5,316,561, Cl. 65-1.000.

Bokerman, Gary N.; Puckett, David E.; and Wood, Larry H., to Dow Corning Corporation. Condensation process for preparation of organofunctional siloxanes. 5,317,072, Cl. 528-12.000.

Boku, Katsushi: *See—*

Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,317,177, Cl. 257-301.000.

Boldt, Hans G. K., to Kimberly-Clark Corporation. Facial tissue dispensing carton. 5,316,177, Cl. 221-63.000.

Bolognese, Renato; Notini, Marco; and Pastorino, Gian C., to Minnesota Mining and Manufacturing Company. Device for feeding single sheets out of a stack of film sheets. 5,316,284, Cl. 271-121.000.

Bolton, Theodore S.; and Stopyra, Stephen, to Carrier Corporation. Grille mount for room air conditioner. 5,315,842, Cl. 62-262.000.

Bolza-Schunemann, Claus A.; Bolza-Schunemann, Hans-Bernhard; and Germann, Albrecht J., to Koenig & Bauer, Aktiengesellschaft. Method for judging printing sheets. 5,317,390, Cl. 356-394.000.

Bolza-Schunemann, Hans-Bernhard: *See—*

Bolza-Schunemann, Claus A.; Bolza-Schunemann, Hans-Bernhard; and Germann, Albrecht J., 5,317,390, Cl. 356-394.000.

Bomberger, David C.: *See—*

Schmitt, Robert J.; Bottaro, Jeffrey C.; Penwell, Paul E.; and Bomberger, David C., 5,316,749, Cl. 423-385.000.

Bonet, Luis A.; Greaves, Carlos A.; and Corleto, Jose G., to Motorola, Inc. Method and apparatus for noise burst detection in a signal processor. 5,317,522, Cl. 364-514.000.

Bonnet, Henri, to United Parcel Service of America, Inc. Easy maintenance high speed endless belt conveyor. 5,316,131, Cl. 198-842.000.

Bonnet, Jacqueline: *See—*

Fauchere, Jean-Luc; Kucharczyk, Nathalie; Morris, Angela D.; Paladino, Joseph; Bonnet, Jacqueline; and Thurieau, Christophe, 5,317,014, Cl. 514-17.000.

Booth, Roy E.: *See—*

Berkebile, Donald C., deceased; Berkebile, Catherine, Administratrix; Lee, Donald M.; Veneziano, Larry D.; Lauer, Joseph J.; Booth, Roy E.; Hettinger, William P.; and Jones, Willard, 5,316,654, Cl. 208-39.000.

Borden, Inc.: *See—*

Gerber, Arthur H., 5,317,050, Cl. 524-107.000.

Borenstein, Martin. Multipurpose convertible furniture assembly. 5,315,726, Cl. 5-618.000.

Borg Instruments Verwaltung-GmbH: *See—*

Hornfeck, Rudiger; Bar, Klaus; Nagler, Josef; and Barth, Manfred, 5,315,865, Cl. 73-118.100.

Borneman, Karl L.: *See—*

Egan, George P.; Borneman, Karl L.; and Jaeger, Douglas A., 5,315,861, Cl. 73-37.000.

Borsodi, Anna; Furst, Zsuzsa; Hosztafi, Sandor; Varga, Schafferne E.; Buzas, Beata; Friedmann, Tamas; Benyhe, Sandor; and Szucs, Maria, to Alkaloida Chemical Company Ltd. Pharmaceutical composition and use. 5,317,022, Cl. 514-282.000.

Boston University, Trustees of: *See—*

Jackson, Andrew C.; and Horenstein, Mark, 5,316,002, Cl. 128-602.060.

Bott, Richard R.: *See—*

Estell, David A.; Caldwell, Robert M.; Bott, Richard R.; and Graycar, Thomas P., 5,316,941, Cl. 435-252.300.

Bottaro, Jeffrey C.: *See—*

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Bottomley, Howard, to Antenna Products Limited. Radio antennas. 5,317,325, Cl. 343-702.000.

Bouchons A Champagne Sabate, S.A.: *See—*

Sabate, Bernard; Masse, Joel; and Jeanty, Gerard, 5,317,047, Cl. 524-16.000.

Boulet, Jean: *See—*

Morin, Pierre; Bardin, Christian; and Boulet, Jean, 5,316,093, Cl. 175-74.000.

Bourekas, Philip A.; Mor, Yeshayahu; and Revak, Scott, to Integrated Device Technology, Inc. Structure and method for monitoring an internal cache. 5,317,711, Cl. 395-425.000.

Bourg, Haden J., Jr.; McNelis, Jim A.; and Weiler, Peter, to National Semiconductor Corporation. Crater prevention technique for semiconductor processing. 5,316,976, Cl. 437-195.000.

Boury, Bradley J. String race game. 5,316,301, Cl. 273-86.00R.

Bowdon, Edward K., to Alcatel Network Systems, Inc. Method and system for selecting an optimal rearrangement sequence for a cross-connect communication matrix. 5,317,310, Cl. 340-826.000.
Bowen, Frederic W. System for managing information using codes and coded objects. 5,317,736, Cl. 395-600.000.
Bowen, Strachan D., to Bex Engineering Ltd. Rotating nozzle. 5,316,218, Cl. 239-246.000.
Boyd, John M.; Ellul, Joseph P.; and Tay, Sing P., to Northern Telecom Limited. Forming resistors for intergrated circuits. 5,316,978, Cl. 437-203.000.
Boyle, Justin P.: *See—*
Biesecker, Lisa B.; Forte, Glenn J.; Boyle, Justin P.; and Matthews, Norris W., 5,315,811, Cl. 53-474.000.
Bradbury, Frank M. Shoe sole saver. 5,315,767, Cl. 36-7.10R.
Bradbury, Ray. Universal exercise apparatus. 5,316,535, Cl. 482-135.000.
Bradford, Wesley L.: *See—*
Baker, Forrest A.; and Bradford, Wesley L., 5,316,740, Cl. 422-186.070.
Bradley, William A. Protective cover for boat outcropping. 5,315,949, Cl. 114-222.000.
Brady, Robert C., III; Karol, Frederick J.; Lynn, Timothy R.; Jorgensen, Robert J.; Kao, Sun-Chueh; and Wasserman, Eric P., to Union Carbide Chemicals & Plastics Technology Corporation. Gas phase polymerization reactions utilizing soluble unsupported catalysts. 5,317,036, Cl. 523-223.000.
Brakus, Bogdan, to Siemens Aktiengesellschaft. Direct-current converter with current limiting. 5,317,499, Cl. 363-56.000.
Bramstedt, Gerd: *See—*
Wolf, Helmut; Bramstedt, Gerd; Mak, Xaver; and Mak, Fritz, 5,316,338, Cl. 280-789.000.
Brand, Nigel: *See—*
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; Dejean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,317,090, Cl. 530-387.100.
Brandberg, Lawrence C.; and Watkins, Jeffrey T., to Golden Valley Microwave Foods Inc. Package with microwave induced insulation chambers. 5,317,118, Cl. 219-727.000.
Brant, Patrick; McElrath, Kenneth O., Jr.; and Robertson, Martha H., to Exxon Chemical Patents, Inc. Syndiotactic hot melt adhesive. 5,317,070, Cl. 526-348.500.
Braumer, Klaus: *See—*
Koepff, Peter; Braumer, Klaus; Stahl, Helmuth; and Dick, Eberhard, 5,316,717, Cl. 264-564.000.
Braun Aktiengesellschaft: *See—*
Penaranda, Mariano; Millan, Jose ; Falco, Desiderio; Masip i Balduque, Josep M.; and Rodriguez, Emilio, 5,316,382, Cl. 366-129.000.
Braun, Hans: *See—*
Setzer, Jurgen; Braun, Hans; and Stein, Hermann, 5,317,258, Cl. 324-225.000.
Braun, Hilarion; Schullerus, Wolfgang; and Schulz, Harald, to Siemens Aktiengesellschaft; and Eastman Kodak Company. Printing module for an ink-printing system having an ink storage container with an integrated ink-printing head. 5,317,339, Cl. 346-1.100.
Brazelton, Carl L.; and Kim, Yong H. Valve with independent control of discharge through plurality of orifices. 5,316,031, Cl. 137-1.000.
Brazinsky, Judy, to Bristol-Myers Squibb Company. Cosmetic gel stick compositions. 5,316,761, Cl. 424-65.000.
Breaker, John V., to Corrosion Control Corp. Isolation gasket for critical service flow line applications. 5,316,320, Cl. 277-233.000.
Breen, Michael T.: *See—*
Slicker, James; Mazur, Joseph S.; and Breen, Michael T., 5,316,116, Cl. 477-181.000.
Breen, William R., to Buddy Orthopoedic Inc. Back support and internal frame. 5,316,375, Cl. 297-452.340.
Breg, Inc.: *See—*
Mason, Bradley R.; and Mason, Jeffrey T., 5,316,250, Cl. 248-161.000.
Brennan, Anthony B.: *See—*
Wilkes, Garth L.; and Brennan, Anthony B., 5,316,695, Cl. 252-315.600.
Brent, Thomas P.: *See—*
Bigner, Darell D.; and Brent, Thomas P., 5,316,932, Cl. 435-193.000.
Brewer, Melvin L.: *See—*
Wills, Kendall S.; Rodriguez, Paul A.; and Brewer, Melvin L., 5,317,186, Cl. 257-629.000.
Brewster, William H., Jr.; Chan, Lun; and Sette, Paul R., to Pitney Bowes Inc. Apparatus including air blowing and infrared light means for drying ink on a sheet. 5,317,127, Cl. 219-388.000.
Breyer, Branko: *See—*
Ferek-Petric, Bozidar; and Breyer, Branko, 5,316,001, Cl. 128-661.080.
Bricko, Thomas K.: *See—*
White, Donald M., III; Bricko, Thomas K.; and Thorud, Richard A., 5,315,771, Cl. 37-260.000.
Bridgestone Corporation: *See—*
Hall, James E.; Hergenrother, William L.; and Oziomek, James, 5,317,057, Cl. 524-575.000.
Kimura, Takeshi; and Kawamata, Satoru, 5,316,112, Cl. 188-267.000.
Tani, Katsutoshi, 5,316,064, Cl. 152-531.000.
Yoshikawa, Masato; Kusano, Yukihiro; Akiyama, Setsuo; Naito, Kazuo; Okazaki, Setiko; and Kogoma, Masuhiro, 5,316,739, Cl. 422-186.050.
Brier, Daniel L.: *See—*
Moretz, Herbert L.; and Brier, Daniel L., 5,315,717, Cl. 2-400.000.
Brigham And Women's Hospital: *See—*
Stevens, Richard L.; Weis, John H.; and Nicodemus, Christopher F., 5,317,085, Cl. 530-326.000.
Brimhall, Owen D., to Technical Research Associates, Inc. Blood sample apparatus and method. 5,316,952, Cl. 436-70.000.
Brimmer, John A. Bicycle tire recharge apparatus. 5,316,055, Cl. 141-38.000.
Bringham, Richard L.: *See—*
Mathewson, Wilfred F.; Bringham, Richard L.; Ritger, Philip L.; and Karshmer, David, 5,316,724, Cl. 422-48.000.
Bristol-Myers Squibb Company: *See—*
Brazinsky, Judy, 5,316,761, Cl. 424-65.000.
Karavadra, Jiva R., 5,315,905, Cl. 83-13.000.
Briteline Industries, Inc.: *See—*
Wyckoff, Charles W., 5,316,406, Cl. 404-12.000.
British Telecommunications public limited company: *See—*
Cameron, Ian R., 5,317,625, Cl. 379-67.000.
Britton, Sharon M.; Allmon, Randy; and Samudrala, Sridhar, to Digital Equipment Corporation. Leading one/zero bit detector for floating point operation. 5,317,527, Cl. 364-715.040.
Brock, George W.; and Long, Michael E., to Eastman Kodak Company. Electrodes for resistive ribbon thermal print head. 5,317,343, Cl. 346-76.0PH.
Broderbund Software, Inc.: *See—*
Ditter, Donald J., Jr., 5,317,680, Cl. 395-135.000.
Brons, Glen B.; Siskin, Michael; and Wrzeszczynski, Kazimierz O., to Exxon Research & Engineering Co. Upgrading of bitumen asphaltenes by hot water treatment. 5,316,659, Cl. 208-39.000.
Bronsvatch, Efim, to Seagate Technology, Inc. Dual pivot disc drive apparatus and method. 5,317,559, Cl. 369-244.000.
Brookdale International Systems Inc.: *See—*
Swann, Linsey, 5,315,987, Cl. 128-201.280.
Brooker, John T.: *See—*
Gray, Charles L.; Brooker, John T.; Bardin, Dale E.; and Salby, E. Reeves, II, 5,317,148, Cl. 250-227.260.
Brooks, E. J.: *See—*
Georgopoulos, George, 5,315,849, Cl. 70-34.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Fukaya, Kousuke, 5,316,396, Cl. 400-76.000.
Iwasaki, Takeo, 5,317,444, Cl. 359-214.000.
Kobayashi, Norio, 5,317,668, Cl. 388-811.000.
Brovelli, Virginio A.; and Man, Mei H., to Lanard Toys Limited. Water-shooting toy configured as a bow and arrow. 5,316,183, Cl. 222-78.000.
Brown, Alan J.; Darsillo, Michael S.; and Bentley, O. Wayne, Jr., to ECC International Inc. Method for production of high solid aqueous calcium carbonate suspensions. 5,317,053, Cl. 524-425.000.
Brown, David L.: *See—*
Decarie, Andre P.; Brown, David L.; Malinowski, Stanley J.; and Dunklee, Douglas M., 5,315,985, Cl. 128-4.000.
Brown-Forman Beverage Company: *See—*
Zimlich, Joseph A., III, 5,316,782, Cl. 426-624.000.
Brown, Hayden D., to Sail Systems, Inc. Luff pad for roller reefing and furling sails. 5,315,948, Cl. 114-106.000.
Brown, Jesse P. Apparatus for noninvasive measuring of upper airway resistance in humans during sleep. 5,316,010, Cl. 128-720.000.
Brown, Karen K.; Ruiz, Linda L. C.; van de Rijn, Ivo; Greene, Nathan D.; Trump, Sandy L.; Wilson, Curtis D.; and Bryant, Sharon A., to Miles Inc. Method for the microbiological production of non-antigenic hyaluronic acid. 5,316,926, Cl. 435-101.000.
Brown, Melvin H. Method and apparatus for producing fluid flow. 5,316,568, Cl. 95-31.000.
Brown, Michael A., to National Semiconductor Corporation. Low-gain, range programmable, temperature compensated voltage controlled ring oscillator. 5,317,287, Cl. 331-57.000.
Brown, Richard I.; and Foley, John T., to Baxter International Inc. Blood processing systems with improved data transfer between stationary and rotating elements. 5,316,666, Cl. 210-85.000.
Brown, Richard L.; and Foley, John T., to Baxter International Inc. Time based interface detection systems for blood processing apparatus. 5,316,667, Cl. 210-85.000.
Brown, Rita C. Self-ejecting garbage receptacle. 5,316,170, Cl. 220-409.000.
Brown, Stanley; and Court, Donald, to United States of America, Health and Human Services. Method for indentifying and expressing proteins that recognize and adhere to specific probes. 5,316,922, Cl. 435-69.700.
Brown-Wensley, Katherine A.: *See—*
George, Billy L.; and Brown-Wensley, Katherine A., 5,316,824, Cl. 428-145.000.
Browne, Richard P. Method of installing putting hole liner and collar. 5,316,292, Cl. 273-34.00R.
Bru-Magniez, Nicole; Potin, Dominique; and Teulon, Jean-Marie, to Laboratoires USPA. Piperidinylthioindole derivatives, their methods of preparation and pharmaceutical compositions in which they are present, useful especially as analgesics. 5,317,025, Cl. 514-323.000.
Brubaker, Philip D.: *See—*
Murray, William J.; McCullough, Mark K.; Brubaker, Philip D.; and Manicke, Paul S., 5,316,202, Cl. 228-5.500.
Bruening, Ronald L., to IBC Advanced Technologies, Inc. Elution of antimony from solid phases using concentrated sulfuric acid containing dilute hydrochloric acid. 5,316,679, Cl. 210-634.000.
Bruker Analytische Messtechnik GmbH: *See—*
Kasten, Arne; and Laukien, Gunter, 5,317,260, Cl. 324-309.000.

Bruker Instruments, Inc.: *See—*
Cory, David G.; and Maas, Werner E., 5,317,263, Cl. 324-309.000.
Brun, Milivoj K.; Giddings, Robert A.; and Prochazka, Svante, to General Electric Company. Silicon carbide composite with metal boride coated fiber reinforcement. 5,316,851, Cl. 428-379.000.
Brunetti, Pierre C.: *See—*
Renault, Bernard A.; and Brunetti, Pierre C., 5,315,962, Cl. 123-190.110.
Brunken, Dean E.; and Hagen, Arnulf P., to Advanced Chemical Technologies, Inc. Method for applying paint with a water repellant composition. 5,316,799, Cl. 427-421.000.
Brusic, Vlasta A.; Frankel, Gerald S.; Petersen, Tina A.; Rush, Benjamin M.; and Schrott, Alejandro G., to International Business Machines Corporation. Corrosion inhibition with CU-BTA. 5,316,573, Cl. 106-14.160.
Bruski, Gary P.; and Malkowski, Chester, Jr., to Allen-Bradley Co., Inc. Gas deflection and isolation system for use with a high power circuit breaker. 5,317,117, Cl. 200-144.00R.
Bryan, William J.; and Corsetti, Lawrence V., to Combustion Engineering, Inc. Use of shape memory alloys in fuel pellet holddown springs. 5,317,612, Cl. 376-451.000.
Bryant, Sharon A.: *See—*
Brown, Karen K.; Ruiz, Linda L. C.; van de Rijn, Ivo; Greene, Nathan D.; Trump, Sandy L.; Wilson, Curtis D.; and Bryant, Sharon A., 5,316,926, Cl. 435-101.000.
Bryson, Kirk R. Vocabulary board game. 5,316,482, Cl. 434-129.000.
BSD Enterprises, Inc.: *See—*
Sowers, David A., 5,316,493, Cl. 439-346.000.
Buchina, Raymond A.: *See—*
Allison, Joseph M.; Buchina, Raymond A.; Mieskowski, James D.; Thomas, Edward J.; and Davenport, John M., 5,317,237, Cl. 315-307.000.
Buck, Daniel C.: *See—*
Everett, David F.; and Buck, Daniel C., 5,317,330, Cl. 343-867.000.
Budantsev, Vladimir I.: *See—*
Ivanov, Oleg R.; Snegirev, Mikhail I.; Chistyakov, Makhail K.; Razhev, Vladimir M.; Budantsev, Vladimir I.; Kipriyanov, Jury I.; Zaitsev, Vikator A., deceased; Zaitseva, Galina M., administrator; and Zaitseva, Natalya V., administrator, 5,316,735, Cl. 422-143.000.
Buddy Orthopoedic Inc.: *See—*
Breen, William R., 5,316,375, Cl. 297-452.340.
Buehler, Friedrich S.; Casanova, Josef; Ernst, Hansjorg; and Schultze, Hans-Joachim, to Ems-Inventa AG. Process and apparatus for producing starch melt and products obtainable by this process. 5,316,578, Cl. 106-210.000.
Buelt, James L.; Oma, Kenton H.; and Eschbach, Eugene A., to Battelle Memorial Institute. Apparatus for in situ heating and vitrification. 5,316,411, Cl. 405-128.000.
Buge, Jean-Pierre: *See—*
Tardy, Michel-Pierre; and Buge, Jean-Pierre, 5,317,230, Cl. 313-293.000.
Bujtas, Geza, to Smith Industries. Clamp activator and circuit card extractor. 5,317,482, Cl. 361-798.000.
Bula, Orest; Koch, Garrett S.; Woyke, Justin A.; and Gomez, Richard S., to International Business Machines Corporation. Apparatus and method for real time data error capture and compression redundancy analysis. 5,317,573, Cl. 371-10.300.
Bull, Christopher; and Barmore, Charles R., to W. R. Grace & Co.-Conn. Method of detecting the permeability of an object to oxygen. 5,316,949, Cl. 436-5.000.
Bullock, Robert L.; and Taillon, Armand P., to Standard Car Truck Company. User friendly wheel chock system. 5,316,421, Cl. 410-9.000.
Bullock, Roddy M. Utility rack for vehicle. 5,316,190, Cl. 224-42.420.
Bunke, Paul R.; and Prosise, Robert L., to Proctor & Gamble Company, The. Microwave susceptor package having an apertured spacer between the susceptor and the food product. 5,317,120, Cl. 219-730.000.
Bunshah, Rointan F.; Jou, Shyankay; Prakash, Shiva; and Doerr, Hans J., to University of California, The Regents of the. Production of fullerenes by electron beam evaporation. 5,316,636, Cl. 204-157.470.
Burch, Daniel E., to Integrated Designs, Inc. Liquid dispensing system. 5,316,181, Cl. 222-61.000.
Burgess, Anthony: *See—*
Whitehead, R. H.; Burgess, Anthony; and Zhang, Hui-Hua, 5,316,937, Cl. 435-240.300.
Burke, John T.: *See—*
Aghajanian, Michael K.; Keck, Steven D.; Burke, John T.; Hannon, Gregory E.; Becker, Kurt J.; Taylor, Steven J.; Wiener, Robert J.; and McCormick, Allyn L., 5,316,069, Cl. 164-97.000.
Burkett, Doug; and Mercer, Gary, to Henny Penny Corporation. Programmable load compensation method and apparatus for use in a food oven. 5,317,130, Cl. 219-497.000.
Burns, Christopher J.: *See—*
Ullrich, John W.; Youssefyeh, Raymond D.; Cheney, Daniel L.; and Burns, Christopher J., 5,317,015, Cl. 514-79.000.
Burnside, Jeffrey A.: *See—*
Topolewski, John N.; and Burnside, Jeffrey A., 5,316,497, Cl. 439-752.000.
Burrell, Frank J., Jr.: *See—*
Huefner, Norman F.; and Burrell, Frank J., Jr., 5,315,732, Cl. 15-167.100.
Burroughs Wellcome Co.: *See—*
Keen, Michael J.; and Rapson, Nicholas T., 5,316,938, Cl. 435-240.310.
Burrows, David J.: *See—*
Martin, Clarence E.; and Burrows, David J., 5,316,434, Cl. 414-607.000.
Buschmann, Ernst: *See—*
Neumann, Ulrich; Buschmann, Ernst; Kiessling, Ulrich; and Renz, Guenter, 5,316,148, Cl. 206-484.100.
Bussinger, Allen L., to Amigo Mobility International, Inc. Bumper mounted anti-tip stabilizers for chair-mounting vehicles utilized by physically disadvantaged persons and others desiring mobility assistance, and methods of stabilizing such vehicles. 5,316,328, Cl. 280-304.100.
Butcher, Eugene C.; and Picker, Louis J., to Stanford University. Neutrophil LECAM-1 as indicator of neutrophil activation. 5,316,913, Cl. 435-7.240.
Butler, Brian R. Aquatic exercise and rehabilitation device. 5,316,532, Cl. 482-111.000.
Butzer, Susan M.: *See—*
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Hanyu, Yukio; and Asaoka, Masanobu, 5,316,805, Cl. 428-1.000.
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Matsuo, Shimpei, 5,316,289, Cl. 271-258.000.
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Takamatsu, Osamu; Hirai, Yutaka; Nakayama, Masaru; Yagi, Takayuki; Kasanuki, Yuji; and Shimada, Yasuhiro, 5,317,152, Cl. 250-306.000.
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Kaufman, Leon; Carlson, Joseph W.; Okada, Shigemasu; and Hashimoto, Shigeo, 5,317,297, Cl. 335-297.000.
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Clarke, John R.; Joye, Donald D.; Carlson, Neal A.; and Wechgelaer, Peter, 5,315,988, Cl. 128-204.230.
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Banker, Dennis C.; Carlson, Tore A.; Dorler, Jack A.; Hendricks, Paul D.; Klara, Walter S.; Masci, Frank M.; and Struk, James R., 5,317,208, Cl. 307-454.000.
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Farnsworth, Vincent P.; and Cartier, Paul F., III, 5,316,034, Cl. 137-208.000.
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Suga, Fusao; and Minami, Narutoshi, 5,316,008, Cl. 128-700.000.
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Judy, Steven W.; Smith, Vernon R.; and Stahl, Alan L., 5,315,972, Cl. 123-198.00D.
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Chapelon, Jean-Yves; Cathignol, Dominique; and Blanc, Emmanuel, 5,316,000, Cl. 128-660.030.
Lacruche, Bernard; Cathignol, Dominique; and Lacoste, Francois, 5,315,986, Cl. 69-4.000.
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Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.
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Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
Cedros, Craig D.: *See—*
Peek, Greg A.; and Cedros, Craig D., 5,317,712, Cl. 395-425.000.
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Tobler, Hugh J.; Lepper, Larry G.; and Sawdon, Robert B., 5,316,197, Cl. 222-281.000.
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Crochon, Michel; and Bellon, Veronique F., 5,315,879, Cl. 73-[illegible].
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Aldissi, Mahmoud, 5,317,109, Cl. 174-84.00C.
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Chang, Mei: *See—*
Sherstinsky, Semyon; Chang, Mei; Harris, Charles C.; Mak, Alfred; Roberts, James F.; Tam, Simon W.; and Chang, Wen T., 5,316,278, Cl. 269-254.00R.
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Kwan, Sze-Hon; Hshieh, Fwu-Iuan; Chang, Mike F.; Ho, Yueh-Se; and Owyang, King, 5,316,959, Cl. 437-40.000.
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Petrovich, Anthony; Weinberg, Marc S.; and Williams, John R., 5,315,874, Cl. 73-493.000.
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Auffret, Rene ; Chawki, Mouhammad; and Berthou, Louis, 5,317,580, Cl. 372-38.000.
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Utley, Daniel E.; Deasy, Kevin M.; and Cheever, Gordon D., Jr., 5,317,248, Cl. 318-811.000.
Cheil Foods & Chemicals, Inc.: *See—*
Lee, Kwang H.; Ko, Dong H.; Kim, Young J.; Xiang, Myung X.; and Yoon, Myeong S., 5,317,099, Cl. 540-222.000.
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Smith, John M., 5,316,443, Cl. 416-197.00R.
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Lee-Huang, Sylvia; Kung, Hsiang-fu; Huang, Paul L.; Huang, Philip L.; Huang, Peter; Huang, Henry I.; and Chen, Hao-chia, 5,317,009, Cl. 514-8.000.
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Arnold, Frances H.; and Chen, Keqin, 5,316,935, Cl. 435-222.000.
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Ullrich, John W.; Youssefyeh, Raymond D.; Cheney, Daniel L.; and Burns, Christopher J., 5,317,015, Cl. 514-79.000.
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- Payne, Phillip E.; and Ney, Clyde N., 5,316,358, Cl. 296-37.600.
- Wing, Philip A., 5,315,763, Cl. 33-288.000.

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- Peterson, David A.; and Grimshaw, Michael N., 5,316,612, Cl. 156-493.000.

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- Ho, Minnie; and Cioffi, John M., 5,317,596, Cl. 375-14.000.

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- Babson, Arthur L.; Ross, Arthur F.; Olson, Douglas R.; Giter, Gershon; and Huebner, Victor R., 5,316,726, Cl. 422-65.000.

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- Louise, John; and Rushing, Thomas, 5,316,481, Cl. 434-99.000.
- Wenke, Gottfried, 5,316,551, Cl. 8-406.000.

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- Savage, Howard T.; Clark, Arthur E.; Wun-Fogle, Marilyn; Kabacoff, Lawrence T.; Hernando, Antonio; and Beihoff, Bruce, 5,315,881, Cl. 73-862.333.

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- Challenger, John G., 5,316,518, Cl. 454-187.000.

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- Thompson, Ray; and Taylor, Robert W., 5,316,503, Cl. 439-740.000.

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Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, to Ensci, Inc. Heating elements containing electrically conductive tin oxide containing coatings. 5,317,132, Cl. 219-543.000.

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- Smalley, Raymond L.; Hall, John C.; Clouse, Ryan J.; Risner, P. Fred; and Strohm, Edward L., 5,316,432, Cl. 414-540.000.

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- Skelley, Arthur P.; McMichael, James C.; Cobb, James T., Jr.; Rohrer, Wesley M., Jr.; Custer, Phillip E., II; and Elsubki, Taha M., 5,316,737, Cl. 422-170.000.

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- Chesney, Charles F.; Finkelstein, Stanley M.; and Cohn, Jay N., 5,316,004, Cl. 128-672.000.

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- Ramacier, Patrick J., Jr.; and Meyer, David W., 5,316,041, Cl. 137-614.040.

Collin, Jean-Claude; Larue, Joseph; Rojey, Alexandre; and Viltard, Jean-Charles, to Institut Francais du Petrole. Process and device for the simultaneous transfer of material and heat. 5,316,628, Cl. 203-72.000.

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Comalco Aluminum Limited: *See—*
- Rogers, Kevin P.; and Heathcock, Christopher J., 5,316,070, Cl. 164-122.000.

Comar, Inc.: *See—*
- Gargione, Frank V., 5,316,161, Cl. 215-220.000.

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- Tokarski, Michael G.; and Roudabush, Lester A., 5,315,923, Cl. 100-39.000.

Combustion Electromagnetics, Inc.: *See—*
- Ward, Michael A. V.; and Redl, Richard, 5,315,982, Cl. 123-634.000.

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- Bryan, William J.; and Corsetti, Lawrence V., 5,317,612, Cl. 376-451.000.
- Formanek, Frank J., 5,317,607, Cl. 376-260.000.
- Rini, Michael J.; Hellewell, Todd D.; Towle, David P.; Jennings, Patrick L.; LaFlesh, Richard C.; and Anderson, David K., 5,315,939, Cl. 110-264.000.

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- Jones, David L., 5,316,567, Cl. 75-743.000.

Commodore Electronics Limited: *See—*
- Gerlach, John D., Jr.; and Weiblen, Michael E., 5,317,732, Cl. 395-600.000.

Compagnie Generale Des Establissements Michelin - Michelin & CIE: *See—*
- Lagnier, Alain, 5,316,063, Cl. 152-209.00R.

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- Lurois, Patrick, 5,316,062, Cl. 152-209.00R.

Comproducts Inc.: *See—*
- Wilkins, John L., 5,317,137, Cl. 235-380.000.

Computing Devices International, Inc.: *See—*
- Pai, Deepak K.; and Krinke, Terrance A., 5,317,479, Cl. 361-773.000.

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- Misholi, Boaz; Danziger, Itzchak; Kowarsky, Stephen R.; and Sandlerman, Nimrod, 5,317,628, Cl. 379-89.000.

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Conner Peripherals, Inc.: *See—*
- Lemke, James U.; French, William W.; and McHargue, William B., 5,317,463, Cl. 360-97.020.

Connors, Frank T.: *See—*
- Flathau, Robert J.; and Connors, Frank T., 5,316,253, Cl. 248-235.000.

Conrad, Dale A.: *See—*
- Martell, Michael D.; and Conrad, Dale A., 5,316,647, Cl. 204-415.000.

Conros Corporation: *See—*
- Chandaria, Kapoor; Stansbury, Benjamin H., Jr.; and Dickie, Robert G., 5,316,398, Cl. 401-18.000.

Conroy, James W.: *See—*
- Beard, Michael S.; Puetz, Curtis; and Conroy, James W., 5,317,663, Cl. 385-70.000.

Conservatek Industries, Inc.: *See—*
- Anderson, Richard F.; Ferry, Robert L.; and Kissell, John R., 5,315,801, Cl. 52-63.000.

Consorzio Per la Ricerca Sulla Microelectronica: *See—*
- Zambrano, Raffaele; and Grimaldi, Antonio, 5,317,182, Cl. 257-378.000.

Cook Incorporated: *See—*
- Eberbach, Mark A., 5,316,543, Cl. 600-37.000.

Coon, Robert J.: *See—*
- Murray, Douglas J.; Coon, Robert J.; Hopmann, Mark E.; Williams, Ronald D.; Jennings, Steve; and Tips, Timothy R., 5,316,084, Cl. 166-332.000.

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Cooper, Robert D., Jr.: *See—*
- Snetting, Mark E.; Kruzel, Thomas F.; and Cooper, Robert D., Jr., 5,316,445, Cl. 417-53.000.

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- Gladfelter, Elizabeth J.; Outlaw, Tina O.; Copeland, James L.; Schulz, Rhonda K.; Boche, Daniel K.; and Peterson, Jeff W., 5,316,688, Cl. 252-90.000.

Corbalis, Charles M.: *See—*
- Nardin, Raffaele P.; and Corbalis, Charles M., 5,317,562, Cl. 370-16.000.

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- Hartley, Richard I.; and Corbett, Peter F., 5,317,755, Cl. 395-800.000.

Cordes, Hans; Krumm, Helmut; Schwartz, Ludwig; Kahn, Ilan; Cornils, Gerd; and Behrend, Ulrich, to Saint Gobain Vitrage International. Process and apparatus for producing a glazing equipped with a peripheral frame based on polymer. 5,316,829, Cl. 428-192.000.

Corio, Ronald P., to Wattsun Corporation. Radiation source detector and tracker control having a shade pole and radiation responsive surface in the shape of narrow bands. 5,317,145, Cl. 250-203.400.

Corleto, Jose G.: *See—*
- Bonet, Luis A.; Greaves, Carlos A.; and Corleto, Jose G., 5,317,522, Cl. 364-514.000.

Cornell Research Foundation, Inc.: *See—*
- Frechet, Jean M. J.; Svec, Frantisek; and Smigol, Vladimir, 5,316,680, Cl. 210-635.000.
- MacDonald, Noel C.; and Zhang, Zuoying L., 5,316,979, Cl. 437-203.000.

Cornils, Gerd: *See—*
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Corning Incorporated: *See—*
- Wu, Shy-Hsien, 5,316,577, Cl. 106-197.100.

Corona, Stephen C.; Fox, Elizabeth D.; and Robinson, Norman D., Jr., to Xerox Corporation. Copier/printer job stacking with discrete cover sheets with extending printed banners. 5,316,279, Cl. 270-1.100.

Corrales, Marvin S.: *See—*
- Barakitis, Nikolaos; Corrales, Marvin S.; and Rodriquez, Jovge C., 5,317,232, Cl. 313-619.000.

Corrosion Control Corp.: *See—*
- Breaker, John V., 5,316,320, Cl. 277-233.000.

Corsetti, Lawrence V.: *See—*
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Corso, Anthony B., to Unosource Controls, Inc. Primary-secondary circuit hydraulic interface. 5,316,384, Cl. 366-338.000.

Cory, David G.; and Maas, Werner E., to Bruker Instruments, Inc. Method for creating a z-rotation using radial pulses in NMR experiments involving coherence transformations. 5,317,263, Cl. 324-309.000.

Cosman, David J.: *See—*
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Costa, Erminio: *See—*
- Walser, Armin; Guidotti, Alessandro; and Costa, Erminio, 5,317,018, Cl. 514-220.000.

Costanzo, Raphael J. Method and apparatus for dampening racquet vibration. 5,316,295, Cl. 273-73.00R.

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Court, Donald: *See—*
- Brown, Stanley; and Court, Donald, 5,316,922, Cl. 435-69.700.

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- Blake, Joseph W.; Cousineau, Robert; Rosen, Mark; and Watson, William, 5,316,730, Cl. 422-73.000.

Coutre, James E.; Griffin, Wayne P.; and Crisler, Charles M., to Abbott Laboratories. Infusion fluid management system. 5,317,506, Cl. 364-413.020.

Cowper, Norman T., to Slurry Systems Pty. Limited. Continuous on-line measurement of fluid or slurry rheology. 5,315,863, Cl. 73-54.090.

Cox, Joel L.: *See—*
- Rodgers, Michael B.; Mezynski, Stanley M.; Halasa, Adel F.; Hsu, Wen-Liang; Matrana, Barry A.; and Cox, Joel L., 5,317,062, Cl. 525-237.000.

CRA Services Limited: *See—*
- Mantey, Paul-Gerhard, 5,316,268, Cl. 266-44.000.

Crandall, Michael D.; and Joseph, Eugene G., to Minnesota Mining and Manufacturing Company. Retroreflective sheet with nonwoven elastic backing. 5,316,838, Cl. 428-283.000.

Crank, Sue E., to Texas Instruments Incorporated. Integrated circuit copper metallization process using a lift-off seed layer and a thick-plated conductor layer. 5,316,974, Cl. 437-190.000.

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Creative Products Resource, Inc.: *See—*
- Hoyt, Earl E.; and Smith, James A., 5,316,400, Cl. 401-132.000.

Credelle, Thomas L.: *See—*
- DeJule, Michael C.; and Credelle, Thomas L., 5,317,445, Cl. 359-250.000.

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- Baker, Bruce R.; Creech, Richard D.; and Smith, Kenneth W., 5,317,671, Cl. 395-2.000.

Crippen, Michael R.: *See—*
- Melkonian, George; and Crippen, Michael R., 5,316,459, Cl. 425-71.000.

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Bale, Richard E.; Banks, Jon M.; Clearman, Melvin R., Jr.; Colson, James C.; Crisp, James M.; Loose, David C.; and Varan, James E., 5,316,281, Cl. 270-58.000.

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Crossman, Antony H.; and Thompson, Edmund S., to Picturetel Corporation. Variable bit rate speech encoder. 5,317,672, Cl. 395-238.000.

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Naggert, Dieter K.; Tang, James J.; and Gruodis, Robert J., 5,315,858, Cl. 72-350.000.

Crown Iron Works Company: *See—*

Anderson, George E., 5,316,625, Cl. 202-176.000.

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Herb, John A.; Pinneo, John M.; and Gardinier, Clayton F., 5,316,842, Cl. 428-319.100.

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Cunningham, David: *See—*

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Curtis Manufacturing Company, Inc.: *See—*

Judd, Thomas W.; and Wagner, Cyril, Jr., 5,316,139, Cl. 206-278.000.

Custer, Phillip E., II: *See—*

Skelley, Arthur P.; McMichael, James C.; Cobb, James T., Jr.; Rohrer, Wesley M., Jr.; Custer, Phillip E., II; and Elsubki, Taha M., 5,316,737, Cl. 422-170.000.

Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., to Digital Equipment Corp. Apparatus and method for main memory unit protection using access and fault logic signals. 5,317,717, Cl. 395-425.000.

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Robertson, John A.; Cyphert, David L.; Muscarella, Joseph; and French, Robert N., 5,316,397, Cl. 400-121.000.

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Czimny, Arnold; Nimberger, Spencer M.; and Ward, Robert L., to Precision General, Inc. Hose swivel. 5,316,351, Cl. 285-276.000.

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Starkey, Glenn, 5,316,467, Cl. 425-438.000.

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Watanabe, Kazushi; and Sumida, Katsuhiko, 5,317,066, Cl. 525-425.000.

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Setzer, Jurgen; Braun, Hans; and Stein, Hermann, 5,317,258, Cl. 324-225.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*

Aotani, Toshiaki, 5,317,424, Cl. 358-491.000.

Dalebout, William T.; and Jones, Ken C., to Proform Fitness Products, Inc. Multipurpose exercise machine. 5,316,534, Cl. 482-133.000.

Dalton, William J. Triple cuff endobronchial tube with selective multiple outlets served by a single airflow passage. 5,315,992, Cl. 128-207.150.

Daly, Robert C.; and Lawrence, Kristine B., to Eastman Kodak Company. Thermal dye transfer receiving element with aqueous dispersible polyester dye image-receiving layer. 5,317,001, Cl. 503-227.000.

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Tedder, Thomas F.; and Zhou, Liang-Ji, 5,316,920, Cl. 435-69.300.

Dandliker, Rene ; Schweizer, Edwin; Schad, Hanspeter; and Odoni, Walter, to Hilti Aktiengesellschaft. Method and apparatus for absolute measurement of force by use of polarized, non-coherent light and compensation of strain-induced birefringence effects in a single mode-fiber optic waveguide. 5,317,147, Cl. 250-227.170.

Danley, Thomas J.; and Rey, Charles A., to Intersonics Incorporated. Loudspeakers having torque drive radiators. 5,317,642, Cl. 381-182.000.

Danmoto, Shojiro: *See—*

Machino, Masaki; and Danmoto, Shojiro, 5,315,746, Cl. 29-451.000.

Danner, Harold J., Jr.; Holmes, William B.; and Barron, Wesley. Vacuum insulated container. 5,316,171, Cl. 220-423.000.

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Misholi, Boaz; Danziger, Itzchak; Kowarsky, Stephen R.; and Sandlerman, Nimrod, 5,317,628, Cl. 379-89.000.

Dao, Dung V.: *See—*

Marchal, Daniel; and Dao, Dung V., 5,316,861, Cl. 428-516.000.

Darbinyan, Robert: *See—*

Garunts, Feliks; and Darbinyan, Robert, 5,315,834, Cl. 62-78.000.

Darin, John P.: *See—*

Smith, Thomas; and Darin, John P., 5,315,786, Cl. 47-74.000.

Darolia, Ramgopal: *See—*

Goldman, Edward H.; and Darolia, Ramgopal, 5,316,866, Cl. 428-621.000.

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Brown, Alan J.; Darsillo, Michael S.; and Bentley, O. Wayne, Jr., 5,317,053, Cl. 524-425.000.

Dart Industries Inc.: *See—*

Cautereels, Victor J. J., 5,316,160, Cl. 215-11.100.

Das, Promit; and Kinney, Terrance R., to Allied-Signal Inc. Spectral signal analyzer system. 5,317,524, Cl. 364-557.000.

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Chang, Chin-Fong; and Das, Santosh K., 5,316,598, Cl. 148-420.000.

Dasgupta, Purnendu K., to Dionex Corporation. Methods for chromatography analysis. 5,316,630, Cl. 204-180.000.

Dassero, William F., to Eastman Kodak Company. Photographic camera with interior dust seal. 5,317,356, Cl. 354-288.000.

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Balch, Richard A.; Mancuso, Marjorie J.; and Dastous, Susan D., 5,317,546, Cl. 368-9.000.

Data Delay Devices, Inc.: *See—*

Lupi, Annibale M.; and Lupi, Massimo G., 5,317,219, Cl. 307-603.000.

Dauber, Thomas W.: *See—*

Groft, Cory L.; and Dauber, Thomas W., 5,316,835, Cl. 428-247.000.

Dauder Guardiola, Agustin, to Talleres Daumar S.A. Automatic weighing machines for food products. 5,317,110, Cl. 177-25.180.

Daugherty, Thomas L., to United States of America, Navy. Duplex rolling element bearing mounting for ensuring preload control. 5,316,393, Cl. 384-517.000.

Davenport, John M.; Hansler, Richard L.; King, Kenneth S.; and Cassarly, William J., to General Electric Company. Collection optics for high brightness discharge light source. 5,317,484, Cl. 362-32.000.

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Allison, Joseph M.; Buchina, Raymond A.; Mieskowski, James D.; Thomas, Edward J.; and Davenport, John M., 5,317,237, Cl. 315-307.000.

Davidson Textron Inc.: *See—*

Gray, John; and Galloway, John, 5,316,335, Cl. 280-728.00B.

Gray, John D., 5,316,715, Cl. 264-245.000.

Davies, Scott T.: *See—*

Grabiec, Alan R.; Frey, William G.; and Davies, Scott T., 5,317,664, Cl. 385-87.000.

Davis, Leo W., to Meyer, Richard J. Liquid spring vehicular suspension system and associated control apparatus. 5,316,272, Cl. 267-64.130.

Davis, Mark M.; and Hedrick, Stephen M. T-cell receptor specific for antigen polypeptides and related polynucleotides. 5,316,925, Cl. 435-91.200.

Davis, Randall W. Aquatic fur-bearing mammal and bird vivarium. 5,315,965, Cl. 119-201.000.

Davis, Richard D.; and Kotowski, Jeff, to Silicon Systems, Inc. Programmable electronic angular position indicator based upon engineering units. 5,317,614, Cl. 377-17.000.

Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., to Albany International Corp. Paper machine clothing. 5,316,833, Cl. 428-225.000.

Davis, Robert E., to R. E. Davis Chemical Corporation. Method and apparatus for dehydrating waste food material. 5,315,921, Cl. 99-407.000.

Davis, William F.: *See—*

Gordon, Yoram; Fain, John; Davis, William F.; and Lancaster, William G., 5,315,809, Cl. 53-399.000.

Dawson, William C., to Exxon Research and Engineering Company. Environmental recovery system. 5,316,085, Cl. 166-369.000.

Dawson, William O.: *See—*

Donson, Jon; Dawson, William O.; Granthan, George L.; Turpen, Thomas H.; Turpen, Ann M.; Garger, Stephen J.; and Grill, Laurence K., 5,316,931, Cl. 435-172.300.

Dearman, Timothy C. Grass trimming shears. 5,315,762, Cl. 30-231.000.

Deasy, Kevin M.: *See—*

Utley, Daniel E.; Deasy, Kevin M.; and Cheever, Gordon D., Jr., 5,317,248, Cl. 318-811.000

Decarie, Andre P.; Brown, David L.; Malinowski, Stanley J.; and Dunklee, Douglas M., to United States Surgical Corporation. Endoscopic instrumentation kit and package therefor. 5,315,985, Cl. 128-4.000.

Deckard, Carl R., to Board of Regents, The University of Texas System. Method and apparatus for producing parts by selective sintering. 5,316,580, Cl. 118-110.000.

DeCoux, Steven P., to Rockwell International Corporation. Method and apparatus for laminar flow control. 5,316,032, Cl. 137-14.000.

Deeg, Rolf: *See—*

Maurer, Eberhard; and Deeg, Rolf, 5,316,784, Cl. 427-2.000.

Deere & Company: *See—*

Behrens, Robert N.; and Eavenson, Jimmy N., Sr., 5,315,893, Cl. 74-512.000.

Isaacson, Charles D.; Killen, Dale H.; and Nagorcka, James A., 5,316,381, Cl. 305-10.000.

Viaud, Jean; and Roth, Arsene, 5,315,925, Cl. 100-88.000.

Wolf, Helmut; Bramstedt, Gerd; Mak, Xaver; and Mak, Fritz, 5,316,338, Cl. 280-789.000.

Defays, Jacques, to Cockerill Sambre S.A. Liquid steel bath reheating method. 5,316,566, Cl. 75-10.390.

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Bloodworth, Robert; Podszun, Wolfgang; Defieuw, Geert; Uytterhoeven, Herman; and Schulze, Hans, 5,317,000, Cl. 503-227.000.

DeFreez, Richard: *See—*

Baird, Brian; and DeFreez, Richard, 5,317,447, Cl. 359-328.000.

Defreitas, Manuel P. Decorative wheel cover. 5,316,376, Cl. 301-37.260.

De Greve, Henri M. J.; Salgado, Maria B. L. F.; Van Montagu, Marc C. E.; Vaeck, Mark A.; Zabeau, Marcus F. O.; Leemans, Jan J. A.; and Hofte, Hermanus F. P., to Plant Genetic Systems, N.V. Transformation vectors allowing expression of foreign polypeptide endotoxins from *Bacillus thuringiensis* in plants. 5,317,096, Cl. 536-23.710.

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Sone, Taeko; Tosaka, Masaki; Saeki, Katsuhisa; Ara, Katsutoshi; Deguchi, Katsuhiko; and Igarashi, Kazuaki, 5,316,691, Cl. 252-174.120.

Degussa Aktiengesellschaft: *See—*

Sextl, Elfriede; Roland, Eckehart; Kleinschmit, Peter; and Kiss, Akos, 5,316,993, Cl. 502-68.000.

Sextl, Gerhard; Strack, Hans; Reuter, Roland; Fuss, Ilona; Kleinschmit, Peter; and Schwarz, Rudolf, 5,316,816, Cl. 428-69.000.

Dejean, Anne: *See—*

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DeJule, Michael C.; and Credelle, Thomas L., to General Electric Company. Optical device with spatial light modulators for switching polarized light. 5,317,445, Cl. 359-250.000.

Delaney, Bobby R.: *See—*

Dunbar, Donald K.; and Delaney, Bobby R., 5,315,821, Cl. 60-226.100.

Delco Electronics Corp.: *See—*

Utley, Daniel E.; Deasy, Kevin M.; and Cheever, Gordon D., Jr., 5,317,248, Cl. 318-811.000.

Dell U.S.A., L.P.: *See—*

Swindler, Dan E., 5,317,483, Cl. 361-801.000.

Delli Gatti, Barbara: *See—*

Delli Gatti, Sal; Delli Gatti, Barbara; and Delli Gatti, Frank, 5,317,489, Cl. 362-157.000.

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Delli Gatti, Sal; Delli Gatti, Barbara; and Delli Gatti, Frank. Illuminated apparatus for playing a game of horseshoes. 5,317,489, Cl. 362-157.000.

DeLong, Leonard D.; and Gray, Freddy A., Jr. Round bale unroller and method. 5,316,427, Cl. 414-24.600.

DeMoss, Edward E., to Halliburton Company. Combination well casing pressure relief and kill valve apparatus. 5,316,086, Cl. 166-373.000.

Denham, Keith; and Miles, Michael, to Avdel Systems Limited. Method and apparatus for pull-through blind installation of a tubular member. 5,315,744, Cl. 29-243.530.

Den Hollander, Jan A.; Luyten, Peter R.; and Van Stapele, Reurt P., to U.S. Philips Corporation. Volume-selective magnetic resonance imaging method and device. 5,317,261, Cl. 324-309.000.

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Hare, Robert V., 5,316,473, Cl. 433-29.000.

De Schepper, Achille J.: *See—*

Haesebroek, Guy G.; and De Schepper, Achille J., 5,316,683, Cl. 210-688.000.

Dessau, Ralph M.; Grasselli, Robert K.; Lago, Rudolph M.; and Tsikoyiannis, John G., to Mobil Oil Corporation. Processes for converting feedstock organic compounds. 5,316,661, Cl. 208-46.000.

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McAninch, Thomas S., 5,316,544, Cl. 602-5.000.

Deutsche Aerospace Airbus GmbH: *See—*

Eilenstein-Wiegmann, Wilfried; and Vogg, Guenter, 5,316,242, Cl. 244-137.100.

Kallies, Guenter; and Lessat-Kaupat, Wolfgang, 5,316,241, Cl. 244-129.500.

Spiegel, Reinhard, 5,316,857, Cl. 428-457.000.

Deutsche Gelatine-Fabriken Stoess AG: *See—*

Koepff, Peter; Braumer, Klaus; Stahl, Helmuth; and Dick, Eberhard, 5,316,717, Cl. 264-564.000.

Deutsche Thomson-Brandt GmbH: *See—*

Rieger, Martin; and Roth, Sabine, 5,317,217, Cl. 307-521.000.

de Volder, Claude: *See—*

Billaud, Philippe; and de Volder, Claude, 5,317,317, Cl. 342-40.000.

DeVolpi, Dean. Joy stick. 5,317,301, Cl. 338-128.000.

Dewhurst, John E.; Pearlstein, Ronald M.; Panunto, Thomas W.; and Machado, Reinaldo M., to Air Products and Chemicals, Inc. Hydroxyl containing quaternary ammonium salts of fatty acids as internal mold release compositions. 5,317,075, Cl. 528-44.000.

Dhyanchand, P. John; Vaidya, Jayant; Mokadam, Rajhunath; and Arbanella, Richard, to Sundstrand Corporation. Electromagnetic transformer. 5,317,299, Cl. 336-5.000.

Dhyandchand, P. John; and Nguyen, Vietson M., to Sundstrand Corporation. Electrical power generation system. 5,317,498, Cl. 363-43.000.

Dias, Daniel M.; Goyal, Ambuj; and Parr, Francis N., to International Business Machines Corporation. Intelligent page store for concurrent and consistent access to a database by a transaction processor and a query processor. 5,317,731, Cl. 395-600.000.

Dibble, Eric P.; Hanakovic, Steven L.; Markovich, Voya R.; Niedrich, Daniel S.; Vlasak, Gary P.; Zarr, Richard S.; and Senger, Richard C., to International Business Machines Corporation. Applying solder to high density substrates. 5,316,788, Cl. 427-98.000.

Dick, Daniel W.: *See—*

Heindel, Timothy R.; Garvey, Michael J.; Dick, Daniel W.; Keller, Richard F.; Jordan, Mary P.; and Schleinz, Alan F., 5,316,836, Cl. 428-284.000.

Dick, Eberhard: *See—*

Koepff, Peter; Braumer, Klaus; Stahl, Helmuth; and Dick, Eberhard, 5,316,717, Cl. 264-564.000.

Dickie, Robert G.: *See—*

Chandaria, Kapoor; Stansbury, Benjamin H., Jr.; and Dickie, Robert G., 5,316,398, Cl. 401-18.000.

Dicon Fiberoptics: *See—*

Lee, Ho-Shang, 5,317,659, Cl. 385-22.000.

Diehl GmbH & Co.: *See—*

Hornfeck, Rudiger; Bar, Klaus; Nagler, Josef; and Barth, Manfred, 5,315,865, Cl. 73-118.100.

Diehl, Raymond L.: *See—*

Lahnan, Robert A.; and Diehl, Raymond L., 5,316,059, Cl. 141-340.000.

Digital Equipment Corporation: *See—*

Britton, Sharon M.; Allmon, Randy; and Samudrala, Sridhar, 5,317,527, Cl. 364-715.040.

Cuenod , ean-Christophe E.; and Sichel, Peter A., 5,317,693, Cl. 395-275.000.

Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., 5,317,717, Cl. 395-425.000.

Edgar, Ron, 5,317,708, Cl. 395-425.000.

Heap, A. Randall; and Santiago, Eduardo A., 5,317,723, Cl. 395-500.000.

Jouppi, Norman P., 5,317,718, Cl. 395-425.000.

Philipossian, Ara; Soleimani, Hamid R.; and Doyle, Brian S., 5,316,965, Cl. 437-70.000.

Rozmovits, Bernard A., 5,317,719, Cl. 395-425.000.

Sites, Richard L., 5,317,740, Cl. 395-700.000.

Stamm, Rebecca L.; Edmondson, John; Archer, David; Nadkarni, Samyojita; and Strouble, Raymond, 5,317,720, Cl. 395-425.000.

Young, David J., Jr.; Randall, Scott L.; Shaw, Scott D.; and Wylde, Andrew F., 5,316,642, Cl. 204-198.000.

Dingle, Brenda: *See—*

Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., 5,317,236, Cl. 315-169.300.

Dinur, Eldad, to Naan Irrigation Systems. Irrigator with mutually perpendicular water path components. 5,316,220, Cl. 239-542.000.

Dinwoodie, Thomas L. Solar cell roofing assembly. 5,316,592, Cl. 136-244.000.

Dionex Corporation: *See—*

Dasgupta, Purnendu K., 5,316,630, Cl. 204-180.000.

Dipl.-Ing Herbert Gunther Gesellschaft mbH: *See—*

Gunther, Herbert, 5,316,468, Cl. 425-549.000.

Dirksing, Robert S.: *See—*

Hall, William G.; and Dirksing, Robert S., 5,316,054, Cl. 141-22.000.

Discovery Chemicals, Inc.: *See—*

Lee, John S.; and Pearson, Michael J., 5,316,998, Cl. 502-415.000.

Ditter, Donald J., Jr., to Broderbund Software, Inc. Using regular graphic shapes to identify a pointer-selected graphic object. 5,317,680, Cl. 395-135.000.

Dixit, Girish A.: *See—*

Chen, Fusen E.; Dixit, Girish A.; and Wei, Che-Chia, 5,317,192, Cl. 257-750.000.

Djie, Eric J., to Sedac-Mecobel. Piece of furniture convertible from a seat into a bed. 5,315,722, Cl. 5-37.100.

Doble Engineering Company: *See—*

Cavigelli, George A., 5,317,277, Cl. 330-109.000.

Dobozy, John. Method and apparatus for recovering elastomeric material. 5,316,224, Cl. 241-30.000.

Dr. Helbig GmbH & Co Orthopadische Produkte KG: *See—*

Weber-Unger, Georg, 5,316,147, Cl. 206-438.000.

Dr. Ing. h.c.F. Porsche AG: *See—*

Wichelhaus, Donatus, 5,315,961, Cl. 123-90.110.

Doerr, Hans J.: *See—*

Bunshah, Rointan F.; Jou, Shyankay; Prakash, Shiva; and Doerr, Hans J., 5,316,636, Cl. 204-157.470.

Doersam, Willi R. L., to Koenig & Bauer Aktiengesellschaft. Blanket fixing and tensioning assembly. 5,315,931, Cl. 101-415.100.

Doi, Shuji: *See—*

Nakano, Tsuyoshi; Doi, Shuji; Noguchi, Takanobu; Ohnishi, Toshihiro; and Iyechika, Yasushi, 5,317,169, Cl. 257-40.000.

Doi, Yoshiyuki: *See—*

Kita, Isamu; Kobashi, Masayuki; Tabuchi, Susumu; Doi, Yoshiyuki; Nakamura, Noboru; Ishihara, Managu; Arioka, Koji; and Kayano, Isamu, 5,317,610, Cl. 376-414.000.

Doke, Michael J.; Howarth, Richard A.; and Recine, Leonard J., Sr., to Marlow Industries, Inc. Modular thermoelectric assembly. 5,315,830, Cl. 62-3.200.

Dolan, Charles P.; Keirsey, David M.; and Reiser, Kurt, to Hughes Aircraft Company. Matching technique for context sensitive rule application. 5,317,677, Cl. 395-77.000.

Domb, Abraham J.; and Maniar, Manoj, to Nova Pharmaceutical Corporation. Fatty acid terminated polyanhydride. 5,317,079, Cl. 528-271.000.

Dong, Dennis, to H-D Tech Inc. Process for maintaining electrolyte flow rate through a microporous diaphragm during electrochemical production of hydrogen peroxide. 5,316,629, Cl. 204-83.000.

Donges, William E.: *See*—

Christyson, Richard G.; Donges, William E.; and Turner, James J., 5,316,219, Cl. 239-533.100.

Donohue, William J., to Automated Production Systems Corporation. Conveyor guidetrack segment. 5,316,134, Cl. 198-861.100.

Donson, Jon; Dawson, William O.; Granthan, George L.; Turpen, Thomas H.; Turpen, Ann M.; Garger, Stephen J.; and Grill, Laurence K., to Biosource Genetics Corp. Plant viral vectors having heterologous subgenomic promoters for systemic expression of foreign genes. 5,316,931, Cl. 435-172.300.

Dore, Pierre: *See*—

Marcel, Francois; Sallaerts, Dany; Allaire, Serge; and Dore, Pierre, 5,317,571, Cl. 370-103.000.

Dorler, Jack A.: *See*—

Banker, Dennis C.; Carlson, Tore A.; Dorler, Jack A.; Hendricks, Paul D.; Klara, Walter S.; Masci, Frank M.; and Struk, James R., 5,317,208, Cl. 307-454.000.

Dornberg, Christian: *See*—

Enning, Norbert; Kreis, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, 5,316,367, Cl. 206-189.000.

Dornier GmbH: *See*—

Obkircher, Bernt, 5,317,163, Cl. 250-495.100.

Dorri, Bizhan; Laskaris, Evangelos T.; Herd, Kenneth G.; and Gabis, Raymond E., to General Electric Company. Apparatus and method for passive shimming of a superconducting magnet which images human limbs. 5,317,298, Cl. 335-301.000.

Dorri, Bizhan: *See*—

Vermilyea, Mark E.; and Dorri, Bizhan, 5,317,296, Cl. 335-216.000.

Dorsey, William I.; Masten, John J., Jr., deceased (by Masten, Barbara C., administratrix); Schroedl, Richard M.; and Will, Donald G., to International Business Machines Corporation. Visual measurement technique and test pattern for aperture offsets in photoplotters. 5,317,338, Cl. 346-1.100.

Dosaka, Shinichi: *See*—

Noda, Hiroaki; Dosaka, Shinichi; and Kurosawa, Hiroshi, 5,317,142, Cl. 250-201.400.

Doss, George A.: *See*—

MacConnell, John G.; Arison, Byron H.; Doss, George A.; and Monaghan, Richard L., 5,317,031, Cl. 514-452.000.

Dougherty, Thomas J.; and Pierson, John R., to Globe-Union, Inc. Dual battery switch circuit. 5,316,868, Cl. 429-9.000.

Dougherty, Thomas K.; Harris, Norman H.; Chow, James R.; Pierce, Brian M.; and Whelan, David A., to Hughes Aircraft Company. Microwave-absorbing materials containing polar icosahedral molecular units and methods of making the same. 5,317,058, Cl. 525-64.000.

Douglas, Jerry A.; and Schmidt, Godfried, to Plastic Processing Corporation. Dual bottle container. 5,316,159, Cl. 215-10.000.

Douglas, Monte A., to Texas Instruments Incorporated. Photolithographic method using non-photoactive resins. 5,316,895, Cl. 430-313.000.

Douty, Brent D.: *See*—

Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.

Dow Chemical Company, The: *See*—

Schrenk, Walter J., 5,316,703, Cl. 264-1.300.

Dow Corning Corporation: *See*—

Bokerman, Gary N.; Puckett, David E.; and Wood, Larry H., 5,317,072, Cl. 528-12.000.

Dow Corning Limited: *See*—

John, Vivian B., 5,316,692, Cl. 252-174.150.

Dower, Steven K.: *See*—

Cerretti, Douglas P.; Cosman, David J.; Dower, Steven K.; March, Carl J.; Urdal, David L.; and Larsen, Alf D., 5,317,087, Cl. 530-350.000.

Dowle, Michael D.: *See*—

Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Montana, John G.; Pass, Martin; and Judd, Duncan B., 5,317,023, Cl. 514-303.000.

Downs, Alfred G.: *See*—

Townsend, Robert L.; and Downs, Alfred G., 5,316,040, Cl. 137-556.000.

Doyle, Brian S.: *See*—

Philipossian, Ara; Soleimani, Hamid R.; and Doyle, Brian S., 5,316,965, Cl. 437-70.000.

Dragerwerk AG: *See*—

Birenheide, Torsten, 5,315,878, Cl. 73-727.000.

Dragerwerk Aktiengesellschaft: *See*—

Koch, Jochim; and Frembgen, Stefan, 5,316,542, Cl. 600-22.000.

Kollenbrandt, Norbert; Schwenke, Heiko; and Wimmers, Elmar, 5,316,350, Cl. 285-242.000.

Kuhn, Uwe; Kiesele, Herbert; and Haupt, Stephan, 5,316,648, Cl. 204-415.000.

Draghetti, Fiorenzo, to G.D. SpA. Device for taking up the leading end of a new roll of strip material and transferring it to a successive work station. 5,316,229, Cl. 242-58.000.

Dreilich, Ludwig; Woersdoerfer, Karl-Friedrich; Egerer, Thomas; and Worms, Reinhold, to Alfred Teves GmbH. Coefficient-of-friction measuring device, in particular for the measurement of coefficients of friction depending on speed. 5,315,860, Cl. 73-9.000.

Dresser-Rand Company: *See*—

Osborne, Colin, 5,316,441, Cl. 415-208.400.

Drews, Terence. Method for making products made from recycled vehicle tires. 5,316,708, Cl. 264-40.500.

Drillat, Jean-Louis: *See*—

Izoard, Jean; Menegaz, M. Eric; Drillat, Jean-Louis; and Le Maitre, Philippe, 5,317,471, Cl. 361-105.000.

Drobish, James L.; Ciboch, Frank A., Jr.; Paul, Robert A.; Edwards, Jimmy C.; and Robbins, Lawrence E., to Procter & Gamble Company, The. Pump pistons for pressurizing liquid dispensing containers. 5,316,187, Cl. 222-401.000.

Drori, Mordeki. Coiled filter strip with upstream and downstream butt ends. 5,316,676, Cl. 210-411.000.

Drozdenko, Ronald: *See*—

Weinstein, Sidney; Weinstein, Curt; and Drozdenko, Ronald, 5,316,011, Cl. 128-744.000.

Drug Plastics & Glass Company, Inc.: *See*—

Biesecker, Lisa B.; Forte, Glenn J.; Boyle, Justin P.; and Matthews, Norris W., 5,315,811, Cl. 53-474.000.

Du Pont Canada Inc.: *See*—

Koster, Edward, 5,316,713, Cl. 264-209.100.

Dubberke, Markus, to Nicole Durr GmbH. Snap fastener for securing shoe laces. 5,315,741, Cl. 24-712.100.

Dubel, Friedrich, to Wako Walzen Konstruktion System GmbH. Apparatus for continuously applying a liquid to a web. 5,316,582, Cl. 118-301.000.

Duda, John, to Industrial Acoustics Company, Inc. Anechoic structural elements and chamber. 5,317,113, Cl. 181-285.000.

Dudley, Jerome M. Airborn archery target. 5,316,312, Cl. 273-362.000.

Duke, Steven R.: *See*—

Rossier, Glenn E.; Duke, Steven R.; Proulx, Edward A.; and Jarvis, Stephen A., 5,315,913, Cl. 89-12.000.

Duke University: *See*—

Bigner, Darell D.; and Brent, Thomas P., 5,316,932, Cl. 435-193.000.

Roe, Diane S., 5,316,917, Cl. 435-15.000.

Dunbar, Donald K.; and Delaney, Bobby R., to General Electric Company. Aircraft bypass turbofan engine thrust reverser. 5,315,821, Cl. 60-226.100.

Dunham, Michael N.; and Edwards, Lawrence D., to Kadee Quality Products Co. Coupler structure for model trains with centering cavity and surfaces. 5,316,158, Cl. 213-75.0TC.

Dunklee, Douglas M.: *See*—

Decarie, Andre P.; Brown, David L.; Malinowski, Stanley J.; and Dunklee, Douglas M., 5,315,985, Cl. 128-4.000.

Dunlop Slazenger Corporation: *See*—

Chappell, Chris, 5,316,297, Cl. 273-77.00A.

Dunthorn, David I. Diffusion-assisted position location particularly for visual pen detection. 5,317,140, Cl. 250-221.000.

Dupont, Antoine; Hepp, Bernard; and Benoit, Eric, to Thomson Consumer Electronics S.A. Apparatus for providing contrast and/or brightness control of a video signal. 5,317,401, Cl. 368-678.000.

Du Pont de Nemours, E. I., and Company: *See*—

Clark, Stephen L., 5,316,487, Cl. 439-78.000.

Kato, Ippei; and Takano, Akiyoshi, 5,316,839, Cl. 428-285.000.

Spinu, Maria, 5,317,064, Cl. 525-411.000.

DuPont Merck Pharmaceutical Co.: *See*—

Cain, Gary A.; Christos, Thomas E.; and Tam, Sang W., 5,317,024, Cl. 514-317.000.

Dupoux, Christian: *See*—

Clemence, Michel; Barocci, Christian; and Dupoux, Christian, 5,316,490, Cl. 439-114.000.

During AG: *See*—

During, Walter, 5,316,184, Cl. 222-107.000.

During, Walter, to During AG. Foldable plastic bottle, blow mold form to make the bottle, and method of making the bottle. 5,316,184, Cl. 222-107.000.

Dutton, Drew J.: *See*—

Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoenner, David W., 5,317,715, Cl. 395-425.000.

Dwyer, Mark A.: *See*—

Dwyer, Paul; and Dwyer, Mark A., 5,316,426, Cl. 414-24.500.

Dwyer, Paul; and Dwyer, Mark A. Lateral bale pick-up assembly having a bale turner mounted thereon. 5,316,426, Cl. 414-24.500.

Dyla, James E., to AMCOL Corporation. System for spraying material on tubing and reclaiming excess material. 5,316,588, Cl. 134-9.000.

Dynamotive Corporation: *See*—

Kiesewetter, Lothar E.; Olsson, Fredy; and Tyren, Carl H., 5,317,223, Cl. 310-26.000.

Dynawave Incorporated: *See*—

Scannelli, Anthony R.; Gartzke, Donald G.; and Lewis, Christopher, 5,316,499, Cl. 439-534.000.

Dzurko, Thomas A.: *See*—

Arabia, Frank J., Jr.; and Dzurko, Thomas A., 5,316,354, Cl. 292-340.000.

E-muSystems, Inc.: *See*—

Frost, David R., 5,317,104, Cl. 84-625.000.

E. R. Squibb & Sons: *See*—

Johnsen, Kenneth A.; and Ferguson, Keith T., 5,316,607, Cl. 156-212.000.

E-Systems, Inc.: *See*—

Kennedy, Joseph P.; Roller, Christopher D.; and Hooper, Robert W., 5,317,323, Cl. 342-457.000.

E-Tek Dynamics, Inc.: *See*—

Pan, Jing-Jong, 5,317,655, Cl. 385-11.000.

Eagan, Nancy J.: *See*—

Loesch-Fries, L. Sue; Eagan, Nancy J.; Merlo, Donald J.; and Alexandrescu, Carol, 5,316,930, Cl. 435-172.300.

Eagles, Dana B.: *See*—

Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.

Eapen, Kalathil C.: *See*—

Snyder, Carl E., Jr.; Gschwender, Lois J.; Eapen, Kalathil C.; and Chen, Grace J., 5,316,686, Cl. 252-54.000.

East, Don G.; Felde, Steven L.; Hu, Paul Y.; and Robles, Guillermo S., to International Business Machines Corporation. Tape cartridge with mount plate. 5,316,235, Cl. 242-199.000.

Eastern Company, The: *See*—

Wright, Raymond L., 5,316,414, Cl. 405-259.600.

Eastman Kodak Company: *See*—

Agostinelli, John A.; Mir, Jose M.; and Revelli, Joseph F., 5,317,666, Cl. 385-122.000.

Beaman, Bryan A.; LaPointe, Jeffrey G.; and Newman, David A., 5,317,344, Cl. 346-107.00R.

Bijay, Shankar S.; and Chen, Tsang J., 5,316,882, Cl. 430-108.000.

Braun, Hilarion; Schullerus, Wolfgang; and Schulz, Harald, 5,317,339, Cl. 346-1.100.

Brock, George W.; and Long, Michael E., 5,317,343, Cl. 346-76.0PH.

Daly, Robert C.; and Lawrence, Kristine B., 5,317,001, Cl. 503-227.000.

Dassero, William F., 5,317,356, Cl. 354-288.000.

Evans, Stuart G.; Morse, John E.; and Hessop, Thomas C., 5,317,139, Cl. 235-462.000.

Fields, Roger A., 5,317,364, Cl. 355-40.000.

Kahen, Keith B., 5,317,588, Cl. 372-96.000.

Lin, Ming-Jye; and Wey, Jong-Shinn, 5,317,521, Cl. 364-496.000.

Long, Michael, 5,315,890, Cl. 74-110.000.

Marcus, Michael A.; Schafer, Kenneth R.; and Kestner, Diane E., 5,317,386, Cl. 356-372.000.

Mir, Jose M.; Stancil, Daniel; and Schlesinger, Tuviah E., 5,317,446, Cl. 359-296.000.

Parton, Richard L.; Stegman, David A.; and Sauter, Frederick J., 5,316,904, Cl. 430-567.000.

Sherburne, David G., 5,317,359, Cl. 354-324.000.

Specht, Donald P.; and Harbison, Kenneth G., 5,316,902, Cl. 430-539.000.

Spence, John P.; Granger, Edward M.; and Rinehart, Charles E., 5,317,425, Cl. 358-504.000.

Tschiderer, Paul E.; and Lawniczak, Gary P., 5,317,365, Cl. 355-75.000.

Walls, John E.; Miller, Gary R.; and Ryan, Raymond W., Jr., 5,316,892, Cl. 430-309.000.

Zander, Dennis R.; and Kataoka, Hideaki, 5,317,355, Cl. 354-277.000.

Eaton Corporation: *See*—

Reichard, Jeffrey A., 5,316,077, Cl. 165-104.280.

Slicker, James; Mazur, Joseph S.; and Breen, Michael T., 5,316,116, Cl. 477-181.000.

Teeter, Terry E., 5,315,900, Cl. 477-165.000.

Eaton, Jay S. Method for filling seed trays. 5,315,810, Cl. 53-473.000.

Eaton, S. Sheffield, Jr., to United Memories, Inc. Low power DRAM. 5,317,538, Cl. 365-189.090.

Eavenson, Jimmy N., Sr.: *See*—

Behrens, Robert N.; and Eavenson, Jimmy N., Sr., 5,315,893, Cl. 74-512.000.

Ebato, Kazuo; Tsuda, Masaomi; and Oomori, Tsutomu, to Nippon Yakin Kogyo Co., Ltd. Method of producing Ni-Ti intermetallic compounds. 5,316,599, Cl. 148-512.000.

Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, to Nissin Electric Co., Ltd. Method of forming copper film on substrate. 5,316,802, Cl. 427-533.000.

Eberbach, Mark A., to Cook Incorporated. Medical apparatus and methods for treating sliding hiatal hernias. 5,316,543, Cl. 600-37.000.

Eberhardt, Werner: *See*—

Hupe, Klaus-Peter; Strohmeier, Fred; Zimmermann, Hans-Peter; and Eberhardt, Werner, 5,316,954, Cl. 436-89.000.

Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; Uzawa, Shunichi; and Hasegawa, Takayuki, to Canon Kabushiki Kaisha. Exposure apparatus. 5,317,615, Cl. 378-34.000.

ECC International Inc.: *See*—

Brown, Alan J.; Darsillo, Michael S.; and Bentley, O. Wayne, Jr., 5,317,053, Cl. 524-425.000.

Eckhardt, Georg W. Slide vane machine. 5,316,456, Cl. 418-150.000.

Ecolab Inc.: *See*—

Gladfelter, Elizabeth J.; Outlaw, Tina O.; Copeland, James L.; Schulz, Rhonda K.; Boche, Daniel K.; and Peterson, Jeff W., 5,316,688, Cl. 252-90.000.

Ed. Zublin Aktiengesellschaft: *See*—

Muhlberger, Johann; Glaser, Eberhard; and Maier, Stefan, 5,316,510, Cl. 445-2.000.

Edamura, Kaoru, to Sharp Kabushiki Kaisha. Microwave oven having preparation of menu assisting function. 5,317,134, Cl. 219-720.000.

Edelson, Glenn D.: *See*—

Salas, R. Pito; Edelson, Glenn D.; Kleppner, Paul S.; and Shaver, Robert S., 5,317,686, Cl. 395-157.000.

Edeus, James A.; and Powell, Timothy J., to National Manufacturing Company. Surface mounted slide bolt. 5,315,850, Cl. 70-129.000.

Edgar, Ron, to Digital Equipment Corporation. Apparatus and method for an improved content addressable memory. 5,317,708, Cl. 395-425.000.

Edlin, George R.: *See*—

Hilbert, Lee A.; Edlin, George R.; Riley, Leon H.; Miller, Thomas G.; Gebhart, Wilford W.; and Johnson, Charles L., 5,317,160, Cl. 250-390.120.

Edmondson, John: *See*—

Stamm, Rebecca L.; Edmondson, John; Archer, David; Nadkarni, Samyojita; and Strouble, Raymond, 5,317,720, Cl. 395-425.000.

Edo Corporation, Fiber Science Division: *See*—

Moser, Daniel J., 5,315,872, Cl. 73-304.00C.

Moser, Daniel J., 5,316,611, Cl. 156-425.000.

Edwards, Glenn R.; Lloyd, Graham; and Oberman, Marl L., to Greenleaf Medical Systems, Inc. Man-machine interface for a joint measurement system. 5,316,017, Cl. 128-782.000.

Edwards, Hardy M., Jr., to University of Georgia Research Foundation, Inc. Vitamin D derivative feed compositions and methods of use. 5,316,770, Cl. 424-442.000.

Edwards, Jimmy C.: *See*—

Drobish, James L.; Ciboch, Frank A., Jr.; Paul, Robert A.; Edwards, Jimmy C.; and Robbins, Lawrence E., 5,316,187, Cl. 222-401.000.

Edwards, Lawrence D.: *See*—

Dunham, Michael N.; and Edwards, Lawrence D., 5,316,158, Cl. 213-75.0TC.

Edwards, William H., III, to United Technologies Corporation. Gas turbine elements rearing coke inhibiting coatings of titanium compounds. 5,315,822, Cl. 60-261.000.

Efrat Future Technology Ltd.: *See*—

Misholi, Boaz; Danziger, Itzchak; Kowarsky, Stephen R.; and Sandlerman, Nimrod, 5,317,628, Cl. 379-89.000.

EG&G Idaho, Inc.: *See*—

O'Brien, Michael H.; and Park, Blair H., 5,316,988, Cl. 501-98.000.

Egan, George P.; Borneman, Karl L.; and Jaeger, Douglas A., to General Electric Company. Method and apparatus for inspection of open face honeycomb structures. 5,315,861, Cl. 73-37.000.

Egerer, Thomas: *See*—

Dreilich, Ludwig; Woersdoerfer, Karl-Friedrich; Egerer, Thomas; and Worms, Reinhold, 5,315,860, Cl. 73-9.000.

Eglinton, Robert B.: *See*—

Roberson, Glenn A., Jr.; and Eglinton, Robert B., 5,315,766, Cl. 34-409.000.

Eguchi, Takatoshi: *See*—

Katayama, Keiichi; Kato, Mitsuo; Tsurusaki, Kazuya; Hanamoto, Mikio; Mihara, Kazumasa; and Eguchi, Takatoshi, 5,317,121, Cl. 219-672.000.

Ehlers, Eberhard: *See*—

Aretz, Werner; Ehlers, Eberhard; and Hedtmann, Udo, 5,316,929, Cl. 435-146.000.

EHWA Diamond Ind. Co., Ltd.: *See*—

Kim, Soo K., 5,316,416, Cl. 408-145.000.

Eidelman, David: *See*—

Kenyon, Christopher; Macklem, Peter; and Eidelman, David, 5,317,644, Cl. 382-6.000.

Eilenstein-Wiegmann, Wilfried; and Vogg, Guenter, to Deutsche Aerospace Airbus GmbH. Apparatus for guiding different size pallets, especially on the loading floor of an aircraft. 5,316,242, Cl. 244-137.100.

Einbinder, Saul J.: *See*—

Bergland, Glenn D.; Camlet, John V.; Einbinder, Saul J.; Pitio, Walter M.; Pritchard, Robert C.; Shevchuk, George J.; and Shugard, Donald D., 5,317,658, Cl. 385-16.000.

Eisai Co., Ltd.: *See*—

Shimizu, Katsumi; Maruoka, Kazumi; and Yamagishi, Kiyoshi, 5,316,030, Cl. 134-105.000.

Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, 5,316,933, Cl. 435-240.100.

Eisele, Harald, to U.S. Philips Corporation. Resistance coupled data transmission arrangement. 5,317,597, Cl. 375-36.000.

Eitoku, Kenji: *See*—

Hattori, Yasuhiko; and Eitoku, Kenji, 5,315,975, Cl. 123-337.000.

Eklund, Robert H.: *See*—

Spratt, David B.; Virkus, Robert L.; Eklund, Robert H.; and Zorinsky, Eldon J., 5,316,957, Cl. 437-31.000.

El A'mma, Anton G.: *See*—

Stewart, Thomas; Lesko, Patricia M.; and El A'mma, Anton G., 5,316,860, Cl. 428-473.000.

Elashmawi, Essam: *See*—

Chiang, Steve S.; Chen, Wenn-Jei; and Elashmawi, Essam, 5,316,971, Cl. 437-170.000.

Elastec, Inc.: *See*—

Wilson, Donald L.; and Trippe, Jerry C., 5,316,672, Cl. 210-242.300.

Electro Scientific Industries, Inc.: *See*—

Baird, Brian; and DeFreez, Richard, 5,317,447, Cl. 359-328.000.

Electrogesic Corporation, The: *See*—

King, Ray J., 5,317,155, Cl. 250-324.000.

Elephant Chain Block Company Limited: *See—*
Nishi, Yoshio; Kubota, Haruo; and Ueno, Yoshio, 5,316,267, Cl. 254-383.000.

Elia, Paul. Hot water storage system. 5,317,670, Cl. 392-464.000.

Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., to International Business Machines Corp. Method and apparatus for coupling data processing systems. 5,317,739, Cl. 395-650.000.

Ell, William. Lamp puller. 5,316,512, Cl. 445-61.000.

Ellis, Thomas O.: *See—*
Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., 5,317,689, Cl. 395-163.000.

Ellison, David W. Timed telephone silencer. (telephone silencer with timer function). 5,317,632, Cl. 379-199.000.

Ellman, Fredric: *See—*
Ellman, Steven; Ellman, Fredric; Ellman, Julius; and Fusi, John C., 5,316,514, Cl. 446-26.000.

Ellman, Julius: *See—*
Ellman, Steven; Ellman, Fredric; Ellman, Julius; and Fusi, John C., 5,316,514, Cl. 446-26.000.

Ellman, Steven; Ellman, Fredric; Ellman, Julius; and Fusi, John C., to Matchbox Toys (USA) Ltd. Toy vehicle and launcher system. 5,316,514, Cl. 446-26.000.

Ellsworth, Thayne N. Portable multiple module simulator apparatus. 5,316,480, Cl. 434-29.000.

Ellul, Joseph P.: *See—*
Boyd, John M.; Ellul, Joseph P.; and Tay, Sing P., 5,316,978, Cl. 437-203.000.

Elsubki, Taha M.: *See—*
Skelley, Arthur P.; McMichael, James C.; Cobb, James T., Jr.; Rohrer, Wesley M., Jr.; Custer, Phillip E., II; and Elsubki, Taha M., 5,316,737, Cl. 422-170.000.

Elverum, John A.: *See—*
Golden, Casey V.; Turner, Ronald L.; Elverum, John A.; and Hauser, Ray L., 5,317,037, Cl. 523-128.000.

Emerson, Stephen W. Razor knife with built-in pencil sharpener. 5,315,760, Cl. 30-123.000.

Emery, Roy W. Carry out tray. 5,316,173, Cl. 220-556.000.

Emhart Inc.: *See—*
Ito, Hiroshi, 5,317,123, Cl. 219-98.000.
Lesser, Carl W.; and Schnur, Earl J., 5,317,124, Cl. 219-99.000.

Emmerson, A. Richard: *See—*
Haag, William D.; Emmerson, A. Richard; and Laube, Daniel J., 5,316,039, Cl. 137-454.600.

Emond, Jeffrey A.: *See—*
Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.

Emonds-Alt, Xavier; Goulaouic, Pierre; Proietto, Vincenzo; and Van Broeck, Didier, to Sanofi. Aromatic amine compounds their method of preparation and pharmaceutical compositions in which they are present. 5,317,020, Cl. 514-255.000.

Ems-Inventa AG: *See—*
Buehler, Friedrich S.; Casanova, Josef; Ernst, Hansjorg; and Schultze, Hans-Joachim, 5,316,578, Cl. 106-210.000.

Endo, Jerry K.: *See—*
Huber, Michael S.; and Endo, Jerry K., 5,315,912, Cl. 89-1.816.

Endo, Masayuki: *See—*
Hashimoto, Kazuhiko; and Endo, Masayuki, 5,316,891, Cl. 430-296.000.

Endo, Shinichi: *See—*
Seki, Yoichi; Hayakawa, Teruyo; Saito, Hiroyuki; and Endo, Shinichi, 5,317,357, Cl. 354-289.120.

Endo, Tadao: *See—*
Kobayashi, Isao; Kaifu, Noriyuki; Saika, Toshihiro; and Endo, Tadao, 5,317,406, Cl. 348-307.000.

Energy Partners, Inc.: *See—*
Perry, John H., Jr.; Person, Abraham; Misiaszek, Steven M.; and Alessi, Donald P., Jr., 5,316,869, Cl. 429-19.000.

Engelbrecht, Hans-Christian: *See—*
Birk, Manfred; Fenchel, Reinhard; Muller, Norbert; Wessel, Wolf; and Engelbrecht, Hans-Christian, 5,315,976, Cl. 123-357.000.

Engineered Products, Inc.: *See—*
Charping, Jimmy D.; and Watson, Walter B., 5,316,428, Cl. 414-267.000.

Englert, Heinrich: *See—*
Inazu, Mizuho; Satoh, Ryoichi; Inoue, Tsutomu; Kitagawa, Hiroshi; Katoh, Masakazu; Englert, Heinrich; Carniato, Denis; and Lang, Hans-Jochen, 5,317,029, Cl. 514-422.000.

English, Gary L.: *See—*
Talley, Laroul J.; and English, Gary L., 5,315,852, Cl. 72-149.000.

Enning, Norbert; Kreis, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, to Audi AG. Bearing structure for the bodywork of a vehicle. 5,316,367, Cl. 296-189.000.

Ensci, Inc.: *See—*
Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, 5,317,132, Cl. 219-543.000.
Pinsky, Naum; and Alkaitis, Saulius A., 5,316,846, Cl. 428-325.000.

Eorgoff, Michael C.: *See—*
Bixby, Joy P.; Eorgoff, Michael C.; Gagne, Bruce N.; Houser, Richard D.; Ivanoff, Mario J.; Osband, Daniel W.; Richardson, Darrel D.; and Skaates, Mary Z., 5,317,568, Cl. 370-85.600.

Eppig, Christopher P.: *See—*
Paspek, Stephen C.; Eppig, Christopher P.; Hauser, Jeffrey B.; and Polisena, Carl, 5,316,655, Cl. 208-131.000.

Erdeljac, John P.: *See—*
Hutter, Louis N.; and Erdeljac, John P., 5,317,180, Cl. 257-337.000.

Eriksson, Lennart: *See—*
Paulsson, Lars; and Eriksson, Lennart, 5,315,933, Cl. 102-489.000.

Eriksson, Per A.; and Lindgren, Mats A. Package and blank for making the same. 5,316,212, Cl. 229-215.000.

Ernst, Hansjorg: *See—*
Buehler, Friedrich S.; Casanova, Josef; Ernst, Hansjorg; and Schultze, Hans-Joachim, 5,316,578, Cl. 106-210.000.

Eschbach, Eugene A.: *See—*
Buelt, James L.; Oma, Kenton H.; and Eschbach, Eugene A., 5,316,411, Cl. 405-128.000.

Eschbach, Reiner; Knox, Keith T.; and Birnbaum, David, to Xerox Corporation. Method for quantization gray level pixel data with application of under compensated error diffusion. 5,317,653, Cl. 382-50.000.

Esposito, Augustine G.: *See—*
Klievoneit, Harold R.; Esposito, Augustine G.; and Runyon, Robert C., 5,316,559, Cl. 51-295.000.

Espy, Herbert H., to Hercules Incorporated. Absorbance and permanent wet-strength in tissue and toweling paper. 5,316,623, Cl. 162-164.300.

Esser, Klaus M.: *See—*
Bender, Paul E.; Griswold, Don E.; Hanna, Nabil; Lee, John C.; Votta, Bartholomew J.; Simon, Philip L.; Badger, Alison M.; and Esser, Klaus M., 5,317,019, Cl. 514-224.200.

Estell, David A.; Caldwell, Robert M.; Bott, Richard R.; and Graycar, Thomas P., to Genencor, Inc. Non-human carbonyl hydrolase mutants, DNA sequences and vectors encoding same and hosts transformed with said vectors. 5,316,941, Cl. 435-252.300.

Estep, Kimberly G.: *See—*
Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.

Esterle, Richard B. Geometric display device and method of demonstrating geometric shapes. 5,316,483, Cl. 434-211.000.

Etchu, Masami; Hamano, Hisashi; Hosoi, Masahiro; and Saeki, Yasuhiro, to Teijin Limited. Magnetic tape. 5,316,823, Cl. 428-141.000.

Ethridge, Charles O.: *See—*
Boatman, L. Terry; Ethridge, Charles O.; Pedersen, Kristen I.; and Poranski, Peter F., Sr., 5,316,509, Cl. 441-3.000.

Eto, Koichi; and Tamagaki, Akira, to Sharp Kabushiki Kaisha. Method for controlling pressure during image development. 5,316,883, Cl. 430-138.000.

Eurafrica Videomatic S.R.L. Societa Per Ricerche: *See—*
Righi, Nardino, 5,315,866, Cl. 73-146.500.

Eury, Robert P.; and Patel, Rajesh, to Advanced Polymer Systems, Inc. Blocked polymeric particles having internal pore networks for delivering active substances to selected environments. 5,316,774, Cl. 424-501.000.

Evans, Edwin R.; and Jeram, Edward M., to General Electric Company. Fluorosilicone hydrides. 5,317,073, Cl. 528-42.000.

Evans, Stuart G.; Morse, John E.; and Hessop, Thomas C., to Eastman Kodak Company. Film optical code reader having clock and data sensors. 5,317,139, Cl. 235-462.000.

Evans, Wayne O., to International Business Machines Corporation. Dynamically adapting multiple versions on system commands to a single operating system. 5,317,722, Cl. 395-500.000.

Everbrite, Inc.: *See—*
Strawbridge, Jon P.; and Fredricks, Mark A., 5,315,776, Cl. [illegible]

Everett, David F.; and Buck, Daniel C., to Westinghouse Electric Corp. Dual resonant antenna circuit for RF tags. 5,317,330, Cl. 343-867.000.

EVG Entwicklungs- u. Verwertungs-gesellschaft m.b.H.: *See—*
Ritter, Klaus; Ritter, Gerhard; and Lassbacher, Anton, 5,316,052, Cl. 140-112.000.

Evrard, Alain, to Sidel. Apparatus for loading containers on a conveyor. 5,316,127, Cl. 198-470.100.

Ewaldt, Helmut, to U.S. Philips Corporation. Printing method for disc-shaped information carriers. 5,317,337, Cl. 346-1.100.

Expandable Grafts Partnership: *See—*
Palmaz, Julio C.; and LaBorde, Jean C., 5,316,023, Cl. 128-898.000.

Exxon Chemical Patents, Inc.: *See—*
Brant, Patrick; McElrath, Kenneth O., Jr.; and Robertson, Martha H., 5,317,070, Cl. 526-348.500.
Yang, Henry W., 5,317,055, Cl. 524-458.000.

Exxon Production Research Company: *See—*
Rasi, Marco; Biegler, Mark W.; and Sikirica, Eugene A., 5,316,091, Cl. 175-61.000.

Exxon Research & Engineering Co.: *See—*
Brons, Glen B.; Siskin, Michael; and Wrzeszczynski, Kazimierz O., 5,316,659, Cl. 208-39.000.
Dawson, William C., 5,316,085, Cl. 166-369.000.

FA. Ernst Siegling: *See—*
Muraoka, Tomonori; and Atsumi, Isato, 5,316,132, Cl. 198-847.000.

Fabio Perini S.p.A.: *See—*
Biagiotti, Guglielmo, 5,315,907, Cl. 83-38.000.

FACSA, Inc.: *See—*
Bauer, Gerald, 5,315,984, Cl. 126-317.000.

Fagarasan, John T.; Alland, Stephen W.; and Jakaub, Ronald J., to Hughes Aircraft Company. Automatic global radar/IR/ESM track association based on ranked candidate pairings and measures of their proximity. 5,317,319, Cl. 342-53.000.

Fain, John: *See—*
Gordon, Yoram; Fain, John; Davis, William F.; and Lancaster, William G., 5,315,809, Cl. 53-399.000.

Falco, Desiderio: *See—*
Penaranda, Mariano; Millan, Jose ; Falco, Desiderio; Masip i Balduque, Josep M.; and Rodriguez, Emilio, 5,316,382, Cl. 366-129.000.

Falk, David C.: *See—*
Jasper, Warren J.; and Falk, David C., 5,316,552, Cl. 8-471.000.

Fan, John C. C.: *See—*
Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., 5,317,236, Cl. 315-169.300.

Fanuc Limited: *See—*
Fujita, Naoki; and Miyamoto, Kota, 5,317,518, Cl. 364-474.260.

Fanuc Ltd: *See—*
Matsuura, Hitoshi; Aramaki, Hitoshi; and Nakajima, Osamu, 5,317,517, Cl. 364-474.030.

FANUC Robotics North America, Inc.: *See—*
Guzowski, Raymond J.; and Lazar, David W., 5,316,217, Cl. 239-71.000.

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Farnsworth, Vincent P.; and Cartier, Paul F., III, to Porton Instruments, Inc. Valve block assembly. 5,316,034, Cl. 137-208.000.

Farrar, Cary S.: *See—*
Stanley, T. K.; and Farrar, Cary S., 5,316,408, Cl. 404-35.000.

Farrell, Dennis A. Toy soap containing compressed sponge which pops out during use. 5,316,689, Cl. 252-92.000.

Fasco Industries, Inc.: *See—*
Gatley, William S., Jr.; and Garrison, Bobby D., 5,316,439, Cl. 415-119.000.

Fashion Nails, Inc.: *See—*
Jenkins, Nevin, 5,316,026, Cl. 132-285.000.

Fasoldt, Carol L.: *See—*
Chao, Herbert S.; and Fasoldt, Carol L., 5,316,867, Cl. 428-626.000.

Fatehi, Mohammad T.; and Heismann, Fred L., to AT&T Bell Laboratories. Automatic on-line monitoring and optimization of optical network switching nodes. 5,317,439, Cl. 359-110.000.

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Taylor, Wilhelm; Faucett, Michael D.; and Woodruff, Daniel J., 5,317,554, Cl. 369-77.200.

Fauchere, Jean-Luc; Kucharczyk, Nathalie; Morris, Angela D.; Paladino, Joseph; Bonnet, Jacqueline; and Thurieau, Christophe, to Adir et Compagnie. Peptides and pseudopeptides derived from tachykinin. 5,317,014, Cl. 514-17.000.

Fay, Robert F., to Murray Corporation. Hose clamp with open diameter lock. 5,315,742, Cl. 24-274.00R.

Feche, Pierre; and Veux, Jean-Luc, to Taylor Made Golf Company. Golf club shaft. 5,316,299, Cl. 273-80.00R.

Federal Products Corporation: *See—*
Silva, John R.; and Wyntjes, Geert J., 5,317,385, Cl. 356-356.000.

Fedorovich, George; and Sharrer, Kenneth J., to JM Clipper Corporation. Method of assembling a seal device. 5,316,317, Cl. 277-1.000.

Fedorowsky, Robert: *See—*
Roncato, Giordano; Fedorowsky, Robert; Boissonnat, Philippe; and Loubinoux, Dominique, 5,316,561, Cl. 65-1.000.

Fegerl, Johannes: *See—*
Chalupka, Alfred; Lammer, Gertraud; Stengl, Gerhard; Wolf, Peter; and Fegerl, Johannes, 5,317,161, Cl. 250-423.00R.

Feikema, Orville A. Automobile sun visor. 5,316,360, Cl. 296-97.300.

Feinberg, Lee A.; and Leung, Yiu K., to AT&T Bell Laboratories. Interface for a data telephone and data terminal in a digital telephone system. 5,317,630, Cl. 379-94.000.

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East, Don G.; Felde, Steven L.; Hu, Paul Y.; and Robles, Guillermo S., 5,316,235, Cl. 242-199.000.

Feldschmid, Alois: *See—*
Enning, Norbert; Kreis, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, 5,316,367, Cl. 296-189.000.

Feliz, Jack M. Flagpole silencers. 5,315,955, Cl. 116-173.000.

Fell, Barry M., to Hexcel Corporation. Process for the preparation of thermoplastic sandwich structures. 5,316,604, Cl. 156-82.000.

Fellows, Thomas G., to Torotrak (Development) Limited. Transmission of the toroidal-race rolling-traction type. 5,316,526, Cl. 476-10.000.

Fenchel, Reinhard: *See—*
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Fennern, Larry E., to General Electric Company. Fuel design for high power density boiling water reactor. 5,317,613, Cl. 376-439.000.

Ferek-Petric, Bozidar; and Breyer, Branko. Cardiac measurement system for measuring blood flow velocity by use of a sensor implanted inside the heart. 5,316,001, Cl. 128-661.080.

Ferenczi, Laszlo; Turner, Mark A.; and Prince, Gregory A., to Vought Aircraft Company. Automated extrusion processing machine. 5,315,906, Cl. 83-27.000.

Ferguson, Keith T.: *See—*
Johnsen, Kenneth A.; and Ferguson, Keith T., 5,316,607, Cl. 156-212.000.

Fernandes, Mark G.; and Kawasaki, Hisao, to Motorola, Inc. Semiconductor device having structures to reduce stress notching effects in conductive lines and method for making the same. 5,317,185, Cl. 257-629.000.

Fernandez, Randolfo M., to ABB Vetco Gray Inc. Method and apparatus for drilling a subsea well. 5,316,089, Cl. 175-7.000.

Ferro Corporation: *See—*
Blonski, Robert P., 5,316,570, Cl. 106-451.000.
Chundury, Deenadayalu; and Bitsch, Bernard G. J., 5,317,059, Cl. 525-66.000.

Ferry, Robert L.: *See—*
Anderson, Richard F.; Ferry, Robert L.; and Kissell, John R., 5,315,801, Cl. 52-63.000.

Ferullo, David A.; Morgan, Roger J.; and Rosen, James L., to General Electric Company. Molded case circuit breaker trip-to-test button. 5,317,295, Cl. 335-172.000.

Feuerlein, Friedrich; and Muller, Helmut, to Metrawatt GmbH. Housing suitable for wall or bottom fastening. 5,316,164, Cl. 220-3.200.

Fichet, Claude; and Villaeys, Roland, to Societe Franco-Belge-de Fabrication de Combustibles. Method and apparatus for installing fuel rods in a nuclear fuel assembly skeleton. 5,317,609, Cl. 376-261.000.

Fidler, Raymond W. Portable footrest apparatus. 5,316,374, Cl. 297-423.390.

Fields, Roger A., to Eastman Kodak Company. Method and apparatus for reproducing an image recorded on a photographic filmstrip. 5,317,364, Cl. 355-40.000.

Fike Corporation: *See—*
Kemp, Willard E., 5,316,594, Cl. 148-281.000.

Filter Materials Limited: *See—*
Hill, Michael; and Nichols, Walter A., 5,316,827, Cl. 428-175.000.

Finch, Clara N.: *See—*
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,317,097, Cl. 536-24.310.

Finch, Steven J.; Chong, Kok H.; and Abdala, Julio, to Motorola, Inc. Door cover assembly. 5,316,168, Cl. 220-341.000.

Finch, Steven J.: *See—*
Chong, Kok H.; Finch, Steven J.; and Leon, Robert, 5,317,247, Cl. 320-2.000.

Fink, David J., to Battelle Memorial Institute. Process for the production of low-cost soluble high-molecular weight collagen. 5,316,942, Cl. 435-273.000.

Finkelstein, Stanley M.: *See—*
Chesney, Charles F.; Finkelstein, Stanley M.; and Cohn, Jay N., 5,316,004, Cl. 128-672.000.

Finkl, Anthony W. Means for improving the performance of planing-type boat hulls. 5,315,951, Cl. 114-280.000.

Finocchio, Richard. Method and apparatus for validating instant-win lottery tickets. 5,317,135, Cl. 235-375.000.

Fiordeliso, James J.: *See—*
Kohn, Joachim B.; and Fiordeliso, James J., 5,317,077, Cl. 528-182.000.

Fischer, Helmut, to Mannesmann Rexroth GmbH. Hydraulic system for hydraulic operators. 5,315,829, Cl. 60-456.000.

Fischer, William B. Enclosure for surgical procedures. 5,316,541, Cl. 600-21.000.

Fischer, Wolfgang; and Storm, Juergen, to Siemens Aktiengesellschaft. Method for switching ATM message cell streams having a high bit rate via a switching equipment having a lower bit rate. 5,317,561, Cl. 370-16.000.

fischerwerke Artur Fischer GmbH & Co. KG.: *See—*
Bohnet, Hartmut; Haug, Willi; and Lind, Stefan, 5,316,419, Cl. 408-236.000.
Weber, Wilfried; Mallee, Rainer; Hein, Bernd; Mayer, Burkhard; Guth, Harald; and Haage, Manfred, 5,315,800, Cl. 52-309.100.

Fish, David J.; Andela, Jeffrey L., deceased (by Andela, Christine R., executrix); and Chiavaroli, Henry T., to Xerox Corporation. Sheet handling apparatus and method for registering a sheet using a gate device. 5,316,288, Cl. 271-250.000.

Fisher, Gordon. Fiber separation process. 5,316,150, Cl. 209-30.000.

Fiskars Inc.: *See—*
Norton, Donald C.; and Sessions, George C., 5,315,761, Cl. 30-162.000.

Flanagan, James R.; and Garland, Michael S., to Whitaker Corporation, The. Snap on plug connector for a UHF connector. 5,316,494, Cl. 439-352.000.

Flathau, Robert J.; and Connors, Frank T., to Symons Corporation. Scaffold bracket. 5,316,253, Cl. 248-235.000.

Fleischman, Aaron J.; Lustig, Naftali E.; and Schad, Robert G., to International Business Machines Corporation. Oxygen assisted ohmic contact formation to N-type gallium arsenide. 5,317,190, Cl. 257-743.000.

Flemming, Patricia S. Dental floss and a device for dispensing. 5,316,028, Cl. 132-329.000.

Flickinger, Michael C.; Hanson, Richard S.; Schendel, Frederick J.; Anderson, Charles R.; and August, Paul R., to University of Minnesota, Regents of the. Direct calcium magnesium acetate production. 5,316,928, Cl. 435-136.000.

Flow International Corporation: *See—*
Ting, Edmund Y.; and Raghavan, Chidambaram, 5,316,745, Cl. 422-295.000.

Fluid Data Systems: *See—*
Glassey, Eugene A.; and Loh, Ralph A., 5,315,876, Cl. 73-708.000.

Flum, Alan: *See—*
Yasuda, Fujio; and Flum, Alan, 5,317,641, Cl. 381-119.000.

- Fluoroware, Inc.: *See—*
  - Collins, Timothy R.; Chinnock, Robert T.; Grant, Robert C.; and Hamilton, Dean T., 5,316,035, Cl. 137-312.000.
- Focke & Co. (GmbH & Co.): *See—*
  - Focke, Heinz; and Wach, Jurgen, 5,316,230, Cl. 242-58.100.
  - Focke, Heinz; and Liedtke, Kurt, 5,316,811, Cl. 428-43.000.
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- Focke, Heinz; and Liedtke, Kurt, to Focke & Co (GmbH & Co.). Process, web of material and apparatus for producing packaging blanks. 5,316,811, Cl. 428-43.000.
- Fogelman, John A., to Wise Child Inc., The. Highway emergency safety sign. 5,315,777, Cl. 40-591.000.
- Foley, John T.: *See—*
  - Brown, Richard I.; and Foley, John T., 5,316,666, Cl. 210-85 000.
  - Brown, Richard L.; and Foley, John T., 5,316,667, Cl. 210-85.000.
- Folkedal, Leiv Å.: *See—*
  - Syslak, Morten; Morley, Edward J.; and Folkedal, Leiv Å., 5,316,206, Cl. 228-183.000.
- Folkers, Karl A.; Langsjoen, Per H.; and Willis, Richard A., to Karl Folkers Foundation for Biomedical and Clinical Research. Use of coenzyme Q_{10} in combination with HMG-CoA reductase inhibitor therapies. 5,316,765, Cl. 424-94.100.
- Fonkalsrud, Philip A. Polyamide-epoxy-silicone modified coating compositions. 5,317,046, Cl. 523-425.000.
- Fontana, Robert J.: *See—*
  - Ross, Gerald F.; Mara, Richard M.; Robbins, Kenneth W.; and Fontana, Robert J., 5,317,303, Cl. 340-539.000.
- Ford Motor Company: *See—*
  - Amner, John A., 5,316,372, Cl. 297-400.000.
  - Baedke, William D.; and Alder, Michael J., 5,316,106, Cl. 184-6.120.
  - Barnes, Charles W., 5,315,901, Cl. 192-3.300.
  - Mastrangelo, Carlos H., 5,316,619, Cl. 156-644.000.
  - Rao, V. Durga N.; Kabat, Daniel M.; and Rose, Robert A., 5,315,970, Cl. 123-193.200.
  - Subramanian, Somasundaram; Kudla, Robert J.; and Chattha, Mohinder S., 5,316,991, Cl. 502-65.000.
  - Weber, Willes H.; Remillard, Jeffrey T.; and Ginder, John M., 5,317,667, Cl. 385-147.000.
- Ford, Robert B., to Motorola, Inc. Transmit mode detector in a battery charger. 5,317,249, Cl. 320-2.000.
- Formanek, Frank J., to Combustion Engineering, Inc. EDM crack removal tooling. 5,317,607, Cl. 376-260.000.
- Forsberg, Sven T., to Whirlpool Europe B.V. Electronic control for a microwave oven. 5,317,115, Cl. 219-716.000.
- Forster, Martin. Method and device for supplying animal feed into a feed trough. 5,315,958, Cl. 119-54.000.
- Forte, Glenn J.: *See—*
  - Biesecker, Lissa B.; Forte, Glenn J.; Boyle, Justin P.; and Matthews, Norris W., 5,315,811, Cl. 53-474.000.
- Forte, Mark. Prosthesis with flexible intramedullary stem. 5,316,550, Cl. 623-23.000.
- Foskett, Peter S.: *See—*
  - Pavely, Andrew P.; Marr, Roy J.; Foskett, Peter S.; and White, David M., 5,316,166, Cl. 220-269.000.
- Fosseen, Dwayne. Fuel limiting method and apparatus for an internal combustion vehicle. 5,315,977, Cl. 123-357.000.
- Foster, Raymond K. System of linear hydraulic motors. 5,315,916, Cl. 91-178.000.
- Fotheringham, Ian G.: *See—*
  - Kidman, Gene E.; Robinson, Larry E.; Scollar, Mark P.; and Fotheringham, Ian G., 5,316,943, Cl. 435-280.000.
- Fox, Elizabeth D.: *See—*
  - Corona, Stephen C.; Fox, Elizabeth D.; and Robinson, Norman D., Jr., 5,316,279, Cl. 270-1.100.
- Fox, Richard: *See—*
  - Bier, Joseph; and Fox, Richard, 5,315,869, Cl. 73-201.000.
- Fox, Ronald C. S., to Alcatel N.V. Telephone subset arrangement. 5,317,634, Cl. 379-362.000.
- France Telecom: *See—*
  - Piole, Philippe, 5,317,327, Cl. 343-725.000.
- France Telecom Etablissement Autonome de Droit Public: *See—*
  - Auffret, Rene ; Chawki, Mouhammad; and Berthou, Louis, 5,317,580, Cl. 372-38.000.
- Franco, Horacio E.: *See—*
  - Cohen, Michael H.; and Franco, Horacio E., 5,317,673, Cl. 395-2.410.
- Frankel, Gerald S.: *See—*
  - Brusic, Vlasta A.; Frankel, Gerald S.; Petersen, Tina A.; Rush, Benjamin M.; and Schrott, Alejandro G., 5,316,573, Cl. 106-14.160.
- Frankeny, Richard F.; and Imken, Ronald L., to International Business Machines Corporation. Method for manufacturing electrically isolated polyimide coated vias in a flexible substrate. 5,316,787, Cl. 427-97.000.
- Franklin, H. Joe, to Franklin, William F. Wrench sleeve attachment for garden hose. 5,316,348, Cl. 285-39.000.
- Franklin, William F.: *See—*
  - Franklin, H. Joe, 5,316,348, Cl. 285-39.000.
- Frantz, Robert H., to Whitaker Corporation, The. Latching system for electrical connectors. 5,316,495, Cl. 439-372.000.
- Franz, Robert L., Jr.: *See—*
  - Graushar, William T.; and Franz, Robert L., Jr., 5,316,425, Cl. 412-19.000.
- Fraunhofer Gesellschaft zur Forderung der angewandten Forschund e.v.: *See—*
  - Ahn, Jochen; and Ledjeff, Konstantin, 5,316,643, Cl. 204-265.000.
- Frechet, Jean M. J.; Svec, Frantisek; and Smigol, Vladimir, to Cornell Research Foundation, Inc. Multimodal chromatographic separation media and process for using same. 5,316,680, Cl. 210-635.000.
- Fredericksen, Raymond M.: *See—*
  - Barry, Daniel T.; Fredericksen, Raymond M.; Soutas-Little, Robert W.; and Peterson, Ruk R., 5,315,769, Cl. 36-114.000.
- Fredricks, Mark A.: *See—*
  - Strawbridge, Jon P.; and Fredricks, Mark A., 5,315,776, Cl. 40-505.000.
- Free, Joseph W.: *See—*
  - Page, George W.; High, Glen T.; Looper, David L.; Frew, James S.; Prevallet, Larry C.; and Free, Joseph W., 5,315,819, Cl. 60-39.282.
- Freeman, Gary M., to J. M. Huber Corporation. High performance pigments of low oil absorption: preparation, properties and end-use applications. 5,316,576, Cl. 106-483.000.
- Freeman, Maurice E.: *See—*
  - Lu, Shih-Lai; Kobe, James J.; Moon, John D.; Freeman, Maurice E.; Rouser, Forrest J.; Heiti, Robert V.; and Boettcher, Thomas E., 5,316,849, Cl. 428-355.000.
- Freitag, Dieter; Wulff, Claus; Alewelt, Wolfgang; and Kauth, Hermann, to Bayer Aktiengesellschaft. Process for isolating polycarbonates from their solutions with tube having cross sectional contrictions. 5,317,083, Cl. 528-499.000.
- Freller, Walter. Heat accumulator. 5,315,938, Cl. 110-233.000.
- Frembgen, Stefan: *See—*
  - Koch, Jochim; and Frembgen, Stefan, 5,316,542, Cl. 600-22.000.
- French, Robert N.: *See—*
  - Robertson, John A.; Cyphert, David L.; Muscarella, Joseph; and French, Robert N., 5,316,397, Cl. 400-121.000.
- French, William W.: *See—*
  - Lemke, James U.; French, William W.; and McHargue, William B., 5,317,463, Cl. 360-97.020.
- Freudenberg, Carl: *See—*
  - Groten, Robert; Heidecke, Gerhard; Mannsbart, Thomas; and Siekermann, Volker, 5,316,832, Cl. 428-224.000.
- Frew, James S.: *See—*
  - Page, George W.; High, Glen T.; Looper, David L.; Frew, James S.; Prevallet, Larry C.; and Free, Joseph W., 5,315,819, Cl. 60-39.282.
- Frey, Jeffrey A.: *See—*
  - Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., 5,317,739, Cl. 395-650.000.
- Frey, William G.: *See—*
  - Grabiec, Alan R.; Frey, William G.; and Davies, Scott T., 5,317,664, Cl. 385-87.000.
- Friedmann, Tamas: *See—*
  - Borsodi, Anna; Furst, Zsuzsa; Hosztafi, Sandor; Varga, Schafferne E.; Buzas, Beata; Friedmann, Tamas; Benyhe, Sandor; and Szucs, Maria, 5,317,022, Cl. 514-282.000.
- Friedrich Wilh. Schwing GmbH: *See—*
  - Schwing, Friedrich, 5,316,453, Cl. 417-516.000.
- Frigoscandia Food Process Systems AB: *See—*
  - Sandstrom, Roland; Maxe, Ann; Strandberg, Tore; Lundsten, Lars; and Andersson, Alvar, 5,316,076, Cl. 165-84.000.
- Froehlich, Eckhard; Steiner, Peter; and Hildebrandt, Karl, to August Krempel Sohne GmbH & Co. Apparatus for stretching tubular material with a least one closed end on a stretcher. 5,316,188, Cl. 223-77.000.
- Frost, David R., to E-muSystems, Inc. Multi-timbral percussion instrument having spatial convolution. 5,317,104, Cl. 84-625.000.
- Frykhult, Rune, to Ingeniorsfirman R. Frykhult AB. Rotatable annular hollow disc for filtering liquids. 5,316,675, Cl. 210-327.000.
- Fuchs, Karl-Heinz; and Graf, Lothar, to Ing. Erich Pfeiffer GmbH & Co. KG. Media dispenser with elastically deformable plunger. 5,316,198, Cl. 222-321.000.
- Fuji Electric Co., Ltd.: *See—*
  - Nakajima, Yukio; Imamura, Kazuhiko; Karatsu, Ryozo; Nishizaki, Sumio; and Kobayashi, Makoto, 5,316,831, Cl. 428-209.000.
  - Nakamura, Yoichi; Mori, Nobuyoshi; and Nogami, Sumitaka, 5,316,881, Cl. 430-59.000.
  - Ohga, Shunsuke, 5,316,870, Cl. 429-24.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Ichikawa, Kouji, 5,317,427, Cl. 358-520.000.
  - Kawada, Ken, 5,317,358, Cl. 354-319.000.
  - Koide, Tomoyuki; and Kojima, Tetsuro, 5,316,886, Cl. 430-203.000.
  - Naruse, Hiedaki; and Tsukahara, Jiro, 5,316,888, Cl. 430-216.000.
  - Nomura, Masaaki; Aosaki, Ko; Kubo, Takashi; Namioka, Kenta; and Takanose, Koji, 5,317,350, Cl. 353-63.000.
  - Okamura, Hisashi; Nii, Kazumi; and Katoh, Kazunobu, 5,316,890, Cl. 430-264.000.
  - Sakai, Minoru, 5,316,889, Cl. 430-264.000.
  - Takahashi, Masatoshi; Inaba, Hiroo; and Taga, Kazuaki, 5,316,845, Cl. 428-323.000.
  - Tomiyama, Hideki, 5,316,903, Cl. 430-546.000.
  - Zander, Dennis R.; and Kataoka, Hideaki, 5,317,355, Cl. 354-277.000.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Takahashi, Minoru, 5,317,362, Cl. 354-418.000.

- Fuji Xerox Co., Ltd.: *See—*
  - Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.
- Fuji Yakuhin Kogyo Kabushiki Kaisha: *See—*
  - Oshima, Akira; Iwata, Kazushi; Muragaki, Yasuteru; Bai, Yasuo; Matsumoto, Eisaku; and Miyamoto, Satoshi, 5,316,914, Cl. 435-7.940.
- Fujii, Tatsuo: *See—*
  - Tomisawa, Maya; Higashi, Shuji; Sasagawa, Koji; and Fujii, Tatsuo, 5,316,209, Cl. 229-87.050.
- Fujii, Toru: *See—*
  - Inage, Katuyuki; Saito, Yumi; Zhang, Zhimming; Fujii, Toru; and Shirasaki, Osamu, 5,316,006, Cl. 128-681.000.
- Fujii, Toshiro; Ito, Koichi; Murakami, Kazuo; and Iwama, Kazuaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Axial multi-piston type compressor having movable discharge valve assembly. 5,316,447, Cl. 417-269.000.
- Fujikura Kasei Co., Ltd.: *See—*
  - Kukimoto, Yutaka; Ueda, Hikoji; Suzuki, Kozo; and Koshiyama, Yoshihiko, 5,317,060, Cl. 525-197.000.
- Fujimori, Haruo; Matsui, Tetsuya; Ajiro, Taiko; Yokose, Kenji; and Izumi, Shigeru, to Hitachi, Ltd. Apparatus for analysis of particulate material, analytical method for same, apparatus for production of ultrapure water, apparatus for manufacturing of semiconductor, and apparatus for production of pure gas. 5,316,983, Cl. 437-250.000.
- Fujimoto, Hiroaki: *See—*
  - Takehashi, Shinitsu; Hatada, Kenzo; and Fujimoto, Hiroaki, 5,316,204, Cl. 228-179.100.
  - Tamaki, Tomohiro; Hatada, Kenzo; Fujimoto, Hiroaki; and Takeshita, Yoshinobu, 5,316,610, Cl. 156-379.600.
- Fujimoto, Munenori, to Matsushita Graphic Communication Systems, Inc. Information communication apparatus. 5,317,422, Cl. 358-476.000.
- Fujinami, Yasushi, to Sony Corporation. Highly efficient encoding apparatus. 5,317,396, Cl. 343-390.000.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Nakano, Satoru; Oshima, Takeo; Okada, Masaaki; and Kunugita, Kiyohiko, 5,316,769, Cl. 424-442.000.
- Fujita, Hisanori; and Nakanishi, Mikihiko, to Sakura Color Products Corporation. Erasable ink composition for writing on impervious surface. 5,316,574, Cl. 106-20.00A.
- Fujita, Koichi: *See—*
  - Ota, Toshiaki; Teguri, Yoshihiko; Muto, Masahito; Fujita, Koichi; and Iyoda, Motomi, 5,317,512, Cl. 364-424.050.
- Fujita, Naoki; and Miyamoto, Kota, to Fanuc Limited. Method of plotting loaded conditions. 5,317,518, Cl. 364-474.260.
- Fujita, Noboru: *See—*
  - Takeda, Yoshiaki; Miwano, Katuyosi; and Fujita, Noboru, 5,315,847, Cl. 68-12.020.
- Fujita, Nobuhiko: *See—*
  - Tomikawa, Tadashi; Fujita, Nobuhiko; Nakagama, Shyoji; and Nakayama, Akira, 5,316,804, Cl. 427-569.000.
- Fujitani, Makoto; Nagato, Yukio; Takeda, Kimiharu; Hirooka, Katsumi; Ukai, Tetsuzo; and Shikanai, Toshiyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Fluid pump and rotary machine having said fluid pump. 5,316,454, Cl. 418-55.600.
- Fujitsu Limited: *See—*
  - Aoyama, Keizo, 5,317,536, Cl. 365-189.040.
  - Imai, Masayuki, 5,316,395, Cl. 400-56.000.
  - Koshi, Makoto; and Kaiju, Yoshihiko, 5,317,366, Cl. 355-202.000.
  - Matsushima, Hidetoshi; Noguchi, Yoshinori; and Ishijima, Shizuo, 5,316,125, Cl. 198-465.200.
  - Mochizuki, Akihiro; and Motoyoshi, Katsusada, 5,317,429, Cl. 359-42.000.
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  - Nishimoto, Hiroshi, 5,317,443, Cl. 359-187.000.
  - Nobuhara, Hiroyuki, 5,317,448, Cl. 359-333.000.
  - Onishi, Masaru; and Suzuki, Kazuhiro, 5,317,581, Cl. 372-38.000.
  - Onoda, Masahiro; and Toda, Yoshifumi, 5,317,602, Cl. 375-118.000.
  - Satoh, Junichi, 5,317,572, Cl. 370-105.100.
  - Watanabe, Kazuko, 5,317,746, Cl. 395-700.000.
  - Yoshida, Hidefumi; and Hanaoka, Kazutaka, 5,317,431, Cl. 359-51.000.
  - Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, 5,317,157, Cl. 250-352.000.
- Fujiwara, Hideki: *See—*
  - Konishi, Yoshihiro; Asa, Masahito; and Fujiwara, Hideki, 5,317,289, Cl. 333-17.100.
- Fujiwara, Hiroshi: *See—*
  - Fukube, Noriaki; Kurihara, Katsumi; Takano, Satoshi; Tanabe, Hiroshi; Fujiwara, Hiroshi; Bannai, Kazunori; and Inobe, Hiroyuki, 5,316,282, Cl. 271-10.000.
- Fujiwara, Isao: *See—*
  - Iwai, Tatsuo; and Fujiwara, Isao, 5,315,791, Cl. 51-215.00M.
- Fukasawa, Yukihisa: *See—*
  - Kinoshita, Mitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.
- Fukaya, Kousuke, to Brother Kogyo Kabushiki Kaisha. Printer capable of printing in a desired print range. 5,316,396, Cl. 400-76.000.
- Fukazawa, Tokuumi: *See—*
  - Okamoto, Yukio; Aida, Toshiyuki; Miyauchi, Katsuki; Takagi, Kazumasa; Fukazawa, Tokuumi; and Takayama, Shinji, 5,316,585, Cl. 118-719.000.
- Fukube, Noriaki; Kurihara, Katsumi; Takano, Satoshi; Tanabe, Hiroshi; Fujiwara, Hiroshi; Bannai, Kazunori; and Inobe, Hiroyuki, to Ricoh Company, Ltd. Sheet feeding and separating device for image forming equipment. 5,316,282, Cl. 271-10.000.
- Fukuda, Hiroshi; and Terasawa, Tsuneo, to Hitachi, Ltd. Method of forming a pattern. 5,316,896, Cl. 430-322.000.
- Fukuda, Ichiro: *See—*
  - Sugimoto, Osamu; Furuya, Yonezo; and Fukuda, Ichiro, 5,316,119, Cl. 194-318.000.
- Fukuhara, Toru; Sosa, Toshio; Hara, Masaharu; Kanai, Hachiro; and Yokonuma, Norikazu, to Nikon Corporation. Control device for preventing red-eye effect on camera. 5,317,361, Cl. 354-415.000.
- Fukui, Tetsuro: *See—*
  - Isaka, Kazuo; Mouri, Akihiro; Katayama, Masato; Fukui, Tetsuro; and Shiraiwa, Yoshinobu, 5,317,363, Cl. 355-27.000.
- Fukunaga, Kazuya: *See—*
  - Kato, Yoshitake; Fukunaga, Kazuya; Katami, Akira; and Oda, Shinichiro, 5,317,467, Cl. 360-133.000.
- Fukunaga, Seiichi: *See—*
  - Yagi, Koji; and Fukunaga, Seiichi, 5,317,067, Cl. 525-438.000.
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  - Tsuboi, Toshio; Nakatani, Munehiro; and Fukushima, Shigenobu, 5,317,416, Cl. 358-444.000.
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- Fukusima, Hiroki: *See—*
  - Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, 5,316,472, Cl. 432-241.000.
- Fukutomi, Yasushi: *See—*
  - Matsushiro, Hiroyuki; Onuki, Tetsuji; Miyazaki, Masaya; and Fukutomi, Yasushi, 5,317,153, Cl. 250-306.000.
- Fukuwatari, Yasuo: *See—*
  - Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.
- Fukuzaki, Takaharu: *See—*
  - Kinoshita, Mitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.
- Fulbright, David J.: *See—*
  - Smith, Walter J.; and Fulbright, David J., 5,315,755, Cl. 29-715.000.
- Fulford, Henry J., Jr.: *See—*
  - Gardner, Mark I.; and Fulford, Henry J., Jr., 5,316,981, Cl. 437-235.000.
- Fulghum, Tracy L.; Lee, Edward K. B.; and Cadd, Jimmy W., to Motorola, Inc. Communication device with code sequence and frequency selection system. 5,317,593, Cl. 375-1.000.
- Full Range, Inc.: *See—*
  - Ziparo, Joseph A., 5,316,528, Cl. 482-52.000.
- Funato, Takashi: *See—*
  - Toyoda, Takashi; Hosono, Yasuji; Funato, Takashi; Miyaji, Takashi; Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,777, Cl. 426-87.000.
- Furman, Kenneth: *See—*
  - Nenadic, Anton; Furman, Kenneth; and Pasco, Robert W., 5,315,749, Cl. 29-559.000.
- Furst, Zsuzsa: *See—*
  - Borsodi, Anna; Furst, Zsuzsa; Hosztafi, Sandor; Varga, Schafferne E.; Buzas, Beata; Friedmann, Tamas; Benyhe, Sandor; and Szucs, Maria, 5,317,022, Cl. 514-282.000.
- Furukawa Electric Co., Ltd., The: *See—*
  - Imai, Kumiko, 5,317,008, Cl. 505-100.000.
  - Jin, Dong Z., 5,315,873, Cl. 73-309.000.
- Furukawa, Tadayasu: *See—*
  - Hara, Takahiro; Takasawa, Seigo; Yokoo, Yoshiharu; and Furukawa, Tadayasu, 5,316,767, Cl. 424-401.000.
- Furukawa, Toshihiko. Stabilized high voltage power supply circuit. 5,317,495, Cl. 363-21.000.
- Furuno, Takashi; Wakasa, Toshiya; Iizuka, Jun; Hagiwara, Kanehiro; and Mitake, Mitsuyoshi, to Pioneer Electronic Corporation. Projection television set. 5,317,449, Cl. 359-443.000.
- Furuya, Akihiro; and Matsumoto, Kinya, to Tokico Ltd. Damping force control type hydraulic shock absorber. 5,316,114, Cl. 188-299.000.
- Furuya, Minoru: *See—*
  - Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.
- Furuya, Yonezo: *See—*
  - Sugimoto, Osamu; Furuya, Yonezo; and Fukuda, Ichiro, 5,316,119, Cl. 194-318.000.
- Furuyama, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,317,540, Cl. 365-230.010.
- Fusi, John C.: *See—*
  - Ellman, Steven; Ellman, Fredric; Ellman, Julius; and Fusi, John C., 5,316,514, Cl. 446-26.000.

Fuss, Ilona: *See*—
Sextl, Gerhard; Strack, Hans; Reuter, Roland; Fuss, Ilona; Kleinschmit, Peter; and Schwarz, Rudolf, 5,316,816, Cl. 478-69.000.
Fussell, Don L. Fish habitat. 5,315,779, Cl. 43-4.000.
Fuyama, Moriaki: *See*—
Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, 5,316,617, Cl. 156-643.000.
G. D. Searle & Co.: *See*—
Chen, Barbara B.; Hanson, Gunnar J.; and Baran, John S., 5,317,039, Cl. 514-616.000.
G. D Societa' Per Azioni: *See*—
Taddia, Giuseppe; and Neri, Armando, 5,316,122, Cl. 198-347.300.
Vaccari, Giorgio; and Gamberini, Antonio, 5,316,537, Cl. 493-179.000.
G.D. SpA: *See*—
Draghetti, Fiorenzo, 5,316,229, Cl. 242-58.000.
G.J. Associates, Ltd.: *See*—
Lee, James S. W.; and Kwan, Chiu K., 5,316,182, Cl. 222-78.000.
Gabas, Carlos; and Roca, Agustin, to Pujol y Tarrago S.A. Precision longitudinal movement transmission cable. 5,315,892, Cl. 74-502.300.
Gaber, Ira: *See*—
Rapp, William H.; Gaber, Ira; and Woodring, Cooper C., 5,316,066, Cl. 160-178.200.
Gabis, Raymond E.: *See*—
Dorri, Bizhan; Laskaris, Evangelos T.; Herd, Kenneth G.; and Gabis, Raymond E., 5,317,298, Cl. 335-301.000.
Gabriel Electronics Incorporated: *See*—
Allen, Daniel C., 5,317,328, Cl. 343-786.000.
Gaddis, Paul G.: *See*—
Hebbard, Carl; Perdelwitz, Lee E., Jr.; and Gaddis, Paul G., 5,316,601, Cl. 156-62.200.
Gagne, Bruce N.: *See*—
Bixby, Joy P.; Eorgoff, Michael C.; Gagne, Bruce N.; Houser, Richard D.; Ivanoff, Mario J.; Osband, Daniel W.; Richardson, Darrel D.; and Skaates, Mary Z., 5,317,568, Cl. 370-85.600.
Gaier, James R.: *See*—
Banks, Bruce A.; and Gaier, James R., 5,316,080, Cl. 165-185.000.
Galaske, Lawrence J., Jr.: *See*—
Rowe, Raymond G.; Martini, Gary T.; Galaske, Lawrence J., Jr.; White, Douglas J.; and Robinson, Mark A., 5,316,203, Cl. 228-118.000.
Galbreath Incorporated: *See*—
Kruzick, Kent, 5,315,924, Cl. 100-53.000.
Galeros, Susan R.; and Zalles, Judi H. Attachable lace tightening book and lace securing device. 5,316,189, Cl. 223-113.000.
Galileo International Partnership: *See*—
Bixby, Joy P.; Eorgoff, Michael C.; Gagne, Bruce N.; Houser, Richard D.; Ivanoff, Mario J.; Osband, Daniel W.; Richardson, Darrel D.; and Skaates, Mary Z., 5,317,568, Cl. 370-85.600.
Galion Holding Company: *See*—
Horning, Larry D.; Grubaugh, Eugene R.; Pfeifer, Thomas E.; and Johnson, Carroll R., 5,316,430, Cl. 414-407.000.
Gallagher, Thomas A., to Van Dorn Company. Ringless paint container with drip free lid. 5,316,169, Cl. 220-355.000.
Gallant, Stephen I. Method for document retrieval and for word sense disambiguation using neural networks. 5,317,507, Cl. 364-419.130.
Gallo, Antonio R.; McDonough, James J.; Robbins, Gordon J.; and Shaw, Robert R., to International Business Machines Corporation. Extrusion of polymer waveguides onto surfaces. 5,317,657, Cl. 385-14.000.
Galloway, John: *See*—
Gray, John; and Galloway, John, 5,316,335, Cl. 280-728.00B.
Gamache, Serge; and Gauvin, Louis-Paul. Hammering device for tube boilers. 5,315,966, Cl. 122-379.000.
Gamberini, Antonio: *See*—
Vaccari, Giorgio; and Gamberini, Antonio, 5,316,537, Cl. 493-179.000.
Gannon, Henry M. Electric and pedal driven bicycle with solar charging. 5,316,101, Cl. 180-221.000.
Gannon, Patrick M.; Gum, Peter H.; Hough, Roger E.; and Murray, Robert E., to International Business Machines Corporation. Apparatus and method for TLB purge reduction in a multi-level machine system. 5,317,705, Cl. 395-400.000.
Ganzi, Gary C.; Wilkins, Frederick; Giuffrida, Anthony J.; and Griffin, Christopher, to IP Holding Company. Electrodeionization apparatus. 5,316,637, Cl. 204-182.400.
GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Pichlmaier, Albert; and Meister, Gisela, 5,317,637, Cl. 380-25.000.
Garay, Oscar: *See*—
Tay, Yew S.; Garay, Oscar; and Llorente, Jose A., 5,317,326, Cl. 343-718.000.
Garay, Robert J.; and Stewart, Bert W. Avian perch. 5,315,957, Cl. 119-26.000.
Garben, Ian: *See*—
Hartwell, Rae; and Garben, Ian, 5,316,355, Cl. 292-347.000.
Garber, Edward E., Jr. Fruit ripening ethylene gas storage and dispensing system and container therefor. 5,316,178, Cl. 222-3.000.
Garcia, Andre, to Hewlett-Packard Company. Compound ink feed slot. 5,317,346, Cl. 346-140.00R.
Garcia, Rod A.: *See*—
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., 5,317,044, Cl. 521-78.000.
Gardinier, Clayton F.: *See*—
Herb, John A.; Pinneo, John M.; and Gardinier, Clayton F., 5,316,842, Cl. 428-319.100.
Gardner, Mark I.; and Fulford, Henry J., Jr., to Advanced MIcro Devices, Inc. Method for achieving a high quality thin oxide using a sacrificial oxide anneal. 5,316,981, Cl. 437-235.000.
Gardner, Michael J.; Kachlic, Jerry D.; and O'Brien, Paul M., to Molex Incorporated. Connector apparatus for IC packs. 5,316,488, Cl. 439-79.000.
Garger, Stephen J.: *See*—
Donson, Jon; Dawson, William O.; Granthan, George L.; Turpen, Thomas H.; Turpen, Ann M.; Garger, Stephen J.; and Grill, Laurence K., 5,316,931, Cl. 435-172.300.
Gargione, Frank V., to Comar, Inc. Child resistant closure. 5,316,161, Cl. 215-220.000.
Garland, Michael S.: *See*—
Flanagan, James R.; and Garland, Michael S., 5,316,494, Cl. 439-352.000.
Garnier, Catherine: *See*—
Ha, Bao; and Garnier, Catherine, 5,315,833, Cl. 62-38.000.
Garrison, Bobby D.: *See*—
Gatley, William S., Jr.; and Garrison, Bobby D., 5,316,439, Cl. 415-119.000.
Gartzke, Donald G.: *See*—
Scannelli, Anthony R.; Gartzke, Donald G.; and Lewis, Christopher, 5,316,499, Cl. 439-534.000.
Garunts, Feliks; and Darbinyan, Robert. Room air environment conditioner. 5,315,834, Cl. 62-78.000.
Garverick, Tim; and Camarota, Rafael C., to National Semiconductor Corporation. Dynamic three-state bussing capability in a configurable logic array. 5,317,209, Cl. 307-465.000.
Garvey, Michael J.: *See*—
Heindel, Timothy R.; Garvey, Michael J.; Dick, Daniel W.; Keller, Richard F.; Jordan, Mary P.; and Schleinz, Alan F., 5,316,836, Cl. 428-284.000.
Garza, Jose A. Q.: *See*—
Patty, Evelyn J.; and Garza, Jose A. Q., 5,317,331, Cl. 345-16.000.
Gas Research Institute: *See*—
Nicol, Donald V.; Kilbourn, Rsuell A.; and Lane, Mark J., 5,315,839, Cl. 62-148.000.
Gass, Michael, to Belland AG. Process for the recovery of polymers dissolvable in aqueous alkaline or acid media. 5,317,043, Cl. 521-43.500.
Gatley, William S., Jr.; and Garrison, Bobby D., to Fasco Industries, Inc. Noise cancellation device for centrifugal blower. 5,316,439, Cl. 415-119.000.
Gauger, Derek K.; Horvet, Kirk K.; and Chaban, Phillip, to ITT Corporation. Power seat adjuster with drive gear force bypass. 5,316,258, Cl. 248-548.000.
Gault, David M.: *See*—
McNair, Samuel S., Jr.; and Gault, David M., 5,316,705, Cl. 264-5.000.
Gauvin, Louis-Paul: *See*—
Gamache, Serge; and Gauvin, Louis-Paul, 5,315,966, Cl. 122-379.000.
Gawish, Ali A. S.: *See*—
Wagle, Sudhakar S.; Steinbach, Thomas; Lawyer, Carl H.; Hermann, William J., Jr.; and Gawish, Ali A. S., 5,316,775, Cl. 424-553.000.
Gebhart, Wilford W.: *See*—
Hilbert, Lee A.; Edlin, George R.; Riley, Leon H.; Miller, Thomas G.; Gebhart, Wilford W.; and Johnson, Charles L., 5,317,160, Cl. 250-390.120.
Gebrueder Sulzer Aktiengesllschaft: *See*—
Bertsch, Gotthilf, 5,316,050, Cl. 139-434.000.
GEC Alsthom SA: *See*—
Wei, Liming, 5,317,246, Cl. 318-432.000.
Geddes, John J., to Honeywell Inc. Power combining oscillator. 5,317,286, Cl. 331-56.000.
Gehring, Rudolf, to Hydrel AG. Radial roller bearing. 5,316,394, Cl. 384-574.000.
Gelorme, Jeffrey D.; Lewis, David A.; and Shaw, Jane M., to International Business Machines Corporation. Microwave processing. 5,317,081, Cl. 528-353.000.
Gendex Corporation: *See*—
Schneck, Gary G., 5,316,590, Cl. 134-26.000.
Genencor, Inc.: *See*—
Estell, David A.; Caldwell, Robert M.; Bott, Richard R.; and Graycar, Thomas P., 5,316,941, Cl. 435-252.300.
Genentech, Inc.: *See*—
Godowski, Paul J.; Lokker, Natalie A.; and Mark, Melanie R., 5,316,921, Cl. 435-69.400.
General Atomics: *See*—
Hazlebeck, David A.; Montgomery, Frederick C.; and Streckert, Holger H., 5,316,797, Cl. 427-376.200.
General DataComm, Inc.: *See*—
Goldstein, Yuri, 5,317,594, Cl. 375-8.000.
General Electric Company: *See*—
Allison, Joseph M.; Buchina, Raymond A.; Mieskowski, James D.; Thomas, Edward J.; and Davenport, John M., 5,317,237, Cl. 315-307.000.
August, John L., Jr.; and Kukla, Mark J., 5,317,590, Cl. 372-109.000.
Balch, Richard A.; Mancuso, Marjorie J.; and Dastous, Susan D., 5,317,546, Cl. 368-9.000.

Benz, Mark G.; Jackson, Melvin R.; and Hughes, John R., 5,316,865, Cl. 428-614.000.
Brun, Milivoj K.; Giddings, Robert A.; and Prochazka, Svante, 5,316,851, Cl. 428-379.000.
Chao, Herbert S.; and Fasoldt, Carol L., 5,316,867, Cl. 428-626.000.
Czachor, Robert P., 5,316,437, Cl. 415-115.000.
Davenport, John M.; Hansler, Richard L.; King, Kenneth S.; and Cassarly, William J., 5,317,484, Cl. 362-32.000.
DeJule, Michael C.; and Credelle, Thomas L., 5,317,445, Cl. 359-250.000.
Dorri, Bizhan; Laskaris, Evangelos T.; Herd, Kenneth G.; and Gabis, Raymond E., 5,317,298, Cl. 335-301.000.
Dunbar, Donald K.; and Delaney, Bobby R., 5,315,821, Cl. 60-226.100.
Egan, George P.; Borneman, Karl L.; and Jaeger, Douglas A., 5,315,861, Cl. 73-37.000.
Evans, Edwin R.; and Jeram, Edward M., 5,317,073, Cl. 528-42.000.
Fennern, Larry E., 5,317,613, Cl. 376-439.000.
Ferullo, David A.; Morgan, Roger J.; and Rosen, James L., 5,317,295, Cl. 335-172.000.
Goldman, Edward H.; and Darolia, Ramgopal, 5,316,866, Cl. 428-621.000.
Hartley, Richard I.; and Corbett, Peter F., 5,317,755, Cl. 395-800.000.
Hopeck, James F., 5,316,801, Cl. 427-486.000.
Jacomb-Hood, Anthony W., 5,317,290, Cl. 333-164.000.
Kast, Howard B., 5,316,450, Cl. 417-295.000.
Klappert, Willi; and Houser, William K., 5,315,754, Cl. 29-609.000.
Maurer, Manfred F., 5,316,346, Cl. 285-23.000.
Michon, Gerald J., 5,317,407, Cl. 348-306.000.
Monzel, Fred J., 5,316,391, Cl. 384-99.000.
Murray, William J.; McCullough, Mark K.; Brubaker, Philip D.; and Manicke, Paul S., 5,316,202, Cl. 228-5.500.
Ralph, Stanley F.; Weinberg, Leonard; and Hart, Joseph J., 5,317,569, Cl. 370-85.900.
Rowe, Raymond G.; Martini, Gary T.; Galaske, Lawrence J., Jr.; White, Douglas J.; and Robinson, Mark A., 5,316,203, Cl. 228-118.000.
Vermilyea, Mark E.; and Dorri, Bizhan, 5,317,296, Cl. 335-216.000.
General Motors Corporation: *See*—
Arabia, Frank J., Jr.; and Dzurko, Thomas A., 5,316,354, Cl. 292-340.000.
Bensinger, Kenneth; and Rycamber, Edward, 5,315,788, Cl. 49-404.000.
Bloink, Raymond L.; and Powell, Bob R., 5,316,687, Cl. 252-71.000.
Kuhlman, Howard W.; and Joyner, Jeffrey K., 5,316,365, Cl. 296-155.000.
Swathirajan, Sundararajan; and Mikhail, Youssef M., 5,316,871, Cl. 429-33.000.
Utley, Daniel E.; Deasy, Kevin M.; and Cheever, Gordon D., Jr., 5,317,248, Cl. 318-811.000.
General Sekiyu Kabushiki Kaisha: *See*—
Kosako, Toshiso; and Nishimura, Kazuo, 5,317,605, Cl. 376-157.000.
Genest, Nelson J. Hair protector shield for food service trays. 5,316,176, Cl. 220-694.000.
George, Billy L.; and Brown-Wensley, Katherine A., to Minnesota Mining and Manufacturing Company. Treating building materials with a compound containing tin covalently bonded to a silylating group. 5,316,824, Cl. 428-145.000.
Georgia-Pacific Corporation: *See*—
Scullin, David J., 5,316,210, Cl. 229-117.160.
Georgiou, George; Phelps, Patricia; and Speitel, Gerald E., Jr., to Board of Regents, The University of Texas System. Constitutive soluble methane monooxygenase mutants of methanotrophic bacteria such as *Methylosinus trichosporium* A.T.C.C. 55314. 5,316,940, Cl. 435-252.100.
Georgopoulos, George, to Brooks, E. J. Box lock construction. 5,315,849, Cl. 70-34.000.
Gerber, Arthur H., to Borden, Inc. Latent acid curable compositions. 5,317,050, Cl. 524-107.000.
Gerlach, John D., Jr.; and Weiblen, Michael E., to Commodore Electronics Limited. System for relocating a multimedia presentation on a different platform by extracting a resource map in order to remap and relocate resources. 5,317,732, Cl. 395-600.000.
German, Alfonso: *See*—
Tyson, Ben B.; and German, Alfonso, 5,316,283, Cl. 271-114.000.
Germann, Albrecht J.: *See*—
Bolza-Schunemann, Claus A.; Bolza-Schunemann, Hans-Bernhard; and Germann, Albrecht J., 5,317,390, Cl. 356-394.000.
Germunson, Gary G., to Yakima Wire Works. Method and apparatus for bagging objects. 5,315,812, Cl. 53-573.000.
Gerner, William: *See*—
Hillis, W. Daniel; and Gerner, William, 5,317,481, Cl. 361-796.000.
Geyer, Paul. Shredding straining apparatus. 5,316,225, Cl. 241-74.000.
Gibbons, James F.: *See*—
Gronet, Christian M.; and Gibbons, James F., 5,317,492, Cl. 362-294.000.
Giberson, Melbourne F. Oil system for constant input speed fluid drive. 5,315,825, Cl. 60-336.000.
Gibson, C. Norman; and Gibson, O. Dean. Tire chain hanger support assembly. 5,316,191, Cl. 224-42.45R.
Gibson, O. Dean: *See*—
Gibson, C. Norman; and Gibson, O. Dean, 5,316,191, Cl. 224-42.45R.
Gibson, William C.: *See*—
Martin, Michael J.; Gibson, William C.; and Massey, Lee R., 5,316,469, Cl. 431-116.000.
Giddings, Robert A.: *See*—
Brun, Milivoj K.; Giddings, Robert A.; and Prochazka, Svante, 5,316,851, Cl. 428-379.000.
Gilbert Corporation: *See*—
Bogen, Steven A.; and Loeffler, Herbert H., 5,316,452, Cl. 417-412.000.
Gildersleeve, Richard E., to Smith & Nephew Donjoy, Inc. Orthopedic brace having pneumatic pads. 5,316,547, Cl. 602-26.000.
Giller, Gerald: *See*—
Mizuguchi, Jin; Giller, Gerald; and Rochat, Alain C., 5,316,852, Cl. 428-411.100.
Gillett, John B., to International Business Machines Corporation. High density interconnection assembly. 5,317,477, Cl. 361-683.000.
Gilpatrick, Michael W.: *See*—
Adams, Louis W., Jr.; Gilpatrick, Michael W.; and Gregory, Richard V., 5,316,830, Cl. 428-195.000.
Ginder, John M.: *See*—
Weber, Willes H.; Remillard, Jeffrey T.; and Ginder, John M., 5,317,667, Cl. 385-147.000.
Gingrich, Robert B.: *See*—
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Giordano, Giuseppe. Hair curler having linking element with crossbar. 5,316,021, Cl. 132-248.000.
Girard, Laurent; Krysinski, Tomasz; and Michel, Pierre, to Aerospatiale Societe Nationale Industrielle. Method and device for filtering the vibratory excitations transmitted between two parts especially between the rotor and the fuselage of a helicopter. 5,316,240, Cl. 244-17.270.
Giter, Gershon: *See*—
Babson, Arthur L.; Ross, Arthur F.; Olson, Douglas R.; Giter, Gershon; and Huebner, Victor R., 5,316,726, Cl. 422-65.000.
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Ueberschar, Manfred; and Giuste, Sergio, 5,316,584, Cl. 118-712.000.
Glacier Metal Company Limited, The: *See*—
New, Nigel H., 5,317,226, Cl. 310-90.500.
Gladfelter, Elizabeth J.; Outlaw, Tina O.; Copeland, James L.; Schulz, Rhonda K.; Boche, Daniel K.; and Peterson, Jeff W., to Ecolab Inc. Water soluble or dispersible film covered alkaline composition. 5,316,688, Cl. 252-90.000.
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Glassburn, Tim R., to Quantum Corporation. Micro-winchester disk drive having on-board segmented cache memory. 5,317,713, Cl. 395-425.000.
Glassey, Eugene A.; and Loh, Ralph A., to Fluid Data Systems. Purge gas pressure monitoring system. 5,315,876, Cl. 73-708.000.
Glassner, Andrew S., to Xerox Corporation. Sequencing and scheduling moves for converting concave polyhedra to their convex hulls. 5,317,681, Cl. 395-141.000.
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Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Montana, John G.; Pass, Martin; and Judd, Duncan B., 5,317,023, Cl. 514-303.000.
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Leonberger, Frederick; Glenn, William H.; and Ball, Gary A., 5,317,576, Cl. 372-6.000.
Global Prepcorp: *See*—
Hougham, John K., 5,316,778, Cl. 426-324.000.
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Dougherty, Thomas J.; and Pierson, John R., 5,316,868, Cl. 429-9.000.
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Gnade, Bruce E.: *See*—
Wallace, Robert M.; and Gnade, Bruce E., 5,316,793, Cl. 427-248.100.
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Gofman, Emanuel, to International Business Machines Corporation. Random number generator. 5,317,528, Cl. 364-717.000.
Golden, Casey V.; Turner, Ronald L.; Elverum, John A.; and Hauser, Ray L., to Bio Dynamics, Ltd. Moldable composition of matter. 5,317,037, Cl. 523-128.000.
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Brandberg, Lawrence C.; and Watkins, Jeffrey T., 5,317,118, Cl. 219-727.000.
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Goldman, William E., to Washington University. Method for the treatment of pertussis with aminoguanidine. 5,317,040, Cl. 514-634.000.

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Park, Seong S., 5,315,835, Cl. 62-80.000.

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Reiffel, Leonard; Jung, Wayne D.; Rosevear, Thomas; and Jakobs, Thomas, 5,317,502, Cl. 364-167.010.

Goldstein, Yuri, to General DataComm, Inc. Systems for and method of identifying V.fast modem within existing automatic interworking procedure standards. 5,317,594, Cl. 375-8.000.

Golukhov, Albert; Baker, Josefina T.; and Matusewicz, Richard S., to Smithkline diagnostics, Inc. Extraction vial. 5,316,732, Cl. 422-102.000.

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Bula, Orest; Koch, Garrett S.; Woyke, Justin A.; and Gomez, Richard S., 5,317,573, Cl. 371-10.300.

Gonzalez, Frank. Catalytic clean-combustion-promoter compositions for liquid hydrocarbon fuels used in internal combustion engines. 5,316,558, Cl. 44-340.000.

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Good, Sidney R., 5,316,096, Cl. 180-19.100.

Good, Sidney R., to Good Marketing, Inc. Portable motorized suitcase. 5,316,096, Cl. 180-19.100.

Goode, John E.; Hoyle, Michael D.; and Lance, Raymond E., to Hydra-Rig, Incorporated. Liquid natural gas and compressed natural gas total fueling system. 5,315,831, Cl. 62-7.000.

Gooderham, Roy J., to Spirax-Sarco Limited. Condensate trap. 5,316,213, Cl. 236-58.000.

Goodman, Michael G.; and Weigle, William O., to Scripps Clinic and Research Foundation. Modulation of animal cellular responses with compositions containing 8-substituted guanine derivatives. 5,317,013, Cl. 514-45.000.

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Rodgers, Michael B.; Mezynski, Stanley M.; Halasa, Adel F.; Hsu, Wen-Liang; Matrana, Barry A.; and Cox, Joel L., 5,317,062, Cl. 525-237.000.

Gordon, Yoram; Fain, John; Davis, William F.; and Lancaster, William G., to Lantech, Inc. Stretch wrapping emergency stop. 5,315,809, Cl. 53-399.000.

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Pellet, Regis J.; and Gortsema, Frank P., 5,316,656, Cl. 208-120.000.

Gorza, Roberto; Baggio, Giorgio; and Battistella, Mirco, to Noridca S.p.A. Ski binding with device for compensating the calibration load for toe unit safety release. 5,316,331, Cl. 280-618.000.

Goseki, Yasuhide: *See—*

Kanda, Hitoshi; Kato, Masayoshi; Mitsumura, Satoshi; Yamada, Yusuke; and Goseki, Yasuhide, 5,316,222, Cl. 241-5.000.

Goto, Atsuo, to Olympus Optical Co., Ltd. Optical head for recording and reproducing information on and/or from optical record medium. 5,317,557, Cl. 369-112.000.

Goto, Haruhiro H.: *See—*

Yamagami, Atsushi; Okamura, Nobuyuki; Ohmi, Tadahiro; Goto, Haruhiro H.; and Shibata, Tadashi, 5,316,645, Cl. 204-298.060.

Goto, Yoh: *See—*

Matsuda, Tsutomu; Goto, Yoh; and Shibata, Tatsuya, 5,316,834, Cl. 428-233.000.

Goulaouic, Pierre: *See—*

Emonds-Alt, Xavier; Goulaouic, Pierre; Proietto, Vincenzo; and Van Broeck, Didier, 5,317,020, Cl. 514-255.000.

Govorchin, Steven W. Furnace atomization electron ionization mass spectrometry. 5,316,955, Cl. 436-155.000.

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Dias, Daniel M.; Goyal, Ambuj; and Parr, Francis N., 5,317,731, Cl. 395-600.000.

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Spektor, Semyon; and Gozokhovsky, Mark, 5,316,058, Cl. 141-319.000.

Graben, Roger D.: *See—*

Jurgens, Raymond W., Jr.; Graben, Roger D.; and Sabir, Adnan S., 5,316,772, Cl. 424-472.000.

Grabiec, Alan R.; Frey, William G.; and Davies, Scott T., to Thomas & Betts Corporation. Fiber optic assembly and crimp sleeve used with the assembly. 5,317,664, Cl. 385-87.000.

Graener, Rudolf: *See—*

von der Lippe, Norbert; Graener, Rudolf; and Sommer, Peter, 5,316,786, Cl. 427-96.000.

Graf, Lothar: *See—*

Fuchs, Karl-Heinz; and Graf, Lothar, 5,316,198, Cl. 222-321.000.

Graff, Daniel A., to Ulster Scientific, Inc. Vial transporter. 5,316,146, Cl. 206-438.000.

Grammatica, Steven J.: *See—*

Herbert, William G.; Hogle, David J.; Grammatica, Steven J.; Schmitt, Peter J.; Jansen, Ronald E.; and Thomas, Mark S., 5,316,651, Cl. 205-67.000.

Grana, Inc.: *See—*

Stein, Peter, 5,316,685, Cl. 210-787.000.

Granger, Edward M.: *See—*

Spence, John P.; Granger, Edward M.; and Rinehart, Charles E., 5,317,425, Cl. 358-504.000.

Grant, David C.: *See—*

Lahoda, Edward J.; Grant, David C.; and Sverdrup, Edward F., 5,316,223, Cl. 241-24.000.

Grant, Robert C.: *See—*

Collins, Timothy R.; Chinnock, Robert T.; Grant, Robert C.; and Hamilton, Dean T., 5,316,035, Cl. 137-312.000.

Granthan, George L.: *See—*

Donson, Jon; Dawson, William O.; Granthan, George L.; Turpen, Thomas H.; Turpen, Ann M.; Garger, Stephen J.; and Grill, Laurence K., 5,316,931, Cl. 435-172.300.

Grasselli, Robert K.: *See—*

Dessau, Ralph M.; Grasselli, Robert K.; Lago, Rudolph M.; and Tsikoyiannis, John G., 5,316,661, Cl. 208-46.000.

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Gray, Charles L.; Brooker, John T.; Bardin, Dale E.; and Salby, E. Reeves, II, to Loral Corporation. IR/ladar scanner. 5,317,148, Cl. 250-227.260.

Gray, Freddy A., Jr.: *See—*

DeLong, Leonard D.; and Gray, Freddy A., Jr., 5,316,427, Cl. 414-24.600.

Gray, Gary A.; LaRocca, Brian; and Strauss, Rodolfo, to Strauss Trading Corp. Telephone timer apparatus. 5,317,545, Cl. 368-4.000.

Gray, John; and Galloway, John, to Davidson Textron Inc. Self piercing cover assembly air bag. 5,316,335, Cl. 280-728.00B.

Gray, John D., to Davidson Textron Inc. Method and apperatus for producing multi-color shells utilizing an indexing divider mold. 5,316,715, Cl. 264-245.000.

Graycar, Thomas P.: *See—*

Estell, David A.; Caldwell, Robert M.; Bott, Richard R.; and Graycar, Thomas P., 5,316,941, Cl. 435-252.300.

Great Lakes Chemical Corporation: *See—*

Tarbit, Brian; Adger, Brian; and Willett, Paul, 5,317,048, Cl. 524-94.000.

Greaves, Carlos A.: *See—*

Bonet, Luis A.; Greaves, Carlos A.; and Corleto, Jose G., 5,317,522, Cl. 364-514.000.

Green, Christopher J.; and Johnson, Paul H., to SRI International. Cloning and expression of a variant gene of platelet factor 4 and compositions thereof to modulate immune responses. 5,317,011, Cl. 514-12.000.

Green, Lawrence W.; and McRae, Glenn, to Atomic Energy of Canada Limited/Energie Atomique du Canada Limitee. Zirconium isotope separation using tuned laser beams. 5,316,635, Cl. 295-157.220.

Green, William P. Formation of threads with varying pitch. 5,316,520, Cl. 470-18.000.

Greene, Nathan D.: *See—*

Brown, Karen K.; Ruiz, Linda L. C.; van de Rijn, Ivo; Greene, Nathan D.; Trump, Sandy L.; Wilson, Curtis D.; and Bryant, Sharon A., 5,316,926, Cl. 435-101.000.

Greenleaf Medical Systems, Inc.: *See—*

Edwards, Glenn R.; Lloyd, Graham; and Oberman, Marl L., 5,316,017, Cl. 128-782.000.

Gregoli, Armand A.; Hamshar, John A.; Rimmer, Daniel P.; and Yildirim, Erdal, to Canadian Occidental Petroleum, Ltd. Process for recovery of hydrocarbons and rejection of sand. 5,316,664, Cl. 208-390.000.

Gregor, Eduard, to Hughes Aircraft Company. Laser reflecting cavity with ASE suppression and heat removal. 5,317,585, Cl. 372-35.000.

Gregory, Richard V.: *See—*

Adams, Louis W., Jr.; Gilpatrick, Michael W.; and Gregory, Richard V., 5,316,830, Cl. 428-195.000.

Gries, Heinz; Renneke, Franz-Josef; and Weinmann, Hanns-Joachim, to Schering Aktiengesellschaft. NMR imaging using paramagnetic chelates having hydroxyalkyl-substituted amide groups. 5,316,756, Cl. 424-9.000.

Griffin, Christopher: *See—*

Ganzi, Gary C.; Wilkins, Frederick; Giuffrida, Anthony J.; and Griffin, Christopher, 5,316,637, Cl. 204-182.400.

Griffin Corporation: *See—*

Misselbrook, John; McKinney, Larry J.; Lefiles, James H.; Hoff, Edwin F., Jr.; and Bergman, Elliot, 5,317,004, Cl. 504-116.000.

Griffin, Wayne P.: *See—*

Coutre, James E.; Griffin, Wayne P.; and Crisler, Charles M., 5,317,506, Cl. 364-413.020.

Grill, Laurence K.: *See—*

Donson, Jon; Dawson, William O.; Granthan, George L.; Turpen, Thomas H.; Turpen, Ann M.; Garger, Stephen J.; and Grill, Laurence K., 5,316,931, Cl. 435-172.300.

Grimaldi, Antonio: *See—*

Zambrano, Raffaele; and Grimaldi, Antonio, 5,317,182, Cl. 257-378.000.

Grimshaw, Michael N.: *See—*

Peterson, David A.; and Grimshaw, Michael N., 5,316,612, Cl. 156-493.000.

Griner, Paul K.; and Smith, Paul T., to Unidynamics Corporation. Bill validator with anti-stringing shut-down feature. 5,316,117, Cl. 194-203.000.

Gripping Tools Technologies, Inc.: *See—*

Ragland, Larry; and Morales, Emmitt, 5,315,902, Cl. 81-53.200.

Griswold, Don E.: *See—*

Bender, Paul E.; Griswold, Don E.; Hanna, Nabil; Lee, John C.; Votta, Bartholomew J.; Simon, Philip L.; Badger, Alison M.; and Esser, Klaus M., 5,317,019, Cl. 514-224.200.

Grobert, Paul H., to Magnavox Electronic Systems Company; and Grobert, Paul H. Null processing and beam steering receiver apparatus and method. 5,317,322, Cl. 342-378.000.

Groft, Cory L.; and Dauber, Thomas W. Low emissivity insulation. 5,316,835, Cl. 428-247.000.

Gronet, Christian M.; and Gibbons, James F., to Applied Materials, Inc. Rapid thermal heating apparatus and method. 5,317,492, Cl. 362-294.000.

Grosch, Hermann, to Rheinmetall GmbH. Method and sensor for determining the distance of sound generating targets. 5,317,543, Cl. 367-125.000.

Gross, Akiva T.: *See—*

Zaks, Aleksey; and Gross, Akiva T., 5,316,927, Cl. 435-134.000.

Gross, Vaughn P.: *See—*

Batchelder, John S.; Gross, Vaughn P.; Gruver, Robert A.; Hobbs, Philip C. D.; and Murray, Kenneth D., 5,316,970, Cl. 437-173.000.

Gross, William H., to Linear Technology Corporation. Method of forming integrated circuits with diffused resistors in isolation regions. 5,316,964, Cl. 437-60.000.

Grosvenor, Victor L.: *See—*

Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, 5,317,132, Cl. 219-543.000.

Groten, Robert; Heidecke, Gerhard; Mannsbart, Thomas; and Siekermann, Volker, to Freudenberg, Carl. Biodegradable sheet for culturing sewage denitrifiers. 5,316,832, Cl. 428-224.000.

Grover, Richard K.; and Kingsbury, Keith M., to Motorola, Inc. Multiple radar interference suppressor. 5,317,320, Cl. 342-159.000.

Grubaugh, Eugene R.: *See—*

Horning, Larry D.; Grubaugh, Eugene R.; Pfeifer, Thomas E.; and Johnson, Carroll R., 5,316,430, Cl. 414-407.000.

Gruber, Michael W.: *See—*

Luhman, Robert A.; Kuhn, Gary K.; Perrington, Kenneth J.; Kropp, Karl M.; and Gruber, Michael W., 5,316,424, Cl. 412-8.000.

Gruhlke, David. Protective sleeve for posts in post frame construction. 5,315,796, Cl. 52-170.000.

Grundmann, Ulrich; Abel, Karl-Josef; and Amann, Eugen, to Behringwerke Aktiengesellschaft. Protein PP 15 preprared by genetic manipulation. 5,317,094, Cl. 536-23.500.

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Hoenk, Michael E.; Grunthaner, Paula J.; and Grunthaner, Frank J., 5,316,586, Cl. 118-728.000.

Grunthaner, Paula J.: *See—*

Hoenk, Michael E.; Grunthaner, Paula J.; and Grunthaner, Frank J., 5,316,586, Cl. 118-728.000.

Gruodis, Robert J.: *See—*

Naggert, Dieter K.; Tang, James J.; and Gruodis, Robert J., 5,315,858, Cl. 72-350.000.

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Batchelder, John S.; Gross, Vaughn P.; Gruver, Robert A.; Hobbs, Philip C. D.; and Murray, Kenneth D., 5,316,970, Cl. 437-173.000.

Gruwez, Marc, to Picanol N.V. Arrangement for separation and reassembly of a two-part weaving machine. 5,316,048, Cl. 139-1.00R.

Gschwender, Lois J.: *See—*

Snyder, Carl E., Jr.; Gschwender, Lois J.; Eapen, Kalathil C.; and Chen, Grace J., 5,316,686, Cl. 252-54.000.

Gsell, Thomas C.: *See—*

Pall, David B.; Gsell, Thomas C.; and Muellers, Brian T., 5,316,674, Cl. 210-257.100.

GTE Control Devices Incorporated: *See—*

Wang, Da Y.; Kennedy, Daniel T.; Middleton, Thomas R.; and MacAllister, Burton W., 5,316,973, Cl. 437-188.000.

GTE Government Systems Corporation: *See—*

Osterweil, Josef, 5,317,603, Cl. 375-122.000.

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Guibert, Bettina: *See—*

Guibert, Raul; and Guibert, Bettina, 5,315,994, Cl. 607-101.000.

Guibert, Raul; and Guibert, Bettina. Combined thermotherapy and electrotherapy technique. 5,315,994, Cl. 607-101.000.

Guidotti, Alessandro: *See—*

Walser, Armin; Guidotti, Alessandro; and Costa, Erminio, 5,317,018, Cl. 514-220.000.

Guigan, Jean. Apparatus for drawing off and dispensing a predetermined quantity of a liquid. 5,315,886, Cl. 73-864.020.

Guither, James E.; and Wadzinski, Francis A., to Pro-Tech Engineering Co., Inc. Encapsulating laminator. 5,316,609, Cl. 156-301.000.

Gum, Peter H.: *See—*

Gannon, Patrick M.; Gum, Peter H.; Hough, Roger E.; and Murray, Robert E., 5,317,705, Cl. 395-400.000.

Gummow, Rosalind J.: *See—*

Thackeray, Michael M.; and Gummow, Rosalind J., 5,316,877, Cl. 429-197.000.

Gundlach, James O.: *See—*

Carbone, John J.; and Gundlach, James O., 5,316,522, Cl. 474-95.000.

Gunther, Herbert, to Dipl.-Ing Herbert Gunther Gesellschaft mbH. Side gate hot runner nozzle. 5,316,468, Cl. 425-549.000.

Gupta, Amitava: *See—*

Blum, Ronald D.; Gupta, Amitava; and Bennington, Steve, 5,316,702, Cl. 264-1.700.

Gupta, Rajiv, to North American Philips Corporation. Method of synchronizing parallel processors employing channels and compiling method minimizing cross-processor data dependencies. 5,317,734, Cl. 395-650.000.

Gupta, Tapan K.: *See—*

Jean, Jau-Ho; and Gupta, Tapan K., 5,316,985, Cl. 501-16.000.

Gurley, Thomas D.; and Lagoni, William A., to Thomson Consumer Electronics, Inc. Non-linear customer contrast control for a color television with autopix. 5,317,400, Cl. 348-679.000.

Gustav Schumacher: *See—*

Schumacher, Gustav; and Schumacher, Friedrich W., 5,316,033, Cl. 137-614.000.

Guth, Harald: *See—*

Weber, Wilfried; Mallee, Rainer; Hein, Bernd; Mayer, Burkhard; Guth, Harald; and Haage, Manfred, 5,315,800, Cl. 52-309.100.

Guttag, Karl M.; Asal, Michael D.; Van Aken, Jerry R.; Tebbutt, Neil; and Novak, Mark F., to Texas Instruments Incorporated. Graphics data processing apparatus with draw and advance operation. 5,317,333, Cl. 345-133.000.

Guy, Blondel. Process and apparatus for the production of fresh water using solar energy. 5,316,626, Cl. 203-10.000.

Guzowski, Raymond J.; and Lazar, David W., to FANUC Robotics North America, Inc. Method and system for detecting blockage in a spray gun of a liquid spray system. 5,316,217, Cl. 239-71.000.

H.B. Fuller Company: *See—*

Batdorf, Vern H., 5,317,056, Cl. 524-556.000.

H-D Tech Inc.: *See—*

Dong, Dennis, 5,316,629, Cl. 204-83.000.

Ha, Bao; and Garnier, Catherine, to Liquid Air Engineering Corporation. Process for the mixed production of high and low purity oxygen. 5,315,833, Cl. 62-38.000.

Haag, William D.; Emmerson, A. Richard; and Laube, Daniel J., to Chicago Faucet Company, The. Cartridge-type faucet valve with improved seal. 5,316,039, Cl. 137-454.600.

Haage, Manfred: *See—*

Weber, Wilfried; Mallee, Rainer; Hein, Bernd; Mayer, Burkhard; Guth, Harald; and Haage, Manfred, 5,315,800, Cl. 52-309.100.

Habelt, Gerhard, to U.S. Philips Corporation. Holder for a cassette. 5,316,144, Cl. 206-387.000.

Habermann, Paul: *See—*

Crause, Peter; Habermann, Paul; Tripier, Dominique; Ulmer, Wolfgang; and Schmid, Gerhard, 5,316,947, Cl. 435-320.100.

Haehn, Peter-Clemens, to Linde Aktiengesellschaft. Absorption column with external mixing for absorption of acetylene. 5,316,744, Cl. 422-257.000.

Haesebroek, Guy G.; and De Schepper, Achille J., to n.v. Union Miniere s.a. Metal extraction by ion exchange. 5,316,683, Cl. 210-688.000.

Hagen, Arnulf P.: *See—*

Brunken, Dean E.; and Hagen, Arnulf P., 5,316,799, Cl. 427-421.000.

Hager, Dean J.; Resch, Robert P.; and Rose, Curtis G., to International Business Machines Corporation. Method and apparatus for automated meeting agenda generation in a data processing system. 5,317,683, Cl. 395-145.000.

Hagiwara, Kanehiro: *See—*

Furuno, Takashi; Wakasa, Toshiya; Iizuka, Jun; Hagiwara, Kanehiro; and Mitake, Mitsuyoshi, 5,317,449, Cl. 359-443.000.

Hagiwara, Noboru: *See—*

Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, 5,317,405, Cl. 348-20.000.

Hagiwara, Tomoyuki: *See—*

Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.

Hajec, John W., Jr. Rack for storing and dispensing plastic oil containers. 5,316,154, Cl. 211-59.200.

Halasa, Adel F.: *See—*

Rodgers, Michael B.; Mezynski, Stanley M.; Halasa, Adel F.; Hsu, Wen-Liang; Matrana, Barry A.; and Cox, Joel L., 5,317,062, Cl. 525-237.000.

Hale, Robert A.; Nathanson, Harvey C.; and Hazlett, Joel F., to Westinghouse Electric Corp. Distributed aperture imaging and tracking system. 5,317,394, Cl. 348-208.000.

Hall, James E.; Hergenrother, William L.; and Oziomek, James, to Bridgestone Corporation. (Halomethyl vinyl arene)-modified elastomers and compositions containing them having reduced hysteresis properties. 5,317,057, Cl. 524-575.000.

Hall, John C.: *See—*

Smalley, Raymond L.; Hall, John C.; Clouse, Ryan J.; Risner, P. Fred; and Strohm, Edward L., 5,316,432, Cl. 414-540.000.

Hall, Kenneth J. Mouse yoke assembly for interfacing with a computer. 5,317,336, Cl. 345-164.000.

Hall, Shelby J.: *See—*

Schrenk, W. Juergen; and Hall, Shelby J., 5,316,731, Cl. 422-101.000.

Hall, William G.; and Dirksing, Robert S., to Procter & Gamble Company, The. Self-contained package for housing, dispensing and diluting concentrated liquid. 5,316,054, Cl. 141-22.000.

Halliburton Company: *See—*

DeMoss, Edward E., 5,316,086, Cl. 166-373.000.

Manke, Kevin R.; Wesson, David S.; and Schultz, Roger L., 5,316,087, Cl. 166-381.000.

Surjaatmadja, Jim B.; Nusz, Bary J.; and Turner, Gordon A., 5,315,864, Cl. 73-54.320.

Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, to Sumitomo Special Metals Co., Ltd. Process for producing magnets having improved corrosion resistance. 5,316,595, Cl. 148-302.000.

Hamamatsu Photonics K.K.: *See—*

Urakami, Tsuneyuki; and Aoshima, Shinichiro, 5,317,577, Cl. 372-21.000.

Hamano, Hisashi: *See—*

Etchu, Masami; Hamano, Hisashi; Hosoi, Masahiro; and Saeki, Yasuhiro, 5,316,823, Cl. 428-141.000.

Hamashima, Shigeki: *See—*

Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, 5,317,157, Cl. 250-352.000.

Hamazaki, Nobuyoshi: *See—*

Suzuki, Takane; Sugawara, Sakuo; Hamazaki, Nobuyoshi; Ito, Ken-ichi; Tsutsumi, Koichiro; and Sakai, Osamu, 5,316,214, Cl. 236-78.00R.

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Hammer, Robert, to International Business Machines Corporation. Method of fabricating a combined linear-rotary direct drive step motor. 5,315,751, Cl. 29-598.000.

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Chen, Barbara B.; Hanson, Gunnar J.; and Baran, John S., 5,317,039, Cl. 514-616.000.

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Hara, Shin-ichi: *See—*

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Harada, Hisashi, to NEC Corporation. Image sensing apparatus using calibration sequences stored in extended portions of shift registers. 5,317,423, Cl. 358-482.000.

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Kuwana, Shoji; Kiyosawa, Yoshihide; and Ikeda, Akio, 5,316,090, Cl. 175-24.000.

Harmony Brook, Inc.: *See—*

Kohlmann, Michael J.; and Williams, Randall K., 5,316,673, Cl. 210-251.000.

Harms, Harold H., II, to Harmsco, Inc. Pleated filtering sleeve for rotational flow filter systems. 5,316,677, Cl. 210-455.000.

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Martin, Clarence E.; and Burrows, David J., 5,316,434, Cl. 414-607.000.

Harpell, Gary A.; and Prevorsek, Dusan C., to AlliedSignal Inc. Flexible composites having flexing rigid panels and articles fabricated from same. 5,316,820, Cl. 428-109.000.

Harrington, Steven J., to Xerox Corporation. Determination of the arc length of a curve. 5,317,650, Cl. 382-22.000.

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Harris Corporation: *See—*

Krzycki, Edwin A.; Luster, Troy R.; and Stone, David L., 5,317,690, Cl. 395-200.000.

Rexer, Christopher L., 5,317,184, Cl. 257-401.000.

Harris, Norman H.: *See—*

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Harry, David N.; and Sharif, Sharif, to Benchmark Research and Technology, Inc. Method and process for the stabilization of resin coated particulates. 5,316,792, Cl. 427-221.000.

Harsch, Gerald, to Von Der Dellen, Wilhelm. Device for erecting walls or ceilings, especially in exhibition constructions. 5,315,805, Cl. 52-775.000.

Hart Enterprises, Inc.: *See—*

Striebel, Robert L., II; Chettleburgh, Kenneth E.; and Taylor, Alan N., 5,316,013, Cl. 128-754.000.

Hart, Joseph J.: *See—*

Ralph, Stanley F.; Weinberg, Leonard; and Hart, Joseph J., 5,317,569, Cl. 370-85.900.

Hart, Robert M. Pre-filter oil inspection screen. 5,316,665, Cl. 210-85.000.

Hart, Thomas W., to Solite Corporation. Modular wall system. 5,315,802, Cl. 52-607.000.

Hartel, Gunter; Losing, Karl-Heinrich; Schurfeld, Armin; Blasczyk, Johann; and Kerkmann, Harald, to Pierburg GmbH. Apparatus for measuring the fraction of liquid fuel in a fuel tank. 5,315,867, Cl. 73-149.000.

Hartig, R. George: *See—*

Palm, Gordon F.; and Hartig, R. George, 5,316,748, Cl. 423-320.000.

Hartley, Richard I.; and Corbett, Peter F., to General Electric Company. Systolic array processors for reducing under-utilization of original design parallel-bit processors with digit-serial processors by using maximum common divisor of latency around the loop connection. 5,317,755, Cl. 395-800.000.

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Harwath, Frank L., to Suntec Industries Incorporated. Gear pump with improved gear/shaft retention. 5,316,457, Cl. 418-171.000.

Harwell, Reginald W.; and Parker, Darrold J., to United States of America, Air Force. Method for configuring a computer server to operate with network operating system software to prevent memory address conflicts between workstations. 5,317,744, Cl. 395-700.000.

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Hasegawa, Haruhiro: *See—*

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Hasegawa, Makoto; and Mori, Koji, to Nippodenso Co., Ltd. Information reading device which controls communication interrupt signal from a host system. 5,317,136, Cl. 235-375.000.

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Hasegawa, Shinichi; Ota, Shuichi; Uetake, Akihiro; Sawada, Takashi; Senshu, Yoichirou; and Sugai, Chiaki, to Sony Corporation. Tape supplying and taking up apparatus and tape cassettes for use therewith. 5,316,236, Cl. 242-200.000.

Hasegawa, Shinichi, to Sony Corporation. Magnetic head drum apparatus having upper and lower stationary drums and a rotatable member therebetween arranged to damp noise and vibration. 5,317,466, Cl. 360-107.000.

Hasegawa, Takayuki: *See—*

Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; Uzawa, Shunichi; and Hasegawa, Takayuki, 5,317,615, Cl. 378-34.000.

Hasegawa, Yoshikazu: *See—*

Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, 5,316,933, Cl. 435-240.100.

Hashimoto, Kazuhiko; and Endo, Masayuki, to Matsushita Electric Industrial Co., Ltd. Fine pattern forming method. 5,316,891, Cl. 430-296.000.

Hashimoto, Mitsuru, to Ricoh Company, Ltd. Bisazo compounds useful as organic photoconductive materials. 5,317,093, Cl. 534-658.000.

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Hashimoto, Yasuaki; Nakane, Akio; and Uematsu, Tadahiro, to Usui Kokusai Sangyo Kaisha Ltd. Apparatus for cutting inner circumferential surface of thick walled small diameter pipe. 5,315,904, Cl. 82-129.000.

Hasselmann, Detlev E. M. Vapor recovery system tester. 5,316,057, Cl. 141-94.000.

Hasselmann, Detley E. M. Flow meter. 5,315,862, Cl. 73-40.50R.

Hasushita, Sachio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Albada finder. 5,317,451, Cl. 359-643.000.

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Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, 5,317,167, Cl. 257-13.000.

Hatano, Mutsuko: *See—*

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Hattori, Yasuhiko; and Eitoku, Kenji, to Aisan Kogyo Kabushiki Kaisha. Intake control device for internal combustion engine. 5,315,975, Cl. 123-337.000.

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Hauck, Emil: *See—*

Baski, Henry A.; and Hauck, Emil, 5,316,081, Cl. 166-188.000.

Haug, Willi: *See—*

Bohnet, Hartmut; Haug, Willi; and Lind, Stefan, 5,316,419, Cl. 408-236.000.

Hauge, Robert H.: *See—*

Patterson, Donald E.; Hauge, Robert H.; Chu, C. Judith; and Margrave, John L., 5,316,795, Cl. 427-249.000.

Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, to Molecular Probes, Inc. Enzymatic analysis using substrates that yield fluorescent precipitates. 5,316,906, Cl. 435-4.000.

Haupt, Stephan: *See—*

Kuhn, Uwe; Kiesele, Herbert; and Haupt, Stephan, 5,316,648, Cl. 204-415.000.

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Paspek, Stephen C.; Eppig, Christopher P.; Hauser, Jeffrey B.; and Polisena, Carl, 5,316,655, Cl. 208-131.000.

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Golden, Casey V.; Turner, Ronald L.; Elverum, John A.; and Hauser, Ray L., 5,317,037, Cl. 523-128.000.

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Husak, David J.; Madnick, Jay L.; and Hauser, Stephen A., 5,317,697, Cl. 395-325.000.

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Hayashi, Shigeo; Kohari, Osamu; and Kato, Masaru, to Oji Paper Co., Ltd. Thermal transfer dye image-receiving sheet. 5,316,999, Cl. 503-227.000.

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Motani, Shigeru; Saito, Tadayuki; and Hayashi, Takahiro, 5,317,033, Cl. 521-79.000.

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Hayashibara Biochemical Laboratories, Inc.: *See—*

Suzuki, Yukio; Muroyama, Koutarou; and Suzuki, Kei, 5,317,095, Cl. 536-16.700.

Hazeltine Corporation: *See—*

Cahalan, Irving W.; La Clair, Michael; Seiter, Paul; and Weber, John, 5,317,598, Cl. 375-75.000.

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Hale, Robert A.; Nathanson, Harvey C.; and Hazlett, Joel F., 5,317,394, Cl. 348-208.000.

Heap, A. Randall; and Santiago, Eduardo A., to Digital Equipment Corporation. System and method for automatically relocating and configuring firmware stored in subsystem modules. 5,317,723, Cl. 395-500.000.

Heaslip, Herbert F., to Stavo Industries, Inc. Filter cell seal assembly. 5,316,678, Cl. 210-486.000.

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Connelly, Joseph W.; Barlow, Clive R.; and Benson, Clark K., 5,316,429, Cl. 414-298.000.

Heathcock, Christopher J.: *See—*

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Schumacher, Michael, 5,315,914, Cl. 89-14.050.

Hedeen, Randall E., to Paccar Inc. Integrated heat exchanger. 5,316,079, Cl. 165-140.000.

Hedgcoth, Virgle L. Sputtered magnetic recording disk. 5,316,864, Cl. 428-611.000.

- Hedrick, Stephen M.: *See—*
  - Davis, Mark M.; and Hedrick, Stephen M., 5,316,925, Cl. 435-91.200.
- Hedtmann, Udo: *See—*
  - Aretz, Werner; Ehlers, Eberhard; and Hedtmann, Udo, 5,316,929, Cl. 435-146.000.
- Heess, Gerhard: *See—*
  - Becker, Rolf; Belzner, Ulrich; Mergenthaler, Rolf-Hermann; and Heess, Gerhard, 5,316,379, Cl. 303-100.000.
- Heiberger, Robert A. Bottle with reflective barrier layer for reducing electromagnetic energy transfer. 5,316,193, Cl. 222-131.000.
- Heidecke, Gerhard: *See—*
  - Groten, Robert; Heidecke, Gerhard; Mannsbart, Thomas; and Siekermann, Volker, 5,316,832, Cl. 428-224.000.
- Heiland, Christoph: *See—*
  - Kneer, Roland; and Heiland, Christoph, 5,316,135, Cl. 220-461.000.
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- Hein, Bernd: *See—*
  - Weber, Wilfried; Mallee, Rainer; Hein, Bernd; Mayer, Burkhard; Guth, Harald; and Haage, Manfred, 5,315,800, Cl. 52-309.100.
- Heindel, Timothy R.; Garvey, Michael J.; Dick, Daniel W.; Keller, Richard F.; Jordan, Mary P.; and Schleinz, Alan F., to Kimberly-Clark Corporation. Sprayed adhesive diaper construction. 5,316,836, Cl. 428-284.000.
- Heinle, Konrad. Thickness compensation actuator system. 5,316,276, Cl. 269-21.000.
- Heismann, Fred L.: *See—*
  - Fatehi, Mohammad T.; and Heismann, Fred L., 5,317,439, Cl. 359-110.000.
- Heit, Martin A.; Wilkins, John J.; and Rau, William C., to Litton Industrial Automation Systems, Inc. Zero pressure accumulation conveyor. 5,316,130, Cl. 198-781.000.
- Heitel, Robert G., to Baxter Diagnostics Inc. Multiport equalization probe. 5,315,887, Cl. 73-864.110.
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  - Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., 5,317,739, Cl. 395-650.000.
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  - Clippard, Stephen R., 5,317,724, Cl. 395-550.000.
- Heller, Lisa C.: *See—*
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- Hellewell, Todd D.: *See—*
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- Hellmick, Mark; Johansson, Leif A.; and Weber, Otto, to Medrad, Inc. Film changer. 5,317,619, Cl. 378-173.000.
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  - Banker, Dennis C.; Carlson, Tore A.; Dorler, Jack A.; Hendricks, Paul D.; Klara, Walter S.; Masci, Frank M.; and Struk, James R., 5,317,208, Cl. 307-454.000.
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  - Kresse, Franz; Osberghaus, Rainer; and Scheller, Bernfrid, 5,315,734, Cl. 15-229.400.
- Henneberger, Roy, to ADC Telecommunications, Inc. Optic cable management. 5,316,243, Cl. 248-68.100.
- Henny Penny Corporation: *See—*
  - Burkett, Doug; and Mercer, Gary, 5,317,130, Cl. 219-497.000.
- Henry Filters, Inc.: *See—*
  - Bailey, Michael R., 5,315,880, Cl. 73-861.250.
- Henry Ford Hospital: *See—*
  - Rivers, Emanuel P., 5,315,995, Cl. 128-634.000.
- Hensel, James T. Page with picture pockets and album containing such pages. 5,316,404, Cl. 402-79.000.
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  - Dupont, Antoine; Hepp, Bernard; and Benoit, Eric, 5,317,401, Cl. 168-678.000.
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  - Espy, Herbert H., 5,316,623, Cl. 162-164.300.
- Herd, Kenneth G.: *See—*
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  - Benedikt, Walter; Vogel, Manfred; Herden, Werner; Konrad, Johann; Schmidt, Wolfgang; Tosch, Josef; and Kuessel, Matthias, 5,315,875, Cl. 73-706.000.
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  - Connell, John W.; Hergenrother, Paul M.; and Smith, Joseph G., 5,317,078, Cl. 528-210.000.
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  - Hall, James E.; Hergenrother, William L.; and Oziomek, James, 5,317,057, Cl. 524-575.000.
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  - Wagle, Sudhakar S.; Steinbach, Thomas; Lawyer, Carl H.; Hermann, William J., Jr.; and Gawish, Ali A. S., 5,316,775, Cl. 424-553.000.
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  - Savage, Howard T.; Clark, Arthur E.; Wun-Fogle, Marilyn; Kabacoff, Lawrence T.; Hernando, Antonio; and Beihoff, Bruce, 5,315,881, Cl. 73-862.333.
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  - Olson, Allan G.; and Beehler, James O., 5,316,285, Cl. 271-122.000.
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  - Watson, Ralph T.; Packard, Barbara B.; and Stearns, Glenn, 5,317 688, Cl. 395-161.000.
  - Yetter, Jeffry D.; and Miller, Robert H., Jr., 5,317,204, Cl. 307-443.000.
  - Zimmer, Robert A.; and Moore, Charles E., 5,317,280, Cl. 330-261.000.
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  - Attalla, Anthony P., 5,315,804, Cl. 52-731.100.
- Hexcel Corporation: *See—*
  - Fell, Barry M., 5,316,604, Cl. 156-82.000.
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  - Kiryu, Naohiko; Yamamoto, Shinichi; Tomiki, Masatoshi; and Higami, Tatuhiko, 5,316,843, Cl. 428-323.000.
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- Hill, Steven L., to Larson Company, The. Artificial frond for use with artificial plants. 5,316,807, Cl. 428-17.000.
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- Hillis, W. Daniel; and Gerner, William, to Thinking Machines Corporation. Circuit board and insertion tool. 5,317,481, Cl. 361-796.000.
- Hilpert, Bernhard. Control system for a numerically controlled machine. 5,317,501, Cl. 364-132.000.
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  - Dandliker, Rene ; Schweizer, Edwin; Schad, Hanspeter; and Odoni, Walter, 5,317,147, Cl. 250-227.170.
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  - Okazaki, Sachiko; Kogoma, Masuhiro; and Hirakawa, Masahiro, 5,316,639, Cl. 204-192.120.
- Hiramatsu, Koji, to Takata Corporation. Seat belt retractor with springs connected in series and motorized spring force adjustment. 5,316,233, Cl. 242-107.000.
- Hirano, Kouji: *See—*
  - Kohyama, Mitsuaki; Kikuchi, Kazuhiko; Yoshida, Naruhito; Yoshida, Minoru; and Hirano, Kouji, 5,317,370, Cl. 355-245.000.
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- Hiraya, Akira: *See—*
  - Sagiyama, Masaru; Abe, Masaki; Hiraya, Akira; Inagaki, Junichi; and Morita, Masaya, 5,316,652, Cl. 205-177.000.
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- Hirose, Atsushi, to Matsushita Electric Industrial Co., Ltd. Learning machine. 5,316,485, Cl. 434-322.000.
- Hirose, Kazuhiko: *See—*
  - Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, 5,317,052, Cl. 524-413.000.
- Hirota, Isao, to Sony Corporation. Horizontally aligned image pickup for CCD image sensor. 5,317,408, Cl. 348-315.000.
- Hirota, Koji: *See—*
  - Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, 5,317,157, Cl. 250-352.000.
- Hirschi, Richard E.; Karbowski, James P.; Tiefenthal, James L.; and Isaac, Ronald M., to Abbott Laboratories. Tube placement verifier system. 5,316,024, Cl. 128-899.000.
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  - Maruyama, Shigeru; Shimasaki, Yuichi; Hisaki, Takashi; Kanehiro, Masaki; Baba, Shigeki; and Ishioka, Takuji, 5,317,268, Cl. 324-402.000.
- Hisazumi, Nobuyuki: *See—*
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- Histand, Ivan: *See—*
  - Mitchell, David N.; and Histand, Ivan, 5,316,325, Cl. 280-11.200.
- Hitachi Construction Machinery Co., Inc.: *See—*
  - Hirata, Toichi; and Sugiyama, Genroku, 5,315,826, Cl. 60-422.000.
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  - Ara, Mari; Sawamoto, Hideo; and Yamagata, Ryo, 5,317,710, Cl. 395-425.000.
  - Fujimori, Haruo; Matsui, Tetsuya; Ajiro, Taiko; Yokose, Kenji; and Izumi, Shigeru, 5,316,983, Cl. 437-250.000.
  - Fukuda, Hiroshi; and Terasawa, Tsuneo, 5,316,896, Cl. 430-322.000.
  - Hiraiwa, Masashi, 5,317,633, Cl. 379-230.000.
  - Hiraoka, Tooru; Nakamura, Kouji; and Shonai, Tohru, 5,317,703, Cl. 395-375.000.
  - Izawa, Satoshi; Watanabe, Masaya; and Kaneko, Seiji, 5,317,704, Cl. 395-400.000.
  - Kanamaru, Hisanobu; and Harada, Kouji, 5,315,926, Cl. 100-218.000.
  - Kato, Takahiko; Ikeda, Shinzo; Aono, Yasuhisa; Izumiya, Masakiyo; Nakata, Kiyotomo; Masaoka, Isao; and Takahashi, Heishichiro, 5,316,597, Cl. 148-327.000.
  - Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, 5,316,617, Cl. 156-643.000.
  - Kinoshita, . Iitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.
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  - Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.
  - Okamoto, Yukio; Aida, Toshiyuki; Miyauchi, Katsuki; Takagi, Kazumasa; Fukazawa, Tokuumi; and Takayama, Shinji, 5,316,585, Cl. 118-719.000.
  - Okawara, Hiroyuki; Kato, Makoto; Miyaoka, Shinichiro; Nohmi, Makoto; and Takizawa, Yuri, 5,317,678, Cl. 395-126.000.
  -Oouchi, Toshiya; Kuroda, Keiko; and Ido, Nobuhiko, 5,317,563, Cl. 370-17.000.
  - Sakai, Masanori; Ohnaka, Noriyuki; Izumiya, Masakiyo; and Hattori, Shigeo, 5,316,633, Cl. 204-153.110.
  - Shinagawa, Satoshi; Sato, Yoichi; Hasegawa, Masami; Shimono, Yasushi; Miyasaka, Masayuki; Tamura, Takatoshi; and Iioka, Yoshio, 5,317,537, Cl. 365-189.040.
  - Takeda, Yoshiaki; Miwano, Katuyosi; and Fujita, Noboru, 5,315,847, Cl. 68-12.020.
  - Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, 5,317,556, Cl. 369-112.000.
  - Tsuchida, Masashi; Ohmachi, Kazuhiko; Honma, Toshio; Imai, Yasuhiro; and Kawamura, Nobuo, 5,317,727, Cl. 395-600.000.
  - Yasutomi, Yoshiyuki; Nakamura, Kousuke; Kita, Hideki; and Sobue, Masahisa, 5,316,987, Cl. 501-97.000.
- Hitachi, Ltd: *See—*
  - Mochida, Tetsuya; Okazawa, Kouichi; Kimura, Kouichi; Kawaguchi, Hitoshi; and Kobayashi, Kazushi, 5,317,747, Cl. 395-725.000.
- Hitachi Maxell, Ltd.: *See—*
  - Kato, Yoshitake; Fukunaga, Kazuya; Katami, Akira; and Oda, Shinichiro, 5,317,467, Cl. 360-133.000.
- Hitachi Microcomputer Engineering, Ltd.: *See—*
  - Izawa, Satoshi; Watanabe, Masaya; and Kaneko, Seiji, 5,317,704, Cl. 395-400.000.
- Hitachi Mizusawa Electronics Co., Ltd.: *See—*
  - Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.
- Hitachi Software Engineering co., Ltd.: *See—*
  - Tsuchida, Masashi; Ohmachi, Kazuhiko; Honma, Toshio; Imai, Yasuhiro; and Kawamura, Nobuo, 5,317,727, Cl. 395-600.000.
- Hitachi VLSI Engineering Corp.: *See—*
  - Shinagawa, Satoshi; Sato, Yoichi; Hasegawa, Masami; Shimono, Yasushi; Miyasaka, Masayuki; Tamura, Takatoshi; and Iioka, Yoshio, 5,317,537, Cl. 365-189.040.
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  - Kwan, Sze-Hon; Hshieh, Fwu-Iuan; Chang, Mike F.; Ho, Yueh-Se; and Owyang, King, 5,316,959, Cl. 437-40.000.
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  - Batchelder, John S.; Gross, Vaughn P.; Gruver, Robert A.; Hobbs, Philip C. D.; and Murray, Kenneth D., 5,316,970, Cl. 437-173.000.
- Hochberg, Eric B.; and Baroth, Edmund C., to California Institute of Technology. Method and apparatus for white-light dispersed-fringe interferometric measurement of corneal topography. 5,317,389, Cl. 356-382.000.
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  - Luder, Ernst; and Hochholzer, Volker, 5,316,893, Cl. 430-313.000.
- Hodgdon, Marion Y.; and Oona, Henn. Refuse collector with hinged collection tray for use with a trash bag. 5,316,060, Cl. 141-390.000.
- Hodgins, K. Bruce: *See—*
  - Hill, Philip G.; and Hodgins, K. Bruce, 5,315,973, Cl. 123-304.000.
- Hodson, Lester L.: *See—*
  - Masten, Billy R.; and Hodson, Lester L., 5,317,523, Cl. 364-525.000.
- Hoeberigs, Jean M. M.: *See—*
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  - Aretz, Werner; Ehlers, Eberhard; and Hedtmann, Udo, 5,316,929, Cl. 435-146.000.
  - Crause, Peter; Habermann, Paul; Tripier, Dominique; Ulmer, Wolfgang; and Schmid, Gerhard, 5,316,947, Cl. 435-320.100.
  - Hammer, Klaus-Dieter; and Siebrecht, Manfred, 5,316,809, Cl. 428-348.000.
  - Krone, Volker; and Walch, Axel, 5,317,065, Cl. 525-420.000.
- Hoechst Celanese Corporation: *See*—
  - McNair, Samuel S., Jr.; and Gault, David M., 5,316,705, Cl. 264-5.000.
- Hoechst Japan Limited: *See*—
  - Inazu, Mizuho; Satoh, Ryoichi; Inoue, Tsutomu; Kitagawa, Hiroshi; Katoh, Masakazu; Englert, Heinrich; Carniato, Denis; and Lang, Hans-Jochen, 5,317,029, Cl. 514-422.000.
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  - Misselbrook, John; McKinney, Larry J.; Lefiles, James H.; Hoff, Edwin F., Jr.; and Bergman, Elliot, 5,317,004, Cl. 504-116.000.
- Hoffman, Charles R.; and Mullen, John M., to International Business Machines Corporation. Substrate noise coupling reduction for VLSI applications with mixed analog and digital circuitry. 5,317,183, Cl. 257-369.000.
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- Hoffman, Robert A.: *See*—
  - Pinsky, Bertram G.; and Hoffman, Robert A., 5,317,162, Cl. 250-461.200.
- Hofte, Hermanus F. P.: *See*—
  - De Greve, Henri M. J.; Salgado, Maria B. L. F.; Van Montagu, Marc C. E.; Vaeck, Mark A.; Zabeau, Marcus F. O.; Leemans, Jan J. A.; and Hofte, Hermanus F. P., 5,317,096, Cl. 536-23.710.
- Hogle, David J.: *See*—
  - Herbert, William G.; Hogle, David J.; Grammatica, Steven J.; Schmitt, Peter J.; Jansen, Ronald E.; and Thomas, Mark S., 5,316,651, Cl. 205-67.000.
- Hoker, Jon J. Band for dancing and exercising. 5,316,533, Cl. 482-121.000.
- Holmes, Timothy: *See*—
  - Swerdloff, Stuart; Mackie, Thomas R.; and Holmes, Timothy, 5,317,616, Cl. 378-65.000.
- Holmes, William B.: *See*—
  - Danner, Harold J., Jr.; Holmes, William B.; and Barron, Wesley, 5,316,171, Cl. 220-423.000.
- Holst, Dietmar: *See*—
  - Orth, Helmut; Horrer, Joachim; and Holst, Dietmar, 5,316,729, Cl. 422-73.000.
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  - Schaper, Ulrich; and Holzapfl, Birgit, 5,317,176, Cl. 257-287.000.
- Homan, James G.: *See*—
  - Stout, George M.; Homan, James G.; Mlinar, John R.; and Wright, Larry R., 5,316,812, Cl. 428-64.000.
- Homayoun, Habib: *See*—
  - Mills, Gary N.; and Homayoun, Habib, 5,317,269, Cl. 324-427.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See*—
  - Koyama, Hideo; and Takemasa, Nobuo, 5,315,898, Cl. 475-330.000.
  - Maruyama, Shigeru; Shimasaki, Yuichi; Hisaki, Takashi; Kanehiro, Masaki; Baba, Shigeki; and Ishioka, Takuji, 5,317,268, Cl. 324-402.000.
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- Honeycutt, Travis W., to Isolyser Company, Inc. Aldehyde treatment system. 5,317,071, Cl. 527-305.000.
- Honeywell Inc.: *See*—
  - Geddes, John J., 5,317,286, Cl. 331-56.000.
  - Haviland, Jeffrey S.; Krahn, Donald R.; and Schneider, Robert W., 5,317,251, Cl. 324-102.000.
  - Patty, Evelyn J.; and Garza, Jose A. Q., 5,317,331, Cl. 345-16.000.
  - Sturm, Patricia K.; Ybarra, Kathryn W.; and Motisher, Lewis R., 5,317,316, Cl. 342-30.000.
- Honma, Masao: *See*—
  - Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.
- Honma, Toshio: *See*—
  - Tsuchida, Masashi; Ohmachi, Kazuhiko; Honma, Toshio; Imai, Yasuhiro; and Kawamura, Nobuo, 5,317,727, Cl. 395-600.000.
- Honsho, Hironori; and Saito, Fuminari, to Matsushita Electric Industrial Co., Ltd. Tape cassette for cassette recording/reproducing apparatus. 5,316,234, Cl. 242-198.000.
- Hooper, Joseph. Battery booster cable storage system. 5,316,498, Cl. 439-501.000.
- Hooper, Robert W.: *See*—
  - Kennedy, Joseph P.; Roller, Christopher D.; and Hooper, Robert W., 5,317,323, Cl. 342-457.000.
- Hopeck, James F., to General Electric Company. Electrostatic powder coating method for insulating the series loop connections of a dynamoelectric machine. 5,316,801, Cl. 427-486.000.
- Hopewell, Richard B., to Process System International, Inc. Process for the recovery of a light hydrocarbon fraction from marine loading operations. 5,315,832, Cl. 62-20.000.
- Hopmann, Mark E.: *See*—
  - Murray, Douglas J.; Coon, Robert J.; Hopmann, Mark E.; Williams, Ronald D.; Jennings, Steve; and Tips, Timothy R., 5,316,084, Cl. 166-332.000.
- Hore, Donald G., deceased (by Hore, Margaret H., executor); Longworth, Norman J.; McCarthy, David; and Pullum, Lionel, to ABB Mineral Slurry Transportation Pty. Ltd. Valve porting for rotating barrel ram pump. 5,316,451, Cl. 417-392.000.
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- Horenstein, Mark: *See*—
  - Jackson, Andrew C.; and Horenstein, Mark, 5,316,002, Cl. 128-601.000.
- Horikoshi, Michio: *See*—
  - Kubo, Tadayuki; Watanabe, Kazuo; and Horikoshi, Michio, 5,317,221, Cl. 310-12.000.
- Horiuchi, Kunio: *See*—
  - Kijima, Toshihiko; Horiuchi, Kunio; and Oshiyama, Hiroyuki, 5,316,440, Cl. 415-206.000.
- Hormec Technic SA: *See*—
  - Reich, Leon, 5,316,196, Cl. 222-160.000.
- Horn, Billy L. Device for holding cylindrical socket heads. 5,316,143, Cl. 206-378.000.
- Horn, Jennifer L.: *See*—
  - Norris, Harry; and Horn, Jennifer L., 5,317,150, Cl. 250-252.100.
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  - Patterson, Donald E.; Hauge, Robert H.; Chu, C. Judith; and Margrave, John L., 5,316,795, Cl. 427-249.000.
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  - Suzuki, Hisanori; and Matsudaira, Takeo, 5,316,844, Cl. 428-323.000.

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- Huang, Henry I.: *See*—
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  - Vinn, Charles L.; and Huang, Yihe, 5,317,281, Cl. 330-265.000.
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  - Smith, Walter J.; and Fulbright, David J., 5,315,755, Cl. 29-715.000.
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  - Dolan, Charles P.; Keirsey, David M.; and Reiser, Kurt, 5,317,677, Cl. 395-77.000.
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  - Gregor, Eduard, 5,317,585, Cl. 372-35.000.
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  - Quon, William; and Tanzer, Herbert J., 5,316,075, Cl. 165-80.400.
  - Siebert, Edward T., 5,317,582, Cl. 372-38.000.
  - Sobhani, Mohi, 5,317,478, Cl. 361-689.000.
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  - Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
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  - Richmond, Allan, 5,315,954, Cl. 116-67.00R.
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  - Goode, John E.; Hoyle, Michael D.; and Lance, Raymond E., 5,315,831, Cl. 62-7.000.
- Hydrel AG: *See*—
  - Gehring, Rudolf, 5,316,394, Cl. 384-574.000.
- Hyman, Greg; Reiner, Lawrence; Caveza, Martin J.; and Newbold, Roger A., to Mattel, Inc. Waist attaching hobby horse. 5,316,515, Cl. 446-28.000.
- Hynecek, Jaroslav, to Texas Instruments Incorporated. Bulk charge modulated device photocell. 5,317,174, Cl. 257-222.000.
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  - Otsuka, Takayuki; Osanai, Akinori; Itoh, Takaaki; Hyodo, Yoshihiko; and Kidokoro, Toru, 5,315,980, Cl. 123-520.000.
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  - Couch, Richard W., Jr.; Sanders, Nicholas A.; Luo, Lifeng; Sobr, John; and Backander, Patrik, 5,317,126, Cl. 219-121.510.
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  - Bruening, Ronald L., 5,316,679, Cl. 210-634.000.
- Ichikawa, Kouji, to Fuji Photo Film Co., Ltd. Image processing apparatus and method for allowing the dynamic range of digital image data having a wide dynamic range to be compressed while preserving information of the digital image data. 5,317,427, Cl. 358-520.000.
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  - Itoh, Toshio, 5,316,996, Cl. 502-238.000.
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Iida, Yasuo: *See—*
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Iioka, Yoshio: *See—*
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Iizuka, Katsuhiko: *See—*
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  Kuwana, Shoji; Kiyosawa, Yoshihide; and Ikeda, Akio, 5,316,090, Cl. 175-24.000.
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Ikuta, Isao: *See—*
  Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, 5,317,556, Cl. 369-112.000.
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Imai, Kumiko, to Furukawa Electric Co., Ltd., The. Method of manufacturing bismuth type oxide superconductor. 5,317,008, Cl. 505-100.000.
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Imamura, Kazuhiko: *See—*
  Nakajima, Yukio; Imamura, Kazuhiko; Karatsu, Ryozo; Nishizaki, Sumio; and Kobayashi, Makoto, 5,316,831, Cl. 428-209.000.
Imgrut, Peter: *See—*
  Koch, Max; and Imgrut, Peter, 5,315,757, Cl. 29-754.000.
Imken, Ronald L.: *See—*
  Frankeny, Richard F.; and Imken, Ronald L., 5,316,787, Cl. 427-97.000.
Immobiliare Centro Nord S.p.A.: *See—*
  Silvestri, Silvestro, 5,316,461, Cl. 425-111.000.
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  Cerretti, Douglas P.; Cosman, David J.; Dower, Steven K.; March, Carl J.; Urdal, David L.; and Larsen, Alf D., 5,317,087, Cl. 530-350.000.
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  Noakes, Timothey J.; Pavey, Ian D.; and Jeffs, Christopher S., 5,316,800, Cl. 427-466.000.
  Oldfield, John; and Tucker, Howard, 5,317,101, Cl. 540-488.000.
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  Chalupka, Alfred; Lammer, Gertraud; Stengl, Gerhard; Wolf, Peter; and Fegerl, Johannes, 5,317,161, Cl. 250-423.00R.
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  Skinner, Andrew C.; and Imthurn, James A., 5,316,071, Cl. 164-155.100.
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  Nishijima, Kazuyoshi; and Inaba, Kazuo, 5,316,822, Cl. 428-138.000.
Inagaki, Junichi: *See—*
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Industri AB Thule: *See—*
  Ng, Daniel, 5,316,192, Cl. 224-324.000.
Industria de Turbo Propulsores S.A.: *See—*
  Tubbs, Henry, 5,316,438, Cl. 415-118.000.
Industrial Acoustics Company, Inc.: *See—*
  Duda, John, 5,317,113, Cl. 181-285.000.
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  Wu, Neng-Wei, 5,317,178, Cl. 257-314.000.
Industrias Romi S/A: *See—*
  Romi, Giordano, 5,316,417, Cl. 408-153.000.
Infectech, Inc.: *See—*
  Ollar, Robert A., 5,316,918, Cl. 435-34.000.
Ing. Erich Pfeiffer GmbH & Co. KG: *See—*
  Fuchs, Karl-Heinz; and Graf, Lothar, 5,316,198, Cl. 222-321.000.
Ing. H.C.F. Porsche AG: *See—*
  Jacobi, Stefan; and Berkefeld, Volker, 5,315,868, Cl. 73-178.00R.
Ingalls, William E., to O'Rourke, Thomas W.; and O'Rourke, John E. Method and structure for correcting alignment of kingpin axle assemblies. 5,316,332, Cl. 280-661.000.
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Ingre, Lars; Axling, Svante; and Johansson, Per-Ove, to Joing Invest AB. Star data network with logical ring function preferably using token access. 5,317,560, Cl. 370-16.000.
Innis, Charles L., Jr., to Morgan Construction Company. Coolant guard for rolling mill oil film bearing assembly. 5,316,392, Cl. 384-147.000.
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  Blum, Ronald D.; Gupta, Amitava; and Bennington, Steve, 5,316,702, Cl. 264-1.700.
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Inobe, Hiroyuki: *See—*
  Fukube, Noriaki; Kurihara, Katsumi; Takano, Satoshi; Tanabe, Hiroshi; Fujiwara, Hiroshi; Bannai, Kazunori; and Inobe, Hiroyuki, 5,316,282, Cl. 271-10.000.
Inoguchi, Toshio: *See—*
  Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 5,316,858, Cl. 428-457.000.
Inomata, Hiroshi: *See—*
  Sato, Shinichi; Oohasi, Morio; and Inomata, Hiroshi, 5,316,716, Cl. 264-338.000.
Inoue, Atsuo, to Sanden Corporation. Control apparatus for use in automotive air conditioning system. 5,315,841, Cl. 62-228.300.
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Inoue, Hiroshi: *See—*
  Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,317,332, Cl. 345-101.000.
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Inoue, Isao. Apparatus for calculating a repair cost of a damaged car. 5,317,503, Cl. 364-400.000.
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  Perry, Alan; Newman, Roger K.; and Kruk, Robert R., 5,317,654, Cl. 382-61.000.
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  Lacruche, Bernard; Cathignol, Dominique; and Lacoste, Francois, 5,315,986, Cl. 69-4.000.
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  Allemand, Charly D., 5,317,380, Cl. 356-338.000.
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  Collin, Jean-Claude; Larue, Joseph; Rojey, Alexandre; and Viltard, Jean-Charles, 5,316,628, Cl. 203-72.000.
  Morin, Pierre; Bardin, Christian; and Boulet, Jean, 5,316,093, Cl. 175-74.000.

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  Chapelon, Jean-Yves; Cathignol, Dominique; and Blanc, Emmanuel, 5,316,000, Cl. 128-660.030.
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  Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; Dejean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,317,090, Cl. 530-387.100.
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  Ong, Estela T.; and Hrdina, Kenneth E., 5,316,555, Cl. 29-623.100.
Instromedix, Inc.: *See—*
  Mills, Gary N.; and Homayoun, Habib, 5,317,269, Cl. 324-427.000.
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  Burch, Daniel E., 5,316,181, Cl. 222-61.000.
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  Bourekas, Philip A.; Mor, Yeshayahu; and Revak, Scott, 5,317,711, Cl. 395-425.000.
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  Chen, Ling; Lin, Tien-ler; and Wu, Albert, 5,317,179, Cl. 257-321.000.
Intel Corporation: *See—*
  Nugent, Steven F., 5,317,564, Cl. 370-17.000.
  Peek, Greg A.; and Cedros, Craig D., 5,317,712, Cl. 395-425.000.
  Talreja, Sanjay S.; Mills, Duane; Javanifard, Jahanshir J.; and Sambandan, Sachidanandan, 5,317,535, Cl. 365-185.000.
  Thomas, Laurence C., Jr., 5,317,307, Cl. 340-815.450.
  Waizman, Alexander, 5,317,202, Cl. 307-269.000.
  Wickersheim, Robert; and Amini, Hamed H., 5,317,750, Cl. 395-725.000.
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  Abraham, Robert L.; and Osisek, Vincent J., 5,317,306, Cl. 345-118.000.
  Ashton, James L.; and Karlsson, Keith E., 5,317,692, Cl. 395-200.000.
  Austvold, Shawn M.; Bigus, Joseph P.; Henckel, Jonathan D.; and Hospers, Paul A., 5,317,676, Cl. 395-26.000.
  Bale, Richard E.; Banks, Jon M.; Clearman, Melvin R., Jr.; Colson, James C.; Crisp, James M.; Loose, David C.; and Varan, James E., 5,316,281, Cl. 270-58.000.
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  Celi, Joseph, Jr., 5,317,695, Cl. 395-275.000.
  Chan, Yuen H., 5,317,541, Cl. 365-230.060.
  Copel, Matthew W.; and Tromp, Rudolf M., 5,316,615, Cl. 117-95.000.
  Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
  Dahlen, Dennis J., 5,317,749, Cl. 395-725.000.
  Dias, Daniel M.; Goyal, Ambuj; and Parr, Francis N., 5,317,731, Cl. 395-600.000.
  Dibble, Eric P.; Hanakovic, Steven L.; Markovich, Voya R.; Niedrich, Daniel S.; Vlasak, Gary P.; Zarr, Richard S.; and Senger, Richard C., 5,316,788, Cl. 427-98.000.
  Dorsey, William I.; Masten, John J., Jr., deceased; Schroedl, Richard M.; and Will, Donald G., 5,317,338, Cl. 346-1.100.
  East, Don G.; Felde, Steven L.; Hu, Paul Y.; and Robles, Guillermo S., 5,316,235, Cl. 242-199.000.
  Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., 5,317,739, Cl. 395-650.000.
  Evans, Wayne O., 5,317,722, Cl. 395-500.000.
  Fleischman, Aaron J.; Lustig, Naftali E.; and Schad, Robert G., 5,317,190, Cl. 257-743.000.
  Frankeny, Richard F.; and Imken, Ronald L., 5,316,787, Cl. 427-97.000.
  Gallo, Antonio R.; McDonough, James J.; Robbins, Gordon J.; and Shaw, Robert R., 5,317,657, Cl. 385-14.000.
  Gannon, Patrick M.; Gum, Peter H.; Hough, Roger E.; and Murray, Robert E., 5,317,705, Cl. 395-400.000.
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  Gillett, John B., 5,317,477, Cl. 361-683.000.
  Gofman, Emanuel, 5,317,528, Cl. 364-717.000.
  Hager, Dean J.; Resch, Robert P.; and Rose, Curtis G., 5,317,683, Cl. 395-145.000.
  Hammer, Robert, 5,315,751, Cl. 29-598.000.
  Hilgendorf, Rolf B., 5,317,696, Cl. 395-325.000.
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  Kakizaki, Yoshitaka; Kitahori, Hiroki; and Takada, Kazuhiko, 5,317,462, Cl. 360-97.020.
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  Liu, Lishing, 5,317,716, Cl. 395-425.000.
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  Medicke, John A.; and Posharow, Paul, 5,317,757, Cl. 395-800.000.
  Meyerson, Bernard S., 5,316,958, Cl. 437-31.000.
  Moore, Richard E.; Nix, Mary K.; and Shackelford, Floyd W., 5,317,730, Cl. 395-600.000.
  Mukherjee, Sujan K.; Ryan, James L.; and Wason, James R., 5,317,729, Cl. 395-600.000.
  Nenadic, Anton; Furman, Kenneth; and Pasco, Robert W., 5,315,749, Cl. 29-559.000.
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  Tevis, Gregory J.; and Waldo, Ellen J., 5,317,728, Cl. 395-600.000.
  Torres, Robert J., 5,317,687, Cl. 395-159.000.
  White, Russell T., Jr.; and Ruane, Robert E., 5,316,803, Cl. 427-554.000.
Intersonics Incorporated: *See—*
  Danley, Thomas J.; and Rey, Charles A., 5,317,642, Cl. 381-182.000.
Inui, Masahiro: *See—*
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Inuzuka, Takeshi: *See—*
  Kotani, Takayuki; and Inuzuka, Takeshi, 5,316,826, Cl. 428-172.000.
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  Pearson, David B., 5,316,108, Cl. 187-95.000.
Ioannides, Antonis C.; Wilson, James S.; and Patel, Ashok, to Oxford Glycosystems Limited. System for dispensing a known volume of fluid. 5,316,179, Cl. 222-56.000.
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  Ganzi, Gary C.; Wilkins, Frederick; Giuffrida, Anthony J.; and Griffin, Christopher, 5,316,637, Cl. 204-182.400.
Irie, Masahiro: *See—*
  Tsujioka, Tsuyoshi; Tatezono, Fumio; Matsuura, Koutaro; and Irie, Masahiro, 5,316,900, Cl. 430-495.000.
Irie, Tadashi: *See—*
  Nishitani, Yasuhiro; and Irie, Tadashi, 5,317,016, Cl. 514-210.000.
Iritani, Kunio: *See—*
  Isaji, Akira; Iritani, Kunio; and Suzuki, Nobunao, 5,316,074, Cl. 165-43.000.
Isaac, Ronald M.: *See—*
  Hirschi, Richard E.; Karbowski, James P.; Tiefenthal, James L.; and Isaac, Ronald M., 5,316,024, Cl. 128-899.000.
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Isenberg, John F., Jr.: *See—*
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  Teraoka, Eiichi; Kengaku, Toru; and Ishida, Hiroichi, 5,317,529, Cl. 364-724.100.
Ishida, Kozo: *See—*
  Nishibayashi, Toru; Ishizue, Yoshihiro; Ishida, Kozo; and Kubo, Masanori, 5,316,773, Cl. 424-499.000.
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  Tanaka, Toshifumi; Ohira, Yasuo; and Ishida, Toshihiko, 5,316,466, Cl. 425-422.000.
Ishihara, Managu: *See—*
  Kita, Isamu; Kobashi, Masayuki; Tabuchi, Susumu; Doi, Yoshiyuki; Nakamura, Noboru; Ishihara, Managu; Arioka, Koji; and Kayano, Isamu, 5,317,610, Cl. 376-414.000.
Ishii, Masami: *See—*
  Yagi, Wataru; Yamada, Masuo; Ishii, Masami; Makimura, Yukuo; Kurikuma, Tsutomu; and Akita, Norihiro, 5,316,068, Cl. 164-58.100.

Ishijima, Shizuo: *See—*
Matsushima, Hidetoshi; Noguchi, Yoshinori; and Ishijima, Shizuo, 5,316,125, Cl. 198-465.200.
Ishikawa Gasket Co., Ltd.: *See—*
Udagawa, Tsunekazu; and Ishikawa, Itsuo, 5,316,322, Cl. 277-235.00B.
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Ishikura, Takuro, to Sharp Kabushiki Kaisha. Motor control unit provided with anti-burning device. 5,317,244, Cl. 318-254.000.
Ishimura, Kazuhiko; Saito, Fumiaki; Yoshikawa, Masaaki; Okada, Misao; and Nakajima, Shinsuke, to Asahi Glass Company Ltd. Vacuum degassing method and its apparatus. 5,316,563, Cl. 65-32.500.
Ishioka, Takuji: *See—*
Maruyama, Shigeru; Shimasaki, Yuichi; Hisaki, Takashi; Kanehiro, Masaki; Baba, Shigeki; and Ishioka, Takuji, 5,317,268, Cl. 324-402.000.
Ishizue, Yoshihiro: *See—*
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ISM Technolog: *See—*
Treglio, James R., 5,317,235, Cl. 315-111.410.
Ismail, Mohammed: *See—*
Zarabadi, Seyed R.; and Ismail, Mohammed, 5,317,279, Cl. 330-253.000.
Isnardi, Michael A.: *See—*
Casavant, Scott D.; Hurst, Robert N., Jr.; Perlman, Stuart S.; Isnardi, Michael A.; and Aschwanden, Felix, 5,317,398, Cl. 348-570.000.
Isobe, Minoru, to OKI Electric Industry Co., Ltd. Read head incorporating an image pick-up function. 5,317,146, Cl. 250-208.100.
Isolyser Company, Inc.: *See—*
Honeycutt, Travis W., 5,317,071, Cl. 527-305.000.
ISP Investments Inc.: *See—*
Narayanan, Kolazi S., 5,317,042, Cl. 514-772.000.
Ito, Akira, to Sumitomo Wiring Systems, Ltd. Terminal for fixing wires. 5,316,506, Cl. 439-879.000.
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Seike, Shoji; Watanabe, Keiichiro; and Ito, Akira, 5,316,072, Cl. 165-9.000.
Ito, Akiyasu; Kimura, Munenori; Tsurumoto, Kazuo; and Nagasaka, Shouichi, to Mitsubishi Denki Kabushiki Kaisha. Discharge-processing electric power-source assembly. 5,317,122, Cl. 219-69.180.
Ito, Daigiro: *See—*
Imai, Hiroshi; and Ito, Daigiro, 5,315,827, Cl. 60-426.000.
Ito, Hiroshi, to Emhart Inc. Controller for a stud welding machine. 5,317,123, Cl. 219-98.000.
Ito, Ken-ichi: *See—*
Suzuki, Takane; Sugawara, Sakuo; Hamazaki, Nobuyoshi; Ito, Ken-ichi; Tsutsumi, Koichiro; and Sakai, Osamu, 5,316,214, Cl. 236-78.00B.
Ito, Koichi: *See—*
Fujii, Toshiro; Ito, Koichi; Murakami, Kazuo; and Iwama, Kazuaki, 5,316,447, Cl. 417-269.000.
Naito, Motoyuki; and Ito, Koichi, 5,317,324, Cl. 343-700.0MS.
Ito, Masaaki, to Ricoh Company, Ltd. White reference data generating unit applied to shading correction system. 5,317,421, Cl. 358-464.000.
Ito, Shuji: *See—*
Murai, Hiroyuki; Bito, Yasuhiko; Hasegawa, Masaki; Ito, Shuji; and Toyoguchi, Yoshinori, 5,316,875, Cl. 429-194.000.
Ito, Susumu: *See—*
Takigawa, Hirofumi; Kubota, Hiromi; and Ito, Susumu, 5,316,939, Cl. 435-252.100.
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Narita, Yuuki; Ito, Takero; and Ogasawara, Shuetsu, 5,316,746, Cl. 423-151.000.
Ito, Yasuo: *See—*
Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,317,267, Cl. 324-402.000.
Ito, Yasushi; and Nirasawa, Nobumasa, to Sumitomo Electric Industries, Ltd. Method and apparatus for manufacturing optical fiber cable. 5,315,813, Cl. 57-6.000.
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Nakai, Takeyuki; Murakami, Kazuyoshi; and Ito, Yoshiko, 5,316,825, Cl. 428-156.000.
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Tanaka, Shinya; and Ito, Yoshiyuki, 5,317,335, Cl. 345-163.000.
Itoh, Makoto: *See—*
Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, 5,317,157, Cl. 250-352.000.
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Otsuka, Takayuki; Osanai, Akinori; Itoh, Takaaki; Hyodo, Yoshihiko; and Kidokoro, Toru, 5,315,980, Cl. 123-520.000.
Itoh, Toshihide: *See—*
Takahashi, Hisaya; and Itoh, Toshihide, 5,316,894, Cl. 430-313.000.
Itoh, Toshio, to Idemitsu Kosan Co., Ltd. Compound oxide catalyst carrier, method of producing the same and method of treating heavy oil with the same. 5,316,996, Cl. 502-238.000.
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Oono, Masahiro; Itoh, Tsuyoshi; Hayashi, Katsuki; Kase, Toshiyuki; Sasaki, Masahiko; Yamamoto, Hiroshi; and Okuda, Isao, 5,317,144, Cl. 250-201.500.
ITT Corporation: *See—*
Gauger, Derek K.; Horvet, Kirk K.; and Chaban, Phillip, 5,316,258, Cl. 248-548.000.
Ivanenok, Joseph F., III: *See—*
Petrosky, Lyman J.; Ivanenok, Joseph F., III; and Carelli, Mario D., 5,317,611, Cl. 376-433.000.
Ivanoff, Mario J.: *See—*
Bixby, Joy P.; Eorgoff, Michael C.; Gagne, Bruce N.; Houser, Richard D.; Ivanoff, Mario J.; Osband, Daniel W.; Richardson, Darrel D.; and Skaates, Mary Z., 5,317,568, Cl. 370-85.600.
Ivanov, Oleg R.; Snegirev, Mikhail I.; Chistyakov, Makhail K.; Razhev, Vladimir M.; Budantsev, Vladimir I.; Kipriyanov, Jury I.; Zaitsev, Vikator A., deceased; by Zaitseva, Galina M., administrator; and by Zaitseva, Natalya V., administrator. Apparatus for producing granulated products. 5,316,735, Cl. 422-143.000.
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Iwaki, Hirofumi: *See—*
Iwase, Akira; Iwaki, Hirofumi; Kaneko, Toshikazu; Kubo, Isao; and Sato, Koichi, 5,316,557, Cl. 29-623.500.
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Fujii, Toshiro; Ito, Koichi; Murakami, Kazuo; and Iwama, Kazuaki, 5,316,447, Cl. 417-269.000.
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Iwano, Hideaki: *See—*
Mori, Katsumi; Asaka, Tatsuya; Iwano, Hideaki; and Kondo, Takayuki, 5,317,584, Cl. 372-46.000.
Iwasaki, Kazuhisa: *See—*
Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, 5,317,375, Cl. 356-5.000.
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Iyechika, Yasushi: *See—*
Nakano, Tsuyoshi; Doi, Shuji; Noguchi, Takanobu; Ohnishi, Toshihiro; and Iyechika, Yasushi, 5,317,169, Cl. 257-40.000.
Iyoda, Isao: *See—*
Taoka, Hisao; Iyoda, Isao; Noguchi, Hideo; Kojima, Yukio; Warashina, Shigeru; and Sato, Nobuyuki, 5,317,525, Cl. 364-578.000.
Iyoda, Motomi: *See—*
Ota, Toshiaki; Teguri, Yoshihiko; Muto, Masahito; Fujita, Koichi; and Iyoda, Motomi, 5,317,512, Cl. 364-424.050.
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Fujimori, Haruo; Matsui, Tetsuya; Ajiro, Taiko; Yokose, Kenji; and Izumi, Shigeru, 5,316,983, Cl. 437-250.000.
Izumiya, Masakiyo: *See—*
Kato, Takahiko; Ikeda, Shinzo; Aono, Yasuhisa; Izumiya, Masakiyo; Nakata, Kiyotomo; Masaoka, Isao; and Takahashi, Heishichiro, 5,316,597, Cl. 148-327.000.
Sakai, Masanori; Ohnaka, Noriyuki; Izumiya, Masakiyo; and Hattori, Shigeo, 5,316,633, Cl. 204-153.110.
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Sugita, Koji; and Izuwa, Yuji, 5,317,699, Cl. 395-325.000.
J. M. Huber Corporation: *See—*
Freeman, Gary M., 5,316,576, Cl. 106-483.000.
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., 5,317,044, Cl. 521-78.000.
J. M. Voith GmbH: *See—*
Begemann, Ulrich; and Scherb, Thoroe, 5,316,383, Cl. 366-160.000.
Ueberschar, Manfred; and Giuste, Sergio, 5,316,584, Cl. 118-712.000.
Jack, Torquil I. M.: *See—*
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Evans, Edwin R.; and Jeram, Edward M., 5,317,073, Cl. 528-42.000.
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Honda, Toshikazu, 5,317,154, Cl. 250-310.000.
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Hellmick, Mark; Johansson, Leif A.; and Weber, Otto, 5,317,619, Cl. 378-173.000.
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Jorgens, Klaus. Process and apparatus employing a stream of electrolytic liquid for examining the porosity of coated objects. 5,317,272, Cl. 324-558.000.
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  Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.
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Joulia, Gerard, to L'Oreal. Closure device for a container. 5,316,399, Cl. 401-127.000.
Jouppi, Norman P., to Digital Equipment Corporation. Data processing system and method with prefetch buffers. 5,317,718, Cl. 395-425.000.
Jovanovic, Victor. Two-part tool holding fixture. 5,316,323, Cl. 279-22.0
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  Clarke, John R.; Joye, Donald D.; Carlson, Neal A.; and Wechgelaer, Peter, 5,315,988, Cl. 128-204.230.
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Jurjevic, Ivan; Melamed, Kasriel; and Wendt, Joachim, to Siemens Aktiengesellschaft. Insertion module for a wire assembly device. 5,315,756, Cl. 29-748.000.
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  Rao, V. Durga N.; Kabat, Daniel M.; and Rose, Robert A., 5,315,970, Cl. 123-193.200.
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  Wang, Yading; Zhou, Stephen O.; and Richards, Thomas P., 5,316,704, Cl. 264-2.600.
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  Kotani, Takayuki; and Inuzuka, Takeshi, 5,316,826, Cl. 428-172.000.
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  Ahura, Tadashi; Nose, Takahiro; Umemoto, Shunichi; and Hayashi, Kenji, 5,316,536, Cl. 492-58.000.
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  Imai, Hiroshi; and Ito, Daigiro, 5,315,827, Cl. 60-426.000.
Kabushiki Kaisha Miyanaga: *See—*
  Miyanaga, Masaaki, 5,316,418, Cl. 408-201.000.
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  Sugiura, Kazuo, 5,316,201, Cl. 228-4.500.
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  Furuyama, Tohru, 5,317,540, Cl. 365-230.010.
  Ikehara, Tadashi, 5,317,675, Cl. 395-23.000.
  Imai, Toru; and Sirakawa, Kenji, 5,317,743, Cl. 395-700.000.
  Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, 5,317,167, Cl. 257-13.000.
  Kashima, Noriyasu; Suematsu, Mutsumi; Ohtani, Kazumi; and Atsumi, Koichiro, 5,317,242, Cl. 318-254.000.
  Kohyama, Mitsuaki; Kikuchi, Kazuhiko; Yoshida, Naruhito; Yoshida, Minoru; and Hirano, Kouji, 5,317,370, Cl. 355-245.000.
  Kunishima, Iwao; and Suguro, Kyoichi, 5,316,977, Cl. 437-200.000.
  Mino, Yoshihito, 5,316,263, Cl. 251-129.050.
  Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, 5,316,472, Cl. 432-241.000.
  Ochiai, Tamiya, 5,317,570, Cl. 370-94.100.
  Ochii, Kiyofumi, 5,317,532, Cl. 365-149.000.
  Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,317,397, Cl. 348-416.000.
  Sako, Shigeki, 5,317,194, Cl. 257-777.000.
  Satou, Youji; Sasaki, Katumaru; Hosoya, Ryo; Kaji, Koichi; and Inoue, Kanji, 5,316,491, Cl. 439-159.000.
  Shimuzu, Noriaki, 5,317,748, Cl. 395-725.000.
  Takashi, Kunugi, 5,315,789, Cl. 51-165.710.
  Takayanagi, Toshinari, 5,317,201, Cl. 307-296.100.
  Yamada, Yutaka; and Murase, Satoru, 5,317,007, Cl. 505-121.000.
  Yamasaki, Hideo, 5,317,552, Cl. 369-44.140.
  Yoshimura, Yumiko; Hirakawa, Hideki; Asahioka, Yoshimi; and Kimura, Mariko, 5,317,510, Cl. 364-419.080.
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  Fujii, Toshiro; Ito, Koichi; Murakami, Kazuo; and Iwama, Kazuaki, 5,316,447, Cl. 417-269.000.
  Kimura, Kazuya; and Kayukawa, Hiroaki, 5,316,446, Cl. 417-269.000.
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  Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Oda, Tomio, 5,317,032, Cl. 514-530.000.
Kachlic, Jerry D.; and Seong, AuYong C., to Molex Incorporated. Surface mount electrical connector. 5,316,489, Cl. 439-79.000.
Kachlic, Jerry D.: *See—*
  Gardner, Michael J.; Kachlic, Jerry D.; and O'Brien, Paul M., 5,316,488, Cl. 439-79.000.
Kadee Quality Products Co.: *See—*
  Dunham, Michael N.; and Edwards, Lawrence D., 5,316,158, Cl. 213-75.0TC.
Kahen, Keith B., to Eastman Kodak Company. Ridge waveguide distributed-feedback laser diode with a depressed-index cladding layer. 5,317,588, Cl. 372-96.000.
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  Cordes, Hans; Krumm, Helmut; Schwartz, Ludwig; Kahn, Ilan; Cornils, Gerd; and Behrend, Ulrich, 5,316,829, Cl. 428-192.000.
Kaido Manufacturing Co., Ltd.: *See—*
  Kaito, Masao, 5,316,226, Cl. 242-56.100.
Kaifu, Noriyuki: *See—*
  Kobayashi, Isao; Kaifu, Noriyuki; Saika, Toshihiro; and Endo, Tadao, 5,317,406, Cl. 348-307.000.
Kaiju, Yoshihiko: *See—*
  Koshi, Makoto; and Kaiju, Yoshihiko, 5,317,366, Cl. 355-202.000.
Kaito, Masao, to Kaido Manufacturing Co., Ltd. Apparatus for winding a film condensor element material. 5,316,226, Cl. 242-56.100.
Kaji, Akira. Method of producing 2 KD to 10KD peptides having no L-methionine residue. 5,316,919, Cl. 435-69.100.
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  Satou, Youji; Sasaki, Katumaru; Hosoya, Ryo; Kaji, Koichi; and Inoue, Kanji, 5,316,491, Cl. 439-159.000.
Kakizaki, Yoshitaka; Kitahori, Hiroki; and Takada, Kazuhiko, to International Business Machines Corporation. Cover seal for magnetic disk enclosure having stepped mating surfaces. 5,317,462, Cl. 360-97.020.
Kako, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Electronic control apparatus for an internal combustion engine. 5,315,979, Cl. 123-478.000.
Kallies, Guenter; and Lessat-Kaupat, Wolfgang, to Deutsche Aerospace Airbus GmbH. Aircraft door lifting and door hinge swivelling mechanism. 5,316,241, Cl. 244-129.500.
Kalvoda, Jaroslav; Kessler, Martin; Lattmann, Rene; and Ramos, Gerardo, to Ciba-Geigy Corp. Process for the preparation of optically active acyloxyazetidinones. 5,317,100, Cl. 540-357.000.
Kamin, Hartmut: *See—*
  Wieschemann, Siegfried; Baitz, Gunter; and Kamin, Hartmut, 5,316,107, Cl. 186-61.000.
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A., *Jr.*; Washecheck, Don M.; and Barr, Mark K., to Amoco Corporation. Hydrocarbon conversion catalyst. 5,316,995, Cl. 502-226.000.

Kamiyama, Yosuhiro: *See—*
  Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.
Kamo, Midori: *See—*
  Yoneda, Tadahiro; Nakahara, Saburo; Takeda, Mitsuo; and Kamo, Midori, 5,316,714, Cl. 264-210.600.
Kamon, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Projection exposure apparatus. 5,317,450, Cl. 359-566.000.
Kanachine, Serguei P.: *See—*
  Morozov, Victor A.; Kanachine, Serguei P.; Krasnochtchekov, Iouri I.; Makienko, Alexandre I.; Matveev, Valentine A.; Khriachtchev, Valeri G.; and Tan, Poi-Sik, 5,315,843, Cl. 62-309.000.
Kanai, Chiaki: *See—*
  Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,841, Cl. 428-319.100.
  Toyoda, Takashi; Hosono, Yasuji; Funato, Takashi; Miyaji, Takashi; Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,777, Cl. 426-87.000.
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  Fukuhara, Toru; Sosa, Toshio; Hara, Masaharu; Kanai, Hachiro; and Yokonuma, Norikazu, 5,317,361, Cl. 354-415.000.
Kanamaru, Hisanobu; and Harada, Kouji, to Hitachi, Ltd. High efficiency, swash plate mechanical press. 5,315,926, Cl. 100-218.000.
Kanao, Shiro. Pressure-resistant helical corrugated pipe. 5,316,047, Cl. 138-173.000.
Kanda, Hitoshi; Kato, Masayoshi; Mitsumura, Satoshi; Yamada, Yusuke; and Goseki, Yasuhide, to Canon Kabushiki Kaisha. Collision type gas current pulverizer and method for pulverizing powders. 5,316,222, Cl. 241-5.000.
Kanda, Kazunori: *See—*
  Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.
Kanda, Yasushi, to Koito Industries, Ltd. Seat arm rest capable of housing television receiver therein. 5,316,369, Cl. 297-194.000.
Kanehiro, Masaki: *See—*
  Maruyama, Shigeru; Shimasaki, Yuichi; Hisaki, Takashi; Kanehiro, Masaki; Baba, Shigeki; and Ishioka, Takuji, 5,317,268, Cl. 324-402.000.
Kaneko, Satoru: *See—*
  Harashige, Masahiro; Kawamura, Tsutomu; Kaneko, Satoru; Inoue, Takashi; Tokutake, Atsuo; and Yoshikawa, Toshitsune, 5,317,051, Cl. 524-310.000.
Kaneko, Seiji: *See—*
  Izawa, Satoshi; Watanabe, Masaya; and Kaneko, Seiji, 5,317,704, Cl. 395-400.000.
Kaneko, Toshikazu: *See—*
  Iwase, Akira; Iwaki, Hirofumi; Kaneko, Toshikazu; Kubo, Isao; and Sato, Koichi, 5,316,557, Cl. 29-623.500.
Kaneno, Nobuaki; Kizuki, Hirotaka; Hayafuji, Norio; Shiba, Tetsuo; and Tada, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Method for producing semiconductor device. 5,316,967, Cl. 437-105.000.
Kaneshige, Toshihiko: *See—*
  Yamamura, Takashi; Hamazaki, Yoshihisa; Kaneshige, Toshihiko; Nanba, Makoto; and Kubota, Yukitoshi, 5,316,571, Cl. 106-692.000.
Kangok, Lee, to Samsung Electron Devices Co., Ltd. Method for making a silicon field emission device. 5,316,511, Cl. 445-24.000.
Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, to Canon Kabushiki Kaisha. Driving apparatus for an electrode matrix suitable for a liquid crystal panel. 5,317,332, Cl. 345-101.000.
Kansakoski, Antti, to Nokia Mobile Phones Ltd. Coarse tuning of the channel frequency. 5,317,600, Cl. 375-97.000.
Kanzaki Paper Mfg. Co., Ltd.: *See—*
  Kitao, Osamu; Tsuji, Masaru; Okuda, Masatoshi; Uchimura, Shunichi; and Tanaka, Jun-ichirou, 5,316,621, Cl. 162-4.000.
Kao, Chang Y.; Kuruts, James P.; and Kodukula, Sivarama K., to International Business Machines Corporation. Performance enhancement for ANSI X3.92 data encryption algorithm standard. 5,317,638, Cl. 380-29.000.
Kao Corporation: *See—*
  Sasaki, Mitsuhiro; and Kawabe, Kuniyasu, 5,316,885, Cl. 430-200.000.
  Sone, Taeko; Tosaka, Masaki; Saeki, Katsuhisa; Ara, Katsutoshi; Deguchi, Katsuhiko; and Igarashi, Kazuaki, 5,316,691, Cl. 252-174.120.
  Takigawa, Hirofumi; Kubota, Hiromi; and Ito, Susumu, 5,316,939, Cl. 435-252.100.
Kao, Sun-Chueh: *See—*
  Brady, Robert C., III; Karol, Frederick J.; Lynn, Timothy R.; Jorgensen, Robert J.; Kao, Sun-Chueh; and Wasserman, Eric P., 5,317,036, Cl. 523-223.000.
Karabed, Raznik; Nemazie, Siamack; and Sardariani, Edmond. Game controller capable of storing and executing stored sequences of user playing button settings. 5,317,505, Cl. 364-410.000.
Karatsu, Ryozo: *See—*
  Nakajima, Yukio; Imamura, Kazuhiko; Karatsu, Ryozo; Nishizaki, Sumio; and Kobayashi, Makoto, 5,316,831, Cl. 428-209.000.
Karavadra, Jiva R., to Bristol-Myers Squibb Company. Method and apparatus for shaping antiperspirant sticks and similar products. 5,315,905, Cl. 83-13.000.
Karbowski, James P.: *See—*
  Hirschi, Richard E.; Karbowski, James P.; Tiefenthal, James L.; and Isaac, Ronald M., 5,316,024, Cl. 128-899.000.
Karhunen, Pentti; and Andersson, Henry, to Vaisala Oy. Method and device for measurement of the velocity of a moving target by making use of the Doppler shift of electromagnetic radiation. 5,317,315, Cl. 342-26.000.
Kariya, Takao: *See—*
  Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; Uzawa, Shunichi; and Hasegawa, Takayuki, 5,317,615, Cl. 378-34.000.
Karl Folkers Foundation for Biomedical and Clinical Research: *See—*
  Folkers, Karl A.; Langsjoen, Per H.; and Willis, Richard A., 5,316,765, Cl. 424-94.100.
Karl Rafeld KG Spritzgusswerk, Elektronik und Formenbau: *See—*
  Rafeld, Karl, 5,316,349, Cl. 285-156.000.
Karlsson, Keith E.: *See—*
  Ashton, James L.; and Karlsson, Keith E., 5,317,692, Cl. 395-200.000.
Karol, Frederick J.: *See—*
  Brady, Robert C., III; Karol, Frederick J.; Lynn, Timothy R.; Jorgensen, Robert J.; Kao, Sun-Chueh; and Wasserman, Eric P., 5,317,036, Cl. 523-223.000.
Karp, Arthur: *See—*
  Lien, Erling; and Karp, Arthur, 5,317,233, Cl. 315-5.370.
Karshmer, David: *See—*
  Mathewson, Wilfred F.; Bringham, Richard L.; Ritger, Philip L.; and Karshmer, David, 5,316,724, Cl. 422-48.000.
Kasanuki, Yuji: *See—*
  Takamatsu, Osamu; Hirai, Yutaka; Nakayama, Masaru; Yagi, Takayuki; Kasanuki, Yuji; and Shimada, Yasuhiro, 5,317,152, Cl. 250-306.000.
Kasazumi, Kenishi; Kato, Makoto; and Kobayashi, Ikunori, to Matsushita Electric Industrial Co., Ltd. Holographic recording apparatus having a liquid crystal modulator including a diffuser with plural phase shift regions. 5,317,435, Cl. 359-69.000.
Kase, Toshiyuki: *See—*
  Oono, Masahiro; Itoh, Tsuyoshi; Hayashi, Katsuki; Kase, Toshiyuki; Sasaki, Masahiko; Yamamoto, Hiroshi; and Okuda, Isao, 5,317,144, Cl. 250-201.500.
Kashida, Motokazu: *See—*
  Satake, Yoshifumi; Watanabe, Ikuo; Kashida, Motokazu; and Shikakura, Akihiro, 5,317,399, Cl. 348-571.000.
Kashihara, Reiichiro: *See—*
  Watanabe, Kazumi; and Kashihara, Reiichiro, 5,316,420, Cl. 409-190.000.
Kashima, Noriyasu; Suematsu, Mutsumi; Ohtani, Kazumi; and Atsumi, Koichiro, to Kabushiki Kaisha Toshiba. Motor-driving circuit and wire-bonding apparatus. 5,317,242, Cl. 318-254.000.
Kassebaum, James W.; and Berk, Howard C., to Monsanto Company. Herbicidal compositions comprising glyphosate salts and alkoxylated quaternary amine surfactants. 5,317,003, Cl. 504-116.000.
Kasseck, Klaus, to Loesche GmbH. Process and apparatus for the treatment of moist gas-dust mixtures. 5,315,940, Cl. 110-345.000.
Kasser, Jurgen, to Blaupunkt-Werke GmbH. Method and apparatus for analog/digital conversion. 5,317,313, Cl. 341-163.000.
Kast, Howard B., to General Electric Company. Fixed cam variable delivery vane pump. 5,316,450, Cl. 417-295.000.
Kasten, Arne; and Laukien, Gunter, to Bruker Analytische Messtechnik GmbH. Process for generating a pulse sequence. 5,317,260, Cl. 324-309.000.
Katakura, Kazunori, to Canon Kabushiki Kaisha. Display apparatus with pixels having subpixel regions. 5,317,437, Cl. 359-87.000.
Katami, Akira: *See—*
  Kato, Yoshitake; Fukunaga, Kazuya; Katami, Akira; and Oda, Shinichiro, 5,317,467, Cl. 360-133.000.
Kataoka, Hideaki: *See—*
  Zander, Dennis R.; and Kataoka, Hideaki, 5,317,355, Cl. 354-277.000.
Kataoka, Yoshihiro, to Kawasaki Steel Corporation. Roll shell material and centrifugal cast composite roll. 5,316,596, Cl. 148-321.000.
Katayama, Keiichi; Kato, Mitsuo; Tsurusaki, Kazuya; Hanamoto, Mikio; Mihara, Kazumasa; and Eguchi, Takatoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Induction heating apparatus having openable and closable coil. 5,317,121, Cl. 219-672.000.
Katayama, Masato: *See—*
  Isaka, Kazuo; Mouri, Akihiro; Katayama, Masato; Fukui, Tetsuro; and Shiraiwa, Yoshinobu, 5,317,363, Cl. 355-27.000.
Kato, Ippei; and Takano, Akiyoshi, to Du Pont de Nemours, E. I., and Company; and Mishima Paper Company Ltd. Heat resistant, flame resistant conducting sheet having an electrical insulation layer. 5,316,839, Cl. 428-285.000.
Kato, Kanji: *See—*
  Kinoshita, Mitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.
Kato, Makoto: *See—*
  Kasazumi, Kenishi; Kato, Makoto; and Kobayashi, Ikunori, 5,317,435, Cl. 359-69.000.
  Okawara, Hiroyuki; Kato, Makoto; Miyaoka, Shinichiro; Nohmi, Makoto; and Takizawa, Yuri, 5,317,678, Cl. 395-126.000.
Kato, Masaru: *See—*
  Hayashi, Shigeo; Kohari, Osamu; and Kato, Masaru, 5,316,999, Cl. 503-227.000.
Kato, Masayoshi: *See—*
  Kanda, Hitoshi; Kato, Masayoshi; Mitsumura, Satoshi; Yamada, Yusuke; and Goseki, Yasuhide, 5,316,222, Cl. 241-5.000.

Kato, Mitsuo: *See—*

Katayama, Keiichi; Kato, Mitsuo; Tsurusaki, Kazuya; Hanamoto, Mikio; Mihara, Kazumasa; and Eguchi, Takatoshi, 5,317,121, Cl. 219-672.000.

Kato, Shigeo: *See—*

Osawa, Hidefumi; Yasuda, Yasuhiko; and Kato, Shigeo, 5,317,428, Cl. 358-539.000.

Kato, Takahiko; Ikeda, Shinzo; Aono, Yasuhisa; Izumiya, Masakiyo; Nakata, Kiyotomo; Masaoka, Isao; and Takahashi, Heishichiro, to Hitachi, Ltd. A nuclear reactor comprising a reactor vessel and structural members made of an austenitic stainless steel having superior resistance to irradiation-induced segregation. 5,316,597, Cl. 148-327.000.

Kato, Yoshitake; Fukunaga, Kazuya; Katami, Akira; and Oda, Shinichiro, to Hitachi Maxell, Ltd. Data recording cartridge including a flexible magnetic recording medium. 5,317,467, Cl. 360-133.000.

Katoh, Kazunobu: *See—*

Okamura, Hisashi; Nii, Kazumi; and Katoh, Kazunobu, 5,316,890, Cl. 430-264.000.

Katoh, Masakazu: *See—*

Inazu, Mizuho; Satoh, Ryoichi; Inoue, Tsutomu; Kitagawa, Hiroshi; Katoh, Masakazu; Englert, Heinrich; Carniato, Denis; and Lang, Hans-Jochen, 5,317,029, Cl. 514-422.000.

Katou, Yoshiaki: *See—*

Tabata, Yoichiro; Ueguri, Shigeo; Ueda, Yoshihiro; Mizuno, Masanori; Katou, Yoshiaki; and Nagano, Osamu, 5,317,116, Cl. 219-130.510.

Katou, Yoshimi: *See—*

Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, 5,317,556, Cl. 369-112.000.

Katsumata, Akira: *See—*

Tanaka, Mitsuho; Katsumata, Akira; and Arisaka, Hiroshi, 5,316,486, Cl. 439-62.000.

Kattus, Thomas A.; and Rice, John B. Bicycle handlebar conducive to rider aerodyanmic efficiency. 5,315,895, Cl. 74-551.800.

Kauffman, James W.: *See—*

Palmer, Bruce R.; and Kauffman, James W., 5,316,697, Cl. 252-518.000.

Kaufman, Craig A.: *See—*

Bocinski, D. Michael; Kaufman, Craig A.; Kisacky, Randy J.; Kunz, Barton H.; Stone, Lawrence A.; Raski, Jerry Z.; Schaefer, David B.; and Schmidt, Douglas A., 5,315,928, Cl. 101-93.140.

Kaufman, Leon; Carlson, Joseph W.; Okada, Shigemasu; and Hashimoto, Shigeo, to University of California, The Regents of the. MRI magnet with robust laminated magnetic circuit member and method of making same. 5,317,297, Cl. 335-297.000.

Kaul, Bansi L.; and Vougioukas, Angelos-Elie, to Sandoz Ltd. Dyestuffs for the dyeing of synthetic polyamides. 5,316,553, Cl. 8-639.000.

Kauth, Hermann: *See—*

Freitag, Dieter; Wulff, Claus; Alewelt, Wolfgang; and Kauth, Hermann, 5,317,083, Cl. 528-499.000.

Kavlico Corporation: *See—*

Park, Kyong M.; and Tirmizi, Abrar A., 5,315,877, Cl. 73-724.000.

Kawabe, Kuniyasu: *See—*

Sasaki, Mitsuhiro; and Kawabe, Kuniyasu, 5,316,885, Cl. 430-200.000.

Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, to Hitachi, Ltd. Thin film magnetic head and method of manufacturing the same. 5,316,617, Cl. 156-643.000.

Kawabe, Ushio: *See—*

Nishino, Toshikazu; Kawabe, Ushio; Murai, Fumio; Kure, Tokuo; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,317,168, Cl. 257-34.000.

Kawada, Ken, to Fuji Photo Film Co., Ltd. Photographic film transporting member, photographic film transporting apparatus and photographic processing system. 5,317,358, Cl. 354-319.000.

Kawaguchi, Chitoshi: *See—*

Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.

Kawaguchi, Hitoshi: *See—*

Mochida, Tetsuya; Okazawa, Kouichi; Kimura, Kouichi; Kawaguchi, Hitoshi; and Kobayashi, Kazushi, 5,317,747, Cl. 395-725.000.

Kawakami, Yasushi: *See—*

Ohta, Masami; Shimizu, Masami; Niijima, Kazuo; and Kawakami, Yasushi, 5,315,752, Cl. 29-598.000.

Kawamata, Satoru: *See—*

Kimura, Takeshi; and Kawamata, Satoru, 5,316,112, Cl. 188-267.000.

Kawamura, Masanori; Arai, Yoshinobu; and Aishita, Hideki, to ONO Pharmaceutical Co., Ltd. 3-mercapto-glutamic acid derivatives. 5,317,021, Cl. 514-275.000.

Kawamura, Nobuo: *See—*

Tsuchida, Masashi; Ohmachi, Kazuhiko; Honma, Toshio; Imai, Yasuhiro; and Kawamura, Nobuo, 5,317,727, Cl. 395-600.000.

Kawamura, Tsutomu: *See—*

Harashige, Masahiro; Kawamura, Tsutomu; Kaneko, Satoru; Inoue, Takashi; Tokutake, Atsuo; and Yoshikawa, Toshitsune, 5,317,051, Cl. 524-310.000.

Kawano, Hiroshi: *See—*

Hasegawa, Fumihiko; Ohtani, Tatsuo; Kawano, Hiroshi; and Yamada, Masayuki, 5,316,620, Cl. 156-645.000.

Kawasaki, Hisao: *See—*

Fernandes, Mark G.; and Kawasaki, Hisao, 5,317,185, Cl. 257-629.000.

Kawasaki, Kazuhisa: *See—*

Iwami, Kenichi; Kawasaki, Kazuhisa; and Nakada, Seiichi, 5,315,773, Cl. 38-77.600.

Kawasaki Steel Corporation: *See—*

Kataoka, Yoshihiro, 5,316,596, Cl. 148-321.000.

Narita, Yuuki; Ito, Takero; and Ogasawara, Shuetsu, 5,316,746, Cl. 423-151.000.

Kawase, Kozo: *See—*

Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.

Kawatetsu Mining Co., Ltd.: *See—*

Narita, Yuuki; Ito, Takero; and Ogasawara, Shuetsu, 5,316,746, Cl. 423-151.000.

Kay, Bruce F., to United Technologies Corporation. Pressure resistant fuel tank closure. 5,316,167, Cl. 220-328.000.

Kayano, Isamu: *See—*

Kita, Isamu; Kobashi, Masayuki; Tabuchi, Susumu; Doi, Yoshiyuki; Nakamura, Noboru; Ishihara, Managu; Arioka, Koji; and Kayano, Isamu, 5,317,610, Cl. 376-414.000.

Kayukawa, Hiroaki: *See—*

Kimura, Kazuya; and Kayukawa, Hiroaki, 5,316,446, Cl. 417-269.000.

Kayukawa, Masahide: *See—*

Suzuki, Junichiro; and Kayukawa, Masahide, 5,316,856, Cl. 428-446.000.

Keck, Steven D.: *See—*

Aghajanian, Michael K.; Keck, Steven D.; Burke, John T.; Hannon, Gregory E.; Becker, Kurt J.; Taylor, Steven J.; Wiener, Robert J.; and McCormick, Allyn L., 5,316,069, Cl. 164-97.000.

Keen, Michael J.; and Rapson, Nicholas T., to Burroughs Wellcome Co. Defined media for serum-free tissue culture. 5,316,938, Cl. 435-240.310.

Keenan, Douglas M., to Thomson Consumer Electronics, Inc. Favorite channel selection using extended keypress. 5,317,403, Cl. 348-731.000.

Keenan, Glenn M.: *See—*

Rubscha, Robert F.; Alexander, Robert H., Jr.; Keenan, Glenn M.; and Lagonegro, Paul R., 5,317,377, Cl. 355-319.000.

Keirsey, David M.: *See—*

Dolan, Charles P.; Keirsey, David M.; and Reiser, Kurt, 5,317,677, Cl. 395-77.000.

KEL Corporation: *See—*

Tanaka, Mitsuho; Katsumata, Akira; and Arisaka, Hiroshi, 5,316,486, Cl. 439-62.000.

Keller, Anton W., to RCA Thomson Licensing Corporation. Kinescope driver apparatus with contrast enhancement. 5,317,240, Cl. 315-383.000

Keller, Richard F.: *See—*

Heindel, Timothy R.; Garvey, Michael J.; Dick, Daniel W.; Keller, Richard F.; Jordan, Mary P.; and Schleinz, Alan F., 5,316,836, Cl. 428-284.000.

Keller, Robert, to Robert Keller AG. Table-top baking oven, particularly for pizza, or the like. 5,315,922, Cl. 99-447.000.

Kelmar, Laura: *See—*

Surka, Stefan; Zheng, Joe; and Kelmar, Laura, 5,317,388, Cl. 356-373.000.

Kelsey, Donald R., to Shell Oil Company. Copper hydrides as cocatalysts for olefin polymerization. 5,316,994, Cl. 502-117.000.

Kemmer, Leif; Mukherjee, Dilip; and Tjellander, Goran, to ABB Stal AB. Method and device for temperature control in a combustion plant. 5,315,816, Cl. 60-39.020.

Kemp, Willard E., to Fike Corporation. Process for surface hardening of refractory metal workpieces. 5,316,594, Cl. 148-281.000.

Kengaku, Toru: *See—*

Teraoka, Eiichi; Kengaku, Toru; and Ishida, Hiroichi, 5,317,529, Cl. 364-724.100.

Kennedy, Daniel J.: *See—*

Meyer, Robert B.; Lackner, John R.; Matuscheck, Hans J.; and Kennedy, Daniel J., 5,316,097, Cl. 180-19.100.

Kennedy, Daniel T.: *See—*

Wang, Da Y.; Kennedy, Daniel T.; Middleton, Thomas R.; and MacAllister, Burton W., 5,316,973, Cl. 437-188.000.

Kennedy, Jan B.: *See—*

McVey, John B.; and Kennedy, Jan B., 5,315,815, Cl. 60-39.060.

Kennedy, Joseph P.; Roller, Christopher D.; and Hooper, Robert W., to E-Systems, Inc. Passive high accuracy geolocation system and method. 5,317,323, Cl. 342-457.000.

Kenney, Maryann C.: *See—*

Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.

Kenyon, Christopher; Macklem, Peter; and Eidelman, David, to McGill University. Method for the enhancement of cell images. 5,317,644, Cl. 382-6.000.

Kerkmann, Harald: *See—*

Hartel, Gunter; Losing, Karl-Heinrich; Schurfeld, Armin; Blasczyk, Johann; and Kerkmann, Harald, 5,315,867, Cl. 73-149.000.

Kerr-McGee Corporation: *See—*

Palmer, Bruce R.; and Kauffman, James W., 5,316,697, Cl. 252-518.000.

Kersh, Karol W. Three-dimensional strategy game. 5,316,307, Cl. 273-241.000.

Kessler, Martin: *See—*

Kalvoda, Jaroslav; Kessler, Martin; Lattmann, Rene; and Ramos, Gerardo, 5,317,100, Cl. 540-357.000.

Kestner, Diane E.: *See—*

Marcus, Michael A.; Schafer, Kenneth R.; and Kestner, Diane E., 5,317,386, Cl. 356-372.000.

Key Solutions, Inc.: *See—*

Keyser, Gene E.; and Barnes, Ellis O., 5,316,682, Cl. 210-649.000.

Keyser, Gene E.; and Barnes, Ellis O., to Key Solutions, Inc. Gas micronizer and purification system and related methods. 5,316,682, Cl. 210-649.000.

Khriachtchev, Valeri G.: *See—*

Morozov, Victor A.; Kanachine, Serguei P.; Krasnochtchekov, Iouri I.; Makienko, Alexandre I.; Matveev, Valentine A.; Khriachtchev, Valeri G.; and Tan, Poi-Sik, 5,315,843, Cl. 62-309.000.

Kiamil, Sinan, to Scholl plc. Emulsion polymerized polymer. 5,316,762, Cl. 424-78.350.

Kibby, Robert M. Carbothermic reduction product gas treatment. 5,316,565, Cl. 75-10.270.

Kidman, Gene E.; Robinson, Larry E.; Scollar, Mark P.; and Fotheringham, Ian G. Racemic conversion of using a transaminase. 5,316,943, Cl. 435-280.000.

Kidokoro, Toru: *See—*

Otsuka, Takayuki; Osanai, Akinori; Itoh, Takaaki; Hyodo, Yoshihiko; and Kidokoro, Toru, 5,315,980, Cl. 123-520.000.

Kiesele, Herbert: *See—*

Kuhn, Uwe; Kiesele, Herbert; and Haupt, Stephan, 5,316,648, Cl. 204-415.000.

Kiesewetter, Lothar E.; Olsson, Fredy; and Tyren, Carl H., to Dynamotive Corporation. Method and device in magnetostrictive motion systems. 5,317,223, Cl. 310-26.000.

Kiessling, Ulrich: *See—*

Neumann, Ulrich; Buschmann, Ernst; Kiessling, Ulrich; and Renz, Guenter, 5,316,148, Cl. 206-484.100.

Kijima, Toshihiko; Horiuchi, Kunio; and Oshiyama, Hiroyuki, to Terumo Kabushiki Kaisha. Blood pump apparatus. 5,316,440, Cl. 415-206.000.

Kikuchi, Kazuhiko: *See—*

Kohyama, Mitsuaki; Kikuchi, Kazuhiko; Yoshida, Naruhito; Yoshida, Minoru; and Hirano, Kouji, 5,317,370, Cl. 355-245.000.

Kikuchi, Makoto: *See—*

Murashiro, Katsuyuki; Kikuchi, Makoto; and Saito, Shinichi, 5,316,694, Cl. 252-299.610.

Kikuchi, Toshiaki: *See—*

Nishikawa, Seiithirou; Kikuchi, Toshiaki; and Kinugawa, Masumi, 5,315,823, Cl. 60-286.000.

Kikuchi, Yoshihiro: *See—*

Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,317,397, Cl. 348-416.000.

Kilbourn, Rsusell A.: *See—*

Nicol, Donald V.; Kilbourn, Rsusell A.; and Lane, Mark J., 5,315,839, Cl. 62-148.000.

Killen, Dale H.: *See—*

Isaacson, Charles D.; Killen, Dale H.; and Nagorcka, James A., 5,316,381, Cl. 305-10.000.

Kim, Chun K.: *See—*

Ko, Jae I.; Lee, Jae W.; Lee, Yoon M.; Jean, En J.; Kim, Chun K.; and Kim, Jin, 5,316,709, Cl. 264-51.000.

Kim, Hee-Man, to SamSung Electronics Co., Ltd. Time difference slow mode control circuit. 5,317,460, Cl. 360-73.050.

Kim, Hyung C.: *See—*

Kim, Il Pyung; and Kim, Hyung C., 5,315,730, Cl. 15-167.100.

Kim, Il Pyung; and Kim, Hyung C. Toothbrush device. 5,315,730, Cl. 15-167.100.

Kim, Jin: *See—*

Ko, Jae I.; Lee, Jae W.; Lee, Yoon M.; Jean, En J.; Kim, Chun K.; and Kim, Jin, 5,316,709, Cl. 264-51.000.

Kim, Soo K., to EHWA Diamond Ind. Co., Ltd. Diamond cutting tool for hard articles. 5,316,416, Cl. 408-145.000.

Kim, Stan: *See—*

Neff, Edward A.; Portegies, Hans; and Kim, Stan, 5,317,222, Cl. 310-13.000.

Kim, Yong H.: *See—*

Brazelton, Carl L.; and Kim, Yong H., 5,316,031, Cl. 137-1.000.

Kim, Young J.: *See—*

Lee, Kwang H.; Ko, Dong H.; Kim, Young J.; Xiang, Myung X.; and Yoon, Myeong S., 5,317,099, Cl. 540-222.000.

Kimberly-Clark Corporation: *See—*

Boldt, Hans G. K., 5,316,177, Cl. 221-63.000.

Cohen, Bernard, 5,316,837, Cl. 428-285.000.

Heindel, Timothy R.; Garvey, Michael J.; Dick, Daniel W.; Keller, Richard F.; Jordan, Mary P.; and Schleinz, Alan F., 5,316,836, Cl. 428-284.000.

Kimizuka, Kazuhiro: *See—*

Yagami, Heihachiro; Kimizuka, Kazuhiro; and Odashima, Masahiro, 5,317,558, Cl. 369-126.000.

Kimmich, Rainer: *See—*

Rommel, Eberhard; and Kimmich, Rainer, 5,317,264, Cl. 324-309.000.

Kimura, Kazuya; and Kayukawa, Hiroaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable capacity wobbling swash plate type compressing apparatus. 5,316,446, Cl. 417-269.000.

Kimura, Kouichi: *See—*

Mochida, Tetsuya; Okazawa, Kouichi; Kimura, Kouichi; Kawaguchi, Hitoshi; and Kobayashi, Kazushi, 5,317,747, Cl. 395-725.000.

Kimura, Mariko: *See—*

Yoshimura, Yumiko; Hirakawa, Hideki; Asahioka, Yoshimi; and Kimura, Mariko, 5,317,510, Cl. 364-419.080.

Kimura, Munenori: *See—*

Ito, Akiyasu; Kimura, Munenori; Tsurumoto, Kazuo; and Nagasaka, Shouichi, 5,317,122, Cl. 219-69.180.

Kimura, Shigeru: *See—*

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Das, Promit; and Kinney, Terrance R., 5,317,524, Cl. 364-557.000.

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Nishikawa, Seiithirou; Kikuchi, Toshiaki; and Kinugawa, Masumi, 5,315,823, Cl. 60-286.000.

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Kirby Lester Inc.: *See—*

Perozek, Barbara; and Smith, Timothy R., 5,317,645, Cl. 382-8.000.

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Anderson, Richard F.; Ferry, Robert L.; and Kissell, John R., 5,315,801, Cl. 52-63.000.

Kita, Hideki: *See—*

Yasutomi, Yoshiyuki; Nakamura, Kousuke; Kita, Hideki; and Sobue, Masahisa, 5,316,987, Cl. 501-97.000.

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Hiroi, Masakazu; Hoshi, Akimitsu; Iida, Noriyoshi; Kitajima, Tadayuki; and Uto, Nobutaka, 5,316,287, Cl. 271-213.000.

Kitamura, Hideki: *See*—
Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, 5,317,375, Cl. 356-5.000.
Kitano, Hirohisa: *See*—
Masuda, Tomohiko; Matsubara, Ken; Yagi, Tsukasa; Wakamiya, Koji; and Kitano, Hirohisa, 5,317,347, Cl. 346-160.000.
Kitao, Osamu; Tsuji, Masaru; Okuda, Masatoshi; Uchimura, Shunichi; and Tanaka, Jun-ichirou, to Kanzaki Paper Mfg. Co., Ltd. Method of pulping waste pressure-sensitive adhesive paper. 5,316,621, Cl. 162-4.000.
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Kuwana, Shoji; Kiyosawa, Yoshihide; and Ikeda, Akio, 5,316,090, Cl. 175-24.000.
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Kaneno, Nobuaki; Kizuki, Hirotaka; Hayafuji, Norio; Shiba, Tetsuo; and Tada, Hitoshi, 5,316,967, Cl. 437-105 000.
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Sextl, Elfriede; Roland, Eckehart; Kleinschmit, Peter; and Kiss, Akos, 5,316,993, Cl. 502-68.000.
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Salas, R. Pito; Edelson, Glenn D.; Kleppner, Paul S.; and Shaver, Robert S., 5,317,686, Cl. 395-157.000.
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Carlson, David P.; Watkins, Paul C.; and Klevan, Leonard, 5,316,908, Cl. 435-6.000.
Klievoneit, Harold R.; Esposito, Augustine G.; and Runyon, Robert C., to St. Florian Company. Dicing blade composition. 5,316,559, Cl. 51-295.000.
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Hoffman, Keigh A., 5,316,389, Cl. 384-18.000.
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Knize, Randall J. Full color solid state laser projector system. 5,317,348, Cl. 353-31.000.
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Eschbach, Reiner; Knox, Keith T.; and Birnbaum, David, 5,317,653, Cl. 382-50.000.
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Ko, Jin-Nam; and Pak, On-Sun. Method for preparation of human serum albumin-sensitized sheep erythrocytes (HSA-cell) for detection of pre-S2 antigen. 5,316,936, Cl. 435-240.200.
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Kasazumi, Kenichi; Kato, Makoto; and Kobayashi, Ikunori, 5,317,435, Cl. 359-69.000.
Kobayashi, Isao; Kaifu, Noriyuki; Saika, Toshihiro; and Endo, Tadao, to Canon Kabushiki Kaisha. Image reading device and image information processing apparatus utilizing the same. 5,317,406, Cl. 348-307.000.
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Mochida, Tetsuya; Okazawa, Kouichi; Kimura, Kouichi; Kawaguchi, Hitoshi; and Kobayashi, Kazushi, 5,317,747, Cl. 395-725.000.
Kobayashi, Makoto: *See*—
Nakajima, Yukio; Imamura, Kazuhiko; Karatsu, Ryozo; Nishizaki, Sumio; and Kobayashi, Makoto, 5,316,831, Cl. 428-209.000.
Kobayashi, Norio, to Brother Kogyo Kabushiki Kaisha. Motor control device for controlling motor speed depending on imparted load. 5,317,668, Cl. 388-811.000.
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Kubo, Kouji; and Kobayashi, Shigeichi, 5,316,840, Cl. 428-318.400.
Kobayashi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronically controlled camera. 5,317,352, Cl. 354-195.100.
Kobayashi, Takumi; and Nishio, Etsuro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter release device. 5,317,353, Cl. 354-266.000.
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Kobrenski, Joseph: *See*—
Kinicki, Rachel M.; Short, Kerry; Kobrenski, Joseph; and Bisson, Janice, 5,315,999, Cl. 128-660.070.
Koch, Claus: *See*—
Baek, Leif; and Koch, Claus, 5,316,911, Cl. 435-7.900.
Koch Engineering Company, Inc.: *See*—
Martin, Michael J.; Gibson, William C.; and Massey, Lee R., 5,316,469, Cl. 431-116.000.
Koch, Garrett S.: *See*—
Bula, Orest; Koch, Garrett S.; Woyke, Justin A.; and Gomez, Richard S., 5,317,573, Cl. 371-10.300.
Koch, Jochim; and Frembgen, Stefan, to Dragerwerk Aktiengesellschaft. Coupled control of operating parameters of an incubator. 5,316,542, Cl. 600-22.000.
Koch, Max; and Imgrut, Peter, to Komax Holding AG. Apparatus for fitting of grommets to electrical cables. 5,315,757, Cl. 29-754.000.
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Moksnes, Stephen L.; Sharma, Jayant; Olson, Ronald D.; Tump, Ronald S.; Kocher, James M.; and Pausch, Terrance J., 5,316,195, Cl. 222-146.600.
Kocsis, Betty H.: *See*—
Chan, Jimmy C.; and Kocsis, Betty H., 5,316,790, Cl. 427-142.000.
Kodukula, Sivarama K.: *See*—
Kao, Chang Y.; Kuruts, James P.; and Kodukula, Sivarama K., 5,317,638, Cl. 380-29.000.
Koebler, Douglas J., to Suprex Corporation. Fluid restrictor apparatus and method for making the same. 5,316,262, Cl. 251-8.000.
Koehler, Georg; Schaetzle, Ulrich; Rohwedder, Arnim; and Scheidt, Martin, to Siemens Aktiengesellschaft. Pressure pulse source operable according to the traveling wave principle. 5,317,229, Cl. 310-334.000.
Koenig & Bauer, Aktiengesellschaft: *See*—
Bolza-Schunemann, Claus A.; Bolza-Schunemann, Hans-Bernhard; and Germann, Albrecht J., 5,317,390, Cl. 356-394.000.
Doersam, Willi R. L., 5,315,931, Cl. 101-415.100.
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Hammitt, Gregory F.; and Koenigsman, Scott D., 5,317,700, Cl. 395-375.000.
Koepff, Peter; Braumer, Klaus; Stahl, Helmuth; and Dick, Eberhard, to Deutsche Gelatine-Fabriken Stoess AG. Process for making gelatine films. 5,316,717, Cl. 264-564.000.
Kogame, Toshihiko; and Hamuro, Mitsuro, to Murata Manufacturing Co., Ltd. Method for manufacturing ceramic green sheet laminate for an electronic component. 5,316,602, Cl. 156-64.000.
Kogoma, Masuhiro: *See*—
Okazaki, Sachiko; Kogoma, Masuhiro; and Hirakawa, Masahiro, 5,316,639, Cl. 204-192.120.
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Toyoda, Takashi; Hosono, Yasuji; Funato, Takashi; Miyaji, Takashi; Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,777, Cl. 426-87.000.
Kohari, Osamu: *See*—
Hayashi, Shigeo; Kohari, Osamu; and Kato, Masaru, 5,316,999, Cl. 503-227.000.
Kohler, Peter: *See*—
Lindh, Leif; and Kohler, Peter, 5,316,546, Cl. 602-16.000.
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Rommel, Eberhard; and Kimmich, Rainer, 5,317,264, Cl. 324-309.000.
Kohlmann, Michael J.; and Williams, Randall K., to Harmony Brook, Inc. Spout assembly for self-service purified water dispenser. 5,316,673, Cl. 210-251.000.
Kohn, Joachim B.; and Fiordeliso, James J., to Rutgers, The State University of New Jersey. Polyarylates containing derivatives of the natural amino acid l-tyrosine. 5,317,077, Cl. 528-182.000.
Kohtamaki, Lauri: *See*—
Taijonlahti, Jorma; and Kohtamaki, Lauri, 5,317,516, Cl. 364-468.000.
Kohyama, Mitsuaki; Kikuchi, Kazuhiko; Yoshida, Naruhito; Yoshida, Minoru; and Hirano, Kouji, to Kabushiki Kaisha Toshiba. Developing apparatus including means for collecting used developing agent. 5,317,370, Cl. 355-245.000.
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Kanda, Yasushi, 5,316,369, Cl. 297-194.000.

Koizumi, Noboru, to Konica Corporation. Image recognition apparatus. 5,317,419, Cl. 358-462.000.
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Maeda, Shigemi; and Kojima, Kunio, 5,317,549, Cl. 369-32.000.
Kojima, Mitsuo, to Rohm Co., Ltd. Method for producing semiconductor device. 5,316,963, Cl. 437-52.000.
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Tazaki, Seiji; Yagihara, Tomio; Matsui, Nobuo; Yanagisawa, Atsushi; and Kojima, Takakazu, 5,317,102, Cl. 544-336.000.
Kojima, Takao; Minoha, Ken; and Yamano, Masaru, to NGK Spark Plug Co., Ltd. Exhaust gas converter device. 5,316,738, Cl. 422-180.000.
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Koide, Tomoyuki; and Kojima, Tetsuro, 5,316,886, Cl. 430-203.000.
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Taoka, Hisao; Iyoda, Isao; Noguchi, Hideo; Kojima, Yukio; Warashina, Shigeru; and Sato, Nobuyuki, 5,317,525, Cl. 364-578.000.
Kokeguchi, Akira, to Takata Corporation. Air bag cover mounting having engagement portions to facilitate attachment. 5,316,333, Cl. 280-728.00A.
Kokusai Denshi Denwa Company, Ltd.: *See*—
Miyazaki, Tetsuya; and Ryu, Shiro, 5,317,382, Cl. 356-351.000.
Koliha, Michael W.: *See*—
Cammack, Michael A.; Koliha, Michael W.; and Smith, David W., 5,316,216, Cl. 239-71.000.
Kollenbrandt, Norbert; Schwenke, Heiko; and Wimmers, Elmar, to Dragerwerk Aktiengesellschaft. Coupling device for a tube system. 5,316,350, Cl. 285-242.000.
Komatsu Electronic Metals Co., Ltd.: *See*—
Tomioka, Junsuke; Nagai, Kazunori; and Matsuzaki, Akihiro, 5,316,742, Cl. 117-217.000.
Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, to Sharp Kabushiki Kaisha. Data processor for detecting identical data coexisting in a plurality of data section of data transmission paths. 5,317,756, Cl. 395-800.000.
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Koch, Max; and Imgrut, Peter, 5,315,757, Cl. 29-754.000.
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Miyawaki, Mamoru; Kondo, Shigeki; Nakamura, Yoshio; and Kouchi, Tetsunobu, 5,317,433, Cl. 359-59.000.
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Mori, Katsumi; Asaka, Tatsuya; Iwano, Hideaki; and Kondo, Takayuki, 5,317,584, Cl. 372-46.000.
Kondou, Kenji, to NEC Corporation. Means for and methods of testing automated tape bonded semiconductor devices. 5,317,188, Cl. 257-668.000.
Konica Corporation: *See*—
Hoshino, Toru, 5,317,426, Cl. 358-515.000.
Koizumi, Noboru, 5,317,419, Cl. 358-462.000.
Ueda, Yutaka; and Yamashita, Hiroshi, 5,316,898, Cl. 430-400.000.
Konishi, Yoshihiro; Asa, Masahito; and Fujiwara, Hideki, to Uniden Corporation. Frequency-fluctuating interference removed receiver. 5,317,289, Cl. 333-17.100.
Konopelski, Peter J., to United States of America, Navy. Ship's attitude data converter. 5,317,542, Cl. 367-12.000.
Konrad, Johann: *See*—
Benedikt, Walter; Vogel, Manfred; Herden, Werner; Konrad, Johann; Schmidt, Wolfgang; Tosch, Josef; and Kuessel, Matthias, 5,315,875, Cl. 73-706.000.
Konstant, Anthony N. Rack having beams and columns of differing numbers. 5,316,157, Cl. 211-151.000.
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Spitzer, Mark B.; Salerno, Jack P.; and Zavracky, Paul M., 5,317,436, Cl. 359-83.000.
Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., 5,317,236, Cl. 315-169.300.
Korhonen, Veijo S., to Nokia Mobile Phones, Ltd. Method to reduce noise in PLL frequency synthesis. 5,317,283, Cl. 331-1.00A.
Kos, Joseph: *See*—
Vannini, Robert M.; Kos, Joseph; Neville, James E.; and Shangraw, Robert D., 5,315,817, Cl. 60-39.091.
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Nakahara, Takehiko; Koshinaka, Masao; and Kosaka, Nobuyuki, 5,317,618, Cl. 378-161.000.
Kosako, Kosei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Remote control for a camera having an optical fiber. 5,317,354, Cl. 354-266.000.
Kosako, Toshiso; and Nishimura, Kazuo, to General Sekiyu Kabushiki Kaisha. Method of measuring reduction of surface layer material and apparatus therefor. 5,317,605, Cl. 376-157.000.
Koshi, Makoto; and Kaiju, Yoshihiko, to Fujitsu Limited. Processing unit and system including plurality of the processing units. 5,317,366, Cl. 355-202.000.
Koshinaka, Masao: *See*—
Nakahara, Takehiko; Koshinaka, Masao; and Kosaka, Nobuyuki, 5,317,618, Cl. 378-161.000.
Koshiyama, Yoshihiko: *See*—
Kukimoto, Yutaka; Ueda, Hikoji; Suzuki, Kozo; and Koshiyama, Yoshihiko, 5,317,060, Cl. 525-197.000.
Kosin, John A.: *See*—
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., 5,317,044, Cl. 521-78.000.
Koster, Edward, to Du Pont Canada Inc. Rubber tube manufacture, with film laminate overwrap. 5,316,713, Cl. 264-209.100.
Kotani, Takayuki; and Inuzuka, Takeshi, to Kabushiki Kaisha Hosokawa Yoko. Barrier packaging material for infusion solution. 5,316,826, Cl. 428-172.000.
Kotowski, Jeff: *See*—
Davis, Richard D.; and Kotowski, Jeff, 5,317,614, Cl. 377-17.000.
Kotter, Dale K.; Rankin, Richard A.; and Morgan, John P.,, to United States of America, Energy. DC-based magnetic field controller. 5,317,259, Cl. 324-251.000.
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Miyawaki, Mamoru; Kondo, Shigeki; Nakamura, Yoshio; and Kouchi, Tetsunobu, 5,317,433, Cl. 359-59.000.
Kouno, Hiroyuki; Yazawa, Minobu; and Kumamoto, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Analog-to-digital converter of an annular configuration. 5,317,312, Cl. 341-158.000.
Kowalewski, Brian J.: *See*—
Carr, Todd R.; and Kowalewski, Brian J., 5,317,395, Cl. 348-164.000.
Kowarsky, Stephen R.: *See*—
Misholi, Boaz; Danziger, Itzchak; Kowarsky, Stephen R.; and Sandlerman, Nimrod, 5,317,628, Cl. 379-89.000.
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Kozulic, Branko: *See*—
Heimgartner, Urs; Kozulic, Branko; and Mosbach, Klaus, 5,316,912, Cl. 435-7.900.
Kraft General Foods, Inc.: *See*—
Stouffer, Scott C.; Majeres, Lisa J.; and Charintranond, Wibul, 5,316,780, Cl. 426-424.000.
Krahn, Donald R.: *See*—
Haviland, Jeffrey S.; Krahn, Donald R.; and Schneider, Robert W., 5,317,251, Cl. 324-102.000.
Kramer, Charles E.: *See*—
Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.
Kranbuehl, David E. Dosimeter for monitoring the condition of polymeric materials and chemical fluids. 5,317,252, Cl. 324-71.700.
Kranzler, David A., to 3COM Corporation. Method and apparatus for frequency discriminating computer network signals. 5,317,215, Cl. 307-517.000.
Krasnochtchekov, Iouri I.: *See*—
Morozov, Victor A.; Kanachine, Serguei P.; Krasnochtchekov, Iouri I.; Makienko, Alexandre I.; Matveev, Valentine A.; Khriachtchev, Valeri G.; and Tan, Poi-Sik, 5,315,843, Cl. 62-309.000.
Kratochvil, Cynthia P.; Lin, Yah Hwa E.; and Novak, Thomas J., to Uncle Ben's, Inc. Parboiled rice product and method of making same. 5,316,783, Cl. 426-627.000.
Kraus, Michael; and Romisch, Jurgen, to Behringwerke Aktiengesellschaft. Method for the determination of antibodies against lipocortins. 5,316,915, Cl. 435-7.950.
Krauser, Jack T. Dental implant with a longitudinally grooved cylindrical surface. 5,316,476, Cl. 433-173.000.
Kreis, Gundolf: *See*—
Enning, Norbert; Kreis, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, 5,316,367, Cl. 296-189.000.
Kremers-Urban Company: *See*—
Wagle, Sudhakar S.; Steinbach, Thomas; Lawyer, Carl H.; Hermann, William J., Jr.; and Gawish, Ali A. S., 5,316,775, Cl. 424-553.000.
Kresse, Franz; Osberghaus, Rainer; and Scheller, Bernfrid, to Henkel Kommanditgesellschaft auf Aktien. Mop head comprising a holder insertion aid. 5,315,734, Cl. 15-229.400.
Krieger, Frederick W., Jr. Method for controlling street surface pollutants. 5,316,589, Cl. 134-10.000.
Krinke, Terrance A.: *See*—
Pai, Deepak K.; and Krinke, Terrance A., 5,317,479, Cl. 361-773.000.
Kronberg, James W., to United States of America, Energy. Capacitive proximity sensor. 5,315,884, Cl. 73-862.680.
Kronberg, James W., to United States of America, Energy. High frequency reference electrode. 5,316,649, Cl. 204-435.000.
Kronberg, James W., to United States of America, Energy. Concealed wire tracing apparatus. 5,317,253, Cl. 324-67.000.
Krone-Schmidt, Wilfried; and Markle, James R., to Hughes Aircraft Company. Environment control apparatus. 5,316,560, Cl. 55-385.200.
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Peterson, Ronald V.; and Krone-Schmidt, Wilfried, 5,315,793, Cl. 51-415.000.
Krone, Volker; and Walch, Axel, to Hoechst Aktiengesellschaft. Poly amino dicarboxylic acid-co-anhydro amino dicarboxylic acid derivative. 5,317,065, Cl. 525-420.000.
Kronenberger, Robert A., to American Needle. Headwear piece with deformable cushion layer. 5,315,715, Cl. 2-183.000.

Kropp, Karl M.: *See—*
Luhman, Robert A.; Kuhn, Gary K.; Perrington, Kenneth J.; Kropp, Karl M.; and Gruber, Michael W., 5,316,424, Cl. 412-8.000.

Kruk, Robert R.: *See—*
Perry, Alan; Newman, Roger K.; and Kruk, Robert R., 5,317,654, Cl. 382-61.000.

Krumm, Helmut: *See—*
Cordes, Hans; Krumm, Helmut; Schwartz, Ludwig; Kahn, Ilan; Cornils, Gerd; and Behrend, Ulrich, 5,316,829, Cl. 428-192.000.

Krust, Andree: *See—*
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; Dejean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,317,090, Cl. 530-387.100.

Kruzel, Thomas F.: *See—*
Snetting, Mark E.; Kruzel, Thomas F.; and Cooper, Robert D., Jr., 5,316,445, Cl. 417-53.000.

Kruzick, Kent, to Galbreath Incorporated. Waste compactor apparatus with compactor and removable subjacent container. 5,315,924, Cl. 100-53.000.

Krysinski, Tomasz: *See—*
Girard, Laurent; Krysinski, Tomasz; and Michel, Pierre, 5,316,240, Cl. 244-17.270.

Krzycki, Edwin A.; Luster, Troy R.; and Stone, David L., to Harris Corporation. Special sensor applied meteorological image process. 5,317,690, Cl. 395-200.000.

Kubo, Isao: *See—*
Iwase, Akira; Iwaki, Hirofumi; Kaneko, Toshikazu; Kubo, Isao; and Sato, Koichi, 5,316,557, Cl. 29-623.500.

Kubo, Kouji; and Kobayashi, Shigeichi, to Sumitomo Chemical Company, Limited. Wallpaper. 5,316,840, Cl. 428-318.400.

Kubo, Masanori: *See—*
Nishibayashi, Toru; Ishizue, Yoshihiro; Ishida, Kozo; and Kubo, Masanori, 5,316,773, Cl. 424-499.000.

Kubo, Ryoji: *See—*
Fukushima, Nobuo; Takeda, Osamu; and Kubo, Ryoji, 5,317,404, Cl. 358-335.000.

Kubo, Tadayuki; Watanabe, Kazuo; and Horikoshi, Michio, to Canon Kabushiki Kaisha. Linear driving device. 5,317,221, Cl. 310-12.000.

Kubo, Takashi: *See—*
Nomura, Masaaki; Aosaki, Ko; Kubo, Takashi; Namioka, Kenta; and Takanose, Koji, 5,317,350, Cl. 353-63.000.

Kubota Corporation: *See—*
Sugitani, Junichi; Inui, Masahiro; Tsuchida, Koji; and Yoshimoto, Teruo, 5,316,721, Cl. 420-50.000.

Kubota, Haruo: *See—*
Nishi, Yoshio; Kubota, Haruo; and Ueno, Yoshio, 5,316,267, Cl. 254-383.000.

Kubota, Hiromi: *See—*
Takigawa, Hirofumi; Kubota, Hiromi; and Ito, Susumu, 5,316,939, Cl. 435-252.100.

Kubota, Masao. Apparatus for producing a substance utilizing agravic effect. 5,316,719, Cl. 420-590.000.

Kubota, Yukitoshi: *See—*
Yamamura, Takashi; Hamazaki, Yoshihisa; Kaneshige, Toshihiko; Nanba, Makoto; and Kubota, Yukitoshi, 5,316,571, Cl. 106-692.000.

Kubulins, Erik R.: *See—*
Stanciu, Virgil V.; Peshek, Jack R.; Neece, Faurice D.; Kubulins, Erik R.; and Logozar, Branko, 5,316,707, Cl. 264-40.100.

Kucharczyk, Nathalie: *See—*
Fauchere, Jean-Luc; Kucharczyk, Nathalie; Morris, Angela D.; Paladino, Joseph; Bonnet, Jacqueline; and Thurieau, Christophe, 5,317,014, Cl. 514-17.000.

Kudla, Robert J.: *See—*
Subramanian, Somasundaram; Kudla, Robert J.; and Chattha, Mohinder S., 5,316,991, Cl. 502-65.000.

Kudsk, Kenneth A., to University of Tennessee Research Corporation, The. Human growth hormone induced improvement in depressed T4/T8 ratio. 5,317,012, Cl. 514-12.000.

Kuenemund, Ronald; and Noll, Tobias, to Siemens Aktiengesellchaft. Coordinate rotation digital computer processor (cordic processor) for vector rotations in carry-save architecture. 5,317,753, Cl. 395-800.000.

Kuessel, Matthias: *See—*
Benedikt, Walter; Vogel, Manfred; Herden, Werner; Konrad, Johann; Schmidt, Wolfgang; Tosch, Josef; and Kuessel, Matthias, 5,315,875, Cl. 73-706.000.

Kuhlman, Howard W.; and Joyner, Jeffrey K., to General Motors Corporation. Sliding door closed loop cable closure system with balanced cable tension and varying diameter pulleys. 5,316,365, Cl. 296-155.000.

Kuhn, Gary K.: *See—*
Luhman, Robert A.; Kuhn, Gary K.; Perrington, Kenneth J.; Kropp, Karl M.; and Gruber, Michael W., 5,316,424, Cl. 412-8.000.

Kuhn, Uwe; Kiesele, Herbert; and Haupt, Stephan, to Dragerwerk Aktiengesellschaft. Electrochemical measuring cell for detecting gases and vapors. 5,316,648, Cl. 204-415.000.

Kukimoto, Yutaka; Ueda, Hikoji; Suzuki, Kozo; and Koshiyama, Yoshihiko, to Fujikura Kasei Co., Ltd. Process for producing composite resin for toner. 5,317,060, Cl. 525-197.000.

Kukla, Mark J.: *See—*
August, John L., Jr.; and Kukla, Mark J., 5,317,590, Cl. 372-109.000.

Kumamoto, Toshio: *See—*
Kouno, Hiroyuki; Yazawa, Minobu; and Kumamoto, Toshio, 5,317,312, Cl. 341-158.000.

Kumar, Nalin, to Microelectronics and Computer Technology Corporation. Cylindrical magnetron sputtering system. 5,317,006, Cl. 204-298.120.

Kung, Hsiang-fu: *See—*
Lee-Huang, Sylvia; Kung, Hsiang-fu; Huang, Paul L.; Huang, Philip L.; Huang, Peter; Huang, Henry I.; and Chen, Hao-chia, 5,317,009, Cl. 514-8.000.

Kunishima, Iwao; and Suguro, Kyoichi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device comprising metal silicide. 5,316,977, Cl. 437-200.000.

Kuno, Masaya. Hydrodelayed thermal cracking process. 5,316,660, Cl. 208-76.000.

Kuno, Sachiko: *See—*
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Oda, Tomio, 5,317,032, Cl. 514-530.000.

Kunugita, Kiyohiko: *See—*
Nakano, Satoru; Oshima, Takeo; Okada, Masaaki; and Kunugita, Kiyohiko, 5,316,769, Cl. 424-442.000.

Kunz, Barton H.: *See—*
Bocinski, D. Michael; Kaufman, Craig A.; Kisacky, Randy J.; Kunz, Barton H.; Stone, Lawrence A.; Raski, Jerry Z.; Schaefer, David B.; and Schmidt, Douglas A., 5,315,928, Cl. 101-93.140.

Kuratani, Naoto: *See—*
Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, 5,316,802, Cl. 427-533.000.

Kure, Tokuo: *See—*
Nishino, Toshikazu; Kawabe, Ushio; Murai, Fumio; Kure, Tokuo; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,317,168, Cl. 257-34.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, 5,317,052, Cl. 524-413.000.

Kurihara, Katsumi: *See—*
Fukube, Noriaki; Kurihara, Katsumi; Takano, Satoshi; Tanabe, Hiroshi; Fujiwara, Hiroshi; Bannai, Kazunori; and Inobe, Hiroyuki, 5,316,282, Cl. 271-10.000.

Kurihara, Noriyuki: *See—*
Suzuki, Yoshiro; Tanaka, Hitoshi; Kurihara, Noriyuki; and Saito, Yutaka, 5,316,727, Cl. 422-68.100.

Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, to Nippon Telegraph and Telephone Corporation. Display and image capture apparatus which enables eye contact. 5,317,405, Cl. 348-20.000.

Kurikuma, Tsutomu: *See—*
Yagi, Wataru; Yamada, Masuo; Ishii, Masami; Makimura, Yukuo; Kurikuma, Tsutomu; and Akita, Norihiro, 5,316,068, Cl. 164-58.100.

Kurimoto, Takashi: *See—*
Nakamura, Moritaka; Kurimoto, Takashi; and Iizuka, Katsuhiko, 5,316,616, Cl. 156-643.000.

Kuriyama, Kazuya; and Nishino, Aya, to Yuasa Battery Co., Ltd. Lithium secondary battery. 5,316,876, Cl. 429-197.000.

Kuroda, Keiko: *See—*
Oouchi, Toshiya; Kuroda, Keiko; and Ido, Nobuhiko, 5,317,563, Cl. 370-17.000.

Kuroda, Motoki: *See—*
Matsuda, Nobuhide; and Kuroda, Motoki, 5,317,548, Cl. 369-13.000.

Kurokawa, Koji: *See—*
Kinoshita, Mitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.

Kurokawa, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Radiotherapy device. 5,317,164, Cl. 250-492.300.

Kuroki, Shigenori. Steering lock device for vehicle. 5,315,851, Cl. 70-252.000.

Kurosawa, Hiroshi: *See—*
Noda, Hiroaki; Dosaka, Shinichi; and Kurosawa, Hiroshi, 5,317,142, Cl. 250-201.400.

Kurtz, Sarah R.: *See—*
Olson, Jerry M.; and Kurtz, Sarah R., 5,316,593, Cl. 136-262.000.

Kuruts, James P.: *See—*
Kao, Chang Y.; Kuruts, James P.; and Kodukula, Sivarama K., 5,317,638, Cl. 380-29.000.

Kusano, Yukihiro: *See—*
Yoshikawa, Masato; Kusano, Yukihiro; Akiyama, Setsuo; Naito, Kazuo; Okazaki, Satiko; and Kogoma, Masuhiro, 5,316,739, Cl. 422-186.050.

Kuwahara, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Noise elimination apparatus for eliminating noise components having a high density and a low density. 5,317,420, Cl. 358-463.000.

Kuwana, Shoji; Kiyosawa, Yoshihide; and Ikeda, Akio, to Harmonic Drive Systems, Inc. Attitude control device and drilling-direction control device. 5,316,090, Cl. 175-24.000.

KW Industries, Inc.: *See—*
Ledebur, Harry C., 5,315,854, Cl. 72-297.000.

Kwan, Chiu K.: *See—*
Lee, James S. W.; and Kwan, Chiu K., 5,316,182, Cl. 222-78.000.

Kwan, Sze-Hon; Hshieh, Fwu-Iuan; Chang, Mike F.; Ho, Yueh-Se; and Owyang, King, to Siliconix, Incorporated. Trenched DMOS transistor fabrication using six masks. 5,316,959, Cl. 437-40.000.

Kwon, Young I., to VLSI Technology, Inc. Coplanar corrector ring. 5,317,106, Cl. 174-52.400.

Kyllonen, Glenn F. Paint saver tray. 5,316,137, Cl. 206-209.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Hara, Takahiro; Takasawa, Seigo; Yokoo, Yoshiharu; and Furukawa, Tadayasu, 5,316,767, Cl. 424-401.000.

Kyriacou, Nestor E. Multi-purpose suspension system. 5,316,326, Cl. 280-104.000.

L.E. Mason Company: *See—*
Prairie, Marshall J., Jr., 5,317,108, Cl. 174-67.000.

L. E. Stott Limited: *See—*
Stott, Leslie, 5,316,056, Cl. 141-68.000.

L.G.L. Electronics S.p.A.: *See—*
Zenoni, Pietro; Pedrini, Giovanni; and Castelli, Rosario, 5,316,051, Cl. 139-452.000.

Label Masters, Inc.: *See—*
Waldhoff, Douglas T., 5,316,343, Cl. 283-70.000.

Laboratoires USPA: *See—*
Bru-Magniez, Nicole; Potin, Dominique; and Teulon, Jean-Marie, 5,317,025, Cl. 514-323.000.

LaBorde, Jean C.: *See—*
Palmaz, Julio C.; and LaBorde, Jean C., 5,316,023, Cl. 128-898.000.

Lackner, John R.: *See—*
Meyer, Robert B.; Lackner, John R.; Matuscheck, Hans J.; and Kennedy, Daniel J., 5,316,097, Cl. 180-19.100.

La Clair, Michael: *See—*
Cahalan, Irving W.; La Clair, Michael; Seiter, Paul; and Weber, John, 5,317,598, Cl. 375-75.000.

Lacoste, Francois: *See—*
Lacruche, Bernard; Cathignol, Dominique; and Lacoste, Francois, 5,315,986, Cl. 69-4.000.

Lacruche, Bernard; Cathignol, Dominique; and Lacoste, Francois, to Technomed International; and Inserm (Institut National de la Recherche Medicale). Apparatus for real-time tracking and imaging of objects within the body of a mammal. 5,315,986, Cl. 69-4.000.

LaFlesh, Richard C.: *See—*
Rini, Michael J.; Hellewell, Todd D.; Towle, David P.; Jennings, Patrick L.; LaFlesh, Richard C.; and Anderson, David K., 5,315,939, Cl. 110-264.000.

Lagnier, Alain, to Compagnie Generale Des Establissements Michelin - Michelin & CIE. Tread having grooves with incisions in the walls. 5,316,063, Cl. 152-209.00R.

Lago, Rudolph M.: *See—*
Dessau, Ralph M.; Grasselli, Robert K.; Lago, Rudolph M.; and Tsikoyiannis, John G., 5,316,661, Cl. 208-46.000.

Lagonegro, Paul R.: *See—*
Rubscha, Robert F.; Alexander, Robert H., Jr.; Keenan, Glenn M.; and Lagonegro, Paul R., 5,317,377, Cl. 355-319.000.

Lagoni, William A.: *See—*
Gurley, Thomas D.; and Lagoni, William A., 5,317,400, Cl. 348-679.000.

Lahnan, Robert A.; and Diehl, Raymond L., to Springfield Investments, Inc. Oil filler funnel cap. 5,316,059, Cl. 141-340.000.

Lahoda, Edward J.; Grant, David C.; and Sverdrup, Edward F., to Westinghouse Electric Corp. Method and apparatus for cleaning contaminated particulate material. 5,316,223, Cl. 241-24.000.

Lai, Genhone. Tennis racket handle. 5,316,316, Cl. 273-73.00J.

Laitram Corporation, The: *See—*
Carbone, John J.; and Gundlach, James O., 5,316,522, Cl. 474-95.000.

Lakhtman, Gregory. Collapsible support for running in place exercising. 5,316,527, Cl. 482-41.000.

Lalonde, Nelson. Farm tractor with backhoe bucket. 5,315,772, Cl. 37-379.000.

Lambert, John A., Jr. Omnidirectional wire dispenser. 5,316,232, Cl. 242-86.50R.

Lammer, Gertraud: *See—*
Chalupka, Alfred; Lammer, Gertraud; Stengl, Gerhard; Wolf, Peter; and Fegerl, Johannes, 5,317,161, Cl. 250-423.00R.

Lamp, Henry W. Apparatus for collecting animal excrement. 5,315,960, Cl. 119-95.000.

Lanard Toys Limited: *See—*
Brovelli, Virginio A.; and Man, Mei H., 5,316,183, Cl. 222-78.000.

Lancaster, William G.: *See—*
Gordon, Yoram; Fain, John; Davis, William F.; and Lancaster, William G., 5,315,809, Cl. 53-399.000.

Lance, Raymond E.: *See—*
Goode, John E.; Hoyle, Michael D.; and Lance, Raymond E., 5,315,831, Cl. 62-7.000.

Land, Marty W.; Mangrum, Russell E.; and Martin, Joseph W. Display rack. 5,316,156, Cl. 211-149.000.

Landis, Gary N.: *See—*
Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., 5,317,689, Cl. 395-163.000.

Landucci, Angelo. Water bicycle. 5,316,508, Cl. 440-030.000.

Lane, Mark J.: *See—*
Nicol, Donald V.; Kilbourn, Rsusell A.; and Lane, Mark J., 5,315,839, Cl. 62-148.000.

Lang, Hans-Jochen: *See—*
Inazu, Mizuho; Satoh, Ryoichi; Inoue, Tsutomu; Kitagawa, Hiroshi; Katoh, Masakazu; Englert, Heinrich; Carniato, Denis; and Lang, Hans-Jochen, 5,317,029, Cl. 514-422.000.

Lang-Ree, Arne: *See—*
Apps, William P.; and Lang-Ree, Arne, 5,316,172, Cl. 220-519.000.

Lange, Jon T. Method and apparatus for mounting the detector array of a CT scanner to a radiation therapy simulator. 5,317,617, Cl. 378-65.000.

Langley, Donald C.: *See—*
Vetterick, Richard C.; and Langley, Donald C., 5,315,941, Cl. 110-345.000.

Langreck, Gerald K.: *See—*
Thomas, Richard H.; and Langreck, Gerald K., 5,316,109, Cl. 188-41.000.

Langsjoen, Per H.: *See—*
Folkers, Karl A.; Langsjoen, Per H.; and Willis, Richard A., 5,316,765, Cl. 424-94.100.

Lansinger, Jere R., to Chrysler Corporation. Anti-reflective automotive interior instrument panel surface. 5,316,359, Cl. 296-70.000.

Lantech, Inc.: *See—*
Gordon, Yoram; Fain, John; Davis, William F.; and Lancaster, William G., 5,315,809, Cl. 53-399.000.

Lanxide Technology Company, LP: *See—*
Aghajanian, Michael K.; Keck, Steven D.; Burke, John T.; Hannon, Gregory E.; Becker, Kurt J.; Taylor, Steven J.; Wiener, Robert J.; and McCormick, Allyn L., 5,316,069, Cl. 164-97.000.

LaPointe, Jeffrey G.: *See—*
Beaman, Bryan A.; LaPointe, Jeffrey G.; and Newman, David A., 5,317,344, Cl. 346-107.00R.

Larison, Karen D.: *See—*
Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.

LaRocca, Brian: *See—*
Gray, Gary A.; LaRocca, Brian; and Strauss, Rodolfo, 5,317,545, Cl. 368-4.000.

Larsen, Alf D.: *See—*
Cerretti, Douglas P.; Cosman, David J.; Dower, Steven K.; March, Carl J.; Urdal, David L.; and Larsen, Alf D., 5,317,087, Cl. 530-350.000.

Larson Company, The: *See—*
Hill, Steven L., 5,316,807, Cl. 428-17.000.

Larue, Joseph: *See—*
Collin, Jean-Claude; Larue, Joseph; Rojey, Alexandre; and Viltard, Jean-Charles, 5,316,628, Cl. 203-72.000.

Lasater, Peter M.: *See—*
Chapman, Cynthia M.; and Lasater, Peter M., 5,317,041, Cl. 514-763.000.

Lashmore, David S.: *See—*
Ratzker, Menahem; Lashmore, David S.; and Teak, John A., 5,316,650, Cl. 205-67.000.

Laskaris, Evangelos T.: *See—*
Dorri, Bizhan; Laskaris, Evangelos T.; Herd, Kenneth G.; and Gabis, Raymond E., 5,317,298, Cl. 335-301.000.

Lassbacher, Anton: *See—*
Ritter, Klaus; Ritter, Gerhard; and Lassbacher, Anton, 5,316,052, Cl. 140-112.000.

Lattmann, Rene: *See—*
Kalvoda, Jaroslav; Kessler, Martin; Lattmann, Rene; and Ramos, Gerardo, 5,317,100, Cl. 540-357.000.

Laube, Daniel J.: *See—*
Haag, William D.; Emmerson, A. Richard; and Laube, Daniel J., 5,316,039, Cl. 137-454.600.

Lauer, Joseph J.: *See—*
Berkebile, Donald C., deceased; Berkebile, Catherine, Administratrix; Lee, Donald M.; Veneziano, Larry D.; Lauer, Joseph J.; Booth, Roy E.; Hettinger, William P.; and Jones, Willard, 5,316,654, Cl. 208-39.000.

Laukien, Gunter: *See—*
Kasten, Arne; and Laukien, Gunter, 5,317,260, Cl. 324-309.000.

Lauren Manufacturing Company: *See—*
Glover, Michael; and Reichert, Gerhard, 5,315,797, Cl. 52-171.300.

Lavin, Thomas J., to Allied-Signal Inc. Pneumatically dithered ring laser gyroscope. 5,317,381, Cl. 356-350.000.

Law, Brian R.: *See—*
Glover, Paul A.; and Law, Brian R., 5,316,221, Cl. 239-708.000.

Law, Kam C. Wok support ring. 5,315,983, Cl. 126-216.000.

Lawniczak, Gary P.: *See—*
Tachiderer, Paul E.; and Lawniczak, Gary P., 5,317,365, Cl. 355-75.000.

Lawrence, Kristine B.: *See—*
Daly, Robert C.; and Lawrence, Kristine B., 5,317,001, Cl. 503-227.000.

Lawrence Paper Company: *See—*
Hill, Alan M.; and Meeks, William R., 5,316,538, Cl. 493-355.000.

Lawyer, Carl H.: *See—*
Wagle, Sudhakar S.; Steinbach, Thomas; Lawyer, Carl H.; Hermann, William J., Jr.; and Gawish, Ali A. S., 5,316,775, Cl. 424-553.000.

Layfield, Jonathon M. H., to Rubery Owen-Rockwell Limited. Vehicle axle beam and brake assembly. 5,316,111, Cl. 188-205.00R.

Layton, Mark R.; Palmer, Ramon L., Jr.; and Smith, Lester L., to AAI Corporation. Flashover simulation for firefighter training. 5,316,484, Cl. 434-226.000.

Lazar, David W.: *See—*
Guzowski, Raymond J.; and Lazar, David W., 5,316,217, Cl. 239-71.000.

LeBlanc, Ralph W.; and Bingham, Robert M. Diesel fuel cracking unit. 5,316,743, Cl. 422-256.000.

- Lebrun, Christian: *See—*
  - Hamy, Michel; Lebrun, Christian; Thebault, Jean-Michel; Maurer, Ghislain; Michelet, Jacques; and Roth, Jean-Luc, 5,316,270, Cl. 266-159.000.
- LeClaire, John W., to Sring Window Fashions Division, Inc. Swag support. 5,316,067, Cl. 160-348.000.
- Ledbetter, William B., Jr.: *See—*
  - Reininger, Russell; and Ledbetter, William B., Jr., 5,317,701, Cl. 395-375.000.
- Ledebur, Harry C., to KW Industries, Inc. Tube tapering apparatus having a variable orifice die. 5,315,854, Cl. 72-297.000.
- Ledingham, Blake A. Paint brush bristle clamp. 5,315,733, Cl. 15-168.000.
- Ledjeff, Konstantin: *See—*
  - Ahn, Jochen; and Ledjeff, Konstantin, 5,316,643, Cl. 204-265.000.
- Lee, Chang B., to Samsung Electronics Co., Ltd. Cooling water storage tank of a refrigerator. 5,315,845, Cl. 62-338.000.
- Lee, Chun Gyoo, to Samsung Electron Devices Company, Ltd. Stereoscopic image displaying apparatus. 5,317,393, Cl. 348-58.000.
- Lee, Donald M.: *See—*
  - Berkebile, Donald C., deceased; Berkebile, Catherine, Administratrix; Lee, Donald M.; Veneziano, Larry D.; Lauer, Joseph J.; Booth, Roy E.; Hettinger, William P.; and Jones, Willard, 5,316,654, Cl. 208-39.000.
- Lee, Edward K. B.: *See—*
  - Fulghum, Tracy L.; Lee, Edward K. B.; and Cadd, Jimmy W., 5,317,593, Cl. 375-1.000.
- Lee, Ho-Shang, to Dicon Fiberoptics. Conical fiberoptic switch. 5,317,659, Cl. 385-22.000.
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  - Ishida, Emi; Sigmon, Thomas W.; and Lynch, William T., 5,316,969, Cl. 437-168.000.
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  - Ho, Minnie; and Cioffi, John M., 5,317,596, Cl. 375-14.000.
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  - Quate, Calvin F.; Zdeblick, Mark J.; and Albrecht, Thomas R., 5,317,533, Cl. 365-151.000.
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  - Leemhuis, Michael C.; and Westhoff, Daniel J., 5,316,539, Cl. 493-459.000.
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  - Focke, Heinz; and Liedtke, Kurt, 5,316,811, Cl. 428-43.000.

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  - Van Der Plas, Paulus A.; Lifka, Herbert; and Verhaar, Robertus D. J., 5,316,966, Cl. 437-70.000.
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  - Tate, David J., 5,316,149, Cl. 206-584.000.
- Lim, Moo-Seang; Yun, Jong-Man; Park, Chan-Kyu; Lee, Sang-Dae; Ma, Sun-Chae; Oh, Seung-Seob; Jeong, Eui-Sik; and Paek, Kwang-Sun, to Daewoo Electronics Co., Ltd. Multi-way rotary valve. 5,316,042, Cl. 137-625.110.
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  - Chen, Ling; Lin, Tien-ler; and Wu, Albert, 5,317,179, Cl. 257-321.000.
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  - Kratochvil, Cynthia P.; Lin, Yah Hwa E.; and Novak, Thomas J., 5,316,783, Cl. 426-627.000.
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  - Bohnet, Hartmut; Haug, Willi; and Lind, Stefan, 5,316,419, Cl. 408-236.000.
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  - Haehn, Peter-Clemens, 5,316,744, Cl. 422-257.000.
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  - Gross, William H., 5,316,964, Cl. 437-60.000.
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  - Pow, Eric G.; Talaba, Mihai; McNeilly, Leonard; Watkins, David S.; and Lines, Donald A., 5,316,747, Cl. 423-247.000.
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  - Komatsu, Masanori; and Iida, Yasuo, 5,317,063, Cl. 525-330.200.
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  - Vaphiadis, John L., 5,316,273, Cl. 267-64.240.
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  - Livingston, Troy W., 5,316,014, Cl. 128-754.000.
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- Llorente, Jose A.: *See—*
  - Tay, Yew S.; Garay, Oscar; and Llorente, Jose A., 5,317,326, Cl. 343-718.000.
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  - Edwards, Glenn R.; Lloyd, Graham; and Oberman, Marl L., 5,316,017, Cl. 128-782.000.
- Loctite Luminescent Systems, Inc.: *See—*
  - Belek, Ronald E., 5,317,497, Cl. 363-40.000.
- Loeffler, Cynthia: *See—*
  - Ochoa, Augusto C.; Loeffler, Cynthia; Urba, Walter; and Longo, Dan L., 5,316,763, Cl. 424-85.200.
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  - Bogen, Steven A.; and Loeffler, Herbert H., 5,316,452, Cl. 417-412.000.
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- Loesche GmbH: *See—*
  - Kasseck, Klaus, 5,315,940, Cl. 110-345.000.
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  - Wong, John D. E.; Tugnum, Curtis C.; and Logan, James P., 5,316,479, Cl. 434-11.000.
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  - Stanciu, Virgil V.; Peshek, Jack R.; Neece, Faurice D.; Kubulins, Erik R.; and Logozar, Branko, 5,316,707, Cl. 264-40.100.
- Loh, Ralph A.: *See—*
  - Glassey, Eugene A.; and Loh, Ralph A., 5,315,876, Cl. 73-708.000.
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  - Godowski, Paul J.; Lokker, Natalie A.; and Mark, Melanie R., 5,316,921, Cl. 435-69.400.
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  - Santandrea, Luciano; and Lombardi, Massimo, 5,316,228, Cl. 242-1.10R.
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  - McMannis, John D.; and London; Nicholas, 5,316,540, Cl. 494-37.000.
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- Long, Michael E.: *See—*
  - Brock, George W.; and Long, Michael E., 5,317,343, Cl. 346-76.0PH.
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  - Ochoa, Augusto C.; Loeffler, Cynthia; Urba, Walter; and Longo, Dan L., 5,316,763, Cl. 424-85.200.
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  - Hore, Donald G., deceased; Longworth, Norman J.; McCarthy, David; and Pullum, Lionel, 5,316,451, Cl. 417-392.000.
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  - Page, George W.; High, Glen T.; Looper, David L.; Frew, James S.; Prevallet, Larry C.; and Free, Joseph W., 5,315,819, Cl. 60-39.282.
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  - Bale, Richard E.; Banks, Jon M.; Clearman, Melvin R., Jr.; Colson, James C.; Crisp, James M.; Loose, David C.; and Varan, James E., 5,316,281, Cl. 270-58.000.
- Loral Corporation: *See—*
  - Gray, Charles L.; Brooker, John T.; Bardin, Dale E.; and Salby, E. Reeves, II, 5,317,148, Cl. 250-227.260.
- Loral Vought Systems Corporation: *See—*
  - Wallace, William D.; and Smith, Larry E., 5,317,476, Cl. 361-220.000.
- L'Oreal: *See—*
  - Joulia, Gerard, 5,316,399, Cl. 401-127.000.
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- Lorenz, Gisela: *See—*
  - Sauter, Hubert; Schelberger, Klaus; Saur, Reinhold; Lorenz, Gisela; and Ammermann, Eberhard, 5,317,027, Cl. 514-399.000.
- Loria, Adrian M.: *See—*
  - Lent, Bruce A.; and Loria, Adrian M., 5,316,575, Cl. 106-20.00R.
- Loron, Inc.: *See—*
  - Chase, Daniel F., 5,316,433, Cl. 414-607.000.
- Los Alamos Technical Associates, Inc.: *See—*
  - Baker, Forrest A.; and Bradford, Wesley L., 5,316,740, Cl. 422-186.070.
- Loshaek, Samuel: *See—*
  - Soye, Paul J.; and Loshaek, Samuel, 5,316,700, Cl. 264-1.100.
- Losing, Karl-Heinrich: *See—*
  - Hartel, Gunter; Losing, Karl-Heinrich; Schurfeld, Armin; Blaczyk, Johann; and Kerkmann, Harald, 5,315,867, Cl. 73-149.000.
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  - Salas, R. Pito; Edelson, Glenn D.; Kleppner, Paul S.; and Shaver, Robert S., 5,317,686, Cl. 395-157.000.
- Loubinoux, Dominique: *See—*
  - Roncato, Giordano; Fedorowsky, Robert; Boissonnat, Philippe; and Loubinoux, Dominique, 5,316,561, Cl. 65-1.000.

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Lu, Jin-Yuh: *See*—
  Chiang, Wen-Yen; and Lu, Jin-Yuh, 5,317,069, Cl. 526-262.000.
Lu, Shih-Lai; Kobe, James J.; Moon, John D.; Freeman, Maurice E.; Rouser, Forrest J.; Heiti, Robert V.; and Boettcher, Thomas E., to Minnesota Mining and Manufacturing Company. Recloseable mechanical fastener based on a composite article. 5,316,849, Cl. 428-355.000.
Lucas Industries public limited company: *See*—
  Smith, Trevor S., 5,315,818, Cl. 60-39.281.
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Lucas, Marvin A.: *See*—
  Klaus, J. Michael; and Lucas, Marvin A., 5,316,073, Cl. 165-11.100.
Lucassen, Guenter: *See*—
  Pinto, Akiva; Lucassen, Guenter; and Schmidt, Reinhard, 5,315,738, Cl. 19-145.500.
Luder, Ernst; and Hochholzer, Volker. Method of producing electronic switching element. 5,316,893, Cl. 430-313.000.
Ludwig Institute for Cancer Research: *See*—
  Whitehead, R. H.; Burgess, Anthony; and Zhang, Hui-Hua, 5,316,937, Cl. 435-240.300.
Lugaresi, Thomas J.: *See*—
  Uebbing, John J.; Lugaresi, Thomas J.; and Pitou, David, 5,317,149, Cl. 250-231.140.
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Luken, William L., Jr., to International Business Machines Corporation. Parametric curve evaluation method and apparatus for a computer graphics display system. 5,317,682, Cl. 395-142.000.
Lundquist, Ingemar H. Torquable catheter and method. 5,315,996, Cl. 128-642.000.
Lundquist, Jan; Stenstrom, Lennart; and Akervall, Sven, to Asea Brown Boveri AB. Surge arrester assembly. 5,317,473, Cl. 361-117.000.
Lundsten, Lars: *See*—
  Sandstrom, Roland; Maxe, Ann; Strandberg, Tore; Lundsten, Lars; and Andersson, Alvar, 5,316,076, Cl. 165-84.000.
Luo, Lifeng: *See*—
  Couch, Richard W., Jr.; Sanders, Nicholas A.; Luo, Lifeng; Sobr, John; and Backander, Patrik, 5,317,126, Cl. 219-121.510.
Lupi, Annibale M.; and Lupi, Massimo G., to Data Delay Devices, Inc. Compensated digital delay circuit. 5,317,219, Cl. 307-603.000.
Lupi, Massimo G.: *See*—
  Lupi, Annibale M.; and Lupi, Massimo G., 5,317,219, Cl. 307-603.000.
Lurie, Keith G.; and Wiegn, Phi, to University of Minnesota, Regents of the. Enzymatic fluorometric assay for adenylate cyclase. 5,316,907, Cl. 435-4.000.
Lurois, Patrick, to Compagnie Generale des Etablissements Michelin - Michelin & Cie. Tire tread for heavy vehicles. 5,316,062, Cl. 152-209.00R.
Luscombe-Mills, Richard J.: *See*—
  Sewell, Peter B.; and Luscombe-Mills, Richard J., 5,316,741, Cl. 422-186.210.
Lussi, Andre ; Zurbuchen, Hans; and von Gunten, Jurg, to Sintra Holding AG. Brewing device for a coffee machine and method of producing coffee. 5,316,781, Cl. 426-433.000.
Luster, Troy R.: *See*—
  Krzycki, Edwin A.; Luster, Troy R.; and Stone, David L., 5,317,690, Cl. 395-200.000.
Lustig, Naftali E.: *See*—
  Fleischman, Aaron J.; Lustig, Naftali E.; and Schad, Robert G., 5,317,190, Cl. 257-743.000.
Luther, James P.: *See*—
  Szentesi, Otto I.; and Luther, James P., 5,317,661, Cl. 385-31.000.
Luyten, Peter R.: *See*—
  Den Hollander, Jan A.; Luyten, Peter R.; and Van Stapele, Reurt P., 5,317,261, Cl. 324-309.000.
Lyle, Vicki A.: *See*—
  Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,317,097, Cl. 536-24.310.
Lynch, William T.: *See*—
  Ishida, Emi; Sigmon, Thomas W.; and Lynch, William T., 5,316,969, Cl. 437-168.000.
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  Wong, Hung Y.; and Magalotti, Mark W., 5,317,402, Cl. 348-705.000.
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  Grobert, Paul H., 5,317,322, Cl. 342-378.000.
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  Morozov, Victor A.; Kanachine, Serguei P.; Krasnochtchekov, Iouri I.; Makienko, Alexandre I.; Matveev, Valentine A.; Khriachtchev, Valeri G.; and Tan, Poi-Sik, 5,315,843, Cl. 62-309.000.
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  Decarie, Andre P.; Brown, David L.; Malinowski, Stanley J.; and Dunklee, Douglas M., 5,315,985, Cl. 128-4.000.
Malkowski, Chester, Jr.: *See*—
  Bruski, Gary P.; and Malkowski, Chester, Jr., 5,317,117, Cl. 200-144.00R.
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  Tittgemeyer, Udo, 5,316,798, Cl. 427-409.000.
Manack, Jack E.: *See*—
  Wu, Chyang J.; and Manack, Jack E., 5,316,653, Cl. 205-245.000.
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Mandel, Alan F.: *See*—
  Vercellotti, Leonard C.; Mandel, Alan F.; Ravas, Richard J.; Schlotterer, John G.; and Neuner, James A., 5,317,309, Cl. 340-825.540.
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  Land, Marty W.; Mangrum, Russell E.; and Martin, Joseph W., 5,316,156, Cl. 211-149.000.
Maniar, Manoj: *See*—
  Domb, Abraham J.; and Maniar, Manoj, 5,317,079, Cl. 528-271.000.
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  Pearcy, English C.; and Manktala, Hersh K., 5,317,608, Cl. 376-261.000.
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  Charnow, Morris; and Manners, Frederick, 5,316,252, Cl. 248-223.400.
Mannesmann Rexroth GmbH: *See*—
  Fischer, Helmut, 5,315,829, Cl. 60-456.000.
  Stellwagen, Armin; and Scandella, Walter, 5,315,828, Cl. 60-426.000.
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  Groten, Robert; Heidecke, Gerhard; Mannsbart, Thomas; and Siekermann, Volker, 5,316,832, Cl. 428-224.000.
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  Hindman, Gregory; Berg, Jack; and Manos, Peter N., II, 5,317,187, Cl. 257-659.000.
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  Ross, Gerald F.; Mara, Richard M.; Robbins, Kenneth W.; and Fontana, Robert J., 5,317,303, Cl. 340-539.000.
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Marcusen, David P., to Prince Corporation. Vacuum container holder. 5,316,255, Cl. 248-362.000.
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  Amzajerdian, Farzin; and Margalit, Eli, 5,317,376, Cl. 356-28.500.
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  Patterson, Donald E.; Hauge, Robert H.; Chu, C. Judith; and Margrave, John L., 5,316,795, Cl. 427-249.000.
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  Godowski, Paul J.; Lokker, Natalie A.; and Mark, Melanie R., 5,316,921, Cl. 435-69.400.
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Markle, James R.: *See*—
  Krone-Schmidt, Wilfried; and Markle, James R., 5,316,560, Cl. 55-385.200.
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  Markling, Floyd F.; Markling, Tracy A.; and Harlow, Robert A., 5,316,377, Cl. 301-64.700.
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  Dibble, Eric P.; Hanakovic, Steven L.; Markovich, Voya R.; Niedrich, Daniel S.; Vlasak, Gary P.; Zarr, Richard S.; and Senger, Richard C., 5,316,788, Cl. 427-98.000.
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  Doke, Michael J.; Howarth, Richard A.; and Recine, Leonard J., Sr., 5,315,830, Cl. 62-3.200.
Marquip Inc.: *See*—
  Thomas, Richard H.; and Langreck, Gerald K., 5,316,109, Cl. 188-41.000.
Marr, Roy J.: *See*—
  Pavely, Andrew P.; Marr, Roy J.; Foskett, Peter S.; and White, David M., 5,316,166, Cl. 220-269.000.
Mars Incorporated: *See*—
  Barnes, Elwood E.; Bernardini, Ronald R.; and June, Geoffrey A., 5,316,124, Cl. 194-206.000.
Marshall, Sameul F.: *See*—
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  Land, Marty W.; Mangrum, Russell E.; and Martin, Joseph W., 5,316,156, Cl. 211-149.000.
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  Amberntson, David S., 5,315,888, Cl. 74-5.500.
  Rossier, Glenn E.; Duke, Steven R.; Proulx, Edward A.; and Jarvis, Stephen A., 5,315,913, Cl. 89-12.000.
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  McElhaney, Stephanie A.; and Chiles, Marion M., 5,317,158, Cl. 250-367.000.
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Martini, Gary T.: *See*—
  Rowe, Raymond G.; Martini, Gary T.; Galaske, Lawrence J., Jr.; White, Douglas J.; and Robinson, Mark A., 5,316,203, Cl. 228-118.000.
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  Shimizu, Katsumi; Maruoka, Kazumi; and Yamagishi, Kiyoshi, 5,316,030, Cl. 134-105.000.
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Masahiro Irie: *See*—
  Tsujioka, Tsuyoshi; Tatezono, Fumio; Matsuura, Koutaro; and Irie, Masahiro, 5,316,900, Cl. 430-495.000.

Masaoka, Isao: *See—*
  Kato, Takahiko; Ikeda, Shinzo; Aono, Yasuhisa; Izumiya, Masakiyo; Nakata, Kiyotomo; Masaoka, Isao; and Takahashi, Heishichiro, 5,316,597, Cl. 148-327.000.

Masci, Frank M.: *See—*
  Banker, Dennis C.; Carlson, Tore A.; Dorler, Jack A.; Hendricks, Paul D.; Klara, Walter S.; Masci, Frank M.; and Struk, James R., 5,317,208, Cl. 307-454.000.

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  Hartwell, Rae; and Garben, Ian, 5,316,355, Cl. 292-347.000.

Mashata, Moshe. Power-driven pipe cutting device. 5,315,759, Cl. 30-97.000.

Mashita, Atsushi: *See—*
  Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.

Masip i Balduque, Josep M.: *See—*
  Penaranda, Mariano; Millan, Jose ; Falco, Desiderio; Masip i Balduque, Josep M.; and Rodriguez, Emilio, 5,316,382, Cl. 366-129.000.

Mason, Bradley R.; and Mason, Jeffrey T., to Breg, Inc. Fluid container stand for therapeutic treatments. 5,316,250, Cl. 248-165.000.

Mason, Jeffrey T.: *See—*
  Mason, Bradley R.; and Mason, Jeffrey T., 5,316,250, Cl. 248-165.000.

Masse, Joel: *See—*
  Sabate, Bernard; Masse, Joel; and Jeanty, Gerard, 5,317,047, Cl. 524-16.000.

Massey, Lee R.: *See—*
  Martin, Michael J.; Gibson, William C.; and Massey, Lee R., 5,316,469, Cl. 431-116.000.

Masten, Barbara C., administratrix: *See—*
  Dorsey, William I.; Masten, John J., Jr., deceased; Schroedl, Richard M.; and Will, Donald G., 5,317,338, Cl. 346-1.100.

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Masten, John J., Jr., deceased: *See—*
  Dorsey, William I.; Masten, John J., Jr., deceased; Schroedl, Richard M.; and Will, Donald G., 5,317,338, Cl. 346-1.100.

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  Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,316,972, Cl. 437-187.000.

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  Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,317,397, Cl. 348-416.000.

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Masunaga, Makoto: *See—*
  Kozuki, Susumu; Tezuka, Nobuo; and Masunaga, Makoto, 5,317,455, Cl. 360-35.100.

Matchbox Toys (USA) Ltd.: *See—*
  Ellman, Steven; Ellman, Fredric; Ellman, Julius; and Fusi, John C., 5,316,514, Cl. 446-26.000.

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  Rodgers, Michael B.; Mezynski, Stanley M.; Halasa, Adel F.; Hsu, Wen-Liang; Matrana, Barry A.; and Cox, Joel L., 5,317,062, Cl. 525-237.000.

Matsubara, Ken: *See—*
  Masuda, Tomohiko; Matsubara, Ken; Yagi, Tsukasa; Wakamiya, Koji; and Kitano, Hirohisa, 5,317,347, Cl. 346-160.000.

Matsubara, Yoshihiro: *See—*
  Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,317,267, Cl. 324-402.000.

Matsuda, Nobuhide; and Kuroda, Motoki, to Matsushita Electric Industrial Co., Ltd. Reduced height magnetic bias apparatus for a magnetooptical disk drive including a coil means having a central axis perpendicular to the rotating axis of a rotatable magnet. 5,317,548, Cl. 369-13.000.

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Matsudaira, Takeo: *See—*
  Suzuki, Hisanori; and Matsudaira, Takeo, 5,316,844, Cl. 428-323.000.

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  Taguchi, Masahiro; Tominaga, Motonori; and Matsuhashi, Toshiaki, 5,316,336, Cl. 280-730.00A.

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  Miyadera, Toshiyuki; Okano, Makoto; and Matsui; Fumio, 5,316,899, Cl. 430-495.000.

Matsui, Nobuo: *See—*
  Tazaki, Seiji; Yagihara, Tomio; Matsui, Nobuo; Yanagisawa, Atsushi; and Kojima, Takakazu, 5,317,102, Cl. 544-336.000.

Matsui, Tetsuya: *See—*
  Fujimori, Haruo; Matsui, Tetsuya; Ajiro, Taiko; Yokose, Kenji; and Izumi, Shigeru, 5,316,983, Cl. 437-250.000.

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  Oshima, Akira; Iwata, Kazushi; Muragaki, Yasuteru; Bai, Yasuo; Matsumoto, Eisaku; and Miyamoto, Satoshi, 5,316,914, Cl. 435-7.940.

Matsumoto, Kinya: *See—*
  Furuya, Akihiro; and Matsumoto, Kinya, 5,316,114, Cl. 188-299.000.

Matsumoto, Manabu: *See—*
  Nakabayashi, Masayoshi; and Matsumoto, Manabu, 5,317,372, Cl. 355-311.000.

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  Toyoda, Tetsuro; and Matsuoka, Katsunori, 5,316,997, Cl. 502-314.000.

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  Hashimoto, Kazuhiko; and Endo, Masayuki, 5,316,891, Cl. 430-296.000.
  Hirose, Atsushi, 5,316,485, Cl. 434-322.000.
  Honsho, Hironori; and Saito, Fuminari, 5,316,234, Cl. 242-198.000.
  Iwami, Kenichi; Kawasaki, Kazuhisa; and Nakada, Seiichi, 5,315,773, Cl. 38-77.600.
  Iwase, Akira; Iwaki, Hirofumi; Kaneko, Toshikazu; Kubo, Isao; and Sato, Koichi, 5,316,557, Cl. 29-623.500.
  Kasazumi, Kenishi; Kato, Makoto; and Kobayashi, Ikunori, 5,317,435, Cl. 359-69.000.
  Kuwahara, Yasuhiro, 5,317,420, Cl. 358-463.000.
  Matsuda, Nobuhide; and Kuroda, Motoki, 5,317,548, Cl. 369-13.000.
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  Monta, Hiroki; Tsuji, Toshiaki; and Imai, Kiyoshi, 5,317,410, Cl. 348-638.000.
  Morimura, Atsushi; and Uomori, Kenya, 5,317,685, Cl. 395-152.000.
  Morioka, Yoshihiro, 5,317,412, Cl. 358-310.000.
  Murai, Hiroyuki; Bito, Yasuhiko; Hasegawa, Masaki; Ito, Shuji; and Toyoguchi, Yoshinori, 5,316,875, Cl. 429-194.000.
  Obana, Noboru; and Satoh, Mitsuo, 5,317,624, Cl. 379-61.000.
  Okamoto, Shusaku; Maeda, Toshiyuki; and Maehara, Fumio, 5,317,508, Cl. 364-419.010.
  Onishi, Hiroshi, 5,317,002, Cl. 503-227.000.
  Shiono, Teruhiro, 5,317,551, Cl. 369-44.120.
  Takehashi, Shinitsu; Hatada, Kenzo; and Fujimoto, Hiroaki, 5,316,204, Cl. 228-179.100.
  Tamaki, Tomohiro; Hatada, Kenzo; Fujimoto, Hiroaki; and Takeshita, Yoshinobu, 5,316,610, Cl. 156-379.600.
  Urano, Miki; and Taniguchi, Takashi, 5,317,526, Cl. 364-715.030.
  Wakabayashi, Noriaki; and Yoshiura, Tsukasa, 5,317,468, Cl. 360-135.000.
  Wakabayashi, Shinichi; Tougou, Hitomaro; Toyoda, Yukio; and Ohki, Yoshimasa, 5,316,640, Cl. 204-192.340.

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  Sawada, Kazuo; and Sasaki, Kenji, 5,317,648, Cl. 382-17.000.

Matsushita Electronics Corporation: *See—*
  Tamaki, Tomohiro; Hatada, Kenzo; Fujimoto, Hiroaki; and Takeshita, Yoshinobu, 5,316,610, Cl. 156-379.600.

Matsushita Graphic Communication Systems, Inc.: *See—*
  Fujimoto, Munenori, 5,317,422, Cl. 358-476.000.
  Yamamura, Katsumi; and Hanaoka, Hideyuki, 5,317,417, Cl. 358-451.000.

Matsushita Refrigeration Company: *See—*
  Yoshimura, Takao; Morita, Ichiro; and Ogahara, Hideharu, 5,316,455, Cl. 418-63.000.

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  Tsujioka, Tsuyoshi; Tatezono, Fumio; Matsuura, Koutaro; and Irie, Masahiro, 5,316,900, Cl. 430-495.000.

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  Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 5,316,595, Cl. 148-302.000.

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  Tomioka, Junsuke; Nagai, Kazunori; and Matsuzaki, Akihiro, 5,316,742, Cl. 117-217.000.

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  Hyman, Greg; Reiner, Lawrence; Caveza, Martin J.; and Newbold, Roger A., 5,316,515, Cl. 446-28.000.

Matthews, Norris W.: *See—*
  Biesecker, Lisa B.; Forte, Glenn J.; Boyle, Justin P.; and Matthews, Norris W., 5,315,811, Cl. 53-474.000.

Matukuma, Hiroyuki: *See—*
  Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.

Matuscheck, Hans J.: *See—*
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  Golukhov, Albert; Baker, Josefina T.; and Matusewicz, Richard S., 5,316,732, Cl. 422-102.000.

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Maurer, Ghislain: *See—*
  Hamy, Michel; Lebrun, Christian; Thebault, Jean-Michel; Maurer, Ghislain; Michelet, Jacques; and Roth, Jean-Luc, 5,316,270, Cl. 266-159.000.

Maurer, Manfred F., to General Electric Company. Anti-rotation bracket for a flanged connection spaced from fixed structure. 5,316,346, Cl. 285-23.000.

Max Levy Autograph, Inc.: *See—*
  Sedberry, Donald C., 5,317,342, Cl. 346-76.0PH.

Maxe, Ann: *See—*
  Sandstrom, Roland; Maxe, Ann; Strandberg, Tore; Lundsten, Lars; and Andersson, Alvar, 5,316,076, Cl. 165-84.000.

Mayer, Burkhard: *See—*
  Weber, Wilfried; Mallee, Rainer; Hein, Bernd; Mayer, Burkhard; Guth, Harald; and Haage, Manfred, 5,315,800, Cl. 52-309.100.

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Mayzes, Edward W. Monoport airgun for seismic exploration having discharge port extending continuously for 360 degree around its axis. 5,315,917, Cl. 91-418.000.

Mazada Motor Corporation: *See—*
  Akita, Ryuya; and Hirabayashi, Shigefumi, 5,316,098, Cl. 180-140.000.

Mazda Motor Corporation: *See—*
  Abe, Mitsutoshi; and Yashiki, Seiji, 5,315,897, Cl. 477-98.000.
  Ohya, Takeji, 5,316,364, Cl. 296-146.500.

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  Slicker, James; Mazur, Joseph S.; and Breen, Michael T., 5,316,116, Cl. 477-181.000.

McAninch, Thomas S., to Detroit Receiving Hospital & University Health Center. Splint pad. 5,316,544, Cl. 602-5.000.

McCabe, Terrill R., to Wilson Sporting Goods Co. Golf clubhead with multi-material soleplate. 5,316,305, Cl. 273-174.000.

McCartha, Robert D. Junction box support for suspended ceilings. 5,316,254, Cl. 248-343.000.

McCarthy, David: *See—*
  Hore, Donald G., deceased; Longworth, Norman J.; McCarthy, David; and Pullum, Lionel, 5,316,451, Cl. 417-392.000.

McClelland, Robert: *See—*
  Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., 5,317,236, Cl. 315-169.300.

McCord Winn Textron: *See—*
  Bishai, Macram N., 5,316,371, Cl. 297-339.000.

McCormack Manufacturing Co., Inc.: *See—*
  Ressler, Thomas B., 5,315,836, Cl. 62-81.000.

McCormick, Allyn L.: *See—*
  Aghajanian, Michael K.; Keck, Steven D.; Burke, John T.; Hannon, Gregory E.; Becker, Kurt J.; Taylor, Steven J.; Wiener, Robert J.; and McCormick, Allyn L., 5,316,069, Cl. 164-97.000.

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  Murray, William J.; McCullough, Mark K.; Brubaker, Philip D.; and Manicke, Paul S., 5,316,202, Cl. 228-5.500.

McDermott, William E.: *See—*
  Spiegel, Lyle B.; and McDermott, William E., 5,316,720, Cl. 419-48.000.

McDonough, James J.: *See—*
  Gallo, Antonio R.; McDonough, James J.; Robbins, Gordon J.; and Shaw, Robert R., 5,317,657, Cl. 385-14.000.

McElhaney, Stephanie A.; and Chiles, Marion M., to Martin Marietta Energy Systems, Inc. Unitary scintillation detector and system. 5,317,158, Cl. 250-367.000.

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  Brant, Patrick; McElrath, Kenneth O., Jr.; and Robertson, Martha H., 5,317,070, Cl. 526-348.500.

McEwen, John C.: *See—*
  Howell, David C.; and McEwen, John C., 5,315,946, Cl. 112-265.100.

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  Kenyon, Christopher; Macklem, Peter; and Eidelman, David, 5,317,644, Cl. 382-6.000.

McGowan, Donald A.: *See—*
  Arnost, Michael J.; Chinoporos, Efthimios; McGowan, Donald A.; and Waller, David P., 5,316,887, Cl. 430-203.000.

McGraw, Raymond V. Self-leveling paint can holder for ladders. 5,316,251, Cl. 248-210.000.

McGuinness, Morgan. Vehicles visor position retainer. 5,316,362, Cl. 296-97.900.

McHargue, William B.: *See—*
  Lemke, James U.; French, William W.; and McHargue, William B., 5,317,463, Cl. 360-97.020.

McKernan, John L. Sleeve for dead bolt. 5,316,353, Cl. 292-337.000.

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  Misselbrook, John; McKinney, Larry J.; Lefiles, James H.; Hoff, Edwin F., Jr.; and Bergman, Elliot, 5,317,004, Cl. 504-116.000.

McKnight, Alexander; and Wodruff, Geoffrey N. 7-((substituted-)amino)-8((substituted)carbonyl)-methylamino-1-oxaspiro(4,5)decanes useful in Parkinson's disease, dystonia, and other movement disorders. 5,317,028, Cl. 514-409.000.

McLeod, Bruce R., to Life Resonances, Inc. Portable magnetic field analyzer for sensing ion specific resonant magnetic fields. 5,316,634, Cl. 204-155.000.

McMannis, John D.; and London, Nicholas, to Cobe Laboratories. Apparatus and method for separating microscopic units in a substantially continuous density gradient solution. 5,316,540, Cl. 494-37.000.

McMichael, James C.: *See—*
  Skelley, Arthur P.; McMichael, James C.; Cobb, James T., Jr.; Rohrer, Wesley M., Jr.; Custer, Phillip E., II; and Elsubki, Taha M., 5,316,737, Cl. 422-170.000.

McMillan, Larry D.; Paz de Araujo, Carlos A.; and Roberts, Tom L., to Symetrix Corporation. Apparatus for forming a thin film with a mist forming means. 5,316,579, Cl. 118-50.000.

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  Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., 5,317,689, Cl. 395-163.000.

McNair, Samuel S., Jr.; and Gault, David M., to Hoechst Celanese Corporation. Process for the production of cellulose ester fibrets. 5,316,705, Cl. 264-5.000.

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  Lesneski, Bernard F., 5,316,458, Cl. 425-34.100.

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  Pow, Eric G.; Talaba, Mihai; McNeilly, Leonard; Watkins, David S.; and Lines, Donald A., 5,316,747, Cl. 423-247.000.

McNelis, Jim A.: *See—*
  Bourg, Haden J., Jr.; McNelis, Jim A.; and Weiler, Peter, 5,316,976, Cl. 437-195.000.

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  Green, Lawrence W.; and McRae, Glenn, 5,316,635, Cl. 295-157.220.

McTaggart, Nancy B., to Plaster, Lee C. Adjustable neckline blouse. 5,315,712, Cl. 2-106.000.

McVey, John B.; and Kennedy, Jan B., to United Technologies Corporation. Mechanism for controlling the rate of mixing in combusting flows. 5,315,815, Cl. 60-39.060.

Mead, George S., to United States of America, Navy. Electronic counter countermeasure circuit for automatic gain control by electronic countermeasure deception. 5,317,314, Cl. 342-16.000.

Medicke, John A.; and Posharow, Paul, to International Business Machines Corporation. System and method for finite state machine processing using action vectors. 5,317,757, Cl. 395-800.000.

Medrad, Inc.: *See—*
  Hellmick, Mark; Johansson, Leif A.; and Weber, Otto, 5,317,619, Cl. 378-173.000.

Meeks, William R.: *See—*
  Hill, Alan M.; and Meeks, William R., 5,316,538, Cl. 493-355.000.

Meenan, Joseph E., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Lever action spray pump dispenser. 5,316,185, Cl. 222-321.000.

Mehta, Nikhil A.: *See—*
  Jewett, Douglas E.; Webster, Phil; Aldridge, Dave; Norwood, Peter C.; and Mehta, Nikhil A., 5,317,752, Cl. 395-750.000.

Meissner, Ralph, to Siemens Aktiengesellschaft. Local Antenna with homogeneous sensitivity for a nuclear magnetic resonance imaging apparatus. 5,317,266, Cl. 324-318.000.

Meister, Gisela: *See—*
  Pichlmaier, Albert; and Meister, Gisela, 5,317,637, Cl. 380-25.000.

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  Jurjevic, Ivan; Melamed, Kasriel; and Wendt, Joachim, 5,315,756, Cl. 29-748.000.

Melkonian, George; and Crippen, Michael R., to Mikron Industries. Extrusion calibrator with insert plates. 5,316,459, Cl. 425-71.000.

Melton, Cynthia, to Motorola, Inc. Method for forming gold bump connection using tin-bismuth solder. 5,316,205, Cl. 228-180.210.

Menegaz, M. Eric: *See—*
  Izoard, Jean; Menegaz, M. Eric; Drillat, Jean-Louis; and Le Maitre, Philippe, 5,317,471, Cl. 361-105.000.

Mercer, Gary: *See—*
  Burkett, Doug; and Mercer, Gary, 5,317,130, Cl. 219-497.000.

Mercier, Craig A.: *See—*
  Sears, Thomas H., 5,316,401, Cl. 401-139.000.

Merck & Co., Inc.: *See—*
  MacConnell, John G.; Arison, Byron H.; Doss, George A.; and Monaghan, Richard L., 5,317,031, Cl. 514-452.000.
  Ok, Hyun O.; Schoen, William R.; and Wyvratt, Matthew, 5,317,017, Cl. 514-211.000.

Merck Sharp & Dohme Limited: *See—*
  Baker, Raymond; Reeve, Austin J.; and Street, Leslie J., 5,317,103, Cl. 544-367.000.

Mergenthaler, Rolf-Hermann: *See—*
  Becker, Rolf; Belzner, Ulrich; Mergenthaler, Rolf-Hermann; and Heess, Gerhard, 5,316,379, Cl. 303-100.000.

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Merlin, Gerin: *See*—
  Izoard, Jean; Menegaz, M. Eric; Drillat, Jean-Louis; and Le Maitre, Philippe, 5,317,471, Cl. 361-105.000.
Merlo, Donald J.: *See*—
  Loesch-Fries, L. Sue; Eagan, Nancy J.; Merlo, Donald J.; and Alexandrescu, Carol, 5,316,930, Cl. 435-172.300.
Merrell Dow Pharmaceuticals: *See*—
  Margolin, Alexey L., 5,316,944, Cl. 435-280.000.
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  Prentiss, Mara; Mervis, Juliet A.; Bloom, Adam H.; and Zarinetchi, Farhad, 5,317,452, Cl. 359-819.000.
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  Capp, Patrick O., 5,316,507, Cl. 439-886.000.
Metrawatt GmbH: *See*—
  Feuerlein, Friedrich; and Muller, Helmut, 5,316,164, Cl. 220-3.200.
Meyer, A. Douglas: *See*—
  Maas, Steven J.; and Meyer, A. Douglas, 5,317,544, Cl. 367-149.000.
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  Ramacier, Patrick J., Jr.; and Meyer, David W., 5,316,041, Cl. 137-614.040.
Meyer, Richard A.; and Olson, Douglas J., to MTS Systems Corporation. Six axis load cell. 5,315,882, Cl. 73-862.044.
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  Davis, Leo W., 5,316,272, Cl. 267-64.130.
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Meyerson, Bernard S., to International Business Machines Corporation. Method of dopant enhancement in an epitaxial silicon layer by using germanium. 5,316,958, Cl. 437-31.000.
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  Rodgers, Michael B.; Mezynski, Stanley M.; Halaas, Adel F.; Hsu, Wen-Liang; Matrana, Barry A.; and Cox, Joel L., 5,317,062, Cl. 525-237.000.
MFM Technology, Inc.: *See*—
  Moritz, Frederick G.; and Masciatti, Roger, 5,317,245, Cl. 318-254.000.
Michel, Pierre: *See*—
  Girard, Laurent; Krysinski, Tomasz; and Michel, Pierre, 5,316,240, Cl. 244-17.270.
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  Hamy, Michel; Lebrun, Christian; Thebault, Jean-Michel; Maurer, Ghislain; Michelet, Jacques; and Roth, Jean-Luc, 5,316,270, Cl. 266-159.000.
Michon, Gerald J., to General Electric Company. Fixed-pattern noise correction circuitry for solid-state imager. 5,317,407, Cl. 348-306.000.
Mick, Jeffery M.: *See*—
  Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., 5,317,739, Cl. 395-650.000.
Micro Control Company: *See*—
  Olson, Donald R., 5,317,254, Cl. 323-316.000.
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  Kumar, Nalin, 5,317,006, Cl. 204-298.120.
Micron Semiconductor, Inc.: *See*—
  Roberts, Martin C., 5,317,197, Cl. 257-401.000.
Middlemiss, David: *See*—
  Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Montana, John G.; Pass, Martin; and Judd, Duncan B., 5,317,023, Cl. 514-303.000.
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  Wang, Da Y.; Kennedy, Daniel T.; Middleton, Thomas R.; and MacAllister, Burton W., 5,316,973, Cl. 437-188.000.
Midwest Research Institute: *See*—
  Olson, Jerry M.; and Kurtz, Sarah R., 5,316,593, Cl. 136-262.000.
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  Allison, Joseph M.; Buchina, Raymond A.; Mieskowski, James D.; Thomas, Edward J.; and Davenport, John M., 5,317,237, Cl. 315-307.000.
Mignani, Gerard: *See*—
  Blanchard, Christiane; Chassagneux, Evelyne; Mignani, Gerard; and Vaultier, Michel, 5,316,986, Cl. 501-96.000.
Mihara, Kazumasa: *See*—
  Katayama, Keiichi; Kato, Mitsuo; Tsurusaki, Kazuya; Hanamoto, Mikio; Mihara, Kazumasa; and Eguchi, Takatoshi, 5,317,121, Cl. 219-672.000.
Mihic, Wlajko. Arrangement in insert holders. 5,315,908, Cl. 83-845.000.
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  Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, 5,316,472, Cl. 432-241.000.
Mikhail, Youssef M.: *See*—
  Swathirajan, Sundararajan; and Mikhail, Youssef M., 5,316,871, Cl. 429-33.000.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, to Canon Kabushiki Kaisha. Process for forming deposited film by use of alkyl aluminum hydride and process for preparing semiconductor device. 5,316,972, Cl. 437-187.000.
Mikron Industries: *See*—
  Melkonian, George; and Crippen, Michael R., 5,316,459, Cl. 425-71.000.
Mikuni Corporation: *See*—
  Muraji, Tetsuo, 5,317,674, Cl. 395-3.000.
Miles Inc.: *See*—
  Brown, Karen K.; Ruiz, Linda L. C.; van de Rijn, Ivo; Greene, Nathan D.; Trump, Sandy L.; Wilson, Curtis D.; and Bryant, Sharon A., 5,316,926, Cl. 435-101.000.
Miles, Michael: *See*—
  Denham, Keith; and Miles, Michael, 5,315,744, Cl. 29-243.530.
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Millar, George D. Individual tooth toothbrush. 5,315,731, Cl. 15-167.100.
Millar, Sharon L.: *See*—
  Shizuya, Hiroaki; and Millar, Sharon L., 5,317,098, Cl. 536-23.100.
Miller, Albert H.; and Wright, Maynard A., to RC Concepts, Inc. Switched active fault locate filter. 5,317,278, Cl. 328-167.000.
Miller, Douglas C., to Plasta Fiber Industries Corp. Expandable visor. 5,316,361, Cl. 296-97.800.
Miller, Gary R.: *See*—
  Walls, John E.; Miller, Gary R.; and Ryan, Raymond W., Jr., 5,316,892, Cl. 430-309.000.
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., to Research Foundation of State University of New York, The. Mutations in the gene encoding the α chain on platelet glycoprotein IB. 5,317,097, Cl. 536-24.310.
Miller, Joseph T., to Mocap Incorporated. Encased flashlight. 5,317,490, Cl. 362-206.000.
Miller, Ray R. Reinforced fluted medium and corrugated fiberboard made using the medium. 5,316,828, Cl. 428-182.000.
Miller, Robert H., Jr.: *See*—
  Yetter, Jeffry D.; and Miller, Robert H., Jr., 5,317,204, Cl. 307-443.000.
Miller, Stephen R.: *See*—
  Welch, James L.; and Miller, Stephen R., 5,316,265, Cl. 254-362.000.
Miller, Thomas G.: *See*—
  Hilbert, Lee A.; Edlin, George R.; Riley, Leon H.; Miller, Thomas G.; Gebhart, Wilford W.; and Johnson, Charles L., 5,317,160, Cl. 250-390.120.
Miller, Wayborn M. Manhole cover support. 5,316,407, Cl. 404-25.000.
Miller, William H.: *See*—
  Palma, Rodolfo; and Miller, William H., 5,317,227, Cl. 310-156.000.
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  Adams, Louis W., Jr.; Gilpatrick, Michael W.; and Gregory, Richard V., 5,316,830, Cl. 428-195.000.
  Thompson, Carl D., 5,316,138, Cl. 206-223.000.
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Mills, Gary N.; and Homayoun, Habib, to Instromedix, Inc. Wrist-worn ECG monitor with battery end of life prediction. 5,317,269, Cl. 324-427.000.
Mimms, Donald H.; and Mimms, Pamala V. Portable cat litter box with electrically powered ventilation. 5,315,964, Cl. 119-165.000.
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  Suga, Fusao; and Minami, Narutoshi, 5,316,008, Cl. 128-700.000.
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Minneosta Mining and Manufacturing Company: *See*—
  Hammar, W. James; and Nave, Miriam D., 5,317,074, Cl. 528-44.000.
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  Bolognese, Renato; Notini, Marco; and Pastorino, Gian C., 5,316,284, Cl. 271-121.000.
  Crandall, Michael D.; and Joseph, Eugene G., 5,316,838, Cl. 428-283.000.
  George, Billy L.; and Brown-Wensley, Katherine A., 5,316,824, Cl. 428-145.000.
  Lu, Shih-Lai; Kobe, James J.; Moon, John D.; Freeman, Maurice E.; Rouser, Forrest J.; Heiti, Robert V.; and Boettcher, Thomas E., 5,316,849, Cl. 428-355.000.
  Luhman, Robert A.; Kuhn, Gary K.; Perrington, Kenneth J.; Kropp, Karl M.; and Gruber, Michael W., 5,316,424, Cl. 412-8.000.
  Samuelson, Bruce E.; and Butzer, Susan M., 5,316,613, Cl. 156-540.000.
  Stout, George M.; Homan, James G.; Mlinar, John R.; and Wright, Larry R., 5,316,812, Cl. 428-64.000.
  Vacca, Alberto; and Sgarbi, Aldo, 5,316,901, Cl. 430-512.000.
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  Masuda, Tomohiko; Matsubara, Ken; Yagi, Tsukasa; Wakamiya, Koji; and Kitano, Hirohisa, 5,317,347, Cl. 346-160.000.
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  Kouno, Hiroyuki; Yazawa, Minobu; and Kumamoto, Toshio, 5,317,312, Cl. 341-158.000.
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  Teraoka, Eiichi; Kengaku, Toru; and Ishida, Hiroichi, 5,317,529, Cl. 364-724.100.
  Watanabe, Shinya, 5,317,193, Cl. 257-774.000.
  Yamamoto, Kazuya, 5,317,276, Cl. 328-155.000.
  Yoshimoto, Kyosuke; and Shimoda, Kyouji, 5,317,143, Cl. 250-201.500.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
  Ishida, Akio, 5,315,978, Cl. 123-467.000.
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- Mizusawa, Nobutoshi: *See—*
  - Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; Uzawa, Shunichi; and Hasegawa, Takayuki, 5,317,615, Cl. 378-34.000.
- Mizutome, Atsushi: *See—*
  - Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,317,332, Cl. 345-101.000.
- Mlinar, John R.: *See—*
  - Stout, George M.; Homan, James G.; Mlinar, John R.; and Wright, Larry R., 5,316,812, Cl. 428-64.000.
- Mobil Oil Corporation: *See—*
  - Dessau, Ralph M.; Grasselli, Robert K.; Lago, Rudolph M.; and Tsikoyiannis, John G., 5,316,661, Cl. 208-46.000.
  - Jennings, Alfred R., Jr., 5,316,082, Cl. 166-281.000.
- Mocap Incorporated: *See—*
  - Miller, Joseph T., 5,317,490, Cl. 362-206.000.
- Mochida, Tetsuya; Okazawa, Kouichi; Kimura, Kouichi; Kawaguchi, Hitoshi; and Kobayashi, Kazushi, to Hitachi, Ltd. Multiprocessor system and interruption control device for controlling interruption requests between processors and peripheral devices in the multiprocessor system. 5,317,747, Cl. 395-725.000.
- Mochizuki, Akihiro; and Motoyoshi, Katsusada, to Fujitsu Limited. Trilayer nematic liquid crystal optical switching device. 5,317,429, Cl. 359-42.000.
- Mochizuki, Hideki, to Jatco Corporation. Hydraulic control system for automatic transmission of automotive vehicle with exhaust braking system using vehicle payload sensing means. 5,315,899, Cl. 477-119.000.
- Mochizuki, Masahiro: *See—*
  - Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.
- Mody, Hemant K. Method and device for erasing and writing on magnetic recording media suitable for direct viewing. 5,317,340, Cl. 346-74.300.
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  - Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., 5,317,689, Cl. 395-163.000.
- Mokadam, Rajhunath: *See—*
  - Dhyanchand, P. John; Vaidya, Jayant; Mokadam, Rajhunath; and Arbanella, Richard, 5,317,299, Cl. 336-5.000.
- Moksnes, Stephen L.; Sharma, Jayant; Olson, Ronald D.; Tump, Ronald S.; Kocher, James M.; and Pausch, Terrance J., to Accurate, Inc. Apparatus for dispensing a flavorable material. 5,316,195, Cl. 222-146.600.
- Molecular Biosystems, Inc.: *See—*
  - Widder, Kenneth J.; and Barnhart, James L., 5,315,997, Cl. 128-653.300.
- Molecular Probes, Inc.: *See—*
  - Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.
- Molex Incorporated: *See—*
  - Gardner, Michael J.; Kachlic, Jerry D.; and O'Brien, Paul M., 5,316,488, Cl. 439-79.000.
  - Kachlic, Jerry D.; and Seong, AuYong C., 5,316,489, Cl. 439-79.000.
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  - Sekhar, Jainagesh A., 5,316,718, Cl. 419-19.000.
- Monaco, Eugenio. Universal, self-blocking vice key. 5,315,903, Cl. 81-91.300.
- Monaghan, Richard L.: *See—*
  - MacConnell, John G.; Arison, Byron H.; Doss, George A.; and Monaghan, Richard L., 5,317,031, Cl. 514-452.000.
- Mondry, Adolph J. Method for delivering incremental doses of oxygen for maximizing blood oxygen saturation levels. 5,315,990, Cl. 128-205.110.
- Monma, Yoshio; and Yamaguchi, Hiroyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Skew prevention structure for electrophotographic printer. 5,317,371, Cl. 355-274.000.
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  - Kassebaum, James W.; and Berk, Howard C., 5,317,003, Cl. 504-116.000.
- Monta, Hiroki; Tsuji, Toshiaki; and Imai, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. I-axis detecting circuit provided in color demodulating circuit of TV receiver. 5,317,410, Cl. 348-638.000.
- Montagna, Giovanni, to SIE Systems S.p.A. Apparatus for detecting the presence and the quality of a flame by detecting and analyzing electromagnetic radiation of different wavelengths. 5,317,165, Cl. 250-554.000.
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  - Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Montana, John G.; Pass, Martin; and Judd, Duncan B., 5,317,023, Cl. 514-303.000.
- Montgomery, Frederick C.: *See—*
  - Hazlebeck, David A.; Montgomery, Frederick C.; and Streckert, Holger H., 5,316,797, Cl. 427-376.200.
- Monzel, Fred J., to General Electric Company. Squeeze film damper seal. 5,316,391, Cl. 384-99.000.
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  - Lu, Shih-Lai; Kobe, James J.; Moon, John D.; Freeman, Maurice E.; Rouser, Forrest J.; Heiti, Robert V.; and Boettcher, Thomas E., 5,316,849, Cl. 428-355.000.
- Moonen, Chrit T. W.; and van Gelderen, Peter, to United States of America, Health and Human Services. Single shot magnetic resonance method to measure diffusion, flow and/or motion. 5,317,262, Cl. 324-309.000.
- Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., to J. M. Huber Corporation. Endothermic blowing agents for surface migration of components in foamed products, compositions and applications. 5,317,044, Cl. 521-78.000.
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- Moore, Charles E.: *See—*
  - Zimmer, Robert A.; and Moore, Charles E., 5,317,280, Cl. 330-261.000.
- Moore Industries International Inc.: *See—*
  - Castle, Jonathan, 5,317,520, Cl. 364-482.000.
- Moore, Jae K. Fluid receptacle. 5,316,386, Cl. 383-10.000.
- Moore, Patrick T. Frangible biodegradable clay target. 5,316,313, Cl. 273-363.000.
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- Morey, Booker W. Foam-limiting drinking cup and method. 5,316,779, Cl. 426-329.000.
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  - Innis, Charles L., Jr., 5,316,392, Cl. 384-147.000.
- Morgan, John P,.: *See—*
  - Kotter, Dale K.; Rankin, Richard A.; and Morgan, John P,., 5,317,259, Cl. 324-251.000.
- Morgan, Roger J.: *See—*
  - Ferullo, David A.; Morgan, Roger J.; and Rosen, James L., 5,317,295, Cl. 335-172.000.
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  - Hasegawa, Makoto; and Mori, Koji, 5,317,136, Cl. 235-375.000.
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- Morin, Jean-Xavier: *See—*
  - Vidal, Jean; Payen, Philippe; Semedard, Jean-Claude; and Morin, Jean-Xavier, 5,316,736, Cl. 422-145.000.
- Morin, Pierre; Bardin, Christian; and Boulet, Jean, to Institut Francais du Petrole. Fitting for controlled trajectory drilling, comprising a variable geometry stabilizer and use of this fitting. 5,316,093, Cl. 175-74.000.
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  - Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.
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- Morishima, Seiji; and Yamazaki, Yoji, to Lion Corporation. Oral composition. 5,316,758, Cl. 424-54.000.
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  - Morita, Motoo, 5,316,269, Cl. 266-117.000.
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- Morita, Masaya: *See—*
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- Moritz, Frederick G.; and Mosciatti, Roger, to MFM Technology, Inc. Brushless DC motor control network. 5,317,245, Cl. 318-254.000.
- Morley, Edward J.: *See—*
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- Morozov, Victor A.; Kanachine, Serguei P.; Krasnochtchekov, Iouri I.; Makienko, Alexandre I.; Matveev, Valentine A.; Khriachtchev, Valeri G.; and Tan, Poi-Sik, to ACMA Limited. Evaporative air conditioner unit. 5,315,843, Cl. 62-309.000.
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  - Fauchere, Jean-Luc; Kucharczyk, Nathalie; Morris, Angela D.; Paladino, Joseph; Bonnet, Jacqueline; and Thurieau, Christophe, 5,317,014, Cl. 514-17.000.
- Morris, Jerry L., to Valence Technology, Inc. Apparatus and method for extruding shear thinning material. 5,316,556, Cl. 29-623.300.
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  - Evans, Stuart G.; Morse, John E.; and Hessop, Thomas C., 5,317,139, Cl. 235-462.000.
- Mortensen, Gordon L., to National Semiconductor Corporation. Integrated circuit having reduced electromagnetic emissions an integrated circuit including a variable impedance for reduced electromagnetic emission. 5,317,207, Cl. 307-443.000.
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  - Heimgartner, Urs; Kozulic, Branko; and Mosbach, Klaus, 5,316,912, Cl. 435-7.900.
- Mosciatti, Roger: *See—*
  - Moritz, Frederick G.; and Mosciatti, Roger, 5,317,245, Cl. 318-254.000.
- Moser, Daniel J., to Edo Corporation, Fiber Science Division. Liquid level sensor for electrically conductive liquid. 5,315,872, Cl. 73-304.00C.
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- Moser, William H., to Mosermatic, Inc. Movable floor mechanism. 5,316,133, Cl. 198-850.000.
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  - Moser, William H., 5,316,133, Cl. 198-850.000.
- Moslehi, Mehrdad M.; and Najm, Habib N., to Texas Instruments Incorporated. Fiber optic network for multi-point emissivity-compensated semiconductor wafer pyrometry. 5,317,656, Cl. 385-12.000.
- Motani, Shigeru; Saito, Tadayuki; and Hayashi, Takahiro. Process for producing synthetic resin foam. 5,317,033, Cl. 521-79.000.
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  - Sturm, Patricia K.; Ybarra, Kathryn W.; and Motisher, Lewis R., 5,317,316, Cl. 342-30.000.
- Motorola, Inc.: *See—*
  - Ackley, Donald E.; and Shieh, Chan-Long, 5,317,587, Cl. 372-45.000.
  - Bonet, Luis A.; Greaves, Carlos A.; and Corleto, Jose G., 5,317,522, Cl. 364-514.000.
  - Chan, Yiu-Kwong, 5,317,285, Cl. 331-16.000.
  - Chong, Kok H.; Finch, Steven J.; and Leon, Robert, 5,317,247, Cl. 320-2.000.
  - Fernandes, Mark G.; and Kawasaki, Hisao, 5,317,185, Cl. 257-629.000.
  - Finch, Steven J.; Chong, Kok H.; and Abdala, Julio, 5,316,168, Cl. 220-341.000.
  - Ford, Robert B., 5,317,249, Cl. 320-2.000.
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  - Grover, Richard K.; and Kingsbury, Keith M., 5,317,320, Cl. 342-159.000.
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  - Osorio, Rolando J., 5,317,107, Cl. 174-52.400.
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  - Tang, Dandas K.; and Sutton, Timothy W., 5,317,211, Cl. 307-465.000.
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- Mouille, Rene L., to Aerospatiale Societe Nationale Industrielle. Articulated rotor head for gyroplanes. 5,316,442, Cl. 416-134.00A.
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  - Isaka, Kazuo; Mouri, Akihiro; Katayama, Masato; Fukui, Tetsuro; and Shiraiwa, Yoshinobu, 5,317,363, Cl. 355-27.000.
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- Mozingo, Robert E., to Case Corporation. Three function control system. 5,316,435, Cl. 414-685.000.
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  - Meyer, Richard A.; and Olson, Douglas J., 5,315,882, Cl. 73-862.044.
- Muellers, Brian T.: *See—*
  - Pall, David B.; Gsell, Thomas C.; and Muellers, Brian T., 5,316,674, Cl. 210-257.100.
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  - Yung, Ming L.; Albrecht, Bernard M., Jr.; Muhlhauser, Nicholas L.; and Herbusky, Stephen T., 5,317,288, Cl. 332-144.000.
- Mukherjee, Dilip: *See—*
  - Kemmer, Leif; Mukherjee, Dilip; and Tjellander, Goran, 5,315,816, Cl. 60-39.020.
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  - Hoffman, Charles R.; and Mullen, John M., 5,317,183, Cl. 257-369.000.
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  - Ross, Gerald F.; Mara, Richard M.; Robbins, Kenneth W.; and Fontana, Robert J., 5,317,303, Cl. 340-539.000.
- Mumford, Warren G.: *See—*
  - Babinsky, Vladislav A.; and Mumford, Warren G., 5,316,622, Cl. 162-109.000.
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- Muraji, Tetsuo, to Mikuni Corporation. Center-of-gravity determining circuit for pulse generation. 5,317,674, Cl. 395-3.000.
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- Murakami, Yoshiteru: *See—*
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  - Hirai, Kazuyasu, 5,316,126, Cl. 198-468.600.
  - Nakanishi, Keiichi, 5,317,369, Cl. 355-208.000.
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  - Kogame, Toshihiko; and Hamuro, Mitsuro, 5,316,602, Cl. 156-64.000.

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Murray, Douglas J.; Coon, Robert J.; Hopmann, Mark E.; Williams, Ronald D.; Jennings, Steve; and Tips, Timothy R., to Baker Hughes Incorporated. Well tool with sealing means. 5,316,084, Cl. 166-332.000.

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Murray, Robert E.: *See*—

Blandy, Geoffrey O.; Heller, Lisa C.; and Murray, Robert E., 5,317,754, Cl. 395-800.000.

Gannon, Patrick M.; Gum, Peter H.; Hough, Roger E.; and Murray, Robert E., 5,317,705, Cl. 395-400.000.

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Ota, Toshiaki; Teguri, Yoshihiko; Muto, Masahito; Fujita, Koichi; and Iyoda, Motomi, 5,317,512, Cl. 364-424.050.

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Tatsuzawa, Hajime, 5,317,758, Cl. 395-800.000.

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Dinur, Eldad, 5,316,220, Cl. 239-542.000.

Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., to Hughes Aircraft Company. Digital visual and sensor simulation system for generating realistic scenes. 5,317,689, Cl. 395-163.000.

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Stamm, Rebecca L.; Edmondson, John; Archer, David; Nadkarni, Samyojita; and Strouble, Raymond, 5,317,720, Cl. 395-425.000.

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Kobayashi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,317,352, Cl. 354-195.100.

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Tomioka, Junsuke; Nagai, Kazunori; and Matsuzaki, Akihiro, 5,316,742, Cl. 117-217.000.

Nagai, Masahiko: *See*—

Wakai, Takeshi; and Nagai, Masahiko, 5,316,402, Cl. 401-202.000.

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Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, 5,317,556, Cl. 369-112.000.

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Ito, Akiyasu; Kimura, Munenori; Tsurumoto, Kazuo; and Nagasaka, Shouichi, 5,317,122, Cl. 219-69.180.

Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, to Texas Instruments Incorporated. Semiconductor device and method of manufacturing the same. 5,317,177, Cl. 257-301.000.

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Hornfeck, Rudiger; Bar, Klaus; Nagler, Josef; and Barth, Manfred, 5,315,865, Cl. 73-118.100.

Nagorcka, James A.: *See*—

Isaacson, Charles D.; Killen, Dale H.; and Nagorcka, James A., 5,316,381, Cl. 305-10.000.

Nagoya, Shinichiro: *See*—

Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.

Nahm, James J. W.; and Wyant, Reece E., to Shell Oil Company. Blast furnace slag spacer. 5,316,083, Cl. 166-291.000.

Nai Anchorlok, Inc.: *See*—

Pierce, William C., 5,315,918, Cl. 92-63.000.

Naito, Kazuo: *See*—

Yoshikawa, Masato; Kusano, Yukihiro; Akiyama, Setsuo; Naito, Kazuo; Okazaki, Satiko; and Kogoma, Masuhiro, 5,316,739, Cl. 422-186.050.

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Najm, Habib N.: *See*—

Moslehi, Mehrdad M.; and Najm, Habib N., 5,317,656, Cl. 385-12.000.

Nakabayashi, Masayoshi; and Matsumoto, Manabu, to Sharp Kabushiki Kaisha. Copying method and apparatus. 5,317,372, Cl. 355-311.000.

Nakada, Seiichi: *See*—

Iwami, Kenichi; Kawasaki, Kazuhisa; and Nakada, Seiichi, 5,315,773, Cl. 38-77.600.

Nakagama, Shyoji: *See*—

Tomikawa, Tadashi; Fujita, Nobuhiko; Nakagama, Shyoji; and Nakayama, Akira, 5,316,804, Cl. 427-569.000.

Nakagawa, Katsuya; Yamato, Satoshi; and Tanaka, Hideki, to Nintendo Co., Ltd. Digital sound source apparatus and external memory catrtridge used therefor. 5,317,714, Cl. 395-425.000.

Nakagawa, Shiro; and Tsuchida, Atsuko, to TDK Corporation. Humidity meter. 5,317,274, Cl. 324-678.000.

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Nakagawa, Yumi, to Chevron Research and Technology Company. Zeolite SSZ-35. 5,316,753, Cl. 423-706.000.

Nakahara, Saburo: *See*—

Yoneda, Tadahiro; Nakahara, Saburo; Takeda, Mitsuo; and Kamo, Midori, 5,316,714, Cl. 264-210.600.

Nakahara, Takehiko; Koshinaka, Masao; and Kosaka, Nobuyuki, to Mitsubishi Denki Kabushiki Kaisha. Light transmission type vacuum separating window and soft X-ray transmitting window. 5,317,618, Cl. 378-161.000.

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Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, 5,317,405, Cl. 348-20.000.

Nakajima, Junsaku: *See*—

Takahashi, Akira; Murakami, Yoshiteru; Nakajima, Junsaku; and Ohta, Kenji, 5,317,555, Cl. 369-110.000.

Nakajima, Osamu: *See*—

Matsuura, Hitoshi; Aramaki, Hitoshi; and Nakajima, Osamu, 5,317,517, Cl. 364-474.030.

Nakajima, Shigeo: *See*—

Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 5,316,858, Cl. 428-457.000.

Nakajima, Shinsuke: *See*—

Ishimura, Kazuhiko; Saito, Fumiaki; Yoshikawa, Masaaki; Okada, Misao; and Nakajima, Shinsuke, 5,316,563, Cl. 65-32.500.

Nakajima, Yukio; Imamura, Kazuhiko; Karatsu, Ryozo; Nishizaki, Sumio; and Kobayashi, Makoto, to Fuji Electric Co., Ltd. Metallic printed board. 5,316,831, Cl. 428-209.000.

Nakamura, Hiroaki: *See*—

Kobayashi, Yoh-ichi; Watabe, Ken; Mukohara, Yukuo; Satoh, Masayuki; and Nakamura, Hiroaki, 5,316,934, Cl. 435-215.000.

Nakamura, Kouji: *See*—

Hiraoka, Tooru; Nakamura, Kouji; and Shonai, Tohru, 5,317,703, Cl. 395-375.000.

Nakamura, Kousuke: *See*—

Yasutomi, Yoshiyuki; Nakamura, Kousuke; Kita, Hideki; and Sobue, Masahisa, 5,316,987, Cl. 501-97.000.

Nakamura, Masato: *See*—

Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, 5,317,405, Cl. 348-20.000.

Nakamura, Moritaka; Kurimoto, Takashi; and Iizuka, Katsuhiko, to Fujitsu Limited. Dry etching with hydrogen bromide or bromine. 5,316,616, Cl. 156-643.000.

Nakamura, Noboru: *See*—

Kita, Isamu; Kobashi, Masayuki; Tabuchi, Susumu; Doi, Yoshiyuki; Nakamura, Noboru; Ishihara, Managu; Arioka, Koji; and Kayano, Isamu, 5,317,610, Cl. 376-414.000.

Nakamura, Satoshi; and Shirahata, Hirokatsu, to Nisshinbo Industries, Inc. Method for producing modified polyisocyanurate foams. 5,317,034, Cl. 521-108.000.

Nakamura, Tatsumasa; Ise, Yoshiaki; and Okamoto, Yoshiaki, to Shin-Etsu Quartz Co., Ltd.; and Okamoto Optics Work, Inc. Method for preparing the base body of a reflecting mirror. 5,316,564, Cl. 65-36.000.

Nakamura, Tomoaki: *See*—

Okamoto, Terumitsu; and Nakamura, Tomoaki, 5,317,461, Cl. 360-77.080.

Nakamura, Yoichi; Mori, Nobuyoshi; and Nogami, Sumitaka, to Fuji Electric Co., Ltd. Photoconductor for electrophtography containing benzidine derivative. 5,316,881, Cl. 430-59.000.

Nakamura, Yoshio: *See*—

Miyawaki, Mamoru; Kondo, Shigeki; Nakamura, Yoshio; and Kouchi, Tetsunobu, 5,317,433, Cl. 359-59.000.

Nakane, Akio: *See*—

Hashimoto, Yasuaki; Nakane, Akio; and Uematsu, Tadahiro, 5,315,904, Cl. 82-129.000.

Nakanishi, Keiichi, to Murata Kikai Kabushiki Kaisha. Apparatus for detecting toner in image forming apparatus. 5,317,369, Cl. 355-208.000.

Nakanishi, Mikihiko: *See*—

Fujita, Hisanori; and Nakanishi, Mikihiko, 5,316,574, Cl. 106-20.00A.

Nakano, Minoru, to Pegasus Sewing Maching Mfg. Co., Ltd. Apparatus and method for thread supplying in a chain stitch sewing machine. 5,315,945, Cl. 112-262.100.

Nakano, Satoru; Oshima, Takeo; Okada, Masaaki; and Kunugita, Kiyohiko, to Fujisawa Pharmaceutical Co., Ltd. Drug for preventing and treating fish diseases. 5,316,769, Cl. 424-442.000.

Nakano, Tamio: *See*—

Ushio, Masaru; Nakano, Tamio; Hatayama, Minoru; Ishikawa, Katuhiko; and Sato, Masaru, 5,316,658, Cl. 208-216.00R.

Nakano, Tsuyoshi; Doi, Shuji; Noguchi, Takanobu; Ohnishi, Toshihiro; and Iyechika, Yasushi, to Sumitomo Chemical Company, Limited. Organic electroluminescence device. 5,317,169, Cl. 257-40.000.

Nakata, Kiyotomo: *See*—

Kato, Takahiko; Ikeda, Shinzo; Aono, Yasuhisa; Izumiya, Masakiyo; Nakata, Kiyotomo; Masaoka, Isao; and Takahashi, Heishichiro, 5,316,597, Cl. 148-327.000.

Nakatani, Munehiro: *See*—

Tsuboi, Toshio; Nakatani, Munehiro; and Fukushima, Shigenobu, 5,317,416, Cl. 358-444.000.

Nakayama, Akira: *See*—

Tomikawa, Tadashi; Fujita, Nobuhiko; Nakagama, Shyoji; and Nakayama, Akira, 5,316,804, Cl. 427-569.000.

Nakayama, Mamoru, to T.A.S. & Trading Co., Ltd. Computer implemented process for executing accounting theory systems. 5,317,504, Cl. 364-406.000.

Nakayama, Masaru: *See*—

Takamatsu, Osamu; Hirai, Yutaka; Nakayama, Masaru; Yagi, Takayuki; Kasanuki, Yuji; and Shimada, Yasuhiro, 5,317,152, Cl. 250-306.000.

Naleway, John J.: *See*—

Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.

Namioka, Kenta: *See*—

Nomura, Masaaki; Aosaki, Ko; Kubo, Takashi; Namioka, Kenta; and Takanose, Koji, 5,317,350, Cl. 353-63.000.

Nanba, Makoto: *See*—

Yamamura, Takashi; Hamazaki, Yoshihisa; Kaneshige, Toshihiko; Nanba, Makoto; and Kubota, Yukitoshi, 5,316,571, Cl. 106-692.000.

Narayanan, Kolazi S., to ISP Investments Inc. Water-based microemulsion formulations. 5,317,042, Cl. 514-772.000.

Nardin, Raffaele P.; and Corbalis, Charles M., to Stratacom, Inc. Method and apparatus for routing cell messages using delay. 5,317,562, Cl. 370-16.000.

Narishige, Shinji: *See*—

Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, 5,316,617, Cl. 156-643.000.

Narita, Yuuki; Ito, Takero; and Ogasawara, Shuetsu, to Kawasaki Steel Corporation; and Kawatetsu Mining Co., Ltd. High purity iron oxide and method for production hereof. 5,316,746, Cl. 423-151.000.

Narumi, Yuji: *See*—

Suzuki, Takumi; Ota, Yuichi; Narumi, Yuji; and Miyaguchi, Youichiro, 5,317,438, Cl. 359-88.000.

Naruse, Hiedaki; and Tsukahara, Jiro, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic film unit. 5,316,888, Cl. 430-216.000.

Naruse, Motoaki: *See*—

Yamaji, Takeshi; Ozaki, Toru; Sugiura, Koji; Bito, Kazuaki; Naruse, Motoaki; and Sogi, Hidehito, 5,316,337, Cl. 280-743.00R.

Naruse, Yoshio: *See*—

Ishida, Masao; and Naruse, Yoshio, 5,316,321, Cl. 277-235.00A.

Nasibov, Alexander S.; and Reznikov, Pavel V., to Principia Optics Incorporated; and P.N. Lebedev Institute of Physics. Semiconductor laser screen of a cathode-ray tube. 5,317,583, Cl. 372-43.000.

Nathanson, Harvey C.: *See*—

Hale, Robert A.; Nathanson, Harvey C.; and Hazlett, Joel F., 5,317,394, Cl. 348-208.000.

National Institutes of Health: *See*—

Lee-Huang, Sylvia; Kung, Hsiang-fu; Huang, Paul L.; Huang, Philip L.; Huang, Peter; Huang, Henry I.; and Chen, Hao-chia, 5,317,009, Cl. 514-8.000.

National Manufacturing Company: *See*—

Edeus, James A.; and Powell, Timothy J., 5,315,850, Cl. 70-129.000.

National Research Council of Canada: *See*—

Wong, John D. E.; Tugnum, Curtis C.; and Logan, James P., 5,316,479, Cl. 434-11.000.

National Science Council: *See*—

Chiang, Wen-Yen; and Lu, Jin-Yuh, 5,317,069, Cl. 526-262.000.

National Semiconductor Corporation: *See*—

Bourg, Haden J., Jr.; McNelis, Jim A.; and Weiler, Peter, 5,316,976, Cl. 437-195.000.

Brown, Michael A., 5,317,287, Cl. 331-57.000.

Garverick, Tim; and Camarota, Rafael C., 5,317,209, Cl. 307-465.000.

Mortensen, Gordon L., 5,317,207, Cl. 307-443.000.

Thomas, Michael E., 5,317,141, Cl. 250-491.100.

Naton, Paul E., to Oatey Company. Compositions containing hollow microsperes. 5,317,038, Cl. 523-219.000.

Nave, Miriam D.: *See*—

Hammar, W. James; and Nave, Miriam D., 5,317,074, Cl. 528-44.000.

NCR Corporation: *See*—

Barton, Richard R., 5,317,737, Cl. 395-650.000.

Cochcroft, Arthur F., Jr.; and Pike, Jimmy D., 5,317,738, Cl. 395-650.000.

Pechter, Richard G., 5,317,706, Cl. 395-400.000.

NEC Corporation: *See*—

Harada, Hisashi, 5,317,423, Cl. 358-482.000.

Hoshino, Yasuharu, 5,317,539, Cl. 365-207.000.

Ishibashi, Ryouji; and Nishimoto, Naomasa, 5,317,392, Cl. 348-6.000.

Kondou, Kenji, 5,317,188, Cl. 257-668.000.

Maeda, Akitoshi, 5,316,975, Cl. 437-195.000.

Morisada, Tsuyoshi, 5,317,702, Cl. 395-375.000.

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Sato, Fumihiko, 5,317,205, Cl. 307-443.000.

Shibayama, Hiroaki, 5,317,621, Cl. 379-57.000.

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Takeshiro, Shinichi, 5,316,980, Cl. 437-228.000.

Toriumi, Yoshitaka, 5,317,530, Cl. 364-745.000.

Ukai, Jun'ichi, 5,317,459, Cl. 360-69.000.

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Stanciu, Virgil V.; Peshek, Jack R.; Neece, Faurice D.; Kubulins, Erik R.; and Logozar, Branko, 5,316,707, Cl. 264-40.100.

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Nell, David J. Method and apparatus for mass transfer in multiple hearth funaces. 5,316,471, Cl. 432-139.000.

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Weinstein, Sidney; Weinstein, Curt; and Drozdenko, Ronald, 5,316,011, Cl. 128-744.000.

Neville, James E.: *See*—

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New, Nigel H., to Glacier Metal Company Limited, The. Rotor and stator components for a magnetic bearing. 5,317,226, Cl. 310-90.500.

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Hyman, Greg; Reiner, Lawrence; Caveza, Martin J.; and Newbold, Roger A., 5,316,515, Cl. 446-28.000.

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Beaman, Bryan A.; LaPointe, Jeffrey G.; and Newman, David A., 5,317,344, Cl. 346-107.00R.

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- Ng, Daniel, to Industri AB Thule. Apparatus for pairwise transport of elongate objects. 5,316,192, Cl. 224-324.000.
- NGK Insulators, Ltd.: *See—*
  - Seike, Shoji; Watanabe, Keiichiro; and Ito, Akira, 5,316,072, Cl. 165-9.000.
  - Tasaki, Yuji; and Wada, Yukihisa, 5,316,710, Cl. 264-57.000.
  - Yajima, Yasuhito; Ishikawa, Zenji; and Yamauchi, Syuichi, 5,315,871, Cl. 73-204.250.
- NGK Spark Plug Co., Ltd.: *See—*
  - Kojima, Takao; Minoha, Ken; and Yamano, Masaru, 5,316,738, Cl. 422-180.000.
  - Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,317,267, Cl. 324-402.000.
  - Suzuki, Junichiro; and Kayukawa, Masahide, 5,316,856, Cl. 428-446.000.
- Nguyen, Hai N.: *See—*
  - Riordan, Thomas J.; Thaik, Albert M.; and Nguyen, Hai N., 5,317,601, Cl. 375-107.000.
- Nguyen, Kha D.: *See—*
  - Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
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  - Dhyandchand, P. John; and Nguyen, Vietson M., 5,317,498, Cl. 363-43.000.
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- Nicol, Donald V.; Kilbourn, Rsusell A.; and Lane, Mark J., to Gas Research Institute. Control system for absorption heat transfer plants. 5,315,839, Cl. 62-148.000.
- Nicole A.: *See—*.
  - Cherubini, Julian H., 5,316,545, Cl. 602-7.000.
- Nicole Durr GmbH: *See—*
  - Dubberke, Markus, 5,315,741, Cl. 24-712.100.
- Niebrzydoski, John L., to Orbital Walbro Corporation. Two-stage fuel delivery system for an internal combustion engine. 5,315,968, Cl. 123-73.00C.
- Niedrich, Daniel S.: *See—*
  - Dibble, Eric P.; Hanakovic, Steven L.; Markovich, Voya R.; Niedrich, Daniel S.; Vlasak, Gary P.; Zarr, Richard S.; and Senger, Richard C., 5,316,788, Cl. 427-98.000.
- Niemiro, Thaddeus A., to Rockwell International Corporation. Keyless inking system for a printing press. 5,315,930, Cl. 101-366.000.
- Nien Made Enterprise Co., Ltd.: *See—*
  - Rapp, William H.; Gaber, Ira; and Woodring, Cooper C., 5,316,066, Cl. 160-178.200.
- Nihon Kohden Corporation: *See—*
  - Yamada, Yoshitsugu, 5,316,009, Cl. 128-716.000.
- Nihon Plast Co., Ltd.: *See—*
  - Nishijima, Kazuyoshi; and Inaba, Kazuo, 5,316,822, Cl. 428-138.000.
- Nii, Kazumi: *See—*
  - Okamura, Hisashi; Nii, Kazumi; and Katoh, Kazunobu, 5,316,890, Cl. 430-264.000.
- Niijima, Kazuo: *See—*
  - Ohta, Masami; Shimizu, Masami; Niijima, Kazuo; and Kawakami, Yasushi, 5,315,752, Cl. 29-598.000.
- Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, to Tokyo Electron Limited; Tokyo Electron Sagami Limited; and Kabushiki Kaisha Toshiba. Vertical boat used for heat treatment of semiconductor wafer and vertical heat treatment apparatus. 5,316,472, Cl. 432-241.000.
- Nikon Corporation: *See—*
  - Fukuhara, Toru; Sosa, Toshio; Hara, Masaharu; Kanai, Hachiro; and Yokonuma, Norikazu, 5,317,361, Cl. 354-415.000.
  - Matsushiro, Hiroyuki; Onuki, Tetsuji; Miyazaki, Masaya; and Fukutomi, Yasushi, 5,317,153, Cl. 250-306.000.
- Nilsson, Ivan, to Plast Och Textil Ivan Nilsson. Connection for an anchor line to a tarpaulin which ruptures before the tarpaulin tears. 5,315,736, Cl. 24-115.00K.
- Nimberger, Spencer M.: *See—*
  - Czimny, Arnold; Nimberger, Spencer M.; and Ward, Robert L., 5,316,351, Cl. 285-276.000.
- Nintendo Co., Ltd.: *See—*
  - Nakagawa, Katsuya; Yamato, Satoshi; and Tanaka, Hideki, 5,317,714, Cl. 395-425.000.
- Nippodenso Co., Ltd.: *See—*
  - Hasegawa, Makoto; and Mori, Koji, 5,317,136, Cl. 235-375.000.
- Nippon Co., Ltd.: *See—*
  - Ushio, Masaru; Nakano, Tamio; Hatayama, Minoru; Ishikawa, Katuhiko; and Sato, Masaru, 5,316,658, Cl. 208-216.00R.
- Nippon Conlux Co., Ltd.: *See—*
  - Sugimoto, Osamu; Furuya, Yonezo; and Fukuda, Ichiro, 5,316,119, Cl. 194-318.000.
- Nippon Densan Corporation: *See—*
  - Miyaji, Itsuo; and Yonei, Hiroyuki, 5,317,225, Cl. 310-67.00R.
- Nippon Paint Co., Ltd.: *See—*
  - Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.
- Nippon Petrochemicals Co., Ltd.: *See—*
  - Harashige, Masahiro; Kawamura, Tsutomu; Kaneko, Satoru; Inoue, Takashi; Tokutake, Atsuo; and Yoshikawa, Toshitsune, 5,317,051, Cl. 524-310.000.
- Nippon Petroleum Refining Co., Ltd.: *See—*
  - Ushio, Masaru; Nakano, Tamio; Hatayama, Minoru; Ishikawa, Katuhiko; and Sato, Masaru, 5,316,658, Cl. 208-216.00R.
- Nippon Shokujai Kagaku Kogyo Co., Ltd.: *See—*
  - Yoneda, Tadahiro; Nakahara, Saburo; Takeda, Mitsuo; and Kamo, Midori, 5,316,714, Cl. 264-210.600.
- Nippon Soda Co., Ltd.: *See—*
  - Kobayashi, Yoh-ichi; Watabe, Ken; Mukohara, Yukuo; Satoh, Masayuki; and Nakamura, Hiroaki, 5,316,934, Cl. 435-215.000.
  - Tazaki, Seiji; Yagihara, Tomio; Matsui, Nobuo; Yanagisawa, Atsushi; and Kojima, Takakazu, 5,317,102, Cl. 544-336.000.
- Nippon Soken, Inc.: *See—*
  - Taguchi, Masahiro; Tominaga, Motonori; and Matsuhashi, Toshiaki, 5,316,336, Cl. 280-730.00A.
- Nippon Telegraph and Telephone Corporation: *See—*
  - Awaya, Nobuyoshi; and Arita, Yoshinobu, 5,316,796, Cl. 427-252.000.
  - Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, 5,317,405, Cl. 348-20.000.
  - Sakamoto, Masayuki; and Hata, Masaharu, 5,317,623, Cl. 379-60.000.
- Nippon Yakin Kogyo Co., Ltd.: *See—*
  - Ebato, Kazuo; Tsuda, Masaomi; and Oomori, Tsutomu, 5,316,599, Cl. 148-512.000.
- Nippon Zeon Co., Ltd.: *See—*
  - Yamamoto, Tamotsu; and Akimoto, Kenji, 5,316,862, Cl. 428-522.000.
- Nippondenso, Co., Ltd.: *See—*
  - Isaji, Akira; Iritani, Kunio; and Suzuki, Nobunao, 5,316,074, Cl. 165-43.000.
  - Nishikawa, Seiithirou; Kikuchi, Toshiaki; and Kinugawa, Masumi, 5,315,823, Cl. 60-286.000.
  - Oohashi, Yasushi; Hayashi, Mithuyuki; and Sakai, Masahiko, 5,316,227, Cl. 242-7.030.
  - Ota, Toshiaki; Teguri, Yoshihiko; Muto, Masahito; Fujita, Koichi; and Iyoda, Motomi, 5,317,512, Cl. 364-424.050.
  - Taguchi, Masahiro; Tominaga, Motonori; and Matsuhashi, Toshiaki, 5,316,336, Cl. 280-730.00A.
- Nirasawa, Nobumasa: *See—*
  - Ito, Yasushi; and Nirasawa, Nobumasa, 5,315,813, Cl. 57-6.000.
- Nishi, Yoshio; Kubota, Haruo; and Ueno, Yoshio, to Elephant Chain Block Company Limited. Hoist including guards with chain swelling and twist corrective surfaces. 5,316,267, Cl. 254-383.000.
- Nishibayashi, Toru; Ishizue, Yoshihiro; Ishida, Kozo; and Kubo, Masanori, to Otsuka Pharmaceutical Co., Ltd. Particulate preparation containing a flourracil derivative and hydroxypropylmethyl-cellulose. 5,316,773, Cl. 424-499.000.
- Nishida, Hirobumi, to Ricoh Company, Ltd. Method for classifying line patterns of characters in dictionary. 5,317,649, Cl. 382-21.000.
- Nishida, Yasuo: *See—*
  - Moro, Shuuji; Tada, Kanehiro; Nishida, Yasuo; and Ohshima, Eiji, 5,315,889, Cl. 74-105.000.
- Nishihara, Toshikazu: *See—*
  - Ando, Toshio; and Nishihara, Toshikazu, 5,316,631, Cl. 204-192.200.
- Nishijima, Kazuyoshi; and Inaba, Kazuo, to Nihon Plast Co., Ltd. Cover for vehicular air bag. 5,316,822, Cl. 428-138.000.
- Nishikawa, Seiithirou; Kikuchi, Toshiaki; and Kinugawa, Masumi, to Nippondenso Co., Ltd. Control apparatus for speedily warming up catalyst in internal combustion engine. 5,315,823, Cl. 60-286.000.
- Nishimoto, Hidetoshi: *See—*
  - Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,316,722, Cl. 420-421.000.
- Nishimoto, Hiroshi, to Fujitsu Limited. Optical transmitter. 5,317,443, Cl. 359-187.000.
- Nishimoto, Naomasa: *See—*
  - Ishibashi, Ryouji; and Nishimoto, Naomasa, 5,317,392, Cl. 348-6.000.
- Nishimura, Akira: *See—*
  - Kinoshita, Mitsuo; Fukuzaki, Takaharu; Kato, Kanji; Nishimura, Akira; Higashikawa, Yuichi; Miyamoto, Yoshiyuki; Fukasawa, Yukihisa; Asami, Kazuo; Kurokawa, Koji; and Hayashi, Tatsuo, 5,317,606, Cl. 376-217.000.
- Nishimura, Kazuo: *See—*
  - Kosako, Toshiso; and Nishimura, Kazuo, 5,317,605, Cl. 376-157.000.
- Nishimura, Tetsuya; Yagyu, Eiji; and Yoshimura, Motomu, to Mitsubishi Denki Kabushiki Kaisha. Optical recording medium. 5,316,813, Cl. 428-64.000.
- Nishimura, Tetsuya; Yoshimura, Motomu; and Maeda, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Optical computer element. 5,317,453, Cl. 359-885.000.
- Nishino, Aya: *See—*
  - Kuriyama, Kazuya; and Nishino, Aya, 5,316,876, Cl. 429-197.000.
- Nishino, Toshikazu; Kawabe, Ushio; Murai, Fumio; Kure, Tokuo; Hatano, Mutsuko; and Hasegawa, Haruhiro, to Hitachi, Ltd. Superconducting field effect transistor. 5,317,168, Cl. 257-34.000.
- Nishio, Etsuro: *See—*
  - Kobayashi, Takumi; and Nishio, Etsuro, 5,317,353, Cl. 354-266.000.

- Nishitani, Yasuhiro; and Irie, Tadashi, to Shionogi Seiyaku Kabushiki Kaisha. Pyrrolidylthiocarbapenem derivative. 5,317,016, Cl. 514-210.000.
- Nishiyama, Satoshi: *See—*
  - Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, 5,316,802, Cl. 427-533.000.
- Nishiyama, Seiichi, to Sony Corporation. Phase shift circuit apparatus. 5,317,200, Cl. 307-262.000.
- Nishizaki, Sumio: *See—*
  - Nakajima, Yukio; Imamura, Kazuhiko; Karatsu, Ryozo; Nishizaki, Sumio; and Kobayashi, Makoto, 5,316,831, Cl. 428-209.000.
- Nissan Motor Co., Ltd.: *See—*
  - Mouri, Hiroshi, 5,317,513, Cl. 364-424.050.
  - Throngnumchai, Kraisorn, 5,317,175, Cl. 257-255.000.
- Nisshinbo Industries, Inc.: *See—*
  - Nakamura, Satoshi; and Shirahata, Hirokatsu, 5,317,034, Cl. 521-108.000.
- Nissin Electric Co., Ltd.: *See—*
  - Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, 5,316,802, Cl. 427-533.000.
- Niuya, Takayuki: *See—*
  - Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,317,177, Cl. 257-301.000.
- Niwa, Yasunori: *See—*
  - Yanai, Kunihiko; Tanaka, Yasuo; and Niwa, Yasunori, 5,316,785, Cl. 427-72.000.
- Nix, Mary K.: *See—*
  - Moore, Richard E.; Nix, Mary K.; and Shackelford, Floyd W., 5,317,730, Cl. 395-600.000.
- NKF Kabel B.V.: *See—*
  - Herrebrugh, Albert V., 5,317,665, Cl. 385-101.000.
  - Schaareman, Jacobus M., 5,316,492, Cl. 439-206.000.
- NKK Corporation: *See—*
  - Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.
  - Sagiyama, Masaru; Abe, Masaki; Hiraya, Akira; Inagaki, Junichi; and Morita, Masaya, 5,316,652, Cl. 205-177.000.
- NMB Ltd.: *See—*
  - Okamura, Hajime; Maekawa, Koichi; and Ozawa, Kazumasa, 5,316,572, Cl. 106-714.000.
- Noakes, Timothey J.; Pavey, Ian D.; and Jeffs, Christopher S., to Imperial Chemical Industries PLC. Spraying of liquids. 5,316,800, Cl. 427-466.000.
- Nobuhara, Hiroyuki, to Fujitsu Limited. Method for driving a laser amplifier with minimized distortion. 5,317,448, Cl. 359-333.000.
- Noda, Hiroaki; Dosaka, Shinichi; and Kurosawa, Hiroshi, to Olympus Optical Co., Ltd. Automatic focusing apparatus which removes light reflected by a lower surface of a sample. 5,317,142, Cl. 250-201.400.
- Nogami, Sumitaka: *See—*
  - Nakamura, Yoichi; Mori, Nobuyoshi; and Nogami, Sumitaka, 5,316,881, Cl. 430-59.000.
- Noguchi, Hideo: *See—*
  - Taoka, Hisao; Iyoda, Isao; Noguchi, Hideo; Kojima, Yukio; Warashina, Shigeru; and Sato, Nobuyuki, 5,317,525, Cl. 364-578.000.
- Noguchi, Takanobu: *See—*
  - Nakano, Tsuyoshi; Doi, Shuji; Noguchi, Takanobu; Ohnishi, Toshihiro; and Iyechika, Yasushi, 5,317,169, Cl. 257-40.000.
- Noguchi, Yoshinori: *See—*
  - Matsushima, Hidetoshi; Noguchi, Yoshinori; and Ishijima, Shizuo, 5,316,125, Cl. 198-465.200.
- Nohmi, Makoto: *See—*
  - Okawara, Hiroyuki; Kato, Makoto; Miyaoka, Shinichiro; Nohmi, Makoto; and Takizawa, Yuri, 5,317,678, Cl. 395-126.000.
- Nokia Mobile Phones Ltd.: *See—*
  - Kansakoski, Antti, 5,317,600, Cl. 375-97.000.
  - Korhonen, Veijo S., 5,317,283, Cl. 331-1.00A.
  - Ostman, Kjell, 5,317,595, Cl. 375-14.000.
- Noll, Tobias: *See—*
  - Kuenemund, Ronald; and Noll, Tobias, 5,317,753, Cl. 395-800.000.
- Nomura, Masaaki; Aosaki, Ko; Kubo, Takashi; Namioka, Kenta; and Takanose, Koji, to Fuji Photo Film Co., Ltd. Overhead projector. 5,317,350, Cl. 353-63.000.
- Norand Corporation: *See—*
  - Traeger, Robert J., 5,317,691, Cl. 395-200.000.
- Nordson Corporation: *See—*
  - Christyson, Richard G.; Donges, William E.; and Turner, James J., 5,316,219, Cl. 239-533.100.
- Noridca S.p.A.: *See—*
  - Gorza, Roberto; Baggio, Giorgio; and Battistella, Mirco, 5,316,331, Cl. 280-618.000.
- Norman, Timothy C.: *See—*
  - Wright, Robert L.; Norman, Tom C.; and Norman, Timothy C., 5,316,641, Cl. 204-197.000.
- Norman, Tom C.: *See—*
  - Wright, Robert L.; Norman, Tom C.; and Norman, Timothy C., 5,316,641, Cl. 204-197.000.
- Noro, Masao, to Yamaha Corporation. Power supply circuit utilizing voltage and current resonance for reducing switching loss. 5,317,494, Cl. 363-18.000.
- Norris, Harry; and Horn, Jennifer L., to Optical Activity Limited. Polarimeter calibration method and apparatus. 5,317,150, Cl. 250-252.100.
- Norsk Hydro a.s.: *See—*
  - Syslak, Morten; Morley, Edward J.; and Folkedal, Leiv Å., 5,316,206, Cl. 228-183.000.
- North American Philips Corporation: *See—*
  - Gupta, Rajiv, 5,317,734, Cl. 395-650.000.
  - Macocs, Stephen, 5,317,409, Cl. 348-751.000.
  - Taylor, Wilhelm; Faucett, Michael D.; and Woodruff, Daniel J., 5,317,554, Cl. 369-77.200.
- North Carolina State University: *See—*
  - Shekar, Mallikarjunaswamy S.; and Baliga, Bantval J., 5,317,171, Cl. 257-138.000.
- Northern Research & Engineering Corp.: *See—*
  - Stoner, George S., 5,316,261, Cl. 251-5.000.
- Northern Telecom Limited: *See—*
  - Boyd, John M.; Ellul, Joseph P.; and Tay, Sing P., 5,316,978, Cl. 437-203.000.
  - King, Jonathan P., 5,317,384, Cl. 356-351.000.
- Norton, Donald C.; and Sessions, George C., to Fiskars Inc. Sheath with adjustable latching assembly. 5,315,761, Cl. 30-162.000.
- Norwood, Peter C.: *See—*
  - Jewett, Douglas E.; Webster, Phil; Aldridge, Dave; Norwood, Peter C.; and Mehta, Nikhil A., 5,317,752, Cl. 395-750.000.
- Nose, Takahiro: *See—*
  - Alura, Tadashi; Nose, Takahiro; Umemoto, Shunichi; and Hayashi, Kenji, 5,316,536, Cl. 492-58.000.
- Notini, Marco: *See—*
  - Bolognese, Renato; Notini, Marco; and Pastorino, Gian C., 5,316,284, Cl. 271-121.000.
- Notoya, Masayoshi: *See—*
  - Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.
- Nova Pharmaceutical Corporation: *See—*
  - Domb, Abraham J.; and Maniar, Manoj, 5,317,079, Cl. 528-271.000.
- Novak, Mark F.: *See—*
  - Guttag, Karl M.; Asal, Michael D.; Van Aken, Jerry R.; Tebbutt, Neil; and Novak, Mark F., 5,317,333, Cl. 345-133.000.
- Novak, Thomas J.: *See—*
  - Kratochvil, Cynthia P.; Lin, Yah Hwa E.; and Novak, Thomas J., 5,316,783, Cl. 426-627.000.
- Novakovich, Michael R.; and Roberts, Richard D., to AEG Westinghouse Transportation Systems, Inc. Method and apparatus for placing a trainline monitor system in a layup mode. 5,317,751, Cl. 395-750.000.
- Novo Nordisk A/S: *See—*
  - Christiansen, Lars, 5,316,923, Cl. 435-69.900.
  - Markussen, Jan, 5,317,092, Cl. 530-413.000.
- NSK Ltd.: *See—*
  - Tsukada, Toru, 5,315,894, Cl. 74-526.000.
- Nu-Tech & Engineering, Inc.: *See—*
  - Ayres, John, 5,317,119, Cl. 219-734.000.
- Nugent, Steven F., to Intel Corporation. Merging network for collection of data from multi-computers. 5,317,564, Cl. 370-17.000.
- Null, Robert L. Trailer brake system with release apparatus. 5,316,110, Cl. 188-112.00R.
- Numako, Norio: *See—*
  - Kobayashi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,317,352, Cl. 354-195.100.
- Nusz, Bary J.: *See—*
  - Surjaatmadja, Jim B.; Nusz, Bary J.; and Turner, Gordon A., 5,315,864, Cl. 73-54.320.
- Nutting, Frederick S. Game dragging device. 5,316,356, Cl. 294-118.000.
- N.V. Baggerwerken Decloedt & Zoon: *See—*
  - Vandendorpe, Guido, 5,316,449, Cl. 417-355.000.
- n.v. Union Miniere s.a.: *See—*
  - Haesebroek, Guy G.; and De Schepper, Achille J., 5,316,683, Cl. 210-688.000.
- Oatey Company: *See—*
  - Naton, Paul E., 5,317,038, Cl. 523-219.000.
- Obana, Noboru; and Satoh, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Cordless automatic answering telephone set. 5,317,624, Cl. 379-61.000.
- Obata, Tomoji, to NEC Corporation. Method and circuit for detecting CN ratio of QPSK signal. 5,317,599, Cl. 375-86.000.
- Oberman, Marl L.: *See—*
  - Edwards, Glenn R.; Lloyd, Graham; and Oberman, Marl L., 5,316,017, Cl. 128-782.000.
- Obkircher, Bernt, to Dornier GmbH. Flying decoy. 5,317,163, Cl. 250-495.100.
- O'Brien, Michael H.; and Park, Blair H., to EG&G Idaho, Inc. Sialon ceramic compositions and methods of fabrication. 5,316,988, Cl. 501-98.000.
- O'Brien, Paul M.: *See—*
  - Gardner, Michael J.; Kachlic, Jerry D.; and O'Brien, Paul M., 5,316,488, Cl. 439-79.000.
- O'Brien, Todd D. Dynamic ambulatory method and apparatus for assessment of joints of the human body. 5,316,018, Cl. 128-782.000.
- Ocampo, Don O.; and Palmer, Emery A., to Rexham Industries Corp. Weatherable protective surfacing film. 5,316,608, Cl. 156-230.000.
- Occidental Chemical Corporation: *See—*
  - Rojstaczer, Sergio R.; Tang, David Y.; and Tyrell, John A., 5,317,049, Cl. 524-104.000.
- OCG Microelectronic Materials, Inc.: *See—*
  - Toukhy, Medhat A., 5,316,884, Cl. 430-165.000.

Ochi, Mitsunori, to Yamaha Corporation. Music score display device. 5,315,911, Cl. 84-477.00R.
Ochiai, Tamiya, to Kabushiki Kaisha Toshiba. System and method for learning transmission band of multiplex packet. 5,317,570, Cl. 370-94.100.
Ochii, Kiyofumi, to Kabushiki Kaisha Toshiba. Semiconductor memory device having voltage stress testing capability. 5,317,532, Cl. 365-149.000.
Ochoa, Augusto C.; Loeffler, Cynthia; Urba, Walter; and Longo, Dan L., to United States of America, Health and Human Services; and University of Minnesota, Regents of the. Short-term anti-CD3 stimulation of lymphocytes to increase their in vivo acitivity. 5,316,763, Cl. 424-85.200.
O'Connor, Joseph G.: *See—*
Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.
Oda, Shinichiro: *See—*
Kato, Yoshitake; Fukunaga, Kazuya; Katami, Akira; and Oda, Shinichiro, 5,317,467, Cl. 360-133.000.
Oda, Tomio: *See—*
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Oda, Tomio, 5,317,032, Cl. 514-530.000.
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, to Kabushiki Kaisha Toshiba. Predictive coding using spatial-temporal filtering and plural motion vectors. 5,317,397, Cl. 348-416.000.
Odashima, Masahiro: *See—*
Yagami, Heihachiro; Kimizuka, Kazuhiro; and Odashima, Masahiro, 5,317,558, Cl. 369-126.000.
Odoni, Walter: *See—*
Dandliker, Rene ; Schweizer, Edwin; Schad, Hanspeter; and Odoni, Walter, 5,317,147, Cl. 250-227.170.
Ogahara, Hideharu: *See—*
Yoshimura, Takao; Morita, Ichiro; and Ogahara, Hideharu, 5,316,455, Cl. 418-63.000.
Ogasawara, Shuetsu: *See—*
Narita, Yuuki; Ito, Takero; and Ogasawara, Shuetsu, 5,316,746, Cl. 423-151.000.
Ogata, Kiyoshi: *See—*
Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, 5,316,802, Cl. 427-533.000.
Ogata, Yoshihiro: *See—*
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,317,177, Cl. 257-301.000.
Ogawa, Fujio: *See—*
Ookuma, Yasuyuki; Ogawa, Fujio; Hattori, Yoshiyuki; Miyamukai, Takamichi; and Sakakura, Takayuki, 5,316,789, Cl. 427-117.000.
Ogawa, Shuji; and Yagi, Shigenori, to Mitsubishi Denki Kabushiki Kaisha. Laser oscillator having a curved mirror with a through-hole. 5,317,589, Cl. 372-99.000.
Ogino, Shigeru: *See—*
Takahara, Hiroyuki; Ogino, Shigeru; and Sekine, Masayoshi, 5,317,351, Cl. 354-195.100.
Ogou, Kenji, to Sharp Kabushiki Kaisha. Laser light output control apparatus. 5,317,578, Cl. 372-29.000.
Oh, Seung-Seob: *See—*
Lim, Moo-Seang; Yun, Jong-Man; Park, Chan-Kyu; Lee, Sang-Dae; Ma, San-Chae; Oh, Seung-Seob; Jeong, Eui-Sik; and Paek, Kwang-Sun, 5,316,042, Cl. 137-625.110.
Ohara, Hiroshi, to Seiko Epson Corporation. Color filter structure for liquid crystal displays with seal end on or surrounded by orientation film. 5,317,434, Cl. 359-68.000.
Ohba, Atsushi: *See—*
Sato, Hirotoshi; Ohba, Atsushi; and Hosogane, Akira, 5,317,213, Cl. 307-475.000.
Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polyvinyl alcohol product and multi-layer product containing the same. 5,317,052, Cl. 524-413.000.
Ohba, Yasuo: *See—*
Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, 5,317,167, Cl. 257-13.000.
Ohga, Norio; Tsurushima, Katsuaki; and Yoshida, Tadao, to Sony Corporation. Optical disc recording and/or reproducing apparatus having a buffer memory to accommodate track jumps. 5,317,553, Cl. 369-54.000.
Ohga, Shunsuke, to Fuji Electric Co., Ltd. Heat supply and electric power-generating fuel cell. 5,316,870, Cl. 429-24.000.
Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, to Hitachi, Ltd.; and Hitachi Mizusawa Electronics Co., Ltd. Deflection yoke for cathode ray tube. 5,317,239, Cl. 315-370.000.
Ohio Associated Enterprises, Inc.: *See—*
Vanaleck, John T.; and Roath, Alan L., 5,316,500, Cl. 439-567.000.
Ohio State University: *See—*
Zarabadi, Seyed R.; and Ismail, Mohammed, 5,317,279, Cl. 330-253.000.
Ohira, Yasuo: *See—*
Tanaka, Toshifumi; Ohira, Yasuo; and Ishida, Toshihiko, 5,316,466, Cl. 425-422.000.
Ohki, Yoshimasa: *See—*
Wakabayashi, Shinichi; Tougou, Hitomaro; Toyoda, Yukio; and Ohki, Yoshimasa, 5,316,640, Cl. 204-192.340.
Ohmachi, Kazuhiko: *See—*
Tsuchida, Masashi; Ohmachi, Kazuhiko; Honma, Toshio; Imai, Yasuhiro; and Kawamura, Nobuo, 5,317,727, Cl. 395-600.000.
Ohmi, Tadahiro: *See—*
Yamagami, Atsushi; Okamura, Nobuyuki; Ohmi, Tadahiro; Goto, Haruhiro H.; and Shibata, Tadashi, 5,316,645, Cl. 204-298.060.
Ohnaka, Noriyuki: *See—*
Sakai, Masanori; Ohnaka, Noriyuki; Izumiya, Masakiyo; and Hattori, Shigeo, 5,316,633, Cl. 204-153.110.
Ohnishi, Toshihiro: *See—*
Nakano, Tsuyoshi; Doi, Shuji; Noguchi, Takanobu; Ohnishi, Toshihiro; and Iyechika, Yasushi, 5,317,169, Cl. 257-40.000.
Ohsawa, Michitaka: *See—*
Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.
Ohshima, Eiji: *See—*
Moro, Shuuji; Tada, Kanehiro; Nishida, Yasuo; and Ohshima, Eiji, 5,315,889, Cl. 74-105.000.
Ohshita, Kazuhito: *See—*
Tani, Hiroji; and Ohshita, Kazuhito, 5,316,698, Cl. 252-512.000.
Ohta, Kenji: *See—*
Takahashi, Akira; Murakami, Yoshiteru; Nakajima, Junsaku; and Ohta, Kenji, 5,317,555, Cl. 369-110.000.
Ohta, Masami; Shimizu, Masami; Niijima, Kazuo; and Kawakami, Yasushi, to Mitsuba Electric Mfg. Co., Ltd. Method for press fiting of a press fitting body and a press fitting apparatus having a linear gauge for the press fitting body. 5,315,752, Cl. 29-598.000.
Ohtani, Kazumi: *See—*
Kashima, Noriyasu; Suematsu, Mutsumi; Ohtani, Kazumi; and Atsumi, Koichiro, 5,317,242, Cl. 318-254.000.
Ohtani, Tatsuo: *See—*
Hasegawa, Fumihiko; Ohtani, Tatsuo; Kawano, Hiroshi; and Yamada, Masayuki, 5,316,620, Cl. 156-645.000.
Ohya, Takeji, to Mazda Motor Corporation. Structure of a door for an automotive vehicle. 5,316,364, Cl. 296-146.500.
Ohya, Yukio: *See—*
Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, 5,316,933, Cl. 435-240.100.
Oishi, Katsumi, to Seikosha Co., Ltd. Time recorder. 5,317,547, Cl. 368-10.000.
Oji Paper Co., Ltd.: *See—*
Hayashi, Shigeo; Kohari, Osamu; and Kato, Masaru, 5,316,999, Cl. 103-227.000.
Oji Yuki Goseishi Co., Ltd.: *See—*
Toyoda, Takashi; Hosono, Yasuji; Funato, Takashi; Miyaji, Takashi; Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,777, Cl. 426-87.000.
Ok, Hyun O.; Schoen, William R.; and Wyvratt, Matthew, to Merck & Co., Inc. N-biphenyl-3-amido substituted benzolactams stimulate growth hormone release. 5,317,017, Cl. 514-211.000.
Okada, Masaaki: *See—*
Nakano, Satoru; Oshima, Takeo; Okada, Masaaki; and Kunugita, Kiyohiko, 5,316,769, Cl. 424-442.000.
Okada, Misao: *See—*
Ishimura, Kazuhiko; Saito, Fumiaki; Yoshikawa, Masaaki; Okada, Misao; and Nakajima, Shinsuke, 5,316,563, Cl. 65-32.500.
Okada, Shigemasu: *See—*
Kaufman, Leon; Carlson, Joseph W.; Okada, Shigemasu; and Hashimoto, Shigeo, 5,317,297, Cl. 335-297.000.
Okada, Shozo: *See—*
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, 5,316,962, Cl. 437-52.000.
Okai, Tetsuya: *See—*
Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, 5,316,617, Cl. 156-643.000.
Okamoto Optics Work, Inc.: *See—*
Nakamura, Tatsumasa; Ise, Yoshiaki; and Okamoto, Yoshiaki, 5,316,564, Cl. 65-36.000.
Okamoto, Shusaku; Maeda, Toshiyuki; and Maehara, Fumio, to Matsushita Electric Industrial Co., Ltd. Image editing apparatus. 5,317,508, Cl. 364-419.010.
Okamoto, Terumitsu; and Nakamura, Tomoaki, to NEC Corporation. Magnetic disk apparatus having a circuit for detecting a position of servo information recorded on a target track. 5,317,461, Cl. 360-77.080.
Okamoto, Yoshiaki: *See—*
Nakamura, Tatsumasa; Ise, Yoshiaki; and Okamoto, Yoshiaki, 5,316,564, Cl. 65-36.000.
Okamoto, Yukio; Aida, Toshiyuki; Miyauchi, Katsuki; Takagi, Kazumasa; Fukazawa, Tokuumi; and Takayama, Shinji, to Hitachi, Ltd. Method for fabricating superconducting materials and superconductive thin films. 5,316,585, Cl. 118-719.000.
Okamura, Hajime; Maekawa, Koichi; and Ozawa, Kazumasa, to NMB Ltd. Method of manufacturing concrete for placement in air not requiring consolidation. 5,316,572, Cl. 106-714.000.
Okamura, Hisashi; Nii, Kazumi; and Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,316,890, Cl. 430-264.000.

Okamura, Nobuyuki: *See—*
Yamagami, Atsushi; Okamura, Nobuyuki; Ohmi, Tadahiro; Goto, Haruhiro H.; and Shibata, Tadashi, 5,316,645, Cl. 204-298.060.
Okano, Makoto: *See—*
Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, 5,316,899, Cl. 430-495.000.
Okarma, Thomas B.: *See—*
Lee, Young M.; Leiby, Kevin R.; and Okarma, Thomas B., 5,317,088, Cl. 530-350.000.
Okawara, Hiroyuki; Kato, Makoto; Miyaoka, Shinichiro; Nohmi, Makoto; and Takizawa, Yuri, to Hitachi, Ltd. Method for changing color of displayed images by use of color components. 5,317,678, Cl. 395-126.000.
Okazaki, Sachiko; Kogoma, Masuhiro; and Hirakawa, Masahiro, to Okazaki, Sachiko; Kogoma, Masuhiro; and Sumitomo Precision Products Co., Ltd. Dielectric material used for an ozone generator and a method of forming a film to the dielectric material. 5,316,639, Cl. 204-192.120.
Okazaki, Satiko: *See—*
Yoshikawa, Masato; Kusano, Yukihiro; Akiyama, Setsuo; Naito, Kazuo; Okazaki, Satiko; and Kogoma, Masuhiro, 5,316,739, Cl. 422-186.050.
Okazaki, Taizo: *See—*
Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, 5,316,802, Cl. 427-533.000.
Okazawa, Kouichi: *See—*
Mochida, Tetsuya; Okazawa, Kouichi; Kimura, Kouichi; Kawaguchi, Hitoshi; and Kobayashi, Kazushi, 5,317,747, Cl. 395-725.000.
Okazawa, Takeshi, to NEC Corporation. Floating gate type erasable and programable read only memory cell, method of making the same, and electrically erasing and writing method. 5,316,961, Cl. 437-43.000.
O'Keefe, Gerald. Fulcrum gear assembly. 5,316,525, Cl. 475-331.000.
OKI Electric Industry Co., Ltd.: *See—*
Isobe, Minoru, 5,317,146, Cl. 250-208.100.
Saito, Tadashi; and Jinbo, Hideyuki, 5,316,878, Cl. 430-5.000.
Oki, Yasumasa: *See—*
Ono, Atsushi; Oki, Yasumasa; and Okumura, Jugoro, 5,316,712, Cl. 264-102.000.
Oku, Tadahiro: *See—*
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,317,397, Cl. 348-416.000.
Okuda, Isao: *See—*
Oono, Masahiro; Itoh, Tsuyoshi; Hayashi, Katsuki; Kase, Toshiyuki; Sasaki, Masahiko; Yamamoto, Hiroshi; and Okuda, Isao, 5,317,144, Cl. 250-201.500.
Okuda, Masatoshi: *See—*
Kitao, Osamu; Tsuji, Masaru; Okuda, Masatoshi; Uchimura, Shunichi; and Tanaka, Jun-ichirou, 5,316,621, Cl. 162-4.000.
Okuma Corporation: *See—*
Maeda, Takeharu, 5,317,519, Cl. 364-474.260.
Okumura, Hirofumi: *See—*
Ono, Yasuichi; Miura, Akito; and Okumura, Hirofumi, 5,315,758, Cl. 29-878.000.
Okumura, Jugoro: *See—*
Ono, Atsushi; Oki, Yasumasa; and Okumura, Jugoro, 5,316,712, Cl. 264-102.000.
Okun, Milton R. Collapsible shower stall. 5,315,721, Cl. 4-599.000.
Okuyama, Nobutaka: *See—*
Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.
Oldfield, John; and Tucker, Howard, to Imperial Chemical Industries PLC. Tricyclic heterocycles. 5,317,101, Cl. 540-488.000.
Oliveros, Alain: *See—*
Thomas, Gerard; and Oliveros, Alain, 5,317,318, Cl. 342-44.000.
Ollar, Robert A., to Infectech, Inc. Method and apparatus for testing MAI (mycobacterium avium–intracellulare) for antimicrobial agent sensitivity. 5,316,918, Cl. 435-34.000.
Olson, Allan G.; and Beehler, James O., to Hewlett-Packard Company. Sheet media realignment mechanism. 5,316,285, Cl. 271-122.000.
Olson, Donald R., to Micro Control Company. Bipolar power supply. 5,317,254, Cl. 323-316.000.
Olson, Douglas J.: *See—*
Meyer, Richard A.; and Olson, Douglas J., 5,315,882, Cl. 73-862.044.
Olson, Douglas R.: *See—*
Babson, Arthur L.; Ross, Arthur F.; Olson, Douglas R.; Giter, Gershon; and Huebner, Victor R., 5,316,726, Cl. 422-65.000.
Olson, Jerry M.; and Kurtz, Sarah R., to Midwest Research Institute. Heterojunction solar cell with passivated emitter surface. 5,316,593, Cl. 136-262.000.
Olson, Nels A.: *See—*
Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.
Olson, Ronald D.: *See—*
Moksnes, Stephen L.; Sharma, Jayant; Olson, Ronald D.; Tump, Ronald S.; Kocher, James M.; and Pausch, Terrance J., 5,316,195, Cl. 222-146.600.
Olson, Timothy A.: *See—*
Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoenner, David W., 5,317,715, Cl. 395-425.000.
Olsson, Fredy: *See—*
Kiesewetter, Lothar E.; Olsson, Fredy; and Tyren, Carl H., 5,317,223, Cl. 310-26.000.
Olympus Optical Co., Ltd.: *See—*
Goto, Atsuo, 5,317,557, Cl. 369-112.000.
Noda, Hiroaki; Dosaka, Shinichi; and Kurosawa, Hiroshi, 5,317,142, Cl. 250-201.400.
Togawa, Tsuyoshi, 5,317,138, Cl. 235-440.000.
Oma, Kenton H.: *See—*
Buelt, James L.; Oma, Kenton H.; and Eschbach, Eugene A., 5,316,411, Cl. 405-128.000.
Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, to Stanley Electric Co., Ltd. Optical distance measuring apparatus. 5,317,375, Cl. 356-5.000.
Omron Corporation: *See—*
Inage, Katuyuki; Saito, Yumi; Zhang, Zhimming; Fujii, Toru; and Shirasaki, Osamu, 5,316,006, Cl. 128-681.000.
Ong, Estela T.; and Hrdina, Kenneth E., to Institute of Gas Technology. Molten carbonate fuel cell electrolyte toughening. 5,316,555, Cl. 29-623.100.
Onishi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Thermal transfer sheet and thermal transfer recording method. 5,317,002, Cl. 503-227.000.
Onishi, Masaru; and Suzuki, Kazuhiro, to Fujitsu Limited. Electric field absorption light modulation driving apparatus and method having improved feature to eliminate noise from optical output. 5,317,581, Cl. 372-38.000.
Ono, Atsushi; Oki, Yasumasa; and Okumura, Jugoro, to JO Cosmetics Co., Ltd. Process for producing solid cosmetics. 5,316,712, Cl. 264-102.000.
ONO Pharmaceutical Co., Ltd.: *See—*
Kawamura, Masanori; Arai, Yoshinobu; and Aishita, Hideki, 5,317,021, Cl. 514-275.000.
Ono, Yasuichi; Miura, Akito; and Okumura, Hirofumi, to Alps Electric Co., Ltd. Method for manufacturing slide electrical contact. 5,315,758, Cl. 29-878.000.
Ono, Yoshiaki: *See—*
Nakagawa, Tanehiro; Ono, Yoshiaki; Tomatsu, Tsutomu; Yamaguchi, Takeo; Aoyama, Kyoji; and Tanaka, Toshiaki, 5,316,513, Cl. 446-14.000.
Onoda, Masahiro; and Toda, Yoshifumi, to Fujitsu Limited. Base-band delayed detector with synchronizing circuit. 5,317,602, Cl. 375-118.000.
Onuki, Tetsuji: *See—*
Matsushiro, Hiroyuki; Onuki, Tetsuji; Miyazaki, Masaya; and Fukutomi, Yasushi, 5,317,153, Cl. 250-306.000.
Onuma, Akira: *See—*
Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, 5,316,617, Cl. 156-643.000.
Oohashi, Yasushi; Hayashi, Mithuyuki; and Sakai, Masahiko, to Nippondenso Co., Ltd. Shaping apparatus for forming a field coil. 5,316,227, Cl. 242-7.030.
Oohasi, Morio: *See—*
Sato, Shinichi; Oohasi, Morio; and Inomata, Hiroshi, 5,316,716, Cl. 264-338.000.
Ookuma, Yasuyuki; Ogawa, Fujio; Hattori, Yoshiyuki; Miyamukai, Takamichi; and Sakakura, Takayuki, to Sumitomo Wiring Systems, Ltd. Method of water-proofing a connected portion of electric wires. 5,316,789, Cl. 427-117.000.
Oomori, Tsutomu: *See—*
Ebato, Kazuo; Tsuda, Masaomi; and Oomori, Tsutomu, 5,316,599, Cl. 148-512.000.
Oona, Henn: *See—*
Hodgdon, Marion Y.; and Oona, Henn, 5,316,060, Cl. 141-390.000.
Oono, Masahiro; Itoh, Tsuyoshi; Hayashi, Katsuki; Kase, Toshiyuki; Sasaki, Masahiko; Yamamoto, Hiroshi; and Okuda, Isao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wave front aberration measuring apparatus having means for adjusting position of collimator lens. 5,317,144, Cl. 250-201.500.
Oouchi, Toshiya; Kuroda, Keiko; and Ido, Nobuhiko, to Hitachi, Ltd. Method of and system for monitoring packet rate in packet network. 5,317,563, Cl. 370-17.000.
Opta Food Ingredients, Inc.: *See—*
Zaks, Aleksey; and Gross, Akiva T., 5,316,927, Cl. 435-134.000.
Optical Activity Limited: *See—*
Norris, Harry; and Horn, Jennifer L., 5,317,150, Cl. 250-252.100.
Oral Logic, Inc.: *See—*
Klinkhammer, Ronald W., 5,316,027, Cl. 132-308.000.
Orban, Jacques; and Mayes, James C., to Schlumberger Technology Corporation. Ultrasonic measurement apparatus. 5,317,111, Cl. 181-105.000.
Orbital Sciences Corporation: *See—*
Mount, Bruce E.; and Von Esch, Myron, 5,317,275, Cl. 324-692.000.
Orbital Walbro Corporation: *See—*
Niebrzydoski, John L., 5,315,968, Cl. 123-73.00C.
Orbits, David A.: *See—*
Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., 5,317,717, Cl. 395-425.000.
Orca Technology, Inc.: *See—*
Smith, Milton O., 5,317,620, Cl. 379-40.000.
Orisaka, Yukihisa: *See—*
Tanaka, Junji; Watanabe, Toshio; and Orisaka, Yukihisa, 5,317,203, Cl. 307-353.000.

- O'Rourke, John E.: *See—*
  - Ingalls, William E., 5,316,332, Cl. 280-661.000.
- O'Rourke, Thomas W.: *See—*
  - Ingalls, William E., 5,316,332, Cl. 280-661.000.
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Crossman, Antony H.; and Thompson, Edmund S., 5,317,672, Cl. 395-238.000.

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Pierson, Theodore J., to Pierson Industries, Inc. Universally adaptable childproof cap. 5,316,162, Cl. 215-223.000.

Pike, Jimmy D.: *See—*
Cochcroft, Arthur F., Jr.; and Pike, Jimmy D., 5,317,738, Cl. 395-680.000.

Pileggi, Vincent J. Apparatus for restraining a variety of neckties. 5,315,713, Cl. 2-145.000.

Pilot Ink Co., Ltd., The: *See—*
Nakagawa, Tanehiro; Ono, Yoshiaki; Tomatsu, Tsutomu; Yamaguchi, Takeo; Aoyama, Kyoji; and Tanaka, Toshiaki, 5,316,513, Cl. 446-14.000.

Pincus, Matthew R.: *See—*
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,317,097, Cl. 536-24.310.

Pinneo, John M.: *See—*
Herb, John A.; Pinneo, John M.; and Gardinier, Clayton F., 5,316,842, Cl. 428-319.100.

Pinsky, Bertram G.; and Hoffman, Robert A., to Becton, Dickinson and Company. Apparatus and method for phase resolved fluorescence lifetimes of independent and varying amplitude pulses. 5,317,162, Cl. 250-461.200.

Pinsky, Naum; and Alkaitis, Saulius A., to Ensci, Inc. Coated substrates. 5,316,846, Cl. 428-325.000.

Pinsky, Naum: *See—*
Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, 5,317,132, Cl. 219-543.000.

Pinto, Akiva; Lucassen, Guenter; and Schmidt, Reinhard, to Hergeth Hollingsworth GmbH. Multiple bale opener having inclined, adjustable tracks. 5,315,738, Cl. 19-145.500.

Piole, Philippe, to France Telecom; and Telediffusion de France. Composite antenna for receiving signals transmitted simultaneously via satellite and by terrestrial stations, in particular for receiving digital audio broadcasting radio signals. 5,317,327, Cl. 343-725.000.

Pioneer Electronic Corporation: *See—*
Furuno, Takashi; Wakasa, Toshiya; Iizuka, Jun; Hagiwara, Kanehiro; and Mitake, Mitsuyoshi, 5,317,449, Cl. 359-443.000.
Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, 5,316,899, Cl. 430-495.000.
Yagami, Heihachiro; Kimizuka, Kazuhiro; and Odashima, Masahiro, 5,317,558, Cl. 369-126.000.

Pioneer Hi-Bred International, Inc.: *See—*
Loesch-Fries, L. Sue; Eagan, Nancy J.; Merlo, Donald J.; and Alexandrescu, Carol, 5,316,930, Cl. 435-172.300.

Piper Plastics, Inc.: *See—*
Rune, Gordon H.; and Wojtysiak, Bruce A., 5,316,733, Cl. 422-104.000.

Pitio, Walter M.: *See—*
Bergland, Glenn D.; Camlet, John V.; Einbinder, Saul J.; Pitio, Walter M.; Pritchard, Robert C.; Shevchuk, George J.; and Shugard, Donald D., 5,317,658, Cl. 385-16.000.

Pitney Bowes Inc.: *See—*
Brewster, William H., Jr.; Chan, Lun; and Sette, Paul R., 5,317,127, Cl. 219-388.000.

Pitou, David: *See—*
Uebbing, John J.; Lugaresi, Thomas J.; and Pitou, David, 5,317,149, Cl. 250-231.140.

Pizairo, Ernie S.: *See—*
Trudeau, John T.; and Pizairo, Ernie S., 5,316,303, Cl. 273-121.00A.

Plant Genetic Systems, N.V.: *See—*
De Greve, Henri M. J.; Salgado, Maria B. L. F.; Van Montagu, Marc C. E.; Vaeck, Mark A.; Zabeau, Marcus F. O.; Leemans, Jan J. A.; and Hofte, Hermanus F. P., 5,317,096, Cl. 536-23.710.

Plast Och Textil Ivan Nilsson: *See—*
Nilsson, Ivan, 5,315,736, Cl. 24-115.00K.

Plasta Fiber Industries Corp.: *See—*
Miller, Douglas C., 5,316,361, Cl. 296-97.800.

Plaster, Lee C.: *See—*
McTaggart, Nancy B., 5,315,712, Cl. 2-106.000.

Plastic Processing Corporation: *See—*
Douglas, Jerry A.; and Schmidt, Godfried, 5,316,159, Cl. 215-10.000.

Plastic Specialties and Technologies, Inc.: *See—*
Seckel, Peter H., 5,315,748, Cl. 29-507.000.

Pless, Reynaldo, to Life Technologies, Inc. N^4-methyl-2'-deoxycytidine 5'-triphosphate and its use in polymerase-catalyzed nucleic acid syntheses. 5,316,948, Cl. 435-91.200

Podell, Allen F., to Pacific Monolithics, Inc. Microstrip filter with reduced ground plane. 5,317,291, Cl. 333-203.000.

Podkowa, Gloria J. Debris trapping comb. 5,315,959, Cl. 119-87.000.

Podszun, Wolfgang: *See—*
Bloodworth, Robert; Podszun, Wolfgang; Defieuw, Geert; Uytterhoeven, Herman; and Schulze, Hans, 5,317,000, Cl. 503-227.000.

Pohl GmbH & Co. KG: *See—*
von Schuckmann, Alfred, 5,316,163, Cl. 215-249.000.

Polaroid Corporation: *See—*
Arnost, Michael J.; Chinoporos, Efthimios; McGowan, Donald A.; and Waller, David P., 5,316,887, Cl. 430-203.000.

Polett, Muriel S.: *See—*
Polett, Walter J.; and Polett, Muriel S., 5,316,387, Cl. 383-119.000.

Polett, Walter J.; and Polett, Muriel S. Structurally-enhanced flexible bulk container. 5,316,387, Cl. 383-119.000.

Polisena, Carl: *See—*
Paspek, Stephen C.; Eppig, Christopher P.; Hauser, Jeffrey B.; and Polisena, Carl, 5,316,655, Cl. 208-131.000.

Poly-Flex, Inc.: *See—*
Markling, Floyd F.; Markling, Tracy A.; and Harlow, Robert A., 5,316,377, Cl. 301-64.700.

Ponce, Fernando A.: *See—*
Thornton, Robert L.; and Ponce, Fernando A., 5,317,586, Cl. 372-45.000.

Pongracz, David J.: *See—*
Chandraiah, Vidyananda B.; and Pongracz, David J., 5,317,480, Cl. 361-785.000.

Popat, Ghanshyam H.; and Sharp, Stephen M., to Avery Dennison Corporation. Stationery with removable printable labels and method therefor. 5,316,344, Cl. 283-81.000.

Poranski, Peter F., Sr.: *See—*
Boatman, L. Terry; Ethridge, Charles O.; Pedersen, Kristen I.; and Poranski, Peter F., Sr., 5,316,509, Cl. 441-3.000.

Portegies, Hans: *See—*
Neff, Edward A.; Portegies, Hans; and Kim, Stan, 5,317,222, Cl. 310-13.000.

Porton Instruments, Inc.: *See—*
Farnsworth, Vincent P.; and Cartier, Paul F., III, 5,316,034, Cl. 137-208.000.

Posharow, Paul: *See—*
Medicke, John A.; and Posharow, Paul, 5,317,757, Cl. 395-800.000.

Potin, Dominique: *See—*
Bru-Magniez, Nicole; Potin, Dominique; and Teulon, Jean-Marie, 5,317,025, Cl. 514-323.000.

Pow, Eric G.; Talaba, Mihai; McNeilly, Leonard; Watkins, David S.; and Lines, Donald A., to Ballard Power Systems Inc. Method and apparatus for the selective oxidation of carbon monoxide in a hydrogen-containing gas mixture. 5,316,747, Cl. 423-247.000.

Powell, Bob R.: *See—*
Bloink, Raymond L.; and Powell, Bob R., 5,316,687, Cl. 252-71.000.

Powell, Timothy J.: *See—*
Edeus, James A.; and Powell, Timothy J., 5,315,850, Cl. 70-129.000.

PPG Industries, Inc.: *See—*
Lin, Chia-Cheng; Basil, John D.; Hunia, Robert M.; and Bihuniak, Peter P., 5,316,854, Cl. 428-426.000.

Prairie, Marshall J., Jr., to L.E. Mason Company. Weather-resistant electrical outlet cover assembly. 5,317,108, Cl. 174-67.000.

Prakash, Shiva: *See—*
Bunshah, Rointan F.; Jou, Shyankay; Prakash, Shiva; and Doerr, Hans J., 5,316,636, Cl. 204-157.470.

Precision General, Inc.: *See—*
Czimny, Arnold; Nimberger, Spencer M.; and Ward, Robert L., 5,316,351, Cl. 285-276.000.

Prentiss, Mara; Mervis, Juliet A.; Bloom, Adam H.; and Zarinetchi, Farhad, to Harvard University. Aligning and attaching a lens to a source of emitted light using light pressure force. 5,317,452, Cl. 359-819.000.

Prestele, Eugen. Fully dischargeable cartridge for paste-like substances. 5,316,186, Cl. 222-327.000.

Prestolite Wire Corporation: *See—*
Kipp, LeRoy E., 5,316,505, Cl. 439-762.000.

Prevallet, Larry C.: *See—*
Page, George W.; High, Glen T.; Looper, David L.; Frew, James S.; Prevallet, Larry C.; and Free, Joseph W., 5,315,819, Cl. 60-39.282.

Prevorsek, Dusan C.: *See—*
Harpell, Gary A.; and Prevorsek, Dusan C., 5,316,820, Cl. 428-109.000.

Primeaux, Dudley J., II, to Texaco Chemical Co. Polyurea elastomer with reduced moisture vapor transmission. 5,317,076, Cl. 528-61.000.

Prince Corporation: *See—*
Arbisi, Thomas E., 5,316,368, Cl. 297-194.000.
Marcusen, David P., 5,316,255, Cl. 248-362.000.

Prince, Gregory A.: *See—*
Ferenczi, Laszlo; Turner, Mark A.; and Prince, Gregory A., 5,315,906, Cl. 83-27.000.

Principia Optics Incorporated: *See—*
Nasibov, Alexander S.; and Reznikov, Pavel V., 5,317,583, Cl. 372-43.000.

Pringle, Ronald E., to Camco International Inc. Well orienting tool and/or thruster. 5,316,094, Cl. 175-74.000.

Pritchard, Robert C.: *See—*
Bergland, Glenn D.; Camlet, John V.; Einbinder, Saul J.; Pitio, Walter M.; Pritchard, Robert C.; Shevchuk, George J.; and Shugard, Donald D., 5,317,658, Cl. 385-16.000.

Pro-Tech Engineering Co., Inc.: *See—*
Guither, James E.; and Wadzinski, Francis A., 5,316,609, Cl. 156-301.000.

Process System International, Inc.: *See—*
Hopewell, Richard B., 5,315,832, Cl. 62-20.000.

Prochazka, Svante: *See—*
Brun, Milivoj K.; Giddings, Robert A.; and Prochazka, Svante, 5,316,851, Cl. 428-379.000.

Procter & Gamble Company, The: *See—*
Drobish, James L.; Ciboch, Frank A., Jr.; Paul, Robert A.; Edwards, Jimmy C.; and Robbins, Lawrence E., 5,316,187, Cl. 222-401.000.
Hall, William G.; and Dirksing, Robert S., 5,316,054, Cl. 141-22.000.

Proctor & Gamble Company, The: *See—*
Bunke, Paul R.; and Prosise, Robert L., 5,317,120, Cl. 219-730.000.

Productive Environments, Inc.: *See—*
Schwartz, David C., 5,316,341, Cl. 281-15.100.

Professional Systems, Inc.: *See—*
Pearson, Gordon I., 5,315,794, Cl. 52-79.100.

Proform Fitness Products, Inc.: *See—*
Dalebout, William T.; and Jones, Ken C., 5,316,534, Cl. 482-133.000.

Proietto, Vincenzo: *See—*
Emonds-Alt, Xavier; Goulaouic, Pierre; Proietto, Vincenzo; and Van Broeck, Didier, 5,317,020, Cl. 514-255.000.

Prosise, Robert L.: *See—*
Bunke, Paul R.; and Prosise, Robert L., 5,317,120, Cl. 219-730.000.

Protechna SA: *See—*
Schutz, Udo, 5,316,174, Cl. 220-571.000.

Proulx, Edward A.: *See—*
Rossier, Glenn E.; Duke, Steven R.; Proulx, Edward A.; and Jarvis, Stephen A., 5,315,913, Cl. 89-12.000.

Provost, George A., to Velcro Industries, B.V. Hook for hook and loop fasteners. 5,315,740, Cl. 24-452.000.

Prunty, Harold. Guarded vehicle hood ornament. 5,316,808, Cl. 428-31.000.

PSC Inc.: *See—*
Tafoya, Benny R., 5,317,166, Cl. 250-568.000.

Puckett, David E.: *See—*
Bokerman, Gary N.; Puckett, David E.; and Wood, Larry H., 5,317,072, Cl. 528-12.000.

Puetz, Curtis: *See—*
Beard, Michael S.; Puetz, Curtis; and Conroy, James W., 5,317,663, Cl. 385-70.000.

Pujol y Tarrago S.A.: *See—*
Gabas, Carlos; and Roca, Agustin, 5,315,892, Cl. 74-502.300.

Pullela, V. Sarma; and Bahjat, Zuhair S., to Otis Elevator Company. Elevator system having dynamic sector assignments. 5,317,114, Cl. 187-128.000.

Pullum, Lionel: *See—*
Hore, Donald G., deceased; Longworth, Norman J.; McCarthy, David; and Pullum, Lionel, 5,316,451, Cl. 417-392.000.

Purer, Edna M.: *See—*
Chao, Sidney C.; Purer, Edna M.; Stanford, Thomas B.; and Townsend, Carl W., 5,316,591, Cl. 134-34.000.

Purkiss, Dennis, to American Guard-It Manufacturing, Inc. Garment carrier. 5,316,140, Cl. 206-287.100.

Quad/Tech, Inc.: *See—*
Graushar, William T.; and Franz, Robert L., Jr., 5,316,425, Cl. 412-19.000.

Qualcomm Incorporated: *See—*
Coffman, Ron D., 5,316,422, Cl. 411-107.000.

Quantum Corporation: *See—*
Glassburn, Tim R., 5,317,713, Cl. 395-425.000.

Quast, Wilfried, to Temic Telefunken microelectronic GmbH. Tetrode biasing circuit. 5,317,282, Cl. 330-277.000.

Quate, Calvin F.; Zdeblick, Mark J.; and Albrecht, Thomas R., to Leland Stanford University, The Board of Trustees of the. Integrated mass storage device. 5,317,533, Cl. 365-151.000.

Qube Corporation: *See—*
Moran, Thomas F., Jr., 5,316,165, Cl. 220-62.000.

Quon, William; and Tanzer, Herbert J., to Hughes Aircraft Company. Liquid jet cold plate for impingement cooling. 5,316,075, Cl. 165-80.400.

R.A. Jones & Co. Inc.: *See—*
Restle, Randall C.; and Munch, Walter, 5,315,807, Cl. 53-51.000.

R. E. Davis Chemical Corporation: *See—*
Davis, Robert E., 5,315,921, Cl. 99-407.000.

Racal-Datacom, Inc.: *See—*
Bapat, Subodh, 5,317,742, Cl. 395-700.000.

Racine, Jean-Guy, to Stone-Consolidated Inc. Method and apparatus for high density paper. 5,316,624, Cl. 162-205.000.

Rafeld, Karl, to Karl Rafeld KG Spritzgusswerk, Elektronik und Formenbau. Tube connecting element of plastic for sanitary and heating purposes. 5,316,349, Cl. 285-156.000.

Ragaly, Istvan, to Robert Bosch GmbH. Electric machine with means for guiding cooling air supplied from outside of the machine. 5,317,224, Cl. 310-58.000.

Raghavan, Chidambaram: *See—*
Ting, Edmund Y.; and Raghavan, Chidambaram, 5,316,745, Cl. 422-295.000.

Ragland, Larry; and Morales, Emmitt, to Gripping Tools Technologies, Inc. Stud removing tool. 5,315,902, Cl. 81-53.200.

Railway Engineering Associates, Inc.: *See—*
List, Harold A., deceased; and List, Marie F., executrix, 5,315,934, Cl. 105-199.300.

Rakonjac, Zoran; and Tucker, Martin, to Tucker, Martin, a part interest. Method of manufacturing and inflatable figure from flexible plastic sheet material. 5,316,605, Cl. 156-145.000.

Ralph, Stanley F.; Weinberg, Leonard; and Hart, Joseph J., to General Electric Co. Alternate path FDDI standard LAN. 5,317,569, Cl. 370-85.900.

Ramacier, Patrick J., Jr.; and Meyer, David W., to Colder Product Company. Quick connection coupling valve assembly. 5,316,041, Cl. 137-614.040.

Ramage, Gary: *See—*
Cantwell, Gill; and Ramage, Gary, 5,315,745, Cl. 29-260.000.

Ramos, Gerardo: *See—*
Kalvoda, Jaroslav; Kessler, Martin; Lattmann, Rene; and Ramos, Gerardo, 5,317,100, Cl. 540-357.000.

Randall, Scott L.: *See—*
Young, David J., Jr.; Randall, Scott L.; Shaw, Scott D.; and Wylde, Andrew F., 5,316,642, Cl. 204-198.000.

Rankin, Richard A.: *See—*
Kotter, Dale K.; Rankin, Richard A.; and Morgan, John P.,, 5,317,259, Cl. 324-251.000.

Rao, V. Durga N.; Kabat, Daniel M.; and Rose, Robert A., to Ford Motor Company. Metal encapsulated solid lubricant coating system. 5,315,970, Cl. 123-193.200.

Rapp, William H.; Gaber, Ira; and Woodring, Cooper C., to Nien Made Enterprise Co., Ltd. Cord-lock mechanism. 5,316,066, Cl. 160-178.200.

Rapson, Nicholas T.: *See—*
Keen, Michael J.; and Rapson, Nicholas T., 5,316,938, Cl. 435-240.310.

Rasi, Marco; Biegler, Mark W.; and Sikirica, Eugene A., to Exxon Production Research Company. Method for reducing occurrences of stuck drill pipe. 5,316,091, Cl. 175-61.000.

Raski, Jerry Z.: *See—*
Bocinski, D. Michael; Kaufman, Craig A.; Kisacky, Randy J.; Kunz, Barton H.; Stone, Lawrence A.; Raski, Jerry Z.; Schaefer, David B.; and Schmidt, Douglas A., 5,315,928, Cl. 101-93.140.

Ratzker, Menahem; Lashmore, David S.; and Tesk, John A. Electroforming of metallic glasses for dental applications. 5,316,650, Cl. 205-67.000.

Rau, William C.: *See—*
Heit, Martin A.; Wilkins, John J.; and Rau, William C., 5,316,130, Cl. 198-781.000.

Ravas, Richard J.: *See—*
Vercellotti, Leonard C.; Mandel, Alan F.; Ravas, Richard J.; Schlotterer, John G.; and Neuner, James A., 5,317,309, Cl. 340-825.540.

Raychem Corporation: *See—*
Chu, Edward F.; Reddy, Vijay; and Saltman, Robert P., 5,317,061, Cl. 525-200.000.

Raytheon Company: *See—*
Bacon, Donald F.; and Richards, Howard M., 5,317,293, Cl. 333-258.000.

Lewis, Edward T., 5,317,214, Cl. 307-475.000.
Vinn, Charles L.; and Huang, Yihe, 5,317,281, Cl. 330-265.000.
Razhev, Vladimir M.: *See—*
Ivanov, Oleg R.; Snegirev, Mikhail I.; Chistyakov, Makhail K.; Razhev, Vladimir M.; Budantsev, Vladimir I.; Kipriyanov, Jury I.; Zaitsev, Vikator A., deceased; Zaitseva, Galina M., administrator; and Zaitseva, Natalya V., administrator, 5,316,735, Cl. 422-143.000.
RC Concepts, Inc.: *See—*
Miller, Albert H.; and Wright, Maynard A., 5,317,278, Cl. 328-167.000.
RCA Thomson Licensing Corporation: *See—*
Casavant, Scott D.; Hurst, Robert N., Jr.; Perlman, Stuart S.; Isnardi, Michael A.; and Aschwanden, Felix, 5,317,398, Cl. 348-570.000.
Keller, Anton W., 5,317,240, Cl. 315-383.000.
Reading Alloys, Inc.: *See—*
Perfect, Frederick H., deceased, 5,316,723, Cl. 420-429.000.
REB Manufacturing Co., Inc.: *See—*
Smalley, Raymond L.; Hall, John C.; Clouse, Ryan J.; Risner, P. Fred; and Strohm, Edward L., 5,316,432, Cl. 414-540.000.
Recine, Leonard J., Sr.: *See—*
Doke, Michael J.; Howarth, Richard A.; and Recine, Leonard J., Sr., 5,315,830, Cl. 62-3.200.
Reddy, Vijay: *See—*
Chu, Edward F.; Reddy, Vijay; and Saltman, Robert P., 5,317,061, Cl. 525-200.000.
Redl, Richard: *See—*
Ward, Michael A. V.; and Redl, Richard, 5,315,982, Cl. 123-634.000.
Reese, William P.: *See—*
Pierce, Daniel J.; and Reese, William P., 5,317,367, Cl. 355-203.000.
Reeve, Austin J.: *See—*
Baker, Raymond; Reeve, Austin J.; and Street, Leslie J., 5,317,103, Cl. 544-367.000.
Refregier, Philippe; and Huignard, Jean-Pierre, to Thomson-CSF. Non-linear and adaptive signal-processing device. 5,317,651, Cl. 382-31.000.
Reggin, Robert F.; and Zamzow, Michael F. Portable tree stand for deer hunting. 5,316,105, Cl. 182-187.000.
Rehrig-Pacific Company, Inc.: *See—*
Apps, William P.; and Lang-Ree, Arne, 5,316,172, Cl. 220-519.000.
Reich, Leon, to Hormec Technic SA. Fluid dispenser, in particular for gluing parts. 5,316,196, Cl. 222-160.000.
Reichard, Jeffrey A., to Eaton Corporation. Heat sink for electrical circuit components. 5,316,077, Cl. 165-104.280.
Reichert, Gerhard: *See—*
Glover, Michael; and Reichert, Gerhard, 5,315,797, Cl. 52-171.300.
Reiffel, Leonard; Jung, Wayne D.; Rosevear, Thomas; and Jakobs, Thomas, to Goldstar Electron Co., Ltd. High resolution system for sensing spatial coordinates. 5,317,502, Cl. 364-167.010.
Reinders, Peter, to Carl Schmale GmbH. Machine for automatically changing lower-thread bobbins. 5,315,944, Cl. 112-180.000.
Reiner, Lawrence: *See—*
Hyman, Greg; Reiner, Lawrence; Caveza, Martin J.; and Newbold, Roger A., 5,316,515, Cl. 446-28.000.
Reinforced Earth Company, The: *See—*
Hummel, Robert A., 5,316,465, Cl. 425-343.000.
Reininger, Russell; and Ledbetter, William B., Jr., to Motorola, Inc. Method for refilling instruction queue by reading predetermined number of instruction words comprising one or more instructions and determining the actual number of instruction words used. 5,317,701, Cl. 395-375.000.
Reiser, Kurt: *See—*
Dolan, Charles P.; Keirsey, David M.; and Reiser, Kurt, 5,317,677, Cl. 395-77.000.
Reiter, Karl: *See—*
Enning, Norbert; Kreis, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, 5,316,367, Cl. 296-189.000.
REM Technologies, Inc.: *See—*
Palma, Rodolfo; and Miller, William H., 5,317,227, Cl. 310-156.000.
Remillard, Jeffrey T.: *See—*
Weber, Willes H.; Remillard, Jeffrey T.; and Ginder, John M., 5,317,667, Cl. 385-147.000.
Remppel, Dieter. Method for improving efficiency of electro-chemical cells. 5,316,632, Cl. 204-146.000.
Renault, Bernard A.; and Brunetti, Pierre C. Valves for a duct, and two-stroke combustion engine incorporating the valves. 5,315,962, Cl. 123-190.110.
Renfer, Dale S.: *See—*
Pai, Damodar M.; Yanus, John F.; Limburg, William W.; and Renfer, Dale S., 5,316,880, Cl. 430-59.000.
Renneke, Franz-Josef: *See—*
Gries, Heinz; Renneke, Franz-Josef; and Weinmann, Hanns-Joachim, 5,316,756, Cl. 424-9.000.
Reno, Ronald G. Bus duct abnormal temperature indicator. 5,315,956, Cl. 116-216.000.
Renz, Guenter: *See—*
Neumann, Ulrich; Buschmann, Ernst; Kiessling, Ulrich; and Renz, Guenter, 5,316,148, Cl. 206-484.100.
Resch, Robert P.: *See—*
Hager, Dean J.; Resch, Robert P.; and Rose, Curtis G., 5,317,683, Cl. 395-145.000.
Research Development Corporation of Japan: *See—*
Takasaki, Yoshiyuki, 5,316,924, Cl. 435-71.200.
Research Foundation of State University of New York, The: *See—*
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,317,097, Cl. 536-24.310.
Ressler, Thomas B., to McCormack Manufacturing Co., Inc. Air cooling unit having a hot gas defrost circuit. 5,315,836, Cl. 62-81.000.
Restle, Randall C.; and Munch, Walter, to R.A. Jones & Co. Inc. Intermittent seal sensing apparatus and methods for pouch webs. 5,315,807, Cl. 53-51.000.
Reuter, Roland: *See—*
Sextl, Gerhard; Strack, Hans; Reuter, Roland; Fuss, Ilona; Kleinschmit, Peter; and Schwarz, Rudolf, 5,316,816, Cl. 428-69.000.
Revak, Scott: *See—*
Bourekas, Philip A.; Mor, Yeshayahu; and Revak, Scott, 5,317,711, Cl. 395-425.000.
Revelli, Joseph F.: *See—*
Agostinelli, John A.; Mir, Jose M.; and Revelli, Joseph F., 5,317,666, Cl. 385-122.000.
Rexer, Christopher L., to Harris Corporation. Device and method for improving current carrying capability in a semiconductor device. 5,317,184, Cl. 257-401.000.
Rexham Industries Corp.: *See—*
Ocampo, Don O.; and Palmer, Emery A., 5,316,608, Cl. 156-230.000.
Rey, Charles A.: *See—*
Danley, Thomas J.; and Rey, Charles A., 5,317,642, Cl. 381-182.000.
Reznikov, Pavel V.: *See—*
Nasibov, Alexander S.; and Reznikov, Pavel V., 5,317,583, Cl. 372-43.000.
Rheinmetall GmbH: *See—*
Grosch, Hermann, 5,317,543, Cl. 367-125.000.
von der Lippe, Norbert; Graener, Rudolf; and Sommer, Peter, 5,316,786, Cl. 427-96.000.
Rhone-Poulenc Chimie: *See—*
Blanchard, Christiane; Chassagneux, Evelyne; Mignani, Gerard; and Vaultier, Michel, 5,316,986, Cl. 501-96.000.
Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See—*
Ullrich, John W.; Youssefyeh, Raymond D.; Cheney, Daniel L.; and Burns, Christopher J., 5,317,015, Cl. 514-79.000.
Rice, John B.: *See—*
Kattus, Thomas A.; and Rice, John B., 5,315,895, Cl. 74-551.800.
Richards, Howard M.: *See—*
Bacon, Donald F.; and Richards, Howard M., 5,317,293, Cl. 333-258.000.
Richards Manufacturing Company, Sales Inc.: *See—*
Bier, Joseph; and Fox, Richard, 5,315,869, Cl. 73-201.000.
Richards, Thomas P.: *See—*
Wang, Yading; Zhou, Stephen O.; and Richards, Thomas P., 5,316,704, Cl. 264-2.600.
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Richardson, Darrel D.: *See—*
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Ito, Masaaki, 5,317,421, Cl. 358-464.000.
Nishida, Hirobumi, 5,317,649, Cl. 382-21.000.
Sawada, Yasuo; Yashiro, Toru; and Ueda, Yutaka, 5,316,814, Cl. 428-64.000.
Suzuki, Takumi; Ota, Yuichi; Narumi, Yuji; and Miyaguchi, Youichiro, 5,317,438, Cl. 359-88.000.
Ueda, Naofumi; and Suzuki, Hiroaki, 5,317,679, Cl. 395-132.000.
Watanabe, Hirofumi; and Terao, Noriyuki, 5,316,960, Cl. 437-40.000.
Ricoh Research Institute of General Electronics Co., Ltd.: *See—*
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Riley, Leon H.: *See—*
Hilbert, Lee A.; Edlin, George R.; Riley, Leon H.; Miller, Thomas G.; Gebhart, Wilford W.; and Johnson, Charles L., 5,317,160, Cl. 250-390.120.
Riley, Norma B.: *See—*
Carlson, David K.; and Riley, Norma B., 5,316,794, Cl. 427-248.100.
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Gregoli, Armand A.; Hamshar, John A.; Rimmer, Daniel P.; and Yildirim, Erdal, 5,316,664, Cl. 208-390.000.

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Spence, John P.; Granger, Edward M.; and Rinehart, Charles E., 5,317,425, Cl. 358-504.000.
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Riris, Haris: *See—*
Cooper, David E.; Carlisle, Clinton B.; and Riris, Haris, 5,317,156, Cl. 250-345.000.
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Smalley, Raymond L.; Hall, John C.; Clouse, Ryan J.; Risner, P. Fred; and Strohm, Edward L., 5,316,432, Cl. 414-540.000.
Ritger, Philip L.: *See—*
Mathewson, Wilfred F.; Bringham, Richard L.; Ritger, Philip L.; and Karshmer, David, 5,316,724, Cl. 422-48.000.
Ritter, Gerhard: *See—*
Ritter, Klaus; Ritter, Gerhard; and Lassbacher, Anton, 5,316,052, Cl. 140-112.000.
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Tribbey, David A.; Hertz, Allen D.; and Rivas, Mario A., 5,317,308, Cl. 340-825.440.
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Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
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Ross, John A.; and Schuster, Richard L., 5,316,207, Cl. 229-23.00R.
RM Engineered Products, Inc.: *See—*
Suggs, Steven M., 5,316,319, Cl. 277-106.000.
Roark, John L., Jr. Poolside anchoring system and method. 5,316,315, Cl. 273-411.000.
Roath, Alan L.: *See—*
Vanaleck, John T.; and Roath, Alan L., 5,316,500, Cl. 439-567.000.
Robbins, Gordon J.: *See—*
Gallo, Antonio R.; McDonough, James J.; Robbins, Gordon J.; and Shaw, Robert R., 5,317,657, Cl. 385-14.000.
Robbins, Jimmy H. Method and apparatus for applying alphanumeric characters to the sidwall of a tire. 5,315,764, Cl. 33-613.000.
Robbins, Kenneth W.: *See—*
Ross, Gerald F.; Mara, Richard M.; Robbins, Kenneth W.; and Fontana, Robert J., 5,317,303, Cl. 340-539.000.
Robbins, Lawrence E.: *See—*
Drobish, James L.; Ciboch, Frank A., Jr.; Paul, Robert A.; Edwards, Jimmy C.; and Robbins, Lawrence E., 5,316,187, Cl. 222-401.000.
Roberson, Glenn A., Jr.; and Eglinton, Robert B., to Semifab Incorporated. Vapor device and method for drying articles such as semiconductor wafers with substances such as isopropyl alcohol. 5,315,766, Cl. 34-409.000.
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Birk, Manfred; Fenchel, Reinhard; Muller, Norbert; Wessel, Wolf; and Engelbrecht, Hans-Christian, 5,315,976, Cl. 123-357.000.
Ragaly, Istvan, 5,317,224, Cl. 310-58.000.
Schwegel, Thomas; and Stiefel, Hans-Peter, 5,315,870, Cl. 73-202.500.
Schweizer, Siegfried; and Sefz, Werner, 5,315,792, Cl. 51-317.000.
Robert Keller AG: *See—*
Keller, Robert, 5,315,922, Cl. 99-447.000.
Roberts, James F.: *See—*
Sherstinsky, Semyon; Chang, Mei; Harris, Charles C.; Mak, Alfred; Roberts, James F.; Tam, Simon W.; and Chang, Wen T., 5,316,278, Cl. 269-254.00R.
Roberts, Martin C., to Micron Semiconductor, Inc. Semiconductor device. 5,317,197, Cl. 257-401.000.
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Novakovich, Michael R.; and Roberts, Richard D., 5,317,751, Cl. 395-750.000.
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McMillan, Larry D.; Paz de Araujo, Carlos A.; and Roberts, Tom L., 5,316,579, Cl. 118-50.000.
Robertshaw Controls Company: *See—*
Sigler, Kent K., 5,316,470, Cl. 431-286.000.
Robertson, James W.: *See—*
Capper, Harry M.; and Robertson, James W., 5,317,474, Cl. 361-119.000.
Robertson, John A.; Cyphert, David L.; Muscarella, Joseph; and French, Robert N., to Telesis Marking Systems, Inc. Marking apparatus with multiple marking modes. 5,316,397, Cl. 400-121.000.
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Brant, Patrick; McElrath, Kenneth O., Jr.; and Robertson, Martha H., 5,317,070, Cl. 526-348.500.
Robertson, Neil C.: *See—*
Stirling, Ronald C.; Schutte, Mark E.; and Robertson, Neil C., 5,317,635, Cl. 380-7.000.
Robertson, Walter H. Dental impression tray. 5,316,474, Cl. 433-38.000.
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Campbell, Willis R.; Robinson, Forrest L.; Perry, Bruce A.; and Schwiefert, Dan, 5,316,029, Cl. 134-104.100.
Robinson, Larry E.: *See—*
Kidman, Gene E.; Robinson, Larry E.; Scollar, Mark P.; and Fotheringham, Ian G., 5,316,943, Cl. 435-280.000.
Robinson, Mark A.: *See—*
Rowe, Raymond G.; Martini, Gary T.; Galaske, Lawrence J., Jr.; White, Douglas J.; and Robinson, Mark A., 5,316,203, Cl. 228-118.000.
Robinson, Norman D., Jr.: *See—*
Corona, Stephen C.; Fox, Elizabeth D.; and Robinson, Norman D., Jr., 5,316,279, Cl. 270-1.100.
Robinson, Shaughnessy: *See—*
Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.
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East, Don G.; Felde, Steven L.; Hu, Paul Y.; and Robles, Guillermo S., 5,316,235, Cl. 242-199.000.
Roca, Agustin: *See—*
Gabas, Carlos; and Roca, Agustin, 5,315,892, Cl. 74-502.300.
Rochat, Alain C.: *See—*
Mizuguchi, Jin; Giller, Gerald; and Rochat, Alain C., 5,316,852, Cl. 428-411.100.
Rockefeller University, The: *See—*
Vlassara, Helen; and Cerami, Anthony, 5,316,754, Cl. 424-2.000.
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DeCoux, Steven P., 5,316,032, Cl. 137-14.000.
Hansen, Robert E.; and Carlson, H. L., 5,316,199, Cl. 226-197.000.
Niemiro, Thaddeus A., 5,315,930, Cl. 101-366.000.
Sovero, Emilio A., 5,317,173, Cl. 257-197.000.
Spiegel, Lyle B.; and McDermott, William E., 5,316,720, Cl. 419-48.000.
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Penaranda, Mariano; Millan, Jose ; Falco, Desiderio; Masip i Balduque, Josep M.; and Rodriguez, Emilio, 5,316,382, Cl. 366-129.000.
Rodriguez, Paul A.: *See—*
Wills, Kendall S.; Rodriguez, Paul A.; and Brewer, Melvin L., 5,317,186, Cl. 257-629.000.
Rodriquez, Jovge C.: *See—*
Barakitis, Nikolaos; Corrales, Marvin S.; and Rodriquez, Jovge C., 5,317,232, Cl. 313-619.000.
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Voerman, Gerard, 5,316,760, Cl. 424-58.000.
Roe, Diane S., to Duke University. Automated analysis of free l-carnitine and total short-chain acylcarnitine. 5,316,917, Cl. 435-15.000.
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Viegas, Herman H.; and Roehrich, Roland L., 5,315,840, Cl. 62-167.000.
Rogers, Kevin P.; and Heathcock, Christopher J., to Comalco Aluminum Limited. Controlled casting of Al-Si hypereutectic alloys. 5,316,070, Cl. 164-122.000.
Rogers, Martin: *See—*
Nicholas, Oscar E., Sr.; Rogers, Martin; Caruso, Anthony J.; and Morrow, Perry F., 5,316,310, Cl. 273-317.000.
Rogerson, L. Keith. Polymeric structure secured to dissimilar components. 5,316,810, Cl. 428-35.700.
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Kojima, Mitsuo, 5,316,963, Cl. 437-52.000.
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Tatsumi, Yutaka, 5,317,341, Cl. 346-76.0PH.
Tsuji, Kazuyoshi; and Shimazaki, Eiji, 5,317,189, Cl. 257-694.000.
Rohm and Haas Company: *See—*
Stewart, Thomas; Lesko, Patricia M.; and El A'mma, Anton G., 5,316,860, Cl. 428-473.000.
Rohrer, Wesley M., Jr.: *See—*
Skelley, Arthur P.; McMichael, James C.; Cobb, James T., Jr.; Rohrer, Wesley M., Jr.; Custer, Phillip E., II; and Elsubki, Taha M., 5,316,737, Cl. 422-170.000.
Rohwedder, Arnim: *See—*
Koehler, Georg; Schaetzle, Ulrich; Rohwedder, Arnim; and Scheidt, Martin, 5,317,229, Cl. 310-334.000.
Rohweller, David J.: *See—*
Chae, Daniel S. H.; Rohweller, David J.; and Thomson, Mark W., 5,315,795, Cl. 52-113.000.

Rojey, Alexandre: *See—*
Collin, Jean-Claude; Larue, Joseph; Rojey, Alexandre; and Viltard, Jean-Charles, 5,316,628, Cl. 203-72.000.
Rojstaczer, Sergio R.; Tang, David Y.; and Tyrell, John A., to Occidental Chemical Corporation. Polyimidesiloxane solution and method of coating substrates. 5,317,049, Cl. 524-104.000.
Roland, Eckehart: *See—*
Sextl, Elfriede; Roland, Eckehart; Kleinschmit, Peter; and Kiss, Akos, 5,316,993, Cl. 502-68.000.
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Kennedy, Joseph P.; Roller, Christopher D.; and Hooper, Robert W., 5,317,323, Cl. 342-457.000.
Romer, Detlef. Downhill-ski training apparatus. 5,316,530, Cl. 482-71.000.
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Romisch, Jurgen: *See—*
Kraus, Michael; and Romisch, Jurgen, 5,316,915, Cl. 435-7.950.
Rommel, Eberhard; and Kimmich, Rainer, to Kohler Schmid & Partner. Method for performing magnetic resonance spectroscopy or tomography in a preselectable region of a material. 5,317,264, Cl. 324-309.000.
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Ronen, Samuel: *See—*
Ben-Zirma, Liora B.; Levanon, Yoram; and Ronen, Samuel, 5,316,296, Cl. 273-73.00R.
Rooney, John P., *Jr.*: *See—*
Davis, Robert B.; Kramer, Charles E.; Rooney, John P., Jr.; Park, Chunghi H.; Eagles, Dana B.; O'Connor, Joseph G.; Lin, Chian-Hsiang; Tabis, Kathleen A.; Kenney, Maryann C.; and Emond, Jeffrey A., 5,316,833, Cl. 428-225.000.
Rose, Curtis G.: *See—*
Hager, Dean J.; Resch, Robert P.; and Rose, Curtis G., 5,317,683, Cl. 395-145.000.
Rose, Jed E.; and Levin, Edward D., to Schaap, Robert J., a part interest. Agonist-antagonist combination to reduce the use of nicotine and other drugs. 5,316,759, Cl. 424-10.000.
Rose, Robert A.: *See—*
Rao, V. Durga N.; Kabat, Daniel M.; and Rose, Robert A., 5,315,970, Cl. 123-193.200.
Roseliep, Robert E., to Utica Enterprises, Inc. Loading/unloading system for broaching machine. 5,315,750, Cl. 29-563.000.
Rosemount Analytical Inc.: *See—*
Ryan, Frederick M.; and Thomson, James W., 5,317,379, Cl. 356-308.000.
Rosen, James L.: *See—*
Ferullo, David A.; Morgan, Roger J.; and Rosen, James L., 5,317,295, Cl. 335-172.000.
Rosen, Mark: *See—*
Blake, Joseph W.; Cousineau, Robert; Rosen, Mark; and Watson, William, 5,316,730, Cl. 422-73.000.
Rosenberg, Neil A. Dental prophy cup. 5,316,475, Cl. 433-166.000.
Rosenstein, Hy: *See—*
Pawlykowych, Zenon; and Rosenstein, Hy, 5,316,259, Cl. 248-601.000.
Rosevear, Thomas: *See—*
Reiffel, Leonard; Jung, Wayne D.; Rosevear, Thomas; and Jakobs, Thomas, 5,317,502, Cl. 364-167.010.
Rosman, Andrew: *See—*
Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., 5,317,689, Cl. 395-163.000.
Ross, Arthur F.: *See—*
Babson, Arthur L.; Ross, Arthur F.; Olson, Douglas R.; Giter, Gershon; and Huebner, Victor R., 5,316,726, Cl. 422-65.000.
Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Montana, John G.; Pass, Martin; and Judd, Duncan B., to Glaxo Group Limited. Benzofuran derivatives. 5,317,023, Cl. 514-303.000.
Ross, Chet: *See—*
Scott, James; and Ross, Chet, 5,316,246, Cl. 248-68.100.
Ross, Gerald F.; Mara, Richard M.; Robbins, Kenneth W.; and Fontana, Robert J., to Anro Engineering, Inc.; and Multispectral Solutions, Inc. Batteryless sensor used in security applications. 5,317,303, Cl. 340-539.000.
Ross, James A. High rise recycling system. 5,316,152, Cl. 209-630.000.
Ross, John A.; and Schuster, Richard L., to Riverwood International Corporation. Container adapted for stacking. 5,316,207, Cl. 229-23.00R.
Rossi, Alessandro, to Axis U.S.A., Inc. Fusing apparatus with temperature control. 5,317,125, Cl. 219-110.000.
Rossier, Glenn E.; Duke, Steven R.; Proulx, Edward A.; and Jarvis, Stephen A., to Martin Marietta Corporation. Gun mechanism for rapidly firing cased telescoped ammunition. 5,315,913, Cl. 89-12.000.
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Viaud, Jean; and Roth, Arsene, 5,315,925, Cl. 100-88.000.
Roth, Jean-Luc: *See—*
Hamy, Michel; Lebrun, Christian; Thebault, Jean-Michel; Maurer, Ghislain; Michelet, Jacques; and Roth, Jean-Luc, 5,316,270, Cl. 266-159.000.
Roth, Sabine: *See—*
Rieger, Martin; and Roth, Sabine, 5,317,217, Cl. 307-521.000.
Rototech Electrical Components, Inc.: *See—*
Yao, Kelvin K. W., 5,317,128, Cl. 219-433.000.
Roudabush, Lester A.: *See—*
Tokarski, Michael G.; and Roudabush, Lester A., 5,315,923, Cl. 100-39.000.
Rouser, Forrest J.: *See—*
Lu, Shih-Lai; Kobe, James J.; Moon, John D.; Freeman, Maurice E.; Rouser, Forrest J.; Heiti, Robert V.; and Boettcher, Thomas E., 5,316,849, Cl. 428-355.000.
Rowe, Raymond G.; Martini, Gary T.; Galaske, Lawrence J., Jr.; White, Douglas J.; and Robinson, Mark A., to General Electric Company. Encapsulated stop-off coating for diffusion bonding. 5,316,203, Cl. 228-118.000.
Roy, Edward M.: *See—*
Chan, May L.; Roy, Edward M.; and Turner, Alan, 5,316,600, Cl. 149-19.400.
Rozmovits, Bernard A., to Digital Equipment Corporation. System for forming serial M-bit information into blocks whose locations correspond to bitmap locations. 5,317,719, Cl. 395-425.000.
Ruane, Robert E.: *See—*
White, Russell T., Jr.; and Ruane, Robert E., 5,316,803, Cl. 427-554.000.
Rubery Owen-Rockwell Limited: *See—*
Layfield, Jonathon M. H., 5,316,111, Cl. 188-205.00R.
Rubscha, Robert F.; Alexander, Robert H., Jr.; Keenan, Glenn M.; and Lagonegro, Paul R., to Xerox Corporation. Inverter apparatus capable of inverting A3 or 11×17" sheets. 5,317,377, Cl. 355-319.000.
Ruckwardt, Hans-Werner, to TRW United Carr GmbH & Co., KG. Plastic holding element. 5,316,245, Cl. 248-68.100.
Rudolph, Axel, to Carl Freudenberg, Firma. Rubber bearing that suppresses vibrations hydraulically. 5,316,274, Cl. 267-140.120.
Ruiz, Jose J.: *See—*
Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
Ruiz, Linda L. C.: *See—*
Brown, Karen K.; Ruiz, Linda L. C.; van de Rijn, Ivo; Greene, Nathan D.; Trump, Sandy L.; Wilson, Curtis D.; and Bryant, Sharon A., 5,316,926, Cl. 435-101.000.
Rune, Gordon H.; and Wojtysiak, Bruce A., to Piper Plastics, Inc. Clean box with sliding arms. 5,316,733, Cl. 422-104.000.
Runyon, Robert C.: *See—*
Klievoneit, Harold R.; Esposito, Augustine G.; and Runyon, Robert C., 5,316,559, Cl. 51-295.000.
Rush, Benjamin M.: *See—*
Brusic, Vlasta A.; Frankel, Gerald S.; Petersen, Tina A.; Rush, Benjamin M.; and Schrott, Alejandro G., 5,316,573, Cl. 106-14.160.
Rushing, Thomas: *See—*
Louise, John; and Rushing, Thomas, 5,316,481, Cl. 434-99.000.
Russ, Michael B.; and Sechrist, Paul A., to UOP. Catalytic reforming process with sulfur arrest. 5,316,992, Cl. 502-66.000.
Rutgers, The State University of New Jersey: *See—*
Kohn, Joachim B.; and Fiordeliso, James J., 5,317,077, Cl. 528-182.000.
Rutherford, Barry K.: *See—*
Crawford, Dennis L.; Rutherford, Barry K.; and Chandler, Paul E., 5,316,153, Cl. 211-13.000.
RWE-DEA Aktiengesellschaft fuer Mineraloel und Chemie: *See—*
Hammer, Hartmut, 5,316,627, Cl. 203-34.000.
Ryan, Frederick M.; and Thomson, James W., to Rosemount Analytical Inc. Chemical species optical analyzer with multiple fiber channels. 5,317,379, Cl. 356-308.000.
Ryan, James L.: *See—*
Mukherjee, Sujan K.; Ryan, James L.; and Wason, James R., 5,317,729, Cl. 395-600.000.
Ryan, Raymond W., Jr.: *See—*
Walls, John E.; Miller, Gary R.; and Ryan, Raymond W., Jr., 5,316,892, Cl. 430-309.000.
Rycamber, Edward: *See—*
Bensinger, Kenneth; and Rycamber, Edward, 5,315,788, Cl. 49-404.000.
Ryu, Shiro: *See—*
Miyazaki, Tetsuya; and Ryu, Shiro, 5,317,382, Cl. 356-351.000.
Sabate, Bernard; Masse, Joel; and Jeanty, Gerard, to Bouchons A Champagne Sabate, S.A. Composition adapted to be used for manufacturing stoppers and process of manufacture. 5,317,047, Cl. 524-16.000.
Sabelstrom, Mats; and Tenglund, Lars, to AB Volvo. Internal combustion engine with compressor function. 5,315,974, Cl. 123-320.000.
Sabir, Adnan S.: *See—*
Jurgens, Raymond W., Jr.; Graben, Roger D.; and Sabir, Adnan S., 5,316,772, Cl. 424-472.000.
Saeki, Katsuhisa: *See—*
Sone, Taeko; Tosaka, Masaki; Saeki, Katsuhisa; Ara, Katsutoshi; Deguchi, Katsuhiko; and Igarashi, Kazuaki, 5,316,691, Cl. 252-174.120.
Saeki, Yasuhiro: *See—*
Etchu, Masami; Hamano, Hisashi; Hosoi, Masahiro; and Saeki, Yasuhiro, 5,316,823, Cl. 428-141.000.
Saf-T Corp.: *See—*
Turner, Arthur R., 5,315,803, Cl. 52-720.000.
Sagiyama, Masaru; Abe, Masaki; Hiraya, Akira; Inagaki, Junichi; and Morita, Masaya, to NKK Corporation. Method for manufacturing iron-zinc alloy plated steel sheet having two plating layers and excellent in electropaintability and pressformability. 5,316,652, Cl. 205-177.000.

Sahm, Jurgen E. Method of set shaping hair. 5,316,025, Cl. 132-211.000.
Said, Waleed: *See—*
Iden, Steven M.; Shires, Edwin J.; and Said, Waleed, 5,317,500, Cl. 363-98.000.
Saika, Toshihiro: *See—*
Kobayashi, Isao; Kaifu, Noriyuki; Saika, Toshihiro; and Endo, Tadao, 5,317,406, Cl. 348-307.000.
Sail Systems, Inc.: *See—*
Brown, Hayden D., 5,315,948, Cl. 114-106.000.
St. Florian Company: *See—*
Klievoneit, Harold R.; Esposito, Augustine G.; and Runyon, Robert C., 5,316,559, Cl. 51-295.000.
Saint Gobain Vitrage International: *See—*
Cordes, Hans; Krumm, Helmut; Schwartz, Ludwig; Kahn, Ilan; Cornils, Gerd; and Behrend, Ulrich, 5,316,829, Cl. 428-192.000.
St. Jude Children's Research Hospital: *See—*
Bigner, Darell D.; and Brent, Thomas P., 5,316,932, Cl. 435-193.000.
Saito, Fumiaki: *See—*
Ishimura, Kazuhiko; Saito, Fumiaki; Yoshikawa, Masaaki; Okada, Misao; and Nakajima, Shinsuke, 5,316,563, Cl. 65-32.500.
Saito, Fuminari: *See—*
Honsho, Hironori; and Saito, Fuminari, 5,316,234, Cl. 242-198.000.
Saito, Hiroyuki: *See—*
Seki, Yoichi; Hayakawa, Teruyo; Saito, Hiroyuki; and Endo, Shinichi, 5,317,357, Cl. 354-289.120.
Saito, Shinichi: *See—*
Murashiro, Katsuyuki; Kikuchi, Makoto; and Saito, Shinichi, 5,316,694, Cl. 252-299.610.
Saito, Tadashi; and Jinbo, Hideyuki, to Oki Electric Industry Co., Ltd. Pattern forming method and photomasks used therefor. 5,316,878, Cl. 430-5.000.
Saito, Tadayuki: *See—*
Motani, Shigeru; Saito, Tadayuki; and Hayashi, Takahiro, 5,317,033, Cl. 521-79.000.
Saito, Yumi: *See—*
Inage, Katuyuki; Saito, Yumi; Zhang, Zhimming; Fujii, Toru; and Shirasaki, Osamu, 5,316,006, Cl. 128-681.000.
Saito, Yutaka: *See—*
Suzuki, Yoshiro; Tanaka, Hitoshi; Kurihara, Noriyuki; and Saito, Yutaka, 5,316,727, Cl. 422-68.100.
Saitoh, Shinya, to Takara Co., Ltd. Animated singing toy bird with external stimulus sensor. 5,316,516, Cl. 446-175.000.
Sakai, Iwao, to Mitsubishi Denki Kabushiki Kaisha. Burn-in apparatus and burn-in board removing method using movable cooling enclosure. 5,317,257, Cl. 324-158.00F.
Sakai, Masahiko: *See—*
Oohashi, Yasushi; Hayashi, Mithuyuki; and Sakai, Masahiko, 5,316,227, Cl. 242-7.030.
Sakai, Masanori; Ohnaka, Noriyuki; Izumiya, Masakiyo; and Hattori, Shigeo, to Hitachi, Ltd. Method and apparatus for measuring sensitization of structural members. 5,316,633, Cl. 204-153.110.
Sakai, Minoru, to Fuji Photo Film Co., Ltd. Silver halide photographic material and photographic image forming method using the same. 5,316,889, Cl. 430-264.000.
Sakai, Osamu: *See—*
Suzuki, Takane; Sugawara, Sakuo; Hamazaki, Nobuyoshi; Ito, Ken-ichi; Tsutsumi, Koichiro; and Sakai, Osamu, 5,316,214, Cl. 236-78.00B.
Sakai, Shigenobu: *See—*
Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, 5,317,405, Cl. 348-20.000.
Sakaki, Hiroaki: *See—*
Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.
Sakakura, Takayuki: *See—*
Ookuma, Yasuyuki; Ogawa, Fujio; Hattori, Yoshiyuki; Miyamukai, Takamichi; and Sakakura, Takayuki, 5,316,789, Cl. 427-117.000.
Sakamoto, Masayuki; and Hata, Masaharu, to Nippon Telegraph and Telephone Corporation. Method of handover and route diversity in mobile radio communication. 5,317,623, Cl. 379-60.000.
Sakayama, Takashi: *See—*
Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.
Sako, Shigeki, to Kabushiki Kaisha Toshiba. Resin-sealed semiconductor device having intermediate silicon thermal dissipation means and embedded heat sink. 5,317,194, Cl. 257-777.000.
Sakura Color Products Corporation: *See—*
Fujita, Hisanori; and Nakanishi, Mikihiko, 5,316,574, Cl. 106-20.00A.
Sakurai, Soichi: *See—*
Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.
Salamo, Gregory J.: *See—*
Sharp, Edward J.; Wood, Gary L.; Clark, William W., III; and Salamo, Gregory J., 5,317,442, Cl. 359-170.000.
Salas, R. Pito; Edelson, Glenn D.; Kleppner, Paul S.; and Shaver, Robert S., to Lotus Development Corporation. Data processing apparatus and method for a reformattable multidimensional spreadsheet. 5,317,686, Cl. 395-157.000.
Salby, E. Reeves, II: *See—*
Gray, Charles L.; Brooker, John T.; Bardin, Dale E.; and Salby, E. Reeves, II, 5,317,148, Cl. 250-227.260.
Salcedo, Louis: *See—*
Crouse, Richard S.; Cazzolla, John J.; Chang, Luke L.; Hurtado, Marco M.; Nguyen, Kha D.; Rivero, Jose L.; Ruiz, Jose J.; and Salcedo, Louis, 5,317,565, Cl. 370-58.200.
Salerno, Jack P.: *See—*
Spitzer, Mark B.; Salerno, Jack P.; and Zavracky, Paul M., 5,317,436, Cl. 359-83.000.
Salgado, Maria B. L. F.: *See—*
De Greve, Henri M. J.; Salgado, Maria B. L. F.; Van Montagu, Marc C. E.; Vaeck, Mark A.; Zabeau, Marcus F. O.; Leemans, Jan J. A.; and Hofte, Hermanus F. P., 5,317,096, Cl. 536-23.710.
Sallaerts, Dany: *See—*
Marcel, Francois; Sallaerts, Dany; Allaire, Serge; and Dore, Pierre, 5,317,571, Cl. 370-103.000.
Saltman, Robert P.: *See—*
Chu, Edward F.; Reddy, Vijay; and Saltman, Robert P., 5,317,061, Cl. 525-200.000.
Sambandan, Sachidanandan: *See—*
Talreja, Sanjay S.; Mills, Duane; Javanifard, Jahanshir J.; and Sambandan, Sachidanandan, 5,317,535, Cl. 365-185.000.
Samsung Electron Devices Co., Ltd.: *See—*
Kangok, Lee, 5,316,511, Cl. 445-24.000.
Lee, Chun Gyoo, 5,317,393, Cl. 348-58.000.
Lee, Sang-rok, 5,317,231, Cl. 313-493.000.
,SamSung Electronics Co., Ltd.: *See—*
Choi, Jeong-Hyeok; and Shin, Chul-Ho, 5,317,534, Cl. 365-182.000.
Kim, Hee-Man, 5,317,460, Cl. 360-73.050.
Lee, Chang B., 5,315,845, Cl. 62-338.000.
Lee, Jae-Seung, 5,315,846, Cl. 62-419.000.
Lee, Kyu C., 5,315,727, Cl. 8-159.000.
Samsung Heavy Industries Co., Ltd.: *See—*
Ko, Jae I.; Lee, Jae W.; Lee, Yoon M.; Jean, En J.; Kim, Chun K.; and Kim, Jin, 5,316,709, Cl. 264-51.000.
Samudrala, Sridhar: *See—*
Britton, Sharon M.; Allmon, Randy; and Samudrala, Sridhar, 5,317,527, Cl. 364-715.040.
Samuelson, Bruce E.; and Butzer, Susan M., to Minnesota Mining and Manufacturing Company. Definite length transfer adhesive dispenser. 5,316,613, Cl. 156-540.000.
Sanborn, Walter J.: *See—*
Wong, Chee-Chiu J.; and Sanborn, Walter J., 5,316,524, Cl. 474-151.000.
Sanden Corporation: *See—*
Inoue, Atsuo, 5,315,841, Cl. 62-228.300.
Sanders, Nicholas A.: *See—*
Couch, Richard W., Jr.; Sanders, Nicholas A.; Luo, Lifeng; Sobr, John; and Backander, Patrik, 5,317,126, Cl. 219-121.510.
Sandlerman, Nimrod: *See—*
Misholi, Boaz; Danziger, Itzchak; Kowarsky, Stephen R.; and Sandlerman, Nimrod, 5,317,628, Cl. 379-89.000.
Sandoz Ltd.: *See—*
Kaul, Bansi L.; and Vougioukas, Angelos-Elie, 5,316,553, Cl. 8-639.000.
Sandstrom, Roland; Maxe, Ann; Strandberg, Tore; Lundsten, Lars; and Andersson, Alvar, to Frigoscandia Food Process Systems AB. Method and arrangement for an enforced heat transmission between alimentary bodies and gases. 5,316,076, Cl. 165-84.000.
Sang, Henry W., Jr.; Tahn, Whei-Tsu H.; and Zhang, Xiao B., to Xerox Corporation. Automated method for creating templates in a forms recognition and processing system. 5,317,646, Cl. 382-9.000.
Sano, Yoshio, to NEC Corporation. Method for driving a plasma dislay panel. 5,317,334, Cl. 345-148.000.
Sanofi: *See—*
Emonds-Alt, Xavier; Goulaouic, Pierre; Proietto, Vincenzo; and Van Broeck, Didier, 5,317,020, Cl. 514-255.000.
Santandrea, Luciano; and Lombardi, Massimo, to Axis S.p.A. Machine for winding two-pole stators. 5,316,228, Cl. 242-1.10R.
Santiago, Eduardo A.: *See—*
Heap, A. Randall; and Santiago, Eduardo A., 5,317,723, Cl. 395-500.000.
Sanyo Electric Co., Ltd.: *See—*
Hosoya, Nobukazu; Miura, Katsunori; and Sasaki, Toru, 5,317,216, Cl. 307-521.000.
Shindo, Yoshitaka; and Anzai, Fukuji, 5,317,414, Cl. 358-336.000.
Tsujioka, Tsuyoshi; Tatezono, Fumio; Matsuura, Koutaro; and Irie, Masahiro, 5,316,900, Cl. 430-495.000.
Sara Lee Corporation: *See—*
Howell, David C.; and McEwen, John C., 5,315,946, Cl. 112-265.100.
Sardariani, Edmond: *See—*
Karabed, Raznik; Nemazie, Siamack; and Sardariani, Edmond, 5,317,505, Cl. 364-410.000.
Sargent, Ralph R.; and Williams, Michael S., to Peach State Labs, Inc. Permanently stain resistant textile fibers. 5,316,850, Cl. 428-378.000.
Sarraf, Nabil G. Fluid dispensing apparatus. 5,316,194, Cl. 222-136.000.
Sasagawa, Koji: *See—*
Tomisawa, Maya; Higashi, Shuji; Sasagawa, Koji; and Fujii, Tatsuo, 5,316,209, Cl. 229-87.050.
Sasaki, Katumaru: *See—*
Satou, Youji; Sasaki, Katumaru; Hosoya, Ryo; Kaji, Koichi; and Inoue, Kanji, 5,316,491, Cl. 439-159.000.

Sasaki, Kenji: *See*—
Sawada, Kazuo; and Sasaki, Kenji, 5,317,648, Cl. 382-17.000.
Sasaki, Masahiko: *See*—
Oono, Masahiro; Itoh, Tsuyoshi; Hayashi, Katsuki; Kase, Toshiyuki; Sasaki, Masahiko; Yamamoto, Hiroshi; and Okuda, Isao, 5,317,144, Cl. 250-201.500.
Sasaki, Mitsuhiro; and Kawabe, Kuniyasu, to Kao Corporation. Pulverulent ink and printing methods. 5,316,885, Cl. 430-200.000.
Sasaki, Toru: *See*—
Hosoya, Nobukazu; Miura, Katsunori; and Sasaki, Toru, 5,317,216, Cl. 307-521.000.
Sass, Paul F., to United States of America, Army. Situation awareness display device. 5,317,321, Cl. 342-176.000.
Satake, Yoshifumi; Watanabe, Ikuo; Kashida, Motokazu; and Shikakura, Akihiro, to Canon Kabushiki Kaisha. Image reproducing apparatus capable of freezing a displayed image. 5,317,399, Cl. 348-571.000.
Sato, Fumihiko, to NEC Corporation. Semiconductor integrated circuit and associated test method. 5,317,205, Cl. 307-443.000.
Sato, Hirotoshi; Ohba, Atsushi; and Hosogane, Akira, to Mitsubishi Denki Kabushiki Kaisha. Level converter with delay circuitry used to increase switching speed. 5,317,213, Cl. 307-475.000.
Sato, Koichi: *See*—
Iwase, Akira; Iwaki, Hirofumi; Kaneko, Toshikazu; Kubo, Isao; and Sato, Koichi, 5,316,557, Cl. 29-623.500.
Yoshinaga, Kazuo; and Sato, Koichi, 5,316,806, Cl. 428-1.000.
Sato, Masaru: *See*—
Ushio, Masaru; Nakano, Tamio; Hatayama, Minoru; Ishikawa, Katuhiko; and Sato, Masaru, 5,316,658, Cl. 208-216.00R.
Sato, Nobuyuki: *See*—
Taoka, Hisao; Iyoda, Isao; Noguchi, Hideo; Kojima, Yukio; Warashina, Shigeru; and Sato, Nobuyuki, 5,317,525, Cl. 364-578.000.
Sato, Shinichi; Oohasi, Morio; and Inomata, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Mold releasing resin composition and molding of curable resin using the same. 5,316,716, Cl. 264-338.000.
Sato, Yoichi: *See*—
Shinagawa, Satoshi; Sato, Yoichi; Hasegawa, Masami; Shimono, Yasushi; Miyasaka, Masayuki; Tamura, Takatoshi; and Iioka, Yoshio, 5,317,537, Cl. 365-189.040.
Sato, Yoshio: *See*—
Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, 5,317,556, Cl. 369-112.000.
Satoh, Hiroshi: *See*—
Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,316,722, Cl. 420-421.000.
Satoh, Junichi, to Fujitsu Limited. Hybrid multiplex synchronizing method and apparatus therefor. 5,317,572, Cl. 370-105.100.
Satoh, Masayuki: *See*—
Kobayashi, Yoh-ichi; Watabe, Ken; Mukohara, Yukuo; Satoh, Masayuki; and Nakamura, Hiroaki, 5,316,934, Cl. 435-215.000.
Satoh, Mitsuo: *See*—
Obana, Noboru; and Satoh, Mitsuo, 5,317,624, Cl. 379-61.000.
Satoh, Ryoichi: *See*—
Inazu, Mizuho; Satoh, Ryoichi; Inoue, Tsutomu; Kitagawa, Hiroshi; Katoh, Masakazu; Englert, Heinrich; Carniato, Denis; and Lang, Hans-Jochen, 5,317,029, Cl. 514-422.000.
Satou, Youji; Sasaki, Katumaru; Hosoya, Ryo; Kaji, Koichi; and Inoue, Kanji, to Kabushiki Kaisha Toshiba. Electronic apparatus, card-type electronic component used with the electronic apparatus, and electronic system with expanding apparatus for expanding function of electronic apparatus. 5,316,491, Cl. 439-159.000.
Saur, Reinhold: *See*—
Sauter, Hubert; Schelberger, Klaus; Saur, Reinhold; Lorenz, Gisela; and Ammermann, Eberhard, 5,317,027, Cl. 514-399.000.
Sauter, Frederick J.: *See*—
Parton, Richard L.; Stegman, David A.; and Sauter, Frederick J., 5,316,904, Cl. 430-567.000.
Sauter, Hubert; Schelberger, Klaus; Saur, Reinhold; Lorenz, Gisela; and Ammermann, Eberhard, to BASF Aktiengesellschaft. Fungicidal compositions. 5,317,027, Cl. 514-399.000.
Savage, Howard T.; Clark, Arthur E.; Wun-Fogle, Marilyn; Kabacoff, Lawrence T.; Hernando, Antonio; and Beihoff, Bruce, to United States of America, Navy. Magnetostrictive torque sensor. 5,315,881, Cl. 73-862.333.
Sawada, Kazuo; and Sasaki, Kenji, to Matsushita Electric Works, Ltd. Process for extracting a particular color image of an object and a color processing device therefor. 5,317,648, Cl. 382-17.000.
Sawada, Takashi: *See*—
Hasegawa, Shinichi; Ota, Shuichi; Uetake, Akihiro; Sawada, Takashi; Senshu, Yoichirou; and Sugai, Chiaki, 5,316,236, Cl. 242-200.000.
Sawada, Yasuo; Yashiro, Toru; and Ueda, Yutaka, to Ricoh Company, Ltd. Optical information recording medium. 5,316,814, Cl. 428-64.000.
Sawamoto, Hideo: *See*—
Ara, Mari; Sawamoto, Hideo; and Yamagata, Ryo, 5,317,710, Cl. 395-425.000.
Sawdon, Robert B.: *See*—
Tobler, Hugh J.; Lepper, Larry G.; and Sawdon, Robert B., 5,316,197, Cl. 222-281.000.
Scandella, Walter: *See*—
Stellwagen, Armin; and Scandella, Walter, 5,315,828, Cl. 60-426.000.
Scannelli, Anthony R.; Gartzke, Donald G.; and Lewis, Christopher, to Dynawave Incorporated. Coaxial connector with rotatable mounting flange. 5,316,499, Cl. 439-534.000.
Schaap, Robert J.: *See*—
Rose, Jed E.; and Levin, Edward D., 5,316,759, Cl. 424-10.000.
Schaareman, Jacobus M., to NKF Kabel B.V. Plug-in connection for high-voltage plastic cable. 5,316,492, Cl. 439-206.000.
Schad, Hanspeter: *See*—
Dandliker, Rene ; Schweizer, Edwin; Schad, Hanspeter; and Odoni, Walter, 5,317,147, Cl. 250-227.170.
Schad, Robert G.: *See*—
Fleischman, Aaron J.; Lustig, Naftali E.; and Schad, Robert G., 5,317,190, Cl. 257-743.000.
Schaedel, Richard. Electromagnetic field sensitive animated ornamental display. 5,317,238, Cl. 315-323.000.
Schaefer, David B.: *See*—
Bocinski, D. Michael; Kaufman, Craig A.; Kisacky, Randy J.; Kunz, Barton H.; Stone, Lawrence A.; Raski, Jerry Z.; Schaefer, David B.; and Schmidt, Douglas A., 5,315,928, Cl. 101-93.140.
Schaetzle, Ulrich: *See*—
Koehler, Georg; Schaetzle, Ulrich; Rohwedder, Arnim; and Scheidt, Martin, 5,317,229, Cl. 310-334.000.
Schafer, Kenneth R.: *See*—
Marcus, Michael A.; Schafer, Kenneth R.; and Kestner, Diane E., 5,317,386, Cl. 356-372.000.
Schafler, Winfried, to U.S. Philips Corporation. Magnetic tape apparatus having a compact reel-brake assembly. 5,316,237, Cl. 242-204.000.
Schaper, Ulrich; and Holzapfl, Birgit, to Siemens Aktiengesellschaft. Power transistor having multifinger contacts. 5,317,176, Cl. 257-287.000.
Scheidler, Herwig: *See*—
Taplan, Martin; Hubert, Stefan; and Scheidler, Herwig, 5,317,129, Cl. 219-464.000.
Scheidt, Martin: *See*—
Koehler, Georg; Schaetzle, Ulrich; Rohwedder, Arnim; and Scheidt, Martin, 5,317,229, Cl. 310-334.000.
Scheiterle, Brian L. Portable construction frame forming apparatus. 5,315,853, Cl. 72-178.000.
Schelberger, Klaus: *See*—
Sauter, Hubert; Schelberger, Klaus; Saur, Reinhold; Lorenz, Gisela; and Ammermann, Eberhard, 5,317,027, Cl. 514-399.000.
Scheller, Bernfrid: *See*—
Kresse, Franz; Osberghaus, Rainer; and Scheller, Bernfrid, 5,315,734, Cl. 15-229.400.
Schendel, Frederick J.: *See*—
Flickinger, Michael C.; Hanson, Richard S.; Schendel, Frederick J.; Anderson, Charles R.; and August, Paul R., 5,316,928, Cl. 435-136.000.
Scherb, Thoroe: *See*—
Begemann, Ulrich; and Scherb, Thoroe, 5,316,383, Cl. 366-160.000.
Schering Agrochemicals Limited: *See*—
Jones, Graham P., 5,317,005, Cl. 504-239.000.
Schering Aktiengesellschaft: *See*—
Baldus, Berthold; Maass, Bernhard; Muller, Bernd; and Witt, Werner, 5,316,766, Cl. 424-94.630.
Gries, Heinz; Renneke, Franz-Josef; and Weinmann, Hanns-Joachim, 5,316,756, Cl. 424-9.000.
Schiek, James W., Sr. Sports belt with cinchable fastener system. 5,316,022, Cl. 128-876.000.
Schleicher, Israel D.; and Schleicher, Yaacov. Apparatus for automatic feeding of container plants. 5,315,787, Cl. 47-79.000.
Schleicher, Louis C., to Tech-Line Engineering Co. Apparatus for forming a clinch joint. 5,315,743, Cl. 29-243.500.
Schleicher, Yaacov: *See*—
Schleicher, Israel D.; and Schleicher, Yaacov, 5,315,787, Cl. 47-79.000.
Schleinz, Alan F.: *See*—
Heindel, Timothy R.; Garvey, Michael J.; Dick, Daniel W.; Keller, Richard F.; Jordan, Mary P.; and Schleinz, Alan F., 5,316,836, Cl. 428-284.000.
Schlesinger, Tuviah E.: *See*—
Mir, Jose M.; Stancil, Daniel; and Schlesinger, Tuviah E., 5,317,446, Cl. 359-296.000.
Schlotterer, John G.: *See*—
Vercellotti, Leonard C.; Mandel, Alan F.; Ravas, Richard J.; Schlotterer, John G.; and Neuner, James A., 5,317,309, Cl. 340-825.540.
Schlumberger Technology Corporation: *See*—
Orban, Jacques; and Mayes, James C., 5,317,111, Cl. 181-105.000.
Schmid, Gerhard: *See*—
Crause, Peter; Habermann, Paul; Tripier, Dominique; Ulmer, Wolfgang; and Schmid, Gerhard, 5,316,947, Cl. 435-320.100.
Schmidt, Douglas A.: *See*—
Bocinski, D. Michael; Kaufman, Craig A.; Kisacky, Randy J.; Kunz, Barton H.; Stone, Lawrence A.; Raski, Jerry Z.; Schaefer, David B.; and Schmidt, Douglas A., 5,315,928, Cl. 101-93.140.
Schmidt, Godfried: *See*—
Douglas, Jerry A.; and Schmidt, Godfried, 5,316,159, Cl. 215-10.000.
Schmidt, Reinhard: *See*—
Pinto, Akiva; Lucassen, Guenter; and Schmidt, Reinhard, 5,315,738, Cl. 19-145.500.
Schmidt, William P.; and Hutchinson, Franklin D. Vehicle mounting assembly. 5,316,257, Cl. 248-487.000.

Schmidt, Wolfgang: *See*—
Benedikt, Walter; Vogel, Manfred; Herden, Werner; Konrad, Johann; Schmidt, Wolfgang; Tosch, Josef; and Kuessel, Matthias, 5,315,875, Cl. 73-706.000.
Schmitt, Karl R., to Textron Inc. Horizontal zero viewing port assembly. 5,317,486, Cl. 362-66.000.
Schmitt, Peter J.: *See*—
Herbert, William G.; Hogle, David J.; Grammatica, Steven J.; Schmitt, Peter J.; Jansen, Ronald E.; and Thomas, Mark S., 5,316,651, Cl. 205-67.000.
Schmitt, Robert J.; Bottaro, Jeffrey C.; Penwell, Paul E.; and Bomberger, David C., to SRI International. Process for forming ammonium dinitramide salt by reaction between ammonia and a nitronium-containing compound. 5,316,749, Cl. 423-385.000.
Schneck, Gary G., to Gendex Corporation. Method for cleaning and lubricating a dental handpiece with a disposable container. 5,316,590, Cl. 134-26.000.
Schneider, Robert W.: *See*—
Haviland, Jeffrey S.; Krahn, Donald R.; and Schneider, Robert W., 5,317,251, Cl. 324-102.000.
Schnur, Earl J.: *See*—
Lesser, Carl W.; and Schnur, Earl J., 5,317,124, Cl. 219-99.000.
Schoell, Harry. Internal combustion rotary engine having a stacked arrangement of cylinders. 5,315,967, Cl. 123-55.0AA.
Schoen, William R.: *See*—
Ok, Hyun O.; Schoen, William R.; and Wyvratt, Matthew, 5,317,017, Cl. 514-211.000.
Scholl plc: *See*—
Kiamil, Sinan, 5,316,762, Cl. 424-78.350.
Schomberg, Hermann, to U.S. Philips Corporation. System for parallel computation with three phase processing in processor tiers in which new instructions trigger execution and forwarding. 5,317,735, Cl. 395-650.000.
Schommer, John. Custom flow restrictor. 5,315,859, Cl. 73-3.000.
Schott Glaswerke: *See*—
Taplan, Martin; Hubert, Stefan; and Scheidler, Herwig, 5,317,129, Cl. 219-464.000.
Schrenk, W. Juergen; and Hall, Shelby J., to Carter-Wallace, Inc. Device for collection and processing of biological samples. 5,316,731, Cl. 422-101.000.
Schrenk, Walter J., to Dow Chemical Company, The. Method of producing a lamellar polymeric body. 5,316,703, Cl. 264-1.300.
Schroeder, James C. Extension wall attachment structure for pickup trucks. 5,316,357, Cl. 296-36.000.
Schroedl, Richard M.: *See*—
Dorsey, William I.; Masten, John J., Jr., deceased; Schroedl, Richard M.; and Will, Donald G., 5,317,338, Cl. 346-1.100.
Schrott, Alejandro G.: *See*—
Brusic, Vlasta A.; Frankel, Gerald S.; Petersen, Tina A.; Rush, Benjamin M.; and Schrott, Alejandro G., 5,316,573, Cl. 106-14.160.
Schullerus, Wolfgang: *See*—
Braun, Hilarion; Schullerus, Wolfgang; and Schulz, Harald, 5,317,339, Cl. 346-1.100.
Schultz, Roger L.: *See*—
Manke, Kevin R.; Wesson, David S.; and Schultz, Roger L., 5,316,087, Cl. 166-381.000.
Schultze, Hans-Joachim: *See*—
Buehler, Friedrich S.; Casanova, Josef; Ernst, Hansjorg; and Schultze, Hans-Joachim, 5,316,578, Cl. 106-210.000.
Schulz, Harald: *See*—
Braun, Hilarion; Schullerus, Wolfgang; and Schulz, Harald, 5,317,339, Cl. 346-1.100.
Schulz, Rhonda K.: *See*—
Gladfelter, Elizabeth J.; Outlaw, Tina O.; Copeland, James L.; Schulz, Rhonda K.; Boche, Daniel K.; and Peterson, Jeff W., 5,316,688, Cl. 252-90.000.
Schulze, Hans: *See*—
Bloodworth, Robert; Podszun, Wolfgang; Defieuw, Geert; Uytterhoeven, Herman; and Schulze, Hans, 5,317,000, Cl. 503-227.000.
Schumacher, Friedrich W.: *See*—
Schumacher, Gustav; and Schumacher, Friedrich W., 5,316,033, Cl. 137-614.000.
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Schumacher, Michael, to Heckler & Koch GmbH. Method of reducing the muzzle noise of firearms and firearm of reduced muzzle noise. 5,315,914, Cl. 89-14.050.
Schurfeld, Armin: *See*—
Hartel, Gunter; Losing, Karl-Heinrich; Schurfeld, Armin; Blasczyk, Johann; and Kerkmann, Harald, 5,315,867, Cl. 73-149.000.
Schuster, Richard L.: *See*—
Ross, John A.; and Schuster, Richard L., 5,316,207, Cl. 229-23.00R.
Schutte, Mark E.: *See*—
Stirling, Ronald C.; Schutte, Mark E.; and Robertson, Neil C., 5,317,635, Cl. 380-7.000.
Schutz, Udo, to Protechna SA. Pallet container. 5,316,174, Cl. 220-571.000.
Schwanke, Robert W., to Siemens Corporate Research, Inc. Computer method for identifying a misclassified software object in a cluster of internally similar software objects. 5,317,741, Cl. 395-700.000.
Schwartz, David C., to Productive Environments, Inc. Hypertext book attachment. 5,316,341, Cl. 281-15.100.
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Cordes, Hans; Krumm, Helmut; Schwartz, Ludwig; Kahn, Ilan; Cornils, Gerd; and Behrend, Ulrich, 5,316,829, Cl. 428-192.000.
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Sextl, Gerhard; Strack, Hans; Reuter, Roland; Fuss, Ilona; Kleinschmit, Peter; and Schwarz, Rudolf, 5,316,816, Cl. 428-69.000.
Schwegel, Thomas; and Stiefel, Hans-Peter, to Robert Bosch GmbH. Housing for an air flow rate meter. 5,315,870, Cl. 73-202.500.
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Schweitzer, Edmund O., III, 5,317,472, Cl. 361-115.000.
Schweizer, Edwin: *See*—
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Schweizer, Siegfried; and Sefz, Werner, to Robert Bosch GmbH. Method for producing sealing faces on valves. 5,315,792, Cl. 51-317.000.
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Kollenbrandt, Norbert; Schwenke, Heiko; and Wimmers, Elmar, 5,316,350, Cl. 285-242.000.
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Campbell, Willis R.; Robinson, Forrest L.; Perry, Bruce A.; and Schwiefert, Dan, 5,316,029, Cl. 134-104.100.
Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Slurry pump with discharge cylinders, especially two-cylinder concrete pump. 5,316,453, Cl. 417-516.000.
Scientific-Atlanta, Inc.: *See*—
Banker, Robert O.; Bacon, Kinney C.; and Bagley, Julius B., 5,317,391, Cl. 348-6.000.
Stirling, Ronald C.; Schutte, Mark E.; and Robertson, Neil C., 5,317,635, Cl. 380-7.000.
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Adams, Daniel O.; Wang, Lixiao; Sogard, David J.; and Hendrickson, Gary L., 5,316,016, Cl. 128-774.000.
Scollar, Mark P.: *See*—
Kidman, Gene E.; Robinson, Larry E.; Scollar, Mark P.; and Fotheringham, Ian G., 5,316,943, Cl. 435-280.000.
Scopes, David I. C.: *See*—
Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Montana, John G.; Pass, Martin; and Judd, Duncan B., 5,317,023, Cl. 514-303.000.
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Meyer, Robert B.; Lackner, John R.; Matuscheck, Hans J.; and Kennedy, Daniel J., 5,316,097, Cl. 180-19.100.
Scott, James; and Ross, Chet, to Scott/Ross Designs Inc. Intravenous tube holder. 5,316,246, Cl. 248-68.100.
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Scott, James; and Ross, Chet, 5,316,246, Cl. 248-68.100.
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Goodman, Michael G.; and Weigle, William O., 5,317,013, Cl. 514-45.000.
Scrivano, Thomas J. Position adjustable battery adapter. 5,316,873, Cl. 429-96.000.
Scullin, David J., to Georgia-Pacific Corporation. Paperboard storage container. 5,316,210, Cl. 229-117.160.
SDC Coatings Inc.: *See*—
Farber, Bruce M.; and Harbison, William C., 5,316,791, Cl. 427-464.000.
Seagate Technology, Inc.: *See*—
Bronsvatch, Efim, 5,317,559, Cl. 369-244.000.
Chapin, Robert E.; and Strom, Richard A., 5,317,465, Cl. 360-103.000.
Searcy, John V., II: *See*—
Anderson, James D.; and Searcy, John V., II, 5,317,669, Cl. 388-829.000.
Sears, Thomas H., to Sears, Thomas H.; and Mercier, Craig A. Scrubbing attachment for spray nozzles. 5,316,401, Cl. 401-139.000.
Secemski, Ephraim. Laser power meter. 5,316,380, Cl. 374-32.000.
Sechrist, Paul A.: *See*—
Russ, Michael B.; and Sechrist, Paul A., 5,316,992, Cl. 502-66.000.
Seckel, Peter H., to Plastic Specialties and Technologies, Inc. Making a kink impeding hose. 5,315,748, Cl. 29-507.000.
Sedac-Mecobel: *See*—
Djie, Eric J., 5,315,722, Cl. 5-37.100.
Sedberry, Donald C., to Max Levy Autograph, Inc. High-density print head. 5,317,342, Cl. 346-76.0PH.
Sedberry, William C. Golf game of skill and chance. 5,316,302, Cl. 273-87.00C.
Seemann, William. Unitary vacuum bag for forming fiber reinforced composite articles. 5,316,462, Cl. 425-112.000.
Sefz, Werner: *See*—
Schweizer, Siegfried; and Sefz, Werner, 5,315,792, Cl. 51-317.000.
Segura Salvador, Maria del Mar: *See*—
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Segura Salvador, Silvia B.; and Segura Salvador, Maria del Mar. Fluid distribution device. 5,316,038, Cl. 137-334.000.
Seiersen, Ole S. DC/DC-converter with a primary circuit and at least one secondary circuit tuned as individually oscillatory circuits. 5,317,496, Cl. 363-24.000.

Seike, Shoji; Watanabe, Keiichiro; and Ito, Akira, to NGK Insulators, Ltd. Sealing members for use in gas preheater. 5,316,072, Cl. 165-9.000.
Seiko Epson Corporation: *See—*
  Mori, Katsumi; Asaka, Tatsuya; Iwano, Hideaki; and Kondo, Takayuki, 5,317,584, Cl. 372-46.000.
  Ohara, Hiroshi, 5,317,434, Cl. 359-68.000.
Seikosha Co., Ltd.: *See—*
  Oishi, Katsumi, 5,317,547, Cl. 368-10.000.
  Seki, Yoichi; Hayakawa, Teruyo; Saito, Hiroyuki; and Endo, Shinichi, 5,317,357, Cl. 354-289.120.
Seiter, Paul: *See—*
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Sekhar, Jainagesh A., to Moltech Invent S.A. Composite electrode for electrochemical processing having improved high temperature properties and method for preparation by combustion synthesis. 5,316,718, Cl. 419-19.000.
Seki, Yoichi; Hayakawa, Teruyo; Saito, Hiroyuki; and Endo, Shinichi, to Seikosha Co., Ltd. Camera dual switch single data input-multiple data output device. 5,317,357, Cl. 354-289.120.
Sekine, Masayoshi: *See—*
  Takahara, Hiroyuki; Ogino, Shigeru; and Sekine, Masayoshi, 5,317,351, Cl. 354-195.100.
Semba, Tetsuo, to International Business Machines Corporation. Apparatus and method for track access. 5,317,550, Cl. 369-32.000.
Semedard, Jean-Claude: *See—*
  Vidal, Jean; Payen, Philippe; Semedard, Jean-Claude; and Morin, Jean-Xavier, 5,316,736, Cl. 422-145.000.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
  Yamazaki, Shunpei, 5,317,302, Cl. 338-225.00D.
Semifab Incorporated: *See—*
  Roberson, Glenn A., Jr.; and Eglinton, Robert B., 5,315,766, Cl. 34-409.000.
Senger, Richard C.: *See—*
  Dibble, Eric P.; Hanakovic, Steven L.; Markovich, Voya R.; Niedrich, Daniel S.; Vlasak, Gary P.; Zarr, Richard S.; and Senger, Richard C., 5,316,788, Cl. 427-98.000.
Senoo, Yasushi: *See—*
  Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, 5,317,375, Cl. 356-5.000.
Senshu, Yoichirou: *See—*
  Hasegawa, Shinichi; Ota, Shuichi; Uetake, Akihiro; Sawada, Takashi; Senshu, Yoichirou; and Sugai, Chiaki, 5,316,236, Cl. 242-200.000.
Seong, AuYong C.: *See—*
  Kachlic, Jerry D.; and Seong, AuYong C., 5,316,489, Cl. 439-79.000.
Separation Oil Services, Inc.: *See—*
  Campbell, Willis R.; Robinson, Forrest L.; Perry, Bruce A.; and Schwiefert, Dan, 5,316,029, Cl. 134-104.100.
Serres, Margaret, to Baxter International Inc. Method of filtering body fluid using a rinse chamber bag. 5,316,681, Cl. 210-645.000.
Sessions, George C.: *See—*
  Norton, Donald C.; and Sessions, George C., 5,315,761, Cl. 30-162.000.
Seto, Takao: *See—*
  Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, 5,317,375, Cl. 356-5.000.
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  Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, 5,316,933, Cl. 435-240.100.
Sette, Paul R.: *See—*
  Brewster, William H., Jr.; Chan, Lun; and Sette, Paul R., 5,317,127, Cl. 219-388.000.
Setzer, Jurgen; Braun, Hans; and Stein, Hermann, to Daimler-Benz AG. Device for evaluating periodic signals from inductive pick-ups having a pulse former stage influenced as a function of the pick-up signal amplitude. 5,317,258, Cl. 324-225.000.
Sewell, Peter B.; and Luscombe-Mills, Richard J., to Zontec Inc. Ozone generator. 5,316,741, Cl. 422-186.210.
Sextl, Elfriede; Roland, Eckehart; Kleinschmit, Peter; and Kiss, Akos, to Degussa Aktiengesellschaft. Molded bodies containing dealuminated zeolite Y and the process for their production. 5,316,993, Cl. 502-68.000.
Sextl, Gerhard; Strack, Hans; Reuter, Roland; Fuss, Ilona; Kleinschmit, Peter; and Schwarz, Rudolf, to Degussa Aktiengesellschaft. Form body for heat insulation and vacuum insulation panel with asymmetric design. 5,316,816, Cl. 428-69.000.
Sgarbi, Aldo: *See—*
  Vacca, Alberto; and Sgarbi, Aldo, 5,316,901, Cl. 430-512.000.
SGS-Thomson Microelectronics, Inc.: *See—*
  Cameron, Scott W., 5,317,243, Cl. 318-254.000.
  Chen, Fusen E.; Dixit, Girish A.; and Wei, Che-Chia, 5,317,192, Cl. 257-750.000.
Shackelford, Floyd W.: *See—*
  Moore, Richard E.; Nix, Mary K.; and Shackelford, Floyd W., 5,317,730, Cl. 395-600.000.
Shafir, Aaron, to Tamglass OY. Method and system for applying a marking to a substrate, particularly a painted border adjacent to and around a windshield plate. 5,316,897, Cl. 430-397.000.
Shah, Viren, to Chips and Technologies, Inc. Fast write support for vga controller. 5,317,694, Cl. 395-275.000.
Shan, Jie: *See—*
  Pang, Peter K. T.; and Shan, Jie, 5,317,010, Cl. 514-12.000.
Shangraw, Robert D.: *See—*
  Vannini, Robert M.; Kos, Joseph; Neville, James E.; and Shangraw, Robert D., 5,315,817, Cl. 60-39.091.
Shannon, Robert E.: *See—*
  Clark, William G., Jr.; Shannon, Robert E.; and Junker, Warren R., 5,317,045, Cl. 523-300.000.
Sharif, Sharif: *See—*
  Harry, David N.; and Sharif, Sharif, 5,316,792, Cl. 427-221.000.
Sharma, Jayant: *See—*
  Moksnes, Stephen L.; Sharma, Jayant; Olson, Ronald D.; Tump, Ronald S.; Kocher, James M.; and Pausch, Terrance J., 5,316,195, Cl. 222-146.600.
Sharp, Edward J.; Wood, Gary L.; Clark, William W., III; and Salamo, Gregory J., to United States of America, Army. Mutually pumped phase conjugator for remote identification. 5,317,442, Cl. 359-170.000.
Sharp, Edward J.; Wood, Gary L.; and Shurtz, Richard R., II, to United States of America, Army. Broadband self-activated optical power limiter system and device. 5,317,454, Cl. 359-886.000.
Sharp Kabushiki Kaisha: *See—*
  Edamura, Kaoru, 5,317,134, Cl. 219-720.000.
  Eto, Koichi; and Tamagaki, Akira, 5,316,883, Cl. 430-138.000.
  Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 5,316,858, Cl. 428-457.000.
  Ishikura, Takuro, 5,317,244, Cl. 318-254.000.
  Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, 5,317,756, Cl. 395-800.000.
  Maeda, Shigemi; and Kojima, Kunio, 5,317,549, Cl. 369-32.000.
  Nakabayashi, Masayoshi; and Matsumoto, Manabu, 5,317,372, Cl. 355-311.000.
  Ogou, Kenji, 5,317,578, Cl. 372-29.000.
  Takahashi, Akira; Murakami, Yoshiteru; Nakajima, Junsaku; and Ohta, Kenji, 5,317,555, Cl. 369-110.000.
  Tanaka, Junji; Watanabe, Toshio; and Orisaka, Yukihisa, 5,317,203, Cl. 307-353.000.
  Taniguchi, Kouji, 5,316,982, Cl. 437-236.000.
  Ueki, Yoshiharu; and Shimazu, Fumio, 5,317,345, Cl. 346-107.00R.
  Uratani, Shinichi, 5,317,430, Cl. 359-49.000.
Sharp, Stephen M.: *See—*
  Popat, Ghanshyam H.; and Sharp, Stephen M., 5,316,344, Cl. 283-81.000.
Sharrer, Kenneth J.: *See—*
  Fedorovich, George; and Sharrer, Kenneth J., 5,316,317, Cl. 277-1.000.
Shaver, Robert S.: *See—*
  Salas, R. Pito; Edelson, Glenn D.; Kleppner, Paul S.; and Shaver, Robert S., 5,317,686, Cl. 395-157.000.
Shaw, Jane M.: *See—*
  Gelorme, Jeffrey D.; Lewis, David A.; and Shaw, Jane M., 5,317,081, Cl. 528-353.000.
Shaw, Robert R.: *See—*
  Gallo, Antonio R.; McDonough, James J.; Robbins, Gordon J.; and Shaw, Robert R., 5,317,657, Cl. 385-14.000.
Shaw, Scott D.: *See—*
  Young, David J., Jr.; Randall, Scott L.; Shaw, Scott D.; and Wylde, Andrew F., 5,316,642, Cl. 204-198.000.
Shekar, Mallikarjunaswamy S.; and Baliga, Bantval J., to North Carolina State University. MOS gated thyristor with remote turn-off electrode. 5,317,171, Cl. 257-138.000.
Shell Oil Company: *See—*
  Berni, Albert J., 5,317,383, Cl. 356-351.000.
  Kelsey, Donald R., 5,316,994, Cl. 502-117.000.
  Nahm, James J. W.; and Wyant, Reece E., 5,316,083, Cl. 166-291.000.
Sherburne, David G., to Eastman Kodak Company. Apparatus for processing photosensitive material. 5,317,359, Cl. 354-324.000.
Sherry, A. Dean; and van Westrenen, Jeroen, to Board of Regents, The University of Texas System. Synthesis of polyazamacrocycles with more than one type of side-chain chelating groups. 5,316,757, Cl. 424-9.000.
Sherstinsky, Semyon; Chang, Mei; Harris, Charles C.; Mak, Alfred; Roberts, James F.; Tam, Simon W.; and Chang, Wen T., to Applied Materials, Inc. Clamping ring apparatus for processing semiconductor wafers. 5,316,278, Cl. 269-254.00R.
Shevchuk, George J.: *See—*
  Bergland, Glenn D.; Camlet, John V.; Einbinder, Saul J.; Pitio, Walter M.; Pritchard, Robert C.; Shevchuk, George J.; and Shugard, Donald D., 5,317,658, Cl. 385-16.000.
Shiba, Tetsuo: *See—*
  Kaneno, Nobuaki; Kizuki, Hirotaka; Hayafuji, Norio; Shiba, Tetsuo; and Tada, Hitoshi, 5,316,967, Cl. 437-105.000.
Shibata, Kazutaka; and Murakami, Yutaka, to Rohm Co., Ltd. Expand tape. 5,316,853, Cl. 428-416.000.
Shibata, Shinji: *See—*
  Tsutsui, Osamu; Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shinbara, Noboru, 5,315,719, Cl. 4-300.000.
Shibata, Tadashi: *See—*
  Yamagami, Atsushi; Okamura, Nobuyuki; Ohmi, Tadahiro; Goto, Haruhiro H.; and Shibata, Tadashi, 5,316,645, Cl. 204-298.060.
Shibata, Tatsuya: *See—*
  Matsuda, Tsutomu; Goto, Yoh; and Shibata, Tatsuya, 5,316,834, Cl. 428-233.000.

Shibayama, Hiroaki, to NEC Corporation. Multi-address radio display pager. 5,317,621, Cl. 379-57.000.
Shieh, Chan-Long: *See—*
  Ackley, Donald E.; and Shieh, Chan-Long, 5,317,587, Cl. 372-45.000.
Shigeta, Yoshifumi: *See—*
  Otsuka, Takashi; Yamamoto, Kenji; Osada, Mototsugu; Taniguchi, Tadao; and Shigeta, Yoshifumi, 5,316,271, Cl. 266-236.000.
Shikakura, Akihiro: *See—*
  Satake, Yoshifumi; Watanabe, Ikuo; Kashida, Motokazu; and Shikakura, Akihiro, 5,317,399, Cl. 348-571.000.
Shikanai, Toshiyuki: *See—*
  Fujitani, Makoto; Nagato, Yukio; Takeda, Kimiharu; Hirooka, Katsumi; Ukai, Tetsuzo; and Shikanai, Toshiyuki, 5,316,454, Cl. 418-55.600.
Shikata, Yasushi: *See—*
  Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, 5,316,933, Cl. 435-240.100.
Shimada, Yasuhiro: *See—*
  Takamatsu, Osamu; Hirai, Yutaka; Nakayama, Masaru; Yagi, Takayuki; Kasanuki, Yuji; and Shimada, Yasuhiro, 5,317,152, Cl. 250-306.000.
Shimadzu Corporation: *See—*
  Fukushima, Toyoaki; and Tanabe, Shozo, 5,317,159, Cl. 250-381.000.
Shimamura, Seiichi: *See—*
  Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.
Shimano Inc.: *See—*
  Sugawara, Kenichi, 5,316,239, Cl. 242-241.000.
Shimasaki, Yuichi: *See—*
  Maruyama, Shigeru; Shimasaki, Yuichi; Hisaki, Takashi; Kanehiro, Masaki; Baba, Shigeki; and Ishioka, Takuji, 5,317,268, Cl. 324-402.000.
Shimazaki, Eiji: *See—*
  Tsuji, Kazuyoshi; and Shimazaki, Eiji, 5,317,189, Cl. 257-694.000.
Shimazu, Fumio: *See—*
  Ueki, Yoshiharu; and Shimazu, Fumio, 5,317,345, Cl. 346-107.00R.
Shimizu, Katsumi; Maruoka, Kazumi; and Yamagishi, Kiyoshi, to Eisai Co., Ltd. Container flusher. 5,316,030, Cl. 134-105.000.
Shimizu, Masami: *See—*
  Ohta, Masami; Shimizu, Masami; Niijima, Kazuo; and Kawakami, Yasushi, 5,315,752, Cl. 29-598.000.
Shimoda, Kyouji: *See—*
  Yoshimoto, Kyosuke; and Shimoda, Kyouji, 5,317,143, Cl. 250-201.500.
Shimomura, Yoshiki; Tanigawa, Sadao; Umeda, Yasushi; Tomiyama, Tetsuo; and Yoshikawa, Hiroyuki, to Mita Industrial Co., Ltd. Image forming apparatus capable of making self-diagnosis. 5,317,368, Cl. 355-207.000.
Shimono, Yasushi: *See—*
  Shinagawa, Satoshi; Sato, Yoichi; Hasegawa, Masami; Shimono, Yasushi; Miyasaka, Masayuki; Tamura, Takatoshi; and Iioka, Yoshio, 5,317,537, Cl. 365-189.040.
Shimura, Mitsunori: *See—*
  Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.
Shimuzu, Noriaki, to Kabushiki Kaisha Toshiba. Information processing apparatus for performing two-way interruption processing. 5,317,748, Cl. 395-725.000.
Shin, Chul-Ho: *See—*
  Choi, Jeong-Hyeok; and Shin, Chul-Ho, 5,317,534, Cl. 365-182.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
  Sato, Shinichi; Oohasi, Morio; and Inomata, Hiroshi, 5,316,716, Cl. 264-338.000.
Shin-Etsu Handotai Co., Ltd.: *See—*
  Hasegawa, Fumihiko; Ohtani, Tatsuo; Kawano, Hiroshi; and Yamada, Masayuki, 5,316,620, Cl. 156-645.000.
Shin-Etsu Quartz Co., Ltd.: *See—*
  Nakamura, Tatsumasa; Ise, Yoshiaki; and Okamoto, Yoshiaki, 5,316,564, Cl. 65-36.000.
Shinagawa Refractories Co., Ltd.: *See—*
  Otsuka, Takashi; Yamamoto, Kenji; Osada, Mototsugu; Taniguchi, Tadao; and Shigeta, Yoshifumi, 5,316,271, Cl. 266-236.000.
  Yamamura, Takashi; Hamazaki, Yoshihisa; Kaneshige, Toshihiko; Nanba, Makoto; and Kubota, Yukitoshi, 5,316,571, Cl. 106-892.000.
Shinagawa, Satoshi; Sato, Yoichi; Hasegawa, Masami; Shimono, Yasushi; Miyasaka, Masayuki; Tamura, Takatoshi; and Iioka, Yoshio, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Multi-port memory device having precharged bit lines. 5,317,537, Cl. 365-189.040.
Shinbara, Noboru: *See—*
  Tsutsui, Osamu; Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shinbara, Noboru, 5,315,719, Cl. 4-300.000.
Shindo, Yoshitaka; and Anzai, Fukuji, to Sanyo Electric Co., Ltd. Drop out compensation circuit. 5,317,414, Cl. 358-336.000.
Shinozaki, Nobuhisa, to NEC Corporation. Ringing circuit for use in a telephone set for detecting a mobile mode or a portable mode of the telephone set. 5,317,622, Cl. 379-58.000.
Shiono, Teruhiro, to Matsushita Electric Industrial Co., Ltd. An optical disk head including a light path having a thickness and width greater than the light beam wavelength by a predetermined amount. 5,317,551, Cl. 369-44.120.
Shionogi Seiyaku Kabushiki Kaisha: *See—*
  Nishitani, Yasuhiro; and Irie, Tadashi, 5,317,016, Cl. 514-210.000.
Shirahata, Hirokatsu: *See—*
  Nakamura, Satoshi; and Shirahata, Hirokatsu, 5,317,034, Cl. 521-108.000.
Shiraiwa, Yoshinobu: *See—*
  Isaka, Kazuo; Mouri, Akihiro; Katayama, Masato; Fukui, Tetsuro; and Shiraiwa, Yoshinobu, 5,317,363, Cl. 355-27.000.
Shirasaki, Osamu: *See—*
  Inage, Katuyuki; Saito, Yumi; Zhang, Zhimming; Fujii, Toru; and Shirasaki, Osamu, 5,316,006, Cl. 128-681.000.
Shires, Edwin J.: *See—*
  Iden, Steven M.; Shires, Edwin J.; and Said, Waleed, 5,317,500, Cl. 363-98.000.
Shiroto, Yoshimi: *See—*
  Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.
Shizuya, Hiroaki; and Millar, Sharon L. Non-radioisotope tagging of fragments. 5,317,098, Cl. 536-23.100.
Shonai, Tohru: *See—*
  Hiraoka, Tooru; Nakamura, Kouji; and Shonai, Tohru, 5,317,703, Cl. 395-375.000.
Shop Vac Corporation: *See—*
  Berfield, Robert C., 5,316,036, Cl. 137-315.000.
Short Brothers PLC: *See—*
  Arnold, Michael J., 5,315,820, Cl. 60-226.100.
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  - Hart, Thomas W., 5,315,802, Cl. 52-607.000.
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- Stearns, Glenn: *See—*
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  - Parton, Richard L.; Stegman, David A.; and Sauter, Frederick J., 5,316,904, Cl. 430-567.000.
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  - Setzer, Jurgen; Braun, Hans; and Stein, Hermann, 5,317,258, Cl. 324-225.000.
- Stein Industrie: *See—*
  - Vidal, Jean; Payen, Philippe; Semedard, Jean-Claude; and Morin, Jean-Xavier, 5,316,736, Cl. 422-145.000.
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- Stembokas, Jeffrey. Shadow board game. 5,316,308, Cl. 273-249.000.
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  - Chalupka, Alfred; Lammer, Gertraud; Stengl, Gerhard; Wolf, Peter; and Fegerl, Johannes, 5,317,161, Cl. 250-423.00R.
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  - Barclay, William M.; and Stenhouse, Peter W. F., 5,315,782, Cl. 47-41.120.
- Stenkvist, Sven-Einar, to Asea Brown Boveri Ltd. Direct-current arc furnace. 5,317,591, Cl. 373-107.000.
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  - Lundquist, Jan; Stenstrom, Lennart; and Akervall, Sven, 5,317,473, Cl. 361-117.000.
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  - Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.
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  - Garay, Robert J.; and Stewart, Bert W., 5,315,957, Cl. 119-26.000.
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  - Schwegel, Thomas; and Stiefel, Hans-Peter, 5,315,870, Cl. 73-202.500.
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  - Racine, Jean-Guy, 5,316,624, Cl. 162-205.000.
- Stone, Daniel J.: *See—*
  - Hutin, Patrice; Cleveland, Roger; and Stone, Daniel J., 5,316,298, Cl. 273-78.000.
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  - Bolton, Theodore S.; and Stopyra, Stephen, 5,315,842, Cl. 62-262.000.
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  - Sextl, Gerhard; Strack, Hans; Reuter, Roland; Fuss, Ilona; Kleinschmit, Peter; and Schwarz, Rudolf, 5,316,816, Cl. 428-69.000.
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  - Sandstrom, Roland; Maxe, Ann; Strandberg, Tore; Lundsten, Lars; and Andersson, Alvar, 5,316,076, Cl. 165-84.000.
- Stratacom, Inc.: *See—*
  - Nardin, Raffaele P.; and Corbalis, Charles M., 5,317,562, Cl. 370-16.000.
- Strauss, Rodolfo: *See—*
  - Gray, Gary A.; LaRocca, Brian; and Strauss, Rodolfo, 5,317,545, Cl. 368-4.000.
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  - Gray, Gary A.; LaRocca, Brian; and Strauss, Rodolfo, 5,317,545, Cl. 368-4.000.
- Strawbridge, Jon P.; and Fredricks, Mark A., to Everbrite, Inc. Multiple-display sign device. 5,315,776, Cl. 40-505.000.
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  - Hazlebeck, David A.; Montgomery, Frederick C.; and Streckert, Holger H., 5,316,797, Cl. 427-376.200.
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  - Baker, Raymond; Reeve, Austin J.; and Street, Leslie J., 5,317,103, Cl. 544-367.000.
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  - Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., 5,317,739, Cl. 395-650.000.
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- Stringer, Michael V. Quick release bicycle pedal. 5,315,896, Cl. 74-594.400.
- Strohm, Edward L.: *See—*
  - Smalley, Raymond L.; Hall, John C.; Clouse, Ryan J.; Risner, P. Fred; and Strohm, Edward L., 5,316,432, Cl. 414-540.000.
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  - Hupe, Klaus-Peter; Strohmeier, Fred; Zimmermann, Hans-Peter; and Eberhardt, Werner, 5,316,954, Cl. 436-89.000.
- Strom, Richard A.: *See—*
  - Chapin, Robert E.; and Strom, Richard A., 5,317,465, Cl. 360-103.000.
- Strouble, Raymond: *See—*
  - Stamm, Rebecca L.; Edmondson, John; Archer, David; Nadkarni, Samyojita; and Strouble, Raymond, 5,317,720, Cl. 395-425.000.
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  - Banker, Dennis C.; Carlson, Tore A.; Dorler, Jack A.; Hendricks, Paul D.; Klara, Walter S.; Masci, Frank M.; and Struk, James R., 5,317,208, Cl. 307-454.000.
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  - Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; Uzawa, Shunichi; and Hasegawa, Takayuki, 5,317,615, Cl. 378-34.000.
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  - Hasegawa, Shinichi; Ota, Shuichi; Uetake, Akihiro; Sawada, Takashi; Senshu, Yoichirou; and Sugai, Chiaki, 5,316,236, Cl. 242-200.000.
- Sugawara, Kenichi, to Shimano Inc. Spinning reel with oscillating mechanism. 5,316,239, Cl. 242-241.000.
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  - Suzuki, Takane; Sugawara, Sakuo; Hamazaki, Nobuyoshi; Ito, Ken-ichi; Tsutsumi, Koichiro; and Sakai, Osamu, 5,316,214, Cl. 236-78.00B.
- Sugawara, Tohru: *See—*
  - Hayashi, Nobuyoshi; and Sugawara, Tohru, 5,316,728, Cl. 422-70.000.
- Suggs, Steven M., to RM Engineered Products, Inc. Liveload assembly for maintaining torque on bolts. 5,316,319, Cl. 277-106.000.
- Sugimoto, Masaki, to Mitsubishi Denki Kabushiki Kaisha. Microcomputer including memory controller for DRAM. 5,317,709, Cl. 395-425.000.
- Sugimoto, Osamu; Furuya, Yonezo; and Fukuda, Ichiro, to Nippon Conlux Co., Ltd. Method and apparatus for discriminating between true and false coins or the like. 5,316,119, Cl. 194-318.000.
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  - Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, 5,317,375, Cl. 356-5.000.
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  - Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, 5,317,556, Cl. 369-112.000.
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  - Kawabe, Takashi; Fuyama, Moriaki; Narishige, Shinji; Onuma, Akira; Okai, Tetsuya; Sugita, Yutaka; and Hara, Shin-ichi, 5,316,617, Cl. 156-643.000.
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- Sugitani, Junichi; Inui, Masahiro; Tsuchida, Koji; and Yoshimoto, Teruo, to Kubota Corporation. Heat-resistant alloy having high creep rupture strength under high-temperature low-stress conditions and excellent resistance to carburization. 5,316,721, Cl. 420-50.000.
- Sugiura, Kazuo, to Kabushiki Kaisha Shinkawa. Bonding apparatus. 5,316,201, Cl. 228-4.500.
- Sugiura, Koji: *See—*
  - Yamaji, Takeshi; Ozaki, Toru; Sugiura, Koji; Bito, Kazuaki; Naruse, Motoaki; and Sogi, Hidehito, 5,316,337, Cl. 280-743.00R.

- Sugiyama, Genroku: *See—*
  - Hirata, Toichi; and Sugiyama, Genroku, 5,315,826, Cl. 60-422.000.
- Sugiyama, Katsuhiro, to Sony Corporation. Method and apparatus for recording signals with different recording current levels to determine optimum recording characteristics. 5,317,456, Cl. 360-46.000.
- Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, to Kabushiki Kaisha Kobe Seiko Sho. Corrosion resistant Ti-Cr-Ni alloy containing a platinum group metal. 5,316,722, Cl. 420-421.000.
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  - Kunishima, Iwao; and Suguro, Kyoichi, 5,316,977, Cl. 437-200.000.
- Sumida, Katsuhiko: *See—*
  - Watanabe, Kazushi; and Sumida, Katsuhiko, 5,317,066, Cl. 525-425.000.
- Sumitomo Chemical Company, Limited: *See—*
  - Kubo, Kouji; and Kobayashi, Shigeichi, 5,316,840, Cl. 428-318.400.
  - Nakano, Tsuyoshi; Doi, Shuji; Noguchi, Takanobu; Ohnishi, Toshihiro; and Iyechika, Yasushi, 5,317,169, Cl. 257-40.000.
- Sumitomo Electric Industries, Ltd.: *See—*
  - Ito, Yasushi; and Nirasawa, Nobumasa, 5,315,813, Cl. 57-6.000.
  - Iwasaki, Takashi; Iguchi, Yasuhiro; and Yamabayashi, Naoyuki, 5,316,956, Cl. 437-5.000.
  - Matsuzaki, Shin-ichi, 5,317,515, Cl. 364-454.000.
  - Tomikawa, Tadashi; Fujita, Nobuhiko; Nakagama, Shyoji; and Nakayama, Akira, 5,316,804, Cl. 427-569.000.
- Sumitomo Metal Mining Co., Ltd.: *See—*
  - Naito, Motoyuki; and Ito, Koichi, 5,317,324, Cl. 343-700.0MS.
- Sumitomo Precision Products Co., Ltd.: *See—*
  - Okazaki, Sachiko; Kogoma, Masuhiro; and Hirakawa, Masahiro, 5,316,639, Cl. 204-192.120.
- Sumitomo Special Metals Co., Ltd.: *See—*
  - Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 5,316,595, Cl. 148-302.000.
- Sumitomo Wiring Systems, Ltd.: *See—*
  - Ito, Akira, 5,316,506, Cl. 439-879.000.
  - Ookuma, Yasuyuki; Ogawa, Fujio; Hattori, Yoshiyuki; Miyamukai, Takamichi; and Sakakura, Takayuki, 5,316,789, Cl. 427-117.000.
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  - Verdonck, Gerard J., 5,316,523, Cl. 474-118.000.
- Sundqvist, James W. Fine adjustment mechanism for screen printing machines. 5,315,929, Cl. 101-127.100.
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  - Dhyanchand, P. John; Vaidya, Jayant; Mokadam, Rajhunath; and Arbanella, Richard, 5,317,299, Cl. 336-5.000.
  - Dhyandchand, P. John; and Nguyen, Vietson M., 5,317,498, Cl. 363-43.000.
  - Iden, Steven M.; Shires, Edwin J.; and Said, Waleed, 5,317,500, Cl. 363-98.000.
- Sundstrom, Tim; and Wahlander, David, to Whirlpool Europe B.V. Method for controlling the microwave energy in a microwave oven, and microwave oven for implementing the method. 5,317,133, Cl. 219-716.000.
- Suntec Industries Incorporated: *See—*
  - Harwath, Frank L., 5,316,457, Cl. 418-171.000.
- Suominen, Hannu L., to Biodata OY. Biologically degradable films comprising enzyme-coated bio-degradable polymer particles. 5,316,847, Cl. 428-327.000.
- Suprex Corporation: *See—*
  - Koebler, Douglas J., 5,316,262, Cl. 251-8.000.
- Surjaatmadja, Jim B.; Nusz, Bary J.; and Turner, Gordon A., to Halliburton Company. Start/stop method to determine static gel strength. 5,315,864, Cl. 73-54.320.
- Surka, Stefan; Zheng, Joe; and Kelmar, Laura, to United Parcel Service of America, Inc. Method and apparatus for determining the displacement of a rectangular object with respect to a reference position. 5,317,388, Cl. 356-373.000.
- Sutton, Timothy W.: *See—*
  - Tang, Dandas K.; and Sutton, Timothy W., 5,317,211, Cl. 307-465.000.
- Suyama, Shinichi; and Haruta, Yuiti, to Soken International Consultants Co., Ltd. Electric inspection unit using anisotropically electroconductive sheet. 5,317,255, Cl. 324-158.00P.
- Suyama, Shirou: *See—*
  - Kuriki, Makoto; Arai, Hitoshi; Sakai, Shigenobu; Nakamura, Masato; Nakajima, Hideki; Suyama, Shirou; Uehira, Kazutake; and Hagiwara, Noboru, 5,317,405, Cl. 348-20.000.
- Suzuki, Hiroaki: *See—*
  - Ueda, Naofumi; and Suzuki, Hiroaki, 5,317,679, Cl. 395-132.000.
- Suzuki, Hisanori; and Matsudaira, Takeo, to Hoya Electronics Corporation. Magnetic recording medium comprising an aluminum alloy substrate, now magnetic underlayers, magnetic layer, protective layer, particulate containing protective layer and lubricant layer. 5,316,844, Cl. 428-323.000.
- Suzuki, Junichiro; and Kayukawa, Masahide, to NGK Spark Plug Co., Ltd. Silicon nitride base sintered body. 5,316,856, Cl. 428-446.000.
- Suzuki, Kazuhiro: *See—*
  - Onishi, Masaru; and Suzuki, Kazuhiro, 5,317,581, Cl. 372-38.000.
- Suzuki, Kei: *See—*
  - Suzuki, Yukio; Muroyama, Koutarou; and Suzuki, Kei, 5,317,095, Cl. 536-16.700.
- Suzuki, Kozo: *See—*
  - Kukimoto, Yutaka; Ueda, Hikoji; Suzuki, Kozo; and Koshiyama, Yoshihiko, 5,317,060, Cl. 525-197.000.
- Suzuki, Nobunao: *See—*
  - Isaji, Akira; Iritani, Kunio; and Suzuki, Nobunao, 5,316,074, Cl. 165-43.000.
- Suzuki Shokan Co., Ltd.: *See—*
  - Mori, Junichi; and Abe, Masaaki, 5,316,905, Cl. 435-3.000.
- Suzuki, Takane; Sugawara, Sakuo; Hamazaki, Nobuyoshi; Ito, Kenichi; Tsutsumi, Koichiro; and Sakai, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner for railway vehicles. 5,316,214, Cl. 236-78.00B.
- Suzuki, Takashi: *See—*
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- Suzuki, Takumi; Ota, Yuichi; Narumi, Yuji; and Miyaguchi, Youichiro, to Ricoh Company, Ltd. Liquid crystal display device and method of producing the same having an improved connection between a flexible film substrate and a drive circuit substrate. 5,317,438, Cl. 359-88.000.
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  - Maeno, Takashi; and Suzuki, Tatsuo, 5,316,275, Cl. 267-140.130.
- Suzuki, Tomonari: *See—*
  - Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 5,316,858, Cl. 428-457.000.
- Suzuki, Yoshiro; Tanaka, Hitoshi; Kurihara, Noriyuki; and Saito, Yutaka, to Terumo Kabushiki Kaisha; and Yamatake-Honeywell Co., Ltd. Measuring apparatus. 5,316,727, Cl. 422-68.100.
- Suzuki, Yukio; Muroyama, Koutarou; and Suzuki, Kei, to Hayashibara Biochemical Laboratories, Inc. Alpha-D-clycosyl kasugamycin, its preparation, and antibacterial agent containing the same. 5,317,095, Cl. 536-16.700.
- Svec, Frantisek: *See—*
  - Frechet, Jean M. J.; Svec, Frantisek; and Smigol, Vladimir, 5,316,680, Cl. 210-635.000.
- Sverdrup, Edward F.: *See—*
  - Lahoda, Edward J.; Grant, David C.; and Sverdrup, Edward F., 5,316,223, Cl. 241-24.000.
- Svoboda, John: *See—*
  - Anderson, James D.; and Searcy, John V., II, 5,317,669, Cl. 388-829.000.
- Swann, Linsey, to Brookdale International Systems Inc. Filtering canister with deployable hood and mouthpiece. 5,315,987, Cl. 128-201.280.
- Swanson, Michael D.: *See—*
  - Elko, David A.; Frey, Jeffrey A.; Isenberg, John F., Jr.; Mick, Jeffery M.; Strickland, Jimmy P.; Swanson, Michael D.; Helffrich, Audrey A.; and Moore, Brian B., 5,317,739, Cl. 395-650.000.
- Swathirajan, Sundararajan; and Mikhail, Youssef M., to General Motors Corporation. Method of making membrane-electrode assemblies for electrochemical cells and assemblies made thereby. 5,316,871, Cl. 429-33.000.
- Swerdloff, Stuart; Mackie, Thomas R.; and Holmes, Timothy, to Wisconsin Alumni Research Foundation. Method and apparatus for radiation therapy. 5,317,616, Cl. 378-65.000.
- Swindler, Dan E., to Dell U.S.A., L.P. Computer expansion card support structure. 5,317,483, Cl. 361-801.000.
- Symetrix Corporation: *See—*
  - McMillan, Larry D.; Paz de Araujo, Carlos A.; and Roberts, Tom L., 5,316,579, Cl. 118-50.000.
- Symons Corporation: *See—*
  - Flathau, Robert J.; and Connors, Frank T., 5,316,253, Cl. 248-235.000.
- Synernetics Inc.: *See—*
  - Husak, David J.; Madnick, Jay L.; and Hauser, Stephen A., 5,317,697, Cl. 395-325.000.
- SyQuest Technology, Inc.: *See—*
  - Witt, William F.; and Tannert, Hans K., 5,317,464, Cl. 360-99.080.
- Syslak, Morten; Morley, Edward J.; and Folkedal, Leiv Å., to Norsk Hydro a.s. Method of joining aluminium members. 5,316,206, Cl. 228-183.000.
- Systems, Machines, Automation Components Corp.: *See—*
  - Neff, Edward A.; Portegies, Hans; and Kim, Stan, 5,317,222, Cl. 310-13.000.
- Szegu, Eduardo; and Biardi, Giuseppe. Hydrocarbon combustion process in which the carbon dioxide produced is prevented from dispersing onto the atmosphere, and a plant for its implementation. 5,316,750, Cl. 423-451.000.
- Szentes, John F.; Zimmermann, Daniel E.; Mack, David C.; and Hutchison, Eric A., to Caterpillar Inc. Hydraulic control valve having a centering spring device. 5,316,044, Cl. 137-625.690.
- Szentesi, Otto I.; and Luther, James P., to Siecor Corporation. Laser removal of altered index of refraction layer on glass fibers. 5,317,661, Cl. 385-31.000.
- Szinyei, W. Jay, to Baker Hughes Incorporated. Sample dispersing apparatus and method. 5,315,885, Cl. 73-863.710.
- Szucs, Maria: *See—*
  - Borsodi, Anna; Furst, Zsuzsa; Hosztafi, Sandor; Varga, Schafferne E.; Buzas, Beata; Friedmann, Tamas; Benyhe, Sandor; and Szucs, Maria, 5,317,022, Cl. 514-282.000.
- T.A.S. & Trading Co., Ltd.: *See—*
  - Nakayama, Mamoru, 5,317,504, Cl. 364-406.000.
- T. K. Stanley Incorporated: *See—*
  - Stanley, T. K.; and Farrar, Cary S., 5,316,408, Cl. 404-35.000.
- Tabata, Yasushi: *See—*
  - Kobayashi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,317,352, Cl. 354-195.100.
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Kita, Isamu; Kobashi, Masayuki; Tabuchi, Susumu; Doi, Yoshiyuki; Nakamura, Noboru; Ishihara, Managu; Arioka, Koji; and Kayano, Isamu, 5,317,610, Cl. 376-414.000.

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Kaneno, Nobuaki; Kizuki, Hirotaka; Hayafuji, Norio; Shiba, Tetsuo; and Tada, Hitoshi, 5,316,967, Cl. 437-105.000.

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Moro, Shuuji; Tada, Kanehiro; Nishida, Yasuo; and Ohshima, Eiji, 5,315,889, Cl. 74-105.000.

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Tafoya, Benny R., to PSC Inc. A system for decoding bar coded labels upon different size containers. 5,317,166, Cl. 250-568.000.

Taga, Kazuaki: *See—*

Takahashi, Masatoshi; Inaba, Hiroo; and Taga, Kazuaki, 5,316,845, Cl. 428-323.000.

Tagawa, Koichi, to Maeda Industries, Ltd. Bicycle speed change operation assembly. 5,315,891, Cl. 74-489.000.

Taguchi, Masahiro; Tominaga, Motonori; and Matsuhashi, Toshiaki, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Air bag apparatus. 5,316,336, Cl. 280-730.00A.

Tahn, Whei-Tsu H.: *See—*

Sang, Henry W., Jr.; Tahn, Whei-Tsu H.; and Zhang, Xiao B., 5,317,646, Cl. 382-9.000.

Taijonlahti, Jorma; and Kohtamaki, Lauri, to Lillbackan Konepaja Oy. Production method and system for handling plates cut out of a plate blank for further production. 5,317,516, Cl. 364-468.000.

Taillon, Armand P.: *See—*

Bullock, Robert L.; and Taillon, Armand P., 5,316,421, Cl. 410-9.000.

Taiwan Semiconductor Manufacturing Company: *See—*

Akazawa, Seigo; and Takagaki, Tadao, 5,316,603, Cl. 156-69.000.

Takada, Kazuhiko: *See—*

Kakizaki, Yoshitaka; Kitahori, Hiroki; and Takada, Kazuhiko, 5,317,462, Cl. 360-97.020.

Takagaki, Tadao: *See—*

Akazawa, Seigo; and Takagaki, Tadao, 5,316,603, Cl. 156-69.000.

Takagi, Kazumasa: *See—*

Okamoto, Yukio; Aida, Toshiyuki; Miyauchi, Katsuki; Takagi, Kazumasa; Fukazawa, Tokuumi; and Takayama, Shinji, 5,316,585, Cl. 118-719.000.

Takahara, Hiroyuki; Ogino, Shigeru; and Sekine, Masayoshi, to Canon Kabushiki Kaisha. Position detecting device. 5,317,351, Cl. 354-195.100.

Takahashi, Akira; Murakami, Yoshiteru; Nakajima, Junsaku; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Optical head device utilizing partially overlapping light spots to read information from a readout layer. 5,317,555, Cl. 369-110.000.

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Kato, Takahiko; Ikeda, Shinzo; Aono, Yasuhisa; Izumiya, Masakiyo; Nakata, Kiyotomo; Masaoka, Isao; and Takahashi, Heishichiro, 5,316,597, Cl. 148-327.000.

Takahashi, Hisaya; and Itoh, Toshihide, to NEC Corporation. Method of making printed wiring boards. 5,316,894, Cl. 430-313.000.

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Takahashi, Minoru, to Fuji Photo Optical Co., Ltd. Control circuit for camera having auxiliary light source. 5,317,362, Cl. 354-418.000.

Takamatsu, Osamu; Hirai, Yutaka; Nakayama, Masaru; Yagi, Takayuki; Kasanuki, Yuji; and Shimada, Yasuhiro, to Canon Kabushiki Kaisha. Cantilever type probe, and scanning tunnel microscope and information processing apparatus employing the same. 5,317,152, Cl. 250-306.000.

Takano, Akiyoshi: *See—*

Kato, Ippei; and Takano, Akiyoshi, 5,316,839, Cl. 428-285.000.

Takano, Satoshi: *See—*

Fukube, Noriaki; Kurihara, Katsumi; Takano, Satoshi; Tanabe, Hiroshi; Fujiwara, Hiroshi; Bannai, Kazunori; and Inobe, Hiroyuki, 5,316,282, Cl. 271-10.000.

Takanose, Koji: *See—*

Nomura, Masaaki; Aosaki, Ko; Kubo, Takashi; Namioka, Kenta; and Takanose, Koji, 5,317,350, Cl. 353-63.000.

Takara Co., Ltd.: *See—*

Saitoh, Shinya, 5,316,516, Cl. 446-175.000.

Takasaki, Yoshiyuki, to Research Development Corporation of Japan. Pullulanase, methods of producing pullulanase and methods of saccharification of starch using pullulanase. 5,316,924, Cl. 435-71.200.

Takasawa, Seigo: *See—*

Hara, Takahiro; Takasawa, Seigo; Yokoo, Yoshiharu; and Furukawa, Tadayasu, 5,316,767, Cl. 424-401.000.

Takase, Mitsunori: *See—*

Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, 5,317,084, Cl. 530-324.000.

Takashi, Kunugi, to Kabushiki Kaisha Toshiba. Numerically controlled machine tool and method of controlling grinding operation thereof. 5,315,789, Cl. 51-165.710.

Takata Corporation: *See—*

Hiramatsu, Koji, 5,316,233, Cl. 242-107.000.

Kokeguchi, Akira, 5,316,333, Cl. 280-728.00A.

Takayama, Shinji: *See—*

Okamoto, Yukio; Aida, Toshiyuki; Miyauchi, Katsuki; Takagi, Kazumasa; Fukazawa, Tokuumi; and Takayama, Shinji, 5,316,585, Cl. 118-719.000.

Takayanagi, Toshinari, to Kabushiki Kaisha Toshiba. Logical circuit for detecting a potential. 5,317,201, Cl. 307-296.100.

Takeda Chemical Industries, Ltd.: *See—*

Hayashi, Nobuyoshi; and Sugawara, Tohru, 5,316,728, Cl. 422-70.000.

Takeda, Kimiharu: *See—*

Fujitani, Makoto; Nagato, Yukio; Takeda, Kimiharu; Hirooka, Katsumi; Ukai, Tetsuzo; and Shikanai, Toshiyuki, 5,316,454, Cl. 418-55.600.

Takeda, Mitsuo: *See—*

Yoneda, Tadahiro; Nakahara, Saburo; Takeda, Mitsuo; and Kamo, Midori, 5,316,714, Cl. 264-210.600.

Takeda, Osamu: *See—*

Fukushima, Nobuo; Takeda, Osamu; and Kubo, Ryoji, 5,317,404, Cl. 358-335.000.

Inoue, Hideo; and Takeda, Osamu, 5,316,099, Cl. 180-140.000.

Takeda, Yoshiaki; Miwano, Katuyosi; and Fujita, Noboru, to Hitachi, Ltd. Washing machine. 5,315,847, Cl. 68-12.020.

Takehashi, Shinitsu; Hatada, Kenzo; and Fujimoto, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Method for bonding lead with electrode of electronic device. 5,316,204, Cl. 228-179.100.

Takemasa, Nobuo: *See—*

Koyama, Hideo; and Takemasa, Nobuo, 5,315,898, Cl. 475-330.000.

Takeshi, Sano, to Asahi Corporation. Memory matching game with mechanically activated rotating disk. 5,316,309, Cl. 273-273.000.

Takeshima, Shinichi, to Toyota Jidosha Kabushiki Kaisha. Cold HC adsorption and removal apparatus for an internal combustion engine. 5,315,824, Cl. 60-297.000.

Takeshiro, Shinichi, to NEC Corporation. Method of making a semiconductor device by dry etching process. 5,316,980, Cl. 437-228.000.

Takeshita, Yoshinobu: *See—*

Tamaki, Tomohiro; Hatada, Kenzo; Fujimoto, Hiroaki; and Takeshita, Yoshinobu, 5,316,610, Cl. 156-379.600.

Takeuchi, Hirofumi: *See—*

Tsutsui, Osamu; Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shinbara, Noboru, 5,315,719, Cl. 4-300.000.

Takeuchi, Koji: *See—*

Arimatsu, Seiji; Kawaguchi, Chitoshi; Kanda, Kazunori; Kimura, Yasuhiro; Honma, Masao; Asada, Syoichi; Mashita, Atsushi; and Takeuchi, Koji, 5,317,080, Cl. 528-332.000.

Takigawa, Hirofumi; Kubota, Hiromi; and Ito, Susumu, to Kao Corporation. Microorganism belonging to the genus Rhodococcus, and process for producing sec-cedrenol and cedrenone. 5,316,939, Cl. 435-252.100.

Takimoto, Kazushi, to Mita Industrial Co., Ltd. Sheet discharging apparatus for use in an image forming apparatus. 5,316,286, Cl. 271-182.000.

Takizawa, Yuri: *See—*

Okawara, Hiroyuki; Kato, Makoto; Miyaoka, Shinichiro; Nohmi, Makoto; and Takizawa, Yuri, 5,317,678, Cl. 395-126.000.

Talaba, Mihai: *See—*

Pow, Eric G.; Talaba, Mihai; McNeilly, Leonard; Watkins, David S.; and Lines, Donald A., 5,316,747, Cl. 423-247.000.

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Dauder Guardiola, Agustin, 5,317,110, Cl. 177-25.180.

Talley, Laroul J.; and English, Gary L., to Babcock & Wilcox Company, The. Rotary draw bending apparatus and method. 5,315,852, Cl. 72-149.000.

Talreja, Sanjay S.; Mills, Duane; Javanifard, Jahanshir J.; and Sambandan, Sachidanandan, to Intel Corporation. Gate/source disturb protection for sixteen-bit flash EEPROM memory arrays. 5,317,535, Cl. 365-185.000.

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Cain, Gary A.; Christos, Thomas E.; and Tam, Sang W., 5,317,024, Cl. 514-317.000.

Tam, Simon W.: *See—*

Sherstinsky, Semyon; Chang, Mei; Harris, Charles C.; Mak, Alfred; Roberts, James F.; Tam, Simon W.; and Chang, Wen T., 5,316,278, Cl. 269-254.00R.

Tamagaki, Akira: *See—*

Eto, Koichi; and Tamagaki, Akira, 5,316,883, Cl. 430-138.000.

Tamaki, Tomohiro; Hatada, Kenzo; Fujimoto, Hiroaki; and Takeshita, Yoshinobu, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Electronics Corporation. Bonding apparatus. 5,316,610, Cl. 156-379.600.

Tamglass OY: *See—*

Shafir, Aaron, 5,316,897, Cl. 430-397.000.

Tamura, Takatoshi: *See—*

Shinagawa, Satoshi; Sato, Yoichi; Hasegawa, Masami; Shimono, Yasushi; Miyasaka, Masayuki; Tamura, Takatoshi; and Iioka, Yoshio, 5,317,537, Cl. 365-189.040.

Tan, Poi-Sik: *See—*

Morozov, Victor A.; Kanachine, Serguei P.; Krasnochtchekov, Iouri I.; Makienko, Alexandre I.; Matveev, Valentine A.; Khriachtchev, Valeri G.; and Tan, Poi-Sik, 5,315,843, Cl. 62-309.000.

Tanabe, Hiroshi: *See—*

Fukube, Noriaki; Kurihara, Katsumi; Takano, Satoshi; Tanabe, Hiroshi; Fujiwara, Hiroshi; Bannai, Kazunori; and Inobe, Hiroyuki, 5,316,282, Cl. 271-10.000.

Tanabe, Shozo: *See—*

Fukushima, Toyoaki; and Tanabe, Shozo, 5,317,159, Cl. 250-381.000.

Tanabe, Toru: *See—*

Omamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; Sugimura, Kazuhiko; and Senoo, Yasushi, 5,317,375, Cl. 356-5.000.

Tanaka, Hideaki: *See—*

Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, 5,317,052, Cl. 524-413.000.

Tanaka, Hideki: *See—*

Nakagawa, Katsuya; Yamato, Satoshi; and Tanaka, Hideki, 5,317,714, Cl. 395-425.000.

Tanaka, Hitoshi: *See—*

Suzuki, Yoshiro; Tanaka, Hitoshi; Kurihara, Noriyuki; and Saito, Yutaka, 5,316,727, Cl. 422-68.100.

Tanaka, Isao: *See—*

Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, 5,316,933, Cl. 435-240.100.

Tanaka, Jun-ichirou: *See—*

Kitao, Osamu; Tsuji, Masaru; Okuda, Masatoshi; Uchimura, Shunichi; and Tanaka, Jun-ichirou, 5,316,621, Cl. 162-4.000.

Tanaka, Junji; Watanabe, Toshio; and Orisaka, Yukihisa, to Sharp Kabushiki Kaisha. Sample-and-hold circuit. 5,317,203, Cl. 307-353.000.

Tanaka, Mitsuho; Katsumata, Akira; and Arisaka, Hiroshi, to KEL Corporation. Connector assembly for film circuitry. 5,316,486, Cl. 439-62.000.

Tanaka, Shinya; and Ito, Yoshiyuki, to ASCII Corporation. Pointing device. 5,317,335, Cl. 345-163.000.

Tanaka, Toshiaki: *See—*

Nakagawa, Tanehiro; Ono, Yoshiaki; Tomatsu, Tsutomu; Yamaguchi, Takeo; Aoyama, Kyoji; and Tanaka, Toshiaki, 5,316,513, Cl. 446-14.000.

Tanaka, Toshifumi; Ohira, Yasuo; and Ishida, Toshihiko, to TDK Corporation. Disc molding apparatus. 5,316,466, Cl. 425-422.000.

Tanaka, Yasuo: *See—*

Yanai, Kunihiko; Tanaka, Yasuo; and Niwa, Yasunori, 5,316,785, Cl. 427-72.000.

Tandem Computers Incorporated: *See—*

Horst, Robert W., 5,317,726, Cl. 395-575.000.

Jewett, Douglas E.; Webster, Phil; Aldridge, Dave; Norwood, Peter C.; and Mehta, Nikhil A., 5,317,752, Cl. 395-750.000.

Tang, Dandas K.; and Sutton, Timothy W., to Motorola, Inc. Programmable pin for use in programmable logic devices. 5,317,211, Cl. 307-465.000.

Tang, David Y.: *See—*

Rojstaczer, Sergio R.; Tang, David Y.; and Tyrell, John A., 5,317,049, Cl. 524-104.000.

Tang, James J.: *See—*

Naggert, Dieter K.; Tang, James J.; and Gruodis, Robert J., 5,315,858, Cl. 72-350.000.

Tang, Nianfa, to JET, Inc. Wastewater treatment plant and apparatus. 5,316,668, Cl. 210-151.000.

Tani, Hiroji; and Ohshita, Kazuhito, to Murata Manufacturing Co., Ltd. Copper paste for internal conductor of multilayer ceramic electronic component. 5,316,698, Cl. 252-512.000.

Tani, Katsutoshi, to Bridgestone Corporation. Pneumatic radial tire including a wound auxiliary belt layer. 5,316,064, Cl. 152-531.000.

Tani, Kazumi: *See—*

Harada, Yoshio; and Tani, Kazumi, 5,316,859, Cl. 428-472.000.

Tanigawa, Sadao: *See—*

Shimomura, Yoshiki; Tanigawa, Sadao; Umeda, Yasushi; Tomiyama, Tetsuo; and Yoshikawa, Hiroyuki, 5,317,368, Cl. 355-207.000.

Taniguchi, Hiroaki: *See—*

Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.

Taniguchi, Kouji, to Sharp Kabushiki Kaisha. Semiconductor device and method for preparing the same. 5,316,982, Cl. 437-236.000.

Taniguchi, Tadao: *See—*

Otsuka, Takashi; Yamamoto, Kenji; Osada, Mototsugu; Taniguchi, Tadao; and Shigeta, Yoshifumi, 5,316,271, Cl. 266-236.000.

Taniguchi, Takashi: *See—*

Urano, Miki; and Taniguchi, Takashi, 5,317,526, Cl. 364-715.030.

Tannert, Hans K.: *See—*

Witt, William F.; and Tannert, Hans K., 5,317,464, Cl. 360-99.080.

Tanzer, Herbert J.: *See—*

Quon, William; and Tanzer, Herbert J., 5,316,075, Cl. 165-80.400.

Taoka, Hisao; Iyoda, Isao; Noguchi, Hideo; Kojima, Yukio; Warashina, Shigeru; and Sato, Nobuyuki, to Mitsubishi Denki Kabushiki Kaisha; and Tokyo Electric Power Co., Inc., The. Electric power system simulator. 5,317,525, Cl. 364-578.000.

Taplan, Martin; Hubert, Stefan; and Scheidler, Herwig, to Schott Glaswerke. Cooking range. 5,317,129, Cl. 219-464.000.

Tapp, William T.: *See—*

Jacoby, Philip; Bauer, Charles W.; Clingman, Scott R.; and Tapp, William T., 5,317,035, Cl. 521-143.000.

Tarbit, Brian; Adger, Brian; and Willett, Paul, to Great Lakes Chemical Corporation. Ultra white N,N'-ethylene-bis(tetrabromophthalimide) and its production in acetic acid. 5,317,048, Cl. 524-94.000.

Tardy, Michel-Pierre; and Buge, Jean-Pierre, to Thomson Tubes Electroniques. Amplifier valve with grid having rods of variable width. 5,317,230, Cl. 313-293.000.

Tarquini, Michael E.: *See—*

Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., 5,317,044, Cl. 521-78.000.

Tasaki, Yuji; and Wada, Yukihisa, to NGK Insulators, Ltd. Process for producing ceramic honeycomb structural bodies. 5,316,710, Cl. 264-57.000.

Tate, David J., to Lilliput Lane Limited. Reusable bag for packaging articles. 5,316,149, Cl. 206-584.000.

Tatezono, Fumio: *See—*

Tsujioka, Tsuyoshi; Tatezono, Fumio; Matsuura, Koutaro; and Irie, Masahiro, 5,316,900, Cl. 430-495.000.

Tatsumi, Yutaka, to Rohm Co., Ltd. Thermal head and method of making the same. 5,317,341, Cl. 346-76.0PH.

Tatsuzawa, Hajime, to Mutoh Industries, Ltd. Method preventing overheating of a thermal line print head by varying the number of print data being simultaneously printed. 5,317,758, Cl. 395-800.000.

Tay, Sing P.: *See—*

Boyd, John M.; Ellul, Joseph P.; and Tay, Sing P., 5,316,978, Cl. 437-203.000.

Tay, Yew S.; Garay, Oscar; and Llorente, Jose A., to Motorola, Inc. Folded dipole antenna. 5,317,326, Cl. 343-718.000.

Taylor, Alan N.: *See—*

Striebel, Robert L., II; Chettleburgh, Kenneth E.; and Taylor, Alan N., 5,316,013, Cl. 128-754.000.

Taylor, James R. Storm drainage conduit plug. 5,316,045, Cl. 138-89.000.

Taylor Made Golf Company: *See—*

Feche, Pierre; and Veux, Jean-Luc, 5,316,299, Cl. 273-80.00R.

Taylor, Robert W.: *See—*

Thompson, Ray; and Taylor, Robert W., 5,316,503, Cl. 439-740.000.

Taylor, Steven J.: *See—*

Aghajanian, Michael K.; Keck, Steven D.; Burke, John T.; Hannon, Gregory E.; Becker, Kurt J.; Taylor, Steven J.; Wiener, Robert J.; and McCormick, Allyn L., 5,316,069, Cl. 164-97.000.

Taylor, Wilhelm; Faucett, Michael D.; and Woodruff, Daniel J., to North American Philips Corporation. Magazine loader having an ejector arm. 5,317,554, Cl. 369-77.200.

Tazaki, Seiji; Yagihara, Tomio; Matsui, Nobuo; Yanagisawa, Atsushi; and Kojima, Takakazu, to Nippon Soda Co., Ltd. 3,6-diamino-2,5-pyrazinedicarbonitrile. 5,317,102, Cl. 544-336.000.

TDK Corporation: *See—*

Nakagawa, Shiro; and Tsuchida, Atsuko, 5,317,274, Cl. 324-678.000.

Tanaka, Toshifumi; Ohira, Yasuo; and Ishida, Toshihiko, 5,316,466, Cl. 425-422.000.

Tomisawa, Maya; Higashi, Shuji; Sasagawa, Koji; and Fujii, Tatsuo, 5,316,209, Cl. 229-87.050.

Teare, Peter R.: *See—*

Hanson, William J.; and Teare, Peter R., 5,317,273, Cl. 324-616.000.

Tebbutt, Neil: *See—*

Guttag, Karl M.; Asal, Michael D.; Van Aken, Jerry R.; Tebbutt, Neil; and Novak, Mark F., 5,317,333, Cl. 345-133.000.

Tech-Line Engineering Co.: *See—*

Schleicher, Louis C., 5,315,743, Cl. 29-243.500.

Techco Corporation: *See—*

Phillips, Edward H., 5,316,043, Cl. 137-625.230.

Technical Research Associates, Inc.: *See—*

Brimhall, Owen D., 5,316,952, Cl. 436-70.000.

Technology Finance Corporation (Proprietary) Limited: *See—*

Thackeray, Michael M.; and Gummow, Rosalind J., 5,316,877, Cl. 429-197.000.

Technomed International: *See—*

Lacruche, Bernard; Cathignol, Dominique; and Lacoste, Francois, 5,315,986, Cl. 69-4.000.

Technomed International (Societe Anonyme): *See—*

Chapelon, Jean-Yves; Cathignol, Dominique; and Blanc, Emmanuel, 5,316,000, Cl. 128-660.030.

Tecogen Inc.: *See—*

Chen, Tze-Ning, 5,315,981, Cl. 123-526.000.

Tedder, Thomas F.; and Zhou, Liang-Ji, to Dana-Faber Cancer Institute, Inc. Lymphocyte activation antigen HB15, a member of the immunoglobulin superfamily. 5,316,920, Cl. 435-69.300.

Teeter, Terry E., to Eaton Corporation. Transmission control lever having cruise and engine brake control. 5,315,900, Cl. 477-165.000.

Teguri, Yoshihiko: *See—*

Ota, Toshiaki; Teguri, Yoshihiko; Muto, Masahito; Fujita, Koichi; and Iyoda, Motomi, 5,317,512, Cl. 364-424.050.

Teijin Limited: *See—*

Etchu, Masami; Hamano, Hisashi; Hosoi, Masahiro; and Saeki, Yasuhiro, 5,316,823, Cl. 428-141.000.

Matsuda, Tsutomu; Goto, Yoh; and Shibata, Tatsuya, 5,316,834, Cl. 428-233.000.

Teikoku Piston Ring Co., Ltd.: *See—*

Ishida, Masao; and Naruse, Yoshio, 5,316,321, Cl. 277-235.00A.

Telediffusion de France: *See—*

Piole, Philippe, 5,317,327, Cl. 343-725.000.

- Teledyne Industries, Inc.: *See—*
  - Cammack, Michael A.; Koliha, Michael W.; and Smith, David W., 5,316,216, Cl. 239-71.000.
  - Mittenthal, Lothrop, 5,317,639, Cl. 380-37.000.
- Teledyne Water Pik: *See—*
  - Cammack, Michael A.; Koliha, Michael W.; and Smith, David W., 5,316,216, Cl. 239-71.000.
- Telefonaktibolaget L M Ericsson: *See—*
  - Leeb, Karl-Erik, 5,317,292, Cl. 333-238.000.
- Telesis Marking Systems, Inc.: *See—*
  - Robertson, John A.; Cyphert, David L.; Muscarella, Joseph; and French, Robert N., 5,316,397, Cl. 400-121.000.
- Temic Telefunken microelectronic GmbH: *See—*
  - Quast, Wilfried, 5,317,282, Cl. 330-277.000.
- Tempcraft, Inc.: *See—*
  - Stanciu, Virgil V.; Peshek, Jack R.; Neece, Faurice D.; Kubulins, Erik R.; and Logozar, Branko, 5,316,707, Cl. 264-40.100.
- Tenglund, Lars: *See—*
  - Sabelstrom, Mats; and Tenglund, Lars, 5,315,974, Cl. 123-320.000.
- Terao, Noriyuki: *See—*
  - Watanabe, Hirofumi; and Terao, Noriyuki, 5,316,960, Cl. 437-40.000.
- Teraoka, Eiichi; Kengaku, Toru; and Ishida, Hiroichi, to Mitsubishi Denki Kabushiki Kaisha. Digital filter using intermediate holding registers and common accumulators and multipliers. 5,317,529, Cl. 364-724.100.
- Terasawa, Tsuneo: *See—*
  - Fukuda, Hiroshi; and Terasawa, Tsuneo, 5,316,896, Cl. 430-322.000.
- Terpetschnig, Ewald: *See—*
  - Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Neis A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.
- Terry, Robert: *See—*
  - Trujillo, Mark; and Terry, Robert, 5,315,724, Cl. 7-145.000.
- Terumo Kabushiki Kaisha: *See—*
  - Kijima, Toshihiko; Horiuchi, Kunio; and Oshiyama, Hiroyuki, 5,316,440, Cl. 415-206.000.
  - Suzuki, Yoshiro; Tanaka, Hitoshi; Kurihara, Noriyuki; and Saito, Yutaka, 5,316,727, Cl. 422-68.100.
- Tesk, John A.: *See—*
  - Ratzker, Menahem; Lashmore, David S.; and Tesk, John A., 5,316,650, Cl. 205-67.000.
- Teulon, Jean-Marie: *See—*
  - Bru-Magniez, Nicole; Potin, Dominique; and Teulon, Jean-Marie, 5,317,025, Cl. 514-323.000.
- Teves, Leonides Y., to Advanced Medical Concepts, Inc. Connector for endotracheal uses. 5,315,991, Cl. 128-207.140.
- Tevis, Gregory J.; and Waldo, Ellen J., to International Business Machines Corporation. Storage management of a first file system using a second file system containing surrogate files and catalog management information. 5,317,728, Cl. 395-600.000.
- Texaco Chemical Co.: *See—*
  - Primeaux, Dudley J., II, 5,317,076, Cl. 528-61.000.
- Texas Instruments Incorporated: *See—*
  - Byatt, Stephen W., 5,317,172, Cl. 257-164.000.
  - Crank, Sue E., 5,316,974, Cl. 437-190.000.
  - Douglas, Monte A., 5,316,895, Cl. 430-313.000.
  - Guttag, Karl M.; Asal, Michael D.; Van Aken, Jerry R.; Tebbutt, Neil; and Novak, Mark F., 5,317,333, Cl. 345-133.000.
  - Hutter, Louis N.; and Erdeljac, John P., 5,317,180, Cl. 257-337.000.
  - Hynecek, Jaroslav, 5,317,174, Cl. 257-222.000.
  - Masten, Billy R.; and Hodson, Lester L., 5,317,523, Cl. 364-525.000.
  - Moslehi, Mehrdad M.; and Najm, Habib N., 5,317,656, Cl. 385-12.000.
  - Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,317,177, Cl. 257-301.000.
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  - Kinami, Hideo; Maei, Yoshihiro; Mochizuki, Masahiro; Tezuka, Yoshiaki; Sakayama, Takashi; Nagoya, Shinichiro; Sakaki, Hiroaki; and Kamiyama, Yosuhiro, 5,317,415, Cl. 358-425.000.
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  - Riordan, Thomas J.; Thaik, Albert M.; and Nguyen, Hai N., 5,317,601, Cl. 375-107.000.
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  - Hamy, Michel; Lebrun, Christian; Thebault, Jean-Michel; Maurer, Ghislain; Michelet, Jacques; and Roth, Jean-Luc, 5,316,270, Cl. 266-159.000.
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  - Viegas, Herman H.; and Roehrich, Roland L., 5,315,840, Cl. 62-167.000.
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  - Hillis, W. Daniel; and Gerner, William, 5,317,481, Cl. 361-796.000.
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  - Allison, Joseph M.; Buchina, Raymond A.; Mieskowski, James D.; Thomas, Edward J.; and Davenport, John M., 5,317,237, Cl. 315-307.000.
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  - Herbert, William G.; Hogle, David J.; Grammatica, Steven J.; Schmitt, Peter J.; Jansen, Ronald E.; and Thomas, Mark S., 5,316,651, Cl. 205-67.000.
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- Thomas, Richard H.; and Langreck, Gerald K., to Marquip Inc. Lockdown apparatus with intermediate membrane. 5,316,109, Cl. 188-41.000.
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  - Cooper, Susan J.; Hards, Graham A.; and Thompsett, David, 5,316,990, Cl. 502-5.000.
- Thompson, Carl D., to Milliken Research Corporation. Carpet display sample kit. 5,316,138, Cl. 206-223.000.
- Thompson, Christopher M., to Whirlpool Corporation. Air conditioner filter monitor. 5,315,838, Cl. 62-129.000.
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  - Gurley, Thomas D.; and Lagoni, William A., 5,317,400, Cl. 348-679.000.
  - Keenan, Douglas M., 5,317,403, Cl. 348-731.000.
  - Lendaro, Jeffery B., 5,317,470, Cl. 361-92.000.
- Thomson Consumer Electronics S.A.: *See—*
  - Dupont, Antoine; Hepp, Bernard; and Benoit, Eric, 5,317,401, Cl. 368-678.000.
- Thomson-CSF: *See—*
  - Billaud, Philippe; and de Volder, Claude, 5,317,317, Cl. 342-40.000.
  - Refregier, Philippe; and Huignard, Jean-Pierre, 5,317,651, Cl. 382-31.000.
- Thomson, James W.: *See—*
  - Ryan, Frederick M.; and Thomson, James W., 5,317,379, Cl. 356-308.000.
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  - Chae, Daniel S. H.; Rohweller, David J.; and Thomson, Mark W., 5,315,795, Cl. 52-113.000.
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  - Tardy, Michel-Pierre; and Buge, Jean-Pierre, 5,317,230, Cl. 313-293.000.
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  - White, Donald M., III; Bricko, Thomas K.; and Thorud, Richard A., 5,315,771, Cl. 37-260.000.
- Throne, James L. Process for producing articles from polymers containing aromatic imide linkages. 5,316,711, Cl. 264-68.000.
- Throngnumchai, Kraisorn, to Nissan Motor Co., Ltd. CMOS device with perpendicular channel current directions. 5,317,175, Cl. 257-255.000.
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  - Fauchere, Jean-Luc; Kucharczyk, Nathalie; Morris, Angela D.; Paladino, Joseph; Bonnet, Jacqueline; and Thurieau, Christophe, 5,317,014, Cl. 514-17.000.
- Tibbitts, Gordon A., to Baker Hughes Incorporated. Drill bit cutting element with cooling channels. 5,316,095, Cl. 175-429.000.
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  - Hirschi, Richard E.; Karbowski, James P.; Tiefenthal, James L.; and Isaac, Ronald M., 5,316,024, Cl. 128-899.000.

- Timm, Heinrich: *See—*
  - Enning, Norbert; Kreis, Gundolf; Feldschmid, Alois; Dornberg, Christian; Reiter, Karl; and Timm, Heinrich, 5,316,367, Cl. 296-189.000.
- Timperley, Clive R. Vehicular car mat. 5,316,817, Cl. 428-78.000.
- Timsit, Roland S.: *See—*
  - Johnson, John J.; and Timsit, Roland S., 5,316,863, Cl. 428-548.000.
- Ting, Edmund Y.; and Raghavan, Chidambaram, to Flow International Corporation. High pressure sterilization apparatus and method. 5,316,745, Cl. 422-295.000.
- Tiollais, Pierre: *See—*
  - Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; Dejean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,317,090, Cl. 530-387.100.
- Tips, Timothy R.: *See—*
  - Murray, Douglas J.; Coon, Robert J.; Hopmann, Mark E.; Williams, Ronald D.; Jennings, Steve; and Tips, Timothy R., 5,316,084, Cl. 166-332.000.
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  - Park, Kyong M.; and Tirmizi, Abrar A., 5,315,877, Cl. 73-724.000.
- Titterington, William A.; and Leonida, Andrei, to United Technologies Corporation. High pressure electrochemical cell structure. 5,316,644, Cl. 204-284.000.
- Tittgemeyer, Udo, to MAN Roland Druckmaschinen AG. Method of making a cylindrical sleeve structure, particularly cover for an offset cylinder in a rotary printing machine. 5,316,798, Cl. 427-409.000.
- Tjellander, Goran: *See—*
  - Kemmer, Leif; Mukherjee, Dilip; and Tjellander, Goran, 5,315,816, Cl. 60-39.020.
- Tobia, Ronald L., to BOC Health Care, Inc. Medical ventilator. 5,315,989, Cl. 128-204.280.
- Tobler, Hugh J.; Lepper, Larry G.; and Sawdon, Robert B., to Cemen Tech, Inc. Feeder for adding fibrous material to a conveyor having concrete ingredients. 5,316,197, Cl. 222-281.000.
- Tocalo Co., Ltd.: *See—*
  - Harada, Yoshio; and Tani, Kazumi, 5,316,859, Cl. 428-472.000.
- Toda, Yoshifumi: *See—*
  - Onoda, Masahiro; and Toda, Yoshifumi, 5,317,602, Cl. 375-118.000.
- Togawa, Tsuyoshi, to Olympus Optical Co., Ltd. Information recording and or reproducing apparatus for use in hybrid type information recording medium. 5,317,138, Cl. 235-440.000.
- Tokai Aluminum Foil Co., Ltd.: *See—*
  - Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,841, Cl. 428-319.100.
  - Toyoda, Takashi; Hosono, Yasuji; Funato, Takashi; Miyaji, Takashi; Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,777, Cl. 426-87.000.
- Tokarski, Michael G.; and Roudabush, Lester A., to Combibloc, Inc. Method of preparing paperboard food and beverage containers for recycling. 5,315,923, Cl. 100-39.000.
- Tokico Ltd.: *See—*
  - Furuya, Akihiro; and Matsumoto, Kinya, 5,316,114, Cl. 188-299.000.
- Tokutake, Atsuo: *See—*
  - Harashige, Masahiro; Kawamura, Tsutomu; Kaneko, Satoru; Inoue, Takashi; Tokutake, Atsuo; and Yoshikawa, Toshitsune, 5,317,051, Cl. 524-310.000.
- Tokyo Electric Power Co., Inc., The: *See—*
  - Taoka, Hisao; Iyoda, Isao; Noguchi, Hideo; Kojima, Yukio; Warashina, Shigeru; and Sato, Nobuyuki, 5,317,525, Cl. 364-578.000.
- Tokyo Electron Limited: *See—*
  - Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, 5,316,472, Cl. 432-241.000.
- Tokyo Electron Sagami Limited: *See—*
  - Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, 5,316,472, Cl. 432-241.000.
- Tokyo Tire & Rubber Company Limited: *See—*
  - Yagi, Koji; and Fukunaga, Seiichi, 5,317,067, Cl. 525-438.000.
- Tomassian, Albert D.: *See—*
  - Sinha, Mahadeva P.; and Tomassian, Albert D., 5,317,151, Cl. 250-298.000.
- Tomatsu, Tsutomu: *See—*
  - Nakagawa, Tanehiro; Ono, Yoshiaki; Tomatsu, Tsutomu; Yamaguchi, Takeo; Aoyama, Kyoji; and Tanaka, Toshiaki, 5,316,513, Cl. 446-14.000.
- Tombow Pencil Co., Ltd.: *See—*
  - Wakai, Takeshi; and Nagai, Masahiko, 5,316,402, Cl. 401-202.000.
- Tomikawa, Tadashi; Fujita, Nobuhiko; Nakagama, Shyoji; and Nakayama, Akira, to Sumitomo Electric Industries, Ltd. Process for the synthesis of hard boron nitride. 5,316,804, Cl. 427-569.000.
- Tomiki, Masatoshi: *See—*
  - Kiryu, Naohiko; Yamamoto, Shinichi; Tomiki, Masatoshi; and Higami, Tatuhiko, 5,316,843, Cl. 428-323.000.
- Tominaga, Motonori: *See—*
  - Taguchi, Masahiro; Tominaga, Motonori; and Matsuhashi, Toshiaki, 5,316,336, Cl. 280-730.00A.
- Tomioka, Junsuke; Nagai, Kazunori; and Matsuzaki, Akihiro, to Komatsu Electronic Metals Co., Ltd. Single crystal pulling apparatus. 5,316,742, Cl. 117-217.000.
- Tomisawa, Maya; Higashi, Shuji; Sasagawa, Koji; and Fujii, Tatsuo, to TDK Corporation. Easy opening film package and a method of preparing the same. 5,316,209, Cl. 229-87.050.
- Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Fukuwatari, Yasuo; Takase, Mitsunori; Bellamy, Wayne; Hagiwara, Tomoyuki; and Matukuma, Hiroyuki, to Morinaga Milk Industry Co., Ltd. Process for large-scale production of antimicrobal peptide in high purity. 5,317,084, Cl. 530-324.000.
- Tomita, Mitsuei. Apparatus for detecting and displaying blood ciculatory information. 5,316,005, Cl. 128-680.000.
- Tomiyama, Hideki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,316,903, Cl. 430-546.000.
- Tomiyama, Tetsuo: *See—*
  - Shimomura, Yoshiki; Tanigawa, Sadao; Umeda, Yasushi; Tomiyama, Tetsuo; and Yoshikawa, Hiroyuki, 5,317,368, Cl. 355-207.000.
- Tonen Corporation: *See—*
  - Watanabe, Osamu; Murakami, Shinichi; Wada, Sadahisa; and Inoue, Hiroshi, 5,317,068, Cl. 525-526.000.
- Toner, John L.: *See—*
  - Illig, Carl R.; Cooper, Eugene R.; Toner, John L.; Upson, Donald A.; Douty, Brent D.; Caulfield, Thomas J.; Bacon, Edward R.; Estep, Kimberly G.; Josef, Kurt A.; Robinson, Shaughnessy; and Spara, Paul P., 5,316,755, Cl. 424-5.000.
- Tong, Shen-Nan: *See—*
  - Chiang, Chih-Cheng; Lee, Mao-Song; Lin, Jen-Lien; Su, Der-Tarng; and Tong, Shen-Nan, 5,317,054, Cl. 524-451.000.
- Topolewski, John N.; and Burnside, Jeffrey A., to United Technologies Automotive, Inc. Electrical connector. 5,316,497, Cl. 439-752.000.
- Toriumi, Yoshitaka, to NEC Corporation. Rounding operation circuit. 5,317,530, Cl. 364-745.000.
- Toro Company, The: *See—*
  - White, Donald M., III; Bricko, Thomas K.; and Thorud, Richard A., 5,315,771, Cl. 37-260.000.
- Torotrak (Development) Limited: *See—*
  - Fellows, Thomas G., 5,316,526, Cl. 476-10.000.
- Torres, Robert J., to International Business Machines Corporation. Method of representing a set of computer menu selections in a single graphical metaphor. 5,317,687, Cl. 395-159.000.
- Tosaka, Masaki: *See—*
  - Sone, Taeko; Tosaka, Masaki; Saeki, Katsuhisa; Ara, Katsutoshi; Deguchi, Katsuhiko; and Igarashi, Kazuaki, 5,316,691, Cl. 252-174.120.
- Tosch, Josef: *See—*
  - Benedikt, Walter; Vogel, Manfred; Herden, Werner; Konrad, Johann; Schmidt, Wolfgang; Tosch, Josef; and Kuessel, Matthias, 5,315,875, Cl. 73-706.000.
- Toto Ltd.: *See—*
  - Tsutsui, Osamu; Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shinbara, Noboru, 5,315,719, Cl. 4-300.000.
- Tougou, Hitomaro: *See—*
  - Wakabayashi, Shinichi; Tougou, Hitomaro; Toyoda, Yukio; and Ohki, Yoshimasa, 5,316,640, Cl. 204-192.340.
- Toukhy, Medhat A., to OCG Microelectronic Materials, Inc. Radiation-sensitive compositions containing 5-indanol in the binder resin as a comonomer. 5,316,884, Cl. 430-165.000.
- Tourshot Golf Co., Inc.: *See—*
  - Simmons, Samuel P., 5,316,300, Cl. 273-80.00R.
- Towle, David P.: *See—*
  - Rini, Michael J.; Hellewell, Todd D.; Towle, David P.; Jennings, Patrick L.; LaFleah, Richard C.; and Anderson, David K., 5,315,939, Cl. 110-264.000.
- Townsend, Carl W.: *See—*
  - Chao, Sidney C.; Purer, Edna M.; Stanford, Thomas B.; and Townsend, Carl W., 5,316,591, Cl. 134-34.000.
- Townsend, Robert L.; and Downs, Alfred G. Valve alignment tool. 5,316,040, Cl. 137-556.000.
- Toyo Tire & Rubber Co., Ltd.: *See—*
  - Yamaji, Takeshi; Ozaki, Toru; Sugiura, Koji; Bito, Kazuaki; Naruse, Motoaki; and Sogi, Hidehito, 5,316,337, Cl. 280-743.00R.
- Toyoda, Takashi; Hosono, Yasuji; Funato, Takashi; Miyaji, Takashi; Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, to Oji Yuki Goseishi Co., Ltd.; and Tokai Aluminum Foil Co., Ltd. Lid of container and container for instant foods using the same. 5,316,777, Cl. 426-87.000.
- Toyoda, Tetsuro; and Matsuoka, Katsunori, to Showa Aircraft Industry Co., Ltd. Heat resisting structure. 5,316,997, Cl. 502-314.000.
- Toyoda, Yukio: *See—*
  - Wakabayashi, Shinichi; Tougou, Hitomaro; Toyoda, Yukio; and Ohki, Yoshimasa, 5,316,640, Cl. 204-192.340.
- Toyoguchi, Yoshinori: *See—*
  - Murai, Hiroyuki; Bito, Yasuhiko; Hasegawa, Masaki; Ito, Shuji; and Toyoguchi, Yoshinori, 5,316,875, Cl. 429-194.000.
- Toyota Gosei Co., Ltd.: *See—*
  - Maeno, Takashi; and Suzuki, Tatsuo, 5,316,275, Cl. 267-140.130.
- Toyota Jidosha Kabushiki Kaisha: *See—*
  - Inoue, Hideo; and Takeda, Osamu, 5,316,099, Cl. 180-140.000.
  - Ota, Toshiaki; Teguri, Yoshihiko; Muto, Masahito; Fujita, Koichi; and Iyoda, Motomi, 5,317,512, Cl. 364-424.050.
  - Otsuka, Takayuki; Osanai, Akinori; Itoh, Takaaki; Hyodo, Yoshihiko; and Kidokoro, Toru, 5,315,980, Cl. 123-520.000.
  - Takeshima, Shinichi, 5,315,824, Cl. 60-297.000.
  - Yamaji, Takeshi; Ozaki, Toru; Sugiura, Koji; Bito, Kazuaki; Naruse, Motoaki; and Sogi, Hidehito, 5,316,337, Cl. 280-743.00R.
- Traeger, Robert J., to Norand Corporation. Data communication system with communicating and recharging docking apparatus for hand-held terminal. 5,317,691, Cl. 395-200.000.
- Treglio, James R., to ISM Technolog. Magnetically-filtered cathodic arc plasma apparatus. 5,317,235, Cl. 315-111.410.
- Tremer, Siegmund H., to Staubli & Trumpelt GmbH Maschinenfabrik. Locking mechanisms for selective retention of oscillating levers engaged by knives in a dobby. 5,316,049, Cl. 139-69.000.

- Tribbey, David A.; Hertz, Allen D.; and Rivas, Mario A., to Motorola, Inc. Circuit supporting mechanical shock isolator for radio receiver. 5,317,308, Cl. 340-825.440.
- Tripier, Dominique: *See*—
  - Crause, Peter; Habermann, Paul; Tripier, Dominique; Ulmer, Wolfgang; and Schmid, Gerhard, 5,316,947, Cl. 435-320.100.
- Tripp, Benjamin A. Tubular rubber structure made from used tires. 5,316,815, Cl. 428-65.000.
- Trippe, Jerry C.: *See*—
  - Wilson, Donald L.; and Trippe, Jerry C., 5,316,672, Cl. 210-242.300.
- Tromp, Rudolf M.: *See*—
  - Copel, Matthew W.; and Tromp, Rudolf M., 5,316,615, Cl. 117-95.000.
- Trudeau, John T.; and Pizairo, Ernie S., to Williams Electronics Games, Inc. Holographic display for pinball games. 5,316,303, Cl. 273-121.00A.
- Truffer, Ernest. Snoring prevention device. 5,316,020, Cl. 128-848.000.
- Trujillo, Mark; and Terry, Robert. Combination fire tool. 5,315,724, Cl. 7-145.000.
- Trump, Sandy L.: *See*—
  - Brown, Karen K.; Ruiz, Linda L. C.; van de Rijn, Ivo; Greene, Nathan D.; Trump, Sandy L.; Wilson, Curtis D.; and Bryant, Sharon A., 5,316,926, Cl. 435-101.000.
- TRW United Carr GmbH & Co., KG: *See*—
  - Ruckwardt, Hans-Werner, 5,316,245, Cl. 248-68.100.
- Tschiderer, Paul E.; and Lawniczak, Gary P., to Eastman Kodak Company. Supply hopper for fanfold paper stacks. 5,317,365, Cl. 355-75.000.
- Tsikoyiannis, John G.: *See*—
  - Dessau, Ralph M.; Grasselli, Robert K.; Lago, Rudolph M.; and Tsikoyiannis, John G., 5,316,661, Cl. 208-46.000.
- Tsubakimoto Precision Products Co., Ltd.: *See*—
  - Iwai, Tatsuo; and Fujiwara, Isao, 5,315,791, Cl. 51-215.00M.
- Tsuboi, Nobuyoshi; Sato, Yoshio; Minemura, Hiroyuki; Andoh, Hisashi; Nagai, Masaichi; Ikuta, Isao; Katou, Yoshimi; Maeda, Yoshihito; Sugita, Tatsuya; and Sugita, Yutaka, to Hitachi, Ltd. Information processing apparatus and optical head incorporated therein. 5,317,556, Cl. 369-112.000.
- Tsuboi, Toshio; Nakatani, Munehiro; and Fukushima, Shigenobu, to Minolta Camera Kabushiki Kaisha. Facsimile apparatus with a page printer having reduced memory capacity requirements. 5,317,416, Cl. 358-444.000.
- Tsubouchi, Kazuo: *See*—
  - Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,316,972, Cl. 437-187.000.
- Tsuchida, Atsuko: *See*—
  - Nakagawa, Shiro; and Tsuchida, Atsuko, 5,317,274, Cl. 324-678.000.
- Tsuchida, Hiroyuki: *See*—
  - Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, 5,317,157, Cl. 250-352.000.
- Tsuchida, Koji: *See*—
  - Sugitani, Junichi; Inui, Masahiro; Tsuchida, Koji; and Yoshimoto, Teruo, 5,316,721, Cl. 420-50.000.
- Tsuchida, Masashi; Ohmachi, Kazuhiko; Honma, Toshio; Imai, Yasuhiro; and Kawamura, Nobuo, to Hitachi Software Engineering co., Ltd.; and Hitachi, Ltd. Method apparatus for determining prefetch operating for a data base. 5,317,727, Cl. 395-600.000.
- Tsuda, Masaomi: *See*—
  - Ebato, Kazuo; Tsuda, Masaomi; and Oomori, Tsutomu, 5,316,599, Cl. 148-512.000.
- Tsuji, Kazuyoshi; and Shimazaki, Eiji, to Rohm Co., Ltd. Axial lead frame. 5,317,189, Cl. 257-694.000.
- Tsuji, Masaru: *See*—
  - Kitao, Osamu; Tsuji, Masaru; Okuda, Masatoshi; Uchimura, Shunichi; and Tanaka, Jun-ichirou, 5,316,621, Cl. 162-4.000.
- Tsuji, Toshiaki: *See*—
  - Monta, Hiroki; Tsuji, Toshiaki; and Imai, Kiyoshi, 5,317,410, Cl. 348-638.000.
- Tsujioka, Tsuyoshi; Tatezono, Fumio; Matsuura, Koutaro; and Irie, Masahiro, to Sanyo Electric Co., Ltd.; and Masahiro Irie. Optical recording medium having a constant birefringent property and an alterable photochromic property. 5,316,900, Cl. 430-495.000.
- Tsukada, Toru, to NSK Ltd. Stopper device for linear guide device. 5,315,894, Cl. 74-526.000.
- Tsukahara, Jiro: *See*—
  - Naruse, Hiedaki; and Tsukahara, Jiro, 5,316,888, Cl. 430-216.000.
- Tsurumoto, Kazuo: *See*—
  - Ito, Akiyasu; Kimura, Munenori; Tsurumoto, Kazuo; and Nagasaka, Shouichi, 5,317,122, Cl. 219-69.180.
- Tsurusaki, Kazuya: *See*—
  - Katayama, Keiichi; Kato, Mitsuo; Tsurusaki, Kazuya; Hanamoto, Mikio; Mihara, Kazumasa; and Eguchi, Takatoshi, 5,317,121, Cl. 219-672.000.
- Tsurushima, Katsuaki: *See*—
  - Ohga, Norio; Tsurushima, Katsuaki; and Yoshida, Tadao, 5,317,553, Cl. 369-54.000.
- Tsutsui, Osamu; Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shinbara, Noboru, to Toto Ltd. Water closet flushing apparatus. 5,315,719, Cl. 4-300.000.
- Tsutsumi, Koichiro: *See*—
  - Suzuki, Takane; Sugawara, Sakuo; Hamazaki, Nobuyoshi; Ito, Ken-ichi; Tsutsumi, Koichiro; and Sakai, Osamu, 5,316,214, Cl. 236-78.00B.
- Tubbs, Henry, to Industria de Turbo Propulsores S.A. Gas turbine engine variable aerofoil vane actuation mechanism. 5,316,438, Cl. 415-118.000.
- Tucker, Howard: *See*—
  - Oldfield, John; and Tucker, Howard, 5,317,101, Cl. 540-488.000.
- Tucker, Martin: *See*—
  - Rakonjac, Zoran; and Tucker, Martin, 5,316,605, Cl. 156-145.000.
- Tugnum, Curtis C.: *See*—
  - Wong, John D. E.; Tugnum, Curtis C.; and Logan, James P., 5,316,479, Cl. 434-11.000.
- Tump, Ronald S.: *See*—
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  - Barrella, Joseph N.; and Lewin, Stanley, 5,316,874, Cl. 429-161.000.
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    - Ritter, Joseph J.; and Shull, Robert D., 5,316,699, Cl. 252-584.000.
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    - Chojnacki, Eric P., 5,317,234, Cl. 315-5.410.
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    - Brown, Stanley; and Court, Donald, 5,316,922, Cl. 435-69.700.
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    - Mead, George S., 5,317,314, Cl. 342-16.000.
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  - Van Leeuwen, Pieter G.; and Rijckaert, Albert M. A., 5,317,458, Cl. 360-48.000.
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  - Williamson, Steven L., 5,317,256, Cl. 324-158.00P.
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  - Kudak, Kenneth A., 5,317,012, Cl. 514-12.000.
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- Uomori, Kenya: *See—*
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  - Cetinkaya, Ismail B., 5,316,662, Cl. 208-113.000.
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  - Bloodworth, Robert; Podszun, Wolfgang; Defieuw, Geert; Uytterhoeven, Herman; and Schulze, Hans, 5,317,000, Cl. 503-227.000.
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  - Karhunen, Pentti; and Andersson, Henry, 5,317,315, Cl. 342-26.000.
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  - Wentworth, Wayne E.; and Stearns, Stanley D., 5,317,271, Cl. 324-464.000.
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  - Morris, Jerry L., 5,316,556, Cl. 29-623.300.
- Valentine, Herman P.: *See—*
  - Siebenaler, James L.; and Valentine, Herman P., 5,316,256, Cl. 248-453.000.
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  - Gallagher, Thomas A., 5,316,169, Cl. 220-355.000.
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- Wallace, Steven J.; and Watts, LaVaughn F., to Texas Instruments Incorporated. Expanded memory interface for supporting expanded, conventional or extended memory for communication between an application processor and an external processor. 5,317,707, Cl. 395-425.000.
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- Waller, David P.: *See—*
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Washington University: *See*—

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Brady, Robert C., III; Karol, Frederick J.; Lynn, Timothy R.; Jorgensen, Robert J.; Kao, Sun-Chueh; and Wasserman, Eric P., 5,317,036, Cl. 523-223.000.

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Wallace, Steven J.; and Watts, LaVaughn F., 5,317,707, Cl. 395-425.000.

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Corio, Ronald P., 5,317,145, Cl. 250-203.400.

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Clarke, John R.; Joye, Donald D.; Carlson, Neal A.; and Wechgelaer, Peter, 5,315,988, Cl. 128-204.230.

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Weigle, William O.: *See*—

Goodman, Michael G.; and Weigle, William O., 5,317,013, Cl. 514-45.000.

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Ralph, Stanley F.; Weinberg, Leonard; and Hart, Joseph J., 5,317,569, Cl. 370-85.900.

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Petrovich, Anthony; Weinberg, Marc S.; and Williams, John R., 5,315,874, Cl. 73-493.000.

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Gries, Heinz; Renneke, Franz-Josef; and Weinmann, Hanns-Joachim, 5,316,756, Cl. 424-9.000.

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Wesson, David S.: *See*—

Manke, Kevin R.; Wesson, David S.; and Schultz, Roger L., 5,316,087, Cl. 166-381.000.

Westhoff, Daniel J.: *See*—

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Westinghouse Electric Corp.: *See*—

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Westonbridge International Limited: *See*—

van Lintel, Harald T. G., 5,316,618, Cl. 156-644.000.

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Lin, Ming-Jye; and Wey, Joag-Shinn, 5,317,521, Cl. 364-496.000.

Weyerhaeuser Company: *See*—

Hebbard, Carl; Perdelwitz, Lee E., Jr.; and Gaddis, Paul G., 5,316,601, Cl. 156-62.200.

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Dougherty, Thomas K.; Harris, Norman H.; Chow, James R.; Pierce, Brian M.; and Whelan, David A., 5,317,058, Cl. 525-64.000.

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Thompson, Christopher M., 5,315,838, Cl. 62-129.000.

Whirlpool Europe B.V.: *See*—

Forsberg, Sven T., 5,317,115, Cl. 219-716.000.

Sundstrom, Tim; and Wahlander, David, 5,317,133, Cl. 219-716.000.

Whitaker Corporation, The: *See*—

Bakermans, Johannes C. W.; and Gingrich, Robert B., 5,315,857, Cl. 72-450.000.

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Hotea, Gheorghe, 5,317,662, Cl. 385-46.000.

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Pavely, Andrew P.; Marr, Roy J.; Foskett, Peter S.; and White, David M., 5,316,166, Cl. 220-269.000.

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White, Douglas J.: *See*—

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Wiegn, Phi: *See*—

Lurie, Keith G.; and Wiegn, Phi, 5,316,907, Cl. 435-4.000.

Wiener, Robert J.: *See*—

Aghajanian, Michael K.; Keck, Steven D.; Burke, John T.; Hannon, Gregory E.; Becker, Kurt J.; Taylor, Steven J.; Wiener, Robert J.; and McCormick, Allyn L., 5,316,069, Cl. 164-97.000.

Wieschemann, Siegfried; Baitz, Gunter; and Kamin, Hartmut, to Siemens Nixdorf Informationssysteme AG. Device for checking out goods. 5,316,107, Cl. 186-61.000.

Wiley, George E.: *See*—

Pantusco, Frank S.; and Wiley, George E., 5,315,942, Cl. 112-134.000.

Wilkes, Garth L.; and Brennan, Anthony B., to Virginia Tech Intellectual Properties, Inc. Use of polymeric catalyst in synthesis of sol-gel derived ceramic materials. 5,316,695, Cl. 252-315.600.

Wilkes, Garth L.: *See*—

Wang, Bing; and Wilkes, Garth L., 5,316,855, Cl. 428-447.000.

Wilkins, Frederick: *See*—

Ganzi, Gary C.; Wilkins, Frederick; Giuffrida, Anthony J.; and Griffin, Christopher, 5,316,637, Cl. 204-182.400.

Wilkins, John J.: *See*—

Heit, Martin A.; Wilkins, John J.; and Rau, William C., 5,316,130, Cl. 198-781.000.

Wilkins, John L., to Comproducts Inc. Magnetic debit card reader fraudulent use prevention. 5,317,137, Cl. 235-380.000.

Wilkins, Larry K. Camper shell mounting rail. 5,316,366, Cl. 296-167.000.

Will, Donald G.: *See*—

Dorsey, William I.; Masten, John J., Jr., deceased; Schroedl, Richard M.; and Will, Donald G., 5,317,338, Cl. 346-1.100.

Willett, Paul: *See*—

Tarbit, Brian; Adger, Brian; and Willett, Paul, 5,317,048, Cl. 524-94.000.

Williams Electronics Games, Inc.: *See*—

Trudeau, John T.; and Pizairo, Ernie S., 5,316,303, Cl. 273-121.00A.

Williams, Ian R.: *See*—

Martell, David K.; and Williams, Ian R., 5,317,311, Cl. 340-905.000.

Williams, John R.: *See*—

Petrovich, Anthony; Weinberg, Marc S.; and Williams, John R., 5,315,874, Cl. 73-493.000.

Williams, Michael S.: *See*—

Muni, Ketan P.; and Williams, Michael S., 5,316,706, Cl. 264-25.000.

Sargent, Ralph R.; and Williams, Michael S., 5,316,850, Cl. 428-378.000.

Williams, Randall K.: *See*—

Kohlmann, Michael J.; and Williams, Randall K., 5,316,673, Cl. 210-251.000.

Williams, Robert M. Waste material combustion ash ejection system. 5,315,937, Cl. 110-165.00A.

Williams, Ronald D.: *See*—

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Folkers, Karl A.; Langsjoen, Per H.; and Willis, Richard A., 5,316,765, Cl. 424-94.100.

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Wilson, Curtis D.: *See*—

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Wilson, Donald L.; and Trippe, Jerry C., to Elastec, Inc. Device for skimming oil from water. 5,316,672, Cl. 210-242.300.

Wilson, James S.: *See*—

Ioannides, Antonis C.; Wilson, James S.; and Patel, Ashok, 5,316,179, Cl. 222-56.000.

Wilson, John. Sports equipment. 5,316,314, Cl. 273-400.000.

Wilson Sporting Goods Co.: *See*—

McCabe, Terrill R., 5,316,305, Cl. 273-174.000.

Wimmers, Elmar: *See*—

Kollenbrandt, Norbert; Schwenke, Heiko; and Wimmers, Elmar, 5,316,350, Cl. 285-242.000.

Windmoller & Holscher: *See*—

Achelpohl, Fritz, 5,316,123, Cl. 198-416.000.

Wing, Philip A., to Chrysler Corporation. Headlight aiming device and method. 5,315,763, Cl. 33-288.000.

Winston, Anthony E.: *See*—

Yam, Benny S.; Joseph, Amy L.; Winston, Anthony E.; and Jones, Keith A., 5,316,587, Cl. 134-7.000.

Wirth Gallo Messtechnik AG: *See*—

Wirth, Johannes, 5,315,883, Cl. 73-862.590.

Wirth, Johannes, to Wirth Gallo Messtechnik AG. Load measuring device. 5,315,883, Cl. 73-862.590.

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  - Swerdloff, Stuart; Mackie, Thomas R.; and Holmes, Timothy, 5,317,616, Cl. 378-65.000.
- Wise Child Inc., The: *See—*
  - Fogelman, John A., 5,315,777, Cl. 40-591.000.
- Witek, Richard T.: *See—*
  - Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., 5,317,717, Cl. 395-425.000.
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  - Baldus, Berthold; Maass, Bernhard; Muller, Bernd; and Witt, Werner, 5,316,766, Cl. 424-94.630.
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  - McKnight, Alexander; and Wodruff, Geoffrey N., 5,317,028, Cl. 514-409.000.
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  - Rune, Gordon H.; and Wojtysiak, Bruce A., 5,316,733, Cl. 422-104.000.
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  - Chalupka, Alfred; Lammer, Gertraud; Stengl, Gerhard; Wolf, Peter; and Fegerl, Johannes, 5,317,161, Cl. 250-423.00R.
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  - Sharp, Edward J.; Wood, Gary L.; Clark, William W., III; and Salamo, Gregory J., 5,317,442, Cl. 359-170.000.
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  - Bokerman, Gary N.; Puckett, David E.; and Wood, Larry H., 5,317,072, Cl. 528-12.000.
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  - Hughes, Bronwyn G.; and Wood, Steven G., 5,316,768, Cl. 424-433.000.
- Woodring, Cooper C.: *See—*
  - Rapp, William H.; Gaber, Ira; and Woodring, Cooper C., 5,316,066, Cl. 160-178.200.
- Woodruff, Daniel J.: *See—*
  - Taylor, Wilhelm; Faucett, Michael D.; and Woodruff, Daniel J., 5,317,554, Cl. 369-77.200.
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  - Smithgall, David H.; and Woodward, Alan T., 5,316,562, Cl. 65-3.110.
- Woog, Gunter. Chemical recycler for photo processing machine. 5,317,360, Cl. 354-324.000.
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  - Dreilich, Ludwig; Woersdoerfer, Karl-Friedrich; Egerer, Thomas; and Worms, Reinhold, 5,315,860, Cl. 73-9.000.
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  - Bula, Orest; Koch, Garrett S.; Woyke, Justin A.; and Gomez, Richard S., 5,317,573, Cl. 371-10.300.
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  - Collins, Antony P.; and Wright, Alfred B., 5,316,155, Cl. 211-70.500.
- Wright, Larry R.: *See—*
  - Stout, George M.; Homan, James G.; Mlinar, John R.; and Wright, Larry R., 5,316,812, Cl. 428-64.000.
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  - Spence, Wayman R., 5,316,531, Cl. 482-93.000.
- Wrzeszczynski, Kazimierz O.: *See—*
  - Brons, Glen B.; Siskin, Michael; and Wrzeszczynski, Kazimierz O., 5,316,659, Cl. 208-39.000.
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  - Chen, Ling; Lin, Tien-ler; and Wu, Albert, 5,317,179, Cl. 257-321.000.
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- Wulff, Claus: *See—*
  - Freitag, Dieter; Wulff, Claus; Alewelt, Wolfgang; and Kauth, Hermann, 5,317,083, Cl. 528-499.000.
- Wun-Fogle, Marilyn: *See—*
  - Savage, Howard T.; Clark, Arthur E.; Wun-Fogle, Marilyn; Kabacoff, Lawrence T.; Hernando, Antonio; and Beihoff, Bruce, 5,315,881, Cl. 73-862.333.
- Wyant, Reece E.: *See—*
  - Nahm, James J. W.; and Wyant, Reece E., 5,316,083, Cl. 166-291.000.
- Wyckoff, Charles W., to Briteline Industries, Inc. Surface marker strip and methods for providing improved integrity and adhesion to roadway and the like 5,316,406, Cl. 404-12.000.
- Wylde, Andrew F.: *See—*
  - Young, David J., Jr.; Randall, Scott L.; Shaw, Scott D.; and Wylde, Andrew F., 5,316,642, Cl. 204-198.000.
- Wyntjes, Geert J.: *See—*
  - Silva, John R.; and Wyntjes, Geert J., 5,317,385, Cl. 356-356.000.
- Wyvratt, Matthew: *See—*
  - Ok, Hyun O.; Schoen, William R.; and Wyvratt, Matthew, 5,317,017, Cl. 514-211.000.
- Xerox Corporation: *See—*
  - Bares, Jan, 5,317,373, Cl. 355-326.00R.
  - Corona, Stephen C.; Fox, Elizabeth D.; and Robinson, Norman D., Jr., 5,316,279, Cl. 270-1.100.
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  - Sang, Henry W., Jr.; Tahn, Whei-Tsu H.; and Zhang, Xiao B., 5,317,646, Cl. 382-9.000.
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- Xiang, Myung X.: *See—*
  - Lee, Kwang H.; Ko, Dong H.; Kim, Young J.; Xiang, Myung X.; and Yoon, Myeong S., 5,317,099, Cl. 540-222.000.
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  - Blake, Joseph W.; Cousineau, Robert; Rosen, Mark; and Watson, William, 5,316,730, Cl. 422-73.000.
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- Yagi, Shigenori: *See—*
  - Ogawa, Shuji; and Yagi, Shigenori, 5,317,589, Cl. 372-99.000.
- Yagi, Takayuki: *See—*
  - Takamatsu, Osamu; Hirai, Yutaka; Nakayama, Masaru; Yagi, Takayuki; Kasanuki, Yuji; and Shimada, Yasuhiro, 5,317,152, Cl. 250-306.000.
- Yagi, Tsukasa: *See—*
  - Masuda, Tomohiko; Matsubara, Ken; Yagi, Tsukasa; Wakamiya, Koji; and Kitano, Hirohisa, 5,317,347, Cl. 346-160.000.
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- Yagihara, Tomio: *See—*
  - Tazaki, Seiji; Yagihara, Tomio; Matsui, Nobuo; Yanagisawa, Atsushi; and Kojima, Takakazu, 5,317,102, Cl. 544-336.000.
- Yagyu, Eiji: *See—*
  - Nishimura, Tetsuya; Yagyu, Eiji; and Yoshimura, Motomu, 5,316,813, Cl. 428-64.000.
- Yajima, Yasuhito; Ishikawa, Zenji; and Yamauchi, Syuichi, to NGK Insulators, Ltd. Thermal flowmeter with detecting element supported by supports having engaging portions. 5,315,871, Cl. 73-204.250.
- Yakima Wire Works: *See—*
  - Germunson, Gary G., 5,315,812, Cl. 53-573.000.
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- Yamabayashi, Naoyuki: *See—*
  - Iwasaki, Takashi; Iguchi, Yasuhiro; and Yamabayashi, Naoyuki, 5,316,956, Cl. 437-5.000.
- Yamada, Kazunori: *See—*
  - Kohama, Yukio; Yamada, Kazunori; Watanabe, Toshiaki; and Kanai, Chiaki, 5,316,841, Cl. 428-319.100.
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- Yamada, Masayuki: *See—*
  - Hasegawa, Fumihiko; Ohtani, Tatsuo; Kawano, Hiroshi; and Yamada, Masayuki, 5,316,620, Cl. 156-645.000.
- Yamada, Masuo: *See—*
  - Yagi, Wataru; Yamada, Masuo; Ishii, Masami; Makimura, Yukuo; Kurikuma, Tsutomu; and Akita, Norihiro, 5,316,068, Cl. 164-58.100.
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  - Kanda, Hitoshi; Kato, Masayoshi; Mitsumura, Satoshi; Yamada, Yusuke; and Goseki, Yasuhide, 5,316,222, Cl. 241-5.000.
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- Yamagata, Ryo: *See—*
  - Ara, Mari; Sawamoto, Hideo; and Yamagata, Ryo, 5,317,710, Cl. 395-425.000.
- Yamagishi, Kiyoshi: *See—*
  - Shimizu, Katsumi; Maruoka, Kazumi; and Yamagishi, Kiyoshi, 5,316,030, Cl. 134-105.000.
- Yamaguchi, Hiroyuki: *See—*
  - Monma, Yoshio; and Yamaguchi, Hiroyuki, 5,317,371, Cl. 355-274.000.
- Yamaguchi, Noboru: *See—*
  - Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,317,397, Cl. 348-416.000.
- Yamaguchi, Takeo: *See—*
  - Nakagawa, Tanehiro; Ono, Yoshiaki; Tomatsu, Tsutomu; Yamaguchi, Takeo; Aoyama, Kyoji; and Tanaka, Toshiaki, 5,316,513, Cl. 446-14.000.
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  - Watanabe, Kazumi; and Kashihara, Reiichiro, 5,316,420, Cl. 409-190.000.
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  - Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,317,397, Cl. 348-416.000.
- Yamamoto, Hiroshi: *See—*
  - Oono, Masahiro; Itoh, Tsuyoshi; Hayashi, Katsuki; Kase, Toshiyuki; Sasaki, Masahiko; Yamamoto, Hiroshi; and Okuda, Isao, 5,317,144, Cl. 250-201.500.
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  - Otsuka, Takashi; Yamamoto, Kenji; Osada, Mototsugu; Taniguchi, Tadao; and Shigeta, Yoshifumi, 5,316,271, Cl. 266-236.000.
- Yamamoto, Shinichi: *See—*
  - Kiryu, Naohiko; Yamamoto, Shinichi; Tomiki, Masatoshi; and Higami, Tatuhiko, 5,316,843, Cl. 428-323.000.
- Yamamoto, Tamotsu; and Akimoto, Kenji, to Nippon Zeon Co., Ltd. Magnetic recording medium, comprising magnetic powder and a sulfoxide group containing vinyl chloride copolymer binder resin. 5,316,862, Cl. 428-522.000.
- Yamamura, Katsumi; and Hanaoka, Hideyuki, to Matsushita Graphic Communication Systems, Inc. Image processing apparatus with improved image reduction. 5,317,417, Cl. 358-451.000.
- Yamamura, Takashi; Hamazaki, Yoshihisa; Kaneshige, Toshihiko; Nanba, Makoto; and Kubota, Yukitoshi, to Shinagawa Refractories Co., Ltd. Alumina-spinel type monolithic refractories. 5,316,571, Cl. 106-692.000.
- Yamano, Masaru: *See—*
  - Kojima, Takao; Minoha, Ken; and Yamano, Masaru, 5,316,738, Cl. 422-180.000.
- Yamaoka, Fumiyuki, to Atsugi Motor Parts Company Ltd. Hydraulic shock absorber. 5,316,113, Cl. 188-282.000.
- Yamasaki, Hideo, to Kabushiki Kaisha Toshiba. Linear actuator for driving an optical head incorporated in an optical disk. 5,317,552, Cl. 369-44.140.
- Yamashita, Hiroshi: *See—*
  - Ueda, Yutaka; and Yamashita, Hiroshi, 5,316,898, Cl. 430-400.000.
- Yamashita, Masayuki: *See—*
  - Ishikawa, Masahiko; Hayano, Kohji; Mori, Shinichi; Yamashita, Masayuki; Ueda, Osamu; and Moriga, Namiki, 5,317,195, Cl. 257-787.000.
- Yamatake-Honeywell Co., Ltd.: *See—*
  - Suzuki, Yoshiro; Tanaka, Hitoshi; Kurihara, Noriyuki; and Saito, Yutaka, 5,316,727, Cl. 422-68.100.
- Yamato, Satoshi: *See—*
  - Nakagawa, Katsuya; Yamato, Satoshi; and Tanaka, Hideki, 5,317,714, Cl. 395-425.000.
- Yamauchi, Syuichi: *See—*
  - Yajima, Yasuhito; Ishikawa, Zenji; and Yamauchi, Syuichi, 5,315,871, Cl. 73-204.250.
- Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Diamond thermistor. 5,317,302, Cl. 338-225.00D.
- Yamazaki, Yoji: *See—*
  - Morishima, Seiji; and Yamazaki, Yoji, 5,316,758, Cl. 424-54.000.
- Yanagihara, Naofumi, to Sony Corporation. Digital high-definition video signal recording and reproducing apparatus. 5,317,413, Cl. 358-335.000.
- Yanagisawa, Atsushi: *See—*
  - Tazaki, Seiji; Yagihara, Tomio; Matsui, Nobuo; Yanagisawa, Atsushi; and Kojima, Takakazu, 5,317,102, Cl. 544-336.000.
- Yanai, Kunihiko; Tanaka, Yasuo; and Niwa, Yasunori, to Sony Corporation. Method and apparatus of forming a coating film on an inner surface of a panel of a cathode ray tube. 5,316,785, Cl. 427-72.000.
- Yang, Chao: *See—*
  - Nack, Myron L.; Ellis, Thomas O.; Moise, Norton L.; Rosman, Andrew; McMillen, Robert J.; Yang, Chao; and Landis, Gary N., 5,317,689, Cl. 395-163.000.
- Yang, Henry W., to Exxon Chemical Patents Inc. Internal resin-tackified acrylic polymers. 5,317,055, Cl. 524-458.000.
- Yang, Jack. Cup washing machine. 5,315,729, Cl. 15-75.000.
- Yang, Steve S., to Hughes Aircraft Company. Wide band, low noise, fine step tuning, phase locked loop frequency synthesizer. 5,317,284, Cl. 331-2.000.
- Yanus, John F.: *See—*
  - Pai, Damodar M.; Yanus, John F.; Limburg, William W.; and Renfer, Dale S., 5,316,880, Cl. 430-59.000.
- Yao, Chia W. Filtering device for aquariums. 5,316,670, Cl. 210-169.000.
- Yao, Kelvin K. W., to Rototech Electrical Components, Inc. Electric heating unit for heating container space to variable temperature with constant electric current. 5,317,128, Cl. 219-433.000.
- Yao, Shin-Chuan, to China Textile T&R Institute. Compound yarn production apparatus. 5,315,814, Cl. 57-75.000.
- Yashiki, Seiji: *See—*
  - Abe, Mitsutoshi; and Yashiki, Seiji, 5,315,897, Cl. 477-98.000.
- Yashiki, Takashi: *See—*
  - Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,316,722, Cl. 420-421.000.
- Yashiro, Toru: *See—*
  - Sawada, Yasuo; Yashiro, Toru; and Ueda, Yutaka, 5,316,814, Cl. 428-64.000.
- Yasuda, Fujio; and Flum, Alan, to Sony Electronics Inc. Fader depth control apparatus. 5,317,641, Cl. 381-119.000.
- Yasuda, Yasuhiko: *See—*
  - Osawa, Hidefumi; Yasuda, Yasuhiko; and Kato, Shigeo, 5,317,428, Cl. 358-539.000.
- Yasunaga, Tatsuya: *See—*
  - Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,316,722, Cl. 420-421.000.
- Yasutomi, Yoshiyuki; Nakamura, Kousuke; Kita, Hideki; and Sobue, Masahisa, to Hitachi, Ltd. Ceramic composite and process for production thereof. 5,316,987, Cl. 501-97.000.
- Yazaki Corporation: *See—*
  - Jinno, Keishi, 5,316,504, Cl. 439-752.000.
- Yazawa, Minobu: *See—*
  - Kouno, Hiroyuki; Yazawa, Minobu; and Kumamoto, Toshio, 5,317,312, Cl. 341-158.000.
- Ybarra, Kathryn W.: *See—*
  - Sturm, Patricia K.; Ybarra, Kathryn W.; and Motisher, Lewis R., 5,317,316, Cl. 342-30.000.
- Yeh, Chin-Chen. Automatic printing apparatus for a packing case carried on a conveyor belt unit. 5,315,927, Cl. 101-35.000.
- Yenglin, Daniel J.: *See—*
  - Parker, Thomas F.; Yenglin, Daniel J.; and Anderson, Bruce A., 5,315,775, Cl. 40-450.000.
- Yetter, Jeffry D.; and Miller, Robert H., Jr., to Hewlett-Packard Company. Mitigating the adverse effects of charge sharing in dynamic logic circuits. 5,317,204, Cl. 307-443.000.
- Yildirim, Erdal: *See—*
  - Gregoli, Armand A.; Hamshar, John A.; Rimmer, Daniel P.; and Yildirim, Erdal, 5,316,664, Cl. 208-390.000.
- Yissum Research Development Company of the Hebrew University of Jerusalem: *See—*
  - Barenholz, Yechezkel; and Haran, Gilad, 5,316,771, Cl. 424-450.000.
- Yokohama Rubber Co., Ltd., The: *See—*
  - Igarashi, Shigeru; and Ozawa; Osamu, 5,316,046, Cl. 138-126.000.

Yokonuma, Norikazu: *See*—
Fukuhara, Toru; Sosa, Toshio; Hara, Masaharu; Kanai, Hachiro; and Yokonuma, Norikazu, 5,317,361, Cl. 354-415.000.

Yokoo, Yoshiharu: *See*—
Hara, Takahiro; Takasawa, Seigo; Yokoo, Yoshiharu; and Furukawa, Tadayasu, 5,316,767, Cl. 424-401.000.

Yokose, Kenji: *See*—
Fujimori, Haruo; Matsui, Tetsuya; Ajiro, Taiko; Yokose, Kenji; and Izumi, Shigeru, 5,316,983, Cl. 437-250.000.

Yokoyama, Kei: *See*—
Otani, Seiya; Taniguchi, Hiroaki; Yokoyama, Kei; Shiroto, Yoshimi; Shimura, Mitsunori; Akimoto, Osamu; and Notoya, Masayoshi, 5,316,821, Cl. 428-131.000.

Yoneda, Tadahiro; Nakahara, Saburo; Takeda, Mitsuo; and Kamo, Midori, to Nippon Shokujai Kagaku Kogyo Co., Ltd. Method of improving slipperiness of polyester film using a monodispersed glycol suspension of inorganic oxide particles. 5,316,714, Cl. 264-210.600.

Yonei, Hiroyuki: *See*—
Miyaji, Itsuo; and Yonei, Hiroyuki, 5,317,225, Cl. 310-67.00R.

Yonekura, Akimichi: *See*—
Niino, Reiji; Siratani, Isao; Simada, Yutaka; Fukusima, Hiroki; Kitayama, Hirofumi; Yonekura, Akimichi; and Mikata, Yuuichi, 5,316,472, Cl. 432-241.000.

Yoon, Myeong S.: *See*—
Lee, Kwang H.; Ko, Dong H.; Kim, Young J.; Xiang, Myung X.; and Yoon, Myeong S., 5,317,099, Cl. 540-222.000.

Yoshida, Hidefumi; and Hanaoka, Kazutaka, to Fujitsu Limited. Liquid crystal display device with scattering white layer and color filter. 5,317,431, Cl. 359-51.000.

Yoshida, Hideji: *See*—
Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,317,267, Cl. 324-402.000.

Yoshida, Hiroyuki: *See*—
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,317,177, Cl. 257-301.000.

Yoshida, Minoru: *See*—
Kohyama, Mitsuaki; Kikuchi, Kazuhiko; Yoshida, Naruhito; Yoshida, Minoru; and Hirano, Kouji, 5,317,370, Cl. 355-245.000.

Yoshida, Naruhito: *See*—
Kohyama, Mitsuaki; Kikuchi, Kazuhiko; Yoshida, Naruhito; Yoshida, Minoru; and Hirano, Kouji, 5,317,370, Cl. 355-245.000.

Yoshida, Shinichi: *See*—
Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, 5,317,756, Cl. 395-800.000.

Yoshida, Tadao: *See*—
Ohga, Norio; Tsurushima, Katsuaki; and Yoshida, Tadao, 5,317,553, Cl. 369-54.000.

Yoshida, Tadashi, to Canon Kabushiki Kaisha. Image encoding. 5,317,411, Cl. 358-261.200.

Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, to Fujitsu Limited. Infrared ray detecting sensor with getter partition. 5,317,157, Cl. 250-352.000.

Yoshikawa, Hiroyuki: *See*—
Shimomura, Yoshiki; Tanigawa, Sadao; Umeda, Yasushi; Tomiyama, Tetsuo; and Yoshikawa, Hiroyuki, 5,317,368, Cl. 355-207.000.

Yoshikawa, Masaaki: *See*—
Ishimura, Kazuhiko; Saito, Fumiaki; Yoshikawa, Masaaki; Okada, Misao; and Nakajima, Shinsuke, 5,316,563, Cl. 65-32.500.

Yoshikawa, Masato; Kusano, Yukihiro; Akiyama, Setsuo; Naito, Kazuo; Okazaki, Satiko; and Kogoma, Masuhiro, to Bridgestone Corporation; Okazaki, Satiko; and Kogoma, Masuhiro. Method and apparatus for surface treatment. 5,316,739, Cl. 422-186.050.

Yoshikawa, Mitsuo: *See*—
Yoshida, Yukihiro; Ueda, Satoshi; Itoh, Makoto; Yoshikawa, Mitsuo; Hamashima, Shigeki; Tsuchida, Hiroyuki; and Hirota, Koji, 5,317,157, Cl. 250-352.000.

Yoshikawa, Toshitsune: *See*—
Harashige, Masahiro; Kawamura, Tsutomu; Kaneko, Satoru; Inoue, Takashi; Tokutake, Atsuo; and Yoshikawa, Toshitsune, 5,317,051, Cl. 524-310.000.

Yoshimatsu, Kentaro; Ohya, Yukio; Shikata, Yasushi; Tanaka, Isao; Hasegawa, Yoshikazu; Seto, Toshio; and Osawa, Toshio, to Eisai Co., Ltd. Recombinant natural killer cell activator. 5,316,933, Cl. 435-240.100.

Yoshimoto, Kyosuke; and Shimoda, Kyouji, to Mitsubishi Denki Kabushiki Kaisha. Optical data medium driving apparatus and a servo circuit with normalization processing. 5,317,143, Cl. 250-201.500.

Yoshimoto, Teruo: *See*—
Sugitani, Junichi; Inui, Masahiro; Tsuchida, Koji; and Yoshimoto, Teruo, 5,316,721, Cl. 420-50.000.

Yoshimoto, Yoshikazu: *See*—
Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 5,316,858, Cl. 428-457.000.

Yoshimura, Motomu: *See*—
Nishimura, Tetsuya; Yagyu, Eiji; and Yoshimura, Motomu, 5,316,813, Cl. 428-64.000.
Nishimura, Tetsuya; Yoshimura, Motomu; and Maeda, Mitsuo, 5,317,453, Cl. 359-885.000.

Yoshimura, Takao; Morita, Ichiro; and Ogahara, Hideharu, to Matsushita Refrigeration Company. Rotary compressor with stabilized rotor. 5,316,455, Cl. 418-63.000.

Yoshimura, Yumiko; Hirakawa, Hideki; Asahioka, Yoshimi; and Kimura, Mariko, to Kabushiki Kaisha Toshiba. Method and apparatus for generating sentences from conceptual structures. 5,317,510, Cl. 364-419.080.

Yoshinaga, Kazuo; and Sato, Koichi, to Canon Kabushiki Kaisha. Information memory medium and information recording/holding process making use of the medium. 5,316,806, Cl. 428-1.000.

Yoshiura, Tsukasa: *See*—
Wakabayashi, Noriaki; and Yoshiura, Tsukasa, 5,317,468, Cl. 360-135.000.

Yoshiwara, Yoshio: *See*—
Ohguro, Hiroki; Yoshiwara, Yoshio; Furuya, Minoru; Okuyama, Nobutaka; Sakurai, Soichi; and Ohsawa, Michitaka, 5,317,239, Cl. 315-370.000.

Yost, David A. Wire faced golf putter. 5,316,304, Cl. 273-168.000.

Young, David J., Jr.; Randall, Scott L.; Shaw, Scott D.; and Wylde, Andrew F., to Digital Equipment Corporation. Oscillation device for plating system. 5,316,642, Cl. 204-198.000.

Youssefyeh, Raymond D.: *See*—
Ullrich, John W.; Youssefyeh, Raymond D.; Cheney, Daniel L.; and Burns, Christopher J., 5,317,015, Cl. 514-79.000.

Yuasa Battery Co., Ltd.: *See*—
Kuriyama, Kazuya; and Nishino, Aya, 5,316,876, Cl. 429-197.000.

Yuasa, Kimihiro; Ido, Motohisa; and Watanabe, Ryusuke, to Idemitsu Kosan Co., Ltd. Liquid crystal composition and information display apparatus using the liquid crystal composition. 5,316,693, Cl. 252-299.010.

Yue, Stephen T.: *See*—
Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.

Yun, Jong-Man: *See*—
Lim, Moo-Seang; Yun, Jong-Man; Park, Chan-Kyu; Lee, Sang-Dae; Ma, Sun-Chae; Oh, Seung-Seob; Jeong, Eui-Sik; and Pack, Kwang-Sun, 5,316,042, Cl. 137-625.110.

Yung, Ming L.; Albrecht, Bernard M., Jr.; Muhlhauser, Nicholas L.; and Herbusky, Stephen T., to Space Systems/Loral, Inc. Continuously variable electronically controlled phase shift circuit. 5,317,288, Cl. 332-144.000.

Yupiteru Industries Co., Ltd.: *See*—
Hatasa, Takeshi, 5,317,329, Cl. 343-786.000.

Zabeau, Marcus F. O.: *See*—
De Greve, Henri M. J.; Salgado, Maria B. L. F.; Van Montagu, Marc C. E.; Vaeck, Mark A.; Zabeau, Marcus F. O.; Leemans, Jan J. A.; and Hofte, Hermanus F. P., 5,317,096, Cl. 536-23.710.

Zaharia, Vlad; and Johnson, Gerald E., to Otis Elevator Company. Escalator missing step detection. 5,316,121, Cl. 198-323.000.

Zaidi, Syed A. A., to Intel Corporation. Apparatus for reducing the size of an arithmetic and logic unit necessary to practice non-restore division. 5,317,531, Cl. 364-766.000.

Zaitsev, Vikator A., deceased: *See*—
Ivanov, Oleg R.; Snegirev, Mikhail I.; Chistyakov, Makhail K.; Razhev, Vladimir M.; Budantsev, Vladimir I.; Kipriyanov, Jury I.; Zaitsev, Vikator A., deceased; Zaitseva, Galina M., administrator; and Zaitseva, Natalya V., administrator, 5,316,735, Cl. 422-143.000.

Zaitseva, Galina M., administrator: *See*—
Ivanov, Oleg R.; Snegirev, Mikhail I.; Chistyakov, Makhail K.; Razhev, Vladimir M.; Budantsev, Vladimir I.; Kipriyanov, Jury I.; Zaitsev, Vikator A., deceased; Zaitseva, Galina M., administrator; and Zaitseva, Natalya V., administrator, 5,316,735, Cl. 422-143.000.

Zaitseva, Natalya V., administrator: *See*—
Ivanov, Oleg R.; Snegirev, Mikhail I.; Chistyakov, Makhail K.; Razhev, Vladimir M.; Budantsev, Vladimir I.; Kipriyanov, Jury I.; Zaitsev, Vikator A., deceased; Zaitseva, Galina M., administrator; and Zaitseva, Natalya V., administrator, 5,316,735, Cl. 422-143.000.

Zaks, Aleksey; and Gross, Akiva T., to Opta Food Ingredients, Inc. Production of monoglycerides by enzymatic transesterification. 5,316,927, Cl. 435-134.000.

Zalles, Judi H.: *See*—
Galeros, Susan R.; and Zalles, Judi H., 5,316,189, Cl. 223-113.000.

Zambrano, Raffaele; and Grimaldi, Antonio, to Consorzio Per la Ricerca Sulla Microelectronica. Termination of the power stage of a monolithic semiconductor device. 5,317,182, Cl. 257-378.000.

Zamzow, Michael F.: *See*—
Reggin, Robert F.; and Zamzow, Michael F., 5,316,105, Cl. 182-187.000.

Zander, Dennis R.; and Kataoka, Hideaki, to Eastman Kodak Company; and Fuji Photo Film Co., Ltd. Film cassette with spool lock and light-shielding door. 5,317,355, Cl. 354-277.000.

Zarabadi, Seyed R.; and Ismail, Mohammed, to Ohio State University. Linear voltage to current converter including feedback network. 5,317,279, Cl. 330-253.000.

Zarina Holding C.V.: *See*—
Atkins, David S., 5,315,728, Cl. 15-1.700.

Zarinetchi, Farhad: *See*—
Prentiss, Mara; Mervis, Juliet A.; Bloom, Adam H.; and Zarinetchi, Farhad, 5,317,452, Cl. 359-819.000.

Zarr, Richard S.: *See*—
Dibble, Eric P.; Hanakovic, Steven L.; Markovich, Voya R.; Niedrich, Daniel S.; Vlasak, Gary P.; Zarr, Richard S.; and Senger, Richard C., 5,316,788, Cl. 427-98.000.

Zarwell, Daniel W. Combined window and vent unit. 5,315,798, Cl. 52-202.000.

Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., to Kopin Corporation. Single crystal silicon arrayed devices for display panels. 5,317,236, Cl. 315-169.300.

Zavracky, Paul M.: *See*—
Spitzer, Mark B.; Salerno, Jack P.; and Zavracky, Paul M., 5,317,436, Cl. 359-83.000.

Zdeblick, Mark J.: *See*—
Quate, Calvin F.; Zdeblick, Mark J.; and Albrecht, Thomas R., 5,317,533, Cl. 365-151.000.

Zellweger Uster AG: *See*—
Warmerdam, Petrus, 5,317,250, Cl. 324-156.000.

Zenith Data Systems Corporation: *See*—
Robinson, Thomas N., 5,317,721, Cl. 395-500.000.

Zenoni, Pietro; Pedrini, Giovanni; and Castelli, Rosario, to L.G.L. Electronics S.p.A. Self-adjusting thread braking device for weft feeder units. 5,316,051, Cl. 139-452.000.

Zetena, Maurice F., Jr. Supporting brackets for calbe raceways. 5,316,244, Cl. 248-49.000.

Zhang, Hui-Hua: *See*—
Whitehead, R. H.; Burgess, Anthony; and Zhang, Hui-Hua, 5,316,937, Cl. 435-240.300.

Zhang, Xiao B.: *See*—
Sang, Henry W., Jr.; Tahn, Whei-Tsu H.; and Zhang, Xiao B., 5,317,646, Cl. 382-9.000.

Zhang, Yu-zhong: *See*—
Haugland, Richard P.; Zhang, Yu-zhong; Yue, Stephen T.; Terpetschnig, Ewald; Olson, Nels A.; Naleway, John J.; Larison, Karen D.; and Huang, Zhijian, 5,316,906, Cl. 435-4.000.

Zhang, Zhimming: *See*—
Inage, Katuyuki; Saito, Yumi; Zhang, Zhimming; Fujii, Toru; and Shirasaki, Osamu, 5,316,006, Cl. 128-681.000.

Zhang, Zuoying L.: *See*—
MacDonald, Noel C.; and Zhang, Zuoying L., 5,316,979, Cl. 437-203.000.

Zheng, Joe: *See*—
Surka, Stefan; Zheng, Joe; and Kelmar, Laura, 5,317,388, Cl. 356-373.000.

Zhou, Liang-Ji: *See*—
Tedder, Thomas F.; and Zhou, Liang-Ji, 5,316,920, Cl. 435-69.300.

Zhou, Stephen O.: *See*—
Wang, Yading; Zhou, Stephen O.; and Richards, Thomas P., 5,316,704, Cl. 264-2.600.

Ziegler, Bruno; Herzog, Hermann; and Wagner, Udo, to Linde Aktiengesellschaft. Process and a device for increasing the efficiency of compression devices. 5,316,448, Cl. 417-307.000.

Zilog, Inc.: *See*—
Chan, Stephen H., 5,317,745, Cl. 395-700.000.
Hindman, Gregory; Berg, Jack; and Manos, Peter N., II, 5,317,187, Cl. 257-659.000.

Zimlich, Joseph A., III, to Brown-Forman Beverage Company. Product and process of making a product flavored using a by-product of alcohol production. 5,316,782, Cl. 426-624.000.

Zimmer, Robert A.; and Moore, Charles E., to Hewlett-Packard Company. High impedance circuit using PFET. 5,317,280, Cl. 330-261.000.

Zimmermann, Daniel E.: *See*—
Szentes, John F.; Zimmermann, Daniel E.; Mack, David C.; and Hutchison, Eric A., 5,316,044, Cl. 137-625.690.

Zimmermann, Hans-Peter: *See*—
Hupe, Klaus-Peter; Strohmeier, Fred; Zimmermann, Hans-Peter; and Eberhardt, Werner, 5,316,954, Cl. 436-89.000.

Zinke, Randy J., to UOP. FCC process for de-gassing spent catalyst boundary layer. 5,316,657, Cl. 208-161.000.

Ziparo, Joseph A., to Full Range, Inc. Fitness apparatus usable for multiple aerobic and anaerobic exercise routines. 5,316,528, Cl. 482-52.000.

Zomeworks Corporation: *See*—
Baer, Stephen C., 5,316,872, Cl. 429-62.000.

Zontec Inc.: *See*—
Sewell, Peter B.; and Luscombe-Mills, Richard J., 5,316,741, Cl. 422-186.210.

Zorinsky, Eldon J.: *See*—
Spratt, David B.; Virkus, Robert L.; Eklund, Robert H.; and Zorinsky, Eldon J., 5,316,957, Cl. 437-31.000.

Zurbuchen, Hans: *See*—
Lussi, Andre ; Zurbuchen, Hans; and von Gunten, Jurg, 5,316,781, Cl. 426-433.000.

3COM Corporation: *See*—
Kranzler, David A., 5,317,215, Cl. 307-517.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31st DAY OF MAY, 1994

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akesson, Leif A. E.; and Mikus, Marian, to Santrade Limited. Sintered body for chip forming machining. Re. 34,625, Cl. 501-87.000.
Bayer AG: *See—*
  Rudolph, Udo; and Wulff, Claus, Re. 34,626, Cl. 568-722.000.
Briggs, Godfrey T., to Colonial Tool Operations Div. of Textron Canada Ltd. High speed spindle with adjustable tool. Re. 34,623, Cl. 408-158.000.
Camilleri, Paul A., to Foundation Technology Limited. Trenching apparatus and methods of forming inground retaining walls. Re. 34,620, Cl. 37-362.000.
Colonial Tool Operations Div. of Textron Canada Ltd.: *See—*
  Briggs, Godfrey T., Re. 34,623, Cl. 408-158.000.
Corning Incorporated: *See—*
  Cunningham, George M., Re. 34,624, Cl. 425-461.000.
Cunningham, George M., to Corning Incorporated. Extrusion die for forming thin walled honeycomb structures. Re. 34,624, Cl. 425-461.000.
Davini, Mark A. Splint system. Re. 34,627, Cl. 602-5.000.
Foundation Technology Limited: *See—*
  Camilleri, Paul A., Re. 34,620, Cl. 37-362.000.
Lamb Robo, Inc.: *See—*
  Waltonen, Edward J.; and Obrecht, Robert E., Re. 34,621, Cl. 83-191.000.
Ledley, Robert S., to National Biomedical Research Foundation. Split-image, multi-power microscopic image display system and method. Re. 34,622, Cl. 348-79.000.
Mikus, Marian: *See—*
  Akesson, Leif A. E.; and Mikus, Marian, Re. 34,625, Cl. 501-87.000.
National Biomedical Research Foundation: *See—*
  Ledley, Robert S., Re. 34,622, Cl. 348-79.000.
Obrecht, Robert E.: *See—*
  Waltonen, Edward J.; and Obrecht, Robert E., Re. 34,621, Cl. 83-191.000.
Rudolph, Udo; and Wulff, Claus, to Bayer AG. Isomerization of bisphenols. Re. 34,626, Cl. 568-722.000.
Santrade Limited: *See—*
  Akesson, Leif A. E.; and Mikus, Marian, Re. 34,625, Cl. 501-87.000.
Waltonen, Edward J.; and Obrecht, Robert E., to Lamb Robo, Inc. Self equalizing piercing machine. Re. 34,621, Cl. 83-191.000.
Wulff, Claus: *See—*
  Rudolph, Udo; and Wulff, Claus, Re. 34,626, Cl. 568-722.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bliss, Peter L.: *See—*
  Neeser, Timothy A.; and Bliss, Peter L., B1 5,136,852, Cl. 62-50.400.
Cross, Michael W. A.: *See—*
  Perez-Cavero, Leonardo; Cross, Michael W. A.; Fielding, Geoffrey; and Gray, Frederick M., B1 4,254,403, Cl. 340-310.00R.
Fielding, Geoffrey: *See—*
  Perez-Cavero, Leonardo; Cross, Michael W. A.; Fielding, Geoffrey; and Gray, Frederick M., B1 4,254,403, Cl. 340-310.00R.
Flexiwatt Corporation: *See—*
  Widmayer, Don F., B1 4,352,045, Cl. 315-291.000.
General Electric Comp., Ltd.: *See—*
  Perez-Cavero, Leonardo; Cross, Michael W. A.; Fielding, Geoffrey; and Gray, Frederick M., B1 4,254,403, Cl. 340-310.00R.
Gray, Frederick M.: *See—*
  Perez-Cavero, Leonardo; Cross, Michael W. A.; Fielding, Geoffrey; and Gray, Frederick M., B1 4,254,403, Cl. 340-310.00R.
Mao, Mark H. K.; Miller, Larry E.; and Weeman, John M., to Procter & Gamble Company. Process of preparing alkylpolsaccharides. B1 4,393,203, 5-31-94, Cl. 536-124.000.
Miller, Larry E.: *See—*
  Mao, Mark H. K.; Miller, Larry E.; and Weeman, John M., B1 4,393,203, Cl. 536-124.000.
Minnesota Valley Engineering, Inc.: *See—*
  Neeser, Timothy A.; and Bliss, Peter L., B1 5,136,852, Cl. 62-50.400.
Neeser, Timothy A.; and Bliss, Peter L., to Minnesota Valley Engineering, Inc. Control regulator and delivery system for a cryogenic vessel. B1 5,136,852, 5-31-94, Cl. 62-50.400.
Perez-Cavero, Leonardo; Cross, Michael W. A.; Fielding, Geoffrey; and Gray, Frederick M., to General Electric Comp., Ltd. Systems for transmitting information in an alternating current electricity supply system. B1 4,254,403, 5-31-94, Cl. 340-310.00R.
Procter & Gamble Company: *See—*
  Mao, Mark H. K.; Miller, Larry E.; and Weeman, John M., B1 4,393,203, Cl. 536-124.000.
Weeman, John M.: *See—*
  Mao, Mark H. K.; Miller, Larry E.; and Weeman, John M., B1 4,393,203, Cl. 536-124.000.
Widmayer, Don F., to Flexiwatt Corporation. Energy conservation system using current control. B1 4,352,045, 5-31-94, Cl. 315-291.000.

LIST OF DESIGN PATENTEES

A. Lassonde Inc.: *See—*
  Guertin, Gilles, 347,391, Cl. D9-566.000.
Abe, Toru; Shoji, Takashi; and Tsuruhe, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Electric vacuum cleaner. 347,500, 5-31-94, Cl. D32-22.000.
Allen-Edmonds Shoe Corporation: *See—*
  Spiece, Walter L., 347,312, Cl. D2-623.000.
Allen Reed Company, Incorporated: *See—*
  Kaiser, Ian R.; Kaiser, Michael C.; and Neiberger, Sean A., 347,345, Cl. D6-518.000.
Allied-Signal Inc.: *See—*
  Rossigno, Louis P.; Dodson, Jon R.; Dodd, Thomas E.; O'Brien, Thomas M.; and Steer, John E., 347,415, Cl. D12-180.000.
Alt, Richard. Hook for displaying articles. 347,379, 5-31-94, Cl. D8-367.000.
Armstrong, Walter E., III, to Wally Armstrong Golf, Inc. Golf putter swing alignment device. 347,457, 5-31-94, Cl. D21-234.000.
Ashley, Jimmy; and Graham, Thomas E., Sr. Deer stand. 347,481, 5-31-94, Cl. D25-62.000.
AT&T Bell Laboratories: *See—*
  Konik, Walter S., 347,371, Cl. D8-51.000.
Attias, James. Neck of a musical instrument. 347,445, 5-31-94, Cl. D17-20.000.
Austin, Theodore R. Combination hook and pulley. 347,507, 5-31-94, Cl. D34-35.000.
Avar, Eric P., to Nike, Inc. Shoe upper. 347,317, 5-31-94, Cl. D2-970.000.
Avar, Eric P., to Nike Inc. Midsole of a shoe. 347,318, 5-31-94, Cl. D2-977.000.

Babcock, Forrest D.: *See—*
  Lutter, Hart D.; Mai, Neil T.; Babcock, Forrest D.; and Tucker, Allen D., 347,441, Cl. D16-132.000.
Baldwin, Gene R. Nasal pocket mask. 347,495, 5-31-94, Cl. D29-8.000.
Baron, Nancy: *See—*
  Solomita, Anthony; Baron, Nancy; and Haber, Barry M., 347,428, Cl. D14-144.000.
Belisle, William W.: *See—*
  Gruber, Harold T.; Brohard, Bonnie J.; Belisle, William W.; and Fouke, Herbert A., 347,486, Cl. D26-85.000.
Bellini, Mario; and Thiel, Dieter. Office table. 347,339, 5-31-94, Cl. D6-477.000.
Bertrand, Victor J., to Ritvik Group Inc., The. Toy space command module. 347,461, 5-31-94, Cl. D21-87.000.
Birchler, Terry: *See—*
  Kolada, Paul P.; Painter, Michael J.; and Birchler, Terry, 347,466, Cl. D23-241.000.
Black & Decker Inc.: *See—*
  Gildersleeve, Paul, 347,357, Cl. D7-384.000.
  Naft, Stuart, 347,354, Cl. D7-354.000.
  Naft, Stuart, 347,355, Cl. D7-357.000.
Bocade, Emil: *See—*
  Mattson, Deborah; Watt, Doyle; Bocade, Emil; and Hendrick, Carl W., 347,376, Cl. D8-317.000.
Bostwick, Martin M.: *See—*
  Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, 347,390, Cl. D9-539.000.
Boudreau, Robert J.: *See—*
  Cunard, Joel C.; Boudreau, Robert J.; and Ziegler, William H., Jr., 347,458, Cl. D21-243.000.
Boughton, Robert D.: *See—*
  Kingston, Jonathan F. M.; and Boughton, Robert D., 347,463, Cl. D23-223.000.
  Kingston, Jonathan F. M.; and Boughton, Robert D., 347,464, Cl. D23-223.000.
Brady, Martin, to Hamilton Beach/Proctor-Silex, Inc. Food processor attachment housing. 347,358, 5-31-94, Cl. D7-412.000.
Braun Aktiengesellschaft: *See—*
  Ullmann, Roland, 347,350, Cl. D7-309.000.
Brehmer, Todd G.; Chow, Christine L.; and Podell, Allen F., to Pacific Monolithics. Protective cover for an integrated antenna/downconverter. 347,437, 5-31-94, Cl. D14-230.000.
Bridger, Peter E. W.; Klette, John T.; Lambeck, Jule G.; and Portoles, Elena, to Mobil Oil Corporation. Bottle and cap. 347,387, 5-31-94, Cl. D9-520.000.
Brohard, Bonnie J.: *See—*
  Gruber, Harold T.; Brohard, Bonnie J.; Belisle, William W.; and Fouke, Herbert A., 347,486, Cl. D26-85.000.
Brookshire, Phillip L.: *See—*
  Myers, Terry L.; and Brookshire, Phillip L., 347,352, Cl. D7-354.000.
Brown, Jeff: *See—*
  Lorenz, Alan S.; and Brown, Jeff, 347,421, Cl. D14-105.000.
Bucaccio, Thomas: *See—*
  Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, 347,390, Cl. D9-539.000.
Bullard, Timothy W.: *See—*
  Gowing, Jim; and Bullard, Timothy W., 347,459, Cl. D22-126.000.
Burton, John W. Soda fountain postmix beverage dispenser. 347,349, 5-31-94, Cl. D7-306.000.
Butcher, Robert C., Jr.: *See—*
  Hansen, Christian M.; Butcher, Robert C., Jr.; and Lear, Kevin D., 347,479, Cl. D24-224.000.
Butler, Cecelia L. Hair wrap. 347,311, 5-31-94, Cl. D2-871.000.
Cannon, Charles M. Pipe cleaning apparatus. 347,498, 5-31-94, Cl. D32-14.000.
Carruthers, Philip D. Fastener for attachment of wall panels and fixtures to walls and ceilings. 347,381, 5-31-94, Cl. D8-382.000.
Carruthers, Philip D. Fastener for attachment of wall panels and fixtures to walls and ceilings. 347,382, 5-31-94, Cl. D8-382.000.
Carruthers, Philip D. Fastener for attachment of wall panels and fixtures to walls and ceilings. 347,383, 5-31-94, Cl. D8-382.000.
Cateye Co., Ltd.: *See—*
  Tsushi, Masao, 347,484, Cl. D26-36.000.
Chapman, Leonard T., to Leonard Studio Equipment, Inc. Expandable support pedestal for a camera. 347,501, 5-31-94, Cl. D16-242.000.
Chen, Chang-Than. Textured venetian blind slat. 347,348, 5-31-94, Cl. D6-380.000.
Chiaphua Industries Limited: *See—*
  Yim, Yung S., 347,356, Cl. D7-360.000.
Chow, Christine L.: *See—*
  Brehmer, Todd G.; Chow, Christine L.; and Podell, Allen F., 347,437, Cl. D14-230.000.
Chudek, Christopher W.: *See—*
  Ghode, Anil P.; Diedrich, Thomas J.; Wente, Steven R.; and Chudek, Christopher W., 347,372, Cl. D8-61.000.
Ciba Corning Diagnostics Corp.: *See—*
  Hansen, Christian M.; Butcher, Robert C., Jr.; and Lear, Kevin D., 347,479, Cl. D24-224.000.
Coleman, Edgar. Light socket cleaner. 347,326, 5-31-94, Cl. D4-135.000.
Colgate-Palmolive Company: *See—*
  Crawford, John C., 347,389, Cl. D9-529.000.
Conair Corporation: *See—*
  Solomita, Anthony; Baron, Nancy; and Haber, Barry M., 347,428, Cl. D14-144.000.
Connolly, Irja. Hair ornament. 347,493, 5-31-94, Cl. D28-41.000.
Contico International, Inc.: *See—*
  Dickinson, Thomas, 347,324, Cl. D3-272.000.
Conway, Kevin M. Computer keyboard. 347,423, 5-31-94, Cl. D14-115.000.
Conway, Terrence N., to Taiyo Oil Company, Ltd. Tray for frozen crabs. 347,386, 5-31-94, Cl. D9-345.000.
Cooler Concepts, Inc.: *See—*
  Redmon, Christopher L., 347,362, Cl. D7-606.000.
Corson, Inger; and White, Linda. Angel soft sculpture. 347,405, 5-31-94, Cl. D11-160.000.
Costigan, Patrick G.: *See—*
  Handley, David J.; and Costigan, Patrick G., 347,341, Cl. D6-481.000.
Crawford, John C., to Hafeez, Abdul. Combined bottle and cap. 347,388, 5-31-94, Cl. D9-529.000.
Crawford, John C., to Colgate-Palmolive Company. Combined bottle and cap. 347,389, 5-31-94, Cl. D9-529.000.
Crescenzi, Donald C.: *See—*
  Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, 347,390, Cl. D9-539.000.
Croyle, Warren L., to Goodyear Tire & Rubber Company, The. Tire tread. 347,412, 5-31-94, Cl. D12-147.000.
Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., to Ericsson GE Mobile Communications Inc. Portable radio. 347,425, 5-31-94, Cl. D14-137.000.
Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., to Ericsson GE Mobile Communications Inc. Portable radio with attached battery. 347,426, 5-31-94, Cl. D14-137.000.
Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., to Ericsson GE Mobile Communications Inc. Portable radio. 347,427, 5-31-94, Cl. D14-137.000.
Cunard, Joel C.; Boudreau, Robert J.; and Ziegler, William H., Jr., to Hedstrom Corporation. Children's play gym. 347,458, 5-31-94, Cl. D21-243.000.
Curran, Daniel C.: *See—*
  Schlesinger, Daniel J.; and Curran, Daniel C., 347,394, Cl. D10-65.000.
David Rozenvasser, Ltd.: *See—*
  Rozenwasser, David, 347,401, Cl. D11-13.000.
Davis, Bob L. Combined toothbrush and toothpaste cap. 347,325, 5-31-94, Cl. D4-108.000.
Davis, Mark A.: *See—*
  Sunderland, Richard A.; Walker, Clarence L.; and Davis, Mark A., 347,472, Cl. D24-111.000.
Davis Water & Waste Industries, Inc.: *See—*
  Hunniford, David J., 347,469, Cl. D23-364.000.
Deeke, Gary A.: *See—*
  Deeke, Ronald V.; and Deeke, Gary A., 347,480, Cl. D25-26.000.
Deeke, Ronald V.; and Deeke, Gary A. Mini square silo. 347,480, 5-31-94, Cl. D25-26.000.
DeHerrera, Carlos. Damper for a ventilation turbine. 347,471, 5-31-94, Cl. D23-373.000.
De Santis, Albert; and Lashman, Morton, to Mode Industries Inc. Scuba scooter. 347,418, 5-31-94, Cl. D12-308.000.
Dickinson, Thomas, to Contico International, Inc. Foot locker. 347,324, 5-31-94, Cl. D3-272.000.
Diedrich, Thomas J.: *See—*
  Ghode, Anil P.; Diedrich, Thomas J.; Wente, Steven R.; and Chudek, Christopher W., 347,372, Cl. D8-61.000.
Dodd, Thomas E.: *See—*
  Rossigno, Louis P.; Dodson, Jon R.; Dodd, Thomas E.; O'Brien, Thomas M.; and Steer, John E., 347,415, Cl. D12-180.000.
Dodson, Jon R.: *See—*
  Rossigno, Louis P.; Dodson, Jon R.; Dodd, Thomas E.; O'Brien, Thomas M.; and Steer, John E., 347,415, Cl. D12-180.000.
Donaghu, Michael T.: *See—*
  Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,315, Cl. D2-961.000.
Donnelly, Philip K., to J.G. Furniture Systems, Inc. Public seating chair. 347,332, 5-31-94, Cl. D6-362.000.
Doskocil Manufacturing Company, Inc.: *See—*
  Fiore, Joseph F., 347,322, Cl. D3-262.000.
  VanSkiver, Ralph, 347,497, Cl. D30-162.000.
Douglas, John H., to H. T. Manufacturing, Inc. Water purification unit. 347,462, 5-31-94, Cl. D23-209.000.
Dowell, Robert G. Combination sled and wagon for children. 347,407, 5-31-94, Cl. D12-6.000.
Dreyer, Steven C. Automobile. 347,408, 5-31-94, Cl. D12-92.000.
Du Corday, Gerard M. Plastic single compact disc case. 347,320, 5-31-94, Cl. D6-634.000.
Dukes, Joseph A.: *See—*
  White, Fred E.; Page, Barry O.; and Dukes, Joseph A., 347,384, Cl. D8-395.000.
E-Quest, Inc.: *See—*
  Wallace, Harry L.; and Taht, Frederick W., 347,503, Cl. D34-32.000.
E.S. Engineering & Software Services Ltd.: *See—*
  Erdman, Yehuda, 347,347, Cl. D6-544.000.
E. S. Originals, Inc.: *See—*
  Uda, Robert, 347,314, Cl. D2-902.000.

EBSCO Industries, Inc.: *See—*
  Gowing, Jim; and Bullard, Timothy W., 347,459, Cl. D22-126.000.
Efthimiou, Peter S. Cradle for infant carrier. 347,328, 5-31-94, Cl. D6-333.000.
Ek, J. Edwin. Flower garden cart. 347,404, 5-31-94, Cl. D11-143.000.
Electro-Catheter Corporation: *See—*
  Nitzsche, Raymond P., 347,473, Cl. D24-112.000.
Elephant Chain Block Company Limited: *See—*
  Kubota, Haruo; and Nishi, Yoshio, 347,508, Cl. D34-35.000.
Empire Brushes, Inc.: *See—*
  Ricciarelli, Paul A.; and Simmons, Sean, 347,327, Cl. D4-138.000.
Erdman, Yehuda, to E.S. Engineering & Software Services Ltd. Custom hair care product dispenser. 347,347, 5-31-94, Cl. D6-544.000.
Ericsson GE Mobile Communications Inc.: *See—*
  Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,425, Cl. D14-137.000.
  Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,426, Cl. D14-137.000.
  Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,427, Cl. D14-137.000.
Ethicon, Inc.: *See—*
  Olson, Todd J., 347,474, Cl. D24-145.000.
Falconer, Leonard S. Combined imitation surveillance camera and support therefor. 347,442, 5-31-94, Cl. D16-203.000.
Fewchuk, Michael A., to Sebel Furniture Limited. Side chair. 347,334, 5-31-94, Cl. D6-375.000.
Fiam Italia, S.p.A.: *See—*
  Ghini, Massimo I., 347,342, Cl. D6-485.000.
Fiore, Joseph F., to Doskocil Manufacturing Company, Inc. Gun case. 347,322, 5-31-94, Cl. D3-262.000.
Florida Foam Fabricators, Inc.: *See—*
  McDonald, Jack D., 347,476, Cl. D24-190.000.
Fouke, Herbert A.: *See—*
  Gruber, Harold T.; Brohard, Bonnie J.; Belisle, William W.; and Fouke, Herbert A., 347,486, Cl. D26-85.000.
Friedman, Larry D. Umbrella handle with radio. 347,319, 5-31-94, Cl. D3-13.000.
Fromson, Howard A. Modular chair. 347,331, 5-31-94, Cl. D6-334.000.
Fuji Photo Film Co., Ltd.: *See—*
  Horikiri, Kazuhisa, 347,444, Cl. D16-209.000.
Furcron, Kent J.; and Owens, Ricky A., to Regina Company, The. Hand tool for a cleaning device. 347,504, 5-31-94, Cl. D32-33.000.
Garfinkle, Benjamin L. Tag holder. 347,449, 5-31-94, Cl. D20-43.000.
Gedert, Leon J. Combined support and level for line trimmer. 347,368, 5-31-94, Cl. D8-8.000.
Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, to Philip Morris Incorporated. Electrical cigarette. 347,490, 5-31-94, Cl. D27-194.000.
Gemette, Basil S. Planter support. 347,336, 5-31-94, Cl. D6-403.000.
Gerber. Sakai: *See—*
  Sakai, Kimiyuki, 347,374, Cl. D8-99.000.
  Sakai, Kimiyuki, 347,375, Cl. D8-99.000.
Ghini, Massimo I., to Fiam Italia, S.p.A. Table. 347,342, 5-31-94, Cl. D6-485.000.
Ghode, Anil P.; Diedrich, Thomas J.; Wente, Steven R.; and Chudek, Christopher W., to Snap-on Tools Corporation. Air tool. 347,372, 5-31-94, Cl. D8-61.000.
Gildersleeve, Paul, to Black & Decker Inc. Food processor. 347,357, 5-31-94, Cl. D7-384.000.
Gioscia, Richard: *See—*
  Kanatani, Masakazu; Uchiyama, Jun; and Gioscia, Richard, 347,429, Cl. D14-163.000.
Goldberg, Herbert B., to Universal Furniture Industries, Inc. Seat. 347,335, 5-31-94, Cl. D6-381.000.
Goodyear Tire & Rubber Company, The: *See—*
  Croyle, Warren L., 347,412, Cl. D12-147.000.
Gowing, Jim; and Bullard, Timothy W., to EBSCO Industries, Inc. Fishing lure. 347,459, 5-31-94, Cl. D22-126.000.
Graham, Thomas E., Sr.: *See—*
  Ashley, Jimmy; and Graham, Thomas E., Sr., 347,481, Cl. D25-62.000.
Gruber, Harold T.; Brohard, Bonnie J.; Belisle, William W.; and Fouke, Herbert A., to Holophane Lighting, Inc. Suspended luminaire. 347,486, 5-31-94, Cl. D26-85.000.
Guertin, Gilles, to A. Lassonde Inc. Bottle. 347,391, 5-31-94, Cl. D9-566.000.
Guido, Anthony Y.: *See—*
  van de Velde, David H.; and Guido, Anthony Y., 347,364, Cl. D7-608.000.
Gyurec, Ernesto D.: *See—*
  Pronsato, Antonio C.; and Gyurec, Ernesto D., 347,453, Cl. D21-108.000.
H. T. Manufacturing, Inc.: *See—*
  Douglas, John H., 347,462, Cl. D23-209.000.
Haas, Johann; and Mader, Ernst, to Metzeler Reifen GmbH. Motorcycle tire. 347,414, 5-31-94, Cl. D12-151.000.
Haber, Barry M.: *See—*
  Solomita, Anthony; Baron, Nancy; and Haber, Barry M., 347,428, Cl. D14-144.000.
Hafeez, Abdul: *See—*
  Crawford, John C., 347,388, Cl. D9-529.000.
Hamilton Beach/Proctor-Silex, Inc.: *See—*
  Brady, Martin, 347,358, Cl. D7-412.000.
  Myers, Terry L.; and Brookshire, Phillip L., 347,352, Cl. D7-354.000.
Hamilton, Thomas F. Interior cargo cover for motor vehicles. 347,417, 5-31-94, Cl. D12-221.000.
Handley, David J.; and Costigan, Patrick G. Modular bar cabinet. 347,341, 5-31-94, Cl. D6-481.000.
Hansen, Christian M.; Butcher, Robert C., Jr.; and Lear, Kevin D., to Ciba Corning Diagnostics Corp. Bottle for a laboratory analyzer. 347,479, 5-31-94, Cl. D24-224.000.
Harmen, Larry; and Harmen, Mildred. Butter or margarine dispenser. 347,366, 5-31-94, Cl. D7-670.000.
Harmen, Mildred: *See—*
  Harmen, Larry; and Harmen, Mildred, 347,366, Cl. D7-670.000.
Harris Corporation: *See—*
  Hill, Kenneth, 347,424, Cl. D14-125.000.
Hashimoto, Kazunori: *See—*
  Ohnuma, Mitsuru; Miyata, Tomoyuki; Hashimoto, Kazunori; Kato, Yoshiaki; and Mimura, Tadao, 347,396, Cl. D10-81.000.
Hedstrom Corporation: *See—*
  Cunard, Joel C.; Boudreau, Robert J.; and Ziegler, William H., Jr., 347,458, Cl. D21-243.000.
Hendrick, Carl W.: *See—*
  Mattson, Deborah; Watt, Doyle; Bocade, Emil; and Hendrick, Carl W., 347,376, Cl. D8-317.000.
Herber, Michael C. Tray support bracket. 347,380, 5-31-94, Cl. D8-[illegible].
Herrera, Fred. Canned drink holder. 347,361, 5-31-94, Cl. D7-606.000.
Hill, Kenneth, to Harris Corporation. Video processor terminal. 347,424, 5-31-94, Cl. D14-125.000.
Hinton, James H., to Oak Manufacturing Company. Combined vending machine and stand. 347,448, 5-31-94, Cl. D20-7.000.
Hitachi, Ltd.: *See—*
  Ohnuma, Mitsuru; Miyata, Tomoyuki; Hashimoto, Kazunori; Kato, Yoshiaki; and Mimura, Tadao, 347,396, Cl. D10-81.000.
Hocheng Pottery Mfg. Co. Ltd.: *See—*
  Wei, Ming-kuo, 347,496, Cl. D23-301.000.
Hodge, Desmond M. Keypad for an anti-theft alarm for automobiles. 347,398, 5-31-94, Cl. D10-106.000.
Holloway, Ruth T. Hair rinsing cap. 347,491, 5-31-94, Cl. D28-20.000.
Holophane Lighting, Inc.: *See—*
  Gruber, Harold T.; Brohard, Bonnie J.; Belisle, William W.; and Fouke, Herbert A., 347,486, Cl. D26-85.000.
Holznagel, Melvin A. Combined periscope and flashlight. 347,440, 5-31-94, Cl. D16-130.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
  Honda, Mitsuhiro; and Shimizu, Toshihiko, 347,410, Cl. D12-92.000.
  Horii, Yoshiyuki; and Kishi, Toshiaki, 347,411, Cl. D12-110.000.
Honda, Mitsuhiro; and Shimizu, Toshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Automobile. 347,410, 5-31-94, Cl. D12-92.000.
Horii, Yoshiyuki; and Kishi, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 347,411, 5-31-94, Cl. D12-110.000.
Horikiri, Kazuhisa, to Fuji Photo Film Co., Ltd. Compact camera. 347,444, 5-31-94, Cl. D16-209.000.
Hoyt, John E.; and Hoyt, Magda. Cloth figure. 347,454, 5-31-94, Cl. D21-154.000.
Hoyt, Magda: *See—*
  Hoyt, John E.; and Hoyt, Magda, 347,454, Cl. D21-154.000.
Hozelock Limited: *See—*
  Kingston, Jonathan F. M.; and Boughton, Robert D., 347,463, Cl. D23-223.000.
  Kingston, Jonathan F. M.; and Boughton, Robert D., 347,464, Cl. D23-223.000.
Hu, Ming-Liang. Decorative frame for license plate. 347,416, 5-31-94, Cl. D12-193.000.
Hunniford, David J., to Davis Water & Waste Industries, Inc. Air scrubber unit for use in removal of pollutants from the air. 347,469, 5-31-94, Cl. D23-364.000.
Hybaid Ltd.: *See—*
  Pinkney, Arthur J., 347,478, Cl. D24-216.000.
International Business Machines Corporation: *See—*
  Yamazaki, Kazuhiko, 347,420, Cl. D14-100.000.
Isserstedt, Robert K. Collapsile; portable document file. 347,447, 5-31-94, Cl. D19-90.000.
J.G. Furniture Systems, Inc.: *See—*
  Donnelly, Philip K., 347,332, Cl. D6-362.000.
Jackson, Claude T. Article tray for the bed of a pickup truck. 347,419, 5-31-94, Cl. D12-425.000.
James Hardie Irrigation Pty Limited: *See—*
  Luppino, Cosmo, 347,465, Cl. D23-233.000.
Johnson, Addison M. Clothes washer installation receptacle. 347,468, 5-31-94, Cl. D23-270.000.
Johnson, Bradford A.; and Worthington, William J., to Nike, Inc. Shoe upper. 347,310, 5-31-94, Cl. D2-969.000.
Johnson, Dennis E.; and Malmsten, Scott P., to SPI Lighting, Inc. Wall lighting fixture. 347,487, 5-31-94, Cl. D26-85.000.
Junaedi, Satria, to Satria International. Pallet assembly. 347,509, 5-31-94, Cl. D34-38.000.
Jungst, Fritz. Automobile. 347,409, 5-31-94, Cl. D12-92.000.
Kabushiki Kaisha Yoshikawa Kuni Kogyosho: *See—*
  Yoshikawa, Toshimichi, 347,512, Cl. D3-304.000.
  Yoshikawa, Toshimichi, 347,513, Cl. D3-304.000.
  Yoshikawa, Toshimichi, 347,514, Cl. D3-308.000.
Kaiser, Ian R.; Kaiser, Michael C.; and Neiberger, Sean A., to Allen Reed Company, Incorporated. Roll film dispenser. 347,345, 5-31-94, Cl. D6-518.000.

Kaiser, Michael C.: *See—*
  Kaiser, Ian R.; Kaiser, Michael C.; and Neiberger, Sean A., 347,345, Cl. D6-518.000.
Kanatani, Masakazu; Uchiyama, Jun; and Gioscia, Richard, to Sony Corporation. Tape recorder combined with a radio tuner. 347,429, 5-31-94, Cl. D14-163.000.
Kaneko, Ryoichi, to Seikosha Co., Ltd. Watch dial. 347,400, 5-31-94, Cl. D10-126.000.
Kangaroo Products Company: *See—*
  Machen, Edmund; Montague, Edgar; and Machen, James, 347,505, Cl. D34-15.000.
Kastner, Arnold. Cigarette sheet rolling device for forming cigarettes. 347,489, 5-31-94, Cl. D27-194.000.
Kato, Yoshiaki: *See—*
  Ohnuma, Mitsuru; Miyata, Tomoyuki; Hashimoto, Kazunori; Kato, Yoshiaki; and Mimura, Tadao, 347,396, Cl. D10-81.000.
Kaufman, Richard H.: *See—*
  Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, 347,390, Cl. D9-539.000.
Kazakowitz, Harry D. Holding tray for playing cards, dominos and other games. 347,451, 5-31-94, Cl. D21-54.000.
Keeler Brass Company: *See—*
  Mattson, Deborah; Watt, Doyle; Bocade, Emil; and Hendrick, Carl W., 347,376, Cl. D8-317.000.
Kehrberger, Ethel. Potpourri canister. 347,470, 5-31-94, Cl. D23-366.000.
Keller, H. Thomas, to Vaughan Furniture Company, Inc. Chest. 347,337, 5-31-94, Cl. D6-434.000.
Kelman, Pepi, to Pepi Kelman, Inc. Jewelry setting. 347,403, 5-31-94, Cl. D11-91.000.
Kemp, Dewey F.; and Kemp, Nina A. Jewelry connector. 347,402, 5-31-94, Cl. D11-86.000.
Kemp, Nina A.: *See—*
  Kemp, Dewey F.; and Kemp, Nina A., 347,402, Cl. D11-86.000.
Kingston, Jonathan F. M.; and Boughton, Robert D., to Hozelock Limited. Spray gun. 347,463, 5-31-94, Cl. D23-223.000.
Kingston, Jonathan F. M.; and Boughton, Robert D., to Hozelock Limited. Spray gun. 347,464, 5-31-94, Cl. D23-223.000.
Kinsman Associates Limited: *See—*
  Kinsman, Rodney W., 347,330, Cl. D6-334.000.
Kinsman, Rodney W., to Kinsman Associates Limited. Seat. 347,330, 5-31-94, Cl. D6-334.000.
Kira, Hitoshi, to Lumiere Design & Manufacturing, Inc. Garden lamp housing. 347,485, 5-31-94, Cl. D26-67.000.
Kishi, Toshiaki: *See—*
  Horii, Yoshiyuki; and Kishi, Toshiaki, 347,411, Cl. D12-110.000.
Klette, John T.: *See—*
  Bridger, Peter E. W.; Klette, John T.; Lambeck, Jule G.; and Portoles, Elena, 347,387, Cl. D9-520.000.
Klil Industries Ltd.: *See—*
  Meshulam, Maurice, 347,482, Cl. D25-119.000.
Kojo, Shin: *See—*
  Nagata, Hideo; and Kojo, Shin, 347,450, Cl. D21-13.000.
Kolada, Paul P.; Painter, Michael J.; and Birchler, Terry, to Moen Incorporated. Faucet body. 347,466, 5-31-94, Cl. D23-241.000.
Konik, Walter S., to AT&T Bell Laboratories. Optical fiber splice re-entry tool. 347,371, 5-31-94, Cl. D8-51.000.
Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, to Kraft General Foods, Inc. Combined one-piece bottle and twist-off closure. 347,390, 5-31-94, Cl. D9-539.000.
Kraft General Foods, Inc.: *See—*
  Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, 347,390, Cl. D9-539.000.
Kramer, Barry L. Multi-shade arc boom lamp. 347,488, 5-31-94, Cl. D26-102.000.
Kruschke, Delton A.; and Soller, Douglas A., to Mebco Industries, Inc. Hair pick. 347,492, 5-31-94, Cl. D28-31.000.
Kubota, Haruo; and Nishi, Yoshio, to Elephant Chain Block Company Limited. Main body of lever-type winding machine. 347,508, 5-31-94, Cl. D34-35.000.
Kunesh, Edward J., to S. C. Johnson & Son, Inc. Dispensing container. 347,385, 5-31-94, Cl. D9-300.000.
Kuo, David. Alarm clock. 347,392, 5-31-94, Cl. D10-7.000.
Lambeck, Jule G.: *See—*
  Bridger, Peter E. W.; Klette, John T.; Lambeck, Jule G.; and Portoles, Elena, 347,387, Cl. D9-520.000.
Lashman, Morton: *See—*
  De Santis, Albert; and Lashman, Morton, 347,418, Cl. D12-308.000.
Lear, Kevin D.: *See—*
  Hansen, Christian M.; Butcher, Robert C., Jr.; and Lear, Kevin D., 347,479, Cl. D24-224.000.
Leonard Studio Equipment, Inc.: *See—*
  Chapman, Leonard T., 347,501, Cl. D16-242.000.
Leupold & Stevens, Inc.: *See—*
  Lutter, Hart D.; Mai, Neil T.; Babcock, Forrest D.; and Tucker, Allen D., 347,441, Cl. D16-132.000.
Li, Ming-Hsiang. Meat hammer. 347,367, 5-31-94, Cl. D7-682.000.
Lilly, A. Clifton: *See—*
  Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, 347,490, Cl. D27-194.000.
Lorenz, Alan S.; and Brown, Jeff, to Lynx Automation, Inc. Electronic file communication unit used to receive and transmit electronic information. 347,421, 5-31-94, Cl. D14-105.000.
Losee, D. Bruce: *See—*
  Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, 347,490, Cl. D27-194.000.
Lucas, Robert J.: *See—*
  Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,315, Cl. D2-961.000.
Lumiere Design & Manufacturing, Inc.: *See—*
  Kira, Hitoshi, 347,485, Cl. D26-67.000.
Lundberg, Daniel C., to Pillsbury Company, The. Cake. 347,308, 5-31-94, Cl. D1-129.000.
Luppino, Cosmo, to James Hardie Irrigation Pty Limited. Backflow prevention valve. 347,465, 5-31-94, Cl. D23-233.000.
Lutter, Hart D.; Mai, Neil T.; Babcock, Forrest D.; and Tucker, Allen D., to Leupold & Stevens, Inc. Optical telescope. 347,441, 5-31-94, Cl. D16-132.000.
Lyden, Robert M.: *See—*
  Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,315, Cl. D2-961.000.
Lynx Automation, Inc.: *See—*
  Lorenz, Alan S.; and Brown, Jeff, 347,421, Cl. D14-105.000.
Machen, Edmund; Montague, Edgar; and Machen, James, to Kangaroo Products Company. Motorized golf bag cart chassis. 347,505, 5-31-94, Cl. D34-15.000.
Machen, James: *See—*
  Machen, Edmund; Montague, Edgar; and Machen, James, 347,505, Cl. D34-15.000.
Mader, Ernst: *See—*
  Haas, Johann; and Mader, Ernst, 347,414, Cl. D12-151.000.
Mai, Neil T.: *See—*
  Lutter, Hart D.; Mai, Neil T.; Babcock, Forrest D.; and Tucker, Allen D., 347,441, Cl. D16-132.000.
Malmsten, Scott P.: *See—*
  Johnson, Dennis E.; and Malmsten, Scott P., 347,487, Cl. D26-85.000.
Manestar, Miroslav, to Michelin Recherche et Technique-Euroresidence. Tire. 347,413, 5-31-94, Cl. D12-147.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
  Abe, Toru; Shoji, Takashi; and Tsuruha, Toshiaki, 347,500, Cl. D32-22.000.
Mattson, Deborah; Watt, Doyle; Bocade, Emil; and Hendrick, Carl W., to Keeler Brass Company. Pull. 347,376, 5-31-94, Cl. D8-317.000.
Mazza, Stephen D. Micro automobile ramp. 347,502, 5-31-94, Cl. D34-32.000.
McDonald, Jack D., to Florida Foam Fabricators, Inc. Combined knee cushion and elevator. 347,476, 5-31-94, Cl. D24-190.000.
McDonald, Steven C., to Nike, Inc. Shoe upper. 347,309, 5-31-94, Cl. D2-969.000.
McKay, Charles H. Beverage container support. 347,365, 5-31-94, Cl. D3-202.000.
Meacham, Kenneth S. Magnetic resonance imaging coil bracket. 347,475, 5-31-94, Cl. D24-158.000.
Mebco Industries, Inc.: *See—*
  Kruschke, Delton A.; and Soller, Douglas A., 347,492, Cl. D28-31.000.
Medvick, Richard J., to Swagelok Quick-Connect Co. Sleeve for a quick connect fluid coupling. 347,467, 5-31-94, Cl. D23-262.000.
Meshulam, Maurice, to Klil Industries Ltd. Shaped bar for window frames. 347,482, 5-31-94, Cl. D25-119.000.
Metzeler Reifen GmbH: *See—*
  Haas, Johann; and Mader, Ernst, 347,414, Cl. D12-151.000.
Michelin Recherche et Technique-Euroresidence: *See—*
  Manestar, Miroslav, 347,413, Cl. D12-147.000.
Mimura, Tadao: *See—*
  Ohnuma, Mitsuru; Miyata, Tomoyuki; Hashimoto, Kazunori; Kato, Yoshiaki; and Mimura, Tadao, 347,396, Cl. D10-81.000.
Minjin, Yan: *See—*
  Uchiyama, Jun; and Minjin, Yan, 347,430, Cl. D14-165.000.
Minkin, Amy S.; and Tavino, Edward G., to Reebok International Ltd. Shoe upper. 347,316, 5-31-94, Cl. D2-969.000.
Miyata, Tomoyuki: *See—*
  Ohnuma, Mitsuru; Miyata, Tomoyuki; Hashimoto, Kazunori; Kato, Yoshiaki; and Mimura, Tadao, 347,396, Cl. D10-81.000.
Mobil Oil Corporation: *See—*
  Bridger, Peter E. W.; Klette, John T.; Lambeck, Jule G.; and Portoles, Elena, 347,387, Cl. D9-520.000.
Mode Industries Inc.: *See—*
  De Santis, Albert; and Lashman, Morton, 347,418, Cl. D12-308.000.
Moen Incorporated: *See—*
  Kolada, Paul P.; Painter, Michael J.; and Birchler, Terry, 347,466, Cl. D23-241.000.
Monier Roof Tile Inc.: *See—*
  Thomas, John F., 347,483, Cl. D25-139.000.
Montague, Edgar: *See—*
  Machen, Edmund; Montague, Edgar; and Machen, James, 347,505, Cl. D34-15.000.
Mooney, Doug: *See—*
  Mooney, Jessica; and Mooney, Doug, 347,406, Cl. D11-184.000.
Mooney, Jessica; and Mooney, Doug. Bow. 347,406, 5-31-94, Cl. D11-184.000.
Morales, Louis. Body massaging roller. 347,477, 5-31-94, Cl. D24-211.000.

- Morgan, Constance H.: *See—*
  - Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, 347,490, Cl. D27-194.000.
- Morioka, Chizuru: *See—*
  - Murakami, Takeyasu; Morioka, Chizuru; and Nakamura, Keiichi, 347,506, Cl. D34-27.000.
- Murakami, Takeyasu; Morioka, Chizuru; and Nakamura, Keiichi, to Yazuki Industrial Chemical Co., Ltd. Corner joint of a chassis for a cart. 347,506, 5-31-94, Cl. D34-27.000.
- Mustelier, Enrique, Jr. Rescue oxygen-medication mask. 347,494, 5-31-94, Cl. D29-7.000.
- Myers, Terry L.; and Brookshire, Phillip L., to Hamilton Beach/Proctor-Silex, Inc. Vegetable/rice steamer. 347,352, 5-31-94, Cl. D7-354.000.
- Myracle, James L., Jr.: *See—*
  - Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, 347,490, Cl. D27-194.000.
- Naft, Stuart, to Black & Decker Inc. Divider basket for a food steaming appliance. 347,354, 5-31-94, Cl. D7-354.000.
- Naft, Stuart, to Black & Decker Inc. Food cooking tray for a cooking appliance. 347,355, 5-31-94, Cl. D7-357.000.
- Nagata, Hideo; and Kojo, Shin, to Nintendo Co., Ltd. Hand-held electronic game machine. 347,450, 5-31-94, Cl. D21-13.000.
- Nakamura, Keiichi; and Shoda, Asao, to Yazaki Industrial Chemical Co Ltd. Joint support for shelves. 347,377, 5-31-94, Cl. D8-354.000.
- Nakamura, Keiichi: *See—*
  - Murakami, Takeyasu; Morioka, Chizuru; and Nakamura, Keiichi, 347,506, Cl. D34-27.000.
- Neiberger, Sean A.: *See—*
  - Kaiser, Ian R.; Kaiser, Michael C.; and Neiberger, Sean A., 347,345, Cl. D6-518.000.
- Nike, Inc.: *See—*
  - Avar, Eric P., 347,317, Cl. D2-970.000.
  - Avar, Eric P., 347,318, Cl. D2-977.000.
  - Johnson, Bradford A.; and Worthington, William J., 347,310, Cl. D2-969.000.
  - McDonald, Steven C., 347,309, Cl. D2-969.000.
  - Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., 347,315, Cl. D2-961.000.
- Nintendo Co., Ltd.: *See—*
  - Nagata, Hideo; and Kojo, Shin, 347,450, Cl. D21-13.000.
- Nishi, Yoshio: *See—*
  - Kubota, Haruo; and Nishi, Yoshio, 347,508, Cl. D34-35.000.
- Nitzsche, Raymond P., to Electro-Catheter Corporation. Steerable catheter handle. 347,473, 5-31-94, Cl. D24-112.000.
- Oak Manufacturing Company: *See—*
  - Hinton, James H., 347,448, Cl. D20-7.000.
- O'Brien, Thomas M.: *See—*
  - Rossigno, Louis P.; Dodson, Jon R.; Dodd, Thomas E.; O'Brien, Thomas M.; and Steer, John E., 347,415, Cl. D12-180.000.
- Ohi, Taku, to Ryobi Ltd. Fishing reel. 347,460, 5-31-94, Cl. D22-140.000.
- Ohnuma, Mitsuru; Miyata, Tomoyuki; Hashimoto, Kazunori; Kato, Yoshiaki; and Mimura, Tadao, to Hitachi, Ltd. Mass spectrometer combined with liquid chromatograph. 347,396, 5-31-94, Cl. D10-81.000.
- Olivetti Synthesis S.p.A.: *See—*
  - Von Klier, Hans, 347,333, Cl. D6-366.000.
- Olson, Todd J., to Ethicon, Inc. Endoscopic stapler. 347,474, 5-31-94, Cl. D24-145.000.
- Owens, Ricky A.: *See—*
  - Furcron, Kent J.; and Owens, Ricky A., 347,504, Cl. D32-33.000.
- Ozeki, Jiro, to Slidex Corporation. Recording medium storing case. 347,321, 5-31-94, Cl. D6-630.000.
- Pacific Monolithics: *See—*
  - Brehmer, Todd G.; Chow, Christine L.; and Podell, Allen F., 347,437, Cl. D14-230.000.
- Page, Barry O.: *See—*
  - White, Fred E.; Page, Barry O.; and Dukes, Joseph A., 347,384, Cl. D8-395.000.
- Painter, Michael J.: *See—*
  - Kolada, Paul P.; Painter, Michael J.; and Birchler, Terry, 347,466, Cl. D23-241.000.
- Panduit Corp.: *See—*
  - White, Fred E.; Page, Barry O.; and Dukes, Joseph A., 347,384, Cl. D8-395.000.
- Pepi Kelman, Inc.: *See—*
  - Kelman, Pepi, 347,403, Cl. D11-91.000.
- Phan, Le T.: *See—*
  - Timperman, Eugene L.; and Phan, Le T., 347,452, Cl. D21-86.000.
- Philip Morris Incorporated: *See—*
  - Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, 347,490, Cl. D27-194.000.
- Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J. Two part interlocking plastic pallet assembly. 347,511, 5-31-94, Cl. D34-38.000.
- Pigott, Maurice J.: *See—*
  - Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J., 347,511, Cl. D34-38.000.
- Pigott, Peter S.: *See—*
  - Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J., 347,511, Cl. D34-38.000.
- Pigott, Schuyler F.: *See—*
  - Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J., 347,511, Cl. D34-38.000.
- Pillsbury Company, The: *See—*
  - Lundberg, Daniel C., 347,308, Cl. D1-129.000.
- Pinkney, Arthur J., to Hybaid Ltd. Laboratory instrument for handling bimolecular samples. 347,478, 5-31-94, Cl. D24-216.000.
- Piret, Philippe; and Ross, Angus. Household deep fat fryer. 347,353, 5-31-94, Cl. D7-354.000.
- Podell, Allen F.: *See—*
  - Brehmer, Todd G.; Chow, Christine L.; and Podell, Allen F., 347,437, Cl. D14-230.000.
- Portoles, Elena: *See—*
  - Bridger, Peter E. W.; Klette, John T.; Lambeck, Jule G.; and Portoles, Elena, 347,387, Cl. D9-520.000.
- Pronsato, Antonio C.; and Gyurec, Ernesto D. Interlocking construction toy element. 347,453, 5-31-94, Cl. D21-108.000.
- Randle, Bernard. Combined organizer and storage box for correspondence. 347,338, 5-31-94, Cl. D6-470.000.
- Redmon, Christopher L., to Cooler Concepts, Inc. Styrofoam ice chest. 347,362, 5-31-94, Cl. D7-606.000.
- Reebok International Ltd.: *See—*
  - Minkin, Amy S.; and Tavino, Edward G., 347,316, Cl. D2-969.000.
- Regina Company, The: *See—*
  - Furcron, Kent J.; and Owens, Ricky A., 347,504, Cl. D32-33.000.
- Ricciarelli, Paul A.; and Simmons, Sean, to Empire Brushes, Inc. Brush handle. 347,327, 5-31-94, Cl. D4-138.000.
- Ricoh Company, Ltd.: *See—*
  - Tago, Takahiro, 347,443, Cl. D16-209.000.
- Riddick, Arthur D. Newspaper bundling article. 347,510, 5-31-94, Cl. D34-38.000.
- Ringblum, Ronald D. Purse. 347,323, 5-31-94, Cl. D3-239.000.
- Riss, Vicki. Organizer notebook. 347,446, 5-31-94, Cl. D19-26.000.
- Ritvik Group Inc., The: *See—*
  - Bertrand, Victor J., 347,461, Cl. D21-87.000.
- Robbins, Edward S., III. Collapsible container. 347,359, 5-31-94, Cl. D7-512.000.
- Robert Krups GmbH & Co. KG: *See—*
  - Storsberg, Gunter, 347,351, Cl. D7-330.000.
- Romero, Bonnie D. Doll. 347,455, 5-31-94, Cl. D21-166.000.
- Ross, Angus: *See—*
  - Piret, Philippe; and Ross, Angus, 347,353, Cl. D7-354.000.
- Rossigno, Louis P.; Dodson, Jon R.; Dodd, Thomas E.; O'Brien, Thomas M.; and Steer, John E., to Allied-Signal Inc. Front partition for a tandem brake booster. 347,415, 5-31-94, Cl. D12-180.000.
- Rozenwasser, David, to David Rozenvasser, Ltd. Ornamental chain. 347,401, 5-31-94, Cl. D11-13.000.
- Runevitch, Edward E. Brake slack adjusting tool. 347,370, 5-31-94, Cl. D8-21.000.
- Ryobi Ltd.: *See—*
  - Ohi, Taku, 347,460, Cl. D22-140.000.
- S. C. Johnson & Son, Inc.: *See—*
  - Kunesh, Edward J., 347,385, Cl. D9-300.000.
- Sakai, Kimiyuki, to Gerber. Sakai. Knife. 347,374, 5-31-94, Cl. D8-99.000.
- Sakai, Kimiyuki, to Gerber. Sakai. Knife. 347,375, 5-31-94, Cl. D8-99.000.
- Sands, Steven L.: *See—*
  - Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,425, Cl. D14-137.000.
  - Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,426, Cl. D14-137.000.
  - Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,427, Cl. D14-137.000.
- Satria International: *See—*
  - Junaedi, Satria, 347,509, Cl. D34-38.000.
- Schlesinger, Daniel J.; and Curran, Daniel C. Golf ball tester. 347,394, 5-31-94, Cl. D10-65.000.
- Schmauch, Charles H. Combined transmitter and receiver for locating children. 347,397, 5-31-94, Cl. D10-104.000.
- Schumaker, Donald D. Dispenser for stacked articles. 347,344, 5-31-94, Cl. D6-515.000.
- Sebel Furniture Limited: *See—*
  - Fewchuk, Michael A., 347,334, Cl. D6-375.000.
- Seikosha Co., Ltd.: *See—*
  - Kaneko, Ryoichi, 347,400, Cl. D10-126.000.
- Sell, James C., Jr.; Lucas, Robert J.; Donaghu, Michael T.; and Lyden, Robert M., to Nike, Inc. Bladder for a shoe sole. 347,315, 5-31-94, Cl. D2-961.000.
- Shames, Harold: *See—*
  - Shames, Sidney J.; and Shames, Harold, 347,346, Cl. D6-531.000.
- Shames, Sidney J.; and Shames, Harold. Combined toothbrush and tumbler holder. 347,346, 5-31-94, Cl. D6-531.000.
- Sherman, Ralph R.: *See—*
  - Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,425, Cl. D14-137.000.
  - Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,426, Cl. D14-137.000.
  - Culbertson, Richard; Sands, Steven L.; and Sherman, Ralph R., 347,427, Cl. D14-137.000.
- Sherwood Medical Company: *See—*
  - Sunderland, Richard A.; Walker, Clarence L.; and Davis, Mark A., 347,472, Cl. D24-111.000.

- Shimizu, Toshihiko: *See—*
  - Honda, Mitsuhiro; and Shimizu, Toshihiko, 347,410, Cl. D12-92.000.
- Shoda, Asao: *See—*
  - Nakamura, Keiichi; and Shoda, Asao, 347,377, Cl. D8-354.000.
- Shoji, Takashi: *See—*
  - Abe, Toru; Shoji, Takashi; and Tsuruha, Toshiaki, 347,500, Cl. D32-22.000.
- Simmons, Sean: *See—*
  - Ricciarelli, Paul A.; and Simmons, Sean, 347,327, Cl. D4-138.000.
- Slidex Corporation: *See—*
  - Ozeki, Jiro, 347,321, Cl. D6-630.000.
- Smith, Thomas J., to TII Industries, Inc. Telephone terminal apparatus. 347,438, 5-31-94, Cl. D14-240.000.
- Snap-on Tools Corporation: *See—*
  - Ghode, Anil P.; Diedrich, Thomas J.; Wente, Steven R.; and Chudek, Christopher W., 347,372, Cl. D8-61.000.
- Snell, Russell, to Sony Electronics Inc. Bookshelf speaker. 347,435, 5-31-94, Cl. D14-214.000.
- Soller, Douglas A.: *See—*
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  - Johnson, Dennis E.; and Malmsten, Scott P., 347,487, Cl. D26-85.000.
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  - Gee, Edward S.; Lilly, A. Clifton; Losee, D. Bruce; Myracle, James L., Jr.; Whidby, Jerry F.; Utsch, Francis V.; Morgan, Constance H.; and Sprinkel, F. Murphy, 347,490, Cl. D27-194.000.
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  - Wong, Kam F., 347,433, Cl. D14-191.000.
- Steer, John E.: *See—*
  - Rossigno, Louis P.; Dodson, Jon R.; Dodd, Thomas E.; O'Brien, Thomas M.; and Steer, John E., 347,415, Cl. D12-180.000.
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  - Medvick, Richard J., 347,467, Cl. D23-262.000.
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- Taht, Frederick W.: *See—*
  - Wallace, Harry L.; and Taht, Frederick W., 347,503, Cl. D34-32.000.
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  - Yang, Tse-Chung, 347,395, Cl. D10-72.000.
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  - Smith, Thomas J., 347,438, Cl. D14-240.000.
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  - Lutter, Hart D.; Mai, Neil T.; Babcock, Forrest D.; and Tucker, Allen D., 347,441, Cl. D16-132.000.
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  - Vananderoye, Dirk J. N., 347,439, Cl. D14-299.000.
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  - Goldberg, Herbert B., 347,335, Cl. D6-381.000.
- Utsch, Francis V.: *See—*
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- Valls, William H.: *See—*
  - Kovacic, Theodore J.; Kaufman, Richard H.; Bostwick, Martin M.; Crescenzi, Donald C.; Valls, William H.; and Bucaccio, Thomas, 347,390, Cl. D9-539.000.
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- Vaughan Furniture Company, Inc.: *See—*
  - Keller, H. Thomas, 347,337, Cl. D6-434.000.
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- Walker, Clarence L.: *See—*
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- Wheeler, Anne. Tray. 347,360, 5-31-94, Cl. D7-550.000.
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Nakamura, Keiichi; and Shoda, Asao, 347,377, Cl. D8-354.000.
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Yoshikawa, Toshimichi, to Kabushiki Kaisha Yoshikawa Kuni Kogyosho. Basket. 347,513, 5-31-94, Cl. D3-304.000.
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Schumann, Ingeborg, 8,760, Cl. 87.120.
Schumann, Ingeborg; and Utecht, Angelika, 8,761, Cl. 87.120.
Hayes, Charles J., Jr., executor: *See*—
Hayes, deceased; Charles J.; and Hayes, Charles J., Jr., executor, 8,755, Cl. 67.600.
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Mantel, Homme. Lily plant Lilium 'Red Dwarf'. 8,764, 5-31-94, Cl. 87.400.
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McRae, Judith F., 8,762, Cl. 87.400.
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Schumann, Ingeborg; and Utecht, Angelika, 8,761, Cl. 87.120.
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VandenBerg, Cornelis P., 8,757, Cl. 78.000.
VandenBerg, Cornelis P., 8,758, Cl. 78.000.
VandenBerg, Cornelis P., 8,759, Cl. 82.200.

CLASSIFICATION OF PATENTS

ISSUED MAY 31, 1994

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

106	5,315,712
145	5,315,713
181.4	5,315,714
183	5,315,715
227	5,315,716
[illegible]	5,315,717
418	5,315,718

CLASS 4

300	5,315,719
488	5,315,720
599	5,315,721

CLASS 5

37.1	5,315,722
85.1	5,315,723
618	5,315,726

CLASS 7

145	5,315,724
	5,315,725

CLASS 8

159	5,315,727
[illegible]	5,316,551
471	5,316,552
639	5,316,553

CLASS 15

1.7	5,315,728
75	5,315,729
167.1	5,315,730
	5,315,731
	5,315,732
168	5,315,733
229.4	5,315,734
250.22	5,315,735

CLASS 19

145.5	5,315,738

CLASS 23

[illegible]	5,316,554

CLASS 24

113 MP	5,315,739
115 K	5,315,736
274 R	5,315,737
	5,315,742
452	5,315,740
712.1	5,315,741

CLASS 29

243.5	5,315,743
243.53	5,315,744
260	5,315,745
447	5,315,747
451	5,315,746
507	5,315,748
559	5,315,749
563	5,315,750
598	5,315,751
	5,315,752
600	5,315,753
609	5,315,754
623.1	5,316,555
623.3	5,316,556
623 5	5,316,557
715	5,315,755
748	5,315,756
754	5,315,757
878	5,315,758

CLASS 30

97	5,315,759
123	5,315,760
162	5,315,761
231	5,315,762

CLASS 33

288	5,315,763
613	5,315,764

CLASS 34

260	5,315,765
409	5,315,766

CLASS 36

7.1 R	5,315,767
	5,315,768
114	5,315,769

CLASS 37

96	5,315,770
[illegible]	5,315,771
362	Re.34,620
379	5,315,772

CLASS 38

77.6	5,315,773

CLASS 40

316	5,315,774
450	5,315,775
505	5,315,776
591	5,315,777

CLASS 42

70.11	5,315,778
101	5,315,781

CLASS 43

4	5,315,779

CLASS 44

340	5,316,558

CLASS 47

33	5,315,780
41.12	5,315,782
66	5,315,783
67	5,315,784
72	5,315,785
74	5,315,786
79	5,315,787

CLASS 49

404	5,315,788

CLASS 51

165.71	5,315,789
	5,315,790
215 M	5,315,791
295	5,316,559
317	5,315,792
415	5,315,793

CLASS 52

63	5,315,801
79.1	5,315,794
81.1	5,315,806
113	5,315,795
170	5,315,796
171.3	5,315,797
[illegible]	5,315,798
288.1	5,315,799
309.1	5,315,800
[illegible]	5,315,802
720	5,315,803
731.1	5,315,804
775	5,315,805

CLASS 53

51	5,315,807
399	5,315,808
	5,315,809
473	5,315,810
474	5,315,811
573	5,315,812

CLASS 55

385.2	5,316,560

CLASS 57

[illegible]	5,315,813
75	5,315,814

CLASS 60

39.02	5,315,816
39.06	5,315,815
39.091	5,315,817
39.281	5,315,818
39.282	5,315,819
226.1	5,315,820
	5,315,821
261	5,315,822
[illegible]	5,315,823
297	5,315,824
336	5,315,825
422	5,315,826
[illegible]	5,315,827
	5,315,828
456	5,315,829

CLASS 62

3.2	5,315,830
7	5,315,831
20	5,315,832
38	5,315,833
50.4	B1 5,136,852
78	5,315,834
80	5,315,835
[illegible]	5,315,836
[illegible]	5,315,837
129	5,315,838
[illegible]	5,315,839
167	5,315,840
228.3	5,315,841
262	5,315,842
[illegible]	5,315,843
325	5,315,844
338	5,315,845
419	5,315,846

CLASS 65

1	5,316,561
3.11	5,316,562
32.5	5,316,563
36	5,316,564

CLASS 68

12.02	5,315,847

CLASS 69

4	5,315,986

CLASS 70

18	5,315,848
34	5,315,849
129	5,315,850
252	5,315,851

CLASS 72

149	5,315,852
178	5,315,853
297	5,315,854
315	5,315,855
350	5,315,858
[illegible]	5,315,856
450	5,315,857

CLASS 73

3	5,315,859
[illegible]	5,315,860
37	5,315,861
40.5 R	5,315,862
54.09	5,315,863
54.32	5,315,864
118.1	5,315,865
146.5	5,315,866
[illegible]	5,315,867
178 R	5,315,868
[illegible]	5,315,869
202.5	5,315,870
204.25	5,315,871
304 C	5,315,872
[illegible]	5,315,873
493	5,315,874
706	5,315,875
[illegible]	5,315,876
724	5,315,877
727	5,315,878
[illegible]	5,315,879
861.25	5,315,880
[illegible]	5,315,882
862.333	5,315,881
[illegible]	5,315,883
[illegible]	5,315,884
863.71	5,315,885
864.02	5,315,886
864.11	5,315,887

CLASS 74

5.5	5,315,888
105	5,315,889
110	5,315,890
[illegible]	5,315,891
502.3	5,315,892
512	5,315,893
526	5,315,894
551.8	5,315,895
594.4	5,315,896

CLASS 75

10.27	5,316,565
10.39	5,316,566
743	5,316,567

CLASS 81

53.2	5,315,902
91.3	5,315,903

CLASS 82

129	5,315,904

CLASS 83

13	5,315,905
27	5,315,906
38	5,315,907
191	Re.34,621
845	5,315,908

CLASS 84

404	5,315,909
453	5,315,910
477 R	5,315,911
625	5,317,104

CLASS 89

1.816	5,315,912
12	5,315,913
14.05	5,315,914
36.14	5,315,915

CLASS 91

178	5,315,916
418	5,315,917

CLASS 92

63	5,315,918

CLASS 95

31	5,316,568

CLASS 96

134	5,316,569

CLASS 99

357	5,315,919
391	5,315,920
407	5,315,921
447	5,315,922

CLASS 100

39	5,315,923
53	5,315,924
88	5,315,925
218	5,315,926

CLASS 101

35	5,315,927
93.14	5,315,928
127.1	5,315,929
366	5,315,930
415.1	5,315,931

CLASS 102

457	5,315,932
[illegible]	5,315,933

CLASS 105

199.3	5,315,934

CLASS 106

14.16	5,316,573
20 A	5,316,574
20 R	5,316,575
197.1	5,316,577
210	5,316,578
451	5,316,570
483	5,316,576
[illegible]	5,316,571
714	5,316,572

CLASS 108

165	5,315,936
193	5,315,935

CLASS 110

165 A	5,315,937
233	5,315,938
264	5,315,939
345	5,315,940
	5,315,941

CLASS 112

134	5,315,942
162	5,315,943
[illegible]	5,315,944
262.1	5,315,945
265.1	5,315,946

CLASS 114

61	5,315,947
106	5,315,948
222	5,315,949
270	5,315,950
[illegible]	5,315,951
312	5,315,952

CLASS 116

28 R	5,315,953
67 R	5,315,954
173	5,315,955
216	5,315,956

CLASS 117

95	5,316,615
217	5,316,742

CLASS 118

50	5,316,579
110	5,316,580
246	5,316,581
301	5,316,582
405	5,316,583
712	5,316,584
719	5,316,585
728	5,316,586

CLASS 119

26	5,315,957
54	5,315,958
[illegible]	5,315,959
95	5,315,960
165	5,315,964
[illegible]	5,315,965

CLASS 122

379	5,315,966

CLASS 123

55 AA	5,315,967
73 C	5,315,968
90.11	5,315,961
190.012	5,315,963
190.11	5,315,962
190.6	5,315,969
193.2	5,315,970
196 R	5,315,971
198 D	5,315,972
304	5,315,973
320	5,315,974
337	5,315,975
357	5,315,976
	5,315,977
467	5,315,978
478	5,315,979
520	5,315,980
526	5,315,981
634	5,315,982

CLASS 126

216	5,315,983
317	5,315,984

CLASS 128

4	5,315,985
201.28	5,315,987
204.23	5,315,988
204.28	5,315,989
205.11	5,315,990
207.14	5,315,991
207.15	5,315,992
[illegible]	5,316,002
634	5,315,993
	5,315,995
642	5,315,996
653.3	5,315,997
660.01	5,315,998
660.03	5,316,000
660.07	5,315,999
[illegible]	5,316,001
662.03	5,316,003
672	5,316,004
680	5,316,005
[illegible]	5,316,006
700	5,316,008
716	5,316,009
720	5,316,010
744	5,316,011
	5,316,012
754	5,316,013
	5,316,014
769	5,316,015
774	5,316,016
782	5,316,017
	5,316,018
844	5,316,019
848	5,316,020
876	5,316,022
898	5,316,023
899	5,316,024

CLASS 132

211	5,316,025
248	5,316,021
285	5,316,026
[illegible]	5,316,027
329	5,316,028

CLASS 134

7	5,316,587
[illegible]	5,316,588
10	5,316,589
26	5,316,590
34	5,316,591
104.1	5,316,029
105	5,316,030

CLASS 136

244	5,316,592
262	5,316,593

CLASS 137

1	5,316,031
14	5,316,032
[illegible]	5,316,034
312	5,316,035
315	5,316,036
318	5,316,037
334	5,316,038
454.6	5,316,039
556	5,316,040
614	5,316,033
614.04	5,316,041
625.11	5,316,042
625.23	5,316,043
625.69	5,316,044

CLASS 138

[illegible]	5,316,045
126	5,316,046
173	5,316,047

CLASS 139

1 R	5,316,048
[illegible]	5,316,049
434	5,316,050
452	5,316,051

CLASS 140

112	5,316,052

CLASS 141

1	5,316,053
22	5,316,054
38	5,316,055
[illegible]	5,316,056
[illegible]	5,316,057
319	5,316,058
340	5,316,059
[illegible]	5,316,060

CLASS 144

218	5,316,061

CLASS 148

281	5,316,594
[illegible]	5,316,595
321	5,316,596
327	5,316,597
420	5,316,598
512	5,316,599

CLASS 149

19.4	5,316,600

CLASS 152

209 R	5,316,062
	5,316,063
531	5,316,064

CLASS 156

62.2	5,316,601
64	5,316,602
69	5,316,603
82	5,316,604
145	5,316,605
201	5,316,606
212	5,316,607
230	5,316,608
[illegible]	5,316,609
379.6	5,316,610
425	5,316,611

493	5,316,612
540	5,316,613
574	5,316,614
643	5,316,616
	5,316,617
644	5,316,618
	5,316,619
645	5,316,620
CLASS 160	
170	5,316,065
178.2	5,316,066
348	5,316,067
CLASS 162	
4	5,316,621
109	5,316,622
164.3	5,316,623
205	5,316,624
CLASS 164	
58.1	5,316,068
97	5,316,069
122	5,316,070
155.1	5,316,071
CLASS 165	
9	5,316,072
11.1	5,316,073
43	5,316,074
80.4	5,316,075
84	5,316,076
104.28	5,316,077
104.33	5,316,078
140	5,316,079
185	5,316,080
CLASS 166	
188	5,316,081
281	5,316,082
291	5,316,083
332	5,316,084
369	5,316,085
373	5,316,086
381	5,316,087
CLASS 172	
510	5,316,088
CLASS 174	
35 GC	5,317,105
52.4	5,317,106
	5,317,107
67	5,317,108
84 C	5,317,109
CLASS 175	
7	5,316,089
24	5,316,090
61	5,316,091
62	5,316,092
74	5,316,093
	5,316,094
429	5,316,095
CLASS 177	
25.18	5,317,110
CLASS 180	
19.1	5,316,096
	5,316,097
140	5,316,098
	5,316,099
167	5,316,100
211	5,316,101
CLASS 181	
105	5,317,111
250	5,317,112
285	5,317,113
CLASS 182	
3	5,316,102
18	5,316,103
187	5,316,104
	5,316,105
CLASS 184	
6.12	5,316,106
CLASS 186	
61	5,316,107
CLASS 187	
95	5,316,108
128	5,317,114
CLASS 188	
41	5,316,109
112 R	5,316,110
205 R	5,316,111
267	5,316,112
282	5,316,113
299	5,316,114
325	5,316,115
CLASS 192	
3.3	5,315,901
CLASS 194	
203	5,316,117
206	5,316,124
317	5,316,118
318	5,316,119
	5,316,120
CLASS 198	
323	5,316,121
347.3	5,316,122
416	5,316,123
465.2	5,316,125
468.6	5,316,126
470.1	5,316,127
530	5,316,128
780	5,316,129
781	5,316,130
842	5,316,131
847	5,316,132
850	5,316,133
861.1	5,316,134
CLASS 200	
144 R	5,317,117
CLASS 202	
176	5,316,625
CLASS 203	
10	5,316,626
34	5,316,627
72	5,316,628
CLASS 204	
83	5,316,629
146	5,316,632
153.11	5,316,633
155	5,316,634
157.47	5,316,636
180	5,316,630
182.4	5,316,637
182.8	5,316,638
192.12	5,316,639
192.2	5,316,631
192.34	5,316,640
197	5,316,641
198	5,316,642
265	5,316,643
284	5,316,644
298.06	5,316,645
298.12	5,317,006
306	5,316,646
415	5,316,647
	5,316,648
435	5,316,649
CLASS 205	
67	5,316,650
	5,316,651
177	5,316,652
245	5,316,653
CLASS 206	
69	5,316,136
209	5,316,137
223	5,316,138
278	5,316,139
287.1	5,316,140
320	5,316,141
370	5,316,142
378	5,316,143
387	5,316,144
	5,316,145
438	5,316,146
	5,316,147
484.1	5,316,148
584	5,316,149
CLASS 208	
39	5,316,654
	5,316,659
46	5,316,661
76	5,316,660
113	5,316,662
120	5,316,656
131	5,316,655
161	5,316,657
216 R	5,316,658
262.1	5,316,663
390	5,316,664
CLASS 209	
30	5,316,150
223.1	5,316,151
830	5,316,152
CLASS 210	
85	5,316,665
	5,316,666
	5,316,667
151	5,316,668
189	5,316,670
220	5,316,671
242.3	5,316,672
251	5,316,673
257.1	5,316,674
327	5,316,675
411	5,316,676
455	5,316,677
486	5,316,678
634	5,316,679
635	5,316,680
645	5,316,681
649	5,316,682
688	5,316,683
757	5,316,684
787	5,316,685
CLASS 211	
13	5,316,153
59.2	5,316,154
70.5	5,316,155
149	5,316,156
151	5,316,157
CLASS 212	
75 TC	5,316,158
CLASS 215	
10	5,316,159
11.1	5,316,160
220	5,316,161
223	5,316,162
249	5,316,163
CLASS 219	
69.13	5,317,122
91	5,317,123
99	5,317,124
110	5,317,125
121.51	5,317,126
130.51	5,317,116
388	5,317,127
433	5,317,128
464	5,317,129
497	5,317,130
543	5,317,132
672	5,317,121
716	5,317,115
	5,317,133
720	5,317,134
727	5,317,118
730	5,317,120
734	5,317,119
CLASS 220	
3.2	5,316,164
62	5,316,165
269	5,316,166
328	5,316,167
341	5,316,168
355	5,316,169
409	5,316,170
423	5,316,171
461	5,316,135
519	5,316,172
556	5,316,173
571	5,316,174
573	5,316,175
694	5,316,176
CLASS 221	
63	5,316,177
CLASS 222	
1	5,316,178
56	5,316,179
	5,316,180
61	5,316,181
78	5,316,182
	5,316,183
107	5,316,184
131	5,316,193
136	5,316,194
146.6	5,316,195
160	5,316,196
181	5,316,197
321	5,316,185
	5,316,198
327	5,316,186
401	5,316,187
CLASS 223	
77	5,316,188
113	5,316,189
CLASS 224	
42.42	5,316,190
42.45 R	5,316,191
324	5,316,192
CLASS 226	
197	5,316,199
CLASS 227	
119	5,316,200
CLASS 228	
4.5	5,316,201
5.5	5,316,202
118	5,316,203
179.1	5,316,204
180.21	5,316,205
183	5,316,206
CLASS 229	
23 R	5,316,207
71	5,316,208
87.05	5,316,209
117.16	5,316,210
120.21	5,316,211
215	5,316,212
CLASS 235	
375	5,317,135
	5,317,136
380	5,317,137
440	5,317,138
462	5,317,139
CLASS 236	
58	5,316,213
78 B	5,316,214
CLASS 239	
67	5,316,215
71	5,316,216
	5,316,217
246	5,316,218
533.1	5,316,219
542	5,316,220
708	5,316,221
CLASS 241	
5	5,316,222
24	5,316,223
30	5,316,224
74	5,316,225
CLASS 242	
1.1 R	5,316,228
7.03	5,316,227
56.1	5,316,226
58	5,316,229
58.1	5,316,230
58.6	5,316,231
68.30 R	5,316,232
197	5,316,233
198	5,316,234
199	5,316,235
200	5,316,236
204	5,316,237
234	5,316,238
241	5,316,239
CLASS 244	
17.27	5,316,240
129.5	5,316,241
137.1	5,316,242
CLASS 248	
49	5,316,244
68.1	5,316,243
	5,316,245
	5,316,246
073	5,316,247
129	5,316,248
146	5,316,249
165	5,316,250
210	5,316,251
223.4	5,316,252
235	5,316,253
343	5,316,254
362	5,316,255
453	5,316,256
487	5,316,257
548	5,316,258
601	5,316,259
648	5,316,260
CLASS 250	
201.4	5,317,142
201.5	5,317,143
	5,317,144
203.4	5,317,145
208.1	5,317,146
221	5,317,140
227.17	5,317,147
227.26	5,317,148
231.14	5,317,149
252.1	5,317,150
298	5,317,151
306	5,317,152
	5,317,153
310	5,317,154
324	5,317,155
345	5,317,156
352	5,317,157
367	5,317,158
381	5,317,159
390.12	5,317,160
423 R	5,317,161
461.2	5,317,162
491.1	5,317,141
492.3	5,317,164
495.1	5,317,163
554	5,317,165
560	5,317,166
CLASS 251	
5	5,316,261
8	5,316,262
129.05	5,316,263
150	5,316,264
CLASS 252	
54	5,316,686
71	5,316,687
90	5,316,688
92	5,316,689
172	5,316,690
174.12	5,316,691
174.15	5,316,692
299.01	5,316,693
299.61	5,316,694
315.6	5,316,695
394	5,316,696
512	5,316,698
518	5,316,697
584	5,316,699
CLASS 254	
362	5,316,265
364	5,316,266
383	5,316,267
CLASS 257	
13	5,317,167
34	5,317,168
40	5,317,169
88	5,317,170
138	5,317,171
164	5,317,172
197	5,317,173
222	5,317,174
255	5,317,175
287	5,317,176
301	5,317,177
314	5,317,178
321	5,317,179
337	5,317,180
347	5,317,181
368	5,317,183
378	5,317,182
401	5,317,184
	5,317,197
629	5,317,185
	5,317,186
659	5,317,187
688	5,317,188
694	5,317,189
743	5,317,190
746	5,317,191
750	5,317,192
774	5,317,193
777	5,317,194
787	5,317,195
791	5,317,196
CLASS 264	
1.1	5,316,700
1.3	5,316,703
1.5	5,316,701
1.7	5,316,702
2.6	5,316,704
8	5,316,705
25	5,316,706
40.1	5,316,707
40.5	5,316,708
51	5,316,709
57	5,316,710
68	5,316,711
102	5,316,712
209.1	5,316,713
210.6	5,316,714
245	5,316,715
338	5,316,716
564	5,316,717
CLASS 266	
44	5,316,268
117	5,316,269
159	5,316,270
236	5,316,271
CLASS 267	
64.13	5,316,272
64.24	5,316,273
140.12	5,316,274
140.13	5,316,275
CLASS 269	
21	5,316,276
25	5,316,277
254 R	5,316,278
CLASS 270	
1.1	5,316,279
37	5,316,280
58	5,316,281
CLASS 271	
10	5,316,282
114	5,316,283
121	5,316,284
122	5,316,285
182	5,316,286
213	5,316,287
250	5,316,288
258	5,316,289
CLASS 273	
1.5 R	5,316,290
34 R	5,316,292
65 EF	5,316,293
65 EG	5,316,294
73 J	5,316,316
73 R	5,316,295
	5,316,296
77 A	5,316,297
78	5,316,298
80 R	5,316,299
	5,316,300
86 R	5,316,301
87 C	5,316,302
121 A	5,316,303
168	5,316,304
174	5,316,305
196.2	5,316,306
241	5,316,307
249	5,316,308
273	5,316,309
317	5,316,310
346	5,316,311
362	5,316,312
383	5,316,313
400	5,316,314
411	5,316,315
CLASS 277	
1	5,316,317
53	5,316,318
106	5,316,319
233	5,316,320
235 A	5,316,321
235 B	5,316,322
CLASS 279	
22	5,316,323
51	5,316,324
CLASS 280	
11.2	5,316,325
104	5,316,326
280	5,316,327
304.1	5,316,328
414.1	5,316,329
477	5,316,330
618	5,316,331
661	5,316,332
728 A	5,316,333
728 B	5,316,334
	5,316,335
730 A	5,316,336
743 R	5,316,337
789	5,316,338
806	5,316,339
821	5,316,340
CLASS 281	
15.1	5,316,341
CLASS 283	
7	5,316,342
70	5,316,343
81	5,316,344
117	5,316,345
CLASS 285	
23	5,316,346
26	5,316,347
39	5,316,348
156	5,316,349
242	5,316,350
276	5,316,351
370	5,316,352
CLASS 292	
337	5,316,353
340	5,316,354
347	5,316,355
CLASS 294	
118	5,316,356
CLASS 295	
157.22	5,316,635
CLASS 296	
16	5,316,357
37.6	5,316,358
70	5,316,359
97.3	5,316,360
97.8	5,316,361
97.9	5,316,362
138	5,316,363
146.5	5,316,364
155	5,316,365
167	5,316,366
189	5,316,367
CLASS 297	
194	5,316,368
	5,316,369
313	5,316,370
339	5,316,371
400	5,316,372

411.32	5,316,373
423.39	5,316,374
452.34	5,316,375
CLASS 301	
37.26	5,316,376
64.7	5,316,377
CLASS 303	
84.2	5,316,378
100	5,316,379
CLASS 305	
10	5,316,381
CLASS 307	
116	5,317,198
228	5,317,199
262	5,317,200
269	5,317,202
296.1	5,317,201
353	5,317,203
443	5,317,204
	5,317,205
	5,317,206
	5,317,207
454	5,317,208
465	5,317,209
	5,317,210
	5,317,211
	5,317,212
475	5,317,213
	5,317,214
517	5,317,215
521	5,317,216
	5,317,217
530	5,317,218
603	5,317,219
CLASS 310	
12	5,317,220
	5,317,221
13	5,317,222
26	5,317,223
58	5,317,224
67 R	5,317,225
90.5	5,317,226
156	5,317,227
178	5,317,228
334	5,317,229
CLASS 313	
293	5,317,230
493	5,317,231
619	5,317,232
CLASS 315	
5.370	5,317,233
5.41	5,317,234
111.41	5,317,235
169.3	5,317,236
291	B1 4,352,045
307	5,317,237
323	5,317,238
370	5,317,239
383	5,317,240
CLASS 318	
254	5,317,241
	5,317,242
	5,317,243
	5,317,244
	5,317,245
432	5,317,246
811	5,317,248
CLASS 319	
113	5,317,441
CLASS 320	
2	5,317,247
	5,317,249
CLASS 323	
316	5,317,254
CLASS 324	
67	5,317,253
71.7	5,317,252
102	5,317,251
156	5,317,250
158 F	5,317,257
158 P	5,317,255
	5,317,256
225	5,317,258
251	5,317,259
309	5,317,260
	5,317,261
	5,317,262
	5,317,263
	5,317,264
312	5,317,265
318	5,317,266
402	5,317,267
	5,317,268
427	5,317,269
460	5,317,270
464	5,317,271
558	5,317,272
616	5,317,273
678	5,317,274
692	5,317,275
CLASS 328	
155	5,317,276
167	5,317,278
CLASS 330	
109	5,317,277
253	5,317,279
261	5,317,280
265	5,317,281
277	5,317,282
CLASS 331	
1 A	5,317,283
2	5,317,284
16	5,317,285
56	5,317,286
57	5,317,287
CLASS 332	
144	5,317,288
CLASS 333	
17.1	5,317,289
164	5,317,290
203	5,317,291
238	5,317,292
258	5,317,293
CLASS 335	
80	5,317,294
172	5,317,295
216	5,317,296
297	5,317,297
301	5,317,298
CLASS 336	
5	5,317,299
96	5,317,300
CLASS 338	
128	5,317,301
225 D	5,317,302
CLASS 340	
310 R	B1 4,254,403
539	5,317,303
571	5,317,304
573	5,317,305
815.45	5,317,307
825.44	5,317,308
825.54	5,317,309
876	5,317,310
905	5,317,311
CLASS 341	
158	5,317,312
163	5,317,313
CLASS 342	
16	5,317,314
26	5,317,315
30	5,317,316
40	5,317,317
44	5,317,318
53	5,317,319
159	5,317,320
176	5,317,321
378	5,317,322
457	5,317,323
CLASS 343	
390	5,317,396
700 MS	5,317,324
702	5,317,325
718	5,317,326
725	5,317,327
786	5,317,328
	5,317,329
867	5,317,330
CLASS 345	
16	5,317,331
101	5,317,332
118	5,317,306
133	5,317,333
148	5,317,334
163	5,317,335
164	5,317,336
CLASS 346	
1.1	5,317,337
	5,317,338
	5,317,339
74.3	5,317,340
76 PH	5,317,341
	5,317,342
	5,317,343
107 R	5,317,344
	5,317,345
140 R	5,317,346
160	5,317,347
CLASS 348	
6	5,317,391
	5,317,392
20	5,317,405
58	5,317,393
79	Re.34,622
164	5,317,395
208	5,317,394
306	5,317,407
307	5,317,406
315	5,317,408
416	5,317,397
570	5,317,398
571	5,317,399
638	5,317,410
679	5,317,400
705	5,317,402
731	5,317,403
751	5,317,409
CLASS 353	
31	5,317,348
38	5,317,349
63	5,317,350
CLASS 354	
195.1	5,317,351
	5,317,352
266	5,317,353
	5,317,354
277	5,317,355
288	5,317,356
289.12	5,317,357
319	5,317,358
324	5,317,359
	5,317,360
415	5,317,361
418	5,317,362
CLASS 355	
27	5,317,363
40	5,317,364
75	5,317,365
202	5,317,366
203	5,317,367
207	5,317,368
208	5,317,369
245	5,317,370
274	5,317,371
311	5,317,372
319	5,317,377
326 R	5,317,373
CLASS 356	
1	5,317,374
5	5,317,375
28.5	5,317,376
301	5,317,378
308	5,317,379
338	5,317,380
350	5,317,381
351	5,317,382
	5,317,383
	5,317,384
356	5,317,385
372	5,317,386
	5,317,387
373	5,317,388
382	5,317,389
394	5,317,390
CLASS 358	
261.2	5,317,411
310	5,317,412
335	5,317,404
	5,317,413
336	5,317,414
425	5,317,415
444	5,317,416
451	5,317,417
456	5,317,418
462	5,317,419
463	5,317,420
464	5,317,421
476	5,317,422
482	5,317,423
491	5,317,424
504	5,317,425
515	5,317,426
520	5,317,427
539	5,317,428
CLASS 359	
42	5,317,429
49	5,317,430
51	5,317,431
59	5,317,432
	5,317,433
68	5,317,434
69	5,317,435
83	5,317,436
87	5,317,437
88	5,317,438
110	5,317,439
113	5,317,440
170	5,317,442
187	5,317,443
214	5,317,444
250	5,317,445
296	5,317,446
328	5,317,447
333	5,317,448
443	5,317,449
566	5,317,450
643	5,317,451
819	5,317,452
885	5,317,453
886	5,317,454
CLASS 360	
35.1	5,317,455
46	5,317,456
48	5,317,457
	5,317,458
69	5,317,459
73.05	5,317,460
77.08	5,317,461
97.02	5,317,462
	5,317,463
99.08	5,317,464
103	5,317,465
107	5,317,466
133	5,317,467
135	5,317,468
CLASS 361	
40	5,317,469
92	5,317,470
105	5,317,471
115	5,317,472
117	5,317,473
119	5,317,474
154	5,317,475
220	5,317,476
663	5,317,477
689	5,317,478
773	5,317,479
785	5,317,480
796	5,317,481
798	5,317,482
801	5,317,483
CLASS 362	
32	5,317,484
	5,317,485
66	5,317,486
80.1	5,317,487
84	5,317,488
157	5,317,489
206	5,317,490
249	5,317,491
294	5,317,492
407	5,317,493
CLASS 363	
18	5,317,494
21	5,317,495
24	5,317,496
40	5,317,497
43	5,317,498
56	5,317,499
98	5,317,500
CLASS 364	
132	5,317,501
167.01	5,317,502
400	5,317,503
406	5,317,504
410	5,317,505
413.02	5,317,506
419	5,317,511
419.01	5,317,508
419.08	5,317,509
	5,317,510
419.13	5,317,507
424.05	5,317,512
	5,317,513
449	5,317,514
454	5,317,515
468	5,317,516
474.03	5,317,517
474.26	5,317,518
	5,317,519
482	5,317,520
496	5,317,521
514	5,317,522
525	5,317,523
557	5,317,524
578	5,317,525
715.03	5,317,526
715.04	5,317,527
717	5,317,528
724.1	5,317,529
745	5,317,530
766	5,317,531
CLASS 365	
149	5,317,532
151	5,317,533
182	5,317,534
185	5,317,535
189.04	5,317,536
	5,317,537
189.09	5,317,538
207	5,317,539
230.01	5,317,540
230.06	5,317,541
CLASS 366	
129	5,316,382
160	5,316,383
338	5,316,384
CLASS 367	
12	5,317,542
125	5,317,543
149	5,317,544
CLASS 368	
4	5,317,545
9	5,317,546
10	5,317,547
678	5,317,401
CLASS 369	
13	5,317,548
32	5,317,549
	5,317,550
44.12	5,317,551
44.14	5,317,552
54	5,317,553
77.2	5,317,554
110	5,317,555
112	5,317,556
	5,317,557
126	5,317,558
244	5,317,559
CLASS 370	
16	5,317,560
	5,317,561
	5,317,562
17	5,317,563
	5,317,564
58.2	5,317,565
60	5,317,566
62	5,317,567
85.6	5,317,568
85.9	5,317,569
94.1	5,317,570
103	5,317,571
105.1	5,317,572
CLASS 371	
10.3	5,317,573
CLASS 372	
1	5,317,574
6	5,317,575
	5,317,576
21	5,317,577
29	5,317,578
35	5,317,579
	5,317,585
38	5,317,580
	5,317,581
	5,317,582
43	5,317,583
45	5,317,586
	5,317,587
86	5,317,584
96	5,317,588
99	5,317,589
109	5,317,590
CLASS 373	
107	5,317,591
109	5,317,592
CLASS 374	
32	5,316,380
130	5,316,385
CLASS 375	
1	5,317,593
8	5,317,594
14	5,317,595
	5,317,596
72	5,317,597
75	5,317,598
86	5,317,599
97	5,317,600
107	5,317,601
118	5,317,602
122	5,317,603
	5,317,604
CLASS 376	
157	5,317,605
217	5,317,606
260	5,317,607
261	5,317,608
	5,317,609
414	5,317,610
433	5,317,611
439	5,317,613
451	5,317,612
CLASS 377	
17	5,317,614
CLASS 378	
34	5,317,615
65	5,317,616
	5,317,617
161	5,317,618
173	5,317,619
CLASS 379	
40	5,317,620
57	5,317,621
58	5,317,622
60	5,317,623
61	5,317,624
67	5,317,625
	5,317,626
88	5,317,627
89	5,317,628
93	5,317,629
94	5,317,630
164	5,317,631
199	5,317,632
230	5,317,633
362	5,317,634
CLASS 380	
7	5,317,635
23	5,317,636
25	5,317,637
29	5,317,638
37	5,317,639
CLASS 381	
68.4	5,317,640
119	5,317,641
182	5,317,642
187	5,317,643
CLASS 382	
6	5,317,644
8	5,317,645
9	5,317,646
14	5,317,647
17	5,317,648
21	5,317,649
22	5,317,650
31	5,317,651
49	5,317,652
50	5,317,653
61	5,317,654
CLASS 383	
10	5,316,386
119	5,316,387
127	5,316,388
CLASS 384	
18	5,316,389
49	5,316,390
96	5,316,391
147	5,316,392
517	5,316,393
574	5,316,394
CLASS 385	
11	5,317,655
12	5,317,656
14	5,317,657
16	5,317,658
22	5,317,659
24	5,317,660
31	5,317,661
46	5,317,662
70	5,317,663
87	5,317,664
101	5,317,665
122	5,317,666
147	5,317,667
CLASS 388	
811	5,317,668
829	5,317,669
CLASS 392	
464	5,317,670
CLASS 395	
2	5,317,671
2.41	5,317,673
3	5,317,674
23	5,317,675
26	5,317,676
77	5,317,677
126	5,317,678
132	5,317,679
135	5,317,680
141	5,317,681
142	5,317,682
145	5,317,683
150	5,317,684
152	5,317,685
157	5,317,686
159	5,317,687
161	5,317,688
163	5,317,689
200	5,317,690
	5,317,691
	5,317,692
238	5,317,672
275	5,317,693
	5,317,694

	5,317,695
325	5,317,696
	5,317,697
	5,317,698
	5,317,699
375	5,317,700
	5,317,701
	5,317,702
	5,317,703
400	5,317,704
	5,317,705
	5,317,706
425	5,317,707
	5,317,708
	5,317,709
	5,317,710
	5,317,711
	5,317,712
	5,317,713
	5,317,714
	5,317,715
	5,317,716
	5,317,717
	5,317,718
	5,317,719
	5,317,720
500	5,317,721
	5,317,722
	5,317,723
550	5,317,724
575	5,317,725
	5,317,726
600	5,317,727
	5,317,728
	5,317,729
	5,317,730
	5,317,731
	5,317,732
	5,317,736
650	5,317,734
	5,317,735
	5,317,737
	5,317,738
	5,317,739
700	5,317,740
	5,317,741
	5,317,742
	5,317,743
	5,317,744
	5,317,745
	5,317,746
725	5,317,747
	5,317,748
	5,317,749
	5,317,750
730	5,317,751
	5,317,752
800	5,317,753
	5,317,754
	5,317,755
	5,317,756
	5,317,757
	5,317,758
CLASS 400	
56	5,316,395
76	5,316,396
121	5,316,397
CLASS 401	
18	5,316,398
127	5,316,399
132	5,316,400
139	5,316,401
201	5,316,402
207	5,316,403
CLASS 402	
79	5,316,404
CLASS 403	
28	5,316,405
CLASS 404	
12	5,316,406
25	5,316,407
35	5,316,408
CLASS 405	
1	5,316,409
43	5,316,410
128	5,316,411
169	5,316,412
217	5,316,413
258.6	5,316,414
CLASS 408	
24	5,316,415
145	5,316,416
153	5,316,417
158	Re.34,623
201	5,316,418
236	5,316,419
CLASS 409	
190	5,316,420

CLASS 410	
9	5,316,421
CLASS 411	
107	5,316,422
110	5,316,423
CLASS 413	
8	5,316,424
18	5,316,425
CLASS 414	
24.5	5,316,426
24.6	5,316,427
267	5,316,428
298	5,316,429
407	5,316,430
523	5,316,431
540	5,316,432
607	5,316,433
	5,316,434
685	5,316,435
778	5,316,436
CLASS 415	
115	5,316,437
118	5,316,438
119	5,316,439
206	5,316,440
208.4	5,316,441
CLASS 416	
134 A	5,316,442
197 R	5,316,443
CLASS 417	
2	5,316,444
53	5,316,445
269	5,316,446
	5,316,447
295	5,316,450
307	5,316,448
355	5,316,449
392	5,316,451
412	5,316,452
516	5,316,453
CLASS 418	
55.6	5,316,454
63	5,316,455
150	5,316,456
171	5,316,457
CLASS 419	
19	5,316,718
48	5,316,720
CLASS 420	
30	5,316,721
421	5,316,722
429	5,316,723
590	5,316,719
CLASS 422	
48	5,316,724
61	5,316,725
67	5,316,726
68.1	5,316,727
70	5,316,728
73	5,316,729
	5,316,730
101	5,316,731
102	5,316,732
104	5,316,733
135	5,316,734
143	5,316,735
145	5,316,736
170	5,316,737
180	5,316,738
186.05	5,316,739
186.07	5,316,740
186.23	5,316,741
256	5,316,743
257	5,316,744
295	5,316,745
CLASS 423	
151	5,316,746
247	5,316,747
320	5,316,748
385	5,316,749
451	5,316,750
571	5,316,751
593	5,316,752
706	5,316,753
CLASS 424	
1.53	5,317,091
2	5,316,754
5	5,316,755
9	5,316,756
	5,316,757
10	5,316,759
54	5,316,758
58	5,316,760
65	5,316,761
78.35	5,316,762
85.2	5,316,763

89	5,316,764
94.1	5,316,765
94.63	5,316,766
401	5,316,767
433	5,316,768
442	5,316,769
	5,316,770
450	5,316,771
472	5,316,772
499	5,316,773
501	5,316,774
553	5,316,775
CLASS 425	
34.1	5,316,458
71	5,316,459
110	5,316,460
111	5,316,461
112	5,316,462
116	5,316,463
118	5,316,464
343	5,316,465
422	5,316,466
438	5,316,467
461	Re.34,624
549	5,316,468
CLASS 426	
18	5,316,776
87	5,316,777
324	5,316,778
329	5,316,779
424	5,316,780
433	5,316,781
624	5,316,782
627	5,316,783
CLASS 427	
2	5,316,784
72	5,316,785
96	5,316,786
97	5,316,787
98	5,316,788
117	5,316,789
142	5,316,790
221	5,316,792
248.1	5,316,793
	5,316,794
249	5,316,795
252	5,316,796
376.2	5,316,797
409	5,316,798
421	5,316,799
464	5,316,791
466	5,316,800
488	5,316,801
533	5,316,802
554	5,316,803
585	5,316,804
CLASS 428	
1	5,316,805
	5,316,806
17	5,316,807
31	5,316,808
35.7	5,316,810
43	5,316,811
64	5,316,812
	5,316,813
	5,316,814
65	5,316,815
69	5,316,816
76	5,316,817
88	5,316,818
102	5,316,819
109	5,316,820
131	5,316,821
138	5,316,822
141	5,316,823
145	5,316,824
156	5,316,825
172	5,316,826
175	5,316,827
181	5,316,828
192	5,316,829
195	5,316,830
209	5,316,831
224	5,316,832
225	5,316,833
233	5,316,834
247	5,316,835
283	5,316,838
284	5,316,836
285	5,316,837
	5,316,839
318.4	5,316,840
319.1	5,316,841
	5,316,842
323	5,316,843
	5,316,844
	5,316,845
325	5,316,846
327	5,316,847
348	5,316,809
351	5,316,848
355	5,316,849

378	5,316,850
379	5,316,851
411.1	5,316,852
416	5,316,853
426	5,316,854
446	5,316,856
447	5,316,855
457	5,316,857
	5,316,858
472	5,316,859
473	5,316,860
516	5,316,861
522	5,316,862
548	5,316,863
611	5,316,864
614	5,316,865
621	5,316,866
626	5,316,867
CLASS 429	
9	5,316,868
19	5,316,869
24	5,316,870
33	5,316,871
62	5,316,872
86	5,316,873
161	5,316,874
194	5,316,875
197	5,316,876
	5,316,877
CLASS 430	
5	5,316,878
	5,316,879
59	5,316,880
	5,316,881
108	5,316,882
138	5,316,883
165	5,316,884
200	5,316,885
203	5,316,886
	5,316,887
216	5,316,888
264	5,316,889
	5,316,890
296	5,316,891
309	5,316,892
313	5,316,893
	5,316,894
	5,316,895
322	5,316,896
397	5,316,897
401	5,316,898
495	5,316,899
	5,316,900
512	5,316,901
539	5,316,902
546	5,316,903
567	5,316,904
CLASS 431	
116	5,316,469
286	5,316,470
CLASS 432	
139	5,316,471
241	5,316,472
CLASS 433	
29	5,316,473
38	5,316,474
166	5,316,475
173	5,316,476
	5,316,477
221	5,316,478
CLASS 434	
11	5,316,479
28	5,316,480
99	5,316,481
129	5,316,482
211	5,316,483
226	5,316,484
322	5,316,485
CLASS 435	
3	5,316,905
4	5,316,906
	5,316,907
6	5,316,908
	5,316,909
7.1	5,316,910
7.24	5,316,913
7.9	5,316,911
	5,316,912
7.94	5,316,914
7.95	5,316,915
11	5,316,916
15	5,316,917
34	5,316,918
69.1	5,316,919
69.3	5,316,920
69.4	5,316,921
69.7	5,316,922
69.9	5,316,923
71.2	5,316,924
91.2	5,316,925

	5,316,948
101	5,316,926
134	5,316,927
136	5,316,928
146	5,316,929
172.3	5,316,930
	5,316,931
193	5,316,932
215	5,316,934
222	5,316,935
240.1	5,316,933
240.2	5,316,936
240.3	5,316,937
240.31	5,316,938
252.1	5,316,939
	5,316,940
252.3	5,316,941
273	5,316,942
280	5,316,943
	5,316,944
285	5,316,945
320.1	5,316,946
	5,316,947
CLASS 436	
5	5,316,949
22	5,316,950
63	5,316,951
70	5,316,952
87	5,316,953
89	5,316,954
155	5,316,955
CLASS 437	
5	5,316,956
31	5,316,957
	5,316,958
40	5,316,959
	5,316,960
43	5,316,961
52	5,316,962
	5,316,963
60	5,316,964
70	5,316,965
	5,316,966
133	5,316,967
	5,316,968
168	5,316,969
170	5,316,971
173	5,316,970
187	5,316,972
188	5,316,973
190	5,316,974
195	5,316,975
	5,316,976
200	5,316,977
203	5,316,978
	5,316,979
228	5,316,980
235	5,316,981
236	5,316,982
250	5,316,983
	5,316,984
CLASS 439	
62	5,316,486
78	5,316,487
79	5,316,488
	5,316,489
114	5,316,490
159	5,316,491
206	5,316,492
266	5,316,493
352	5,316,494
372	5,316,495
495	5,316,496
501	5,316,498
534	5,316,499
587	5,316,500
607	5,316,501
621	5,316,502
740	5,316,503
752	5,316,497
	5,316,504
762	5,316,505
879	5,316,506
886	5,316,507
CLASS 440	
900	5,316,508
CLASS 441	
1	5,316,509
CLASS 445	
2	5,316,510
24	5,316,511
61	5,316,512
CLASS 446	
18	5,316,513
26	5,316,514
28	5,316,515
175	5,316,516
CLASS 453	
57	5,316,517

CLASS 454	
187	5,316,518
CLASS 460	
96	5,316,519
CLASS 470	
18	5,316,520
CLASS 473	
115	5,316,521
CLASS 474	
95	5,316,522
110	5,316,523
151	5,316,524
CLASS 475	
330	5,315,898
331	5,316,525
CLASS 476	
10	5,316,526
CLASS 477	
98	5,315,897
119	5,315,899
165	5,315,900
181	5,316,116
CLASS 482	
41	5,316,527
52	5,316,528
53	5,316,529
71	5,316,530
93	5,316,531
111	5,316,532
121	5,316,533
133	5,316,534
135	5,316,535
CLASS 492	
38	5,316,536
CLASS 493	
179	5,316,537
355	5,316,538
459	5,316,539
CLASS 494	
37	5,316,540
CLASS 501	
16	5,316,985
87	Re.34,625
96	5,316,986
97	5,316,987
98	5,316,988
153	5,316,989
CLASS 502	
5	5,316,990
65	5,316,991
66	5,316,992
68	5,316,993
117	5,316,994
226	5,316,995
239	5,316,996
314	5,316,997
415	5,316,998
CLASS 503	
227	5,316,999
	5,317,000
	5,317,001
	5,317,002
CLASS 504	
116	5,317,003
	5,317,004
239	5,317,005
CLASS 505	
100	5,317,008
121	5,317,007
CLASS 514	
8	5,317,009
12	5,317,010
	5,317,011
	5,317,012
17	5,317,014
45	5,317,013
79	5,317,015
210	5,317,016
211	5,317,017
220	5,317,018
224.2	5,317,019
255	5,317,020
275	5,317,021
282	5,317,022
303	5,317,023
317	5,317,024
323	5,317,025
331	5,317,026
399	5,317,027
400	5,317,028
422	5,317,029

450	5,317,030
452	5,317,031
530	5,317,032
616	5,317,039
634	5,317,040
763	5,317,041
772	5,317,042
CLASS 521	
43.5	5,317,043
78	5,317,044
79	5,317,033
108	5,317,034
143	5,317,035
CLASS 523	
128	5,317,037
219	5,317,038
223	5,317,036
300	5,317,045

425	5,317,046
CLASS 524	
16	5,317,047
94	5,317,048
104	5,317,049
107	5,317,050
310	5,317,051
413	5,317,052
425	5,317,053
451	5,317,054
493	5,317,055
556	5,317,056
575	5,317,057
CLASS 525	
64	5,317,058
66	5,317,059
197	5,317,060
206	5,317,061
237	5,317,062

330.2	5,317,063
411	5,317,064
420	5,317,065
425	5,317,066
438	5,317,067
526	5,317,068
CLASS 526	
262	5,317,069
348.5	5,317,070
CLASS 527	
305	5,317,071
CLASS 528	
12	5,317,072
42	5,317,073
44	5,317,074
	5,317,075
61	5,317,076
182	5,317,077

210	5,317,078
271	5,317,079
332	5,317,080
353	5,317,081
	5,317,082
499	5,317,083
CLASS 530	
324	5,317,084
326	5,317,085
327	5,317,086
350	5,317,087
	5,317,088
351	5,317,089
387.1	5,317,090
413	5,317,092
CLASS 534	
658	5,317,093

CLASS 536	
16.7	5,317,095
23.1	5,317,098
23.5	5,317,094
23.71	5,317,096
24.31	5,317,097
124	B1 4,393,203
CLASS 540	
222	5,317,099
357	5,317,100
488	5,317,101
CLASS 544	
336	5,317,102
367	5,317,103
CLASS 568	
722	Re.34,626

CLASS 600	
21	5,316,541
22	5,316,542
37	5,316,543
CLASS 602	
5	Re.34,627
	5,316,544
7	5,316,545
16	5,316,546
26	5,316,547
CLASS 604	
281	5,316,549
CLASS 607	
101	5,315,994
CLASS 623	
23	5,316,550

CLASSIFICATION OF DESIGNS

D1—	106	347,307
	129	347,308
D2—	623	347,312
	642	347,313
	871	347,311
	902	347,314
	961	347,315
	969	347,309
		347,310
		347,316
	970	347,317
	977	347,318
D3—	13	347,319
	202	347,365
	239	347,323
	262	347,322
	272	347,324
	304	347,512
		347,513
	308	347,514
D4—	108	347,325
	135	347,326
	138	347,327
D6—	333	347,328
		347,329
	334	347,330
		347,331
	362	347,332
	366	347,333
	375	347,334
	381	347,335
	403	347,336
	434	347,337
	470	347,338
	477	347,339

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	485	347,342
	491	347,343
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	518	347,345
	531	347,346
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	611	347,321
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D7—	306	347,349
	309	347,350
	330	347,351
	354	347,352
		347,353
		347,354
	357	347,355
	360	347,356
	384	347,357
	412	347,358
	512	347,359
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	606	347,361
		347,362
	608	347,363
		347,364
	670	347,366
	682	347,367
D8—	8	347,368
	14	347,369
	21	347,370
	51	347,371
	61	347,372
	83	347,373

	99	347,374
		347,375
	317	347,376
	354	347,377
	360	347,378
	367	347,379
	380	347,380
	382	347,381
		347,382
		347,383
	395	347,384
D9—	300	347,385
	345	347,386
	510	347,387
	529	347,388
		347,389
	539	347,390
	566	347,391
D10—	7	347,392
	59	347,393
	65	347,394
	72	347,395
	81	347,396
	104	347,397
	106	347,398
	116	347,399
	126	347,400
D11—	13	347,401
	86	347,402
	91	347,403
	143	347,404
	160	347,405
	184	347,406
D12—	6	347,407
	92	347,408

		347,409
		347,410
	110	347,411
	147	347,412
		347,413
	151	347,414
	180	347,415
	193	347,416
	221	347,417
	308	347,418
	425	347,419
D14—	100	347,420
	105	347,421
	114	347,422
	115	347,423
	125	347,424
	137	347,425
		347,426
		347,427
	144	347,428
	163	347,429
	165	347,430
		347,431
		347,432
	191	347,433
	205	347,434
	214	347,435
	230	347,436
		347,437
	240	347,438
	299	347,439
D16—	130	347,440
	132	347,441
	203	347,442
	209	347,443

		347,444
	242	347,501
D17—	20	347,445
D19—	26	347,446
	90	347,447
D20—	7	347,448
	43	347,449
D21—	13	347,450
	54	347,451
	86	347,452
	87	347,461
	108	347,453
	154	347,454
	166	347,455
	233	347,456
	234	347,457
	243	347,458
D22—	126	347,459
	140	347,460
D23—	209	347,462
	223	347,463
		347,464
	233	347,465
	241	347,466
	262	347,467
	270	347,468
	301	347,496
	364	347,469
	366	347,470
	373	347,471
D24—	111	347,472
	112	347,473
	145	347,474
	158	347,475

	190	347,476
	211	347,477
	216	347,478
	224	347,479
D25—	16	347,480
	82	347,481
	119	347,482
	139	347,483
D26—	36	347,484
	67	347,485
	85	347,486
		347,487
	102	347,488
D27—	194	347,489
		347,490
D28—	20	347,491
	31	347,492
	41	347,493
D29—	7	347,494
	8	347,495
D30—	162	347,497
D32—	14	347,498
	20	347,499
	22	347,500
	33	347,504
D34—	15	347,505
	27	347,506
	32	347,502
		347,503
	35	347,507
		347,508
	38	347,509
		347,510
		347,511

CLASSIFICATION OF PLANTS

P.—	5	8,753
	21	8,754
	67.6	8,755
	74.1	8,756
	78	8,757
		8,758
	82.2	8,759
	87.12	8,760
		8,761
	87.4	8,762
		8,763
		8,764

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1
Alaska	2
American Samoa	3
Arizona	4
Arkansas	5
California	6
Canal Zone	7
Colorado	8
Connecticut	9
Delaware	10
District of Columbia	11
Florida	12
Georgia	13
Guam	14
Hawaii	15
Idaho	16
Illinois	17
Indiana	18
Iowa	19
Kansas	20
Kentucky	21
Louisiana	22
Maine	23
Maryland	24
Massachusetts	25
Michigan	26
Minnesota	27
Mississippi	28
Missouri	29
Montana	30
Nebraska	31
Nevada	32
New Hampshire	33
New Jersey	34
New Mexico	35
New York	36
North Carolina	37
North Dakota	38
Ohio	39
Oklahoma	40
Oregon	41
Pennsylvania	42
Puerto Rico	43
Rhode Island	44
South Carolina	45
South Dakota	46
Tennessee	47
Texas	48
Utah	49
Vermont	50
Virginia	51
Virgin Islands	52
Washington	53
West Virginia	54
Wisconsin	55
Wyoming	56
U.S. Air Force	57
U.S. Army	58
U.S. Navy	59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,315,764
5,316,232
5,316,565
5,317,160
04 : 5,315,819
5,316,235
5,316,246
5,316,559
5,316,642
5,316,807
5,317,211
5,317,316
5,317,320
5,317,587
5,317,680
5,317,728
5,317,750
05 : 5,315,935
5,316,208
5,316,293
06 : 5,315,726
5,315,732
5,315,745
5,315,747
5,315,766
5,315,774
5,315,787
5,315,793
5,315,795
5,315,833
5,315,834
5,315,859
5,315,862
5,315,876
5,315,877
5,315,887
5,315,895
5,315,912
5,315,949
5,315,952
5,315,955
5,315,957
5,315,969
5,315,983
5,315,994
5,315,996
5,315,997
5,316,015
5,316,017
5,316,018
5,316,032
5,316,034
5,316,057

5,316,058
5,316,066
5,316,075
5,316,150
5,316,172
5,316,180
5,316,250
5,316,265
5,316,276
5,316,278
5,316,294
5,316,298
5,316,300
5,316,306
5,316,311
5,316,313
5,316,332
5,316,339
5,316,344
5,316,362
5,316,363
5,316,388
5,316,413
5,316,422
5,316,474
5,316,488
5,316,489
5,316,519
5,316,520
5,316,535
5,316,547
5,316,556
5,316,560
5,316,586
5,316,589
5,316,591
5,316,592
5,316,600
5,316,605
5,316,606
5,316,614
5,316,636
5,316,647
5,316,704
5,316,706
5,316,720
5,316,724
5,316,732
5,316,749
5,316,751
5,316,753
5,316,759
5,316,774

5,316,778
5,316,779
5,316,791
5,316,794
5,316,797
5,316,842
5,316,844
5,316,846
5,316,864
5,316,873
5,316,913
5,316,916
5,316,921
5,316,925
5,316,931
5,316,935
5,316,941
5,316,950
5,316,959
5,316,964
5,316,965
5,316,969
5,316,971
5,317,011
5,317,013
5,317,058
5,317,061
5,317,086
5,317,088
5,317,098
5,317,104
5,317,106
5,317,132
5,317,141
5,317,149
5,317,151
5,317,156
5,317,162
5,317,170
5,317,173
5,317,179
5,317,207
5,317,209
5,317,210
5,317,212
5,317,215
5,317,220
5,317,222
5,317,233
5,317,235
5,317,238
5,317,243
5,317,265

5,317,275
5,317,278
5,317,281
5,317,284
5,317,287
5,317,288
5,317,291
5,317,297
5,317,304
5,317,319
5,317,322
5,317,343
5,317,348
5,317,376
5,317,389
5,317,418
5,317,440
5,317,463
5,317,464
5,317,478
5,317,492
5,317,505
5,317,509
5,317,520
5,317,531
5,317,533
5,317,535
5,317,544
5,317,559
5,317,562
5,317,574
5,317,585
5,317,586
5,317,595
5,317,596
5,317,601
5,317,613
5,317,614
5,317,619
5,317,631
5,317,639
5,317,646
5,317,647
5,317,655
5,317,659
5,317,673
5,317,677
5,317,681
5,317,688
5,317,689
5,317,693
5,317,694
5,317,698

5,317,706
5,317,711
5,317,713
5,317,715
5,317,718
5,317,723
5,317,745
08 : 5,315,724
5,315,753
5,316,081
5,316,101
5,316,154
5,316,191
5,316,193
5,316,216
5,316,320
5,316,325
5,316,540
5,316,579
5,316,593
5,316,892
5,316,955
5,317,037
5,317,181
5,317,204
5,317,280
5,317,336
5,317,538
5,317,554
5,317,568
5,317,725
■ : 5,315,731
5,315,751
5,315,790
5,315,815
5,315,939
5,316,028
5,316,121
5,316,167
5,316,244
5,316,295
5,316,551
5,316,684
5,316,725
5,316,730
5,316,951
5,317,081
5,317,114
5,317,127
5,317,295
5,317,388
5,317,497
5,317,576

5,317,582
5,317,594
5,317,607
5,317,612
5,317,645
10 : 5,316,069
5,316,473
5,316,623
5,317,024
5,317,064
11 : 5,316,763
12 : 5,315,759
5,315,767
5,315,794
5,315,808
5,315,822
5,315,888
5,315,947
5,315,951
5,315,967
5,315,988
5,315,991
5,316,026
5,316,045
5,316,065
5,316,145
5,316,168
5,316,260
5,316,329
5,316,360
5,316,377
5,316,405
5,316,436
5,316,476
5,316,477
5,316,493
5,316,543
5,316,677
5,316,682
5,316,748
5,316,869
5,317,247
5,317,249
5,317,303
5,317,308
5,317,326
5,317,565
5,317,579
5,317,593
5,317,641
5,317,695
5,317,724
5,317,742

13 : 5,315,942
5,316,131
5,316,138
5,316,207
5,316,319
5,316,403
5,316,576
5,316,770
5,316,772
5,316,837
5,316,850
5,316,910
5,317,053
5,317,071
5,317,306
5,317,391
5,317,627
5,317,635
5,317,729
5,317,730
15 : 5,316,053
5,316,671
16 : 5,315,896
5,316,283
5,316,480
5,316,988
5,317,187
5,317,197
5,317,259
17 : 5,315,715
5,315,780
5,315,850
5,315,858
5,315,921
5,315,930
5,315,959
5,315,960
5,315,972
5,316,014
5,316,031
5,316,039
5,316,044
5,316,140
5,316,152
5,316,157
5,316,159
5,316,199
5,316,205
5,316,253
5,316,256
5,316,303
5,316,312
5,316,381
5,316,410
5,316,421
5,316,444
5,316,457
5,316,467
5,316,541
5,316,555
5,316,575
5,316,590
5,316,657
5,316,662
5,316,663
5,316,666
5,316,667
5,316,672
5,316,681
5,316,700
5,316,733
5,316,780
5,316,863
5,316,992
5,316,995
5,317,035
5,317,039
5,317,082
5,317,234
5,317,299
5,317,301
5,317,486
5,317,488
5,317,498
5,317,500
5,317,502
5,317,632
5,317,642
5,317,726
5,317,736
18 : 5,315,924
5,316,315
5,316,373
5,316,790
5,317,248
5,317,279
5,317,400
5,317,403
5,317,470
5,317,524
19 : 5,315,977
5,316,197
5,316,429
5,316,435
5,316,568
5,316,808

5,317,691
20 : 5,316,029
5,316,538
5,317,514
21 : 5,315,807
5,315,809
5,315,861
5,315,920
5,316,037
5,316,539
5,316,654
5,316,782
5,317,050
22 : 5,316,085
5,316,104
5,316,310
5,316,522
5,316,743
5,316,998
23 : 5,316,176
5,317,328
24 : Re.34,622
5,315,730
5,315,881
5,315,934
5,316,134
5,316,178
5,316,393
5,316,401
5,316,484
5,316,650
5,316,699
5,316,908
5,316,922
5,316,948
5,316,949
5,317,079
5,317,091
5,317,262
5,317,330
5,317,394
5,317,454
5,317,603
5,317,604
5,317,757
4,352,045
25 : Re.34,627
5,315,721
5,315,817
5,315,832
5,315,874
5,315,948
5,315,964
5,315,981
5,315,982
5,315,999
5,316,002
5,316,189
5,316,261
5,316,341
5,316,353
5,316,371
5,316,392
5,316,406
5,316,452
5,316,475
5,316,478
5,316,499
5,316,545
5,316,637
5,316,833
5,316,848
5,316,887
5,316,920
5,316,927
5,316,973
5,316,989
5,317,085
5,317,135
5,317,198
5,317,214
5,317,232
5,317,236
5,317,263
5,317,273
5,317,277
5,317,293
5,317,314
5,317,380
5,317,385
5,317,436
5,317,452
5,317,481
5,317,485
5,317,506
5,317,507
5,317,527
5,317,672
5,317,686
5,317,720
5,317,740
26 : Re.34,621
5,315,743
5,315,750
5,315,763
5,315,769

5,315,775
5,315,786
5,315,788
5,315,848
5,315,855
5,315,900
5,315,901
5,315,918
5,315,956
5,315,968
5,315,970
5,315,990
5,315,995
5,316,013
5,316,043
5,316,106
5,316,115
5,316,116
5,316,142
5,316,217
5,316,247
5,316,255
5,316,257
5,316,258
5,316,273
5,316,290
5,316,301
5,316,328
5,316,354
5,316,358
5,316,359
5,316,361
5,316,365
5,316,368
5,316,389
5,316,390
5,316,497
5,316,505
5,316,544
5,316,588
5,316,619
5,316,687
5,316,703
5,316,871
5,316,943
5,316,991
5,317,072
5,317,119
5,317,124
5,317,256
5,317,294
5,317,652
5,317,667
5,317,721
27 : 5,315,771
5,315,796
5,315,840
5,315,882
5,316,004
5,316,016
5,316,035
5,316,041
5,316,105
5,316,200
5,316,238
5,316,243
5,316,251
5,316,259
5,316,343
5,316,357
5,316,445
5,316,613
5,316,625
5,316,673
5,316,688
5,316,708
5,316,812
5,316,838
5,316,849
5,316,907
5,316,928
5,317,056
5,317,074
5,317,118
5,317,251
5,317,254
5,317,286
5,317,300
5,317,465
5,317,479
5,317,511
5,317,663
5,317,676
5,317,683
5,317,700
5,317,722
5,136,852
28 : 5,316,302
5,316,408
5,316,462
29 : 5,315,784
5,315,937
5,316,117
5,316,264
5,316,342
5,316,427

5,316,439
5,316,926
5,316,946
5,317,003
5,317,040
5,317,490
30 : 5,316,634
5,316,701
31 : 5,316,426
5,317,690
5,317,744
33 : 5,315,740
5,315,804
5,316,139
5,316,335
5,316,644
5,316,715
5,317,126
5,317,546
5,317,567
5,317,636
5,317,697
5,317,708
5,317,719
34 : 5,315,748
5,315,849
5,315,869
5,315,905
5,315,989
5,315,993
5,316,108
5,316,161
5,316,162
5,316,387
5,316,400
5,316,471
5,316,550
5,316,562
5,316,581
5,316,587
5,316,598
5,316,607
5,316,659
5,316,661
5,316,726
5,316,731
5,316,754
5,316,761
5,316,820
5,316,879
5,316,968
5,317,004
5,317,017
5,317,018
5,317,019
5,317,031
5,317,036
5,317,042
5,317,077
5,317,113
5,317,128
5,317,190
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5,317,192
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5,317,078
5,317,137
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5,317,395
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5,317,732
53 : 5,315,812
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DESIGN PATENTS

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08 : 347,325
09 : 347,331
347,354
347,355
347,357
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12 : 347,329
347,418
347,445
347,451
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347,462
347,469
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347,494
13 : 347,371
347,384
17 : 347,335

347,343
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347,477
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347,479
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347,368
347,376
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27 : 347,308
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347,412
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347,425
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PLANT PATENTS

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12 : 8,753
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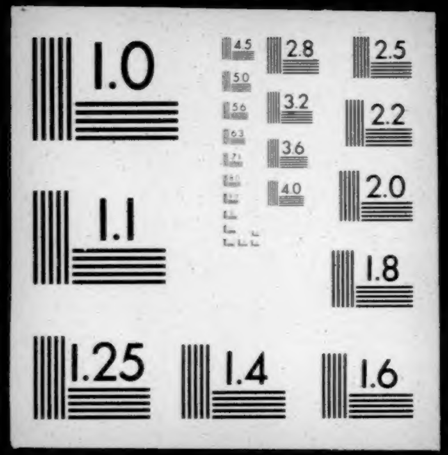

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